

SNAG LAKE MANAGEMENT REPORT

by

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INTRODUCTION

On September 1 and 2, 1976 a survey of Snag Lake was completed to determine its value as a fishery and its place in the park ecosystem.

Snag Lake is located in Sections 27, 28 and 33 of T31N, R6E of Lassen Volcanic National Park. Access is by trail, five miles from Butte Lake Ranger Station or four miles from Juniper Lake Ranger Station.

In normal water years the surface pool is 445 acres in area.

MATERIALS AND METHODS

General materials and methods are described in the Management Unit 14 Report, (Twin Lakes), (Purvis, 9/76) or in the Lassen Park Report, (West, 9/76).

The gill nets (2) were set at approximately Station #8 and between Stations #15 and #17 as used by Everest (1964). It should be noted that the surface area was about 1/2 of the normal when the survey was done, so the actual locations of the net sets were probably a little farther offshore than the stations used by Everest.

RESULTS AND DISCUSSION

As noted before, the surface area of Snag Lake was about 1/2 of normal, exposing many areas along the banks. It is estimated that the water level was down about 8-12 feet.

According to Everest (1964) the water level of Snag Lake during his study (July 31 to August 27, 1963) dropped ten feet. It would be interesting to know if this drop occurs annually, or if it is a function of a low water year. No precipitation data was available for Snag Lake during the 1963 season.

Except for this variation in size of the lake, most of the other parameters of the lake are fairly well correlated with Everest (1964).

The apparent color of the water was green. Visibility was about 20 feet. Everest (1964) claimed 22 feet visibility.

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(Snag)

The bottom near shore, and where it could be seen from the raft, appeared to be about 60% sand and 40% mud and organic debris.

Water temperature during 1976 was 1.5°C higher than in 1963. In 1963 it was 20°C on the surface and in 1976 it was 21.5°C.

Four streams were noted flowing into Snag Lake during the 1976 study. The first enters between Stations #19 and #22. The next two enter at Station #24. It appears that these are one stream which has formed a delta on the receding mudflat. The fourth inlet is Grassy Creek, and enters at Station #1 (during the 1976 study, its actual entrance into the lake occurred at about Station #3).

Spawning areas for salmonids are present in all of the flowing feeders. The areas are extensive in Grassy Creek, and slight in the remaining two or three. Juvenile fish of unknown species were observed in all of these inlets.

Wildlife noted were Canadian geese, cinammon teal, great blue herons, bald eagles, spotted sandpipers and deer. Alan Denniston, Resource Management Specialist, noted river otter on Snag Lake, September 21, 1976.

About 1/2 of the bottom substrates are sprouting aquatic vegetation. Most of this vegetation is a Potamogeton sp. Everest (1964) identified this as P. nodusus. Myriophyllum sp. is also present with the P. nodusus and has been identified as M. hippuroides.

Several other Potamogeton species were noted in the lake as well as Carex sp. and Juncus sp. A species of Elodea was noted at approximately 1/3 of the distance between Station #17 and #18.

Low water conditions made the stands of vegetation appear more dense than they might have been. Still the stands are dense, nonetheless.

Fish food organisms noted were Chironomidae and other Diptera, being abundant in all sections of the lake. The midges were conducting a hatch during the period of the 1976 study. Other food organisms seen in much smaller quantities were Odonata, Ephemeroptera, Trichoptera and Gastropoda. One of the rainbow trout had an eight inch garter snake in its mouth when it was retrieved from the net.

Four species of fish were caught in Snag Lake during the study of 1976; rainbow trout (Salmo gairdneri Richardson), coarse-raker tui chub (Siphateles bicolor obesus Girard), Modoc sucker (Catostomus microps Rutter) and Tahoe sucker (C. tahoensis Gill and Jordan).

An average of 3.93 fish per hour were taken with the nets. By number, rainbow trout composed 19.1% of the catch, coarse-raker tui chub 14.5%, Modoc sucker 7.3% and Tahoe sucker 59.1%. Apparently since 1963 the numbers of rainbow trout and Tahoe sucker have increased, while the coarse-raker tui chub population has declined.

No speckled dace (Rhinichthys osculus Girard) or Eastern brook trout (Salvelinus fontinalis Mitchell) were captured during the 1976 study. These fish composed only 0.7% and 2.0% of the catch in 1963, respectively. It is likely that the dace population is either very small or has disappeared entirely. The Eastern brook trout are thought also to be a small population and move up into the cooler waters of Grassy Creek during the summer.

The appearance of the Modoc sucker indicated either introduction of another undesirable "trash" fish, either intentionally or accidentally by an angler or a mistake was made in keying fish during the previous study. This is easy to do as the difference is often difficult to discern.

By weight the rainbow trout composed 46.2% of the catch, tui-chubs 9.2%, Modoc sucker 3.5% and Tahoe sucker 59.1%.

A total of 110 fish were netted, weighing 12.9996 kilograms. The average rainbow weighed 285.9 grams, tui-chub 57.4 grams, Modoc sucker 74.6 and Tahoe sucker 82.2 grams. The average condition factor (K) of the rainbow trout was 1.03. This indicates that the fish are just above the borderline for being considered as being in good shape.

There is apparently an adequate supply of food, cover and spawning grounds to maintain a salmonid population in this lake without stocking and this appears to be occurring. Unfortunately the salmonids must compete to some extent with the other fish for these parameters, and this limits the population to some extent. Exactly how much limiting is occurring is not known and would require extensive research to learn.

Stocking of Snag Lake is an undesirable management tool. The introduced fish would compete with the natives and put further stress on the system. It is highly unlikely that trout would overwhelm the other species by "sheer bulk of numbers" as has been tried in the past at other locations with little or no success (an example of this is Reflection Lake in the northwest corner of the park). The cost factor in planting is not justified by the return that would be garnered by the sportsman, and the knowledge that this lake had been recently stocked, or the sight of an airplane dumping fish might detract from the sportsman's wilderness experience.

Treatment of the lake with a chemical poison, such as rotenone, to remove all of the fish, coarse and game alike, and then to restock with a game fish is also an undesirable management tool. Treatment of Snag Lake would necessitate treatment of Grassy Creek, where the suckers and trout spawn, as well as the other inlets. The more bodies of water which must be treated, the more difficult it is to remove all of the fish. Horseshoe Lake might have to be done as some fish might escape via this route, and some fish may find refuge in pockets in the lava flow.

Also eggs may be present, which may escape the action of the treatment.

The best management policy for this lake appears to be to leave it alone. The lake appears to have held its conditions of 1963, or possibly improved, as far as sports fishing possibilities exist and no alteration is deemed necessary.

COMMENTS

The following are comments made on the management recommendations ("further investigation are needed to determine") section of Chapter VIII in Review of Trout Fishery Situation, Lassen Volcanic National Park, an unpublished manuscript by Orthello L. Wallis, 1955.

- A. Ratio of rainbow trout to Eastern brook trout; there are few brook trout in the lake, if any, and those that reside there probably tend to summer in Grassy Creek, which is cooler.
- B. Extent of chub population; 14.5% by number and 9.2% by weight.
- C. Size range of trout taken; to 1.14 kg.
- D. Amount of fishing pressure and relative success of the anglers; fishing pressure is medium to heavy for lakes in the park. Success is moderate. More fishing should be encouraged to aid the health of the trout population. Suckers and chubs should be removed high on the banks and/or buried when caught. They should not be returned to the lake.
- E. More about the biological and physical features of the lake; a study on the aquatic vegetation communities of the lake would be very interesting, especially the south end of the lake. This could be coupled with a limnological study. Special attention should be given to the invertebrates living in, on, or around the plants, as they may play an important role in the food web of this lake.

MANAGEMENT RECOMMENDATIONS

1. No fish shall be stocked in Snag Lake.
2. Trail crew should remove the garbage in and around the lake and on the lakeshore. This problem has been long unattended.

3. A further limnological study should be undertaken to note any changes since Everest's study of 1963.
4. A study of the aquatic vegetation communities should be undertaken when funds can be obtained.
5. No poisoning to remove trash fish shall be undertaken.