Middle Missouri River Recreational Fishing Survey
- 2003 field season -

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Summary

A creel survey was conducted in the middle Missouri River during the period May – October, 2003. A total of 361 anglers were interviewed and had fished for a total of 1,277 hours. The majority of interviews (37%) were collected in the Robinson section and most of interviews (44%) occurred in May. Generally, catch rates for game fish were low. Goldeye was the most common species caught by anglers averaging 0.25 fish/h. Channel catfish, the most common game fish caught, averaged 0.08 fish/h and the sauger rate averaged 0.05 fish/h. Interest in fishing the middle Missouri River has increased substantially over the past decade especially in the Upper section, where fishing pressure has increased 210%.

Introduction

Surveying the recreational fishing use is important for determining present use levels and for evaluating management changes that have been implemented for improving the fishery. Very few surveys have been conducted in this area during the past. Berg (1981) conducted the only and most recent survey during 1977-78, 25 years ago. This information is outdated and not pertinent for today's use, however, it is an important reference for future comparisons. New survey information is needed to gauge public fishing use of this important native fishery. The information generated from this creel survey will be valuable for providing insight on the effects of PPLMT's, Great Falls hydropower dams on fisheries resources as directed by the Federal Energy Regulatory Commission, re-licensing order 2188, Article 417. Also, the data from the study will be useful information regarding the effects of the Recreation Plan (Article 426) and add to the Recreational Use Monitoring Study (Article 427)

The middle Missouri River supports a diverse warmwater fishery. All of the native fish species that historically occurred here are still found in this reach because of the relatively unaltered state of the river. There are substantial angling opportunities for sauger, walleye, channel catfish, shovelnose sturgeon, smallmouth bass, freshwater drum, burbot and a wide variety of nongame species. A major paddlefish snagging fishery exists in the lower 40-mile reach of the middle Missouri River. This fishery averages about 2,500 angler days, with an annual harvest of about 500 paddlefish (Gilge 2002). Rainbow trout, brown trout and mountain whitefish are coldwater game fish that are mostly common in the upper 16-mile reach between Morony Dam and Carter Ferry. The Montana Fish Wildlife and Parks (MFWP) fisheries objective for the middle Missouri River is to emphasize native species management (MFWP 1997).

The middle Missouri River is a 238-mile reach from Morony Dam near Great Falls to the confluence with the Musselshell River in the Charles M. Russell National Wildlife Refuge. The river meanders through remote scenic canyons and cottonwood bottoms and is a highly acclaimed wildlife and recreational area. About 80% of the river lies within the Upper Missouri River Breaks National Monument and the Charles M. Russell National Wildlife Refuge. The river is also classified as Wild and Scenic and motorboat use restrictions occur during the summer period between Memorial Day and Labor Day. Access is limited in the area with only 8 boat ramps throughout the reach located at Widow Coulee (RM-2102), Carter Ferry (RM-2089), Fort Benton (RM-2073), Loma (RM-2053), Coal Banks (RM-2032), Judith Landing (RM-1982), Robinson Bridge (RM-1921) and Rock Creek (RM-1907).

Anglers were routinely surveyed in about 200 miles of this reach. The survey ran from May 2 through October 26, 2003. One person boated the river from Portage Coulee (RM-2102) down river to near Wilder Coulee (RM-1901) and contacted anglers for information on their present days fishing experience. One complete survey of the river took 4 days to do the first half (Morony to Judith Landing) and 3-4 days to do the second half (Judith Landing to Wilder Coulee). Study section locations (Table 1) were arranged so that comparisons could be made with the previous creel survey and the Montana Statewide Annual Angling Pressure Survey. A copy of the creel survey form used is given in Appendix A. Creel dates and number of anglers sampled are given in Appendices B-G.

River conditions in the study area were abnormally low during 2003 because of a severe drought, and this probably reduced angling use and success. The 2003 annual mean discharge of the Missouri River at the Robinson Bridge USGS gage station was 6321 cfs compared to the average annual mean of 9085 cfs. The lower flows made it difficult to launch boats and navigate the river, which probably discouraged angling. Low flows probably also reduced upstream movements of migratory fish species due to lack of important trigger flows, which in turn makes angling less productive due to the lack of fish concentrations.

Table 1. Locations, river mile boundaries and number of access points for the creel survey study sections in the middle Missouri River study area

Section	**Location**	**Length** (mi)	**Number of public access points**
Upper	RM 2051- 2106	55	9
Middle	RM 1984-2051	67	4
Lower	RM 1921-1984	63	7
Robinson	RM 1901-1921	20	11
Marias Confl.	RM 0-1	1	4

General creel results

A total of 361 anglers were contacted during the 6-month survey period. Most anglers interviewed (96 %) were residents, with Great Falls area residents comprising the greatest portion (25%) of the total anglers. Anglers came from a wide array of outside areas representing 23 Montana counties and 10 other states and provinces.
Rod fishing, snagging, and set lining were the three common methods (Table 2). When a combination of methods were used, (e.g. rod fishing and snagging by the same angler during the day) each category was awarded 0.5 number of contacts and the hours for each category was divided as reported by the angler.

Fishing with a rod was by far the most common fishing method and was used by 73 % of the anglers interviewed (Table 2). Snagging was a fairly popular method for fishing during the short period that paddlefish are concentrated in the river during May and June. Set line fishing was the least popular fishing method and was used by only 4% of the anglers.

Most (84%) of the anglers contacted were fishing from the bank. The distribution of angler interviews was not even and probably was indicative of the angling use that was occurring on the river. Most of the interviews (44%) occurred in May and the Robinson Bridge section was the area where the greatest proportion of interviews were collected (37%) (Figure 1). This specific heavy use was probably related to the great turnout that was observed during the Memorial Day weekend which is normally the peak of the paddlefish snagging season. During this period (May 23-26) 30% of the anglers for the entire survey were interviewed.

A little over half (62%) of the anglers interviewed indicated a target species they were fishing for (Table 3). Paddlefish were indicated as a preference by 23% (82/361) of the anglers, although all anglers were confined to the Robinson Section. Sauger/walleye (19%) and channel catfish (12%) were the next most popular species targeted by anglers and both these groups were targeted throughout the Middle Missouri River.

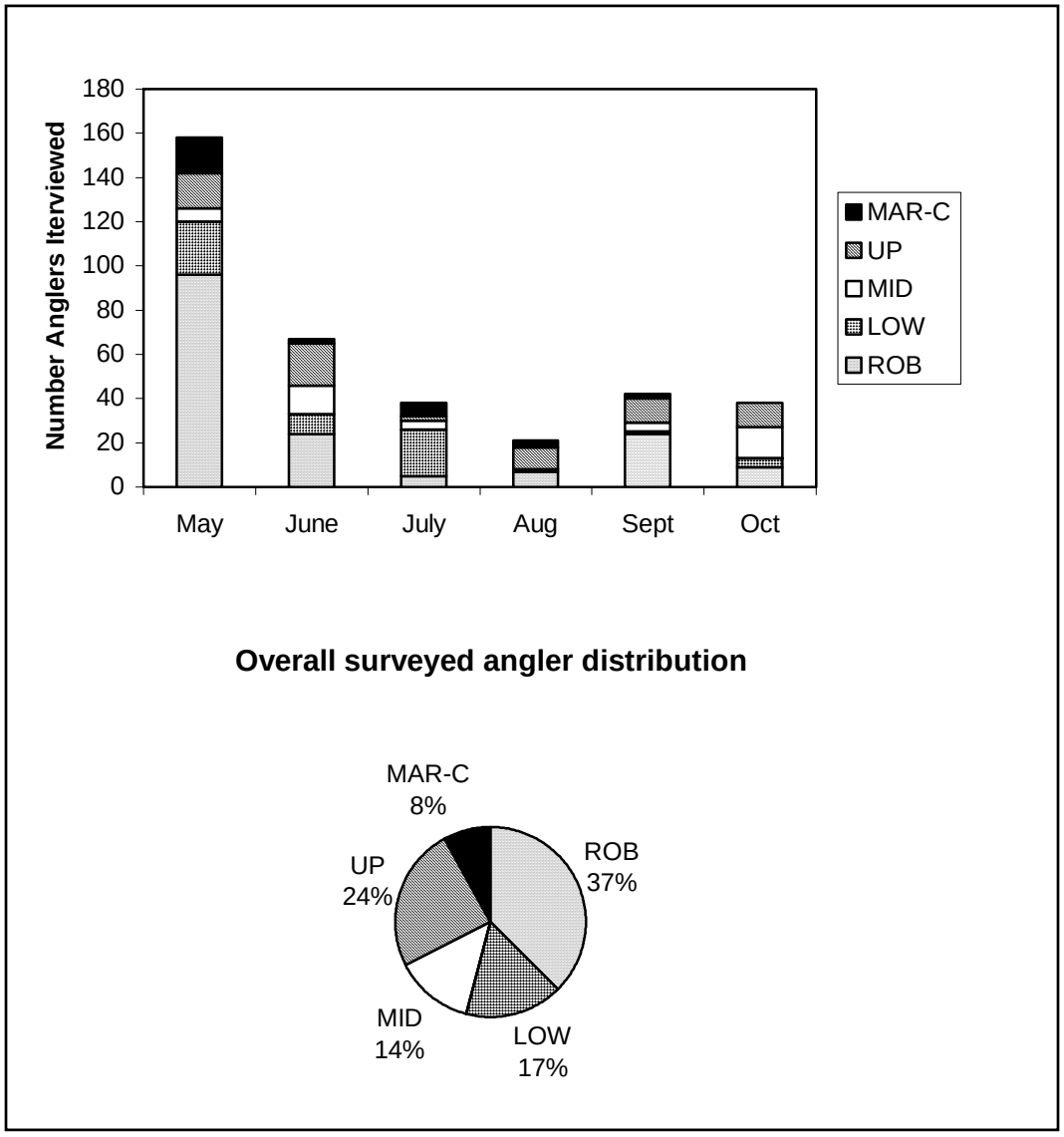
Table 2. Creel survey statistics for the three types of recreational anglers sampled in the middle Missouri River, 2003.

	Rod	Snagging	Set Line
Total number of interviews	263	82	16
Months when present	All	May, June	May, Aug-Oct
Location (use)*	All	LOW ROB	MAR-C, LOW ROB
Fishing effort (hr) [1/]	824	276	177
Number fish caught	493	25	56
Most common game fish species caught	Channel catfish	Paddlefish	Channl.catfsh

* UP = Missouri River reach upstream of Marias River Confluence; MAR-C = Lower mile of Marias river; MID = Missouri River reach below Marias River to Judith Landing; LOW = Missouri River reach downstream of Judith Landing to Robinson Brg.; ROB = Missouri River reach downstream of Robinson Brg. to Wilder Coulee.

[1/] Mostly represented by incomplete trips

Figure 1. Spatial and temporal distribution of the number of anglers interviewed while conducting angler surveys in the Middle Missouri River, 2003.



(* UP = Missouri River reach upstream of Marias River Confluence; MAR-C = Lower mile of Marias river; MID = Missouri River reach below Marias River to Judith Landing; LOW = Missouri River reach downstream of Judith Landing to Robinson Brg.; ROB = Missouri River reach downstream of Robinson Brg. to Wilder Coulee.)

Table 3. Species of fish targeted by anglers fishing in the Middle Missouri River as indicated from the creel survey interviews, 2003.

	---Number of anglers indicating preference at each section ---					
	Overall	**UP**	**MID**	**LOW**	**ROB**	**MAR-C**
Channel catfish	44	9	3	12	18	2
Freshwater drum	3	0	0	0	0	3
Goldeye	1	0	0	1	0	0
Northern pike	3	2	0	0	0	1
Paddlefish	82	0	0	0	82	0
Rainbow trout	1	1	0	0	0	0
Sauger/walleye	67	16	13	7	24	7
Shovelnose sturgeon	15	0	2	1	6	6
Smallmouth bass	8	7	0	0	0	1
Total # anglers	224	35	18	20	130	20

Specific catch results

A total of 1,277 hours of angling were recorded while conducting the survey. Because the hours spent snagging for paddlefish were limited to only that species, these hours (276 hrs) were subtracted from the total hours (1,277- 276 = 1,001) to get a total number of hours for general species fishing for purposes of calculating general catch rates. Most anglers interviewed were still in the process of fishing and only 15.5% reported completed trips. The average number of hours spent fishing for the completed trip anglers was 3.4 hours. Table 4 is a list of all the fish species caught and catch rates. A total of 574 fish represented by 14 species were reported to the creel clerk. Goldeye was the most common species caught by anglers during the survey averaging 0.25 fish/hr. Generally, catch rates for game fish were found to be low in the 2003 creel survey. Channel catfish was the most common game fish caught throughout the study area, averaging 0.08 fish/hr. Average sizes of fish measured in the creel are presented in Table 5. For the most part, the sizes recorded here are fairly typical compared to the sizes recorded for species measured in the annual electro fishing surveys (Gardner 2004). Age analysis was completed only for the channel catfish because fewer other game fish species were measured (Table 6). A total of 83% of the channel catfish creeled were seven years or older.

In general, angler catch rates appear to have declined significantly since 1977-78. The overall catch rate for sauger has declined 75% since 1977-78, with smaller declines for shovelnose and channel catfish (38 and 11% declines, respectively; Table 7). Fisheries field surveys have also shown a steep decline in sauger numbers over this long period but numbers rebounded somewhat in the Lower and Robinson sections recently (Gardner 2004). Walleye were rarely encountered in the 1977-78 angler creel, but they were was the fourth most common game fish caught in the 2003 creel. Walleye catch rates, although low, were highest in the Upper and Middle sections (Table 6). Walleye catch rate was highest (0.11/hr) in the Middle Section. Smallmouth bass were never recorded in the 1977-78 creel but were relatively common 2003 in the Upper and Marias Confluence sections, averaging 0.08 and 0.06 fish/hr, respectively.

Sauger are of special interest because of the recent change in angler creel limit. In 2000 the combined sauger/walleye daily limit of 5 daily was changed to allow only one sauger in the Upper, Middle and Marias sections. By 2002 the reduced sauger limit was extended to include the entire study area. It is important to evaluate what effect, if any, this change has had on the sauger population. A total of 47 sauger were reported caught by anglers in this study and 32 of these were released giving a release rate of 68%. Anglers released sauger due to the regulation but also several anglers didn't keep any because they wanted to help conserve sauger numbers. Gilge 2002, reported a sauger release rate of 74% for the Robinson Section during the spring, 2002.

Shovelnose sturgeon are another special interest species because they are vulnerable to over exploitation as a result of their low recruitment. Quist et al. (2002) believed there is potential for over fishing this population even with low exploitation rates. However, this study found that very few anglers harvest shovelnose. Only 9% of the 2003 interviewed anglers who caught at least one fish, caught shovelnose sturgeon and only 30% of the 48 shovelnose that were reported caught were harvested. It appears the angling pressure on shovelnose in the Middle Missouri River remains extremely low.

Interest in fishing the middle Missouri River has increased substantially over the past decade. Table 8 shows an 80 – 210% increase in fishing pressure for the three sections in the middle Missouri River comparing the beginning of the decade (1989, 1990 and 1991) to the end of the decade (1999, 2001 and 2003). Part of the increase can be related to the general trend of increased recreation interest throughout the state, however, the increased fishing pressure, especially in the Upper Section (210% increase), might also be related to the recently new and/or improved fishing and boat access sites (Widow Coulee and Fort Benton).

Table 4. Angler catch rates (number/hr.) at section locations for 15 species reported from survey interviews.

	Number Caught	CPUE					
		Overall	UP	MID	LOW	ROB	MAR-C
Burbot	1	Tr.	0	0	0	Tr	0
Carp	29	0.03	0.02	0.06	0	0.02	0.05
Channel catfish	82	0.08	0.04	0.13	0.16	0.03	0
Freshwater drum	77	0.08	0.06	0.18	0.11	0.02	0.04
Goldeye	217	0.22	0.48	0.55	0.05	0.05	0.45
Paddlefish	5	NA	NA	NA	0	0.03**	NA
Rainbow trout	1	Tr.	0.01	0	0	0	0
Sauger	47	0.05	0.02	0.01	0.10	0.04	0
Shorthead redhorse	12	0.02	0.02	0.01	0	Tr.	0.04
Shovelnose sturgeon	48	0.05	0.01	0.03	0.01	0.12	0.03
Smallmouth bass	18	0.02	0.08	0	0	0	0.06
Smallmouth buffalo	1	Tr.	0	0	0	Tr.	0
Walleye	30	0.03	0.04	0.11	0.01	0.02	0
Yellow perch	3	Tr.	0.02	0	0	0	0
Total # hours		1,002*	170	119	315	318*	80

***** Catch rates not including the 276 paddlefish snagging hours.
****** Catch rate calculated using a total of 276 paddlefish snagging hours.

Table 5. Lengths of harvested fish from anglers creeled in the Middle Missouri River, 2003.

	Number	Average Total Length (in.)	Length Range
Channel catfish	37	21.6	11.3 – 30.2
Freshwater drum	10	12.0	9.4 – 14.0
Paddlefish	5	54.5	36.9 – 65.0
Rainbow trout	1	11.0*	
Sauger	10	15.0	11.3 – 16.7
Shovelnose sturgeon	11	32.9**	29.8 – 36.7
Smallmouth bass	12	11.8	10.2 – 13.2
Walleye	14	16.3	12.0 – 21.1

** Indicates a fork length measurement

Table 6. Average ages for harvested channel catfish measured during the middle Missouri River creel survey, 2003.

Size Group (TL inches)	**Number smpl.**	**Average Age**
12.0 - 12.9	1	4
13.0 - 13.9	2	5
14.0 - 14.9	1	5
15.0 - 15.9	0	
16.0 – 16.9	2	6
17.0 – 17.9	0	
18.0 – 18.9	3	7.3
19.0 - 19.9	2	8.5
20.0 – 20.9	1	8
21.0 – 21.9	7	10.1
22.0 – 22.9	3	9.7
23.0 – 23.9	5	10.4
24.0 – 24.9	0	
25.0 +	9	11.2

Table 7. Comparisons of sauger, shovelnose and channel catfish catch rates (number/hr) between the 1977-78 creel survey (Berg 1981) and the 2003 creel survey, middle Missouri River.

	Upper Section	**Marias, Middle & Lower Sec.**	Robinson Section
Sauger			
1977-78	0.40	0.14	0.07
2003	0.02	0.04	0.04
Shovelnose			
1977-78	0.02	0.19	0.02
2003	0.01	0.02	0.12
Channel catfish			
1977-78	0.02	0.16	0.09
2003	0.04	0.10	0.03

Table 8. Fishing pressure (angler-days) for the Missouri River from Morony Dam to the headwaters of Fort Peck Reservoir for 1989 through 2003. Data from MFWP statewide fishing pressure mail survey.

Year	Upper Section (Sec 7)	Middle Section (Sec 6B)	Lower & Robinson Sections (Sec 6A)
1989	2,056	1,660	8,312
1991	5,215	4,513	9,726
1993	5,557	2,859	10,767
1995	6,606	6,693	15,131
1997	11,568	7,818	16,857
1999	16,861	11,491	19,527
2001	16,686	6,896	11,740
2003	6,094	7,499	19,657

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Appendix A. Creel survey form used.

2003 Middle Missouri River Creel Data

Interview #: _____. Time: _____. Date: ___/ ___/ ___.

Area Fished: _____. RM = _____.

Residence : _____. Fishing from: ( ) Bank ( ) Boat ( ) Combo.

Methods: ( ) Angling ( ) Setline ( ) Snagging

Lures: ( ) Live bait ( ) Prepared bait ( ) Artificial lure

Target fish species: _____.

Total hours spent fishing: _____.

Fishing for day: ( ) Complete ( ) Not complete

	------- ROD ------		------- Setline ------	
	Number Kept	**Number Relsd**	**Number Kept**	**Number Relsd**
Sauger				
Walleye				
Bass				
Sturgeon				
Catfish				
Paddlefish				
Goldeye				
FW Drum				

That completes the interview. Thanks for your time. Do you have any comments that you would like to make about the management of this fisheries?

Appendix B. Number of anglers surveyed during May for the five study sections, middle Missouri River, 2003.

	Date	UP	MAR-C	MID	LOW	ROB	
MAY	**1**						
	2					14	
	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15	0					
	16	8					
	17	0	7	6			
	18			0			
	19			0			
	20						
	21						
	22						
	23				2		
	24				13		
	25				9	24	
Holiday	**26**					58	
	27						
	28						
	29						
	30	8					
	31	0	9	0			
Ttl # Anglers		16	16	6	24	96	158
Sect'n visits		5	2	4	3	3	17 visits

Appendix C. Number of anglers surveyed during June for the five study sections, middle Missouri River, 2003.

	Date	UP	MAR-C	MID	LOW	ROB	
June	**1**			2			
	2			1			
	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						
	19						
	20				9		
	21				0		
	22				0	13	
	23					11	
	24						
	25						
	26						
	27	6					
	28	13	2	6			
	29			1			
	30			3			
Ttl # Anglers		19	2	13	9	24	67
Sect'n visits		2	1	5	3	2	13 visits

Appendix D. Number of anglers surveyed during July for the five study sections, middle Missouri River, 2003.

	Date	UP	MAR-C	MID	LOW	ROB	
July	**1**						
	2						
	3						
Holiday	**4**				7		
	5				13		
	6				1	4	
	7						
	8						
	9						
	10						
	11	2					
	12	0	4	4			
	13			0			
	14			0			
	15						
	16						
	17						
	18				0		
	19				0		
	20					0	
	21						
	22						
	23						
	24						
	25	0					
	26	0	2	0			
	27			0			
	28			0			
	29						
	30						
	31						
Ttl # Anglers		2	6	4	21	5	38
Sect'n visits		4	2	6	5	3	20visits

Appendix E. Number of anglers surveyed during August for the five study sections, middle Missouri River, 2003.

	Date	UP	MAR-C	MID	LOW	ROB	
August	**1**				0		
	2				1		
	3				0	0	
	4						
	5						
	6						
	7						
	8						
	9	9	2	0			
	10						
	11						
	12						
	13						
	14						
	15				0		
	16				0		
	17				0	2	
	18						
	19						
	20						
	21						
	22	1					
	23	0	1	0			
	24			0			
	25			0			
	26						
	27						
	28						
	29				0		
	30				0		
	31				0	5	
Ttl # Anglers		10	3	0	1	7	21
Sect'n visits		3	2	4	9	3	21visits

Appendix F. Number of anglers surveyed during September for the five study sections, middle Missouri River, 2003.

Date		UP	MAR-C	MID	LOW	ROB	
September	**1**						
Holiday	**2**						
	3						
	4						
	5	4					
	6	2	2	0			
	7			0			
	8			0			
	9						
	10						
	11						
	12				0		
	13				0		
	14				1	6	
	15						
	16						
	17						
	18						
	19	1					
	20	4	0	2			
	21			0			
	22			2			
	23						
	24						
	25				0		
	26				0		
	27				0	18	
	28						
	29						
	30						
Ttl # Anglers		11	2	4	1	24	42
Sect'n visits		4	2	6	6	2	20visits

Appendix G. Number of anglers surveyed during October for the five study sections, middle Missouri River, 2003.

	Date	UP	MAR-C	MID	LOW	ROB	
October	**1**						
	2						
	3	3					
	4	0	0	5			
	5			5			
	6			0			
	7						
	8						
	9						
	10				0		
	11				0		
	12				0	7	
	13						
	14						
	15						
	16						
	17	5					
	18	3	0	4			
	19			0			
	20			0			
	21						
	22						
	23				0		
	24				2		
	25				2	2	
	26						
	27						
	28						
	29						
	30						
	31						
Ttl # Anglers		11	0	14	4	9	38
Sect'n visits		4	2	6	6	2	20 visits

Appendix H. Individual angler comments recorded while conducting creel interviews.

Species :

- Paddlefish population on decrease; spawning problems.
- More paddlefish needed in the river.
- Dredge a channel out of FT Peck for female paddlefish.
- 2002 someone weighed and measured paddlefish twice a day at each camp. Should still be doing that.
- More surveys done on all fisheries especially paddlefish
- Would like to see more smallmouth bass in river.
- Would like to see more trout below Morony Dam.

Fishing regulations :

- Sauger limit of one is not right. Catch many more sauger than walleye.
- Sauger limit of one is wrong; all you catch is sauger.
- All I catch is sauger; no walleye. Sauger limit should be more than one.
- Shouldn't have to buy a warm water license. It should be included in the sportsman license.
- License fee to high for out of state fishermen; highest in the U.S.
- I would like to keep a shovelnose if I snag it.
- I want to keep the shovelnose sturgeon I snag.
- Would like to keep shovelnose snagged while fishing for paddlefish.
- Need to make regulations clearer. Is Morony Reservoir closed to fishing?
- Post fishing regulations at all fishing accesses.

Land management:

- Need more places to access river.
- Don't pull FT Benton boat ramp out so early in the fall.
- Maintain higher water levels in FT Peck Reservoir and river.
- Fix Power Plant Road.
- Hard to find FWP fishing access sites, need more of them.
- Need to mark river channel in low water.
- Need more mile-markers on the river.
- Nice river parks.
- Sod house and campground at Woodhawk is very nice.
- More fire rings at camp spots.
- More bathrooms and garbage facilities at Robinson Bridge.

Appendix H. Continued

<u>Other</u>:

- Pattern MT FWP after Arkansas FWP.
- Beautiful country (Carter area).
- People should be required to bury their human waste and toilet paper.
- Too many big game permits go to out of state hunters.
- Increase limits on upper Missouri (Dearborn area).
- Too many streams are catch and release only. Kids should be allowed to keep one fish.
- Open Tiber damn face back open to fishing.
- Tiber walleye are too small. Why don't they grow.
- Need better blue ribbon trout streams.
- **Boat launches on the Yellowstone (especially in the Forsyth area) need repair.**