MONTANA FISH AND GAME DEPARTMENT
FISHERIES DIVISION

JOB COMPLETION REPORT

RESEARCH PROJECT SEGMENT

State of Montana

Project No.: F-12-R-8 Name Western Montana Fishery Study

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

Period Covered: May 1, 1961 through April 30, 1962

Abstract:

Fourteen lakes and seven streams were surveyed during the project period. Thirteen of these waters were lakes or streams on which initial surveys were conducted. The remainder were waters on which follow-up survey information or specific information concerning management measures was desired. Management problems on Inez and Salmon Lakes, Silver Lake, Ninemile Creek and Clark Fork River are discussed and management recommendations are given for all waters surveyed.

Original survey data are filed in the district headquarters, and copies of permanent record lake and stream survey cards have been sent to Helena.

Recommendations:

1. Salmon Lake - Gill net sets should be repeated in 1962 as a means of evaluating the survival of the 53,986, 3-inch, rainbow trout which were planted in 1962. The plant and the gill net sets should be repeated for three years if fish are available.

2. Inez Lake - If a suitable barrier site can be found, this lake should be rehabilitated and replanted with west-slope cutthroat trout.

3. Silver and Diamond Lakes, Mineral County. These lakes should be planted as recommended in the F-12-R-7 report. Creel limits on brook trout should be reduced to 10 pounds and one fish, and the lakes should be surveyed again in 1963.

4. Middle Bowman Lake (Bowman Lake No. 2) - This lake should be re-surveyed in 1962, to determine changes in habitat and fish population coincident with the raising of a dam. The new construction was started in 1960 and will impound water for the first time in 1962.

5. Miller Creek - The section of this stream which is on state land should be opened to fishing. Two years after it is opened, the stream should be re-sampled.

6. Ninemile Creek - The study sections should be electro-fished as soon in 1962 as water levels permit, and again in August, 1962. The plant should be continued in 1962.

7. Flint Creek - To the present time the operation of the downstream-migrant, fry trap in this stream has been given a low priority. As a result the data have been sketchy and inconclusive. A concerted effort should be made in 1962 to install the trap before the migration begins and to continue its operation until the run is over. The late opening date on this stream should be continued.

8. Clark Fork River - The river section from Garrison to Rock Creek should be opened to fishing with the general season in 1962.

9. Lost Horse, Boulder and Twelvemile Creeks - No planting is recommended. Twelvemile Creek should be sampled again in 1962.

10. East Fork Reservoir - Plant with 36,600, 4-inch, rainbow trout in 1962.

11. Echo Lake - Continue the present plant in 1962 and 1963 and sample again in 1963.

12. Kaiser Lake - Investigate for permanency of public access. If access is suitable, rehabilitate and restock with 3,000, 2-inch rainbow trout.

13. Meadow Lake - Recommend that U.S.F.S. stabilize the beaver dam in the outlet to prevent washouts.

14. Moose Lake - No change in present management.

15. Silver Lake (Deerlodge County) - No change in present management.

16. Stony Lake - The Fish and Game Department should approve the U.S.F.S., dam-construction project on this lake and should cooperate on the project where possible.

17. Twin Lakes - No change in present management.

Objectives:

The primary objective of inventorying waters of the project area is to obtain basic information from waters on which no information concerning existing fish populations or the water's physical characteristics are presently available. These basic data are needed to determine management practices required to maintain, or provide, sustained yield fisheries in suitable waters.

In addition to surveying waters on which no information is presently available, more detailed surveys are frequently needed to plan or evaluate extensive management practices on specific waters. A brief description of the specific objective for each survey in this category is presented in conjunction with the findings from each survey.

Techniques Used:

Fourteen lakes and seven streams were surveyed by standard methods during the project period. Survey data were recorded on net set record forms, electric stream census forms, and/or field copies of Montana's standard lake and stream survey cards. Original data are in the district files and duplicates of permanent record lake and stream survey cards have been sent to Helena.

The following is a list of common names, abbreviations used, and scientific names used for all species mentioned in this report. Scientific and common names are those listed in the American Fisheries Society Special Publication No. 2, 1960.

Common Name	Abbreviation	Scientific Name
Kokanee	KOK	Oncorhynchus nerka (Walbaum)
Mountain whitefish	Wf	Prosopium williamsoni (Girard)
Cutthroat trout	Ct	Salmo clarki Richardson
Rainbow trout	Rb	Salmo gairdneri Richardson
Brown trout	LL	Salmo trutta Linnaeus
Brook trout	Eb	Salvelinus fontinalis Mitchill
Dolly Varden	Dv	Salvelinus malma (Walbaum)
Redside shiner	RSS	Richardsonius balteatus (Richardson)
Longnose sucker	F Su	Catostomus catostomus (Forster)
Largescale sucker	C Su Col.	Catostomus macrocheilus Girard
Sculpin	Cott	Cottus sp.
Northern Squawfish	SQ	Ptychocheilus oregonensis (Richardson)
Peamouth	CRC	Mylocheilus caurinus (Richardson)
Yellow Perch	YP	Perca flavescens (Mitchill)
Pumpkinseed	PS	Lepomis gibbosus (Linneaus)

All lengths of fishes in this report are presented as total lengths in inches.

Findings:

Salmon and Inez Lakes

These lakes are both known to contain mostly non-game fish. An experimental plant of 40,000, 2-inch, rainbow trout was made in Inez Lake in 1958 in an attempt to provide an economical "put and take" fishery. Because of the proximity and similar characteristics of Salmon Lake to Inez Lake, Salmon Lake was chosen as a control lake.

To evaluate the 1958 plant in Inez Lake, 20, overnight gill net sets were made in Salmon Lake and 15 sets in Inez Lake. Nets used were standard, 125 foot, experimental gill nets.

Scale samples and individual lengths and weights were taken from all game fish captured. Individual lengths and weights were taken from approximately 50 of each species of non-game fish and the remainder counted and weighed.

The game fish captured in 20 overnight gill net sets in Salmon Lake comprised 19.7 per cent of the 937 fish taken. Excluding whitefish, only 7.2 per cent of the total fish taken were game fish. Game fish in Inez Lake

comprised 12.4 per cent of the total fish taken, and excluding whitefish, only 1.9 per cent were game fish.

Catch data showing the per cent of total fish caught, by species and for both lakes, are presented in Table 1. Unfortunately, other work commitments prevented sampling of these lakes in 1959 or 1960. As a result, conclusive

Table 1. SUMMARIZATION OF SALMON AND INEZ LAKE POPULATION SURVEY.

Salmon Lake

Species	CSuCol	SQ	CRC	F Su	YP	PS	Wf	KOK	Dv	LL	Rb	Ct
No. caught	83	178	177	62	242	10	117	44	15	6	2	1
Ave.length	12.61	11.36	11.16	13.00	6.50	5.33	11.12	9.60	14.47	14.20	13.8	8.2
Ave.weight	.86	.52	.41	.73	.12	.14	.41	.33	.92	1.09	.87	.20
% of Total	8.86	19.00	18.89	6.62	25.83	1.07	12.49	4.70	1.60	.64	.21	.11

Inez Lake

No. caught	72	240	17	20	306	3	79	3	6	--	--	5
Ave.length	12.46	11.38	12.58	13.84	6.64	5.2	10.79	11.06	13.40	--	--	14.46
Ave.weight	.75	.49	.78	.94	.13	.17	.38	.49	.88	--	--	1.06
% of Total	9.59	31.96	2.26	2.66	40.74	.40	10.52	.40	.80	--	--	.66

data pertaining to the survival of the 1958 plant of 40,000 rainbow trout during these years are lacking. No rainbows were taken by gill netting in 1961, none were recorded in warden creel census during 1959, and four Inez Lake home owners who were interviewed during the survey reported no rainbow caught. Thus, if the 1958 plant did provide any fishing, it was a small amount and was short-lived.

In 1961, 53,986, 3-inch, rainbow trout were planted in Salmon Lake. The lake should be netted again in 1962 to evaluate this plant.

None of the various types of planting which have been used in Inez Lake since 1954 have significantly increased the game fish population of that lake (See the completion report for Job No. I, F-12-R-4). If a suitable barrier site can be found between Inez and Seeley Lakes, a barrier should be constructed and Inez and Alva Lakes should be rehabilitated and replanted with west-slope, cutthroat trout.

Age and growth data for game fish captured are presented in Appendix B.

Silver Lake (Mineral County)

Silver Lake was surveyed in 1955 and found to contain a population composed solely of brook trout, which averaged 8.5 inches. The catch limit was liberalized in 1956 in an attempt to direct more fishing pressure to the lake to increase the harvest. In 1958, the lake was again gill netted and the average size of the brook trout was 8.1 inches.

To further investigate the effects of the "no-limit" regulations, two experimental gill nets were fished overnight to obtain comparative data. Scales, lengths and weights were taken from all fish captured.

Brook trout were again the only species of fish taken from this lake. Age and growth data obtained from scale samples are presented in Appendix B.

Like several other brook trout lakes in Mineral County (see Completion Report for Job No. I, F-12-R-7) the growth rate of brook trout in Silver Lake is as good as or better than that of other trout species in similar mountain lakes. These fish are not stunted, instead their small size is due to some factor which prevents them from living over three years. Thus an increased harvest might be expected to have little or no effect on increasing the size of the fish. This is indicated by the data in Table 2, which show the catch per net and the average length and weight of brook trout taken in 1955, 58 and 61. From the steady drop in catch per net, as well as in average length and weight, it appears that the liberal regulations on Silver Lake have re-

duced numbers of fish without increasing their average size. Silver Lake has had liberalized creel limits for brook trout since 1956. In 1956 and 57 the limit was 10 pounds and 1 fish, since 1958 there has been no limit.

As recommended in the completion report for Job No. I, F-12-R-7, Silver Lake should be planted with 7-inch rainbow trout. The creel limit for brook trout should be 10 pounds and 1 fish, and the lake should be surveyed again in 1963.

Table 2. AVERAGE LENGTHS AND WEIGHTS OF BROOK TROUT, SILVER LAKE, 1955,58,61.

Year	No. in Sample	Ave. Length in inches	Ave. weight in pounds	Catch/net
1955	39	8.50	--	39
1958	91	8.12	0.18	23
1961	28	8.02	0.16	14

Middle Bowman Lake (#2)

This lake was surveyed initially in 1960. While the lake is on U.S.F.S. land, a private individual has obtained a special use permit for the lake and plans to raise the water level several feet by increasing the height of the dam which forms the lake.

To evaluate the effect on the fishery by the increased water level and subsequent water level fluctuations, five, overnight gill net sets were made to obtain data concerning the fish population prior to the alteration planned. These sets will be repeated following dam construction to obtain comparable data. Fish captured were weighed and measured, and scale samples taken.

In 1960, the rate of growth for rainbow trout in Bowman Lake was slower than that of cutthroat. At annulus I, cutthroat trout averaged 2.7 inches and rainbow trout averaged 2.1 inches. At annulus IV, cutthroat trout averaged 10.8 inches and rainbow trout averaged 8.5 inches. In 1961, growth rates between the two species were similar, with the exception of growth to annulus I (Appendix B.).

The average length of both species increased slightly from 1960 to 1961, while the average number of cutthroat captured per net decreased and the average number of rainbow captured per net increased (Table 3.).

Table 3. CATCH DATA FROM MIDDLE BOWMAN LAKE, 1960-61.

Species	Ave. catch per net		No. of fish captured		Ave. length (inches)	
	60	61	60	61	60	61
Ct	9.3	5.2	93	26	9.2	9.9
Rb	1.7	2.2	17	11	10.0	10.2

In 1960, construction on an impoundment dam on upper Bowman Lake was in progress, but at the time of survey had had no apparent effect on Middle Bowman Lake. In 1961, the dam on Upper Bowman Lake was completed and work on the dam on Middle Bowman had been initiated. This dam should impound water for the first time in 1962. At the time of survey in 1961, storage water was being released from Upper Bowman through Middle Bowman for irrigation purposes, and the lake was more turbid than normal.

This lake should be surveyed again in 1962.

Miller Creek

This stream has been closed to fishing since 1953 because of private land ownership problems. In 1959, two, 300 foot sections of the stream were electro-fished to obtain data on an unexploited, mixed population of cutthroat and brook trout. These sections were again electro-fished in 1961 as a continuation of the study. Periodic sampling of these stations will continue.

Numbers of trout collected during the 1961 sampling of Miller Creek were much lower than in 1959 (Table 4.). The average length of the trout remained about the same. Since Miller Creek is used for irrigation purposes, the

reduction in numbers is probably due to increased dewatering of the stream during the severely dry summer of 1961.

Table 4. NUMBERS AND AVERAGE LENGTHS OF BROOK TROUT AND CUTTHROAT TROUT CAPTURED FROM TWO SECTIONS OF MILLER CREEK, 1959 and 1961.

Species	1959		1961	
	No. in Sample	Average Length	No. in Sample	Average Length
Eb	130	4.18	48	3.96
Ct	54	6.20	22	6.55

Age and growth data from fish captured in 1961 are presented in Appendix B.

The portion of Miller Creek on state land should be open to fishing. Two years after it is opened, the stream should be re-sampled.

Ninemile Creek

Three, 300 foot, sections were again electro-fished following recommendations made in the 1959 completion report for an annual plant of 2,000 fingerling cutthroat trout. After survey in 1959, it was concluded that spawning success had been seriously impaired by previous dredge mining operations on this stream and that planting was necessary to sustain the fishery. Following three years of planting and fish population sampling, an evaluation of the success of these plants will be made.

The identical sections that were sampled in 1959 and 1960 were again electro-fished. All fish captured were weighed and measured and recorded by species.

Numbers of fish, by species, captured by electro-fishing the same sections in 1959, 60, and 61, are presented in Table 5. The stream was planted with 3,053, two to three-inch cutthroat trout on July 13, 1961, in the same general area in which the three study sections are located. These sections were sampled on Aug. 7, 1961, approximately the same length of time following the plant as in 1960.

Totals for all species captured did not change appreciably from totals obtained in 1960. A significant increase in numbers of fish in the 2.0 to 3.9 inch range occurred for cutthroat (Table 6.), but the number of fish in catchable sized categories decreased.

The data for evaluating management procedures on this stream are at present inconclusive. Data concerning the existing fish population immediately prior to the opening of the general fishing season would be an asset for evaluation. The study sections should be electro-fished as soon in 1962 as water levels permit, and again in August, 1962. The experimental plant should be continued in 1962.

Table 5. NUMBERS OF FISH, BY SPECIES AND SECTION, COLLECTED DURING SAMPLING ON NINEMILE CREEK, 1959-61.

Species	Section 1			Section 2			Section 3			Totals		
	59	60	61	59	60	61	59	60	61	59	60	61
Ct	20	49	48	9	46	33	20	33	55	49	128	136
Eb	6	20	4	4	3	14	4	8	7	14	31	25
Dv	0	0	1	0	0	0	1	6	3	1	6	4
Rb	0	0	0	0	0	1	0	0	0	0	0	1
Wf	13	10	5	1	7	18	0	0	0	14	17	23
F Su	0	3	3	0	0	0	0	0	0	0	3	3
Cott	30	27	--*	2	6	--	5	5	--	37	38	--

*Cottus not collected

Table 6. NUMBERS OF CUTTHROAT TROUT, BY 2-INCH LENGTH INTERVALS, COLLECTED FROM NINEMILE CREEK SHOCKING SECTIONS, 1959-61.

Length Intervals	Numbers of fish		
	1959	1960	1961
2.0 - 3.9"	19	40	71
4.0 - 5.9"	18	59	55
6.0 - 7.9"	11	19	9
8.0 - 9.9"	1	7	0
10.0 - 11.9"	0	1	0
12.0 - 13.9"	0	2	1
Totals	49	128	136

Clark Fork River

Five sections in the upper reaches of Clark Fork were electro-fished as a continuation of a population study designed to evaluate the effects of a serious pollution of the river in 1960 by industrial wastes.

A 230-volt, D.C., Homelite generator with a 2-negative, 1-positive electrode system was used for sampling. Section locations were identical to comparable sections fished in 1960. Standard block nets were used to delineate 300 foot sections. Scales, lengths, and weights were taken from all species of game fish captured and non-game fish were counted and recorded.

A summary of catch data obtained by electro-fishing five sections of the Clark Fork River is presented in Table 7. Sections 1, 3, and 6 are located in a portion of the river which at this time is classified as an "industrial" stream and is not subject to fisheries management. These three sections were not affected by the special closure to fishing. Sections 9 and 10 were included in the area which was closed to allow indigenous fish populations to reproduce and repopulate the river through natural means. Reports of pollution of the "industrial" section of the river are still received periodically.

Since 1960, numbers of game fish under 10 inches in length have increased 272 per cent, game fish over 10 inches have increased 633 per cent and non-game fish have increased by 1,476 per cent. The majority of the increase in non-game fish was composed of redside shiners and longnosed suckers smaller than 10 inches.

Game fish populations are apparently recovering from the severe fish-kill in 1960. The river from Garrison to Rock Creek should be opened to fishing with the general season in 1962.

Table 7. SUMMARY OF CATCH FROM FIVE SECTIONS OF CLARK FORK RIVER, 1960-61.

Section No.	LL				Eb				Ct				Wf				Non-game fish	
	Over 10"		Under 10"		Over 10"		Under 10"		Over 10"		Under 10"		Over 10"		Under 10"		All	
	60	61	60	61	60	61	60	61	60	61	60	61	60	61	60	61	60	61
1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40
6	0	3	0	0	0	0	1	4	0	0	0	0	0	0	0	0	0	17
9	2	9	0	8	0	0	0	0	0	0	0	0	0	1	2	1	20	255
10	0	5	4	18	0	0	0	0	1	4	2	6	0	0	0	4	1	19
Total Number	2	17	6	26	0	0	1	4	1	4	2	6	0	1	2	5	21	331
Average length	15.8	12.7	8.1	7.3	0	0	9.4	8.8	10.4	12.4	5.4	7.6	0	11.7	8.0	8.8	--	--

Flint Creek

A down-migrant fry trap was installed in Flint Creek, above Georgetown Lake, on July 2, 1961. The trap is designed to capture fry from about one-half the width of the stream. During periods of operation, the trap was checked and cleaned each 24-hour period. Fry captured were counted and released.

Other work assignments prevented operation of the trap during the period of greatest migration. As a result, comparable data were not obtained. The results of this phase of the study are recorded in Appendix A, but are not discussed.

Lost Horse, Boulder, and Twelvemile Creeks

These streams were surveyed because fish plants had been requested for Boulder and Lost Horse Creeks and the U.S.F.S. has begun a habitat improvement project on Twelvemile Creek. Sections electro-fished were 300 feet in length and were blocked with standard block nets. Fish captured were weighed and measured, and scale samples were taken. Physical characteristics of the streams were recorded on stream survey forms. All streams contained suitable spawning areas and small-sized trout were taken in our samples.

Existing fish populations were sampled in two sections of Lost Horse Creek and Boulder Creek. Three sections were electro-fished in Twelvemile Creek. Two of the sections of Twelvemile Creek (Sections 1 and 2) included sites at which the U.S.F.S. is planning to construct stream improvement structures. The other section (Section 3) includes a completed structure installed in 1961 by the U.S.F.S. These sections will be re-sampled in subsequent years, in cooperation with the U.S.F.S., to evaluate the effectiveness of these habitat improvement structures.

Age and growth data obtained from fish collected from these three streams are recorded in Appendix B. Fish from Lost Horse and Twelvemile Creeks exhibit slow growth typical of sterile waters. The growth rate of fish in Boulder Creek is much better. Cutthroat attain the same length in two years in Boulder Creek that they do in three years in the other two streams.

Numbers of fish and the average lengths of fish captured in Twelvemile Creek are presented in Table 8. A greater number of fish were captured in Section 3 than in either of the other sections, which could indicate that the

Table 8. NUMBER AND AVERAGE LENGTH IN INCHES OF TROUT FROM THREE SECTIONS OF TWELVEMILE CREEK, 1961.

Section	Ct		Eb		Dv	
	No.	Ave. Length	No.	Ave. Length	No.	Ave. Length
1	18	5.3	8	4.4	-	--
2	25	4.1	2	9.1	-	--
3*	28	4.7	6	6.3	6	6.0

*Includes stream improvement structure.

improvement structure did provide habitat for a greater number of fish. These figures may be misleading however, because this section originally had better natural habitat.

The same sections should be sampled again in 1962.

Mountain Lakes

Ten mountain lakes were surveyed during this report period. Six of these lakes were accessible by conventional or four-wheel drive vehicle. Survey personnel were packed into Stony Lake in cooperation with the U.S.F.S., and into Meadow and the Twin Lakes, without recompense, by the White-Tail Ranch of Ovando, Montana.

The lakes were surveyed by standard mountain lake survey methods, with the exception that a Bendix Depth Recorder was used for sounding five of the lakes accessible by vehicle. Survey data were recorded on lake survey forms.

A list of the mountain lakes surveyed, including location, number of gill nets fished, and a summary of catch data, is presented in Table 9. Data are also included on this table for Silver Lake (Mineral County) and Middle Bowman Lake. These two mountain lakes were discussed earlier because theirs were follow-up surveys that concerned special problems. Age and growth data obtained from fish captured are included in Appendix B. A brief description of findings pertinent to each lake, and management recommendations, are given:

Diamond Lake - Brook trout from this lake, as in Silver Lake, have a good growth rate for a mountain lake habitat, but no fish over three years old were taken. Creel limits should be reduced to ten pounds and one fish for brook trout and the lake should be planted with 1,000, 4-inch, rainbow trout. This is part of the management study on brook trout lakes which was recommended in the F-12-R-7 report. Comparable gill net sets should be repeated in 1963.

East Fork Reservoir - A severe mortality of rainbow trout was reported and investigated in this reservoir during the summer of 1960. Specimens were obtained and sent to various laboratories to ascertain the causative agent, but no explanation for the kill could be found. The reservoir was replanted in 1961 and during that summer the reservoir was drawn down almost to the minimum level, which resulted in almost depleting fish stocks in the reservoir. At the time of survey, only brook and Dolly Varden trout were captured in gill nets.

The reservoir is on the planting program to receive 36,600, 4-inch, rainbow trout in 1962, in an attempt to re-establish a rainbow trout fishery.

Table 9. LIST OF HIGH MOUNTAIN LAKES SURVEYED, 1961.

Lake	Location	Size (Acres)	Over-night sets	Species Collected	Number Collected	Ave. length (inches)
Diamond	16N,28W,18 Mineral Co.	25 (est)	2	Eb	87	7.6
East Fork Reservoir	4N,14W,6 Granite Co.	323	7	Eb	5	10.0
				Dv	35	16.2
Echo	6N,13W,32 Granite Co.	101	6	Eb	14	9.0
				Ct	1	11.5
				Rb	42	8.6
				F Su	233	10.7
Kaiser	4N,15W,18 Granite Co.	11	2	Dv	1	21.5
				Ct	5	10.4
				F Su	113	10.3
Meadow	16N,9W,18 Lewis and Clark Co.	9	1	Rb	17	10.9
Moose	4N,16W,36 Granite Co.	16	3	Eb	3	8.6
				Dv	9	21.4
				Ct	1	10.5
				Rb	23	12.8
				F Su	53	9.4
Silver	5N,13W,21 Deerlodge Co.	305	7	Eb	1	9.8
				Dv	2	20.2
				Rb	2	9.4
				KOK	1	9.2
				F Su	308	9.0
Stony	6N,17W,16 Granite Co.	10	1	Ct	36	9.9
Twin (Lower)	16N,9W,6 Lewis and Clark Co.	10	1	Ct	7	11.1
Twin (Upper)	16N,9W,8 Lewis and Clark Co.	7	1	Ct	17	15.0
Silver	19N,31W,32 Mineral Co.	17 (est)	2	Eb	28	8.0
Bowman #2	7N,11W,31 Powell Co.	10 (est)	5	Ct	26	10.0
				Rb	11	10.2

Echo Lake - This one hundred acre lake is within two miles of Georgetown Lake and has opened in May with the general season for many years. During this time, Georgetown has had a special season which opened near the end of June. Georgetown will open with the general season in 1962. Because of high fishing pressure on Echo during the period between the general season and the Georgetown openings, Echo Lake has received a large plant of catchable-sized trout each year. Following a winter angling season on Echo Lake in 1959-60, complaints of poor fishing have increased.

Comparative catch data from surveys in 1955 and 1961 are presented in Table 10. The longnosed sucker population increased 33 per cent from 1955 to 1961. The average size of suckers captured increased by 1.8 inches. In addition to species recorded in Table 10, two brown trout and one

Table 10. SUMMARY OF CATCH DATA FROM ECHO LAKE, 1955 and 1961.

Year	Sets	Eb			Rb			F Su		
		No.	No./net	Ave.Lgt.	No.	No./net	Ave.Lgt.	No.	No./net	Ave.Lgt.
1955	6	6	1.0	8.8	74	12.3	8.9	78	13.0	8.9
1961	6	14	2.3	9.0	42	7.0	8.6	233	38.8	10.7

cutthroat were taken in 1955, and in 1961, one cutthroat was captured. Age and growth data are presented in Appendix B. Scale samples were not taken from rainbow trout captured in 1961, because all but three fish were planted only one month prior to survey.

These data indicate that Echo Lake's game fish population did not improve between 1955 and 1961, either in total or in comparison to rough fish. Therefore, the present rate of planting should be continued through 1963, even though Georgetown will now open with the general season. Echo Lake should be sampled again in 1963 to see if the expected decrease in early season pressure has had an effect on Echo Lake's trout population.

Kaiser - Survey data from this lake indicate that the present fish population is not providing a suitable fishery. Public access to this lake should be investigated and if found to be sufficient the lake should be rehabilitated and the beaver dam blocking the inlet stream should be removed. Cabin owner participation in keeping the inlet stream free should be solicited. Following rehabilitation, the lake should be replanted with 3,100, 2-inch, rainbow trout.

Meadow - Rainbow trout were the only species of fish collected during survey of this lake. The stream (Meadow Creek) which parallels the lake shore and which the lake outlet empties into, is known to contain cutthroat trout, however. Although the lake is only four feet deep, it apparently does not winter-kill severely. The lake may have a sufficient quantity of suitable spring water to carry it through periods of heavy snow cover.

A beaver dam impounds the water which forms the lake. This dam reportedly washed out four years prior to survey, and according to packers who frequent the area, the size of fish presently being caught is much smaller than normal. It has been recommended to the U.S.F.S. on whose land the lake is situated, that some form of stabilization be given the beaver dam to prevent a recurrence of the dam washout. It was also stressed in recommendations that the depth of the lake should not be increased during any dam manipulation.

Moose - Moose Lake is on the current planting program to receive 3,000, 2-inch, rainbow trout in 1962. Age and growth data show that these fish reach the average size of 8.4 inches at the time of the formation of the second annulus, which is an acceptable growth rate. No change is recommended in the present management of this lake.

Silver (Deerlodge County) - Silver Lake has been impounded to form a reservoir for the storage of industrial and municipal water supplies. The

lake is located within two miles of Georgetown Lake, which is managed extensively as a mixed rainbow and cutthroat trout fishery. Silver Lake is presently infested with a large population of longnosed suckers and contains relatively few game fish. Because of severe drawdowns, the proximity of a popular fishing lake, and the status of the present fish population, no change in management is recommended.

Stony Lake - An old, mine-water-supply dam on this lake is in poor condition and should be rebuilt or torn out. The dam is partially breached and does not impound water now. It does cause about a four-foot increase in water level during spring runoff. The U.S.F.S. has proposed rebuilding the dam for fish habitat improvement. This should increase productivity by eliminating the present four-foot fluctuation in water level and may increase overwinter survival by adding 10 feet to the lake's depth; therefore it is recommended that the Montana Fish and Game Department approve the U.S.F.S. project.

Survey data indicate that fish spawning areas are sufficient to maintain the fishery and that the age class composition of the population is satisfactory. All reports indicate that the lake is providing a sustained-yield fishery through natural means, therefore no planting is recommended.

Twin Lakes - Upper Twin Lake contains a population of relatively few large cutthroat trout, plus a small number of smaller cutthroat trout. Few of the large cutthroat are caught, but the lake provides an area of quality fishing for the angler who wishes to fish it. Lower Twin Lake has a population of smaller cutthroat, and because of the proximity of Lower to Upper Twin Lake, the two lakes provide fisheries for anglers who wish to try for a large fish, or those who desire to catch more, but smaller fish. For this reason, neither of the lakes require planting.

Prepared by Ralph W. Boland Approved by George D. Holton

Date May 15, 1962

Appendix A. NUMBERS OF FRY CAPTURED IN FLINT CREEK DOWNSTREAM-MIGRANT FRY TRAP, 1958, 60 AND 61.

Date	Numbers of Fry Captured 1958*	1960	1961	Date	1958*	1960	1961
July 2	--**	--	0	Aug. 1	139	--	--
3	--	--	0	2	181	7	--
4	--	--	0	3	380	9	--
5	--	--	0	4	--	11	--
6	--	--	0	5	--	0	--
7	--	--	0	6	--	0	0
8	--	--	0	7	114	1	0
9	--	--	0	8	--	0	0
10	--	--	0	9	--	1	0
11	--	--	0	10	--	1	0
12	--	--	0	11	--	1	0
13	--	--	0	12	10	4	0
14	--	100	35	13	27	1	0
15	--	158	9	14	--	0	0
16	--	161	--	15	--	0	0
17	--	351	--	16	20	0	0
18	--	41	--	17	--	0	0
19	--	700	--	18	--	0	0
20	--	313	0	19	25	0	--
21	--	131	--	20	--	0	--
22	--	10	--	21	--	0	--
23	--	22	--	22	--	0	--
24	--	45	--	23	--	1	--
25	60	26	--	24	--	0	--
26	--	--	--	25	--	0	--
27	27	--	--				
28	--	--	71				
29	--	--	12				
30	--	--	Molested				
31	--	--	31				

*Trap in operation for approximate 12 hours, overnight, periods in 1958.
In 1960 and 1961, trap operated for approximate 24 hr. periods.

**Dash designates trap not operated.

Appendix B. AGE AND GROWTH FOR ALL SPECIES, ALL WATERS SURVEYED*, 1961

Water	Sp.	Average Length in inches at annulus I	II	III	IV	V	VI
Streams:							
Boulder Cr.	Ct	3.5 (35)	6.3 (12)	9.9 (1)			
	Eb	2.2 (1)	5.6 (1)				
	LL	3.7 (1)	8.9 (1)				
	Dv	2.8 (34)	5.6 (17)				
Clark Fk. #6	Eb	3.5 (4)	6.5 (4)				
	LL	2.5 (3)	5.2 (3)	13.7 (1)			
Clark Fk. #9	LL	3.2 (15)	7.0 (11)	12.1 (1)			
Clark Fk. #10	LL	3.5 (19)	7.6 (8)	11.2 (2)			
	Ct	2.8 (10)	7.4 (5)	14.3 (1)			
	Wf	5.0 (4)					
Lost Horse Cr.	Ct	2.5 (11)	4.4 (9)	6.3 (4)	6.3 (1)		
	Eb	1.7 (3)	3.6 (3)				
	Dv	1.5 (1)	3.1 (1)				
Miller Cr.	Eb	3.1 (15)	6.3 (5)				
	Ct	3.0 (19)	5.0 (4)	7.4 (3)			
Twelvemile Cr.	Ct	2.4 (46)	4.6 (15)	6.2 (2)			
	Eb	2.9 (11)	5.0 (5)	7.4 (2)			
	Dv	2.3 (6)	4.2 (3)	6.4 (2)			
Lakes:							
Bowman (#2)	Ct	2.8 (24)	6.0 (26)	8.9 (25)			
	Rb	3.2 (11)	6.4 (11)	9.0 (9)	12.1 (2)		
Diamond	Eb	2.7 (75)	5.8 (75)	7.5 (11)			
Echo**	Eb	3.0 (13)	5.9 (13)	8.4 (3)	11.9 (1)	14.5 (1)	16.0 (1)
Inez	Ct	2.4 (5)	4.7 (5)	6.9 (5)	11.5 (5)	14.9 (3)	
	Dv	3.2 (6)	6.3 (6)	9.5 (5)	14.6 (1)		
	KOK	4.3 (2)	8.4 (2)	10.4 (2)			
	Wf	3.5 (25)	6.6 (25)	8.7 (23)	10.0 (18)	10.8 (7)	11.1 (1)
Kaiser	Ct	2.5 (5)	6.1 (5)	9.7 (5)			
	Dv	3.7 (1)	5.8 (1)	10.3 (1)	14.6 (1)	18.0 (1)	
Meadow	Rb	2.4 (17)	5.3 (17)	8.3 (14)	10.3 (7)	12.4 (4)	
Moose	Ct	3.6 (1)	5.5 (1)	9.4 (1)			
	Rb	2.3 (23)	8.4 (23)	12.1 (20)	14.9 (4)		
	Dv	2.8 (5)	5.8 (5)	9.7 (5)	14.0 (5)	19.3 (3)	23.4 (2)
	Eb	3.0 (3)	5.6 (3)	8.9 (1)			

Appendix B. (cont'd.)

Water	Sp.	Average Length in inches at annulus I	II	III	IV	V	VI
Salmon	Ct	2.9 (1)	5.7 (1)				
	LL	2.9 (6)	5.4 (6)	8.8 (6)	11.7 (5)	14.1 (3)	15.8 (2)
	Rb	2.8 (2)	6.8 (2)	10.4 (2)	14.5 (1)		
	Dv	3.0 (15)	5.9 (15)	9.2 (14)	12.5 (10)	17.3 (1)	
	KOK	4.1 (16)	8.8 (6)				
	Wf	3.2 (33)	6.6 (32)	9.4 (29)	10.5 (15)	11.7 (7)	13.0 (3)
Silver (19N,31W,32)	Eb	2.8 (28)	6.0 (27)	7.4 (4)			
Silver (5N,13W,21)	Rb	2.6 (2)	7.1 (2)	10.4 (1)			
	Dv	2.8 (1)	5.5 (1)	9.7 (1)			
	KOK	4.3 (1)	8.4 (1)				
	Eb	2.0 (1)	3.7 (1)	6.4 (1)	8.5 (1)		
Stony	Ct	2.3 (14)	5.7 (14)	8.6 (14)	10.6 (9)	14.9 (1)	
Twin (Lower)	Ct	2.9 (7)	6.4 (7)	9.8 (6)	12.4 (2)		
Twin (Upper)	Ct	3.4 (16)	6.6 (12)	10.8 (11)	15.0 (11)	18.0 (5)	

*Age and growth data not obtained from Ninemile Creek, Flint Creek, or East Fork Reservoir.
**One fish reached 17.4 inches at annulus VII.