LIMNOLOGICAL INVESTIGATION OF SIX LAKES IN SOUTHEAST ALASKA George A. McCoy, William W. Wiggins, and Artwin E. Schmidt

Limnological data were collected in cooperation with the State of Alaska Department of Fish and Game from six lakes in southeast Alaska during the summer of 1974. The purpose of this study was to provide information for the management of the sport fishery resources of these lakes and to supply the U.S. Geological Survey with basic data that will facilitate the characterization of the lakes in this region. This study was supported in part by Federal Aid in Fish Restoration Funds, Dingell-Johnson F-9-7 project G-I-A granted to the State of Alaska, Department of Fish and Game.

Spurt Point, Swan, Green, Blue, Osprey, and Redoubt Lakes were visited twice during 1974. An attempt was made to reach each lake as soon as possible after the ice melted but before summer stratification and again in late summer when stratification was well developed. Thi schedule was not met at all the lakes because of logistical problems and delays caused by bad weather. Spurt Point Lake had already become stratified before the first sampling trip, and Swan and Spurt Point Lakes had begun to lose stratification when visited in late September Except for Blue Lake where the outlet was inaccessible, samples for chemical analysis were obtained from the outlet and from the center of each lake at depths of 1-2 m. If thermal stratification was noted, then two chemical samples were obtained, one from above and one from below the steepest part of the temperature gradient.

Water-quality data for six lakes in southeast Alaska, May 16 to September 28, 1974.

Analyses were made for major inorganic constituents, nutrients, selected trace metals, total organic carbon, and chlorophyll. Vertical profiles of specific conductance, temperature, dissolved oxygen saturation, and pH were drawn. Profiles extended to the bottom in all the lakes except Redoubt and Swan which are deeper than the maximum length (100 m) of cable available for the instrument used, a Martek Mark I water-quality monitoring system. 1/ All chemical samples were collected and analyzed in accordance with standard methods of the U.S. Geological Survey (Brown, Skougstad, and Fishman, 1970). Alkalinity was determined in the field by the electrometric titration method. Chlorophyll concentrations were measured using a Turner Fluorometer (Strickland and Parsons, 1968, p. 201).

1/ The use of brand names in the report is for identification only and does not imply endorsement by the U.S. Geological Survey.

Except for Redoubt, all of these lakes are chemically similar. The small differences in chemical composition probably reflect variations in geology of the drainage basins, altitudes, and morphometric characteristics of the lakes. The very low specific conductance, small amount of chlorophyll, low dissolved solids, nitrogen and phosphorus concentrations, and high transparency indicate that all the lakes studied have low productivity. It was not possible to determine from reconnaissance sampling the most or least productive of the lakes. Nutrients were low in all these lakes; phosphorus was at the limit o detection (0.01 mg/L) by the methods employed. The principal species of nitrogen was nitrate, but lesser amounts of organic nitrogen and ammonia were measured. With the exception of meromictic Redoubt Lake,

all the other lakes are probably dimictic and holomictic.

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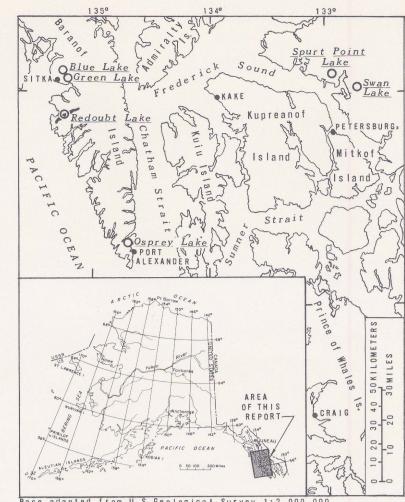
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METRIC-ENGLISH EQUIVALENTS

Metric unit		English equivaler
millimeter (mm)		0.03937 inch (in)
meter (m)		3.28 feet (ft)
kilometer (km) — — — — — — — — — —		.62 mile (mi)
square kilometer (km²)——————		.386 square mile
cubic hectometer (hm³) — — — — — — —	8	10 7 acre-feet



Base adapted from U.S.Geological Survey 1;2,000,000 Location of the six lakes in southeast Alaska.

Silver (Ag), cobalt (Co), cadmium (Cd), lithium (Li), beryllium (Be), bismuth (Bi chromium (Cr), gallium (Ba), germanium (Ge), tin (Sn), and zirconium (Zr) were not present in detectable quantities.

