MONTANA DEPARTMENT OF FISH, WILDLIFE, AND PARKS

FISHERIES DIVISION
JOB PERFORMANCE REPORT

STATE: MONTANA **PROJECT TITLE:** STATEWIDE FISHERIES INVESTIGATIONS

PROJECT NO.: F-46-R-5 **STUDY TITLE:** SURVEY AND INVENTORY OF COLDWATER STREAMS

JOB NO.: I-a **JOB TITLE:** NORTHWEST MONTANA COLDWATER STREAM INVESTIGATIONS

PROJECT PERIOD: JULY 1, 1991 THROUGH JUNE 30, 1992

BACKGROUND

The coldwater fisheries resource of northwest Montana includes about 3,500 miles of streams ranging in size from average flows of less than 1 cfs up to 18,000 cfs. Stream dwelling Salmonidae include brook (Salvelinus fontinalis), brown (Salmo trutta), bull (Salvelinus confluentus), cutthroat (Oncorhynchus clarki) and rainbow trout (O. mykiss), and mountain whitefish (Prosopium williamsni). Other species found in streams includes suckers (Catostomus spp.), northern squawfish (Ptychocheilus oregonensis), peamouth (Mylocheilus caurinus), redside shiners (Richardsonius balteatus), and sculpins (Cottus spp.). This array of stream habitat and species mix with proper management should support an estimated angler use of 163,000 days by 1992. This survey and inventory project is an ongoing effort to update management programs to maintain or improve the coldwater streams fisheries.

OBJECTIVES AND DEGREE OF ATTAINMENT

1. To determine and maintain, within legal limits, the flows necessary to maintain or enhance existing fish populations. This objective accomplished utilizing state funding.

2. To maintain streambanks and channels in present or improved condition. This objective met utilizing state funding. During calendar year 1991 project personnel reviewed a total of 385 construction projects affecting streams. Two project personnel continued to be team members on "best management practices" (BMP's) timber harvest audits.

3. To maintain water quality at or above present levels as measured by the state Water Quality Bureau and the U.S. Geological Service. Objective accomplished using state funding.

4. To maintain aquatic habitat and associated fish populations at or above present levels. This objective may not be met but potential failure is due to causes uncontrollable by man. Western Montana had a moderate drought from 1985 through fall of 1989, then had above normal precipitation from fall 1989 through September 1991. Since September, 1991 through the end of the report period precipitation has been about 50 percent of normal. Streamflow in June 1992 was estimated to average about 40 to 60 percent of normal in almost all western Montana streams and long range weather predictions indicate a worsening of streamflow. Air temperatures have averaged above normal since about November 1991 and are predicted to be above normal through summer 1992. The combination of below normal streamflow and high air temperatures could result in adverse

habitat conditions very deleterious to maintaining "normal" fish populations.

5. To maintain fish populations and harvest at acceptable levels to provide 163,300 angler days of use by 1992 and a catch rate of 0.5 fish/hour or greater. This objective partially met. Conditions described above apply to this item also.

6. To maintain a population of 1,300 rainbow trout per mile with five percent being larger than 14 inches in the Kootenai River. This objective was partially met.

7. To maintain or expand populations of species of special concern (westslope cutthroat trout, bull trout and inland (redband) rainbow trout). Objective was met and a special segment report has been submitted. The Kootenai National Forest has embarked on an extensive forest-wide genetic testing program to locate populations of redband rainbow trout and westslope cutthroat trout. Their first years' effort was concentrated on the Yaak River Drainage which complements previous Department genetic sampling.

8. Secure public access on currently used sites on private ground. Provide floating accesses four to six hours apart on major streams. Objective met using state funding. Negotiations were started with W.R. Grace Co. to obtain land for a fishing access site near Rainey Creek tributary to Kootenai River about mid-point between Libby Dam and the town of Libby, Montana.

PROCEDURES

Fish Sampling Techniques

Methods used to estimate fish populations varied by stream and included the following:

1. Lake Creek Sculpin Sampling. Two 272 square foot areas of a riffle above and below the ASARCO Troy Mine tailing pond were encircled with 1/4-inch bar mesh netting and two-pass electrofishing estimates of sculpins made using a backpack Coffelt electrofishing unit. Estimates from the two areas were expanded to number of sculpins per 1,000 square feet of riffle.

2. Kootenai River Sampling. Numbers of rainbow trout and mountain whitefish were estimated in the Kootenai River at two locations; below the town of Libby and the town of Troy. Fish were captured using a jet boat with electrodes powered by a Coffelt 2-C electrofishing unit, weighed and measured, fin clipped and released. Capture and recapture efforts were one week apart in late August-early September. Rainbow trout redds were counted in an area of the river between Alexander Creek and Fisher River.

3. Swan River. Electrofished one 3.7 mile long section of Swan River using a drift boat with electrodes powered by a Coffelt 2-C electrofishing unit. Captured fish were weighed, measured, marked and released. Marking and recapture efforts were about one week apart. Estimates were made of numbers of rainbow trout, brook trout and mountain whitefish. Not enough cutthroat or bull trout were caught to make a valid estimate.

4. Clark Fork River. Two sections of the Clark Fork River near Plains, Montana, were survey electrofished using jet boat mounted electrofishing equipment to determine areas inhabited by gamefish. These areas were from the town of Paradise downstream to Plains (about 8 miles) and from the lower Weeksville Rapids to below Swamp Creek (about 3 miles).

5. Bull Trout Redd Counts. Biologists walked standard stream sections in Lion, Squeezer, Elk and Goat creeks, all Swan River tributaries, and counted bull trout redds in late September and early October when maximum stream temperatures had fallen to 50° F or less.

6. Age and Growth. Fish scale impressions were made on heated strips of acetate in a scale press and read using a microfiche reader. Magnification used varied with species and size of scale but was uniform for individual scale collections.

7. Other Waters. It had been planned to do snorkel-peterson population estimates in sections of the North Fork and South Fork Flathead River. Higher than normal streamflows during the time set aside for these estimates precluded the effort.

FINDINGS AND DISCUSSION

Lake Creek

A hard rock mining operation in the Stanley Creek Drainage tributary to Lake Creek, Lincoln County, Montana, has caused considerable concern about potential effects upon the biota of Lake Creek. The mine's waste rock slurry pipeline traverses Stanley Creek, crosses Lake Creek, and terminates in a settling pond in close proximity to Lake Creek. Lake Creek in the vicinity of the settling pond and downstream for at least six miles supports a small trout population. Good populations of sculpins do exist above and below the tailings ponds and, because of their preference for riffle areas and clean, cold water, are sensitive to habitat deterioration. Sculpin populations were estimated in two riffle areas, one above the tailings and pipeline crossing and the other below the tailings pond. Table 1 shows the number of sculpins per 1,000 square feet of creek bottom by year. Sampling has been done in late August to late September.

Table 1. Numbers of sculpins per 1,000 square feet of riffle area, Lake Creek above and below mine tailings pond 1977 and 1986 through 1991.

Year	Number Sculpins per 1,000 Square Foot	
	Above Pond	Below Pond
1977	92	206
1986	137	274
1987	197	155
1988	125	255
1989	108	129
1990	146	167
1991	119	140

The creek channel at the below pond riffle was starting to shift away from the riffle and there is a good chance that the lower sampling area will not be usable in 1992. If this does occur a riffle about 50 yards downstream will be substituted.

Kootenai River

Estimates of total numbers of mountain whitefish and rainbow trout per 1,000 feet of river are listed in Table 2 below. Data listed include rainbow trout numbers for 1988-1991 and whitefish for 1989 and 1990 for the Alley Springs-Pipe Creek section and for whitefish and rainbow trout for 1990 from the Troy section. The 1991 whitefish estimate has not been computed yet but will be included in next year's report.

Table 2. Number of whitefish and rainbow trout from the Alley Springs-Pipe Creek and Troy sections of Kootenai River.

		Number of fish per 1,000 feet of river			
Section	Species	1988	1989	1990	1991
Alley Springs - Pipe Creek	Rainbow Trout	192	420	291	473
	Mountain Whitefish	---	2,193	1,821	---
Troy	Rainbow Trout	---	---	14	---
	Mountain Whitefish	---	---	1,066	---

The 1990 and 1991 estimates have not been broken down into age classes at this time so age class comparisons between the two years can only be speculative. The differences between the 1988 estimate and the 1989 estimate is large increases in one- and two-year-old fish in 1989 compared to 1988. Numbers of three-year-old and older fish appeared constant between the two years.

Almost all of the rainbow trout in the Alley Springs-Pipe Creek section spawn in tributary streams and most small fish smolt to the river as one- or two-year-old fish based on scale analysis. A few fry and three-year-old migrants also occur. Age at smolting has averaged about 84 percent one and two-year-old smolts with the remainder being fry and three-year-old smolts from 1982 through 1988. In 1990 and 1991 one and two-year-old smolts made up 86 and 89 percent of the sample with the remainder being fry and three-year-old smolts.

Growth rates of mountain whitefish and rainbow trout collected in the Troy and Alley Springs-Pipe sections are listed in Table 3. The rainbow trout data includes only fish that smolted into the river as one or two-year-old fish.

Table 3. Age and growth of one and two-year-old smolting rainbow trout and mountain whitefish from Troy and Alley Springs-Pipe sections of Kootenai River, 1990 and 1991.

			Length in Inches at Annulus					
Species	Year	Section	I	II	III	IV	V	VI
Rainbow Trout	1990	Alley-Pipe	3.1(79)	7.9(29)				
	1991		2.9(113)	7.3(36)	12.1(4)			
Mountain Whitefish	1990	Alley-Pipe	4.2(156)	8.5(109)	11.1(64)	12.4(32)	13.4(14)	14.4(4)
	1991		4.3(107)	8.8(99)	11.2(52)	13.0(19)	14.6(6)	16.5(2)
Rainbow Trout	1990	Troy	3.1(36)	8.5(24)	11.8(5)	14.2(1)		
Mountain Whitefish	1990	Troy	4.2(132)	8.2(96)	9.9(73)	11.4(33)	12.9(7)	14.6(2)

Number in parenthesis is size of sample.

Rainbow trout were first observed spawning in Kootenai River near the Blackwell Flats recreation area in 1981 and surveys located 14 redds. Thirteen redds were counted in this same area, between the Montana Highway #37 bridge immediately above the mouth of Fisher River upstream to Alexander Creek, in spring 1992. Rainbow trout redds have never been observed in the river downstream from the Highway #37 bridge.

Anglers have been catching a fair number of large (5-29 pound) rainbow trout downstream of Libby Dam to about the mouth of Fisher River in recent years. Prior to the establishment of kokanee in Lake Koocanusa (Libby Reservoir) these larger rainbow trout were scarce in the river. It is also known that large numbers of kokanee are entrained from the reservoir through the turbines. It is theorized that rainbow trout resident to Kootenai River or Kamloops rainbow trout escaping out of the reservoir with the kokanee are using the kokanee for a food base. Genetic analysis of the larger rainbow trout below the dam will determine if these fish are river residents (mostly coastal genetic material) or Kamloops (inland genetic material).

Clark Fork River

About 11 miles of the Clark Fork River near Plains, Montana were survey electrofished. The most numerous fish species observed were suckers, squawfish and redsided shiners. Mountain whitefish were numerous in and around riffles areas. Only two brown trout and one rainbow trout were caught and all were taken from streambanks covered with large rip rap. This section of river was planted annually with 50,000 fingerling brown trout in 1990, 1991 and 1992 in an attempt to increase gamefish densities.

Swan River Drainage

Bull trout redds were counted in 11 tributaries of the Swan River. These counts are presented in Table 4 below and compared to previous years' data. The kokanee spawning crew also reported observing good numbers of bull trout on the kokanee spawning grounds in Swan Lake in October and November, 1991.

Table 4. Number of bull trout redds from annual monitoring sections in major Swan River spawning tributaries.

Stream	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Elk	56	91	93	19	53	162	201	186	136	140
Goat	33	39	31	40	56	31	46	34	27	31
Squeezer	41	56	83	24	55	64	9[1]	67	42	101
Lion	63	49	88	26	46	33	65	84	58	94
Total	193	236	295	109[1]	210	290	321[1]	371	263	366

[1]Redds possibly obliterated by high flows.

Table 3. Bull trout redd counts from spawning streams randomly monitored in Swan River tributaries.

Stream	1982	1983	1984	1989	1990	1991
Jim	*	7	6	39	22	40
N. Lost	9	6	7	*	13	5
Piper	0	0	1	25	*	18
Cold	1	9	6	*	*	5
S. Lost	2	1	12	*	*	1
Cedar	1	*	*	*	*	*
Glacier	0	1	*	*	*	*
S. Woodward	*	*	*	*	*	8
Woodward	0	1	*	*	*	28

*No counts conducted.

Numbers of rainbow trout per 1,000 feet of stream in the 3.7 mile long Salmon Prairie-Piper Creek section of Swan River was estimated using the Peterson mark and recapture method. The August, 1991 estimate was 198 rainbow trout ranging from 4.0 to 19.9 inches long of which 10 percent were 12 inches long or longer. The September, 1990 estimate was 80 rainbow trout ranging from 4.0 to 20.5 inches long of which 21 percent were 12 inches long or longer. There was no significant differences between the 1990 and 1991 number estimate at the 95 percent confidence level. Sizes of fish caught in both years was similar although a higher percent of large fish were present in 1990.

Number of mountain whitefish in the Salmon Prairie-Piper Creek section per 1,000 feet of stream was also estimated in 1991. This estimate was 208 fish ranging in size from 3.5 inches to 17.4 inches total length with a 95 percent confidence interval of 57 fish.

Genetic analysis of fish collected from Hall Lake, headwater of Hall Creek, tributary to Swan Lake revealed a population of rainbow trout. In summer 1991 Hall Lake and creek were planted with 5,000 and 20,000 westslope cutthroat fingerlings, respectively. Purpose of these plantings are to eventually replace rainbow with westslope cutthroat and to establish cutthroat spawning runs into the creek from Swan Lake.

RECOMMENDATIONS

Recommendations for work to be done in fiscal year 1993 are presented below by drainage and include:

1. Clark Fork River Drainage. The Washington Water Power Company, Kootenai National Forest and Montana Department of Fish, Wildlife and Parks have agreed to perform cooperative basic fisheries and physical habitat surveys on tributaries of Cabinet Gorge and Noxon Rapids Reservoirs starting in FY 93 extending through several years. The Department is the lead entity for collecting fish for genetic analysis, doing fish population and age-growth studies and make brown and bull trout redd counts. Washington Water Power Company will assist the Department on the above activities and be the lead entity on habitat surveys, review of historical records and report writing.

The Kootenai National Forest will assist the other entities as needed, provide documents on present and historical uses and provide the Company with additional funding. The Bull River Drainage, tributary to Cabinet Gorge Reservoir, was picked as the first system for survey in FY 93. Data from this survey will be reported in Job Progress Report, Project Number F-46-R-5, Job II-a.

Status of brown trout planted in Thompson River should be determined by creel census, survey electrofishing or other pertinent method(s). Fishtrap Creek, tributary to Thompson River, from its mouth to about four miles upstream should be checked for presence or absence of spawning bull trout (Salvelinus confluentus).

2. Kootenai River Drainage. Populations of rainbow trout and mountain whitefish should be determined in one or two sections of Kootenai River downstream from Libby Dam. Number of spawning bull trout should be determined by trapping or making redd counts in Kootenai River tributaries. Number of rainbow trout spawning in Kootenai River between Alexander Creek and Fisher River should be determined by making redd counts. Genetics of the large rainbow trout in Kootenai River below Libby Dam should be determined by collecting adipose fins for starch gel electrophoresis. Sculpin sampling in Lake Creek should be continued.

3. Swan River. Fish populations inhabiting Swan River above Swan Lake should be sampled to determine effectiveness of Onchorhynchus catch and release fishing regulations. Swan River or lake tributaries being planted with westslope cutthroat trout should be sampled to determine survival of the planted fish.

4. South Fork Flathead River. Fish population estimates should be made on at lease one section of the South Fork Flathead River above the Bob Marshall Wilderness boundary.

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Waters referred to:

Clark Fork River (05-1440)
Hall Creek (07-1860)
Kootenai River (11-3500)
Lake Creek (11-3540)
Swan River (07-4560)

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