MONTANA FISH AND GAME DEPARTMENT
FISHERIES DIVISION

JOB PROGRESS REPORT

State Montana

Project No. F-7-R-19 Title Northwest Montana Fisheries Study

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

Period Covered April 1, 1969 through March 31, 1970

ABSTRACT

Fish population surveys were conducted for fifteen (15) lakes and eleven (11) streams in District One to provide additional information for management of these waters. Water chemistry data (total alkalinity, specific conductance and pH) were collected in conjunction with most fish population surveys.

BACKGROUND

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

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 electro-fishing 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, 1969 and March 31, 1970. Game fish 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), and largemouth bass (Micropterus salmoides). Non-game species found were: yellow perch (Perca flavescens), pumpkinseed (Lepomis gibbosus), northern squawfish (Ptychocheilus oregonensis), largescale sucker (Catostomus macrocheilus), longnose sucker (Catostomus catostomus), peamouth (Mylocheilus caurinus), slimy sculpin (Cottus cognatus) and longnose dace (Rhinichthys cataractae).

Fish population surveys were conducted for fifteen (15) lakes and eleven (11) streams in the District where additional data were needed for management. A summary of lake and stream fish population data is shown in Tables 1 and 2. Water chemistry data, pH, alkalinity and specific conductance are presented in Table 3.

Lake and Stream Surveys

Flathead River Drainage

Lake population surveys conducted in the Flathead River Drainage include: Bootjack, Rainbow, Lauri, Swan, Lake Mary Ronan, and Jim Lakes Numbers 6, 7, 8, 12, 19 and 20.

Bootjack Lake, with a surface area of 65 acres and a maximum depth of 60 feet, is located approximately 8 miles west of Whitefish and was netted in April, 1969 to determine the relative abundance of cutthroat trout. Two overnight net sets yielded two cutthroat trout averaging 3.5 pounds. These fish are believed to be a remnant population of cutthroat trout brood fish planted as three-year-old fish from the Libby Fish Hatchery. Recommendations were made to stock cutthroat trout.

Rainbow Lake, a small pothole lake located north of Whitefish, was sounded and netted in April, 1969 to determine the success of a rainbow trout plant made in 1967. No fish were caught from one overnight gill net set. The lake has a maximum depth of 12 feet and probably does not sustain fish life through the winter.

Lauri Lake, a former cutthroat trout brood lake, experienced a severe winter kill during the winter of 1968-69 that included trout, pumpkinseed and longnose suckers. A pig feed lot was established along the east shore of the lake during the summer of 1968, increasing the nutrient runoff into the lake. The winter kill was preceded by a sudden bloom of aquatic vegetation. Two overnight gill net sets caught 22 small longnose suckers and 3 small brook trout. Because of their small size, it is believed these fish moved down from the inlet (Lost Creek) into the lake during spring runoff. No further management measures of this lake are anticipated in the near future.

Table 1. Summary of lake population data collected by gill netting between April 1, 1969 and March 31, 1970

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						
Bootjack Lake (07-5480-03)	65	2	Ct(2)	Ct(20.1-21.4)	100	Ct(20.8)
Rainbow Lake (07-8360-03)	4	2	None	-	-	-
Lauri Lake (07-7240-03)	28	2	Eb(3) LNSu(22)	Eb(5.7-7.3)	12	Eb(6.4)
Swan Lake (07-9000-05)	2680	8	DV(16) Wf(25) KOK(11) Eb(1) SQ(86) PM(68) CSu(20) LNSu(17) YP(57)	DV(8.4-16.0) Wf(7.2-14.8) KOK(7.1-10.0) Eb(8.4)	18	DV(12.7) Wf(9.3) KOK(8.7) Eb(8.4)
Lake Mary Ronan [2] (07-7700-03)	1506	5	PS(295) Rb(1) KOK(1) LMB(1)	Rb(17.3) KOK(6.9) LMB(5.9)	1	Rb(17.3) KOK(6.9) LMB(5.9)
Lake Mary Ronan [3] (07-7700-03)	1506	5	PS(136) Rb(4) KOK(8) LMB(11)	Rb(12.7) LMB(10.4) KOK(10.4)	-	Rb(10.6-17.7) LMB(5.6-15.4) KOK(8.5-19.8)
Jim Lake No. 6 (07-6964-03)	6	1	None	-	-	-
Jim Lake No. 7 (07-6965-03)	15	1	None	-	-	-
Jim Lake No. 8 (07-6966-03)	24	1	None	-	-	-

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)
Jim Lake No. 12 (07-6970-03)	31	1	None	-	-	-
Jim Lake No. 19 (07-6875-03	16	1	None	-	-	-
Jim Lake No. 20 (07-6976-03)	5	1	None	-	-	-
Kootenai River Drainage						
Bull Lake (11-8040-03)	1250	8	Rb(1) Ct(1) DV(10) Wf(19) Eb(1) CSu(28) LNSu(18) PM(260) SQ(139)	Rb(14.8-15.0) Ct(7.6) Eb(9.8) DV(11.3-20.4) Wf(8.2-11.7)	7	Rb(14.9) Ct(7.6) Eb(9.8) DV(14.2) Wf(10.2)
Loon Lake (11-8980-03)	26	1	Eb(17)[4]	Eb(10.1-14.6)	100	Eb(11.9)
Bootjack Lake (11-7980-03)	10	1	Rb(3)	Rb(15.7-18.5)	100	Rb(17.5)
Topless Lake (11-9830-03)	10	1	None	-	-	-

[1] Species abbreviations: Ct = cutthroat trout, Eb = brook trout, DV = Dolly Varden, Rb = rainbow trout Wf = mountain whitefish, KOK = kokanee, LMB = largemouth bass, SQ = northern squawfish, PS = pumpkinseed, CSu = largescale sucker, LNSu = longnose sucker, YP = yellow perch.

[2] Spring netting series.

[3] Fall netting series.

[4] Includes 6 fish returned to water.

Table 2. Summary of stream population data collected by electrofishing from District One, April 1, 1969 through March 31, 1970

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 (inches) (game species)
Flathead River Drainage					
Goat Creek (07-1720-01)	500	Eb(17) Ct(12) DV(16) Wf(2)	Eb(3.1-13.4) Ct(5.1-5.6) DV(3.5-10.8) Wf(7.9-9.5)	100	Eb(5.9) Ct(5.6) DV(5.3) Wf(8.7)
Squeezer Creek (07-4330-01)	450	Eb(18) Ct(10) DV(36) Wf(2)	Eb(3.4-11.0) Ct(5.7-9.8) DV(2.1-27.5) Wf(9.7-9.9)	100	Eb(5.3) Ct(8.3) DV(9.1) Wf(9.8)
South Fork of Jocko River (07-4160-01) (Upper Section)	550	Eb(3) Ct(38) *Ct(18) DV(14)	Eb(4.2-8.3) Ct(4.3-9.9) *Ct(5.7-7.5) DV(5.7-9.5) Rb(6.6-9.0)	100	Eb(6.4) Ct(6.2) *Ct(6.9) DV(7.1) Rb(7.8)
South Fork of Jocko River (07-4160-01) (Lower Section)	575	Eb(32) Ct(21) *Ct(13) DV(2) Rb(3)	Eb(4.1-11.2) Ct(3.9-11.2) *Ct(5.4-8.1) DV(5.6-10.8) Rb(4.4-6.3)	100	Eb(5.7) Ct(6.9) *Ct(6.9) DV(8.2) Rb(5.4)
Jocko River (07-2260-01)	550	Rb(11) Wf(51)	Rb(3.4-22.5) Wf(7.7-15.1)	100	Rb(7.6) Wf(12.5)
Mission Creek (07-2900-01) (Bison Range)	550	Rb(31) Wf(25) SQ(2) Su(13)	Rb(8.0-8.3) Wf(11.2-14.5)	82	Rb(8.2) Wf(13.4)

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 (inches) (game species)
Mission Creek (07-2900-01) (Above Reservoir)	550	Eb(29) Ct(10) *Ct(83) DV(10) Rb(3) Su(3)	Eb(2.2-15.4) Ct(5.1-7.5) *Ct(5.0-7.8) DV(4.1-25.3) Rb(3.6-10.2)	98	Eb(5.7) Ct(6.3) *Ct(6.6) DV(10.6) Rb(7.4)
Spring Creek (07-1520-01) (Schall)	575	Eb(1) LL(3) Rb(62 Wf(78) Su(1)	Eb(6.6) LL(3.8-4.1) Rb(2.7-10.5) Wf(3.5-14.8)	99	Eb(6.6) LL(3.9) Rb(5.8) Wf(6.7)
Spring Creek (07-4300-01) (Ronan)	560	Eb(10) Rb(59) Wf(4) LNSu(23) PS(5) CSu(2)	Eb(3.8-5.7) Rb(2.7-8.5) Wf(4.2-5.1)	78	Eb(4.7) Rb(4.1) Wf(4.6)
North Fork of Crow Creek (07-3120-01)	540	Ct(84) Eb(7)	Ct(3.3-8.8) Eb(4.2-6.8)	100	Ct(5.6) Eb(5.5)
Post Creek (07-3560-01)	550	Eb(1) Rb(41) Wf(56) Su(21)	Eb(4.6) Rb(3.0-8.7) Wf(4.0-13.0)	83	Eb(4.6) Rb(4.6) Wf(5.9)
Kootenai River Drainage					
Fisher River (11-2320-01) (Above Loon Lake)	550	Rb(17) Eb(1) Wf(6)	Rb(4.5-13.3) Eb(3.0) Wf(2.4-9.3)	100	Rb(6.3) Eb(3.0) Wf(5.3)
Fisher River (11-2320-01) (Below Loon Lake	550	Rb(12) Eb(1) Wf(21) SQ(7) CSu(5)	Rb(4.3-9.9) Eb(7.2) Wf(2.7-12.2)	89	Rb(7.1) Eb(7.2) Wf(7.3)

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 (inches) (game species)
Clark Fork River Drainage					
Martin Creek (05-4432-01) (Lower Section)	1120	Eb(10) Ct(14) LL(11) Wf(13) CSu(21)	Eb(5.8-10.6) Ct(4.1-8.2) LL(2.3-12.1) Wf(2.9-7.1)	70	Eb(7.4) Ct(5.3) LL(4.6) Wf(3.7)
Martin Creek (05-4432-01) (Homestead Section)	585	Eb(13) LL(6) Ct(37) DV(2)	Eb(2.6-8.8) Ct(3.4-10.1) DV(9.9-17.5) LL(2.5-8.8)	100	Eb(5.7) Ct(5.7) DV(13.7) LL(3.7)
Martin Creek (05-4432-01) (Upper Section)	465	Ct(23)	Ct(3.7-9.1)	100	Ct(6.5)

[1/] Species abbreviations: Eb = brook trout, Ct = cutthroat trout, Rb = rainbow trout, DV = Dolly Varden, Wf = mountain whitefish, LL = brown trout, PS = pumpkinseed, SQ = northern squawfish, Su = sucker (largescale and longnose), LNSu = longnose sucker, CSu = largescale sucker.

* Hatchery cutthroat trout.

Table 3. Water quality data, (pH, alkalinity and standard conductance) for streams and lakes surveyed in District One

Lake or Stream		pH units	Total alkalinity (ppm)	Standard conductance (micromhos/cm)
Flathead River Drainage				
Bootjack Lake	5/14/69	7.6	109	209
Rainbow Lake	3/29/69	7.2	141	-
Swan Lake	6/27/69	8.0	182	107
Lake Mary Ronan	6/16/69	7.9	60	122
Jim Lake No. 6	8/69	7.1	41	71
Jim Lake No. 7	8/69	7.1	42	78
Jim Lake No. 8	8/69	7.1	23	38
Jim Lake No. 12	8/69	7.2	31	54
Jim Lake No. 19	8/69	7.3	40	67
Jim Lake No. 20	8/69	7.1	30	48
Goat Creek	7/29/69	7.6	160	290
Squeezer Creek	7/29/69	7.8	124	218
Jocko River	9/10/69	7.8	160	218
Mission Creek	9/ 9/69	8.0	172	309
Spring Creek (Schall)	9/10/69	7.8	187	323
Spring Creek (Ronan)	9/11/69	8.2	155	255
Post Creek	9/11/69	7.8	178	197
Kootenai River Drainage				
Bull Lake	5/20/69	7.5	40	72
Topless Lake	5/14/69	7.2	56	144
Fisher River	10/15/69	8.1	108	224
Clark Fork River Drainage				
Martin Creek	8/19/69	7.35	-	-

Eight gill nets were set in Swan Lake overnight in June, 1969 to determine the status of the trout population. Non-game fish, mainly squawfish, peamouth and yellow perch comprised 88 percent of the catch. Game fish, predominately mountain whitefish and Dolly Varden comprised the remaining 12 percent of the catch.

The annual spring and fall fish population data collected from Lake Mary Ronan in 1969 indicated an increase in the number of yearling kokanee. Although only one kokanee was caught in the spring sampling series, eight kokanee, six of which were yearlings, were collected from the fall sampling series. This was the largest number of yearling kokanee caught in the fall sampling series since 1966. This age class (1+) has been caught by anglers in increasing numbers in the late summer of 1969 and hopefully will improve the kokanee fishery within the next two years. The number of rainbow trout collected in net samples have decreased in recent years as a result of a management recommendation to reduce annual stocking program from 70,000 to 40,000 fish. It is recommended that spring and fall netting series be continued to determine population trends of kokanee and rainbow trout.

Fish population surveys were conducted for six high mountain lakes located within the Mission Mountain Wilderness Area in August, 1969. These lakes known as the "Jim Lakes", are situated in the Jim Lake Basin at the head water of the Jim Creek. The lakes are among a group of 20 or more lakes interconnected by small high gradient intermittent streams. The surrounding terrain is steep, rocky and densely wooded. The elevation at which these lakes lie ranges between 6,225 and 6,723 feet (msl). The lake areas range between 6.4 and 31.2 surface acres.

Eight lakes in the Jim Lakes Basin were previously surveyed by Stefanich in 1957 and 1958. He found the lakes to be barren of fish and recommended stocking with golden trout. In September of 1958, a total of 14,000 golden trout were planted in eight lakes considered deep enough to support fish life throughout the year. The introductions provided a fishery for a brief period of time but fishing success declined in the late 1960's. The Jim Lake survey was iniated to determine the reproductive success of the initial golden trout introductions.

Accessibility to the lakes was primarily by unmarked trail, following basically the access route used in the initial survey of 1958. Depth soundings and temperature profiles were recorded for three lakes accessible to horse travel where nets and rubber raft could be packed in. Gill nets were back packed into the remaining three lakes and set from shore across small coves. From cursory observations it appeared these lakes were deep enough to support fish life. Surface temperatures for the six lakes ranged between 58° and 60° F..

There was no evidence of survival of golden trout. None were collected from six lakes netted. It is assumed the introductions were unsuccessful in reproducing and maintaining themselves. It was recommended that cutthroat trout be stocked in these lakes.

Stream population surveys conducted with electrofishing gear in the Flathead River drainage include Squeezer and Goat Creeks and seven streams in the Mission Valley within the boundary of the Flathead Indian Reservation.

Brook trout and Dolly Varden were the dominant species collected from Goat Creek comprising 46 and 43 percent respectively of the total fish collected. Dolly Varden from Goat Creek were immature fish ranging from 3.7 to 10.8 inches.

Eight of 36 Dolly Varden collected from Squeezer Creek were mature spawning adults ranging in size from 19.0 to 27.5 inches. The species composition of the catch was 55 percent Dolly Varden, 25 percent brook trout, 15 percent cutthroat trout and 2 percent mountain whitefish. Both Goat and Squeezer Creek flow through an area where the timber sales will be let in the near future. The utilization by spawning Dolly Varden demonstrates the need for unlimited caution to preserve the critical spawning areas of this stream.

Fish populations of seven streams in the Mission Valley within the boundaries of the Flathead Indian Reservation were surveyed with electrofishing gear during the week of September 8-12, 1969. Fish and Game Department personnel were assisted by Indian Reservation Rangers.

Fish population data were collected for the following streams: Jocko River, South Fork of Jocko River (two sections), Spring Creek (Schall), Spring Creek (Ronan), North Fork of Crow Creek, Mission Creek (two sections) and Post Creek. Stream sections selected for collection of data were located in areas not affected by irrigation, exceptions being the lower section of Mission Creek, Post Creek and the Jocko River.

An excellent population of native cutthroat with a size distribution ranging from 3.9 to 11.2 inches were collected from both the upper and lower sections of the South Fork of the Jocko River.

Approximately 30 percent (31 fish) of the total number of cutthroat trout collected from both sections were identified as hatchery fish stocked as catchable fish from the Creston National Fish Hatchery in July of 1969. The fish averaged 6.9 inches and weighed 0.10 pounds, the body-length relationship being considerably less than the native species. The poor condition of the hatchery fish in the South Fork of the Jocko River is probably related to its inability to successfully compete with the native cutthroat. Fish in this poor condition do not provide quality trout fishing. It is doubtful that there will be many survivors through the following year. It would seem that the contribution of hatchery cutthroat in this environment would provide little or nothing to enhancement of the existing fishery.

The large volume flow of the Jocko River made fish shocking difficult and the recovery efficiency was relatively low. Whitefish and rainbow trout were the only species collected with mature whitefish comprising about 80 percent of the catch. The largest fish collected was a 22.5 inch rainbow

weighing 4.0 pounds. Although the lower Jocko River is heavily utilized for irrigation, it does support good rainbow and whitefish populations and is highly regarded for its rainbow fishing. Excessive cattle grazing along the stream bank and channel straightening has created unstable bank conditions. Bank erosion and flooding occur frequently during spring runoff.

Approximately 60 percent of the total number of fish collected from the upper section of Mission Creek (above Mission Reservoir) were hatchery cutthroat trout. These fish, like those collected in the South Fork of Jocko River, were in poor condition. Brook trout, native cutthroat trout, Dolly Varden, and rainbow trout comprised the remaining game fish population. Three of the Dolly Varden collected were mature fish, the largest measuring 25.3 inches, weighing an estimated six pounds.

Large volume flows and high turbidities from irrigation return flows reduced the recovery effeciency of fish shocking efforts from the lower section of Mission Creek. Only 33 game fish were collected of which 25 were mature whitefish and 3 were rainbow trout. Suckers and squawfish comprised 3 percent of the total number of fish collected. Heavy silt deposits were noted along stream banks and back water areas.

Whitefish and rainbow trout were the dominant species collected from Spring Creek (Schall). Catchable rainbow trout are stocked annually in Spring Creek and make up approximately six percent of the rainbow trout collection. The large number of juvenile and young-of-the-year whitefish and rainbow would indicate good spawning success and survival of these species. The mature whitefish collected (approximately 40 percent) are believed to be on their annual spawning migration, having moved up from the Jocko River. Three small young-of-the-year brown trout were collected, which would indicate that brown trout utilize Spring Creek for spawning to a limited extent.

A comparison of fish population data collected from the same section of Spring Creek (Ronan) in 1965 with the present survey indicate that the number and species composition of game fish has remained about the same. In 1965, 54 rainbow and brook trout were collected as compared to 59 rainbow and 10 brook trout in 1969. However, the average size of trout collected was significantly smaller in 1969 as compared to 1965. Approximately 27 percent of the game fish collected from Spring Creek in 1965 exceeded 7 inches as compared to 3 percent in 1969.

The species composition of fish collected from the North Fork of Crow Creek was 93 percent native cutthroat and 7 percent brook trout. This stream supports an excellent population of small native cutthroat.

Whitefish and rainbow trout comprised the majority of fish collected from Post Creek. Approximately 80 percent of these fish were less than 7 inches. The large population of trout species was surprising in view of the high turbid condition of the stream and lack of spawning areas. Heavy silt deposits were noted in back water areas and along the stream banks. Longnose and largescale suckers were prominent in the catch comprising 20 percent of the total number of fish collected.

Kootenai River Drainage

Lake population surveys were conducted in the Kootenai River drainage for Bull Lake, Loon Lake, Bootjack Lake and Topless Lake.

The shoal areas of Bull Lake are netted in mid-May of 1969 to determine the inshore movement of spawning rough fish. Shoreline treatment with fish toxicant to remove rough fisn was scheduled for the peak of the suckers and squawfish spawning period. Nine gill nets set overnight caught 470 fish of which 54 percent were peamouth, 29 percent squawfish and 10 percent suckers. The remaining 7 percent were mountain whitefish, Dolly Varden, rainbow trout, cutthroat trout and brook trout. Because of the relatively small number of mature squawfish and suckers, the partial poisoning was delayed until the first week of June.

Loon Lake (Pipe Creek drainage) was netted in May of 1969 to check for the survival of brook trout. Dissolved oxygen samples taken in March of 1969 beneath the ice were extremely low ranging from 0.0 at the bottom to 0.5 at the surface. A severe winter kill seemed evident, however, a total of 17 brook trout ranging in size from 10.1 to 14.6 inches were collected from one overnight net set. Apparently, some areas of the lake are more oxygenated then others enabling trout to survive the winter.

Bootjack Lake, (Highway 2) and Topless Lake located in the vicinity of Happy's Inn were netted in May of 1969 to determine the status of existing trout populations. A remnant population of rainbow trout ranging 15.7 to 18.5 inches was collected from Bootjack Lake. None were collected from Topless Lake. Both lakes were recommended for cutthroat fingerling plants.

A stream population survey of the Fisher River was conducted above and below Loon Lake to determine if smallmouth bass stocked in Loon Lake in 1964 had moved into the stream environment. Mountain whitefish and rainbow trout were the dominant game fish species collected. No smallmouth bass were collected above or below the lake.

Clark Fork River Drainage

Martin Creek was sampled in August, 1967 to determine the relative abundance and size distribution of game fish. Estimated summer flows ranged from 2 cfs at the upper end and 5 to 6 cfs near the mouth.

The species composition of 129 game fish collected was 57 percent cutthroat trout, 18 percent brook trout, 13 percent brown trout, 10 percent mountain whitefish and 2 percent Dolly Varden. Forage fish species collected included numerous slimy sculpins and longnose dace. Catchable fish (6 inches and over) comprised 41 percent of the trout species collected.

RECOMMENDATIONS

It is recommended that the project be continued to obtain additional information on chemical, physical and biological characteristic of waters in the project area for the purpose of evaluating present and instigating new management practices.

Prepared by Robert Domrose

Date May 19, 1971

Waters referred to are presented in Tables 1 and 2.