

CPR

REPORT ON TERRACE, SHADOW AND CLIFF LAKES

by

John R. West
September 7, 1976

INTRODUCTION

Terrace, Shadow and Cliff Lakes, located at the NE foot of Reading Peak in Lassen Volcanic National Park, were investigated August 30 and 31, 1976. This paper discusses and summarizes the general results of preliminary lake inventories performed on these water bodies.

MATERIALS AND METHODS

An experimental gill net was set in Shadow Lake on the night of August 30 and was removed 14 hours later on the morning of August 31. Terrace and Cliff Lakes were sampled with rod and reel for one hour each. Five small lakes in T30N, R5E, Sections 7 and 8 were inventoried during the study period.

All inventories included the measurement and observation of the following characteristics: water color, clarity, depth, temperature, abundance of aquatic invertebrates and vegetation, watershed condition, shoreline type, bottom type, use and accessibility.

RESULTS

Specific results of each lake inventory are given in separate lake reports.

The gill net set in Shadow Lake yielded one large (+2.5 lb.) eastern brook trout (*Salvelinus fontinalis*).

One hour of rod and reel effort on the morning of August 31 at Terrace Lake yielded eleven small brook trout. They ranged in size from 14.0 cm (5.5 in.) to 17.5 cm (6.9 in.).

Cliff Lake was clear enough so that the bottom could be seen. No fish was seen or captured in one hour of effort. Numerous dead and dying tadpoles were seen lining the shores of the lake and in the inlet stream.

Three small lakes between Shadow and Cliff Lakes in Section 7 were dry.

LASSEN VOLCANIC NATIONAL PARK
Research Library

Nature 13.1.76/046220
NPS

West
(Report)

Two small lakes near Cliff Lake in Section 8 contained water and one of them had a small glacier covering approximately 80% of its surface area. This "glacier lake" is very small and located adjacent to a scree slide at the bottom of the north slope of Reading Peak. We did not measure the size of the glacier but estimate that it is 125 feet in length, 75 feet in width and from three to ten feet thick.

DISCUSSION

The brook trout taken from Shadow Lake probably represents part of a very small population of similar fish. I feel that there may only be several other fish in this lake, if any at all. Shadow Lake was last planted in 1966 with rainbow trout (Salmo gairdneri). Terrace Lake, which evidently contains a reproductive population of brook trout, flows via its outlet into Shadow Lake. The outlet plunges down a nearly vertical "creek bed" into Shadow Lake and about 100 feet below. I believe that the brook trout captured in Shadow Lake was carried over the outlet of Terrace Lake, several years ago when it was a fingerling.

To survive such a fall fish must be quite small, such as those stocked from airplanes. This "carryover" may occur annually or every several years, but I seriously doubt that it would ever create a fishery worthy of note in Shadow Lake.

The "carryover" should indicate to resource managers the danger of stocking exotics in the uppermost lake of a multi-lake chain. In this instance, the park is lucky that no highly desirable species were located lower in the drainage. (Similar incidents have occurred in Sequoia and Kings Canyon National Parks, involving a mixture of golden trout (Salmo agua-bonita) and rainbow trout populations. Unfortunately, the most desirable species is usually the one that dies off or is degraded).

The relatively high catch rate (greatest found in the park so far) of brook trout in Terrace Lake indicates a fairly dense population. This is encouraging, until conditions of the fish are examined. I would say all fish captured were in poor to fair condition. Many small (ie: 5 inch) fish were mature and growth proceeds rather slowly following maturity.

Cliff Lake is one of the few lakes studied in the park that has spawning conditions suitable for rainbow trout reproduction. It was stocked with rainbow trout in past years, but something kept them from reproducing successfully. I believe that natural chemical conditions may inhibit successful spawning. A whitish-pink deposit (probably a compound of calcium) was noticed on most of the dry rocks and snags along the shore. Additionally, numerous dead and dying tadpoles were found in the inlet and around the shore. Some chemical phenomenon is apparently responsible for the death of these animals. No other dead vertebrate species were seen in the area.

The final point worthy of discussion is the "glacier lake" and its physical characteristics. I believe that this glacier is not just a heavy snowpack. The lowermost layers of it were composed of clear blue ice and the uppermost layers were "corn" snow. I feel that it may fluctuate in size from year to year, but it is apparently perennial in nature and probably fairly permanent.

Although I could come up with numerous research possibilities and management suggestions for this area, I will mention only those that I believe are most urgent and/or interesting.

Cliff Lake should be closed to camping or have stringent restrictions put on campers. It does not, at this time, show signs of overuse, but some campsites were found close to the water. Trash was present, but not abundant. I believe it is a delicate, beautiful, unique system and could easily be degraded by camper misuse.

Fishing should be encouraged in Terrace Lake for the remainder of this year. If sufficient numbers of fish are removed from the lake before next summer, the average size and condition of the fish population may be increased.

Annual monitoring of the size of the glacier at "glacier lake" might be of interest to the Interpretive Division.

None of the lakes in this area should be stocked, with the exception of Cliff Lake. It may be worthwhile to stock Cliff Lake with rainbow trout under the following conditions. A detailed limnological study should be performed to determine whether the lake is chemically suited to rainbow trout reproduction. If suitable and National Park Service policy will permit stocking, it should be stocked. No more than one group of fish should be stocked in this lake. If they are not successful at reproduction, the lake should be left alone.

Backcountry patrol should become a daily routine in this area. Day use is moderate to heavy and I suspect that some camping is done in closed areas. It would be an easy 1-2 hour downhill patrol from Road Marker 27 to the Summit Lake Ranger Station.

Terrace and Shadow Lakes, which are presently closed to camping, should be posted as closed to camping.