

KUNK and ANITA LAKES

INTRODUCTION

1. A plan for the hydroelectric development of two adjoining drainage basins on Etolin Island has been proposed by the town of Wrangell to replace its existing diesel generator facilities. Figures 1 and 2 show the location of Etolin Island in Southeastern Alaska and the area surrounding the two basins. As described in Federal Power Commission Preliminary Permit No. 2189, which was issued February 29, 1956, the project would consist of a three-stage development. The first stage would include a dam 40 feet high at the outlet of Kunk Lake (elevation 295 feet), 3,500 feet of penstock from the dam to the powerhouse at the mouth of Kunk Creek with a 2,200 horsepower turbine connected to a 1,500 kw generator; 6,000 feet of submarine transmission cable to Wrangell Island; and 14 miles of 25 kw transmission line to the town of Wrangell. The second stage would consist of the construction of two diversion channels each approximately 3,000 feet long, one from Anita Creek and one from the North Arm of Kunk Creek into Kunk Lake, and an additional 1,500 kw generating unit at the powerhouse.

The third stage would consist of 1,800 feet of tunnel tapping Anita Lake 50 feet below its present level of 1,500 feet elevation and connected with 3,500 feet of penstock to a powerhouse with a generating capacity of 4,000 kw at elevation 315 feet on Kunk Lake. Pertinent features of the proposed project are indicated on the map of Figure 2.

OBJECTIVES OF THE SURVEY

1. To determine the species of fish and wildlife inhabiting Kunk and Anita Basins.
2. To determine the extent to which spawning salmon utilize these drainages.
3. To evaluate the sport fishing potential of the area.

CHARACTERISTICS OF THE DRAINAGE BASINS

2. Neither Kunk nor Anita Basin possesses a resident human population. An excellent trail is maintained by the U. S. Forest Service from the mouth of Kunk Creek up to Kunk Lake, where a rustic lean-to is provided for the use of hikers and anglers. The nearest population center is the town of Wrangell which, in 1950, possessed a population of 1,263 persons.

3. Geologically, Etolin Island is composed of rocks of the Paleozoic and Mesozoic ages which were profoundly altered by the Coast Range batholith, an immense mass of granitic rock intruded into the area at about the time

when the Rocky Mountains were formed. The topography has been shaped and modified - in large part - by glacial action, with more recent stream erosion also a factor. Kunk Lake lies in a basin gouged out by the action of a glacier which flowed from the center of the island to the eastern coast. Anita Lake is situated in the cirque of a former glacier which probably contributed to that which formed the basin of Kunk Lake. No permanent ice fields now exist on Etolin Island, although snow remains at the higher elevations and in certain slide areas well into the summer.

4. Soils in the vicinities of both lakes are very shallow and composed largely of peat. Undeveloped glacial materials are exposed immediately beneath these vegetational deposits.

5. In common with Southeastern Alaska in general, the climate of Etolin Island is mild, being characterized by uniform temperatures and abundant precipitation. The weather station nearest Etolin Island is at Wrangell, which has an average annual precipitation of 84.4 inches and a mean temperature of 43.9°F. Below zero temperatures are quite rare for coastal locations in this region. Rainfall, although frequent, generally takes the form of mist or drizzle with thunder storms seldom occurring. Months of heaviest precipitation are those of September, October and November, and amounts totaling up to 35% of the annual precipitation may fall during this period.

6. Southeastern Alaska lies in the Sitkan biotic province, as defined by Dice (1943). Western hemlock and Sitka spruce are the dominant forest trees with western red cedar and Alaska cedar present in lesser abundance. In most locations a dense, shrubby understory exists, composed largely of blueberry and huckleberry. Fallen and decaying timber is strewn about the forest floor. Mosses, ferns and several species of small flowering plants constitute the ground cover.

7. The forest of Kunk and Anita Basins is of this general type with small stands of alder and black cottonwood also present. Sedges and rushes were common around the margin of Kunk Lake, while a nearby muskeg area supported scattered lodgepole pine.

KUNK LAKE

General Description

8. Kunk Lake is $1\frac{1}{2}$ miles long, $\frac{3}{8}$ mile wide, and of elliptical shape (Figures 2, 3 and 4) with its long axis having a northeast, southwest orientation. Steep mountains ranging up to 2,500 feet in height surround the lake on all sides, except to the northwest where a gently sloping muskeg saddle extends nearly $1\frac{1}{2}$ miles to the basin boundary. A total of 3.2 square miles drain to the outlet of Kunk Lake.

9. Depth contours for these lakes could not be obtained during this survey due to lack of proper equipment, although areas were found at which

the depth exceeded 50 feet. Bottom deposits are composed primarily of organic debris and silt, with sandy deltas being located around the lake margins, especially at the alluvial fans of tributary streams.

10. Water lillies were abundant in the shoal areas, which are limited to a narrow band adjacent to the lake margin and to a fairly extensive area near the lake's outlet.

11. The waters of Kunk Lake are darkly stained by humic substances, although the Secchi disk could be observed at a maximum of 22 feet. Surface water temperatures averaged 62°F during the period of survey, which is relatively warm for lakes in this region. The waters of the inlet seeps and streams averaged 54°F. It was noted that water temperatures in the outlet stream, Kunk Creek, averaged a few degrees cooler than the lake's surface water.

12. Areas which looked to be suitable for spawning were found generally distributed around the lake's margin, especially in the vicinity of the tributary stream deltas. Further up these tributaries, excellent appearing sand and gravel areas were present.

Methods

13. Gillnetting was the primary method used in sampling the fish populations. Two nets, each 90' by 6' and containing six sections of graduated mesh sizes ranging from $\frac{1}{2}$ " to 3" stretch measurement were set at different locations in the lake. The smallest mesh size was placed at the inshore