Ref ID: 85749

MONTANA FISH AND GAME DEPARTMENT
FISHERIES DIVISION

JOB PROGRESS REPORT

State Montana

Project No. F-7-R-20 Name Northwest Montana Fisheries Study

Job No. I-a Title Inventory of Waters of the Project Area

Period Covered April 1, 1970 through March 31, 1971

ABSTRACT

Fish population surveys were conducted on eleven (11) lakes and two (2) streams in District One to provide additional information for management of these waters. Water chemistry data (total alkalinity, standard conductance, and pH) were collected in conjunction with most fish population surveys.

Water quality monitoring stations were established in the Prospect Creek, Lake Creek and Bull River drainages to establish base line data on water quality of streams subjected to present and future mining development.

BACKGROUND

This is a continuing project designed to accumulate and update physical, chemical and biological data on waters in the District One.

OBJECTIVES

The objective of this project is to obtain biological, chemical and physical data on lakes, streams and reservoirs and to prescribe management practices where needed.

PROCEDURES

Experimental gill nets 125 feet in length and 8 feet in depth of graduated mesh size from 3/4 to 2 inch (square measure) were used to sample fish populations in lakes. A Mite-lite 110 volt generator in conjunction with a variable voltage pulsator was the power source used for electrofishing to sample stream fish populations. Individual total lengths and weights of fish were recorded and scale samples collected. Lake depths were determined with either a Bendix Echo Sounder or a Lowrance Fish Lo-K-Tor. All data contained in this report are kept on file at the District One headquarters.

FINDINGS

The following fish species were collected from lake and stream surveys conducted between April 1, 1970 and March 31, 1971. Game species collected were: rainbow trout (Salmo gairdneri), cutthroat trout (Salmo clarki), brook trout (Salvelinus fontinalis), brown trout (Salmo trutta), Dolly Varden (Salvelinus malma), mountain whitefish (Prosopium williamsoni), kokanee (Oncorhynchus nerka), Arctic grayling (Thymallus arcticus), and largemouth bass (Micropterus salmoides). Non-game species found were: pumpkinseed (Lepomis gibbosus), northern squawfish (Ptychocheilus oregonensis), largescale sucker (Catostomus macrocheilus), longnose sucker (Catostomus catostomus), peamouth (Mylocheilus caurinus), and redside shiner (Richardsonius balteatus), black bullhead (Ictalurus melas), and yellow bullhead (Ictalurus natalis).

Fish population surveys were conducted on eleven (11) lakes and two (2) streams in the District where additional data were needed for management. A summary of lake and stream population data is shown in Tables 1 and 2.

Lake and Stream Surveys

Flathead River Drainage

Fish population surveys were conducted for the following lakes in District One: Baney, Cliff, Lilly, Mary Ronan, Red Meadow, Sylvia, Wood and Wyman.

Baney Lake, an alkaline lake of 22 acres located 10 miles northwest of Kalispell, was sounded and netted to determine its potential as a trout lake. The lake has a maximum depth of 8 feet and has no inlet or outlet. Extremely large populations of gammarus were observed. Transparency was limited with secchi disc readings of less than two feet. No fish were captured from one overnight gill net set. The lake was considered too shallow to sustain salmonid populations.

Cliff Lake, a 9 acre pothole lake near Kalispell, was netted in the fall of 1970 to determine the success of a cutthroat fry plant made in the spring of 1969. Cliff Lake has a maximum depth of 24 feet. One overnight gill net set caught three cutthroat trout averaging 9.5 inches. The low catch rate may indicate that a partial winter mortality occurred. Winter dissolved oxygen measurements should be made to determine if sufficient dissolved oxygen is present for trout survival.

Lilly Lake, a small isolated pothole lake of 7.2 acres located approximately 1/4 mile west of Swan Lake, was initially surveyed in June of 1970. No fish were caught from one overnight gill net set. The lake was recommended for stocking with grayling.

Annual spring and fall fish population sampling was conducted for Lake Mary Ronan. Catch per net night for the spring netting series increased from .2 kokanee in 1969 to 8.2 in 1970. A similar increase was noted for the fall sampling series. In 1969 the fall catch per net night was 1.6 kokanee as compared to 9.0 kokanee caught in 1970.

Table 1. Summary of netting data collected from lakes in District One between April 1, 1970 and March 31, 1971

Lake (I.B.M. code no.)	Surface acres	Number sets	Species (number)[1]	Size range (inches) (game species)	Percent of game species	Average length (inches) (game species)
Flathead River drainage						
Baney Lake (no code)	22	1	None	-	-	-
Cliff Lake (7-6440-03)	9	1	Ct(3)	Ct(8.3-10.5)	100	Ct(9.5)
Lilly Lake (7-8385-03)	7	1	None	-	-	-
Lake Mary Ronan [2] (7-7700-03)	1506	5	KOK(42) Rb(1) PS(320)	KOK(10.2) Rb(12.6)	11	KOK(9.2-13.8) Rb(12.6)
Lake Mary Ronan [3]	1506	5	KOK(55) PS(51) Rb(6) LMB(1)	KOK(11.4) Rb(12.0) LMB(11.7)	55	KOK(7.8-16.5) Rb(9.2-15.5) LMB(11.7)
Red Meadow (8-9540-03)	17	2	Ct(9) Gr(10)	Ct(8.2-12.2) Gr(6.5-14.2)	100	Ct(10.8) Gr(8.9)
Sylvia Lake (7-9040-03)	22	1	Gr(10)	Gr(9.1-10.2)	100	Gr(9.8)
Wood Lake (7-9580-03)	20	2	Rb(41) RSS(8)	Rb(6.4-15.3)	84	Rb(9.1)
Wyman Lake (7-9755-03)	19	1	Eb(27)	Eb(6.5-9.6)	100	Eb(7.7)

Table 1. Continued

Lake (I.B.M. code no.)	Surface acres	Number sets	Species (number) 1/	Size range (inches) (game species)	Percent of game species	Average length (inches) (game species)
Kootenai River drainage						
Bull Lake (11-8040-03)	1250	9	DV(2) Sq(111) Wf(6) Csu(12) KOK(1) FSu(2) Eb(3) PM(93)	DV(8.5-15.0) Wf(7.8-11.7) KOK(13.5) Eb(7.0-14.3)	5	DV(15.8) Wt(10.2) KOK(13.5) Eb(10.6)
Martin Lake (11-9140-03)	32	1	Eb(16) RbxCt(1) FSu(73)	Eb(6.6-14.1) RbxCt(10.5)	19	Eb(8.4) RbxCt(10.5)
Schoolhouse Lake (11-9500-03)	14	2	Rb(3) PS(1) BB(49)	Rb(8.6-10.0)	6	Rb(9.3)

1/ Species abbreviations: Ct - cutthroat trout, Eb - brook trout, DV - Dolly Varden, Gr - grayling, Rb - rainbow trout, LMB - largemouth bass, Wf - mountain whitefish, Csu - largescale sucker, FSu - longnose sucker, PS - pumpkinseed, Rss - redside shiner, Sq - northern squawfish, RbxCt - rainbow-cutthroat hybrid, BB - black bullhead

2/ Spring netting series (May 12, 1970)

3/ Fall netting series (October 15, 1970)

Table 2. Summary of stream population data collected by electrofishing from District One, April 1, 1970 through March 31, 1971

Stream (I.B.M. code no.)	Length of stream section (feet)	Species (number)[1/]	Size range (inches) (game species)	Percent of game species	Average length (species) (game species)
Clark Fork River drainage					
Prospect Creek (11-5300-01) (Gilbert-Coyote Gulch Section)	1200	Ct(6) DV(4) Eb(12)	Ct(3.5-6.4) DV(2.5-3.0) Eb(2.4-6.7)	100	Ct(4.5) DV(2.8) Eb(4.5)
Prospect Creek (Clear Cr. Section)	600	Rb(16) Eb(19) DV(1) LL(2)	Rb(3.0-13.4) Eb(2.8-7.5) DV(4.7) LL(3.1-7.5)	100	Rb(6.7) Eb(4.4) DV(4.7) LL(5.3)
Prospect Creek (Twenty-three Mile	600	DV(13) Ct(53)	DV(3.2-9.3) Ct(2.4-8.1)	100	DV(5.8) Ct(5.3)
Bull River (5-0864-01) (Upper Section)	600	Eb(105) Ct(22) DV(5) Wf(4)	Eb(2.1-11.2) Ct(3.2-8.6) DV(5.7-7.1) Wf(3.2-4.1)	100	Eb(4.6) Ct(4.9) DV(6.3) Wf(3.8)
Bull River (Bear Cr. Cabin Section)	600	Eb(114) Ct(26) DV(5) Wf(29)	Eb(2.2-9.5) Ct(1.6-10.1) DV(4.5-15.6) Wf(3.5-9.3)	100	Eb(5.0) Ct(5.2) DV(7.4) Wf(4.0)
Bull River (Lower Section) (Initial Run)	3700	Eb(295) CSu(2) Ct(80) FSu(6) Wf(16* RSS(2) LL(3) YB(1) DV(1)	Eb(2.7-12.3) Ct(1.5-15.6) Wf(4.1-7.1) LL(4.6-23.8) DV(10.8)	97	Eb(5.1) Ct(5.1) Wf(5.9) LL(11.4) DV(10.9)

Table 2. Continued

Stream (I.B.M. code no.)	Length of stream section (feet)	Species (number)1/	Size range (inches) (game species)	Percent of game species	Average length (species) (game species)
Bull River (Lower Section) (Recapture Run)	3700	Eb(396) Ct(104) Wf(14) RSS(3) LL(4) FSu(7)	Eb(2.5-12.3) Ct(1.9-11.4) Wf(2.5-4.1) LL(2.8-18.8)	98	Eb(4.9) Ct(4.4) Wf(3.1) LL(8.4)

* Excludes several hundred small whitefish three inches or less not recorded.

1/ Species abbreviations: Ct - cutthroat trout, DV - Dolly Varden, Eb - brook trout, LL - brown trout, Rb - rainbow trout, Wf - mountain whitefish, CSu - largescale sucker, FSu - longnose sucker, RSS - redside shiner, YB - yellow bullhead

Kokanee of age class 2+, averaging 10.1 inches in length, comprised 98 percent of the spring catch in 1970. Fall catches for 1970 were 29 percent for age class 1+ fish, averaging 8.4 inches, and 71 percent age-class 2+ averaging, 11.6 inches. Kokanee of age class 1+ became large enough to enter the catch in the fall. Mature spawning kokanee (Age class 3+ or more) caught in the fall were not included in age composition.

It would appear that Lake Mary Ronan has regained its importance as a kokanee fishery after several years of poor fishing. It is recommended that the fall and spring fish population sampling be continued to provide an index to the survival and relative abundance of kokanee and rainbow trout.

Red Meadow Lake, a small headwater lake of 17 acres in the North Fork drainage, was netted to determine the extent of a reported winter fish kill. A few scattered dead fish decayed beyond recognition were observed along the shoreline. However, fair populations of grayling and cutthroat were still present. One overnight net set caught 10 grayling from 6.8 to 14.2 inches and 9 cutthroat ranging in size from 8.2 to 12.2 inches. Red Meadow Lake was previously stocked with grayling fry in 1966 and cutthroat trout in 1968. Numerous grayling fry were observed near the mouth of the inlet stream to Red Meadow Lake. No further stocking is recommended.

Sylvia Lake, 22 acres, has a maximum depth of 45 feet and is located approximately 25 miles northwest of Kalispell. One overnight gill net set captured 10 grayling averaging 9.8 inches comprising age groups 3+ and 4+. The lake has not been stocked with grayling since 1965 and these fish are apparently progeny of former grayling plants. Although the lake has no permanent inlet the grayling population is self-sustaining. It is recommended that no further grayling plants be made and an attempt be made to identify spawning areas.

Woods Lake, a 20 acre lake located approximately five miles northwest of Whitefish, was netted in the summer of 1970 to determine the success of former rainbow plants. A total of 41 rainbow ranging in size from 6.4 to 15.2 inches and 8 redside shiners ranging from 4.9 and 5.9 inches were captured from two gill net sets. It is recommended that Woods Lake receive continued stocking of rainbow trout on an alternative year basis.

Wyman Lake is a small impoundment of 10 acres on Wyman Creek approximately 1/4 mile west of Swan Lake. The lake has a self-sustaining population of small brook trout ranging from 6.5 to 9.6 inches. No further management measurements are recommended.

Kootenai River drainage

Fish population surveys were conducted for the following lakes in the Kootenai River drainage: Bull, Martin, and Schoolhouse Lakes.

The shoal areas of Bull Lake were netted in mid-May to determine the inshore movement of spawning rough fish. Trap netting and partial poisioning efforts to remove rough fish species were scheduled for the peak of the spawning season. Nine gill nets set overnight caught a total of 227 fish. Species composition of the catch was: 49 percent squawfish, 41 percent peamouth, 5 percent coarsescale sucker, 1 percent longnose sucker and 4 percent game fish (mountain whitefish, kokanee and Dolly Varden). The majority of suckers and squawfish were immature so the rough fish removal operation was delayed until late May when concentrations moved in toward shore.

An initial population survey of Martin Lake (32 acres), located in the vicinity of Fortine, was conducted in July of 1970. A total of 16 brook trout and one rainbow-cutthroat hybrid were captured from one overnight gill net set. The lake has an excellent self-sustaining brook trout population. No management changes are recommended.

Schoolhouse Lake, a 14 acre pothole lake, near Troy was netted in April of 1970 to determine the over-all survival of rainbow trout. A lake shore subdivision development project is presently being proposed by the St. Regis Lumber Company which will close out public access to the lake. A total of 49 black bullheads, 1 pumpkinseed and 3 rainbow trout were captured from two gill net sets. In view of the dominance of black bullheads and the lack of public access it is recommended that stocking rainbow trout be discontinued.

Clark Fork River drainage

Stream population surveys in the Clark Fork River drainage includes those of Prospect Creek and the Bull River. Both streams are or will be in the influence zone of mining activity. Base line data concerning fish populations, water quality and bottom fauna will be collected to monitor over-all quality of stream environment prior to and after mine development.

The U. S. Antimony Corporation has recently constructed an ore concentrator and two small settling ponds on the Prospect Creek flood plain near the mouth of Cox Creek. The concentrator was put into operation in January of 1971.

In August and October of 1970 fish population sampling was conducted for three sections of Prospect Creek. Two 600 foot sections of stream were sampled approximately three miles below Cox Creek. These sections had an extremely low game-fish population yielding only one fish per 55 linear feet of stream. Several miles of stream in this area go dry and run underground in late summer. The sparse population of game fish undoubtedly reflects the unstable condition of this stream.

A second section of stream (600 feet) was sampled further downstream near the junction of Clear Creek approximately two miles above the mouth of Prospect Creek. The species composition of the catch in this section was 50 percent brook trout, 42 percent rainbow trout, 5 percent brown trout and 3 percent Dolly Varden. This section of stream yielded one fish for every 15 linear feet of stream. Although the water flows were continuous year around through this section of stream, the bank cover was sparse and pools were shallow and infrequent.

A 600 foot section of Prospect Creek was sampled about five miles upstream from the mouth of Cox Creek, in the vicinity of Twenty-three Mile Creek. Cutthroat trout comprised 80 percent of the catch and immature Dolly Varden 20 percent. The fish population in this section of stream was considerably higher than the downstream sections yielding one fish for every nine linear feet of stream.

It is recommended that stream fish populations be monitored periodically to determine if mining activity in the drainage has affected wild trout populations.

Mining exploration work is presently being conducted in the Bull River drainage. A tract of land four sections in area has been purchased by the Kendicott Copper Mining Company for the purpose of constructing a tailings pond of undetermined size in the upper Bull River drainage. Two 600 foot sections above the proposed pond site and one 3,700 foot section below were sampled with electrofishing gear to provide base line data on existing fish populations in the upper Bull River drainage.

Twenty percent of the game fish in the upper sections exceeded six inches in length compared to 23 percent for the lower section. Most abundant in the catch in the upper two sections were brook trout, followed by cutthroat, whitefish, and Dolly Varden.

Fish population estimates were made for the lower 3,700 foot section. Population estimates of brook trout and cutthroat trout larger than three inches were determined from the ratio of marked to unmarked fish. The return of marked brown trout and whitefish was too small to make population estimates for these species. The return of marked fish on the recapture run was 29 percent brook trout as compared to 24 percent for cutthroat trout. An estimated population of 1,214 brook trout and 356 cutthroat trout inhabitated the 3,700 foot section of stream.

It is recommended that the stream fish population be monitored periodically during the operational phase of mining to determine detrimental affects on wild trout populations.

Monitoring of Water Quality

In January of 1970, water quality stations were established in the Prospect Creek, Bull River and Lake Creek drainages. Sampling stations were set up for Bull River (3), Ross Creek (1), Stanley Creek (1), Lake Creek (2), Prospect Creek (3) and Cox Creek (1). Water samples were collected on a monthly basis to establish base line data on water quality of streams which may be altered chemically by future mining development. The Montana Bureau of Mines and Geology was contracted to run the water quality analysis. The parameters analysed include the dissolved heavy metals - Cadmium (cd), Zinc (zn), Copper (Cu), Nickel (Ni), and Iron (Fe), plus Calcium (Ca), Magnesium (Mg), Maganese (Mn), Potassium (K), and Sodium (Na). Numerous other parameters included in the analysis are on file at District and Helena offices.

Streams in the Prospect Creek drainage are low in total alkalinity and dissolved solids. Total alkalinity ranges from 8 to 25 ppm and specific conductance from 13 to 70 micromhos. pH values ranged from 6.4 to 7.8.

Streams in the Bull River and Lake Creek drainages exhibited somewhat higher total alkalinity and dissolved solid readings. Total alkalinity ranged between 18 and 52 ppm and specific conductance from 25 to 111 micromhos. pH vlaues range from 6.5 to 7.8. Concentrations of dissolved iron (Fe) from all creeks sampled were relatively low and did not exceed .13 ppm. Concentrations of the other heavy metals (Cu, Ni, Zn and Cd) did not exceed .06 ppm. A summary of all water quality parameters (collected from Prospect Creek, Lake Creek and Bull River drainages) will be presented in Completion Report, F-7-R-21.

The U.S. Forest Service plans to extend the base monitoring of water quality on these waters for two additional years. The three years data will be combined.

RECOMMENDATIONS

It is recommended that the project be continued to obtain additional information on chemical, physical and biological characteristics of waters in the project area for the purpose of evaluating present and instigating new management practices. A detailed study of the Swan River and its tributaries is planned which will be the basis for a comprehensive management action program. Plans include re-introduction of westslope cutthroat trout into suitable streams, recommendations to land managers for stream quality preservation, operation of a fish ladder and a survey and modification of existing migration barriers.

Prepared by Robert Domrose

Date May 31, 1972

Waters referred:

11-5300-01	7-9755-03	8-9540-03
11-8040-03	7-9580-03	
11-9140-03	7-9040-03	
11-9500-03	7-8385-03	
	7-7700-03	
5-0864-01	7-6440-03	