MONTANA FISH AND GAME DEPARTMENT
FISHERIES DIVISION
HELENA, MONTANA

JOB COMPLETION REPORT
INVESTIGATIONS PROJECTS

State of Montana Name Helicopter Mountain Lake Survey

Project No. F-32-R-4 Title Mountain Lake Survey - District 3

Job No. IV

Period Covered July 1, 1967, to June 30, 1968.

ABSTRACT:

A total of twenty-eight mountain lakes were surveyed in District Three with the aid of a helicopter in July, 1967. The area of the lakes ranged from 3.9 to 41.9 acres and had maximum depths of four to ninety-eight feet. Gamefish populations were found in sixteen of the lakes. Rainbow trout populations were found in eight lakes, combinations of rainbow trout, cutthroat trout, and rainbow-cutthroat hybrids were taken from five lakes, and grayling only were found in three lakes. Six lakes were recommended for plants of rainbow trout or cutthroat trout in the Pioneer Mountain Range in 1968. Cutthroat trout were stocked in two lakes in the Tobacco Root Mountains in 1967, following the surveys.

RECOMMENDATIONS:

High mountain lake surveys should continue in order to eventually complete the file of fishing waters in the district. Knowledge of the characteristics of each high lake is needed to provide a basis for management recommendations.

Ferguson, Foolhen, and Sand Lakes were recommended for plants of rainbow trout in 1968. Results from the survey reveal the past planting recommendations have been about optimum for these lakes.

Tendoy, Torrey, and Upper Stone Lakes were recommended for plants of two-inch cutthroat trout in 1968. Although no fish were captured from these three lakes, a fishery was reported present in them in the early 1960's.

Bell and Louise Lakes were recommended for plants of fingerling cutthroat trout in 1967. Both lakes were stocked in 1967, following the surveys.

OBJECTIVES:

The purpose of this project is to determine the physical and biological characteristics of high mountain lakes and to determine the suitability of these lakes for sport fisheries. The characteristics and past history of each lake are examined to determine if planting of hatchery fish is desirable.

TECHNIQUES:

A helicopter fitted with pontoons was employed as a "packhorse" and also served as a raft from which the equipment was handled. Water temperatures were obtained at the surface and near the bottom with an electrical resistance thermometer. Lake depths were obtained with a Bendix depth recorder. Potential spawning areas were observed and classified into three categories as follows:

Good - adequate reproduction judged likely to occur every year;

Poor - questionable whether reproduction occurs every year, reproduction might occur in favorable years;

Nil - no suitable spawning areas available.

One 125-foot experimental monofilament gill net was fished in each lake for about twenty-four hours. Scale samples were obtained from fish from most of the lakes where fish populations were found. Data obtained from each lake was recorded on lake survey cards for the District and Helena files.

FINDINGS:

PIONEER MOUNTAIN LAKES

A summary of most of the data obtained from the survey is presented in Table 1. Gamefish populations were found in fifteen of the twenty-four lakes surveyed in the Pioneer Mountain Range. Several fish were observed rising in Foolhen Lake, but none were taken in the gill net. Only rainbow trout were captured from seven lakes, grayling from three lakes, and combinations of rainbow trout, cutthroat trout, or rainbow-cutthroat trout hybrids from five lakes. Mountain suckers were the only species captured from Black Lion Lake.

Gamefish over ten inches in total length were taken from all lakes containing populations except from Lake-of-the-Woods. The largest fish captured was a rainbow trout (16.2 inches, 1.74 pounds) from Lower Stone Lake. Fish over fifteen inches in length were taken from six lakes.

Spawning areas appeared to be good on four lakes and the number of fish taken in the nets indicated adequate reproduction. Adequate reproduction apparently occurs on two other lakes (North Bobcat and Schwinegar) even though visible spawning areas were judged to be poor.

Depth was considered a limiting factor on three of the lakes. These lakes are Vera, West Bobcat, and Elbow. Four fish were caught from Vera Lake; however, these may have moved into the lake during high water. West Bobcat and Elbow Lakes did not have permanent inlets and had no outlets at all. The drainage area of all three lakes is less than a half square mile.

Three of the lakes surveyed are on a periodic planting schedule for rainbow trout. These are Ferguson, Foolhen, and Sand Lakes. As mentioned previously, no fish were caught from Foolhen Lake, but several were seen rising during the survey. The rainbow trout taken from Ferguson and Sand Lakes were of a desirable size and in good body condition.

Table 1. Summary of mountain lakes surveyed in District Three (Pioneer Mountains and Tobacco Root Mountains), July, 1967. Lakes listed alphabetically.

Lake	Location T.	R.	S.	Sub-drainage	Area (A.)	Max. Depth (ft.)	Elevation (ft.)	Species	No.	Size Range (inches)	Spawning Areas
PIONEER MOUNTAINS											
Abundance	3S,	11W,	7	Canyon Cr.	3.7	35	8,600	Hybrid 1/	3	10.1-15.4	Poor
Baldy	3S,	14W,	1	Wise R.	32.5	85	8,450	Rainbow	8	11.2-15.8	Poor
Black Lion	2S,	11W,	32	Wise R.	11.8	29	8,600	Mt. Sucker	5	7.0- 7.3	Nil
Bobcat (No.)	2S,	13W,	33	Wise R.	5.0	23	8,300	Grayling	34	6.6-12.2	Poor
Bobcat (West)	2S,	13W,	32	Wise R.	5.0	17	8,400	None			Nil
Canyon	3S,	11W,	8	Canyon Cr.	11.9	9	8,250	Cutthroat	8	9.3-10.4	Good
								Hybrid	17	8.2-11.2	
Crescent	3S,	11W,	18	Canyon Cr.	30.0	22	8,600	Hybrid	4	8.5-15.6	Good
Elbow	3S,	14W,	12	Wise R.	10.6	12	8,550	None			Nil
Ferguson	1N,	12W,	31	Alder Cr.	17.5	48	7,450	Rainbow	19	10.7-15.6	Nil
Foolhen	1N,	12W,	29	Alder Cr.	8.1	38	7,100	None			Nil
Gorge (No.)	4S,	11W,	9	Willow Cr.	10.6	30	9,000	None			Nil
Gorge (So.)	4S,	11W,	16	Willow Cr.	16.8	43	9,000	None			Nil
Grayling	3S,	11W,	17	Canyon Cr.	12.5	33	8,600	Rainbow	7	8.6-12.1	Good
								Cutthroat	5	9.3-12.6	
								Hybrid	11	7.3-12.2	
Lake-of-the-Woods	3S,	13W,	8	Wise R.	10.6	30	8,300	Rainbow	3	8.7- 9.0	Poor
								Cutthroat	3	9.1-10.1	
								Hybrid	4	9.1- 9.6	
Lion	3S,	11W,	17	Canyon Cr.	11.2	32	8,700	Rainbow	4	10.2-14.4	Poor
O'Dell	3S,	13W,	17	Wise R.	35.6	35	8,250	Grayling	43	7.2-10.7	Good
Sand	2S,	14W,	36	Wise R.	41.9	38	8,150	Rainbow	19	7.4-13.8	Poor
Schwinegar	3S,	13W,	8	Wise R.	5.0	30	8,125	Grayling	25	8.3-10.2	Poor
Stone (Lower)	2S,	13W,	5	Wise R.	10.6	47	8,100	Rainbow	8	10.6-16.2	Poor
Stone (Upper)	2S,	13W,	6	Wise R.	16.9	30	8,300	None			Nil
Tahepia	3S,	11W,	21	Wise R.	15.6	20	8,700	Rainbow	7	8.9-15.0	Poor
Tendoy	4S,	11W,	4	Willow Cr.	30.0	98	9,100	None			Poor
Torrey	4S,	11W,	21	Wise R.	28.4	35	8,800	None			Poor
Vera	3S,	11W,	16	Canyon Cr.	4.4	10	8,600	Hybrid	4	6.1-12.9	Poor
TOBACCO ROOT MOUNTAINS											
Bell	3S,	3W,	32	Willow Cr.	20.0	72	8,800	None			Nil
Boulder (Upper)	3S,	4W,	5	Boulder Cr.	15.8	4	9,000	None			Nil
Lost Cabin	3S,	4W,	14	S. Boulder R.	7.1	22	9,000	Rainbow		8.5-13.0	Nil
Louise	3S,	4W,	11	S. Boulder R.	12.5	40	8,900	None			Nil

1/ Hybrid (rainbow trout-cutthroat trout cross).

Scale samples were not taken from fish from Ferguson Lake. Examination of scales from Sand Lake fish revealed some natural reproduction occurs. Most of the fish taken were age II and IV, which corresponded to the years they were planted.

Scale samples were obtained from fish from several lakes for age and growth analysis. The scales were also valuable in verifying whether or not natural reproduction occurs. Nearly all fish attained a length of seven inches in their third growing season, which is about average for mountain lakes in Montana. Age and growth data is presented in Table 2.

Table 2. Age and growth of fish from lakes in the Pioneer Mountain Range. (Figure in parentheses is the number of fish in the sample).

Lake	Species	AGE					
		I	II	III	IV	V	VI
Abundance	Hybrid 1/	2.4 (3)	6.7 (3)	11.2 (2)	13.9 (1)		
Baldy	Rainbow	2.1 (6)	6.0 (6)	9.8 (6)	12.7 (2)	14.1 (1)	
Canyon	Cutthroat	3.0 (7)	6.1 (7)	8.3 (7)	8.8 (2)		
	Hybrid	3.0 (14)	6.2 (14)	8.4 (14)	10.5 (3)	13.6 (1)	
Crescent	Hybrid	2.7 (4)	6.3 (4)	10.1 (3)	14.0 (2)	14.3 (1)	
Grayling	Rainbow	2.3 (7)	5.0 (7)	7.6 (6)	9.4 (3)	11.1 (1)	
	Cutthroat	2.7 (5)	5.7 (5)	8.3 (4)	10.3 (1)		
	Hybrid	2.6 (10)	5.6 (10)	8.4 (7)	10.2 (1)		
Lion	Rainbow	2.8 (4)	5.2 (4)	8.2 (4)	10.9 (3)	12.6 (2)	14.3 (1)
O'Dell	Grayling	2.7 (17)	6.3 (17)	8.1 (13)	9.6 (1)		
Sand	Rainbow	3.7 (12)	8.1 (11)	10.9 (6)	12.0 (4)		
Tahepia	Rainbow	2.0 (7)	5.8 (7)	9.8 (5)	11.9 (4)	13.8 (2)	
Vera	Hybrid	3.4 (4)	7.2 (2)	10.4 (1)			

1/ Hybrid (rainbow trout-cutthroat trout cross).

Growth of grayling in O'Dell Lake is considerably slower than in other Montana lakes. Most of the O'Dell Lake grayling were in poor body condition. The size of the grayling, growth rate, and body condition are quite similar to the grayling collected from Lake Agnes in June, 1966 (Wipperman, 1967 1/). Scales were not taken from grayling from Schwinegar Lake, but the size and condition of the fish were comparable to those in O'Dell Lake. Several grayling near a foot in length and weighing up to one-half pound were caught from North Bobcat Lake. Scales were not taken from these fish, but the dominant size groups in the catch indicated faster growth than in O'Dell Lake.

Considerable effort is required to reach most lakes in the Pioneer Mountains from the ground. Trails provide access to most of the lakes, but are steep and poorly maintained. Only Schwinegar Lake can be reached with a four-wheel drive vehicle. A good trail provides access to the lakes in the Canyon Creek drainage.

TOBACCO ROOT MOUNTAIN LAKES

Survey data for the lakes in the Tobacco Root Mountains is summarized in Table 1. Only one of the four lakes surveyed supported a fish population. Rainbow trout were captured in Lost Cabin Lake, and scale samples indicated that all four fish were of the same age class. Spawning areas were classified as nil for all lakes surveyed. Depth was considered a limiting factor in only one lake, Upper Boulder. Two lakes, Bell and Louise, were planted with cutthroat trout in 1967, following the surveys. Access is limited to trails.

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1/ Wipperman, A. H. 1967. Inventory of the Waters of the Project Area. Job Completion Report, Federal Aid in Fish and Wildlife Restoration Acts. Montana Project No. F-9-R-15, Job I.