MONTANA FISH AND GAME DEPARTMENT
FISHERIES DIVISION

JOB PROGRESS REPORT

State Montana

Project No. F-32-R-7 Title Helicopter Mountain Lake Survey

Job No. I-a Title North Fork Flathead River and Kootenai River Drainage - District One

Period Covered July 1, 1970 to June 30, 1971

ABSTRACT

Fish population surveys of 11 mountain lakes outside wilderness areas in the North Fork of the Flathead River and Kootenai River drainages were conducted July 19 through July 23, 1970. Trout populations were present in 2 lakes surveyed in the North Fork of the Flathead River drainage and 3 lakes in the Kootenai River drainage. Physical and chemical data (depth soundings, water temperatures, specific conductance, pH and total alkalinity) were collected in conjunction with the fish population data.

An additional 42 small lakes in the North Fork of the Flathead River drainage and 24 lakes in the Kootenai River drainage were closely observed from the air and were designated as being too shallow for fish management.

BACKGROUND

The helicopter has become a useful management tool for transporting men and equipment to survey and inventory fish populations in high mountain lakes. It has all but replaced the traditional slow and cumbersome method of conducting lake surveys with pack animals in remote mountain areas. Since 1966, the helicopter was used to survey the fish populations of 97 lakes in District One outside wilderness area boundaries. During this period, 183 additional lakes were observed from the air and were classified as being too shallow for fish management.

OBJECTIVES

The purpose of this survey is to inventory fish populations of mountain lakes inaccessible to wheeled vehicle travel but outside wilderness and primitive area boundaries. This is a continuing project.

PROCEDURES

A two-man helicopter crew conducted the lake surveys. Monofilament gill nets, 125 feet by 5 feet in depth with graduated mesh size of 3/4 to 2 inches square, were used to sample fish populations. Gill nets were set from pontoons of the helicopter as it taxied across the water. Total lengths and weights of all fish collected were recorded. Scale samples were collected for age and growth analysis. Outline maps of lakes were traced from U. S. Forest Service or U. S. Geological Survey Maps and surface areas were determined with a planimeter. Lake depths were recorded with a Lowrance Fish Lo-K-Tor. Temperature profile data were recorded with a thermister thermometer. Lake elevations were recorded from altimeter readings. Cursory observations were made of inlet tributary streams to evaluate their spawning potential. Data for all lakes surveyed were recorded on index file cards and kept on file at the district and Helena offices. Lakes too shallow for fish management were identified by location (township, range and section) and are shown in Table 1.

FINDINGS

The mountain lakes surveyed in the summer of 1970 includes 6 lakes in the North Fork of the Flathead River drainage and 5 lakes in the Kootenai River drainage. The elevation (MSL) of lakes surveyed ranged from 3600 to 6475 feet. The majority of lakes were relatively small and shallow. Surface areas of lakes surveyed ranges from 2.6 to 16.0 surface areas, with the exception of Cyclone Lake. Cyclone Lake has a surface area of 128 acres. Maximum depths ranged from 16 to 40 feet. Surface temperatures ranged from 59° to 74° F. Water chemistry data collected include pH, alkalinity and standard conductance. A summary of the physical and chemical data collected from the helicopter mountain lake survey in 1970 is presented in Table 2.

In addition, lakes in which the entire lake basin could be observed by air were considered too shallow for fish management were identified by location. No other data were collected for these lakes.

Fish populations were found to be present in 5 of the 11 lakes surveyed. Adequate populations of game fish were found present in 3 lakes. Remnant populations of game fish were found in 2 lakes. A summary of the mountain lake gill netting data is shown in Table 3.

Eight lakes were recommended for stocking with westslope cutthroat trout fry. These include 4 lakes in the North Fork Flathead and 4 lakes in the Kootenai River drainages.

RECOMMENDATIONS

Management recommendations made for lakes surveyed are presented in Table 4. Air plants of westslope cutthroat trout fry were recommended for 8 mountain lakes.

Table 1. Mountain Lakes observed by helicopter considered too shallow for fish management, July 19, through July 23, 1970.

Lake	Immediate drainage	No. of lakes	Location T	R	S
North Fork Flathead River Drainage					
Unnamed	Whitefish L.	1	31	21	7
Unnamed	Haskill Cr.	1	31	21	3
Unnamed	Trumbull Cr.	1	31	21	10
Unnamed	Skookoleel Cr.	2	32	21	15,21
Unnamed	Kimberly	1	32	21	13
Unnamed	Big Cr.	1	33	21	27
Unnamed	Deadhorse Cr.	1	33	21	10
Unnamed	Coal Cr.	4	33	21	1
Unnamed	N. Fk. Flathead R.	1	34	20	19
Unnamed	N. Fk. Flathead R.	1	34	21	13
Unnamed	Moran Cr.	1	35	21	33
Unnamed	Coal Cr.	6	34	23	15,22,26
Unnamed	Hay Cr.	2	34	23	11,15
Unnamed	Moose Cr.	2	35	23	9
Unnamed	Akinkoka Cr.	2	35	23	9
Unnamed	Whale Cr.	2	35	24	8
Unnamed	Inuya Cr.	3	36	24	27,34
Unnamed	Ninko Cr.	2	36	24	24,13
Unnamed	Antley Cr.	2	36	23	17,18
Miller	N. Fk. Flathead R.	1	36	22	15
Unnamed	Thoma Cr.	2	37	23	17,18
Unnamed	Tuchuck Cr.	1	37	24	23
Unnamed	Frozen Cr.	2	37	23	7,18
Kootenai River Drainage.					
Unnamed	Divide Cr.	2	37	25	24
Unnamed	Foundation Cr.	2	37	25	25
Unnamed	Lewis Cr.	2	36	24	8
Unnamed	Williams Cr.	2	35	25	1
Unnamed	Rusky Cr.	3	35	24	15,20
Unnamed	Stahl Cr.	2	36	25	6,8
Baboon	Stahl Cr.	1	36	25	5
Unnamed	Clarence Cr.	1	36	25	4
Unnamed	Clarence Cr.	2	37	25	27,33
Unnamed	Rich Cr.	1	37	25	22
Unnamed	Camp Cr.	1	37	25	12
Unnamed	Wam Cr.	1	37	25	23
Lake Geneva	Young Cr.	1	37	29	8
Unnamed	West Fork Cr.	1	36	30	17
Unnamed	Windy Cr.	1	36	31	14
Unnamed	Vinal Cr.	1	36	31	23

Table 2. Summary of physical and chemical data collected for mountain lakes surveyed by helicopter July 19, through July 23, 1970.

Lake	Location T	R	S	Elevation (feet MSL)	Surface area (acres)	Maximum depth (feet)	pH units	Standard conductance (micromhos/cm)	Total alkalinity (ppm)
North Fork Flathead River Drainage									
Cyclone	34	21	15,16	4000	128.0	22	7.9	46	24
Diamond	34	23	23	6425	6.4	16	7.5	6	12
Elelehum	33	21	10	4300	11.2	25	7.6	81	49
Hunchburger	35	24	11	6200	16.0	40	---	--	--
Nasukoin	35	23	15	6475	6.4	27	7.8	45	49
Tuchuck	37	23	18	6000	8.0	20	7.6	19	12
Kootenai River Drainage									
North Fish	36	31	11	3640	6.9	33	7.2	35	16
Middle Fish	36	31	14	3600	2.6	16	7.2	42	18
South Fish	36	31	14,23	3600	14.7	40	7.1	23	16
St. Clair	37	25	31	6000	3.2	17	7.8	127	79
Mt. Henry	36	30	17	5900	8.3	27	7.2	18	7

Table 3. Summary of fish collected by one overnight gill net set from mountain lakes surveyed by helicopter July 19, through July 23, 1970.

Lake	Immediate drainage	Species 1/ number caught in parentheses	Game species average length (inches)	Game species size range (inches)
North Fork Flathead River Drainage				
Cyclone	Cyclone Cr.	DV(9) Wf(32) Gr(2) Ct(3) LNSu(22)	DV(16.0) Wf(9.9) Gr(9.6) Ct(7.7)	DV(11.2-19.3) Ct(6.8-9.2) Gr(9.6) Wf(6.5-12.7)
Diamond	Coal Cr.	None	---	---
Elelehum	Elelehum Cr.	None	---	---
Hunchburger	Whale Cr.	Ct(9)	Ct(7.3)	Ct(6.8 -7.4)
Nasukoin	Moose Cr.	None	---	---
Tuchuck	Frozen Cr.	None	---	---
Kootenai River Drainage				
North Fish	Windy Cr.	None	---	---
Middle Fish	Windy Cr.	* Ct(2)	* Ct(15.5)	* Ct(13.4-17.6)
South Fish	Windy Cr.	Rb(13)	Rb(10.3)	Rb(6.5-14.4)
St. Clair	Therriault L.	None	---	---
Mt. Henry	West Fork Cr.	Yct(2)	Yct(18.3)	Yct(17.9-18.7)

1/ Dv = Dolly Varden, Ct = cutthroat trout, Yct = Yellowstone cutthroat, Rb = rainbow trout
Gr = grayling, Wf = mountain whitefish, LNSu = longnose sucker

* includes Rb x Ct hybrid

Table 4. Management recommendations for mountain lakes surveyed by helicopter July 19 through July 23, 1970

Lake	Code number	Recommendations for stocking
North Fork Flathead Drainage		
Cyclone	08-8480-03	None, adequate population of DV, & Wf
Diamond	08-8505-03	Stock Wct fry
Elelehum	08-8539-03	Stock Wct fry
Hunchburger	08-8880-03	None, adequate population of Wct
Nasukoin	08-9350-03	Stock Wct fry
Tuchuck	08-9933-03	Stock Wct fry
Kootenai River Drainage		
North Fish	11-9297-03	Stock Wct fry
Middle Fish	11-9173-03	Stock Wct fry, remnant population of Rb
South Fish	11-9630-03	None, adequate population of Yct
St. Clair	11-9470-03	Stock Wct fry
Mt. Henry	11-9250-03	Stock Wct fry, remnant population of Yct

Abbreviations: DV = Dolly Varden, Wf = mountain whitefish, Wct = westslope cutthroat trout, Rb = rainbow trout, Yct = yellowstone cutthroat trout.

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Code numbers of waters referred to are listed in Table 4.