JOB PROGRESS REPORT

State: Montana

Project No: F-5-R-34 Title: Northcentral Montana Fisheries Study

Job No.: I-a Title: Inventory and Survey of Water

the Western Half of Region Four

Period Covered: July 1, 1984 through June 30, 1985

Report Period: April 1, 1984 through March 31, 1985

ABSTRACT

A total of 9 streams, 8 large lakes and reservoirs, and 6 small lakes and farm ponds were investigated during the report period. Six rainbow trout strains are being evaluated in several reservoirs. These strains include McConaughy, Arlee, Arlee triploid, Eagle Lake, Arlee X Eagle Lake, and DeSmet. The northern pike population in Pishkun Reservoir is on the increase and is resulting in increased predation on hatchery rainbow trout. Tag returns from northern pike indicate at least 30 percent harvest by fishermen. Spottail shiner were introduced into Lake Frances and Lake Elwell to improve forage for walleye and northern pike. Spottail reproduction was documented in Lake Elwell. Tag returns by anglers reveal at least 19 percent harvest on walleye from Lake Elwell. Poor survival and growth of trout in Bynum Reservoir lead to the recommendation to convert it to a warm/coolwater fishery. Trout populations were sampled for species composition and abundance in the Dearborn River within the Scapegoat Wilderness Area. Cutthroat trout were collected from 4 streams along the Rocky Mountain Front and tested for genetic purity. Preliminary results indicate these fish were 97 percent westslope cutthroat. Rainbow and brown trout populations were estimated in two sections of the Smith River. Survey electrofishing was conducted in two sections of the Marias River upstream from Lake Elwell.

OBJECTIVES AND DEGREE OF ATTAINMENT

1. To inventory fish populations in six streams to update management files. Data from ten streams is included in this report.

2. To evaluate survival, growth and fishermen success for rainbow trout annually stocked in Bynum, Eureka, Nilan, Willow Creek, Pishkun and Holter Reservoirs and Bean Lake. This report includes the results found on these waters.

3. To evaluate present management of 10 small lakes and farm ponds and to investigate the fishery potential of new ponds. Information was collected for 6 presently managed waters. No new ponds were investigated.

4. To estimate the population and harvest of northern pike in Pishkun Reservoir and to monitor trends in the kokanee salmon population. This work was done and the data appears in the report.

5. To obtain trend information for management measures on northern pike, walleye, burbot and lake trout in Lake Elwell and Lake Frances and to evaluate composition and abundance of existing and introduced forage fish in these waters. This information was collected and is included in the report.

6. To monitor stability of stream habitat in two sections of the Teton River where flood debris was mechanically removed and where it was not removed. This objective will be investigated only if significant changes occur in channel morphology and river habitat. No work was accomplished on this objective since major changes have not occurred. Also, this portion of river is so badly dewatered that trout populations will never be healthy. It is recommended that this objective be deleted from future investigations.

PROCEDURES

Fish were sampled with 125 x 6 foot experimental gill nets (3/4 to 2-inch mesh), 3 x 4 foot and 4 x 6 foot from net traps (1/4, 1/2 and 1-inch mesh), a 300-volt D.C. electrofish shocker, and by hook and line. Measurements taken on fish include total lengths to the nearest tenth of an inch and weights to the nearest hundredth of a pound. Scale samples were collected for age and growth studies. Northern pike were marked with T-tags and walleye with Cinch-up tags anchored near the dorsal fin. Angler success and harvest determinations were made through voluntary angler tag returns, occasional creel census and interviews with fishermen.

Stomach samples were analyzed from northern pike and walleye. Rainbow trout planted in Pishkun and Holter Reservoirs and Bean Lake were marked with adipose fin clips for later identification. Population estimates of northern pike were made by intensive short-term mark and recovery. Fish population estimates on the Smith River were made using the mark and recapture method described by Vincent (1971 and 1974).

FINDINGS

Lakes and Reservoirs

Gill net summaries for the lakes and reservoirs inventoried are presented in Table 1. Individual discussion of various waters is as follows:

Bean Lake

DeSmet strain of rainbow trout were introduced into Bean Lake in July of 1984. Equal numbers of Arlee strain of rainbow trout were introduced in May of 1984. Subsequent sampling with gill nets the following fall and spring revealed good survival of these fish. DeSmet rainbows planted in the spring of 1982 represented the only strain planted that year when gill net sampling was conducted in April of 1985. Evaluation on longevity of the two strains will continue for another three years.

Bynum Reservoir

Arlee triploid rainbow trout were planted in this reservoir in 1983 and 1984, with 50,000 planted each year. Gill nets fished under the ice on January 22, 1985, caught only 2 fish from the 1983 plant and none from the 1984 plant (Table 1). Growth and survival appears to be poor. It is recommended to discontinue trout management in this water and convert to warm/coolwater fisheries. A Preliminary Environmental Review (Hill, 1985) was prepared to introduce walleye into Bynum Reservoir with yellow perch and spottail shiner as forage. The reservoir presently supports a large white sucker and mountain whitefish population that could serve as initial forage. Extremely low water conditions have been experienced the past few years, making this water difficult to manage with any species.

Eureka Reservoir

Approximately 30,000 Eagle Lake rainbow trout were stocked in Eureka Reservoir on August 30, 1984. It is hoped that this strain of rainbow will utilize small suckers for forage. Fish were too small to sample with gill nets prior to this report period.

Table 1. Lake and Reservoir Gill Netting Summaries, 1984.

(Date Sampled)	Surface Acres	No. of Nets	Species	Fish	Length Range (Average)	Weight Range (Average)
Bean Lake	200	2	ARb[1/]	17	10.2-11.5(10.9)	0.39-0.62(0.50)
(10/22/84)			ARb[1/]	10	11.6-14.3(13.1)	0.64-1.11(0.85)
			DRb[2/]	36	6.2- 9.1(7.9)	0.09-0.27(0.16)
			DRb[2/]	6	13.5-14.9(14.0)	0.86-1.09(1.01)
(4/26/85)		2	ARb[1/]	19	10.3-12.1(11.4)	0.37-0.69(0.58)
			ARb[1/]	8	12.7-15.2(13.9)	0.86-1.32(1.06)
			DRb[2/]	23	7.5-10.5(9.0)	0.13-0.41(0.26)
			DRb[2/]	12	13.7-16.9(15.5)	0.94-1.73(1.31)
Bynum Res.	2000*		TRb[3/]	2	11.4-12.2(11.8)	0.51-0.58(0.55)
(Jan. 22, 1985)			WF	46	9.4-16.9(12.6)	0.27-1.35(0.65)
			WSu	26	7.5-17.3(12.5)	0.16-1.82(0.82)
Holter Res.						
(11/16/84)	4800	3	ARb[1/]	27	9.7-12.0(10.4)	0.36-0.65(0.44)
			ARb[1/]	15	13.9-18.4(16.3)	0.98-2.38(1.64)
			LnSu	6		
Lake Elwell	14,100	16	WE	2	7.5-7.8 (7.7)	0.11-0.14(0.13)
(Oct. 2,3)				42	9.3-15.0(12.1)	0.22-1.16(0.57)
				23	15.7-19.2(17.4)	1.32-2.68(1.89)
				3	21.0-24.3(22.9)	3.11-5.10(4.27)
			NP	9	13.9-16.9(14.2)	0.46-1.10(0.83)
				32	17.7-25.0(21.0)	1.22-3.40(2.17)
			Rb	1	(15.6)	(1.41)
			Yp	19	7.8-11.2(8.6)	0.21-0.70(0.29)
			WSu	19	14.9-18.7(16.6)	1.50-3.08(2.24)
			LnSu	3	(19.3)	2.70-3.17(2.94)
			Carp	4	22.5-26.0(-)	4.80-10.00(-)
Lake Frances	2500	1	WE	20	10.7-13.9(11.7)	0.37-0.85(0.50)
(Sept. 21)				1	(16.7)	(1.58)
			NP	1	(23.4)	(2.84)
Nilan Res.	150	2	ARb[1/]	116	8.8-11.0(9.7)	0.21-0.49(0.33)
(Oct. 5)				63	11.5-13.8(12.8)	0.52-0.96(0.71)
			WSu	20	7.4-12.7(-)	0.14-0.87(-)
Pishkun Res.	1100	2	Kok	3	13.2-14.4(13.7)	0.82-0.98(0.88)
(July 18)			Yp	11	6.0- 7.7(6.4)	0.09-0.20(0.11)
Willow Creek Res.	1000	2	XRb[4/]	21	6.7- 8.2(7.2)	0.10-0.16(0.13)
(Oct. 5)			ARb[1/]	38	12.3-14.3(13.2)	0.68-0.92(0.78)
				1	(15.9)	(1.66)
			WSu	5	9.6-14.8(12.9)	0.30-1.28(0.89)

*Approximate surface acres at time of survey.
**Species Abbreviations: Rb - rainbow trout; WF - mountain whitefish; WE - walleye; NP - yellow perch; WSu - white sucker; Ln Su - longnose sucker; Kok - kokanee salmon; NP - Northern Pike

1/ Arlee Rainbow

2/ DeSmet Rainbow

3/ Triploid Arlee

4/ Arlee X Eagle Lake Rainbow

Holter Reservoir

Gill net sampling in November, 1984, took very low numbers of trout from the 1983 and 1984 plants of Arlee Rainbow. High flood flows in June flushed large numbers of 12 to 14 inch trout from the reservoir. Many of these fish were caught by anglers in the Missouri River immediately below Holter Dam. In mid-August through September, flow in the magnitude of 10,500 to 11,000 cfs was released from Canyon Ferry Reservoir to draw water levels down for dike maintenance. This flow through Holter Reservoir may have caused another loss of newly planted fish as evidenced by the low gill net catch. By comparison, 235 current year trout were sampled in the fall of 1983 and only 27 were sampled in the fall of 1984. Anglers reported very poor fishing in Holter Reservoir throughout most of the winter.

Some anglers voiced concerns that larger rainbow trout would be desirable during the spring spawning run into the Missouri River at the upper end of Holter Reservoir. Arlee rainbow trout have been planted into Holter Reservoir for many years to create fishing for the thousands of anglers that recreate on this lake. High harvest on these fish is desirable since unpredictable flood flows cause loss of fish over Holter Dam. With this type of management, few fish survive the reservoir long enough to spawn in the free flowing portion of the Missouri River above Holter Lake. Arlee rainbow trout are filter feeders, therefore they are commonly found in the upper strata of the reservoir where they are subject to anglers and flood flows.

In September, 1984, a total of 50,000 fingerling McConaughy rainbow trout were introduced into the Missouri River above Holter Lake. This rainbow trout strain is noted for longevity, has piscivorous feeding habits, large size at maturity and exhibits strong tributary spawning runs. It is hoped this trout will supplement the fishery through self-reproduction in the system plus provide a larger rainbow to the creel. We plan to stock the McConaughy two more years in an attempt to establish a spawning population.

Lake Elwell

Trap nets were fished a total of 70 days in three areas of Lake Elwell (Table 2) from April 5-17, 1984. The best catch per unit of effort was in the Devon area, and the poorest was the Bootlegger Trail area. All northern pike and walleye taken were tagged. T-tags were used on northern and Cinch-up tags on walleye. Northern pike retain the T-tags very well. Voluntary returns for northerns tagged in 1984 is 11.9 percent. High loss

of T-tags from walleye were noted, so the new Cinch-up tags were tried in 1984. To date, anglers have returned 18.9 percent of the walleye tagged in the spring of 1984. Early indications reveal loss of the new type of tag is much reduced when compared to the T-tag. Surveys planned in the spring of 1985 will determine tag loss of the Cinch-up type. Tag returns indicate the majority of the fish are caught in the same area in which they were tagged. However, there is movement from and to each of the three tagging areas.

Table 2. Species Composition and Relative Abundance of Trap Nets, Lake Elwell, April, 1984.

Area (Date)	No. of Trap Days	Number of Fish*							
		NP	WE	Ling	Rb	Yp	Sucker	Carp	Cr.
Willow Cr. Arm (April 5-11)	38	98	129	3	0	15	152	3	3
Devon (April 12-13)	10	52	37	1	6	6	16	21	0
Bootlegger Tr. (April 15-17)	22	27	19	1	1	5	10	19	0
Totals	70	177	185	5	7	26	178	43	3

*Species Abbreviations: Cr. - Black Crappe. Refer to Table 1 for other Species.

Forage fish surveys were conducted during July, August and October, using seines, trap nets and visual observations. Species observed or collected in decreasing order of abundance are yellow perch, emerald shiner, white sucker and spottail shiner. A total of 30,000 spottail shiner was introduced in June, 1984, into two areas of the reservoir. Young spottail were sampled in both areas, several miles from the release site. Other species collected during the forage fish surveys include young-of-the-year northern pike and crappie, crayfish and mottled sculpin.

Seven species were collected during the gill net surveys of October 2-3 (Table 1). Walleye and northern pike were most abundant. Stomach samples taken from these two species indicate yellow perch and crayfish to be the most important food items although a high percentage had no food in the stomach (35% of the northern and 50% of the walleye checked). Crayfish appear to be more important for northern than walleye. This may be a result of habitat preference - northern pike in shallow bays and shoreline areas with higher crayfish densities. Large numbers of small crayfish were taken during forage fish sampling.

One gill net and two trap nets were fished on the south shore of the Bootlegger Trail area on November 8 in attempts to sample lake trout. None were collected although fishermen have reported catching lake trout in this vicinity. Additional efforts should be made to gather information on this species.

Lake Frances

Trap nets fished in April to collect walleye and northern pike were hampered by bad weather (wind) and vandalism. A total of 30 northern pike and 24 walleye, were tagged with T-tags and Cinch-up tags, respectively. Only four tags from northerns and one from walleye have been returned to date. Other species taken during spring trapping operations include 8 burbot, 4 rainbow trout, 8 yellow perch and 21 white sucker.

An introduction of 10,000 spottail shiner was made in June, 1984. Reproduction of this species was not documented during forage fish surveys conducted during August and September. However, ice fishermen reported both adult and young-of-the-year spottail in stomachs of northern pike caught in January and February. Species collected during forage fish sampling include yellow perch, white sucker and walleye, with none of these taken in large numbers.

Lake Frances reached dead storage levels during 1984 due to irrigation withdrawal and below normal precipitation for the past several years. The walleye population in the lake reached its highest number levels during the last three years (1982-1984). Harvest of walleye by fishermen was good in 1983 and exceptional in 1984. This success in part must be attributed to walleye being confined to a much smaller area of the lake than normal. Several large walleye were harvested by fishermen. One gill net fished in September captured 21 walleye (Table 1). Although the majority of these were smaller fish (10.7-13.9 inches), it is felt there is an adequate walleye spawning population left in the lake. Surveys planned for the spring of 1985 will reveal the population size and numbers.

The Valier Chapter of Walleye Unlimited is planning to construct artificial reefs made of tires and brush. The reefs are expected to serve as spawning sites for yellow perch, as shelter for forage fishes and to attract game fishes (northern pike and walleye). The objective is to improve fishing. The Department of Fish, Wildlife and Parks is working with the Valier Chapter to obtain the necessary permits and to design and locate the reefs.

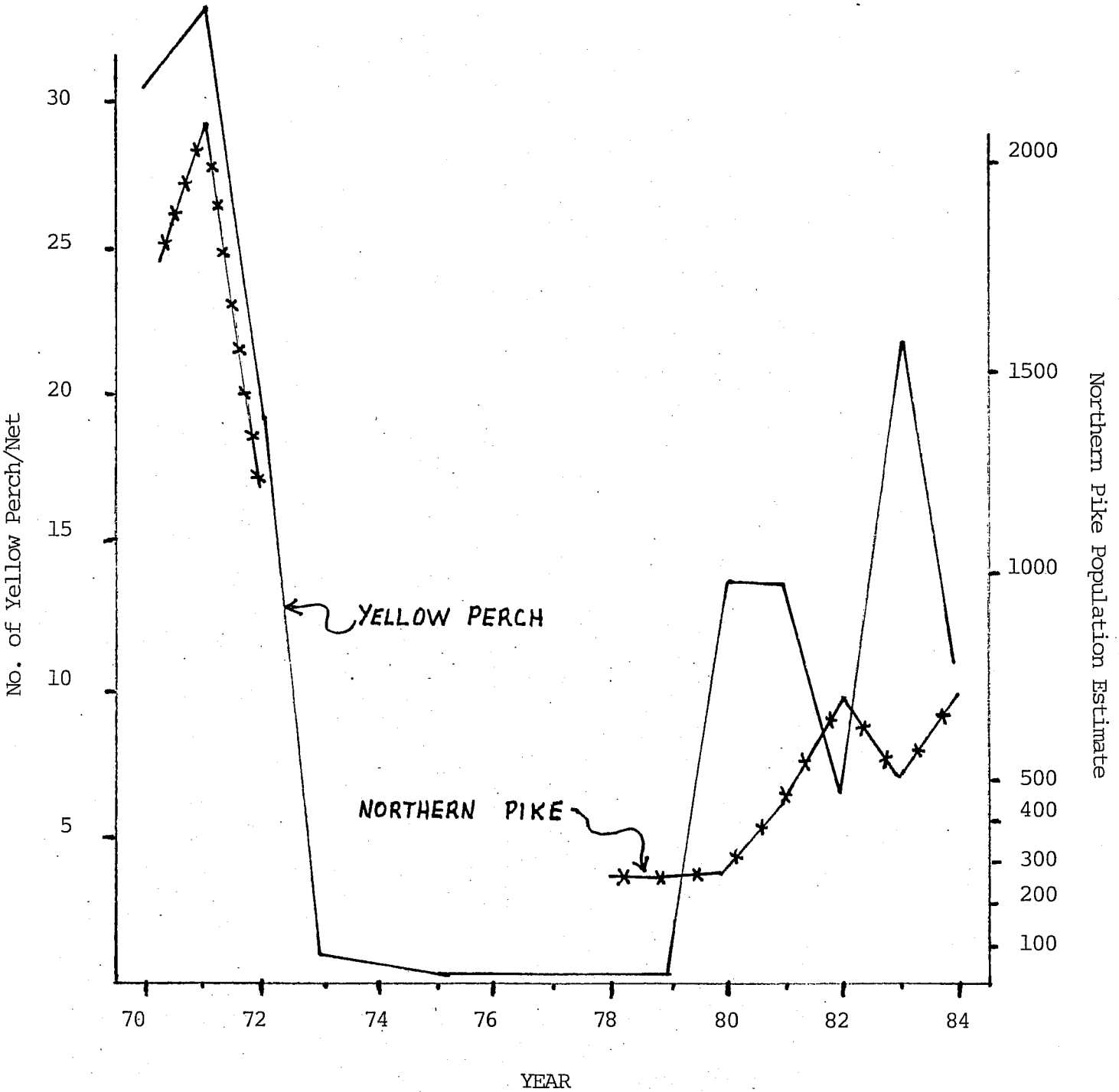

Figure 1. Yellow Perch and Northern Pike Population Fluctuations. Pishkun Reservoir.

Nilan Reservoir

Three trap nets were fished in May, 1984, to collect northern pike in this reservoir. No pike were taken, only rainbow trout and white sucker. Nilan Reservoir provides approximately 10,000 angler days per year, trout growth is good and harvest of Arlee rainbow is high. The gill net survey of October 5 (Table 1) collected 116 trout of the 1984 plant and 63 from the 1983 plant.

Pishkun Reservoir

A total of 30 trap days from April 17-23 captured 301 northern pike, 8 rainbow trout, 62 yellow perch, 61 white sucker and 1 kokanee salmon. Two hundred pike were tagged with T-tags and fishermen have returned 60 tags for a 30.0 percent return. Fishermen also returned 16 tags from fish tagged in 1983, bringing the accumulative return to 28.8 percent.

A northern pike population estimate of 690 fish was made using the Schnabel Method as described by Rounsefell and Everhart (1960) with the final estimate and confidence limits determined using formulas described by Chapman and Overton (1966). The estimate includes fish over 16 inches.

Two gill nets were fished overnight in July to sample kokanee salmon. Very few salmon were taken in the netting survey (Table 1) and few if any were snagged during the spawning season. The low numbers of salmon in the reservoir at this time is attributed to fewer fish planted in 1981, 1982 and 1983, due to reduced numbers available for stocking. Normal numbers of salmon were planted in 1984 (100,000), but they will not enter the fishery until about 1986.

Rainbow trout have been planted in this water since 1977, because northern pike numbers were considerably lower than earlier estimates made in the early 1970's (less than 300 pike from 1977 to 1980 as compared to 1232-2086 in the early 1970's. Predation on trout by pike was low from 1977-1980, as about 5 percent of the pike stomachs checked contained trout. Pike numbers increased from 1981 to the present, varying from 447 to 705 per year. Predation increased in 1984, with 20 percent of the pike stomachs containing trout. Predation was greatest in the month of May, with a 50 percent occurence. Undoubtedly, this coincides with time of stocking. In the early years of trout stocking, planted fish made up 50-75 percent of the catch in the creel and the remaining 25-50 percent were wild trout entering the reservoir via the Sun River. In 1984, this trend was reversed. Creeled trout comprised 25 percent planted fish while

75 percent were wild. Based on the combination of increased predation and reduced return to the creel, trout plants will be discontinued in Pishkun Reservoir until pike populations return to lower levels.

Yellow perch is the main forage species in Pishkun Reservoir. Examination of Figure 1 shows the fluctuations in the perch populations, as well as the northern pike population. It is apparent that they control each other. If the perch population is high, it allows the pike numbers to increase. When the pike population peaks, the perch numbers begin to decline. The cycle is then repeated.

Various groups have requested the introduction of walleye into Pishkun Reservoir. The present forage base is able to maintain a limited pike population, but is doubtful if it could supply enough forage for another predator. Based on what has occurred in Lake Elwell and Lake Frances, the perch population has never recovered once pike and walleye cropped it down. The same situation would more than likely happen if walleye were established in Pishkun Reservoir.

Willow Creek Reservoir

Gill nets fished in October captured 60 rainbow trout representing fish planted in 1982, 1983 and 1984 (Table 1).

Trout planted in 1984 were Arlee-Eagle Lake cross, known as AXE. It is hoped this strain will exhibit good growth by utilizing the abundant sucker population.

Small Lakes and Farm Ponds

An extremely low water year was experienced in 1984 and several small lakes and farm ponds were affected. The largest, Eyraud Lake near Choteau, was drained due to irrigation demand. The fish population in this lake (yellow perch and northern pike) was essentially removed with the water. Re-population is expected to occur with drift of fish from the upper two pothole lakes.

Three farm ponds were checked for water levels in relation to feasibility of stocking trout. Henry Pond, Cameron Reservoir and Stewart Reservoir showed reductions in water levels ranging from one to five feet. Adquate depths remained in all three waters so trout were planted.

Another Farm Pond, Furnell Pond, was found to be very low. A meeting was held with the U.S. Fish and Wildlife Service, adjoining landowners and the Hi-Line Sportsmen Club to discuss

the possibility of raising the water levels by diversion of water from a coulee. At this time, the possibility is remote. However, this pond will be stocked again when runoff fills it naturally. Trout grow well in this water.

Trap nets were fished in April, May and June to monitor survival of yellow perch and crappie stocked in Priest Butte Lake in previous years. Several perch and only two crappie were collected. No reproduction of either species was documented. A total of 15,000 crappie and 10,000 largemouth bass were planted in August with similar numbers proposed for stocking in 1985. Additional perch will be transferred from ponds in the area, depending upon availability. Artificial reefs were constructed on the ice at locations in February and March and they settled to the bottom of the lake by melting through the ice. The Choteau Chapter of Walleye Unlimited constructed the reefs of tires and brush. Permit authorization, design, and location was handled by the Department of Fish, Wildlife and Parks. The reefs are to provide spawning and shelter for perch, crappie and bass.

Streams

Fish populations were surveyed in eight streams (Table 3) to update management files.

Marias River

Two sections of the Marias River were electro-fished to

Table 3. Stream Surveys, 1984

Area (Date Sampled)	Method+	No Of Fish	Species**	Length Range
Marias River				
Nelson Section	E-F	3	Rb	5.4-10.5
(6-17-84)		20	WF	5.8-14.6
		2	WE	19.0-19.4
Robertson Section	E-F	18	WE	5.8-16.6
(61-17-84)		1	NP	19.3
Rock Creek	E-F	38	RbxCt	2.1-10.4
(9-13-84)				
Dearborn River	H-L	10	Rb	5.0-11.0
Welcome Creek				
To Headwaters				
(7-31-84)		23	Ct	6.1-12.4
		8	RbxCt	7.5- 9.2
Welcome Creek to				
Lost Cabin Creek	H-L	34	Rb	4.5-12.2
(7-31-84)		26	Ct	3.0-15.5
		5	RbxCt	7.0-10.0

Table 3. (Continued)

Area (Date Sampled)	Method+	No. of Fish	Species**	Length Range
Mouth of Whitetail Creek (8-1-84)	H-L	17	Rb	4.0-13.3
		1	Ct	9.5
Whitetail Creek (8-1-84)	H-L	6	Rb	8.6-12.6
		1	Ct	10.6
South Fork Two Medicine River (8-15-84)	H-L/E-F	19	Ct	3.6- 9.8
Woods Creek (8-14-84)	EF	18	Ct	2.9- 8.0
Badger Creek (8/14/84)	H-L/E-F	11	Ct	8.0-13.1
Lee Creek (8/14/84)	E-F	9	Ct	3.1- 7.0

*Method: E-F = Electrofish; H-L = Hook-And-Line.

**Species Abbreviations: Rb-Rainbow trout; WF-Mountain Whitefish; WE-Walleye; NP-Northern Pike; CT-Cutthroat Trout; RbxCt - Rainbow-Cutthroat Hybrid.

document upstream movement of walleye and northern pike out of Lake Elwell, as well as ther species present. Approximately six miles were surveyed in the Nelson Section and three miles in the Robertson Section. Walleye were most abundant in the section nearest the reservoir (Table 3). Whether these fish are resident or migratory will involve more sampling. The larger walleye were tagged to determine harvest and movement. Other species collected during electrofishing include longnose dace, carp, emerald shiner, flathead chub, mountain sucker, white sucker, longnose sucker and mottled sculpin. Greater numbers of fish could probably have been obtained by shocking at night; however, this would be difficult due to rocky shallow areas in the river.

Dearborn River

This river was sampled by hook-and-line from its headwaters to Lost Cabin Creek and at the mouth of Whitetail Creek (Table 2). Cutthroat were planted in this water in 1969, with no follow-up

surveys until 1984. As expected, cutthroat numbers are greatest near the headwaters. There appears to be more than adequate numbers of fish, particularly in the upper portion. The greatest fishing pressure probably occurs in the Canyon area where vehicle access is possible near the forest boundary. Not many large trout were sampled. Cutthroat averaged 9.6 inches and rainbow 8.4 inches. Growth is rated fair. Most of the cutthroat sampled were three years old and ranged from 8.3 - 11.5 inches. The largest cutthroat was 12.4 inches and was four years old. The oldest rainbow was four years old and 12.0 inches. ~~Most of the rainbow were three, and four years old, ranging from 6.3-8.9 inches. Growth is rated fair. Most of the cutthroat sampled were three years old and ranged from 8.3 - 11.5 inches. The largest cutthroat was 12.4 inches and was four years old. The oldest rainbow was four years old and 12.0 inches.~~ Most of the rainbow were three and four years old, ranging from 6.3 - 8.9 inches, and 7.0 - 12.0 inches, respectively.

Whitetail Creek

Fish sampled in this stream, a tributary to the Dearborn River, are similar in size and species composition to those found in The Dearborn (Table 3).

Smith River

Trout populations were estimated in two sections of the Smith River in early September, 1984. Populations were estimated in the Zieg Section where data has been gathered form 1975 to 1981, and in a new section within the Smith River Canyon. Estimates for these two sections are presented in Tables 4 and 5.

Rainbow and brown trout populations in the Zieg section were very similar to fall estimates from 1977 to 1981.

A new section was established in the Canyon area of the river where public concern indicated fishing success was declining for the past few years. The population estimates reveal fewer trout per unit of stream length than in the Zieg Section (Tables 4 and 5). The brown trout estimates are believed to be high, since recapture efficiency was very low. Also, only about half as many brown trout as rainbow trout were sampled during the mark and recapture runs.

The rainbow trout estimates in the Canyon Section, when compared with those made in the Fraunhoffer Section (located about 10 miles downstream) in 1976 and 1977, revealed about four times more age II and older fish. Habitat types in the two sections are similar, which indicates an improvement in the rainbow population within the canyon zone of the river. Further data collection is necessary to provide a data base to evaluate trout population structure for management decisions.

Table 4. Trout population estimates from Zieg Section, Smith River, 1984. Section length 10,750 Ft.

Species	Age	Length (inches) Range	Average	Number	Weight (Pounds)
Rainbow trout	I	5.1 - 8.6	7.2	774	117
	II	7.7 -10.8	9.4	780	237
	III	9.7 -14.1	11.6	406	223
	IV+	10.8 -15.0	12.4	228	146
				2188±343	723
Brown Trout	I	7.4 - 9.6	8.5	89	21
	II	10.2 -13.0	11.6	47	27
	III	11.5 -16.1	14.6	80	98
	IV+	14.1 -19.0	16.5	60	102
				276±78	248
Grand Total				2464	971
Standing Crop/1000 feet				229	90
Standing Crop/acre				118	46

Table 5. Trout population estimates from Canyon Section, Smith River 1984. Section length, 18,775 Ft.

Species	Age	Length (Inches) Range	Average	Number	Weight (Pounds)
Rainbow trout	I	6.2- 8.7	7.6	460	81
	II	8.3-12.2	9.8	581	210
	III	9.8-14.6	11.9	269	173
	IV+	11.8-16.5	13.9	196	188
				1506±275	652
Brown trout	I	7.1-10.4	8.7	1099*	273
	II	9.8-15.0	12.2	279*	196
	III	14.6-17.0	16.3	92*	152
	IV	16.0-22.1	18.0	67*	145
				1537±437	766
Grand Total				3043	1418
Standing Crop/1000 Feet				162	76

*Estimates high - may be invalid due to sampling error.

Cutthroat Trout - Stream Populations

Cutthroat trout from the South Fork of the Two Medicine River, woods Creek, North Fork, Badger Creek and Lee Creek were collected for analysis of genetic purity. Electrophoresis testing was completed by personnel from the University of Montana.

Specimens from the South Fork Two Medicine River and Woods Creek were found to be 97 percent pure Westslope cutthroat. Woods Creek is a tributary to the South Fork and both samples were combined for testing purposes.

Samples from the North Fork of Badger Creek and Lee Creek were not large enough for statistical reliability. Additional fish are needed to validate genetic purity. However, preliminary testing showed no evidence of Yellowstone cutthroat or rainbow trout genes in the North Fork sample.

Grayling Introduction

Arctic grayling were introduced into Rock Creek in October of 1983 (Hill and Wipperman, 1984). A survey was conducted on June 25, 1984, to check survival of this introduction. Hook-and-line and visual observation methods were employed. The stream was clear, but flow was high. No grayling were caught or observed. Forest Service employees and an outfitter checked for grayling throughout the summer. They reported seeing one grayling a short distance downstream from the point of introduction. A grayling was caught by a fisherman at the mouth of Gates Creek, approximately two miles upstream from Rock Creek. Additional surveys are needed to determine survival of grayling in Rock Creek.

Arctic grayling were also introduced into the Sun River below Diversion Dam in April, 1983. Grayling were caught at this location by fishermen in the fall of 1983 and in July of 1984.

Discussion And Recommendations

The majority of the lakes and reservoirs are irrigation storage impoundments that experience tremendous fluctuations. Most of these waters also have large populations of suckers. Past management with Arlee rainbow has produced occasional poor survival and short life span. Several new strains of rainbow trout are being tested to increase longevity, to improve growth rates by feeding on small suckers, and to improve overall quality of the trout fishery. Future surveys will determine the contribution to the fishery of the following strains: Eagle Lake rainbow in Eureka Reservoir; Arlee X Eagle Lake Rainbow in Willow Creek Reservoir; McConaughy rainbow in Holter Reservoir and DeSmet rainbow in Bean Lake. Bynum Reservoir received plants of triploids in 1983 and 1984, but will be discontinued. Arlee rainbow do well in Nilan Reservoir and will continue to be stocked. Rainbow trout stocking will be discontinued in Pishkun Reservoir, due to northern pike predation.

Significant demands for increased warm/coolwater fisheries are being requested in the Region, particularly from Walleye Unlimited Chapters. Existing warm/coolwater fisheries are present in Lake Frances, Lake Elwell, Pishkun Reservoir and a number of smaller waters. Spottail shiner were introduced into Frances and Elwell to provide an additional forage fish for northern pike and walleye. Future surveys are needed to assess natural reproduction, abundance, and the role they play as forage. Requests to introduce walleye into Pishkun Reservoir are being discouraged at this time, due to a forage problem. Introduction of spottail shiner into this water to provide adequate forage for pike and walleye is not thought to be possible due to the morphometry and productivity of the reservoir. Walleye are being considered for introduction into Bynum Reservoir, along with yellow perch and spottail shiner as forage. To better understand the dynamics of walleye fisheries, present studies should be expanded to gather additional information on population size, harvest, natural mortality, and bag size limit restrictions. The Cinch-up Tag used on walleye in 1984 appears to be near "tag loss proof", as compared to the T-Tag, and should be used in future tagging studies. Artificial reefs have been installed in Priest Butte Lake to provide spawning habitat and shelter for various fishes. These structures should be evaluated for their effectiveness.

Stream surveys need to be continued to update management files. Additional data is needed on waters in the Dearborn River Drainage. More information is needed on the upper Marias River as to existing species composition and abundance, temperature and flow. The possibility of introducing warm/coolwater species into this section of river should be investigated. Electrophoresis testing of cutthroat in streams along the Front should be continued and expanded to determine genetic purity of this species concern. Pure strains of cutthroat and their habitat should be given top priority protection from logging, grazing, oil and gas exploration and road construction. Survival and reproduction of grayling introductions should be further evaluated. Population estimate monitoring will be continued in the Smith River to evaluate effectiveness of a reduced creel limit. Angler success and harvest also should be conducted on this river.

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Prepared by: William J. Hill and A.H. Wipperman

Date: September 3, 1985

CODE NUMBERS OF WATERS REFERRED TO IN THE REPORT ARE:

14-0200	Badger creek
14-2880	Lee Creek
14-3280	Marias River
14-5680	So. Fork Two Medicine River
14-6040	Teton River
14-6760	Woods Creek
14-7080	Bynum Reservoir
14-7120	Cameron Reservoir
14-7320	Eureka Reservoir
14-6840	Eyraud Lake
14-7440	Lake Frances
14-7450	Furnell Pond
14-7620	Henry Pond
14-8540	Priest Butte Lake
14-9091	Stewart Reservoir
14-9240	Lake Elwell (Tiber Reservoir)
17-2064	Dearborn River
17-6224	Rock Creek
17-6832	Smith River
17-8416	Whitetail Creek
17-8720	Bean Lake
17-9136	Holter Lake
20-5100	Rock Creek
20-6100	Sun River
20-7900	Nilan Reservoir
20-7950	Pishkun Reservoir
20-8500	Willow Creek Reservoir

MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS

FISHERIES DIVISION

JOB PROGRESS REPORT

State: Montana

Project No.: F-5-R-34 Title: Northcentral Montana Fisheries Study

Job No.: I-b Title: Inventory and Survey of Waters in the Eastern Half of Region Four

Period Covered: July 1, 1984 through June 30, 1985

Report Period: July 1, 1984 through June 30, 1985

ABSTRACT

Netting surveys were conducted on 5 large reservoirs and 17 farm ponds located within the study area. Fifteen BLM reservoirs and 8 private ponds were investigated for fisheries potential. Streambank stabilization projects and habitat conditions were monitored and documented along Big Spring Creek and its tributaries. Invertebrate bottom samples were collected at the nine established stations along the stream and its tributaries. Trout population estimates were made for two sections of Big Spring Creek. Progress on a proposed small hydropower project on Big Spring Creek and one on Warm Spring Creek was monitored. Fish populations were sampled in several small streams including Little Rock Creek, Louse Creek, Copper Creek and the North Fork of Musselshell River. Cutthroat trout were collected from the South Fork of the Judith River and sent to the University of Montana for analysis of genetic purity.

OBJECTIVES AND DEGREE OF ATTAINMENT

The objectives of this job were:

1. To monitor growth, survival, catchability and longevity for two strains of rainbow trout planted into Ackley Lake, Bair Reservoir and East Fork Spring Creek Reservoir. This work was started on East Fork Reservoir and the findings are included.

2. To survey new farm ponds for possible addition to our management program. Twenty-three ponds were investigated for fishery potential.

3. To obtain information for management of several species of trout, kokanee, burbot and walleye in 6 reservoirs, 12 farm ponds and 4 streams. This work was done for 5 reservoirs, 17 farm ponds and 6 streams and the findings are included.

4. To evaluate survival and growth of northern pike introduced into Petrolia and War Horse Reservoirs and survival and growth of largemouth bass and yellow perch introduced into eight farm ponds. This work was done and the findings are included.

5. To monitor habitat changes and rainbow and brown trout populations in Big Spring Creek. This work was done and the findings are included.

6. To estimate trout populations in the Craig section of the Missouri River. Field work was done , but errors in computer printout data sheets were not corrected in time to present results in this report.

7. To continue monitoring potential impacts of proposed small hydro-projects on aquatic ecosystems on Warm Spring Creek and Big Spring Creek. This work was done and the latest findings are included.

PROCEDURES

Fish were sampled with sinking and floating nylon gill nets 125 foot by 6 foot (with graduated mesh sizes from 3/4 to 2 inch); 4-foot by 6-foot frame trap nets (1/2- and 1-inch mesh); 3-by 4-foot frame trap nets (1/4 -inch mesh); a 300 volt D.C. electrofish shocker; and by hook and line. Fish captured were measured to the nearest tenth of an inch (total length) and weighed to the nearest hundredth of a pound. Scales were collected for age and growth analysis. Random creel census and fishermen interview were employed to check harvest, fishing pressure, and success of trout stocking in the more important reservoirs and streams. Bottom samples were collected with a Surber Sampler for analysis of invertebrates. Population estimates for Big Spring Creek were made using the mark and recapture method described by Vincent (1971 and 1974). Erosion and habitat changes were measured from established transects and photo points. Flow measurements, channel characteristic measurements, and photos were used to determine stream flow needed for maintenance of aquatic life in Big Spring Creek and Warm Spring Creek. Techniques developed by the Instream Flow Group and the Department of Fish, Wildlife and Parks were utilized.

ACCOMPLISHMENTS

Large Reservoirs

Five of the seven larger Department of Natural Resources reservoirs located within the study area were sampled during 1984 and 1985. The results of this work are presented in Table 1. War Horse Reservoir was not sampled because low water and extensive mud flats made it impossible to launch a boat. Bair Reservoir was not sampled because heavy irrigation withdrawals completely drained the lake resulting in total loss of the fishery. A short narrative summary of findings on each of the other five reservoirs follows.

Ackley Lake - Extended drouth conditions and heavy irrigation drawdown dropped water levels in Ackley Lake to dead storage by early fall of 1984. Extremely low water provided us with the opportunity to eradicate the existing rough fish population with chemical treatment. A net set in the spring of 1985 took no fish indicating a complete kill was attained. Ackley Lake failed to fill completely in 1985 because of reduced mountain snowpack. Arlee strain rainbow trout were planted into the lake but because of severe drawdown a scheduled fall plant of Eagle Lake strain rainbow trout was cancelled.

Martinsdale Reservoir - Netting surveys conducted at this popular fishing location showed good growth and survival of the 1984 rainbow plant. Brown trout which enter the reservoir from the Musselshell River made up about 10% of the catch. Recreational use was high and fisherman success was good throughout the spring and summer but by fall heavy irrigation drawdown will reduce the reservoir to dead storage. Summer kill and or winter kill is imminent in the small amount of water that remains.

Petrolia Reservoir - Heavy irrigation withdrawal during 1984 resulted in the lake going through the winter at much lower than average levels. Nets set early in the spring of 1985 showed all the fish sampled except for one northern pike to be in poor condition. Early withdrawals for the irrigation season coupled with reduced runoff has resulted in extreme low water for the third year in a row. Until we get back to a more normal pattern of precipitation and runoff, the outlook for the fishery in Petrolia looks dim.

Smith River Reservoir - Netting surveys indicated poor survival of the 1984 plant of rainbow trout. No burbot were taken in the nets but the average size of suckers sampled was large indicating the burbot are still quite effective as a means of rough fish control in this lake. Lake levels dropped rapidly throughout the summer and if withdrawals continue at the same rate,the reservoir will be dry by fall.

Yellow Water Reservoir - Extended drouth conditions and irrigation drawdown resulted in the lake draining to dead storage by the fall of 1984. Carp and white sucker populations had been increasing in the reservoir for a number of years so the low water afforded us the opportunity to chemically treat the lake. A complete fish kill was achieved but the lake failed to fill with water during 1985 and no trout were planted. Repairs upon the dam and outlet structure are scheduled for 1985. It is anticipated that these repairs can be made while the lake is dry.

Table 1. Summary of Netting Data From Large Lakes and Reservoirs.
Fall '84, Spring '85

ocation Date Sampled)	Acres	Type Of Net	Species	No. of Fish	Length Range Inches (Average)	Weight Range Lbs. Average
ckley Lake 4/18/1985)	247	1 Gill	No fish	0	0	0
artinsdale eservoir 6/11-12/85)	1000	2 Gill	Rb	57	6.3-15.8(12.5)	0.10-1.28(0.7
			LL	7	10.6-28.0(16.6)	0.48-9.00(2.3
			WF	1	14.2	0.94
			CSu	35	--	--
			FSu	9	--	--
etrolia eservoir 5/16-17/85)	515	2 Trap	N.P.	1	22.0	2.79
			WE	1	9.4	0.10
			Bullhead	4	--	--
			Y-Perch	26	--	--
			CSu	34	--	--
			Carp	12	--	--
mith River eservoir 6/11-12/85)	327	2 Gill	Rb	2	13.7-14.4(14.0)	1.03-1.13(1.0
			WF	1	15.0	1.19
			CSu	11	--	--
			FSu	94	--	--
ellow Water eservoir 3/19/84)	600	1 Gill	CSu	43	--	--
			Carp	21		

Farm Ponds

Seventeen farm ponds and small reservoirs stocked by the department were netted during the report period and the results are given in Table 2. Fifteen BLM reservoirs and eight private ponds were checked for fisheries potential. As a result of these investigations, fish were planted into several of the ponds. Extended drouth and continually declining water levels in many ponds resulted in many winter kills and summer die-off. This is very evident in Table 2 with the large number of ponds where netting surveys revealed no fish. Particularly hard hit are ponds and reservoirs along the northern and eastern portions of the project area.

Streams

Big Spring Creek - Stream flows in Big Spring Creek during the report period have been average to below normal. Reduced mountain snowpack and below normal precipitation have contributed to the low flows. Moderate stream flows have resulted in reduced erosion rates and contributed to increased revegetation along streambanks and riparian zones. Proliferation of dense mats of rooted aquatic vegetation has increased dramatically in response to stable flows over the past few years. Present abundance and distribution of rooted aquatic vegetation is much more widespread than it has been for at least twenty years.

Erosion and other naturally occurring stream channel stabilization processes throughout the lower watershed were monitored and documented with photos and measurements. The photos are used to update our erosion slide series which documents the effects of stream channelization. Erosion rates during the period were minimal in response to the below normal stream flows.

Bottom samples were collected at the nine established stations located along Big Spring Creek and its tributaries to evaluate invertebrate populations. The results are given in Table 3. The total number of invertebrates collected from all the sampling sites in 1984 (9103) was slightly lower than the number collected in 1983 (9276). High invertebrate numbers are directly related to the moderate to low stream flows throughout the past few years. Although changes in management directives for the region have made it unfeasible to continue the sampling any longer it is anticipated that with the large increase in rooted aquatic vegetation a corresponding increase in invertebrates would be expected.

Table 2. Results of Sampling Ponds and Reservoirs, 1984-1985.

Pond (Year)	No. Of Nets	Species	Fish	Length Range Inches (Average)	Weight Range Pounds (Average)
Benes Res. (1985)	1 Trap	N.P.	20	19.8-24.3(22.2)	1.85-3.70(3.30)
Buffalo Wallow (1985)	1 Gill	CT	7	13.5-15.8(15.2)	1.40-2.00(1.78)
Cambell Res. (1985)	1 Trap	Y-Perch	6	--	--
		FH	Many	--	--
Carters Pond (1985)	1 Gill	No Fish	--	--	--
Culver Res. (1985)	2 Traps	FH	Many	--	--
Dry Blood Res. (1985)	1 Gill	No Fish	--	--	--
E. Fork Dam (1985)	1 Gill	Rb	4	7.3-9.8(8.0)	0.12-0.32(0.18)
		CSu	69	--	--
		FSu	9	--	--
Hassler Res. (1985)	1 Gill	No Fish	--	--	--
Hanson Res, (1985)	1 Gill	Rb	1	12.9	0.88
Holland Res. (1985)	1 Trap	No Fish	--	--	--
Jakes Dam (1985)	1 Trap	Y-Perch	8	--	--
Norman Res.	--	Drained	--	--	--
Payola Res. (1985)	1 Gill	Y-Perch	66	4.5-12.8(5.2)	0.02-0.81(0.19)
	1 Trap	Bullhead	11	5.2-8.6(6.5)	0.03-0.45(0.21)
		LMB	27	4.1-8.9(6.2)	0.03-0.37(0.18)
S. Fork Dry Blood (1985)	1 Gill	Rb	21	6.3-10.5(9.3)	0.22-0.55(0.37)

Table 2. Continued

Pond (Year)	No. Of Nets	Species	Fish	Length Range Inches (Average)	Weight Range Pounds (Average
Stafford Res. (1985)	1 Gill	No Fish	--	--	--
Styer Res. (1985)	1 Gill	No Fish	--	--	--
Lower Wolf Cr.	1 Gill	No Fish	--	--	--

1/ Abbreviations: NP - Northern pike, Ct - Cutthroat trout, Y-Perch-yellow perch, FH - Fathead minnow, Rb - Rainbow trout, CSu - White sucker, FSu - Longnose sucker, LMB - Largemouth bass

Table 3. Number and families of organisms collected in two one-square foot bottom samples from nine stations on Big Spring Creek and East Fork on August 6-10, 1984

Organism	Hatchery	East Fork	Burleigh's	Montana Power	St. Leo's School	Above Sewer	Below Sewer	Trestle	Spring Cr. Colony
Trichoptera									
Brachycentridae	112	14	205	377	36	786	310	6	56
Leptoceridae	55	3	25	160	10	12	31	16	40
Rhyacophilidae	3		16	66	2	11	10		4
Hydropsychidae		39		12		21		188	426
Hydroptilidae	1	174	3	37	42	42		9	58
Philopotamidae		1					108		
Psychomyiidae						2		1	
Limniphilidae								3	
Gastropoda									
Planorbidae		1	2	4					
Physidae	16	12		2		11	290	8	
Diptera									
Ephydridae									
Tipulidae	54	3	99	3	212	172	20	5	62
Tendipedidae	361	13	190		185	311	1360	28	128
Rhagionidae		1				5		4	440
Empididae		1					1		
Simuliidae			1					110	4
Tabanidae	22	2					2		
Ephemeroptera									
Baetidae	70	18	232	51	5	52	34	103	369
Heptageniidae	1	1	17	2				25	10
Plecoptera									
Perlodidae		1	5	1				1	
Chloroperlidae									
Perlidae	1		1	1				1	
Nemouridae									

Table 3. Number and families of organisms collected in two one-square foot bottom samples from nine stations on Big Spring Creek and East Fork on August 6-10, 1984 - (Continued)

Organism	Hatchery	East Fork	Burleigh's	Montana Power	St. Leo's School	Above Sewer	Below Sewer	Trestle	Spring Cr. Colony
Annilida									
Oligochaeta	3			4		2	10		
Coleoptera									
Elmidae	1	5	10	29	8	58	4	6	8
Hydracerina	12		3	8	18	16	48		
Odonata									
Gomphidae									
Pelecypoda									
Sphaeriidae				1					
Planariadae	10					20	188		
Gammarus	1								
Station Totals	723	239	809	758	518	1518	2416	514	1605
Org. No./Sq. Foot	361	119	404	379	259	759	1208	257	802
No. of Families	16	16	14	16	9	15	14	16	12

Trout population estimates were made in two sections of Big Spring Creek during the fall of 1984. The results of these population estimates are summarized in Table 4.

Rainbow trout numbers in Section B increased about two and a half times over the estimated number in 1983. The increase was observed in all age groups with a particular large increase in age group I fish indicating good spawning and recruitment during 1983. The large increase in all other age groups indicates a significant movement of fish into the section from other parts of the stream.

Brown trout numbers in Section B increased about 69% over estimates made in 1983 but the population is still so small that it is difficult to draw conclusions from the data.

Rainbow trout population estimates made in section D were down about 12% when compared to estimates made in 1983 but total weight of rainbow trout in the section was up about 8% indicating an increase in average size of fish within the section. The 1984 population estimates revealed substantial numbers of age group III and IV fish which would be large in average weight. The small number of age group II fish in 1984 is a puzzle when compared to the large number of age group I fish from 1983. Sometime during the year a substantial number of these fish disappeared from the section.

Brown trout population estimates for section D increased slightly over those made in 1983. an increase was noted in age groups I, III and IV, but a significant decrease was noted in age group V and older.

Fergus Electric Cooperative Incorporated filed a water use permit in 1983 for a small hydro project to be incorporated into the mill ditch diversion channel of Big Spring Creek. However, they turned the project over to the City of Lewistown. The City of Lewistown plans to continue with the proposed project provided outside funding can be procured. Additional photos were taken and flows measured in the old stream channel through town in an attempt to further refine flows considered adequate to maintain the existing fishery.

Warm Spring Creek - Progress on a proposed hydroelectric project which plans to divert 75 cfs of water from Warm Spring Creek has been slow. Several meetings and on-site inspections have been held involving a consultant retained by the applicant. The primary job of the consultant includes design and construction of a new supply ditch and an accurate stream flow measuring system. An accurate flow measuring system is particularly important for the maintenance of minimum year around flows within the stream channel.

Louse Creek - A short section of Louse Creek was electrofished. This work is part of a continuing study to inventory and sample waters located within the project area. Electrofishing within a 400 foot section of stream took a total of 49 brook trout ranging in size from 3.5 - 13.3 inches. This was a decrease of 177% from the number of fish sampled in the same section during 1983. five of the fish sampled were marked in the same section during the previous year.

Little Rock Creek - Two short sections of stream were electrofished to check on the success of an introduction of brook trout made ten years ago. Approximately 400 feet of stream was electrofished above King Colony and the catch was 3 brook trout, numerous dace and sculpins. Several miles downstream from the colony, a 600 foot section was electrofished and only 2 white suckers and 2 dace were taken. Since the stream flows through the middle of the livestock operation and holding pens, it is possible that a substance entering the stream at that point has adversely impacted the downstream fishery.

Copper Creek - A short section of Copper Creek was electrofished as part of a continuing study to inventory and sample waters within the project area. Electrofishing a 400 foot section of stream took 58 brook trout ranging in length from 2.9 - 7-0 inches.

Sage Creek - A short section of Sage Creek was electrofished as part of a continuing study to inventory and sample waters within the project area. Sampling within a 200 foot section of stream took 36 brook trout ranging in size from 4.6 - 9.3 inches.

North Fork Musselshell River - A 200 foot section of the North Fork of Smith River above Bair Reservoir was electrofished to determine if any significant movement of fish from the reservoir had taken place prior to complete drainage. A total of 76 brook trout ranging in size from 3.3 - 8.5 inches and 5 rainbow trout ranging in size from 3.8 - 5.5 inches was sampled. It appeared that all the fish sampled were probably resident stream fish.

South Fork Judith River - A sample of Upper Missouri cutthroat trout was collected from the upper South Fork in and around the mouth of Big Hill Creek for analysis of genetic purity. This project done in cooperation with the United States Forest Service, involved electrophoretic analysis done at the University of Montana. The South Fork fish were found to be a slightly hybridized population of rainbow, westslope, and yellowstone cutthroat trout. The population proved to be 98% pure westslope cutthroat trout overall.

DISCUSSION AND RECOMMENDATIONS

Water levels in all the larger reservoirs located within the project area, with the exception of Newlan Creek Reservoir, are very low due to extended drouth conditions and irrigation drawdown. Four of the eight, Ackley, Bair, Martinsdale and Yellow Water, are completely dry or at dead storage and three of the remaining four, Petrolia, Smith River Reservoir and War Horse, are so low the fishery has little chance of surviving a hard winter. During most years, six of these reservoirs are usually in the top twenty five of fishing reservoirs statewide. All but one of these reservoirs normally fills with water if average amounts of yearly precipitation is received. Because of the importance of these reservoirs on a local, as well as regional basis, a major effort is going to be required to re-establish the documented fisheries as soon as they fill with water.

Farm ponds and reservoirs along the northern and eastern portions of the area are dry or so low that the fisheries will probably be lost. With anticipated winter losses, probably less than 20% of the ponds and reservoirs on the management program will contain viable fish populations. Re-establishment of drouth devastated fisheries in many parts of Central Montana is going to take a major effort. Re-establishing warm water fish populations such as perch, crappies, walleyes, bass and northern pike is particularly time consuming since it requires trapping and transplanting of these species as they become available. In many cases, this takes years to accomplish. A reliable warm water hatchery system should be a big help for this purpose.

Continued monitoring, evaluation and surveying of streams located within the project area should continue to be a primary objective. This work is particularly important because of the fragile nature, limited number and high value of the streams in the area.

A major forest fire which burned a large area in the headwaters of the Judith River along the west side of the Lost Fork could potentially have a severe impact upon the fishery. Several small tributaries contained populations of Upper Missouri Cutthroat trout that were severely impacted or possibly destroyed. A thorough evaluation should be done: to determine the extent of damage; plan for re-establishment of the fishery in areas; and determine impact of ash and sediment increases upon the fishery of the Lost Fork. Population estimates should be done and compared to estimates made prior to the fire.

With the major increase in rooted aquatic vegetation and anticipated associated increase in invertebrate populations, wild trout numbers should continue to increase throughout Big Spring Creek. The influence of Lewistown new secondary sewage treatment plant should be closely monitored with respect to invertebrate populations and trout populations in sampling section D, located immediately downstream from the sewage outfall. It is possible that a change in the nutrient load entering the stream will impact the fish population downstream. Many years of fish population estimates and invertebrate samples collected in section D are available for comparison purposes.

Potential impacts to several streams from proposed hydropower projects could be fairly severe. Additional work should be done to determine flushing flows, timing and duration of specific flows and various mitigation recommendations. A meeting should be held with the City of Lewistown to discuss their plans for the proposed hydropower project and to express our concerns about the project. Close monitoring of both projects is necessary to assure that our recommendations and concerns are incorporated into the projects.

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Prepared By: Michael D. Poore

Date: September 2, 1985

CODE NUMBERS OF WATERS REFERRED TO IN THE REPORT ARE:

16-0300	Big Spring Creek Sec. 01
16-0301	Big Spring Creek Sec. 02
16-2140	Lost Fork Judith River
16-2160	Louse Creek
16-3040	Little Rock Creek
16-3200	Sage Creek
16-3520	South Fork Judith River
16-3920	Warm Spring Creek
16-4593	Cambell Reservoir
16-4300	Ackley Lake
16-4463	Benes Reservoir
16-4950	East Fork Spring Creek Reservoir
16-5535	Hanson Creek Reservoir
16-5700	Hassler Reservoir
16-6420	Carters Pond (Lower)
16-7286	Norman Reservoir #1
16-8380	Stafford Reservoir
17-9330	Newlan Creek Reservoir
17-9616	Smith River Reservoir
18-1320	Copper Creek
18-4350	North Fork Musselshell River
18-7340	Buffalo Wallow Reservoir
18-7565	Dry Blood Reservoir
18-7750	Bair Reservoir
18-8380	Martinsdale Reservoir
18-8700	Payola Reservoir
18-8720	Petrolia Reservoir
18-9150	South Fork Dry Blood Reservoir
18-9440	War Horse Reservoir
18-9500	Yellow Water Reservoir