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

STATE: Montana PROJECT NO. 3491
PROJECT: Statewide Fisheries Investigations
JOB TITLE: Tiber Reservoir and Lake Frances Summer Creel Survey

1998 Annual Report

ABSTRACT

A total of 701 angling parties were interviewed at Tiber Reservoir and Lake Frances on weekends during 1998 between Memorial Day and Labor Day. They fished a total of 7945 hours and caught approximately 3400 walleye, 1850 northern pike and 1300 yellow perch. Anglers preferred to catch walleye in both waters. Catch rates for walleye averaged 0.23 fish per hour at Lake Frances and 0.57 fish per hour at Tiber Reservoir. Northern pike catch rates at Lake Frances averaged 0.45 fish per hour while yellow perch averaged 0.33 fish per hour. Of the walleye caught by anglers, 71 percent were kept at Lake Frances and 41 percent were kept at Tiber. These fish averaged 15.7 and 14.4 inches, respectively, at Lake Frances and Tiber Reservoir. At Lake Frances, walleye were most easily caught during June while northern pike were caught equally during July and August. At Tiber, walleye were taken more readily during July. The oldest walleye harvested at Lake Frances was twenty years, while a nine year old walleye was taken at Tiber. The average age of walleye taken during 1998 was 4.1 years at Tiber and 5.2 years at Lake Frances. The results of this census are compared to studies conducted on Lake Frances in 1989, and 1993-1997, and on Tiber Reservoir in 1991, and 1993-1997.

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 dating back to 1989 for Lake Frances and 1991 for Tiber Reservoir, along with 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 problems 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 angling party were measured to eliminate bias of measuring one large fish. Dorsal spines of walleye were collected for determinatin 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

Data collected from both reservoirs during 1998 will be compared to earlier creel surveys conducted at Lake Frances in 1989 and 1993-97 and at Tiber Reservoir in 1991 and 1993-97 (Hill, 1998).

Angler and Trip Characteristics

Angler and trip characteristics at Tiber Reservoir are presented in Table 1. During 1998, creel clerks interiewed 416 parties, representing 1,065 anglers. In previous years, party interviews ranged from 356 (1997) to 528 (1991). Average party size in 1998 was 2.6 anglers which is the highest of all survey years. In 1998, anglers spent an average of 5.2 hours for completed boat trip which is comparable to earlier years. Completed shore angler trips averaged slightly less than boat trips at 4.2 hours, but this parameter is higher than most previous years. Anglers used an average of 1.2 attended lines from both boat and shore during 1998. Approximately 75 percent of all anglers continue to originate from within a local or 75 mile radius area. As in past years, bait, and lures and bait were the preferred angling method, while walleye continue to be the preferred target species. Angler satisfaction with size and number of fish caught varies considerably from year to year. In 1998, 59 percent of anglers were satisfied with the number of fish while 45 percent were satisfied with size of fish.

Table 2 presents angler and trip characteristics for Lake Frances. Average party size in 1998 was 2.3 anglers which is comparable to earlier years. A total of 285 party interviews were conducted during 1998, representing 648 anglers, the lowest totals of all survey years. Both boat and shore anglers spent more average hours per completed trip in 1998 than in other survey years. Most other parameters listed in Table 2 are comparable for 1998 and all previous survey years. Boat anglers averaged 1.2 attended lines while shore anglers averaged 1.0 attended lines. Approximately 76 percent of the anglers are considered local (within a 75 mile radius). The most popular angling methods are using bait, and lures and bait, while walleye are the main target species. In 1998, angler satisfaction with number of fish caught was highest of all survey years at 57 percent while the size of fish was second highest at 54 percent.

Table 1. Angler and trip characteristics, Tiber Reservoir.

	1991	1993	1994	1995	1996	1997	1998
Parties interviewed	528	409	463	499	401	356	416
Anglers represented	1245	996	965	1039	902	794	1065
Completed trip interviews	147	120	203	188	185	139	210
Avg. hrs/completed trip							
- boat	5.8	5.1	5.0	5.2	5.0	4.7	5.2
- shore	5.3	4.2	4.1	2.6	3.5	2.1	4.2
Avg. no. attended lines							
- boat	1.2	1.1	1.0	1.0	1.0	1.1	1.2
- shore	1.5	1.4	1.6	1.5	1.5	1.6	1.2
Angler origin (%)							
- local	78	74	75	74	74	81	75
- Western Montana	6	7	6	10	6	8	9
- Other Montana	14	17	19	13	17	11	9
- Non-resident	2	2	0	3	2	1	7
Angling method (%)							
- lures	7	19	19	15	15	8	9
- bait	38	37	32	35	37	39	45
- lures and bait	55	44	49	50	49	53	46
Target species (% of anglers)							
- WE	72	42	57	58	63	61	71
- NP	1	0	1	1	0	0	1
- YP	0	1	0	0	0	0	0
- WE/NP	6	2	1	2	1	1	6
- WE/NP/YP	11	1	0	0	0	Tr.	Tr.
- any fish	11	55	41	40	36	38	17
Angler satisfaction (%)							
- no. of fish	-	54	62	34	46	37	59
- size of fish	-	61	55	46	67	30	45

Table 2. Angler and trip characteristics, Lake Frances.

	1989	1993	1994	1995	1996	1997	1998
Parties interviewed	962	402	301	451	377	290	285
Anglers represented	2102	939	690	1108	792	652	648
Completed trip interviews	433	209	215	251	228	147	191
Avg. hrs/completed trip							
- boat	5.3	4.8	4.6	4.6	4.6	5.2	5.5
- shore	3.9	2.8	2.8	3.8	3.7	3.9	4.3
Avg. no. attended lines							
- boat	1.1	1.1	1.2	1.2	1.3	1.3	1.2
- shore	1.2	1.0	1.2	1.2	1.4	1.3	1.0
Angler origin (%)							
- local	70	71	83	75	79	72	76
- Western Montana	17	13	9	8	9	16	11
- Other Montana	10	13	7	15	12	12	11
- Non-resident	3	3	1	2	Tr.	1	2
Angling method (%)							
- lures	13	13	4	12	9	15	3
- bait	35	54	60	58	52	67	47
- lures and bait	52	33	36	30	39	18	49
Target species (% of anglers)							
- WE	59	52	54	54	46	66	56
- NP	9	8	3	3	3	6	Tr.
- YP	1	1	1	1	3	2	3
- WE/NP	14	7	10	17	28	10	10
- WE/NP/YP	3	3	12	6	7	3	6
- any fish	15	29	20	19	13	13	18
Angler satisfaction (%)							
- No. of fish	-	29	24	49	37	55	57
- size of fish	-	38	25	64	48	47	54

Catch Statistics and Angler Success

Catch statistics and angler success are presented in Table 3 for Tiber Reservoir and in Table 4 for Lake Frances. Catch rates at Tiber Reservoir in 1998 are the highest recorded for northern pike and yellow perch and second highest for walleye. Walleye catch rates in 1998 were 0.57 fish per hour, surpassed by 1994 rates of 0.72 fish per hour. Harvest rates for both northern pike and yellow perch remain low at 0.01 fish per hour while walleye increased from 0.12 fish per hour in 1997 to 0.23 fish per hour in 1998.

Catch rates during 1998 increased for all three species in Lake Frances, with northern pike (0.45 fish/hr.) and yellow perch (0.33 fish/hr.) being the highest recorded of all survey years and walleye (0.23 fish/hr.) nearly double of the rates of the past four years. Only 1989 recorded a higher catch rate for walleye at 0.35 fish per hour. Harvest rates also increased for all three species, equaling or surpassing all survey years.

Anglers keep a larger percentage of all species caught at Lake Frances as compared to Tiber Reservoir. Nearly 3/4 of the walleye are kept at Lake Frances while about ½ of those caught at Tiber are kept. Northern pike and yellow perch are kept at much higher rates at Lake Frances than at Tiber.

In 1998, walleye catch rates at Tiber Reservoir were good throughout the summer with July having the highest rate at 0.70 fish per hour. At Lake Frances, walleye catches were best in June followed by August. Northern pike were readily caught at Lake Frances in July and August.

The average size of walleye kept in 1998 at Tiber Reservoir was 14.4 inches which is comparable to survey years 1994-1997. Average length of northern pike and yellow perch kept at Tiber increased over the previous year. Walleye size at Lake Frances in 1998 is similar to 1997 but lower than 1995-96. Northern pike and yellow perch averages are similar to past years.

Management Concerns

During interviews, creel clerks asked anglers whether or not they felt there were any management problems at either reservoir. Approximately 19 percent of those interviewed at Tiber and 13 percent at Lake Frances felt there were problems. Additional forage and improved facilities ranked highest among concerns at Tiber. At Lake Frances, anglers would like to see walleye planted, followed by improved facilities and stable water levels.

Age and Growth

Various parameters of age composition of walleye are presented in Tables 5 through 8. A total of 365 walleye were aged at Tiber Reservoir while 343 walleye were aged at Lake Frances.

At Tiber Reservoir, the average age of walleye harvested was 4.1 years, the lowest of all years

Table 3. Catch statistics and angler success, Tiber Reservoir.

		1991	1993	1994	1995	1996	1997	1998
Catch rate (fish/hr)	WE	0.35	0.38	0.72	0.44	0.38	0.24	0.57
	NP	0.07	0.03	0.03	0.06	0.07	0.02	0.08
	YP	0.04	0.01	0.04	0.02	0.03	0.02	0.05
Harvest rate (fish/hr)	WE	0.18	0.21	0.24	0.22	0.21	0.12	0.23
	NP	0.03	0.03	0.01	0.02	0.03	0.01	0.01
	YP	0.03	0.01	0.01	0.01	0.01	Tr.	0.01
Fish kept (%)	WE	51	54	33	49	54	49	41
	NP	48	83	38	26	34	52	16
	YP	82	76	29	33	35	16	18
Avg. length (in.)	WE	15.9	15.3	14.4	14.3	14.6	14.7	14.4
	NP	22.1	22.6	21.5	21.1	20.7	21.3	22.7
	YP	---	8.5	8.9	9.8	9.9	8.4	10.0
Catch rate by month (fish/hr.)	June - WE	0.54	0.16	0.52	0.48	0.28	0.23	0.42
	- NP	0.05	0.02	0.05	0.09	0.09	0.02	0.08
	July - WE	0.51	0.44	0.99	0.59	0.60	0.29	0.70
	- NP	0.12	0.04	0.04	0.06	0.06	0.03	0.08
	Aug. - WE	0.36	0.68	0.87	0.21	0.22	0.22	0.58
	- NP	0.04	0.03	0.03	0.05	0.05	0.02	0.06

Table 4. Catch statistics and angler success, Lake Frances.

		1989	1993	1994	1995	1996	1997	1998
Catch rate (fish/hr)	WE	0.35	0.17	0.13	0.13	0.11	0.13	0.23
	NP	0.11	0.28	0.35	0.21	0.36	0.33	0.45
	YP	0.29	0.13	0.22	0.23	0.24	0.24	0.33
Harvest rate (fish/hr)	WE	0.17	0.12	0.11	0.11	0.08	0.10	0.17
	NP	0.07	0.11	0.13	0.09	0.12	0.12	0.17
	YP	0.12	0.08	0.18	0.11	0.11	0.15	0.21
Fish kept (%)	WE	50	73	86	84	73	73	71
	NP	64	40	38	43	33	37	37
	YP	46	63	83	50	46	63	64
Avg. length (in.)	WE	14.4	15.4	15.8	16.8	17.3	15.8	15.7
	NP	21.2	19.5	20.2	20.2	20.0	19.2	19.2
	YP	9.4	9.9	9.6	8.5	9.2	9.0	9.6
Catch rate by month (fish/hr)	June - WE	0.31	0.11	0.14	0.19	0.15	0.21	0.34
	- NP	0.10	0.28	0.21	0.16	0.27	0.28	0.30
	July - WE	0.15	0.07	0.18	0.13	0.08	0.09	0.07
	- NP	0.10	0.39	0.42	0.20	0.39	0.33	0.55
	Aug. - WE	0.82	0.32	0.08	0.07	0.04	0.08	0.23
	- NP	0.13	0.23	0.43	0.26	0.61	0.40	0.50

Table 5. Age composition of walleye harvested in Tiber Reservoir, 1998.

Length	No. per inch group	No. fish per age group							
		2	3	4	5	6	7	8	9
8	1	1							
9	4	3							
10	6	3	2						
11	30	7	17	2					
12	58	8	29	12	1	1			
13	63	5	26	21	3	2	1		
14	79	1	24	33	12	3	2		
15	59		9	23	12	9	2		
16	28		1	8	7	9	1		
17	19			2	1	7	6	1	1
18	11				2	5	3	1	
19	3					2	1		
20	2						1	1	
21	1						1		
22	1							1	
Total	365	30	120	108	40	41	20	5	1
Avg. length		11.7	13.1	14.4	15.2	16.3	17.2	19.1	17.3
Length range		8.7-14.3	10.8-16.1	11.5-17.7	12.1-18.5	12.8-19.1	13.0-21.8	16.2-22.8	17.3

Table 6. Age composition of walleye harvested in Lake Frances, 1998.

Length	No. per inch group	No. fish per age group											
		2	3	4	5	6	7	8	9	10	11	12	13+
10	2	1	1										
11	16	3	13										
12	17	2	12	3									
13	69		32	37									
14	69		7	62									
15	46		2	42	2								
16	26			18	6	2							
17	10			1	3	2	2	2					
18	28				1	9	6	5	2		1	3	1
19	27					5	5	6	2	1		7	1
20	14						1	4	4	1	3		1
21	10					1		2	1	1	2	1	2
22	4										2	2	
23	2											1	1
26	2										1		1
27	1												1
Total	343	6	67	163	12	19	14	19	9	3	9	14	8
Avg. length		11.7	12.9	14.7	16.7	18.4	18.8	19.4	19.8	20.4	21.5	20.1	22.2
Length range		10.8-12.5	10.3-15.1	12.7-17.0	15.7-18.5	16.6-21.1	17.3-20.4	17.3-21.5	18.1-21.0	19.6-21.3	18.9-26.4	18.0-23.2	18.4-27.9

Table 7. Composition of harvested walleye by length and age, Tiber Reservoir and Lake Frances.

	TIBER RESERVOIR						
	1991	1993	1994	1995	1996	1997	1998
Average age	4.7	4.5	4.9	4.3	4.6	4.6	4.1
Composition by length:							
8-11.9"	0%	4%	13%	5%	7%	9%	11%
12-13.9"	9	21	37	50	34	34	33
14-15.9"	42	42	23	24	37	30	38
16-17.9"	40	21	14	12	12	17	13
18-19.9"	7	9	10	7	7	8	4
20" +	2	3	3	1	3	2	1
Composition by age:							
2 years	1%	3%	3%	0%	Tr.%	8%	8%
3	20	19	16	28	18	14	33
4	26	40	37	42	40	28	30
5	30	18	18	16	24	31	11
6	17	11	8	8	10	10	11
7	3	6	7	2	4	4	5
8	1	2	5	3	1	2	1
9	2		5	1	1	2	Tr.
10			0		1	Tr.	
11			1		1	1	

	LAKE FRANCES						
	1989	1993	1994	1995	1996	1997	1998
Average age	3.6	4.9	5.8	6.2	7.0	5.6	5.2
Composition by length:							
8-11.9"	15%	3%	2%	1%	1%	8%	5%
12-13.9"	44	21	13	14	4	28	25
14-15.9"	16	51	35	22	19	7	34
16-17.9"	7	15	32	29	30	29	10
18-19.9"	10	5	12	23	31	19	16
20" +	7	5	6	11	16	8	10
Composition by age:							
2 years	12%	1%	0%	1%	1%	1%	2%
3	40	12	6	12	1	36	19
4	21	43	25	13	14	5	47
5	27 *	21	27	20	12	11	3
6		6	14	16	20	14	5
7		10	5	8	14	12	4
8		4	10	8	9	9	5
9		0	6	12	10	2	2
10		1	3	3	11	3	1
11		0	0	4	5	5	2
12		0	3	3	1	1	4
13		1	1		1	1	1
14						1	Tr.
15						Tr.	5
20							Tr.

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

Table 8. 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	14	15	20
Tiber Res.	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						
	1996	10.7	12.3	13.7	15.1	16.9	17.8	18.7	18.8	21.6	-	24.3				
	1997	11.7	12.5	14.1	15.0	16.6	17.3	19.3	19.3	22.8	19.9					
	1998	11.7	13.1	14.4	15.2	16.3	17.2	19.1	17.3							
Averages		11.1	12.8	14.2	15.4	16.8	17.4	19.3	18.9	21.8	23.1	24.3				
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				
	1996	10.5	12.3	14.5	15.9	17.2	17.3	18.7	19.7	20.2	21.2	20.9	20.0			
	1997	10.9	12.6	14.8	16.7	17.3	18.2	18.7	20.5	18.9	19.8	20.9	22.4	24.4	24.0	
	1998	11.7	12.9	14.7	16.7	18.4	18.8	19.4	19.8	20.4	21.5	20.1	21.2	20.1	22.4	27.9
Averages		11.0	12.7	14.4	16.0	17.2	18.0	18.7	20.2	20.5	21.4	21.1	22.3	22.3	23.2	27.9

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

surveyed. The oldest fish aged was nine years, but was only 17.3 inches long. The majority of the harvest continues to be composed of small fish. Approximately 71 percent of the walleye harvest was composed of 12.0-15.9 inch fish, with these fish being represented by age groups two through seven. Average length by age group is comparable to past years.

Several older walleye were aged at Lake Frances, with 9 fish at eleven years, 14 fish at twelve years, 4 fish at thirteen years, 1 fish at fourteen years, 2 fish at fifteen years and 1 fish at twenty years old. The average age was 5.2 years, continuing a downward trend from a high of 7.0 years in 1996. This is significant in that smaller, younger age fish are coming into the fishery. Compared to Tiber, approximately 59 percent of the walleye harvest at Lake Frances is in the 12.0-15.9 inch range and is represented by age groups two through five.

DISCUSSION AND RECOMMENDATIONS

Creel clerks interviewed 701 parties of fishermen at Tiber Reservoir and Lake Frances during 1998. Local anglers (those within a 75-mile radius) continue to account for 70-75 percent of the fishing pressure. Angler satisfaction with both the number of fish caught and the size of the fish caught increased in both waters during 1998. Low water levels at Lake Frances resulted in reduced access for fishermen and may account for lower numbers of interviews and anglers. Higher percentages of walleye are kept at Lake Frances than Tiber. A possible explanation is that there has been fewer fish in Lake Frances. In Tiber, walleye abundance appears to be higher but size is less, with anglers keeping a lower percentage. The majority of the 1713 anglers represented specified that walleye are the preferred species to catch in both waters. Walleye catch rates during 1998 improved considerably over previous years in both waters. The catch rate of 0.23 fish per hour at Lake Frances is the highest since 1989 (0.35 fish/hr) while 0.57 fish per hour at Tiber is the highest since 1994 (0.72 fish/hr). Average length of Lake Frances walleye decreased again slightly in 1998. As mentioned in the 1997 creel report (Hill, 1998), larger walleye in Lake Frances are probably being replaced by younger, smaller fish. This appears to be verified by age analysis which shows a higher percentage of three and four year old fish now as compared to four to seven year old fish in 1994, 1995 and 1996. Anglers had few management concerns at either lake. The major concerns voiced at Tiber related to improving facilities and stocking additional forage fish. A significant introduction of cisco was made into Tiber in 1997 and 1998 with information presented in another document (Hill, et. al, 1999). At Lake Frances, concerns centered on stocking additional walleye into the lake. This water generally has excellent natural reproduction and it appears that fairly good numbers have recruited into the fishery over the past two years as evidenced by increased percentages of three and four year old fish. Walleye fingerlings were stocked in 1997 but few are expected to recruit due to the poor condition of the fish when stocked.

It is recommended to continue the creel surveys on Lake Frances and Tiber Reservoir if funding permits. The weekend creel surveys are an effective tool for monitoring these fisheries.

ACKNOWLEDGMENTS

Kelly Widhalm conducted the creel census on Lake Frances while Chris Stores handled the Tiber Reservoir survey. Paul Hamlin and Kelly Smith assisted in mounting spines or analyzing data.

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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