High Lake Survey Report

1965

Eagle Cap Wilderness Area-Wallowa County

Ken Witty

Table of Contents

Name	Page
Crescent Lake	1-6
Lee Lake	7-12
Douglas Lake	13-18
Horseshoe Lake	19-24
Unit Lake	25-30
Razz Lake	31-36
Glacier Lake	37-42
Mirror Lake	43-48
Moccasin Lake	49-54
Ice Lake	55-60
Billy Jones Lake	61-65

Oregon State Game Commission
Fishery Division

HIGH LAKE SURVEY REPORT

Date July 24, 1965

Name of Lake Crescent Lake — Elevation (feet) 7,440

County Wallowa — T. 4S R. 44E Sec. 23

Area Eagle Cap Wilderness — IBM No. 08060-0-0-000

Maximum Depth (feet) 21 feet — Watershed No. 8

Surface acres: 23.8

Acre-feet: 200

General

Crescent Lake is noted for large brook trout to 16 inches and over in total length. Angling is generally good. However, on some days, especially in August, angling may be very slow. Crescent Lake is quite rich in fish food which accounts for the large fish. The area of the lake over 12 feet in depth is quite small. Winter kill should be slight because of springs below the surface of the water.

Accessibility

Crescent Lake is slightly over 11 miles by trail south of Wallowa Lake. Trail 1820 begins at the P.P.L. power generator south of Wallowa Lake. Trail 1821 branches from Trail 1820 six miles south of Wallowa Lake. The trails are maintained annually. There should be no problem in locating the lake. The trail is generally free of snow by July 15. There are three crude rafts on the lake. A foot trail extends around the lake for angler access.

Improvements

There are no man-made improvements near Crescent Lake. There are three primitive camping sites located on the northeast shore, southeast shore, and the southwest shore. The camping sites show heavy use, and there are times when all three sites are being used.

Character of Lake Basin

The lake is surrounded on three sides by alpine-type coniferous trees including whitebark pine, alpine fir, lodgepole pine, and Engelman spruce. The understory is dominated by huckleberry shrubs. The north basin side is a large granite ridge with scattered dying trees. There is a meadow in the northeast area of the basin. Because of numerous springs in the meadow and the small size, there is limited grazing areas for horses. The lake bottom has several rock rims which causes an irregular formation. The bottom is covered with muck except for the spring areas.

Tributaries

The entire north shore has small springs which run into the lake. There is a total of 30 square yards of good spawning gravel in the spring streams. The temperature in these streams varies from 56°F. to 70°F. There are four sub-surface spring areas in the west and north shore areas.

The outlet flows approximately 2 cfs. and has a temperature of 64°F. when the air temperature was 62°F. Logs and debris form a barrier to the outlet 50 feet below the lake.

Reproduction

The 30 square yards of good spawning gravel in the tributary streams plus an additional 13 square yards of good spawning gravel in the spring areas in the lake is ideal for the natural reproduction of brook trout. Numerous one-inch brook trout fry were observed in the tributary streams at the time of the survey. It appears that the natural reproduction of brook trout is sufficient to maintain a good fishery in Crescent Lake.

Fluctuation

On extremely dry years, it is possible that the springs would not flow, and the lake may fluctuate one foot or more. Even on wet years, many of the springs dry by the latter part of August.

Water Temperatures

		pH	Alkalinity Carbonate ppm	Alkalinity Bicarbonate ppm	TDS
Lake temperature:	Surface - 61°F.	6.6	0.0	5.0	56
	3 feet - 60°F.				
	5 feet - 59°F.				
	7 feet - 59°F.				
	9 feet - 58°F.				
	11 feet - 57°F.				
	13 feet - 52°F.				
	15 feet - 52°F.				
	17 feet - 51°F.				
	19 feet - 50°F.				
	21 feet - 50°F.				

Air temperature: 62°F.

Fish Population

The fish population, under present management practices, appears to be supporting a good fishery for larger brook trout at Crescent Lake.

One gill net, fishing 10 hours, caught 14 brook trout.

Composition and Length Frequency of Catch by Gill Nets Represented in One-Inch Size Groups

Date July 25, 1965

Species	Number Collected	Percentage of Total	Percentage in One-Inch Size Groups *										
			5	6	7	8	9	10	11	12	13	14	15
Brook Trout	14	100.0		1		1	2	5	2	3			

* Fork length measurement

Maturity

The maturity for each female fish in the gill net sample was recorded as immature, maturing, or mature. One gill net caught 10 female fish.

Numbers, Average Lengths, and Percentages of Female Specimens Occurring in Three Stages of Maturity

Date July 25, 1965

Species	Stage of Maturity	Number of Females	Average Length		Percentage of Total
			Centimeters	Inches	
Brook Trout	Maturing	2	21.8	8.6	20.0
	Mature	8	28.4	11.2	80.0

Condition of Fish

Condition: All the fish appeared to be in excellent body condition with the head size in proportion with the body size.

Parasites: Eight percent of the fish contained adult tapeworms and 35 percent contained one tapeworm cyst. Considering the age of the majority of the fish sample, the fish were lightly infected with tapeworms.

Stomach Analysis: Grasshopper adults and Diptera Larvae

Stocking Record

The original stock or date of stocking of brook trout into Crescent Lake is unknown. There is one recorded stocking of brook trout in 1945.

Year	Species	Number	Size (inches)	Date	Hatchery	Remarks
1945	Brook Trout	5,360	0 - 2	-	-	-

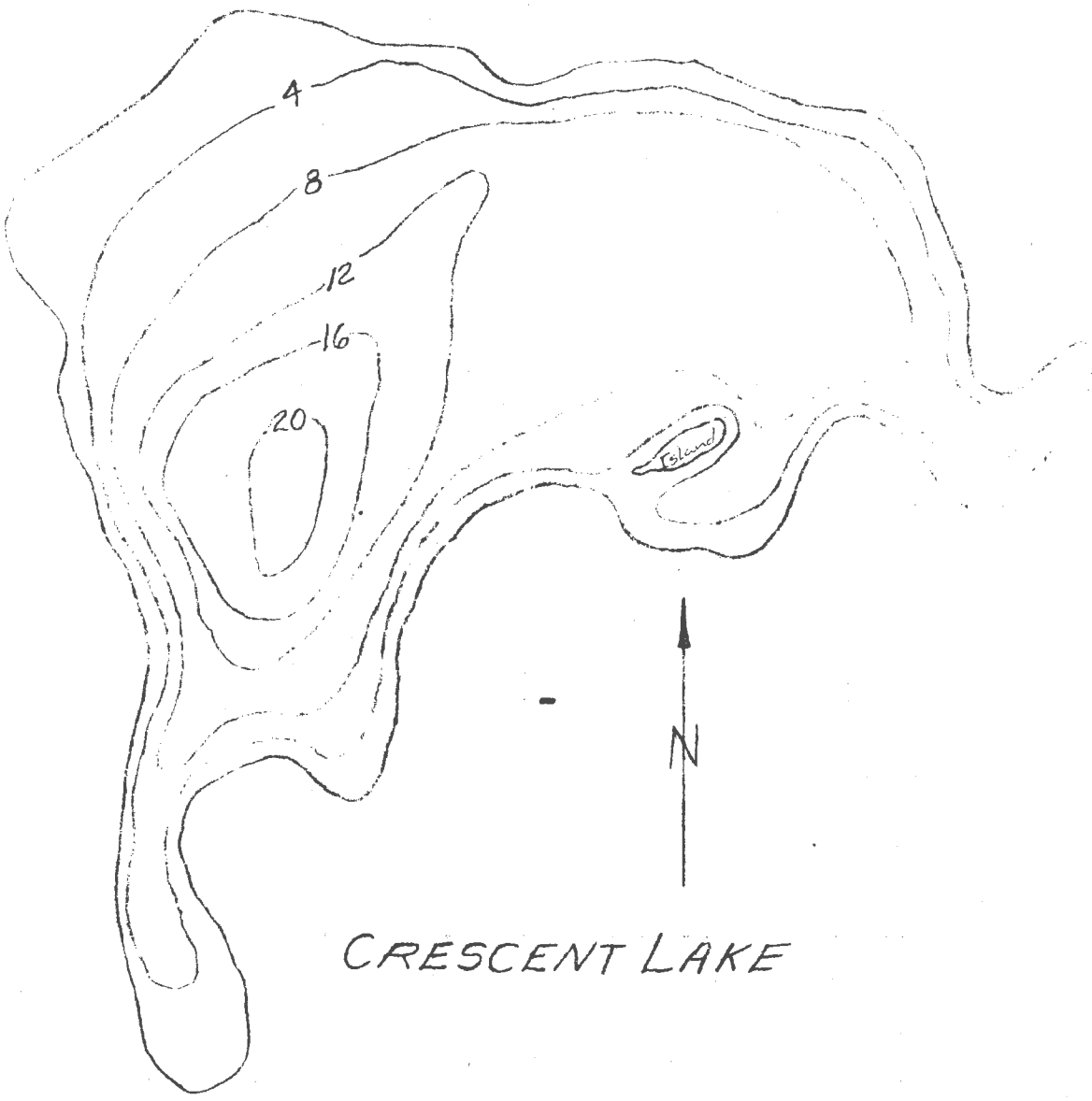
Recommendations

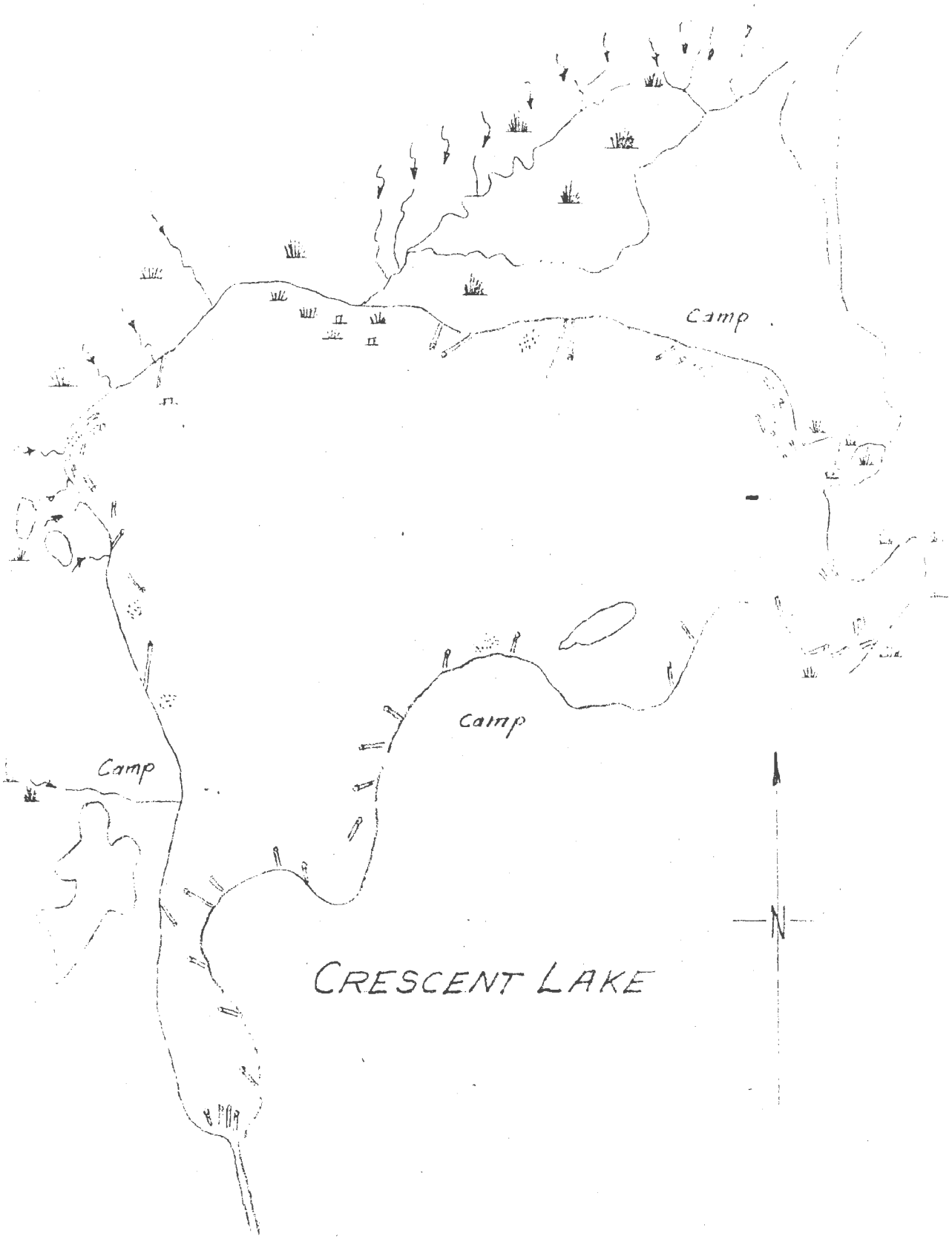
Because of the natural spawning area available and the apparent success of the natural reproduction, it is recommended that no stocking program be scheduled. It is recommended that fish samples be taken once every third year to check the abundance and condition of the fish.

It is also believed that Crescent Lake should be managed to provide large brook trout rather than greater numbers of smaller trout to the angler.

Name Origin

Named for its shape in 1929 by George M. Rogers.


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16
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Island
N
CRESCENT LAKE


Camp
Camp
Camp
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CRESCENT LAKE

Form 354
Page 1
Rev. 5/66

OREGON STATE GAME COMMISSION
FISHERY DIVISION

HIGH LAKE SURVEY REPORT

Date July 25, 1965

Name of Lake Lee Lake
Elevation (feet) 7,200
County Wallowa
T. 4S R. 44E Sec. 24-35
Area Eagle Cap Wilderness
IBM No. 0884-0-0-000
Maximum Depth (feet) 80 feet
Watershed No. 8
Surface acres: 9.2
Acre-feet: 368

General

Lee Lake, located near the center of the Lake Basin, is a deep lake considering its small size. Although access is easy, it is not a popular lake with the angler. The brook trout are small, and the lake is hard to fish because of limited shallow areas. There are unlimited amounts of spawning gravel in the outlet which maintains the natural reproduction of brook trout in the lake.

Accessibility

Lee Lake is located 10 miles by trail south of Wallowa Lake. Trail 1820 begins at the power generator south of Wallowa Lake. Trail 1821 branches west from Trail 1820 six miles south of Wallowa Lake. The trails are maintained annually. There should be no problem in locating Lee Lake. The trail is generally free of snow by July 1. Trail 1821 goes only a short distance along the northeast shore of the lake. There is a foot trail along the north portion of the shore for angler access.

Improvements

There are no man-made improvements, and there are no primitive camping sites at Lee Lake. Most anglers camp at Horseshoe or Douglas Lakes.

Character of Lake Basin

Rim rocks, both around the lake and in the lake bottom, are the dominating feature. There are scattered alpine-type conifer trees. There is one small meadow near a secondary water outlet in the northeast corner of the lake. The lake bottom is covered with muck.

Tributaries

The inlet is located on the west shore, flowed 4 cfs., and was 58°F. at the time of the survey. The inlet contained 10 square yards of good spawning gravel in the stream and at the mouth of the stream. The creek is blocked by a falls a short distance from the lake. The outlet is tied with Horseshoe Lake, flowed approximately 4 cfs., and was 58°F. at the time of the survey. The outlet contains much good spawning gravel.

Reproduction

There is spawning gravel in the outlet, and the natural reproduction in the outlet of Lee Lake would be more than enough to supply fish for both Lee and Horseshoe Lakes. Small one-inch brook trout fry were observed in the inlet and outlet of Lee Lake.

Fluctuation

The lake level had dropped one foot at the time of the survey, July 26.

Water Temperatures

			Alkalinity		
		pH	Carbonate ppm	Bicarbonate ppm	TDS
Lake temperature:	Surface - 57°F.	6.6	0.0	4.0	47
	5 feet - 54°F.				
	10 feet - 51°F.				
	15 feet - 45°F.				
	20 feet - 42°F.				
	25 feet - 39°F.				
	30 feet - 39°F.				
	35 feet - 39°F.				
	40 feet - 38°F.				
	45 feet - 38°F.				
	50 feet - 38°F.				
	55 feet - 38°F.				
	60 feet - 38°F.				
	65 feet - 38°F.				
	70 feet - 38°F.				
Air temperature:	61°F.				

Fish Population

The fish population, under the present management practices, appears to support a large population of small brook trout.

Two gill nets, fishing 13 hours, caught 32 brook trout.

Composition and Length Frequency of Catch by Gill Nets Represented in One-Inch Size Groups

Date July 26, 1965

Species	Number Collected	Percentage of Total	Percentage in One-Inch Size Groups *										
			4	5	6	7	8	9	10	11	12	13	14	15
Brook Trout	32	100.0	1	1	13	10	1	6						

* Fork length measurement

Maturity

The maturity for each female fish in the gill net sample was recorded as immature, maturing, or mature. Two gill nets caught 13 female brook trout.

Numbers, Average Lengths, and Percentages of Female Specimens Occurring in Three Stages of Maturity

Date July 26, 1965

Species	Stage of Maturity	Number of Females	Average Length * Centimeters	Average Length * Inches	Percentage of Total
Brook Trout	Maturing	8	16.7	6.6	61.5
	Mature	5	20.8	8.2	38.5

* Fork length measurement

Condition of Fish

Condition: Most of the fish, especially males, had large heads for the size of the fish body.

Parasites: Nine percent of the fish had adult tapeworms, 3 percent had several tapeworm larvae, and 35 percent contained one tapeworm cyst.

Stomach Analysis: Segmented worms, grasshopper adults, ants, Diptera larvae.

Stocking Record

There are no stocking records for Lee Lake. The number and date of the original stock of brook trout into Lee Lake is unknown.

Recommendations

Lee Lake is not a popular lake with the anglers. There are several bodies of water close to Lee Lake which have better angling, places to camp, and larger fish. It may be possible to block the outlet with natural material which would restrict natural reproduction fish from entering Lee Lake. However, with the limited rearing area in the lake, the 10 square yards of spawning gravel in the inlet may be more than enough to populate Lee Lake with brook trout.

It is recommended that no stocking program be initiated. It is also recommended that a sample of fish be taken once every third year to check the abundance and condition of the fish.

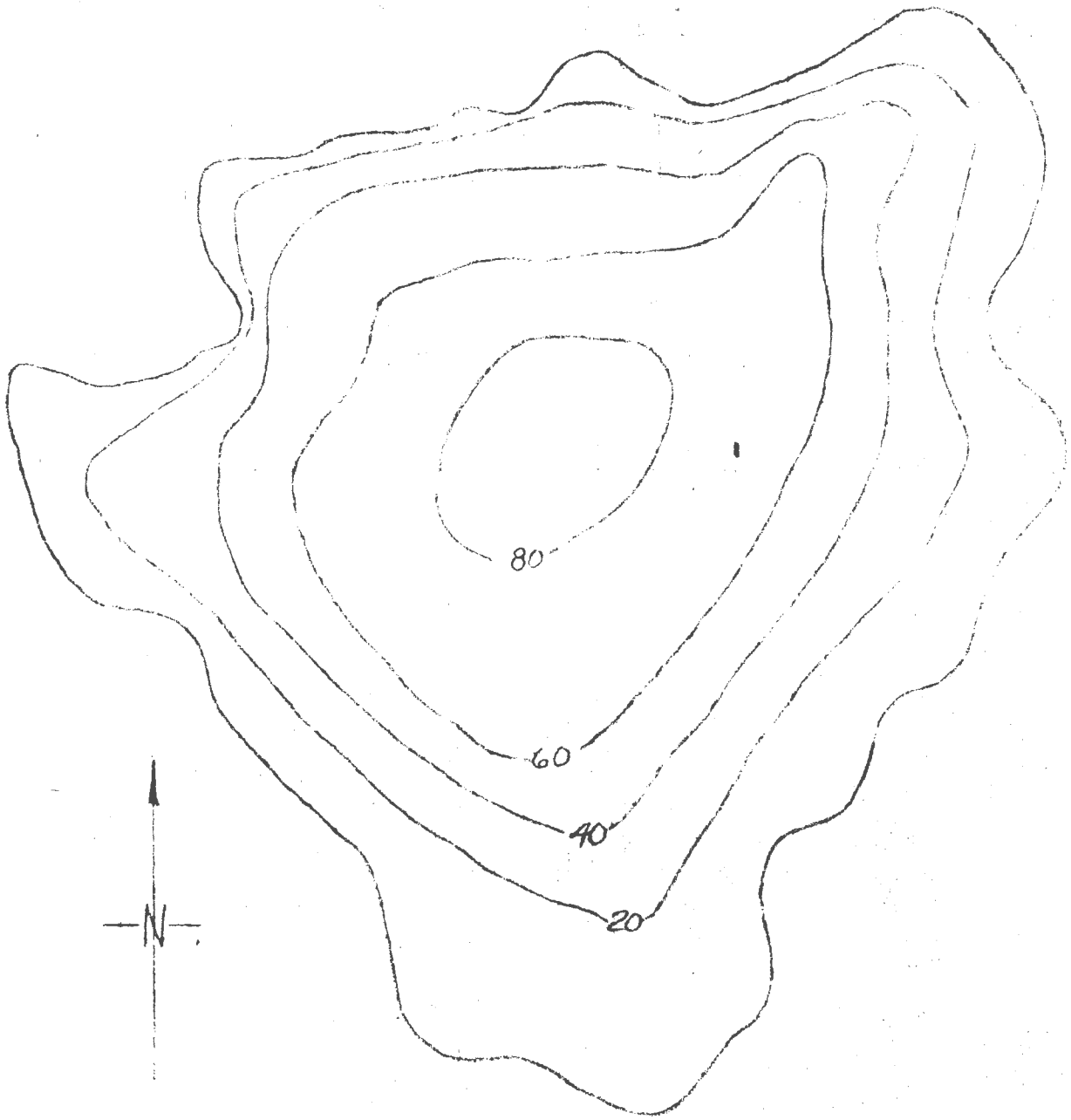
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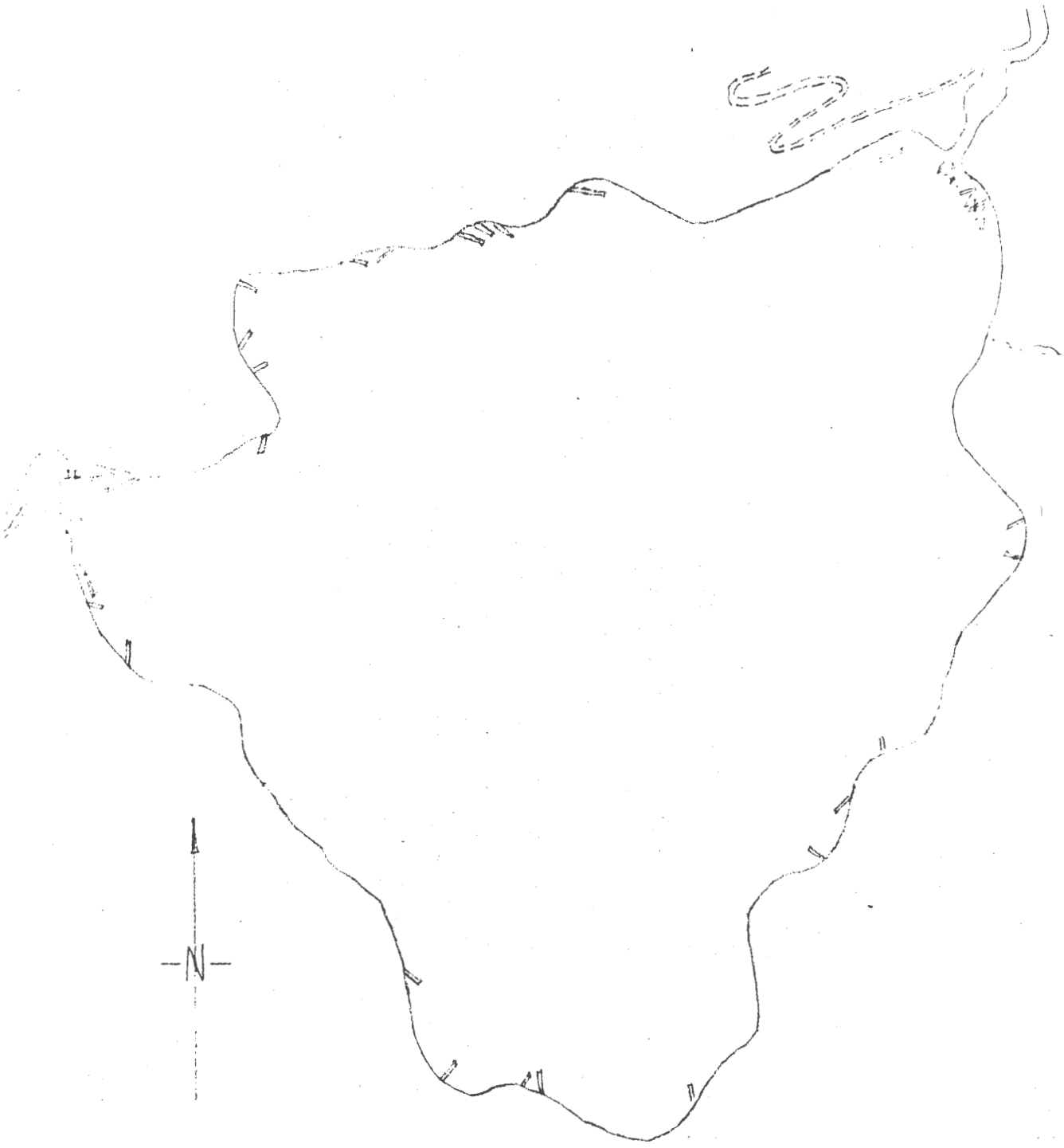
Recommendations

Lee Lake is not a popular lake with the anglers. There are several bodies of water close to Lee Lake which have better angling, places to camp, and larger fish. It may be possible to block the outlet with natural material which would restrict natural reproduction fish from entering Lee Lake. However, with the limited rearing area in the lake, the 10 square yards of spawning gravel in the inlet may be more than enough to populate Lee Lake with brook trout.

It is recommended that no stocking program be initiated. It is also recommended that a sample of fish be taken once every third year to check the abundance and condition of the fish.



LEE LAKE



LEE LAKE

Form 354
Page 1
Rev. 5/66

Oregon State Game Commission
Fishery Division

HIGH LAKE SURVEY REPORT

Date July 26, 1965

Name of Lake Douglas Lake
Elevation (feet) 7,350
County Wallowa
T. 4S R. 44E Sec. 25-34
Area Eagle Cap Wilderness
IBM No. 08265-0-0-000
Maximum Depth (feet) 80 feet
Watershed No. 8
Surface acres: 43.9
Acre-feet: 1,353

General

Douglas Lake, located near the center of the Lake Basin, is the largest lake in the Lake Basin. Although access is easy, Douglas Lake is not fished to any great extent. The fish are small, and there does not appear to be any larger brook trout in the lake. There are not many camping sites around the lake, and the meadow area is limited.

Accessibility

Douglas Lake, located 10½ miles by trail south of Wallowa Lake, can be reached by Trails 1820 and 1821 up the west fork of the Wallowa River, up Lake Creek, and into the Lake Basin. Trail 1821 goes on the north side and Trail 1820 goes along the south shore of Douglas Lake. The trails are generally free of snow by July 1, and the trails are maintained annually.

Improvements

There is one camp ground with toilet facilities on the east shore, and there are two primitive camping sites on the east and southeast shore.

Character of Lake Basin

The dominating feature is rim rock covered with alpine-type trees including whitebark pine, alpine fir, lodgepole pine, and spruce. The understory consists of huckleberry shrubs. The lake bottom has several rock rims which causes an irregular formation. There is a very small amount of meadow area close to the lake. The lake bottom is covered with muck.

Tributaries: There are seven tributaries. The tributary from Crescent Lake carries 3 cfs., was 50°F. at the time of the survey, and contained 20 square yards of spawning gravel. The tributary stream from Craig Lake to the north flows one-eighth cfs, was 63°F. at the time of the survey, and contained one yard of spawning gravel. Another creek flowing one-fourth cfs. from springs enters from the north. The creek contained 38 square yards of gravel and was 65°F. at the time of the survey. Two streams enter from the south. They had a total flow of 1 cfs, contained 7 square yards of spawning gravel, and the water temperature was 46°F. A small stream, flowing one-fourth cfs., enters from the southwest. It had 4 yards of spawning gravel and the water temperature was 36°F. at the time of the survey.

(over)

Reproduction

There is a total of 81 square yards of available spawning gravel in the tributary streams, and 19 square yards of spawning gravel in Douglas Lake. It appears that the natural reproduction of brook trout is more than enough to supply fish for Douglas Lake. Small brook trout fry were observed in all the tributaries, and old redds were observed in the lake spawning areas.

Fluctuation

There does not appear to be any fluctuation of the lake level.

Water Temperatures

			Alkalinity		
		pH	Carbonate ppm	Bicarbonate ppm	TDS
Lake temperature:	Surface - 56°F.	7.1	0.0	2.0	58
	5 feet - 52°F.				
	10 feet - 50°F.				
	15 feet - 47°F.				
	20 feet - 43°F.				
	25 feet - 41°F.				
	30 feet - 40°F.				
	35 feet - 39°F.				
	40 feet - 39°F.				
	45 feet - 38°F.				
	50 feet - 38°F.				
	55 feet - 38°F.				
	60 feet - 37°F.				
	65 feet - 37°F.				
	70 feet - 37°F.				
Air temperature:	60°F.				

Fish Population

The fish population, under present management practices, appears to be supporting a fair fishery for small brook trout at Douglas Lake.

Two gill nets, fishing 11 hours, caught 73 brook trout.

Composition and Length Frequency of Catch by Gill Nets Represented in One-Inch Size Groups

Date July 26, 1965

Species	Number Collected	Percentage of Total	Percentage in One-Inch Size Groups *										
			5	6	7	8	9	10	11	12	13	14	15
Brook Trout	73	100.0	1	18	26	18	10						

* Fork length measurement

Maturity

The maturity for each female fish in the gill net sample was recorded as immature, maturing, or mature. Two gill nets caught 34 female brook trout at Douglas Lake.

Numbers, Average Lengths, and Percentages of Female Specimens Occurring in Three Stages of Maturity

Date July 26, 1965

Species	Stage of Maturity	Number of Females	Average Length *		Percentage of Total
			Centimeters	Inches	
Brook Trout	Maturing	18	18.0	7.1	52.9
	Mature	16	21.1	8.3	47.1

* Fork length measurement

Condition of Fish

Condition: Most of the fish, expecially males, had large heads for the size of the fish body.

Parasites: Twenty-three percent of the fish were infected with adult tapeworms, 15 percent contained several tapeworm larvae, and 22 percent were infected with one tapeworm cyst.

Stomach Analysis: Grasshopper adults, ants, segmented worms, mayfly larvae, and Diptera larvae. Grasshoppers were found in all the stomach samples.

Stocking Record

There is one stocking record of fish being released in 1945. The original stock and date of stocking of brook trout into Douglas Lake is unknown.

Year	Species	Number	Size (inches)	Date	Hatchery	Remarks
1945	Brook Trout	5,344	2 - 4	-	-	-

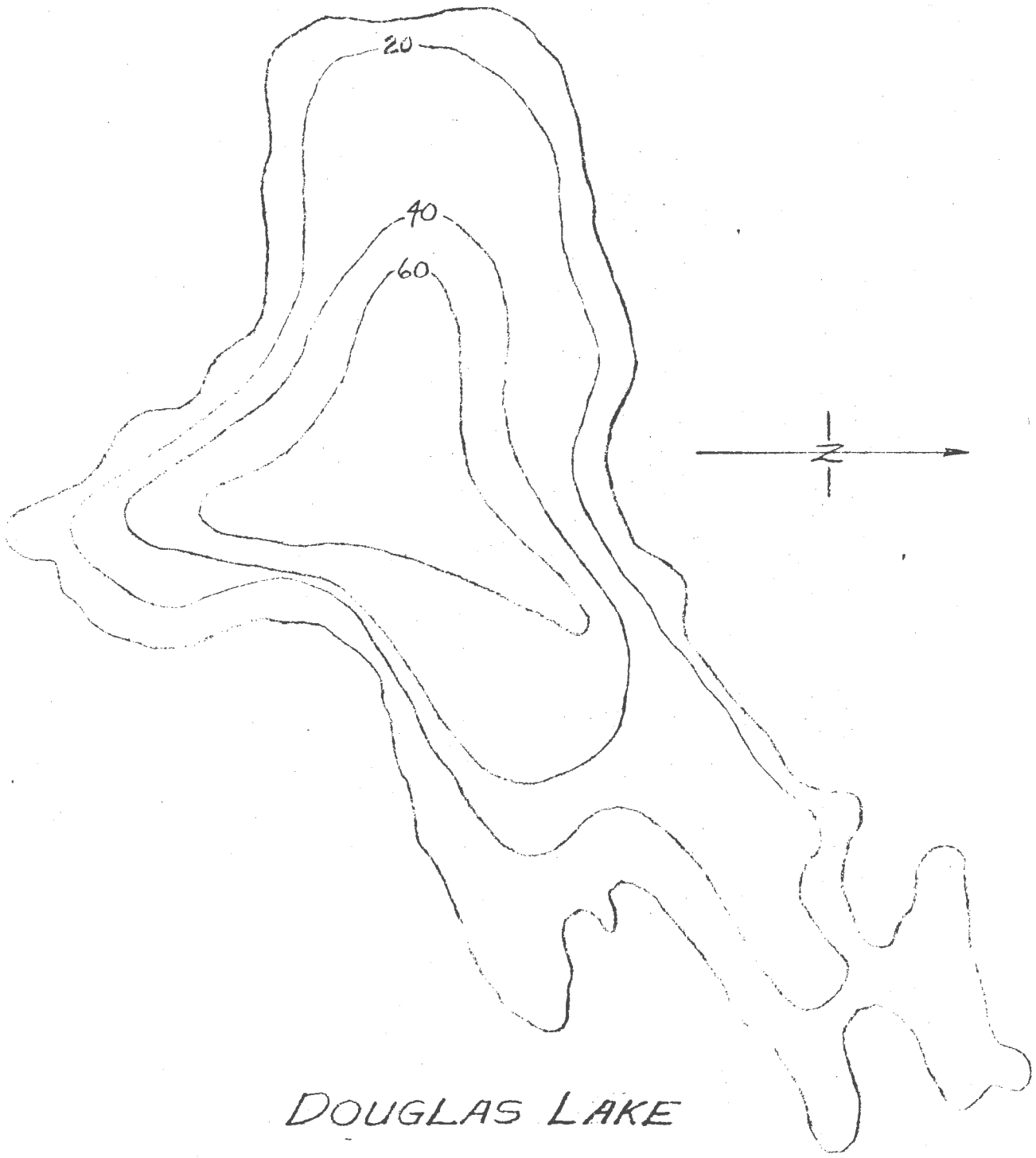
Recommendations

Because of the abundant supply of spawning gravel and a limited supply of fish food life, natural reproduction of brook trout has over-populated Douglas Lake. The result has been a reduction of the length in the fish and an increase in total numbers of fish.

It is recommended that the 30 fish bag limit be maintained on Douglas Lake to attract anglers. It is also recommended that fish samples be taken once every third year to check the abundance and condition of the fish. More creel check information is needed to determine angler success and angler satisfaction with the fishery.

Name Origin

Named for Mrs. Harvey Harris (maiden name Lora Douglass Cramer) who admired it a great deal when on a trip with her husband, who was a Forest Ranger at the time.



DOUGLAS LAKE

Oregon State Game Commission
Fishery Division

HIGH LAKE SURVEY REPORT

Name of Lake Horseshoe Lake
County Wallowa
Area Eagle Cap Wilderness
Maximum Depth (feet) 73 feet
Surface acres: 39.6
Acre-feet: 1122

Date July 28, 1965
Elevation (feet) 7,180
T. 4S R. 44E Sec. 24
IBM No. 08078-0-0-000
Watershed No. 8

General

Horseshoe Lake receives heavy angling pressure. It could be described as the hub of activity in the Lake Basin. Because of a considerable amount of spawning gravel, fish drifting in from other lakes, and the relative deepness of the lake with a limited amount of shallow areas, Horseshoe Lake has an abundant supply of small brook trout. Even with considerable angling pressure and a 30 fish bag limit, the average size of the fish remains small.

Accessibility

Horseshoe Lake is approximately 9 miles south of Wallowa Lake. Trail 1820 begins at the P.P.L. power generator south of Wallowa Lake. Trail 1821 branches west from Trail 1820 six miles south of Wallowa Lake. The trails are maintained annually. There should be no problem in locating Horseshoe Lake. The trail is generally free of snow by July 1. Trail 1821 goes around the east and north shores. There is generally at least one raft on the lake.

Improvements

There are three units of two outhouse type restrooms on the north shore. Each of these areas also has a maintained camping site. In addition, there is one primitive camp site on the east shore. There is one horse hitch post on the north shore. All camping sites show heavy use, and at times, all the camping locations are full.

Character of Lake Basin

The lake is surrounded by alpine-type coniferous trees. There are meadow areas on the north shore which offer horse grazing. However, heavy use often limits the available grass after August. The lake bottom consists of rim rocks which accounts for steep sides and an irregular lake bottom. The lake bottom is covered with muck.

Tributaries

There are two major incoming tributaries on the west and north shores. The west tributary flows from Lee Lake, has a flow of 5 to 10 cfs., has 110 square yards of good spawning gravel, and had a water temperature of 60°F. at the time of the survey. The north tributary flows from Razz Lake, has a flow of 5 cfs., has 78 square yards of spawning gravel below a falls, and had a water temperature of 56°F. at the time of the survey. The outlet on the southeast shore had a flow of 8 cfs., 43 square yards of spawning gravel, and was 58°F. at the time of the survey.

Reproduction

The 231 square yards of good spawning gravel in the tributary streams plus 2 yards of gravel in the lake is more than enough spawning area for natural reproduction to maintain a fishery. Fish from other lakes can also drift into Horseshoe Lake. Many one-inch brook trout fry were observed in the streams and in the lake.

Fluctuation

There is no fluctuation of the lake water surface.

Water Temperatures

		pH	Alkalinity Carbonate ppm	Alkalinity Bicarbonate ppm	TDS
Lake temperature:	Surface - 56°F.	6.6	0.0	3.5	42
	5 feet - 53°F.				
	10 feet - 50°F.				
	15 feet - 48°F.				
	20 feet - 45°F.				
	25 feet - 43°F.				
	30 feet - 40°F.				
	35 feet - 39°F.				
	40 feet - 38°F.				
	45 feet - 38°F.				
	50 feet - 38°F.				
	55 feet - 38°F.				
	60 feet - 38°F.				
	65 feet - 38°F.				
	70 feet - 38°F.				
	75 feet - 38°F.				
	80 feet - 38°F.				

Air temperature: 67°F.

Fish Population

The fish population, under present management practices, appears to be supporting a good fishery for small brook trout at Horseshoe Lake.

Two gill nets, fishing 14 hours, caught 57 brook trout.

Composition and Length Frequency of Catch by Gill Nets Represented in One-Inch Size Groups

Date July 28, 1965

Species	Number Collected	Percentage of Total	Percentage in One-Inch Size Groups * 5	6	7	8	9	10	11	12	13	14	15
Brook Trout	57	100.0	1	20	16	6	13	1					

* Fork length measurement

Maturity

The maturity for each female fish in the gill net sample was recorded as immature, maturing, or mature. Two gill nets caught 31 female brook trout.

Numbers, Average Lengths, and Percentages of Female Specimens Occurring in Three Stages of Maturity

Date July 28, 1965

Species	Stage of Maturity	Number of Females	Average Length * Centimeters	Average Length * Inches	Percentage of Total
Brook Trout	Maturing	21	18.3	7.2	67.7
	Mature	10	21.8	8.6	32.3

* Fork length measurement

Condition of Fish

Condition: Most of the fish, especially males, had large heads for the size of the fish body.

Parasites: Eleven percent of the fish had adult tapeworms, 2 percent had several tapeworm larvae, and 12 percent of the fish contained one tapeworm cyst.

Stomach Analysis: Segmented worms, ants, grasshopper adults, mayfly larvae, Diptera larvae, and Coleoptera larvae.

Stocking Record

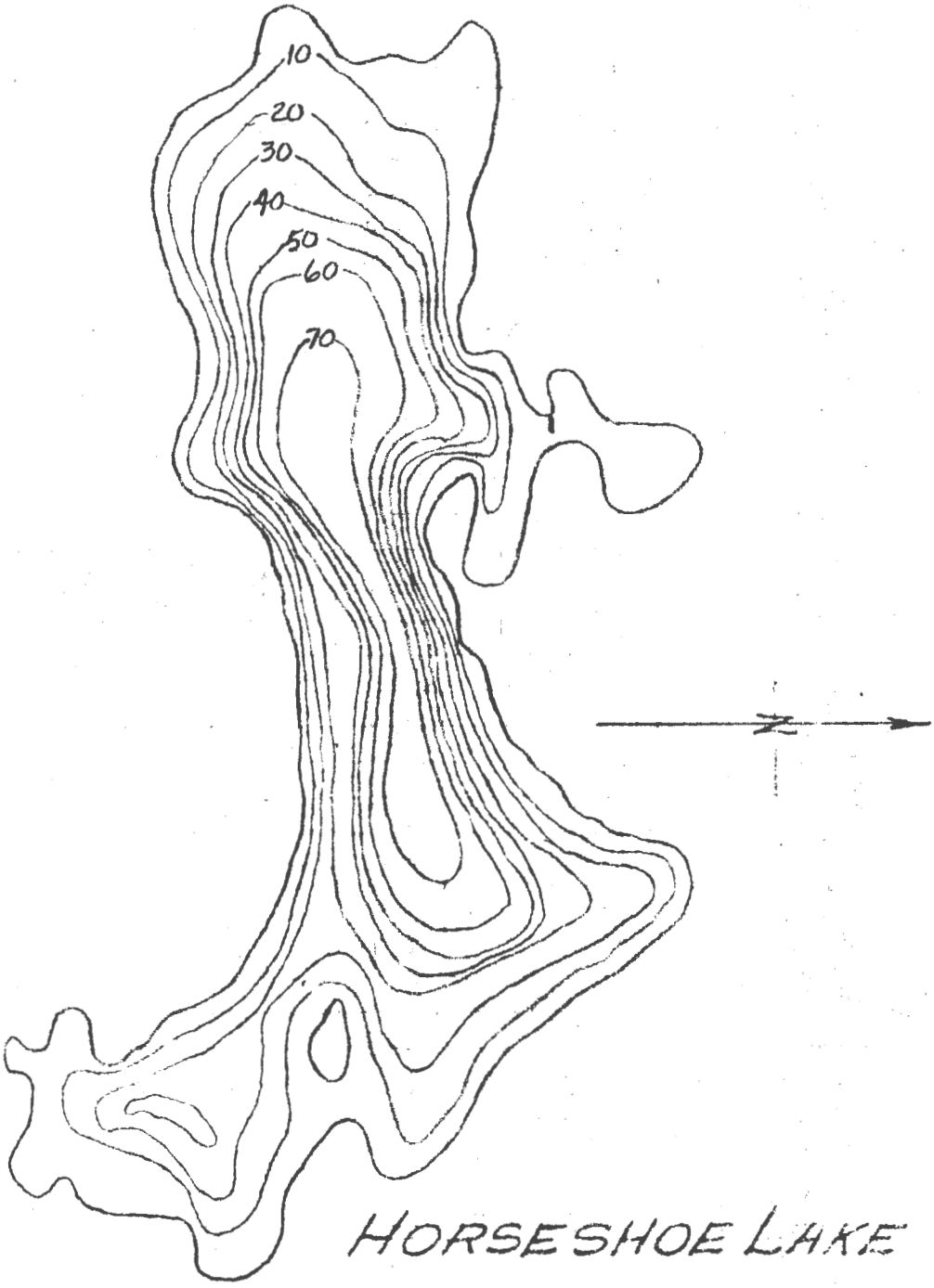
There is no record of fish being stocked in Horseshoe Lake.

Recommendations

Because of natural spawning areas available and the apparent success of natural reproduction, it is recommended that no stocking program be outlined for Horseshoe Lake. It is recommended that fish samples be taken once every third year to check the abundance and condition of the fish.

Name Origin

Named for its resemblance to a horse shoe from a point on Lookout Mountain.


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HORSESHOE LAKE

Form 354
Page 1
Rev. 5/66

Oregon State Game Commission
Fishery Division

HIGH LAKE SURVEY REPORT

Date August 3, 1965

Name of Lake Unit Lake

Elevation (feet) 7,040

County Wallowa

T. 4S R. 45E Sec. 19

Area Eagle Cap Wilderness

IBM No. 08 0102-0-0-000

Maximum Depth (feet) 31 feet

Watershed No. 8

Surface acres: 14.9

Acre-feet: 256

General

Unit Lake is located in the Lake Basin, and the fishing pressure is classed as moderate to heavy. The lake is one of the first lakes in the Lake Basin to become free of ice in the spring. Unit Lake is quite rich in fish food life as compared to many lakes in the Wallowa Mountains. The depth of Unit Lake is nearly ideal for the production of salmonids.

Accessibility

Unit Lake can be reached by Trail 1820 which begins at the P.P.L. power generator south of Wallowa Lake. Trail 1821 branches from Trail 1820 six miles south of Wallowa Lake and travels three miles to Horseshoe Lake and other lakes in the Lake Basin. Unit Lake is approximately one mile by trail northeast of Horseshoe Lake. The route is well signed, and there is no problem of becoming lost. The trails are maintained annually. There is a foot trail along the northwest shore of the lake for fishing access.

Improvements

There are no man-made improvements near Unit Lake. However, there are three primitive camping areas established on the north and east shores of the lake.

Character of Lake Basin

The lake is surrounded by alpine-type coniferous timber. There are rock bluffs around portions of Unit Lake. Several small meadows are present on the east side of the lake. These meadows offer limited horse grazing. Lily plants are present around the lake shore.

Tributaries

A small stream enters the lake in the northwest corner of the shore. The stream was carrying one-half cfs. of water, and the water was 47°F. at the time of the survey.

Another small stream enters at the northeast corner of the lake. This stream was flowing one-half cfs. of water and was 48°F. at the time of the survey.

The outlet leaves Unit Lake on the east shore. The flow of the outlet was one cfs. and the water temperature was 62°F. when the air was 60°F.

Reproduction

The inflowing stream on the northwest shore contained one yard of available spawning gravel. The stream was blocked with debris three yards above the mouth. Small brook trout were observed in the stream.

The inflowing creek on the northeast shore contained 18 square yards of good gravel. Many small fish were observed in the stream.

The outlet contained three yards of gravel, and fish were numerous.

Fluctuation

There was no evidence of fluctuation in the lake water level.

Water Temperatures

			Alkalinity		
		pH	Carbonate ppm	Bicarbonate ppm	TDS
Lake temperature:	Surface - 60°F. 5 feet - 59°F. 10 feet - 54°F. 15 feet - 49°F. 20 feet - 45°F. 25 feet - 43°F. 30 feet - 40°F.	7.0	0.0	7.5	60

Air temperature - 60°F.

Fish Population

The fish population, under the present management program, appears to be supporting a good fishery for the anglers at Unit Lake.

Two gill nets, fishing 14 hours, caught 28 fish.

Composition and Length Frequency of Catch by Gill Nets Represented in One-Inch Size Groups

Date August 4, 1965

Species	Number Collected	Percentage of Total	Percentage in One-Inch Size Groups *										
			5	6	7	8	9	10	11	12	13	14	15
Brook Trout	25	89.7	1	11	8	5	1						
Rainbow	3	10.3					1	1	1				

* Fork length measurement

Maturity

The maturity for each female fish in the gill net sample was recorded as immature, maturing, or mature. Two gill nets caught 14 female fish which were classified as described.

Numbers, Average Lengths, and Percentages of Female Specimens Occurring in Three Stages of Maturity

Date August 4, 1965

Species	Stage of Maturity	Number of Females	Average Length * Centimeters	Average Length * Inches	Percentage of Total
Brook Trout	Maturing	11	18.3	7.2	91.6
	Mature	1	20.6	8.1	8.4
Rainbow	Maturing	2	28.0	11.0	100.0

* Fork length measurement

Condition of Fish

Condition: All the fish appeared to be in good body condition with the fish head size in proportion with the body size.

Parasites: Seventeen percent of the fish contained adult tapeworms, 7 percent contained several larvae tapeworms, and 7 percent contained one larvae tapeworm.

Stomach Analysis: Diptera larvae, Odonata larvae, Coleoptera adults, and small fish

Stocking Record

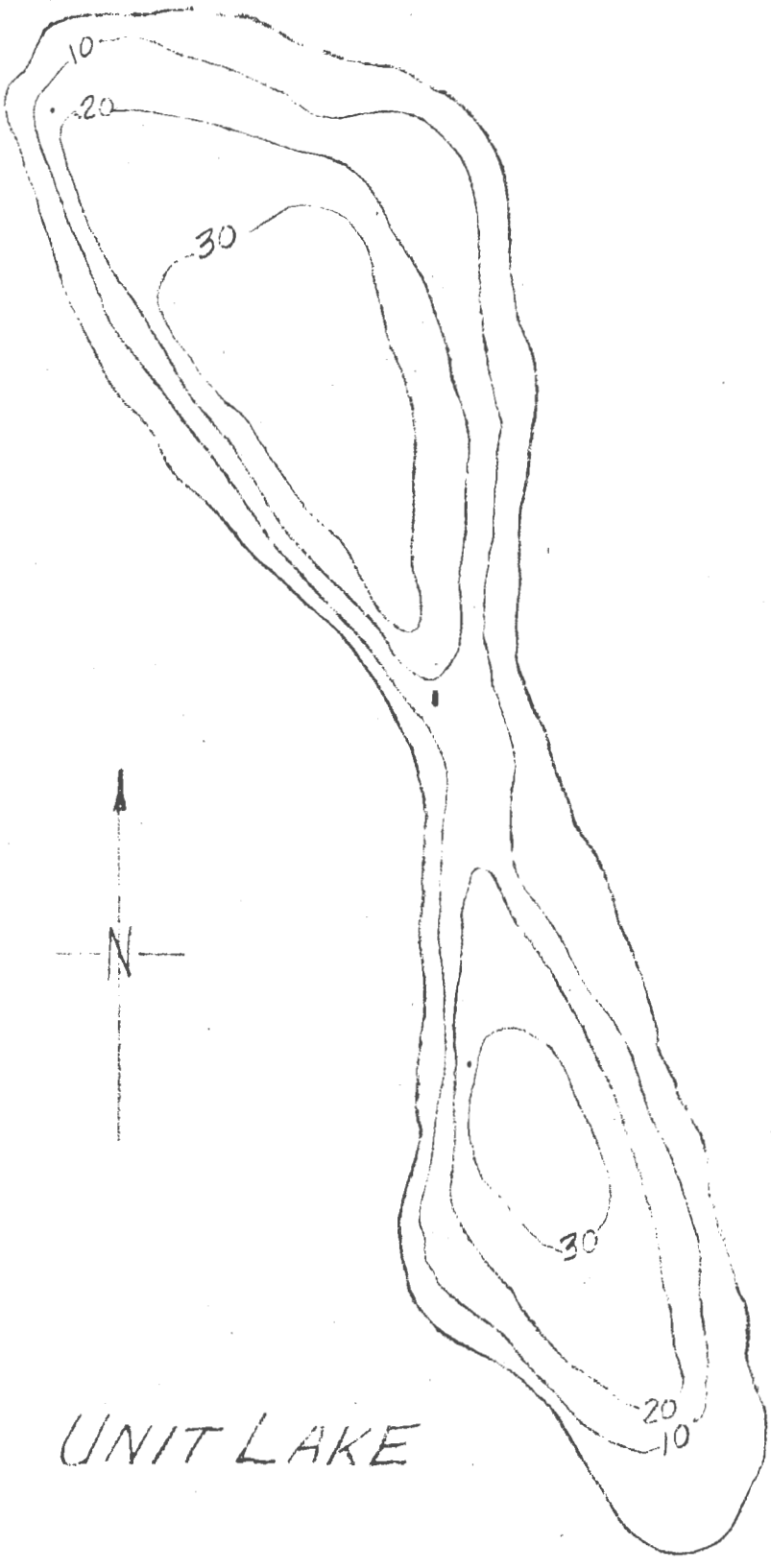
The original stock or date of stocking of brook trout is unknown. Rainbow were first introduced in 1960. Stocking records are accurate to 1945.

Year	Species	Number	Size (inches)	Date	Hatchery	Remarks
1945	Brook Trout	5,360	0 - 2	-	-	-
1960	Rainbow	10,030	0 - 2	7-15	Wallowa	Aerial release
1962	Rainbow	8,000	2	7-31	Wallowa	Aerial release
1965	Rainbow	5,100	2	7-18	Wallowa	Aerial release

Recommendations

It is recommended that 5,000 fingerling rainbow be stocked in Unit Lake every other year. Fish samples should be taken every three years to check the abundance and condition of the fish.

Unit Lake should be one of the first lakes in the Lake Basin to indicate a storage of fish with increased angler pressure. Consequently, monitoring the fish population on a regular schedule is very necessary.



UNIT LAKE

Form 354
Page 1
Rev. 5/66

Oregon State Game Commission
Fishery Division

HIGH LAKE SURVEY REPORT

Name of Lake Razz Lake
Date July 29, 1965
County Wallowa
Elevation (feet) 8,470
Area Eagle Cap Wilderness
T. 4S R. 44E Sec. 13
Maximum Depth (feet) 24 feet
IBM No. 08-94-0-0-000
Surface acres: 13.5
Watershed No. 8
Acre-feet: 213

General

Razz Lake is located on the Hurwal Divide approximately one air mile south of Ice Lake. The lake has been noted for small, but numerous brook trout. The lake is easy to fish although angling pressure is light because of poor access to lake.

Accessibility

Trails 1820 and 1821 up the west fork of the Wallowa River and Lake Creek lead to Horseshoe Lake. An unclaimed trail branches north from Horseshoe Lake to Razz Lake. This trail is not maintained, and in areas it is quite difficult to follow. The route from Horseshoe Lake to Razz Lake is a challange to the hiker, and only experienced horsemen should attempt the trip on horseback. The total distance from Wallowa Lake to Razz Lake is 11 miles by trail.

Improvements

There are no man-made improvements at Razz Lake.

Character of Lake Basin

The north and west sides of the basin consist of a granite mountain. The south side is a low moraine which breaks off into the Lake Basin. There are scattered alpine-type trees in the area. The lake bottom is irregular in contour and has a thin layer of muck cover. There is a small meadow in the southwest portion of the basin. Horse feed is very limited.

Tributaries

There are two small snow fed tributaries entering on the southwest shore. The southern tributary carries 2 cfs., contains 15 square yards of good spawning gravel, and had a water temperature of 41°F. at the time of the survey.

The outlet carries a flow of 4 cfs., contained 1½ square yards of available spawning gravel, and the water temperature was 46°F. at the time of the survey. There are undoubtedly subsurface spring areas making the difference in the inflow-outflow ratio.

Reproduction

Old fish redds were found in the southwest tributary. Small brook trout fry were observed in the lake and in the tributary streams. In 1954, Razz Lake was chemically treated to remove the brook trout, and golden trout were stocked in 1954, 1957, and 1958. Rod sampling in 1958 revealed that brook trout had survived and reproduced. As shown in the fish population section, only brook trout remain in Razz Lake.

Fluctuation

There may be as much as one foot fluctuation of the lake level although there was no evidence of fluctuation at the time of the survey.

Water Temperatures

		pH	Alkalinity Carbonate ppm	Alkalinity Bicarbonate ppm	TDS
Lake temperature:	Surface - 50°F. 3 feet - 43°F. 6 feet - 40°F. 9 feet - 40°F. 12 feet - 39°F. 15 feet - 39°F. 18 feet - 39°F. 21 feet - 39°F.	6.5	0.0	2.0	42
Air temperature:	70°F.				

Fish Population

The fish population, under present management practices, appears to be supporting a good fishery for small brook trout at Razz Lake.

Two gill nets, fishing 17 hours, caught 25 brook trout.

Composition and Length Frequency of Catch by Gill Nets Represented in One-Inch Size Groups

Date July 29, 1965

Species	Number Collected	Percentage of Total	Percentage in One-Inch Size Groups * 5	6	7	8	9	10	11	12	13	14	15
Brook Trout	25	100.0		15	6	3	1						

* Fork length measurement

OR 82

Maturity

The maturity for each female fish in the gill net sample was recorded as immature, maturing, or mature. Two gill nets caught 13 female brook trout at Razz Lake.

Numbers, Average Lengths, and Percentages of Female Specimens Occurring in Three Stages of Maturity

Date July 29, 1965

Species	Stage of Maturity	Number of Females	Average Length * Centimeters	Average Length * Inches	Percentage of Total
Brook Trout	Maturing	3	17.5	6.9	23.1
	Mature	10	18.8	7.4	76.9

* Fork length measurement

Condition of Fish

Condition: Although the fish were quite small, the body condition appeared to be fair with the head size in proportion with the body size.

Parasites: Eight percent of the fish were infected with adult tapeworms, 8 percent were infected with several tapeworm cysts, and 28 percent of the fish contained one tapeworm cyst.

Stomach Analysis: Segmented worms, ants, Diptera larvae, freshwater clams, Coleoptera adults, Dragonfly larvae, and grasshoppers.

Stocking Record

The original brook trout stocking date is unknown. In 1954, Razz Lake was chemically treated to remove the small brook trout so that a fishery for golden trout could be established. Golden trout were stocked in 1954, 1957, and 1958.

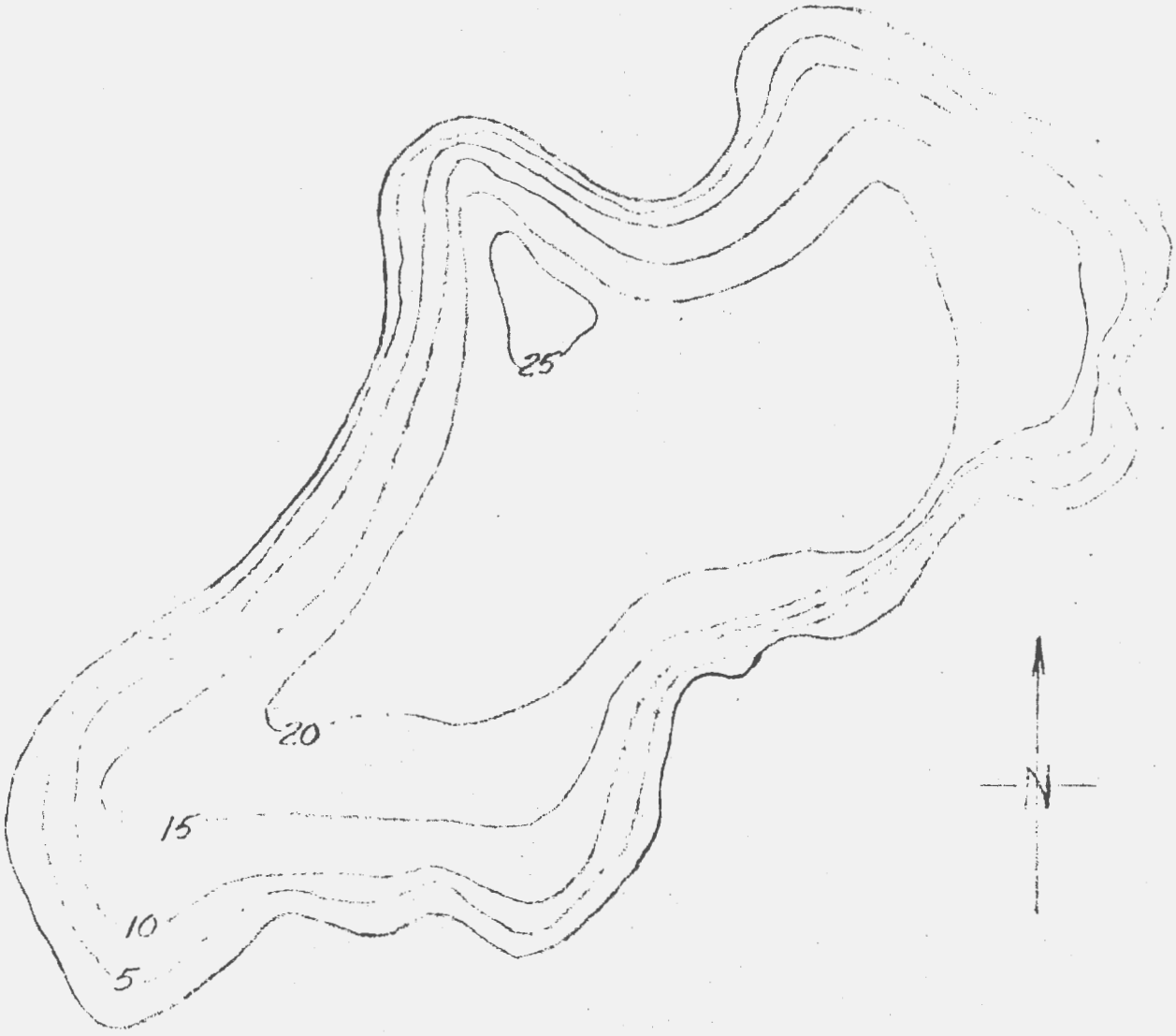
Year	Species	Number	Size (inches)	Date	Hatchery	Remarks
1954	Golden Trout	1,274	1	9-25	Wallowa	Aerial release
1957	Golden Trout	8,100	1	7-23	Wallowa	Aerial release
1958	Golden Trout	7,936	0 - 2	9-3	Wizard Falls	Aerial release

Recommendations

The golden trout soon became as small as the brook trout after the chemical rehabilitation project, and the golden trout did not provide much of a fishery in Razz Lake. Brook trout dominated the waters and the golden trout disappeared. Because of sub-surface spring areas, a complete rehabilitation project could not be successful at Razz Lake.

Razz Lake could be used as an intensively managed lake, in that partial control of the brook trout could be attempted periodically to maintain a larger sized fish. Need for this type of management should be justified by biological and recreational demands. At the present time, it is not believed that this demand is present. However, Razz Lake could be used as a pilot project lake for studying an intensive management program for the high lakes.

It is recommended that fish samples be taken once every three years to measure abundance and condition of the fish population. A need for more creel information and records of angler satisfaction of the fishery is needed at Razz Lake.



RAZZ LAKE

Form 354
Page 1
Rev. 5/66

Oregon State Game Commission
Fishery Division

HIGH LAKE SURVEY REPORT

Name of Lake Glacier Lake
County Wallowa
Area Eagle Cap Wilderness
Maximum Depth (feet) 124 feet
Surface acres: 40.9
Acre-feet: 2,184

Date August 18, 1965
Elevation (feet) 8,200
T. 5S R. 44E Sec. 1-2
IBM No. 08073-0-0-000
Watershed No. 8

General

Glacier Lake, located at the northeast foot of Eagle Cap Mountain, is noted for fine scenery and angling. The fish are larger than the average fish in most of the mountain lakes. Glacier Lake is one of the last lakes to become free of ice and snow in the spring. There are both shallow and deep areas in the lake. Glacier Lake receives light to moderate angling pressure.

Accessibility

Glacier Lake, located 12 miles by trail south of Wallowa Lake, can be reached by Trails 1820 and 1806 by way of the west fork of the Wallowa River, or by Trails 1820, 1821, 1810 and 1806 by way of the Lake Basin and Glacier Pass. The trail up the Wallowa River is generally free of snow by July 15 while Trail 1806 over Glacier Pass may not be open until later. Access around the north, east, and south shores is available to foot access.

Improvements

There are 3 or 4 primitive camping sites on the north and east shore. The wind blows quite hard at Glacier Lake and many campers prefer to stay at Frazier or Moccasin Lakes.

Character of Lake Basin

The west and northwest side of the basin is the north side of Eagle Cap Mountain. The south side of the basin is a rock rim from the mountain. The east side is a moraine. Beyond the moraine, the elevation drops rapidly to Frazier Lake. Glacier Lake has two distinct areas. The west lake is open, deep water while the east lake area is shallow, and there are several islands present in this portion of the lake. The bottom of the lake is covered with muck. The basin is characteristic of a typical glacier formed lake.

Tributaries

There are three snow fed tributaries from the northwest, southwest, and south. All three of these streams probably dry after the snow melts. The northwest tributary was flowing 6 cfs. and the water temperature was 39.5°F. at the time of the survey. The southwest stream flowed 2 cfs. and the water temperature was 38.5°F. at the time of the survey. The south stream comes from the small lake above Glacier Lake and this stream was quite small.

The outlet was flowing 10 to 12 cfs., contained 20 square yards of available spawning gravel, and was 53°F. at the time of the survey.

(over)

Reproduction

The 20 square yards of spawning gravel in the outlet plus an undetermined amount of gravel in the lake supports natural reproduction of brook trout in Glacier Lake. The size of the trout indicates that the natural reproduction is in balance with the food supply. Many small brook trout fry were observed around the lake shore.

Fluctuation

There may be a fluctuation of one foot or more of the surface water. However, at the time of the survey there was no evidence of a lake fluctuation.

Water Temperatures

Lake temperature:
Surface - 51°F.
5 feet - 44°F.
10 feet - 40°F.
15 feet - 39°F.
20 feet - 39°F.
25 feet - 38°F.
30 feet - 38°F.
35 feet - 38°F.
40 feet - 38°F.
45 feet - 38°F.
50 feet - 38°F.
55 feet - 37°F.
60 feet - 37°F.
65 feet - 37°F.
70 feet - 37°F.
75 feet - 37°F.
80 feet - 37°F.

	Alkalinity		
pH	Carbonate ppm	Bicarbonate ppm	TDS
6.4	0.0	5.0	46

Air temperature: 59°F.

Fish Population

The fish population, under present management practices, appears to be supporting a good fishery for nice sized brook trout in Glacier Lake. Two gill nets, fishing 14 hours, caught 53 brook trout.

Composition and Length Frequency of Catch by Gill Nets Represented in One-Inch Size Groups

Date August 18, 1965

Species	Number Collected	Percentage of Total	Percentage in One-Inch Size Groups *										
			5	6	7	8	9	10	11	12	13	14	15
Brook Trout	53	100.0		12	6	14	3	10	7	1			

* Fork length measurement

Maturity

The maturity for each female fish in the gill net sample was recorded as immature, maturing, or mature. Two gill nets caught 24 female brook trout.

Numbers, Average Lengths, and Percentages of Female Specimens Occurring in Three Stages of Maturity

Date August 18, 1965

Species	Stage of Maturity	Number of Females	Average Length * Centimeters	Average Length * Inches	Percentage of Total
Brook Trout	Maturing	10	18.8	7.4	41.7
	Mature	14	25.1	9.9	58.3

* Fork length measurement

Condition of Fish

Condition: The brook trout had excellent body condition with the head size in proportion with the body size.

Parasites: Less than one percent of the fish were infected with tapeworm cysts.

Stomach Analysis: Grasshopper adults, Diptera larvae, segmented worms, Coleoptera, and ants. Grasshoppers were the most often in the sample.

Stocking Record

There are no stocking records for Glacier Lake. However, in 1964 gill net samples took six rainbow over 10 inches in length. It is believed that an allocation of 28,000 rainbow for Mirror Lake were actually released in Glacier Lake.

The original number of brook trout and the stocking date is unknown.

The table below depicts what is believed to be the stocking record since 1945.

Year	Species	Number	Size (inches)	Date	Hatchery	Remarks
1959	Rainbow	28,000	1	7-30	Wallowa	Mistaken aerial release

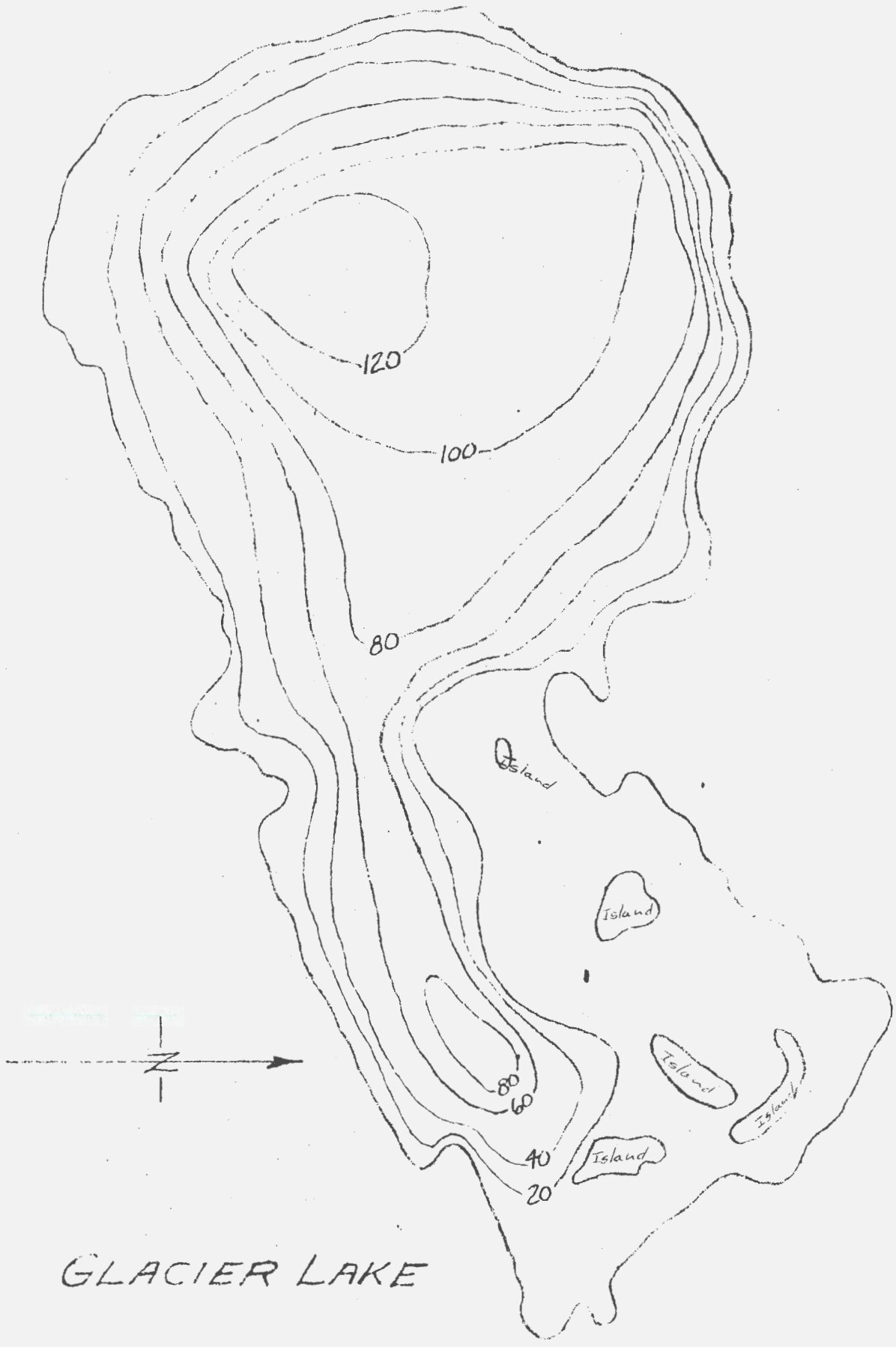
Recommendations

Since the rainbow released in 1959 showed good survival, growth rates, angling success, and little competition with the brook trout, it is recommended that 3,000 rainbow 2 to 3 inches in length be released into Glacier Lake once every two years beginning in 1967. The natural reproduction of brook trout appears to be sufficient to supply Glacier Lake with char.

It is recommended that fish samples be taken once every third year to check the abundance and condition of the fish. The rainbow should be discontinued if the size of the brook trout is reduced by the introduction of rainbow.

Name Origin

Named for Benson Glacier that feeds it.



GLACIER LAKE

Form 354
Page 1
Rev. 5/66

Oregon State Game Commission
Fishery Division

HIGH LAKE SURVEY REPORT

Date August 7, 1965

Name of Lake Mirror Lake
Elevation (feet) 7,590
County Wallowa
T. 4S R. 44E Sec. 38
Area Eagle Cap Wilderness
IBM No. 08488-0-0-000
Maximum Depth (feet) 77 feet
Watershed No. 8
Surface acres: 26.2
Acre-feet: 793

General

Mirror Lake, located in the upper end of the Lake Basin, is a popular lake with the anglers, and angling pressure is considered heavy. While most of the brook trout are fairly small, an occasional large fish is caught. There is not a large area of shallow water for the production of fish food life.

Accessibility

Mirror Lake can be reached by the Lake Basin Trail 1821, the Hurricane Creek Trail 1807, or the East Fork Lostine River Trail 1662. By Trail 1821, it is 14 miles to Mirror Lake. By Trail 1807, it is 11 miles to Mirror Lake. By Trail 1662, it is 6 miles to Mirror Lake. The trails are well signed, and there is no problem of becoming lost. The trails are generally open and free of snow by July 20. There is a trail along the north shore of Mirror Lake for angler access.

Improvements

There is one outhouse type restroom. There are seven primitive camping sites around the west, north, and east shores. Because of the open area, camping sites are generally easy to locate.

Character of Lake Basin

Mirror Lake is high at the base of Eagle Cap Mountain. There are several meadows around the north and east shores. The trees are alpine-type conifers, and they are very scattered. There are rims in the lake bottom which account for an irregular bottom contour. The lake bottom is covered with a shallow layer of muck.

Tributaries

There are four tributaries flowing into Mirror Lake from the west, north, and southeast. The tributaries contain a total of 139 square yards of good spawning gravel, and small brook trout were observed in all four streams. The water temperatures varied from 45°F. to 65°F., and the stream flow varied from 1 to 8 cfs. The outlet flows 7 to 10 cfs., was 53°F. at the time of the survey, and contained 2 square yards of good spawning gravel.

Reproduction

The 141 square yards of good spawning gravel in the streams is enough spawning area for natural reproduction to maintain a good fishery for brook trout. Numerous brook trout fry were observed around the lake shore and in the tributary streams at the time of the survey.

Fluctuation

There does not appear to be any fluctuation of the lake water surface.

Water Temperatures

		pH	Alkalinity Carbonate ppm	Alkalinity Bicarbonate ppm	TDS
Lake temperature:	Surface - 47°F.	6.6	0.0	3.0	47
	5 feet - 46°F.				
	10 feet - 43°F.				
	20 feet - 41°F.				
	25 feet - 40°F.				
	30 feet - 39°F.				
	35 feet - 38°F.				
	40 feet - 38°F.				
	45 feet - 38°F.				
	50 feet - 37°F.				
	55 feet - 37°F.				

Fish Population

The fish population, under present management practices, appears to be supporting a good fishery for brook trout eight inches in length with an occassional large fish being caught. Two gill nets caught 55 brook trout.

Composition and Length Frequency of Catch by Gill Nets Represented in One-Inch Size Groups

Date August 7, 1965

Species	Number Collected	Percentage of Total	Percentage in One-Inch Size Groups *										
			5	6	7	8	9	10	11	12	13	14	15
Brook Trout	55	100.0		24	16	8	4	2			1		

* Fork length measurement

Maturity

The maturity for each female fish in the gill net sample was recorded as immature, maturing, or mature. Two gill nets caught 29 female brook trout.

Numbers, Average Lengths, and Percentages of Female Specimens Occurring in Three Stages of Maturity

Date August 7, 1965

Species	Stage of Maturity	Number of Females	Average Length * Centimeters	Average Length * Inches	Percentage of Total
Brook Trout	Maturing	17	17.8	7.0	58.6
	Mature	12	20.0	7.9	41.4

* Fork length measurement

Condition of Fish

Condition: All fish appeared to be in fair body condition with the head size in fair proportion to the body size.

Parasites: Two percent of the fish had adult tapeworms, 5 percent contained several tapeworm larvae, and 10 percent contained one tapeworm cyst.

Stomach Analysis: Grasshopper adults, segmented worms, Diptera larvae, small fish.

Stocking Record

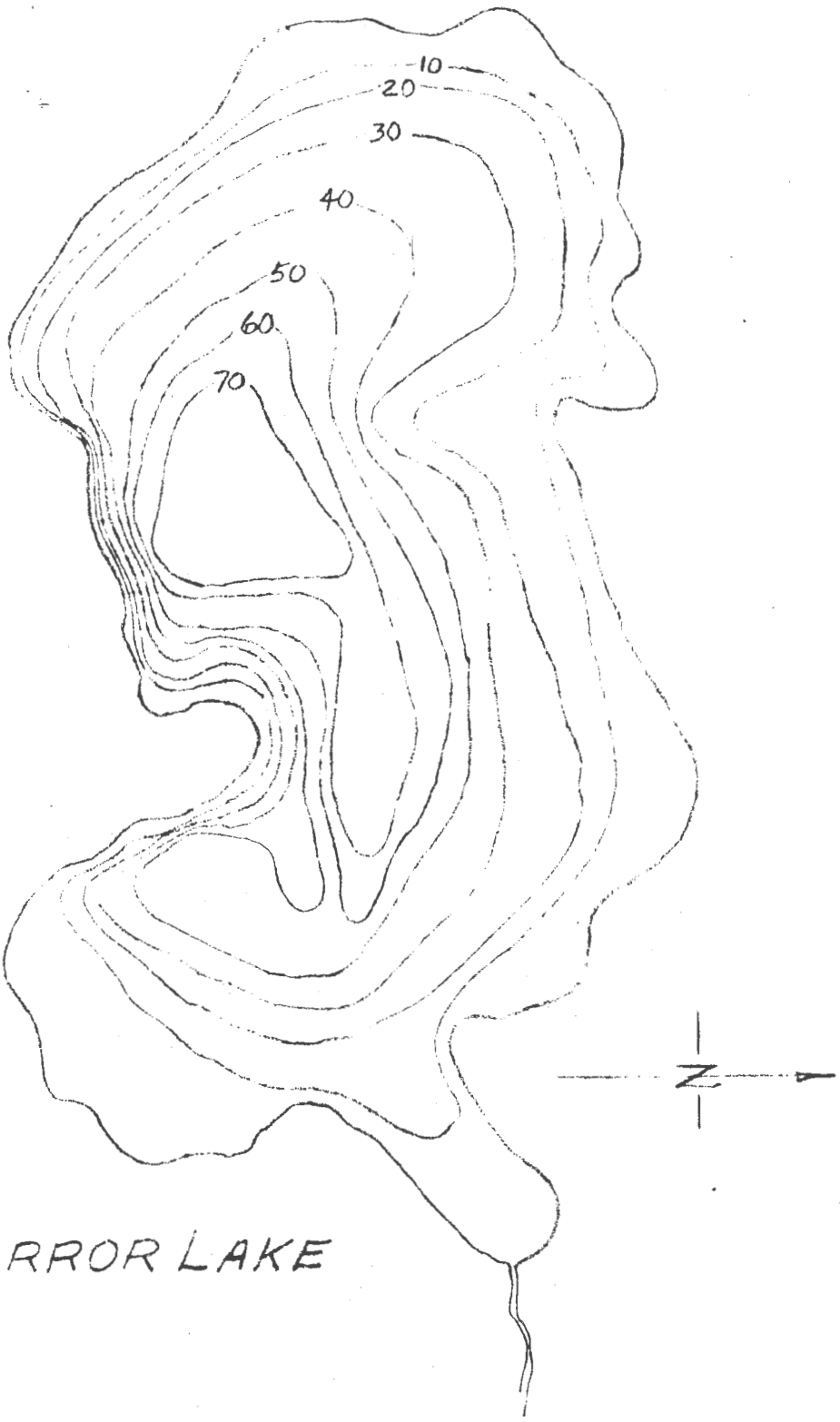
The original stock or date of stocking of brook trout into Mirror Lake is unknown. Rainbow were allocated and reported stocked into Mirror Lake in 1959, 1961, and 1963. However, it is believed that the rainbow stocked in 1959 were actually released into Glacier Lake. There has been no evidence that the rainbow survived from the 1961 or 1963 releases.

Year	Species	Number	Size (inches)	Date	Hatchery	Remarks
1945	Brook Trout	4,355	2 - 4	-	-	-
1959	Rainbow	28,000	1	7-30	Wallowa	Aerial release
1961	Rainbow	9,000	1	7-18	Wallowa	Aerial release
1963	Rainbow	10,193	2	8-2	Wallowa	Aerial release

Recommendations

It appears that in the face of competition with brook trout and the escapement possibility through the outlet because of the competition, rainbow can not be successfully liberated into Mirror Lake. Consequently, it is recommended that all fish stocking programs be discontinued at Mirror Lake. The natural reproduction of brook trout is supplying a satisfactory fishery for the anglers.

Fish samples should be taken once every third year to check the abundance and condition of the fish.


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MIRROR LAKE

Form 354
Page 1
Rev. 5/66

Oregon State Game Commission
Fishery Division

HIGH LAKE SURVEY REPORT

Date August 5, 1965

Name of Lake Moccasin Lake — Elevation (feet) 7,510

County Wallowa — T. 4S R. 44E Sec. 34-37

Area Eagle Cap Wilderness — IBM No. 08089-0-0-000

Maximum Depth (feet) 82 feet — Watershed No. 8

Surface acres: 33.4

Acre-feet: 1012

General

Moccasin Lake, located on the east boundary of the Lake Basin, is a popular lake with the anglers. Generally, the fish are quite small, but occassionally a larger brook trout can be caught. The lake has both shallow and deep areas, and the lake also has a long shore line with fairly easy access.

Accessibility

Moccasin Lake is located 11 miles south of Wallowa Lake. Trail 1820 begins at the power generator south of Wallowa Lake. Trail 1821 branches west from Trail 1820 six miles south of Wallowa Lake. At Douglas Lake, Trail 1810 branches east to Moccasin Lake. Moccasin Lake can also be reached by Trail 1807 up Hurricane Creek or Trail 1662 up the east fork of the Lostine River. The trails are generally free of snow by July 15. Trail 1810 goes along the north shore of the lake for angler access.

Improvements

There is one improved camp with toilet facilities on the north shore near the center of the lake. There are four primitive camping sites on the east, north, and west shores.

Character of Lake Basin

The area is characterized by rim rock both above and below the surface of the water. There are scattered alpine-type trees in the vicinity, and there are meadow areas around the west shore. Horse grazing is generally available until September. The lake bottom is covered with muck.

Tributaries

The major creek flowing from Mirror Lake enters Moccasin from the west. There is a falls a short distance above Moccasin Lake on this tributary. The flow varies from 6 to 12 cfs. and the water temperature was 49°F. at the time of the survey. There are 23 square yards of available spawning gravel. A stream flowing 1 to 2 cfs. enters from the northwest. The stream contains 18 square yards of good spawning gravel, and the water temperature was 60°F. at the time of the survey. A third stream flowing one-fourth cfs. enters from

OREGON STATE GAME COMMISSION
FISHERY DIVISION

Reproduction

The 81 square yards of good spawning gravel in the tributary streams plus 17 square yards of good gravel in the lake around the springs seems to be quite adequate for natural reproduction of brook trout in Moccasin Lake. Numerous brook trout fry were observed in the streams and in the lake.

Fluctuation

At the time of the survey, there was no evidence of any fluctuation of the lake surface.

Water Temperatures

		pH	Alkalinity Carbonate ppm	Alkalinity Bicarbonate ppm	TDS
Lake temperature:	Surface - 51°F.	6.5	0.0	2.5	66
	5 feet - 50°F.				
	10 feet - 50°F.				
	15 feet - 46°F.				
	20 feet - 42°F.				
	25 feet - 40°F.				
	30 feet - 39°F.				
	35 feet - 38°F.				
	40 feet - 38°F.				
	45 feet - 38°F.				
	50 feet - 37°F.				
	55 feet - 37°F.				
	60 feet - 37°F.				
Air temperature:	57°F.				

Fish Population

The fish population, under present management practices, appears to be supporting a good fishery for both small and larger brook trout at Moccasin Lake. Two gill nets, fishing 14 hours, caught 27 brook trout.

Composition and Length Frequency of Catch by Gill Nets
Represented in One-Inch Size Groups

Date August 5, 1965

Species	Number Collected	Percentage of Total	Percentage in One-Inch Size Groups* 5	6	7	8	9	10	11	12	13	14	15
Brook Trout	27	100.0		16	8	1	1					1	

* Fork length measurement

OREGON STATE GAME COMMISSION
FISHERY DIVISION

Maturity

The maturity for each female fish in the gill net sample was recorded as immature, maturing, or mature. Two gill nets caught 16 female brook trout at Moccasin Lake.

Numbers, Average Lengths, and Percentages of Female Specimens Occurring in Three Stages of Maturity

Date August 5, 1965

Species	Stage of Maturity	Number of Females	Average Length * Centimeters	Average Length * Inches	Percentage of Total
Brook Trout	Maturing	10	18.0	7.1	62.5
	Mature	6	17.8	7.0	37.5

* Fork length measurement

Condition of Fish

Condition: Most all the fish had good body condition with the head of the fish in proportion with the body size.

Parasites: Seven percent of the fish had adult tapeworms, 4 percent were infected with several tapeworm larvae, and 4 percent contained one tapeworm cyst.

Stomach Analysis: Grasshopper adults, segmented worms, mayfly larvae, ants, Diptera larvae, and small fish.

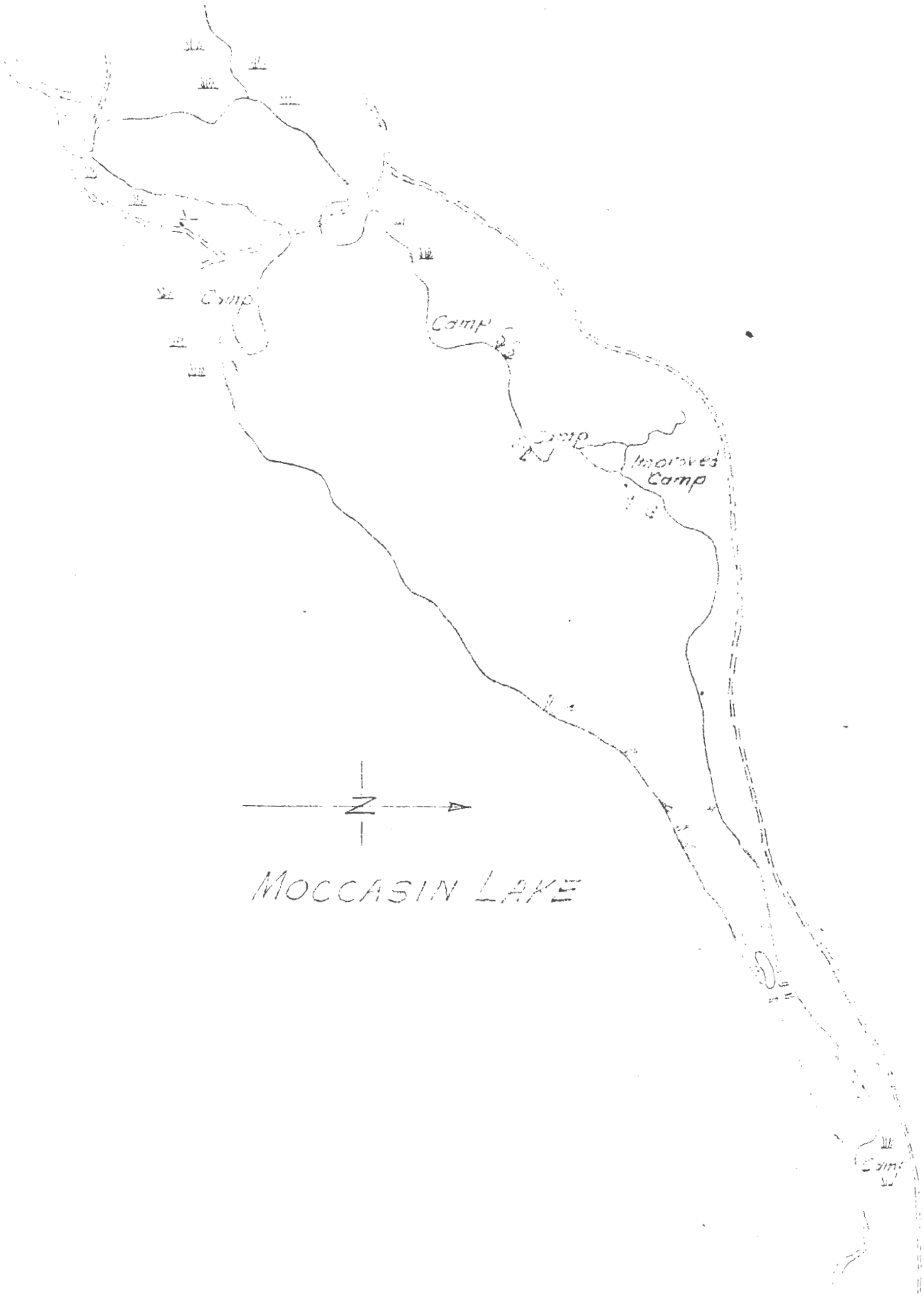
Stocking Record

There is one stocking record of brook trout being released in 1945. The original stocking date and number of fish released is unknown.

Year	Species	Number	Size (inches)	Date	Hatchery	Remarks
1945	Brook Trout	4,355	2 - 4	-	-	-

Recommendations

Because of the abundant supply of spawning gravel and the apparent success of natural reproduction, it is recommended that no stocking program be outlined for Moccasin Lake. It is also recommended that fish samples be taken once every third year to check the abundance and condition of the fish. More creel checks are needed to obtain a better understanding of the fishery.


Camp
Camp
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Improved
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MOCCASIN LAKE

OREGON STATE GAME COMMISSION
FISHERY DIVISION

HIGH LAKE SURVEY REPORT

Name of Lake Ice Lake
County Wallowa
Area Eagle Cap Wilderness
Maximum Depth (feet) 193 feet
Surface acres: 46.1
Acre-feet: 2,681

Date August 20, 1965
Elevation (feet) 7,920
T. 4S R. 44E Sec. 12
IBM No. 0879-0-0-000
Watershed No. 8

General

Ice Lake is one of the more famous lakes in the Wallowa Mountains for its beauty and fine angling. The shore line is quite long which offers anglers many areas to fish. Fishing is generally best just after the ice melts in the spring and again in September and October. While the main body of the lake is quite deep, the south east "arm" offers an ideal area for fish production.

Accessibility

Ice Lake can be reached by Trail 1820 which begins at the P.P.L. power generator south of Wallowa Lake. At approximately 2 miles, Trail 1808 branches west and goes approximately 4 miles to Ice Lake. While Trail 1820 is quite flat, Trail 1808 has a rather steep grade. However, the trail is in very good condition and is maintained annually. The trail is well marked and there should be no problem in locating Ice Lake.

Improvements

There are two very primitive camping areas, one toilet, and a horse hitching post on the northeast corner of the lake.

Character of Lake Basin

The lake is located above the timber line. There are a few alpine-type coniferous trees located around the east and south shores. To the west of Ice Lake is the Matterhorn Mountain with an elevation of 9,845 feet. There is a small meadow on the west shore. Because Ice Lake is so deep in a small area, it is suspected that the lake may have been formed by volcanic action.

Tributaries

There are four tributaries entering from the west in the meadow area. There is a total of 39 square yards of good spawning gravel in these four tributaries. The streams water temperatures were approximately 45°F. A stream also enters from the southeast shore on the "arm". This stream contained 69 square yards of good spawning gravel. The stream was carrying 4 to 5 cfs. of water, and the water temperature was 47°F. at the time of the survey.

The outlet was carrying 8 - 10 cfs. of water and was 49°F. at the time of the survey. There did not appear to be any spawning gravel in the outlet.

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FISHERY DIVISION

Reproduction

The 108 square yards of good spawning gravel in the tributary streams plus an undetermined amount in the lake is sufficient to maintain a good fishery for brook trout in Ice Lake.

Fluctuation

There does not appear to be a lake fluctuation, but the west tributaries may dry on low snow years.

Water Temperatures

Lake temperature:
Surface - 50°F.
5 feet - 49°F.
10 feet - 49°F.
15 feet - 49°F.
20 feet - 47°F.
25 feet - 46°F.
30 feet - 43°F.
35 feet - 41°F.
40 feet - 40°F.
45 feet - 39°F.
50 feet - 39°F.
55 feet - 39°F.
60 feet - 38°F.
65 feet - 37°F.
70 feet - 36°F.
75 feet - 36°F.
80 feet - 36°F.
85 feet - 36°F.

	Alkalinity		
pH	Carbonate ppm	Bicarbonate ppm	TDS
7.4	0.0	15.0	65

Air temperature: 62°F.

Fish Population

The fish population, under present management practices, appears to be supporting a good fishery for brook trout at Ice Lake.
Two gill nets, fishing 15 hours, caught 34 brook trout.

Composition and Length Frequency of Catch by Gill Nets Represented in One-Inch Size Groups

Date August 20, 1965

Species	Number Collected	Percentage of Total	Percentage in One-Inch Size Groups *										
			5	6	7	8	9	10	11	12	13	14	15
Brook Trout	34	100.0	1	6	3	10	11	3					

* Fork length measurement

Maturity

The maturity for each female fish in the gill net sample was recorded as immature, maturing, or mature. Two gill nets caught 14 female fish.

Numbers, Average Lengths, and Percentages of Female Specimens Occurring in Three Stages of Maturity

Date August 20, 1965

Species	Stage of Maturity	Number of Females	Average Length *		Percentage of Total
			Centimeters	Inches	
Brook Trout	Maturing	10	23.6	9.3	71.5
	Mature	4	23.1	9.1	28.5

* Fork length measurement

Condition of Fish

Condition: All the fish appeared to be in excellent condition with the head size in proportion with the body size.

Parasites: A very small percent of the fish contained tapeworm larvae.

Stomach Analysis: Stomach samples were not taken.

Stocking Record

The original stock or date of stocking of brook trout into Ice Lake is unknown. There are no stocking records for Ice Lake.

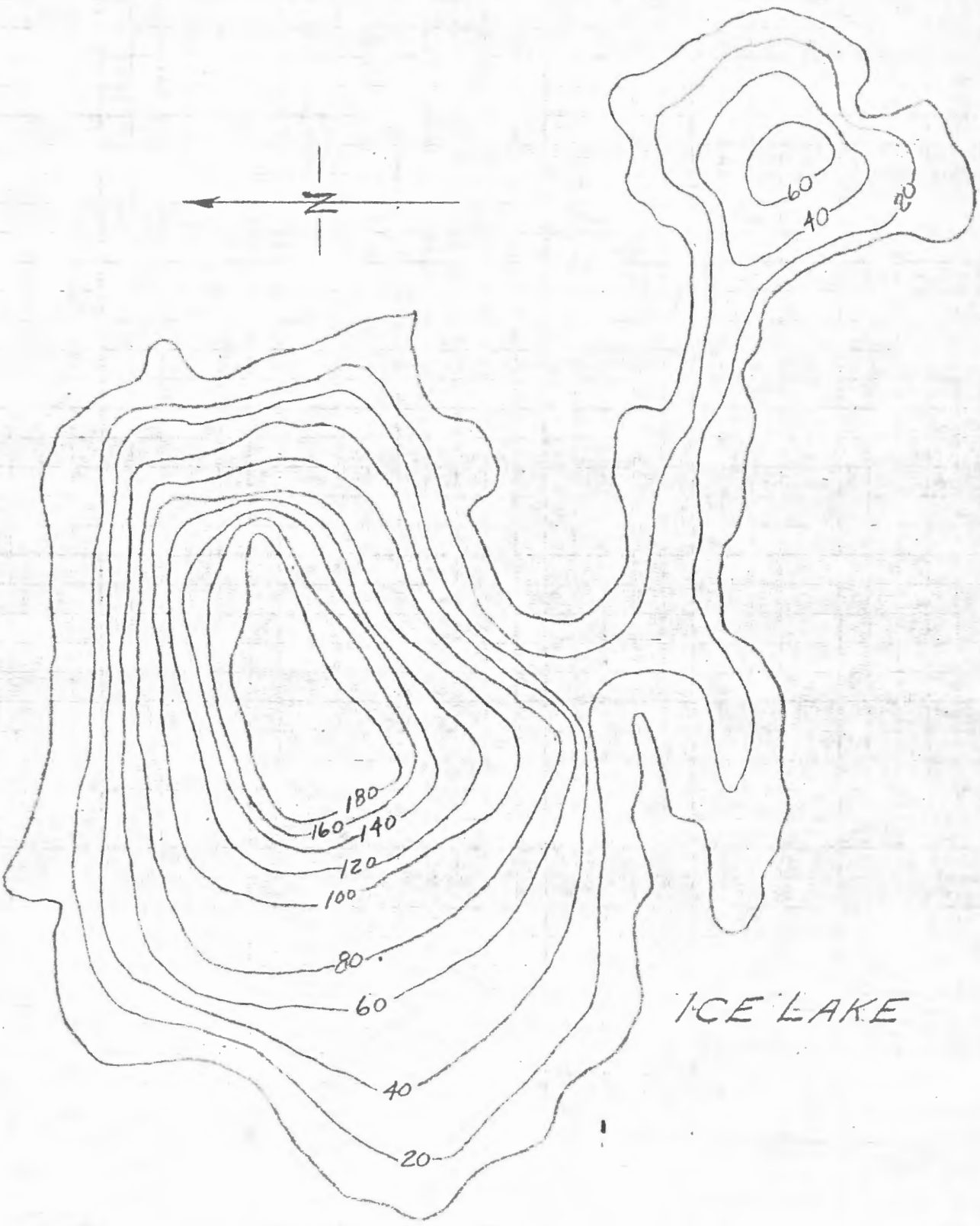
Recommendations

Because of the natural spawning area available and the apparent success of natural reproduction, it is recommended that no stocking program be established. It is recommended that fish samples be taken once every three years to check the abundance and condition of the fish.

If the introduction of opossum shrimp, Mysis relicta, is successful in Wallowa Lake, it may be desireable to stock Ice Lake with the shrimp also.

Name Origin

Ice Lake was called Pyramid Lake because the mountains form three natural pyramids around it. It was called so by Ed A. Pollock in 1895.


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180
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ICE LAKE

Form 354
Page 1
Rev. 5/66

OREGON STATE GAME COMMISSION
FISHERY DIVISION

HIGH LAKE SURVEY REPORT

Name of Lake Billy Jones Lake
County Wallowa
Area Eagle Cap Wilderness
Maximum Depth (feet) 66 feet
Surface acres: 5.8
Acre-feet: 167

Date September 28, 1966
Elevation (feet) 8,400
T. 4S R. 44E Sec. 5
IBM No. 0852-0-0-000
Watershed No. 8

General

Billy Jones Lake is noted for large rainbow to 18 inches in length. Angling pressure is light to moderate. Anglers in the area have the choice of angling for smaller brook trout in Echo Lake or fishing for rainbow in Billy Jones Lake. The lake is not rich in fish food organisms, however, the angling pressure is light so that the fish have a chance to grow quite large.

Accessibility

Billy Jones Lake can be reached by traveling up the Hurricane Creek Trail 1807 and Trail 1824. Trail 1824 branches west from Trail 1807 4.4 miles above the end of the Hurricane Creek road. Trail 1824 travels approximately 4 miles to Echo Lake. Billy Jones Lake can be reached by walking south around Echo Lake and through a saddle in the ridge to the south of Echo Lake. There are no trails to Billy Jones Lake from Echo Lake. Trail 1824 is a poor class trail. There is no way to get a horse to Billy Jones Lake.

Improvements

There are no man-made improvements at Billy Jones Lake.

Character of Lake Basin

The basin is characterized by rim rock. The lake is above the timber line and the basin is so rocky that there is very little grass present. The lake bottom is covered with a thin layer of muck.

Tributaries

There are no inflowing tributaries. The outlet leaves the lake underground and emerges a short distance below the lake on the opposite side of the ridge on the southeast corner of the lake. No springs were located.

Reproduction

It appears that natural reproduction of rainbow occurs at Billy Jones Lake, but it is doubtful that a good fishery can be maintained with natural reproduction. Two fingerling rainbow, approximately three inches in length, were observed in the lake.

Fluctuation

At the time of the survey, the water level was five feet below the high water mark. This may be the extreme limit of the fluctuation.

Water Temperatures

Lake temperature: Surface - 51°F.
5 feet - 51°F.
10 feet - 50°F.
15 feet - 50°F.
20 feet - 50°F.
25 feet - 50°F.
30 feet - 49°F.
35 feet - 49°F.
40 feet - 48°F.
45 feet - 46°F.
50 feet - 45°F.
55 feet - 45°F.
60 feet - 44°F.
65 feet - 44°F.

Air temperature: 64°F.

pH	Alkalinity Bicarbonate ppm	Conductivity	TDS
6.1	2	6	5

Fish Population

Billy Jones Lake supports a good population of rainbow trout. Two gill nets, fishing 13 hours, caught 15 fish.

Composition and Length Frequency of Catch by Gill Nets
Represented in One-Inch Size Groups

Date September 28, 1966

Species	Number Collected	Percentage of Total	Percentage in One-Inch Size Groups *										
			5	6	7	8	9	10	11	12	13	14	15
Rainbow	15	100.0	1	3	1	3	4	1	2				

* Fork length measurement

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FISHERY DIVISION

Maturity

The maturity for each female fish in the gill net sample was recorded as immature, maturing, or mature. Two gill nets caught 7 female rainbow trout.

Numbers, Average Lengths, and Percentages of Female Specimens Occurring in Three Stages of Maturity

Date September 28, 1966

Species	Stage of Maturity	Number of Females	Average Length * Centimeters	Average Length * Inches	Percentage of Total
Rainbow	Maturing	6	24.9	9.8	85.7
	Mature	1	24.4	9.6	14.3

* Fork length measurement

Condition of Fish

Condition: All the fish were in excellent condition with the head size in proportion with the body size.

Parasites: Seven percent of the fish were infected with adult tapeworms.

Stomach Analysis: Stomach analysis were not made.

Stocking Record

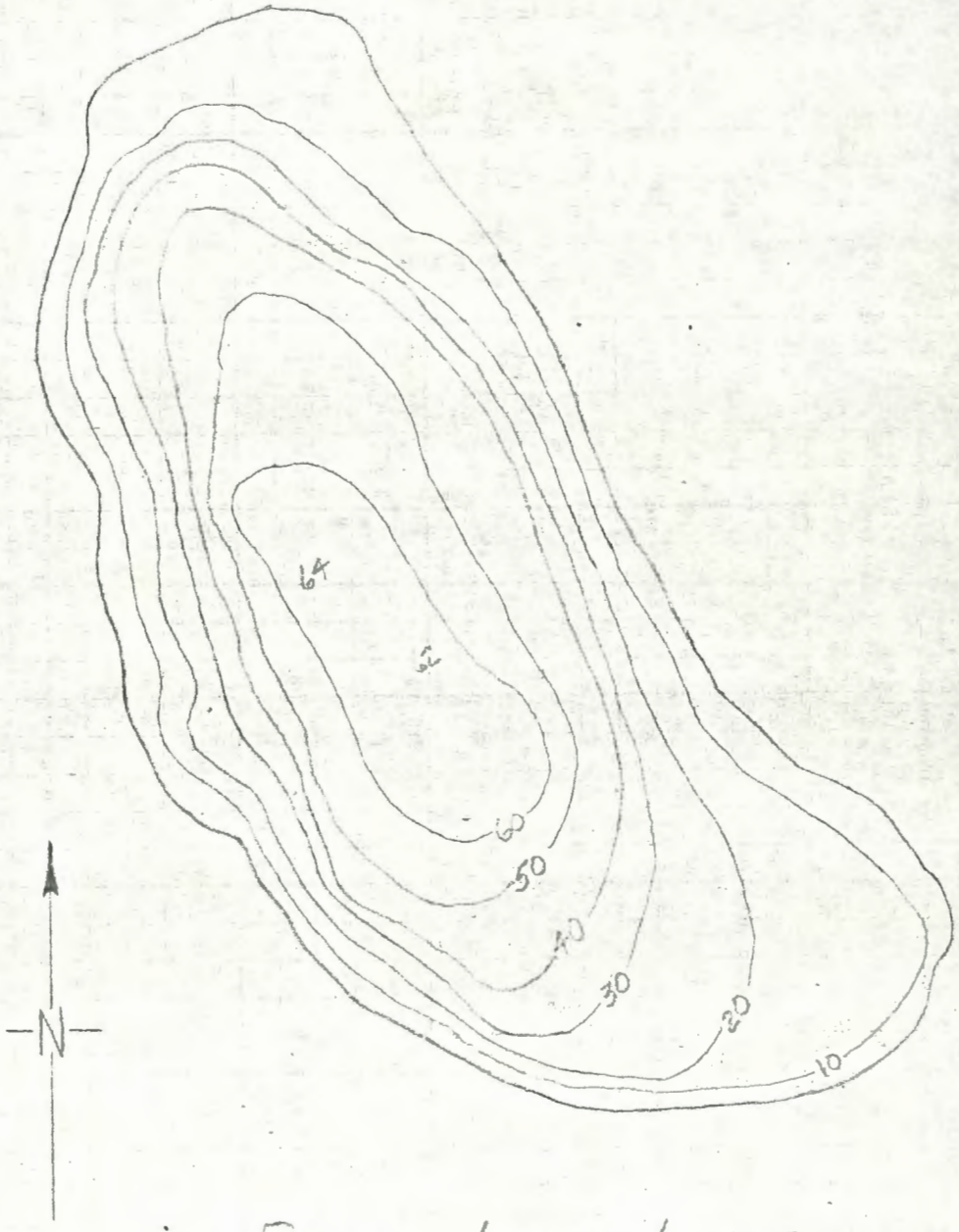
The original stock or date of stocking of rainbow into Billy Jones Lake is unknown, but the 1953 date may well be the first release of fish into the lake.

Year	Species	Number	Size (inches)	Date	Hatchery	Remarks
1953	Rainbow	2,019	2	9-17	Wallowa	Aerial release
1956	Rainbow	5,350	2	8-22	Wallowa	Aerial release
1956	Rainbow	5,050	2	8-31	Wallowa	Aerial release
1961	Rainbow	3,000	1	7-18	Wallowa	Aerial release
1963	Rainbow	4,993	2	8-2	Wallowa	Aerial release

Recommendations

Although natural reproduction may occur to a slight degree, it is doubtful if natural reproduction will support enough fish to maintain a good fishery. It is recommended that 2,000 rainbow fingerling be stocked in Billy Jones Lake every two years.

Fish samples should be taken once every 2 years, preferably the year prior to stocking, to check the abundance and condition of the fish.



BILLY JONES LAKE
1" = 120'