MONTANA FISH AND GAME DEPARTMENT
FISHERIES DIVISION
HELENA, MONTANA

JOB COMPLETION REPORT
INVESTIGATIONS PROJECTS

State of Montana

Project No. F-7-R-14 Name: Northwest Montana Fishery Study

Job No. I Title: Inventory of Water of the Project Area

Period Covered: July 1, 1964 to June 30, 1965

Abstract:

A total of 14 lakes were surveyed in the district to determine the physical, chemical and biological characteristics of the water involved. Initial surveys were conducted on 10 mountain lakes and follow-up surveys were made on the remaining 4 lakes. Mountain Lake surveys were accomplished by the use of horses, back packing and helicopter. Contour maps were produced from sounding data.

Toxicity tests were conducted on three lakes with toxaphene in 1960. They were found suitable for stocking and were providing excellent fishing at the end of the project period.

Water quality information was obtained from a group of lakes in the Eureka area which exhibit a wide degree of chemical variation.

Recommendations:

It is recommended that the project be continued to obtain further information on the physical, chemical and biological characteristics of waters in the project area.

Management recommendations were made for the following lakes:

Blanchard Lake---------- Discontinue kokanee fry plants--manage lake for warm water species only.

McGregor Lake ---------- Introduce kokanee fry on an experimental 4 year basis to provide forage species for lake trout.

Vinal Lake---------- Rehabilitate lake and re-introduce rainbow or cutthroat.

Hoskins Lake ---------- Stock with westslope cutthroat fingerlings.

Woodward Lake---------- No change in management plans until investigations of water in the Big Salmon drainage have been completed.

Paradise Lake ----------Too shallow to manage.

Bat Lake---------- Too shallow to manage.

Bluebird Lake ----------	Stock with cutthroat or rainbow fry for two years on a trial basis.
Unknown Lake ----------	Stock with cutthroat or rainbow fry for two years on a trial basis.
Rainbow Lake ----------	adequate natural reproduction, no changes recommended.
Lower Blossom Lake------	over populated with small brook trout --- encourage intensive fisherman use.
Upper Blossom Lake ---	over populated with small brook trout --- encourage intensive fisherman use.
Rock Lake ----------	adequate natural reproduction, no change recommended.
Terrace Lake ----------	reproduction limited, access good, should be stocked with fingerling yellowstone or westslope cutthroat trout.

Objective: The objective of this job is to obtain biological, chemical and physical data where information is needed and to prescribe management practices where needed.

Techniques used: Experimental gill nets 125 feet long with graduated meshes from 1/2 to 3 inches (square mesh) were used to sample fish populations. In some cases when netting was not feasible, sampling was accomplished by hook and line. Total length and weights of fish were recorded and scale samples were collected for age and growth analysis. Lake depths were determined by use of echo sounder. Outline maps of lakes were traced from aerial photos and enlarged with a pantagraph for use as work maps. Sounding records provided the basis for bottom contours. Reduced copies of the finalized contour maps were printed and made available for public use. The lake areas were computed with the aid of a planimeter. Conductance readings were standardized at 77 F. Lake survey data are kept on standard lake survey file cards both at the district and Helena offices.

Findings: During the summer of 1964, the primary emphasis was to have been on a survey of lakes and streams in the upper Big Salmon drainage in the Bob Marshall Wilderness Area and on the tributary streams of the Swan River above Swan Lake. Poor flying weather and restricted use of the helicopter in the Bob Marshall Wilderness Area prevented the completion of the Big Salmon drainage lake survey. As a result of late spring floods, high water continued throughout the summer and fall making stream population sampling with shocking gear on the Swan tributaries impossible. Thus, two of the major objectives of this year's survey plans were not accomplished during the report period and efforts were diverted toward other objectives.

Initial surveys were conducted on 10 mountain lakes in District 1. These include Woodward Lake in the South Fork drainage; Rainbow, Bluebird, Paradise and an unnamed lake in the Kootenai drainage; and

Lower and Upper Blossom, Rock and Terrace Lakes in the Clark Fork drainage. A summary of the catch data from mountain lakes surveyed in 1964 is presented in Table 1. Scale samples were collected from fish collections and age and growth analysis are shown in Table 2.

Woodward Lake is one of a number of lakes scheduled for survey in the Big Salmon River drainage. These surveys are being conducted to determine the degree of encroachment of rainbow trout into these waters where westslope cutthroat trout are native. The headwaters of this drainage were stocked with hatchery rainbow trout in the early 20's.

Two overnight gill net sets produced a total of 28 rainbow trout which averaged 14.9 inches and represented a variety of age classes. Since cutthroat trout were not represented in the catch, it is presumed that the rainbow has been successful in maintaining themselves through natural reproduction and have gradually filled the niche once occupied by native cutthroat species. Additional survey work is scheduled for the summer of 1965 to further determine the distribution of rainbow in this drainage.

Five lakes were surveyed in what is known as the Ten Lakes Basin, northeast of Eureka, in the Kootenai drainage. Paradise and Bat Lakes were found to be too shallow to sustain fish life through the winter months (maximum depths between 5 and 8 feet) and were not netted. Although no fish were collected from overnight sets in Bluebird and an unnamed lake, these lakes had, at one time, supported trout populations. They would probably be considered marginal but could conceivably sustain fish through average winter. These lakes should be included in the mountain lake stocking program on a trial basis.

An overnight gill net set in Rainbow Lake resulted in a catch of 24 yellowstone cutthroat trout representing four age classes. Excellent spawning conditions exist in the outlet streams and numerous trout fry were observed.

Four lakes which lie in the Cabinet Mountains of the Clark Fork drainage were surveyed. Fish sampling was by angling and collecting catch data from fishermen. Upper and Lower Blossom Lake catches were composed entirely of brook trout averaging 5 to 7 inches. The large numbers of fish and small average size suggest an over population of brook trout.

Rock Lake supports an excellent population of cutthroat trout of several age classes. Spawning grounds in the inlet and outlet of the lake are sufficient to maintain a fishable population.

Observation and catch information from Terrace Lake indicate a poor population of cutthroat trout. Spawning areas in this lake are very limited and reproductive success is low. This lake should be included on the stocking program as it is one of the most heavily fished lakes in the Thompson Falls area.

Follow-up surveys were conducted on Blanchard, McGregor, Vinal and Hoskins Lakes. A summary of gill net catches is shown in Table 3. Age and growth data are presented in Table 2.

Table 1

Summary of gill net catches from mountain lakes surveyed in 1964. (Number of fish in parenthesis.)

Drainage and Lake	Acres	Maximum Depth	Number of net sets	Fish taken: Species 1/ and numbers	Fish taken: Average Length-inches (Game species)
SouthFork, Flathead drainage:					
Woodward	70	110	2	Rb (28)	14.9
Kootenai Drainage:					
Rainbow	10(Est.)	40 (Est.)	1	Ct 2/	- 10.5
Unnamed	1.5 (Est.)	17	1	None	
Bluebird	2 (Est.)	14	1	None	
Paradise	1.5 (Est.)	5	None - too shallow for sustaining fish life.		
Bat	3 (Est.)	8 (Est.)	None - too shallow for sustaining fish life.		
Clark Fork Drainage:					
Blossom, Lower	25 (Est.)	50 (Est.)		Eb (150) 3/	5.0
Blossom, Upper	10 (Est.)	25 (Est.)		Eb (150) 3/	7.0
Rock	40 (Est.)	50 (Est.)		Ct (30) 3/	10.0
Terrace	25 (Est.)	50 (Est.)		Ct (1) 3/	15.0

1/ Rb= Rainbow trout, Ct= Cutthroat trout, Eb= Brook trout
2/ Yellowstone Ct.
3/ Approximate catch by angling.

Table 2

The average calculated total lengths (inches) of fish collected from Dist. 1 lakes surveyed in 1964

(Numbers of specimens in parenthesis.)

Lake	Species	Average Total Length	Average Weight	Average lengths for year of life. I	II	III	IV	V	VI	VII	VIII	IX
Blanchard	Yp	10.3	0.61	1.5	2.9	4.8	6.4	7.6	9.1	9.4	9.6	9.6
				(14)	(14)	(14)	(12)	(10)	(9)	(5)	(2)	(1)
	PS	6.5	0.23	1.1	2.0	3.2	4.4	5.4	5.9			
				(12)	(12)	(12)	(10)	(7)	(3)			
	LMB	8.4	0.27	1.8	4.4	7.2						
				(3)	(3)	(3)						
Blossom, Lower	Eb	6.3		2.8	4.9							
				(21)	(17)							
Blossom, Upper	Eb	7.8		2.8	4.7	7.0						
				(4)	(4)	(2)						
McGregor	Lt	19.2	2.04	3.4	6.6	9.6	12.6	15.3	17.7	19.9	22.6	
				(8)	(8)	(8)	(8)	(8)	(6)	(3)	(1)	
Rock	Ct	11.7		5.0	8.7	10.2						
				(6)	(6)	(2)						
Rainbow	Ct	11.1		3.8	6.9	9.4	11.1					
				(30)	(25)	(18)	(7)					
Woodward	Rb	14.9		3.9	7.4	11.5	13.9	15.8	18.0			
				(28)	(27)	(23)	(17)	(5)	(1)			

Table

Summary of gill net catches from follow-up surveys in 1964.

	Acres	Maximum Depth (feet)	Numbers of net sets	Fish taken: Species 1/ and numbers	Fish taken: Average total length (game species)
Blanchard	147	32	3	Yp(14),PS(12) LMB(3)	LMB(8.4)
Hoskins	10 (Est.)	31	1	None	
McGregor	1328	220	4	Lt(5),Wf(1)	Lt(16.9) Wf(11.9)
Vinal	18.5	42	2	Ct(2),PS(137) Fss(12),Rss(5)	Ct(19.0)

1/Yp= Yellow Perch, Ps=Pumpkinseed, LMB=Largemouth bass, Wf=Mountain Whitefish, ct=Cutthroat trout, Fss=Longnose sucker, Rss= Redsided shiner

The Blanchard Lake fish population was sampled with three overnight gill net sets to determine the success of kokanee fry planted on a trial basis annually since 1961. Yellow perch, pumpkinseed and largemouth bass were represented in the catch. Due to the absence of kokanee in the catch and apparent failure of previous introductions, it is recommended that plants of kokanee fry into Blanchard Lake be discontinued.

McGregor Lake was sampled with gill nets to determine the status of the lake trout population. Four overnight net sets produced eight lake trout averaging 19.2 inches and 2.04 pounds. One whitefish was also taken. The lake trout is the dominant game species in McGregor Lake and the catch rate here probably exceed that for other lake trout lakes in the state. However, McGregor Lake lake trout are in relatively poor condition, probably due to a limited supply of forage species. It is recommended that a trial plant of 200,000 kokanee fry be made annually for four years. These could serve as forage for lake trout and in addition perhaps create a kokanee fishery.

Two small lakes, Vinal and Hoskins Lakes, located in the Yaak River drainage were sampled with gill nets. Two overnight net sets in Vinal Lake yielded an abundance of rough fish, mainly pumpkinseed, longnose suckers and redside shiners. Two large Yellowstone cutthroat were also taken. It appears the lake is dominated by pumpkinseed and only a remnant of an old Yellowstone cutthroat population remains. It is recommended the present fish population be eradicated and replaced with rainbow or cutthroat trout.

One experimental gill net was set in Hoskins Lake for 6 hours. No fish were caught. It is recommended the lake be stocked with Westslope cutthroat.

Since the rehabilitation of Beaver, Little Beaver and Crystal Lakes with toxaphene in 1960, toxicity tests have been conducted annually during the spring overturn period to determine if the lakes had detoxified. In all previous tests, a 100 percent mortality of the test fish occurred. Hatchery rainbow and cutthroat trout from the Arlee and Somers hatcheries were used this year as test fish. Between 5 and 10 fish, averaging 3 to 4 inches, were placed in holding cages and set on the lake bottom at various depths for a two week period. At the end of this period the cages were removed and mortality was observed. In all cases, mortality rates were low and the lakes were considered non-toxic. The lakes were restocked with fingerling rainbow trout and at the end of the project period were providing excellent fishing.

A water quality study was initiated for a group of high alkaline lakes in the Eureka area. pH, alkalinity and conductivity data are being collected periodically to determine seasonal variation in the water chemistry and the effects of chemical changes on the fish populations.

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