

F-78-R-1
Region 4

MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS
FISHERIES DIVISION
JOB PROGRESS REPORT

STATE: Montana PROJECT NO. 3491
PROJECT TITLE: Statewide Fisheries Investigations
STUDY TITLE: Survey and Inventory of Warmwater Lakes
JOB TITLE: Creel Census - Lake Frances & Tiber Reservoir
PERIOD COVERED: May 27, 1995, through September 3, 1995

ABSTRACT

Interviews of 450 parties of anglers on Lake Frances and 500 parties on Tiber Reservoir were conducted during weekend creel census surveys throughout the summer of 1995. Boat anglers averaged approximately 5.2 hours per completed trip at Tiber Reservoir and 4.6 hours at Lake Frances. Most anglers originated from within a 75 mile radius of the lakes. Walleye were the main target species with catch rates of 0.13 and 0.44 fish per hour, at Lake Frances and Tiber Reservoir, respectively. Catch rates for northern pike were 0.21 fish per hour at Lake Frances and 0.06 fish per hour at Tiber Reservoir. Anglers at Lake Frances kept 84 percent of the walleye and 43 percent of the northern pike they caught. At Tiber Reservoir, anglers kept 49 percent of walleye and 26 percent of northern pike caught. June and July produced the highest catch rates for walleye at Tiber, while at Lake Frances, walleye catch rates were best in June. At Lake Frances, August produced the highest catch rates for both northern pike and yellow perch. The majority of the walleye harvested at Tiber Reservoir were four years old while those at Lake Frances were five and six years old. The results of this census are compared to studies conducted on Lake Frances in 1989, 1993 and 1994 and on Tiber Reservoir in 1991, 1993 and 1994.

OBJECTIVES AND DEGREE OF ATTAINMENT

This project will monitor angler use, satisfaction, and success on Tiber Reservoir and Lake Frances by directly interviewing anglers on weekends throughout the summer. It will also provide data to monitor changes in species, size, and age composition and exploitation rate of fish harvested by anglers. Data will be compared to results from similar weekend creel surveys conducted in 1993 and 1994, detailed creel surveys conducted in 1989 and 1991, and statewide mail survey results to monitor changes. The project will provide current, accurate information on angler satisfaction and success.

Progress was made on the objectives listed above and data are included in this report.

PROCEDURES

Working eight-hour days, ground-based creel clerks interviewed as many parties of anglers as possible on weekends between Memorial Day and Labor Day. Information on species composition, catch rates, angler and trip characteristics, angler satisfaction, and opinions on fisheries management were obtained from each party interviewed. Clerks recorded number and species of fish caught. Fish were measured to the nearest tenth of an inch and weighed to the nearest hundredth of a pound. All fish caught by an individual party were measured to eliminate bias of measuring one large fish. Dorsal spines or pelvic fin rays of walleye were collected for determination of age classes harvested. Spines were mounted and sectioned as described previously (Hill, et al, 1996). Abbreviations for species listed in tables are as follows: WE=walleye; NP=northern pike; YP=yellow perch.

FINDINGS

The 1995 data from both waters will be compared to earlier creel surveys conducted in 1989, 1993 and 1994 on Lake Frances and 1991, 1993 and 1994 on Tiber Reservoir.

Angler and Trip Characteristics

Angler and trip characteristics are presented in Table 1. During 1995, creel clerks interviewed 499 parties at Tiber Reservoir and 451 parties at Lake Frances. Approximately 38 percent of the interviews at Tiber were completed trips, while 56 percent of the Lake Frances interviews were completed trips. The average hours per completed trip for boat anglers was 5.2 at Tiber and 4.6 at Frances, which is comparable to recent years. Shore fishermen spent less time fishing than did boat fishermen.

Approximately 75 percent of the anglers fishing both waters are considered local (within a 75 mile radius). A small percentage (2-3 percent) were from out-of-state. Walleye continue to be the main species targeted in both waters, but "any fish" also ranked high. Up to 17 percent of anglers at Lake Frances targeted the walleye and northern pike combination. Lures and bait combinations were the most popular angling method at Tiber while bait predominated at Frances. Live minnows can be use as bait at Tiber but not at Lake Frances.

During interviews, creel clerks asked anglers about their satisfaction with the fishery. Examination of Table 1 indicates fewer anglers at Tiber were satisfied with both the number and size of fish caught in 1995 as compared to previous years. At Lake Frances, angler satisfaction greatly increased in 1995 compared to past surveys.

Table 1. Angler and trip characteristics, Tiber Reservoir and Lake Frances.

TIBER RESERVOIR		1991	1993	1994	1995
No. of parties interviewed		528	409	463	399
No. of anglers represented		1245	996	965	1039
No. completed trip interviews		147	120	203	188
Avg. hours/completed trip	- boat	5.8	5.1	5.0	5.2
	- shore	5.3	4.2	4.1	2.6
Avg. no. attended lines	- boat	1.2	1.1	1.0	1.0
	- shore	1.5	1.4	1.6	1.5
Angler origin (%)	- local (75 mi rad)	78	74	75	74
	- Western MT	6	7	6	10
	- Other MT	14	17	19	13
	- Non-resident	2	2	0	3
Angling method (%)	- Lures	7	19	19	15
	- Bait	38	37	32	35
	- Lures & bait	55	44	49	50
Target species	WE	72	42	57	58
(% of anglers)	NP	1	0	1	1
	YP	0	1	0	0
	WE/NP	6	2	1	2
	WE/NP/YP	11	1	0	0
	Any fish	11	55	41	40
Angler satisfaction (%)	- No. of fish	--	54	62	34
	- Size of fish	--	61	55	46
LAKE FRANCES		1989	1993	1994	1995
No. of parties interviewed		962	402	301	451
No. of anglers represented		2102	939	690	1108
No. completed trip interviews		433	209	215	251
Avg. hours/completed trip	- boat	5.3	4.8	4.6	4.6
	- shore	3.9	2.8	2.8	3.8
Avg. no. attended lines	- boat	1.1	1.1	1.2	1.2
	- shore	1.2	1.0	1.2	1.2
Angler origin (%)	- local (75 mi rad)	70	71	83	75
	- Western MT	17	13	9	8
	- Other MT	10	13	7	15
	- Non-resident	3	3	1	2
Angling method (%)	- Lures	13	13	4	12
	- Bait	35	54	60	58
	- Lures & bait	52	33	36	30
Target species	WE	59	52	54	54
(% of anglers)	NP	9	8	3	3
	YP	1	1	1	1
	WE/NP	14	7	10	17
	WE/NP/YP	3	3	12	6
	Any fish	15	29	20	19
Angler satisfaction (%)	- No. of fish	--	29	24	49
	- Size of fish	--	38	25	64

Catch Statistics and Angler Success

Catch statistics and angler success are presented in Table 2. Walleye catch rates in 1995 at Tiber averaged 0.44 fish per hour, a decrease from a much higher rate of 0.72 in 1994, but slightly higher than that observed in 1991 and 1993. Catch rates for walleye at Lake Frances were much lower, averaging 0.13 fish per hour, both in 1994 and 1995. Northern pike catch rates remain low at Tiber, at 0.06 fish per hour. At Lake Frances, northern pike were caught at higher rates (0.21 fish/hour) but decreased from 0.35 fish per hour in 1994. Catch rates for yellow perch in both waters remain similar to past years. At Tiber in 1995, walleye were caught more readily in June and July as compared to July and August in previous years. At Lake Frances, walleye catches were highest in June while northern pike and yellow perch catches were best in August.

Harvest rates were fairly comparable to the earlier surveys with walleye at Tiber harvested at 0.22 fish per hour while Lake Frances walleye were harvested at 0.11 fish per hour. Harvest of northern pike and yellow perch at Tiber continues at low rates. At Lake Frances, northern pike were harvested at 0.09 fish per hour while yellow perch were removed at 0.11 fish per hour.

During 1994, fishermen kept approximately 33 percent of the walleye and 38 percent of the northern pike caught in Tiber. In 1995, they kept a greater proportion of walleye caught, (nearly 50 percent) and kept fewer northern pike (26 percent). At Lake Frances, anglers kept 84 percent of the walleye caught in 1995, which is comparable to 1994. Lake Frances anglers kept 43 percent of the northern pike caught in 1995, up from 38 percent kept in 1994. Walleye average length continued to decrease in Tiber, from 15.9 inches in 1991 to 14.3 inches in 1995. Average weight of walleye for the past two years remains at approximately one pound. At Lake Frances, walleye average length increased from 14.4 inches in 1989 to 15.8 inches in 1994 and to 16.8 inches in 1995. Average weight of Lake Frances walleye in 1995 was 1.67 pounds. Northern pike average length in 1995 in both waters remained comparable to 1994. Overall condition of walleye (length and weight) may explain angler satisfaction/dissatisfaction discussed in the preceding section.

MANAGEMENT CONCERNS

During interviews, anglers were asked whether or not there were any management problems. In 1994, approximately 85 percent of those interviewed at both waters said there were no problems. About 80 percent of those interviewed in 1995 also said there were no major problems. A listing of comments on management concerns appears in Table 3. Improved facilities at both lakes were highest on the list of concerns. Tiber anglers feel there is a need for additional forage. At Lake Frances, further concerns include more fish in the lake and better enforcement.

Table 2. Catch statistics and angler success, Tiber Reservoir and Lake Frances.

		TIBER RESERVOIR							
		1991		1993		1994		1995	
Catch rate (fish/hr)	WE	0.35		0.38		0.72		0.44	
	NP	0.07		0.03		0.03		0.06	
	YP	0.04		0.01		0.04		0.02	
Harvest rate (fish/hr)	WE	0.18		0.21		0.24		0.22	
	NP	0.03		0.03		0.01		0.02	
	YP	0.03		0.01		0.01		0.01	
Fish kept (%)	WE	51		54		33		49	
	NP	48		83		38		26	
	YP	82		76		29		33	
Average length(in.)	WE	15.9		15.3		14.4		14.3	
	NP	22.1		22.6		21.5		21.1	
	YP	--		8.5		8.9		9.8	
Catch rates by month (fish/hr)		WE	NP	WE	NP	WE	NP	WE	NP
	June	0.54	0.05	0.16	0.02	0.52	0.05	0.48	0.09
	July	0.51	0.12	0.44	0.04	0.99	0.04	0.59	0.06
	August	0.36	0.04	0.68	0.03	0.87	0.03	0.21	0.05
		LAKE FRANCES							
		1989		1993		1994		1995	
Catch rate (fish/hr)	WE	0.35		0.17		0.13		0.13	
	NP	0.11		0.28		0.35		0.21	
	YP	0.29		0.13		0.22		0.23	
Harvest rate (fish/hr)	WE	0.17		0.12		0.11		0.11	
	NP	0.07		0.11		0.13		0.09	
	YP	0.12		0.08		0.18		0.11	
Fish kept (%)	WE	50		73		86		84	
	NP	64		40		38		43	
	YP	46		63		83		50	
Average length(in.)	WE	14.4		15.4		15.8		16.8	
	NP	21.2		19.5		20.2		20.2	
	YP	9.4		9.9		9.6		8.5	
Catch rate by month (fish/hr.)		WE	NP	WE	NP	WE	NP	WE	NP
	June	0.31	0.10	0.11	0.28	0.14	0.21	0.19	0.16
	July	0.15	0.10	0.07	0.39	0.18	0.42	0.13	0.20
	August	0.82	0.13	0.32	0.23	0.08	0.43	0.07	0.26

Table 3. Comments on management of Tiber Reservoir and Lake Frances (through party interviews).

	Number responding							
	Tiber Reservoir				Lake Frances			
	1991	1993	1994	1995	1989	1993	1994	1995
Maintain water levels	61	9	6	7	21	10	4	5
Improve/add facilities	19	34	18	47	16	21	8	17
Better access	1	10	6	7	7		1	
More fish	5	15	10	4	4	13	5	14
Plant bluegills/cisco		3	7	5	3			
Stock walleye		2	3	1	2	10	9	11
More forage	10	3	10	26	2	1	1	2
Limits on small fish			1	1	12	3	4	10
Need more enforcement	1	2	4	1	1	3	2	14
More regulations (slot limits)			2	2		6	2	4
Change filet law	2		5				11	1
Increase pike limit		1			1	8	1	1

AGE AND GROWTH

The age structure of harvested walleye is presented in Tables 4 and 5. Cross sections of 273 walleye spines from Lake Frances were examined, representing length groups from 11 through 25 inches, and age groups two through twelve years. Slightly more five year old fish were harvested but fairly uniform harvest occurred with age groups three through nine. Approximately 74 percent of the harvested walleye were five years old or older.

A total of 197 walleye spines from Tiber Reservoir were analyzed. Harvested fish ranged in age from three to ten years and were represented in length groups from 10 through 21 inches. Approximately 70 percent of the harvested walleye were younger than five years old.

The average age of walleye harvested in Lake Frances was 6.2 years while in Tiber Reservoir the average age was 4.3 years (Table 6). Table 6 also presents percent composition by length and age. From this information it is apparent that the walleye harvest at Tiber Reservoir has changed from 14-18 inch fish in 1991 to 12-13.9 inch fish in 1995. At Lake Frances, 1995 harvested walleye are more evenly distributed among length groups.

Average length of walleye harvested by age group over four census years is compared in Table 7 for Tiber Reservoir and Lake Frances. At Tiber, average length decreased from 1991 through 1994, but in 1995, began to increase, most noticeably in age groups three through five. At Lake Frances, average length by age group remained fairly uniform through all census years.

DISCUSSION AND RECOMMENDATIONS

Tiber Reservoir and Lake Frances are important fisheries in northcentral Montana. The main species sought by anglers include walleye, northern pike and yellow perch. Walleye continue to be the target species in both waters. Angler satisfaction with number and size of fish caught decreased over a three year period at Tiber, and increased at Lake Frances although fewer fish were caught. Catch rates remain high for walleye at Tiber and are considerably higher than Lake Frances. At Lake Frances, over 70 percent of the harvested walleye were five or older, while at Tiber, 70 percent of the harvested walleye were under five years. Anglers at both waters would like to see additional or improved facilities.

The weekend creel surveys on Lake Frances and Tiber Reservoir are very effective for monitoring these fisheries at relatively low cost. It is recommended to continue the surveys as funding permits.

Table 4. Age composition of walleye harvested in Lake Frances, 1995.

Length inch group	No. per inch group	No. fish per age group										
		2	3	4	5	6	7	8	9	10	11	12
11	4	3	1									
12	16		15	1								
13	22		13	8	1							
14	27		4	19	4							
15	34			8	23	3						
16	36				20	11	3	2				
17	42				5	21	7	3	6			
18	34				1	7	9	4	10	1	1	1
19	28					1	3	8	8	2	5	1
20	13							4	7	2	1	1
21	6							2	2			
22	2									2	2	2
23	4								1		1	1
24	3											
25	2											
Totals	273	3	33	36	54	43	22	23	33	8	10	8
Avg. length		11.5	12.9	14.4	15.8	17.2	17.9	18.9	19.1	20.9	20.8	22.5
Length range		11.2-	11.9-	12.5-	13.1-	15.5-	16.4-	16.0-	17.0-	18.6-	18.3-	18.6-
		11.8	14.2	15.6	18.4	19.1	19.5	21.5	21.6	24.9	25.0	25.3

Table 5. Age composition of walleye harvested in Tiber Reservoir, 1995.

Length	No. per inch group	No. fish per age group							
		3	4	5	6	7	8	9	10
10	1		1						
11	9	7	1		1				
12	37	24	12		1				
13	61	19	36	4	1	1			
14	33	4	18	11					
15	18		8	9	1				
16	16	1	5	4	6				
17	8		3	2	2	1			
18	5			1	3	1			
19	4			1			2	1	
20	2						1	1	
21	3						2		1
Totals	197	55	84	32	15	3	5	2	1
Avg. length		12.8	13.9	15.2	16.1	16.3	20.4	19.9	21.7
Length range		11.0- 16.3	10.5- 17.4	13.0- 19.2	11.3- 18.5	13.0- 18.5	19.0- 21.6	19.8- 20.1	21.7

Table 6. Composition of harvested walleye by length and age, Tiber Reservoir and Lake Frances.

TIBER RESERVOIR				
	1991	1993	1994	1995
Average age	4.7	4.5	4.9	4.3
Composition by length:				
8 - 11.9"	0%	4%	13%	5%
12 - 13.9"	9	21	37	50
14 - 15.9"	42	42	23	24
16 - 17.9"	40	21	14	12
18 - 19.9"	7	9	10	7
20" +	2	3	3	1
Composition by age:				
2 years	1%	3%	3%	0%
3	20	19	16	28
4	26	40	37	42
5	30	18	18	16
6	17	11	8	8
7	3	6	7	2
8	1	2	5	3
9	2		5	1
10			0	
11			1	
LAKE FRANCES				
	1989	1993	1994	1995
Average age	3.6	4.9	5.8	6.2
Composition by length:				
8 - 11.9"	15%	3%	2%	1%
12 - 13.9"	44	21	13	14
14 - 15.9"	16	51	35	22
16 - 17.9"	7	15	32	29
18 - 19.9"	10	5	12	23
20" +	7	5	6	11
Composition by age:				
2 years	12%	1%	0%	1%
3	40	12	6	12
4	21	43	25	13
5	27 *	21	27	20
6		6	14	16
7		10	5	8
8		4	10	8
9		0	6	12
10		1	3	3
11		0	0	4
12		0	3	3
13		1	1	

*1989 Lake Frances - Composition for age five includes five and older fish.

Table 7. Average length by age group of harvested walleye from Tiber Reservoir and Lake Frances.

Lake	Census year	Age group											
		2	3	4	5	6	7	8	9	10	11	12	13
Tiber Reservoir	1991	-	13.9	15.1	16.1	17.3	18.5	19.9	19.5	24.0			
	1993	11.3	13.2	14.9	16.3	17.8	17.7	19.8	19.0	20.5	22.2		
	1994	10.0	12.1	13.3	14.8	16.6	17.2	17.7	18.5	20.4	27.1		
	1995	-	12.8	13.9	15.2	16.1	16.3	20.4	19.9	21.7			
Lake Frances	1989*	11.1	12.7	14.0									
	1993	10.1	12.7	14.3	15.3	16.6	18.5	18.8	22.5	22.5	25.0	21.0	24.4
	1994	11.0	12.6	13.9	15.4	16.6	17.2	17.8	19.4	20.2	20.0	20.9	23.3
	1995	11.5	12.9	14.4	15.8	17.2	17.9	18.9	19.1	20.9	20.8	22.5	

* 1989 at Lake Frances - data not presented beyond age four because data lumped for age five and older fish.

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LITERATURE CITED

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PRINCIPAL FISH SPECIES INVOLVED: Walleye, northern pike, yellow perch.

CODE NUMBERS OF WATERS REFERRED TO IN REPORT:

14-7440 Lake Frances
14-9240 Tiber Reservoir