

LAKE SURVEY DATA

SURVEYED BY: F.C. WITTLER
Fish Res. Board DATE SURVEYED: 1945 → ?

NAME: Swan MAP REF. CODE NO. 103P15E

DATA ON FILE:

| | | | |
|---------------------------|---------------|-------------------|--------------------|
| Physical Data | <u> x </u> | Fish Samples | <u> x </u> |
| Geography | <u> </u> | Stomach Analysis | <u> </u> |
| Chemical | <u> </u> | Scale Reading | <u> </u> |
| Flora | <u> </u> | Resort & Campsite | <u> </u> |
| Invertebrates | <u> </u> | Habitation | <u> </u> |
| Temperature Series | <u> </u> | Access | <u> </u> |
| Obstructions & Pollutions | <u> </u> | Oxygen | <u> </u> |
| Stocking | <u> </u> | Photography | <u> </u> |
| General Information | <u> </u> | Rehabilitation | <u> </u> Year |
| Miscellaneous | <u> </u> | Bench Mark | <u> </u> |

LOCATION:

Latitude, Longitude 55° 46' 30" : 128° 39'
Drainage, System → Club Lake → Stephens Lake & Creek → Kispiox R.
Elevation 1720 Ft.

PHYSICAL DATA:

| | | | |
|------------------------|---------------|-----------------------|---------------|
| Surface Area | <u> </u> | Volume | <u> </u> |
| Area, contour | <u> </u> | Shoreline Perimeter | <u> </u> |
| Maximum Depth | <u> </u> | Mean Depth | <u> </u> |
| Total Dissolved Solids | <u> </u> | Shoreline Development | <u> </u> |
| Bench Mark | <u> </u> | Secchi Reading | <u> </u> |

GEOGRAPHY

Immediate Shoreline:

Surrounding Country:

Lake Drainage:

production is relatively high but the eastern whitefish, adapted to plankton apparently as a result of the lack of their usual diet of bottom organisms, are using up much of the available food. It is of course possible that the sockeye young were never present in large numbers and, in such a case, the whitefish could not be considered as having replaced the salmon in the food cycle of the lake. The probability of this latter situation is indicated by the definitely limited spawning grounds of the system.

Morrison lake resembles most closely those lakes of the Skeena drainage designated as Class 2, *i.e.*, "rather shallow bodies of water, clear, of moderate temperature and abundant in plant life." It is, however, deeper than the average of the type and not outstanding in its production of flora.

The writer wishes to extend his thanks to Messrs. W. R. Hourston, M. P. Shepard and H. Godfrey for their able assistance in the collection and recording of the data. He is also indebted to Dr. A. L. Pritchard for guidance and help in the preparation of this paper.

Pacific Biological Station

V. H. McMahon

LAKES OF THE SKEENA RIVER DRAINAGE

VIII. LAKES OF THE LAC-DA-DAH BASIN*

To anyone faced with the investigation of the lakes of the Skeena drainage, one of the first problems to be solved is that of transportation. Particularly is this true of the Lac-da-dah basin, draining into the Kispiox river, which can be classified as one of the less accessible spawning areas. Unless air transport with its relative comfort is utilized, the investigator must resort to the older method of Indian pack-horse travel. This involves roughly paralleling on horseback and on foot the route taken by the adult salmon on their way to the spawning grounds of the Lac-da-dah.

Thus, one leaves Hazelton, at the junction of the Skeena and Bulkley, to proceed northward for eight miles along the Skeena river to the Indian village of Kispiox, which is situated at the mouth of the Kispiox river. Turning in a north-westerly direction, the trail follows the east bank of the Kispiox river past Grouse, Scounsnosit, Sweetin and Mongeese creeks flowing into the main stream. One of the highlights of the difficult four-day trip is thundering Kitwangulf canyon, which presents the upper limit of migration for the pink salmon, *Oncorhynchus gorbuscha*. At the entrance of Stephens creek, on turning westerly, the investigator arrives at Stephens lakes and thereby enters the Lac-da-dah, having followed the same route as the migrating salmon for at least 60 miles.

* The eighth in a series presenting general information on the lakes of Skeena river drainage particularly as it affects salmon production.

The Lac-da-dah, a chain of three lakes lying at approximately 55° 41' N. and 128° 40' W., is 40 miles directly NNW of Hazelton, and 70 miles east of the Portland canal. The drainage boundaries are marked by mountains which separate the area from the Cranberry drainage to the west and the Nass drainage to the north. Between the lakes and the Kispiox river are small hills whose lower portions run into marshland. Over all the surrounding territory is a thick growth of spruce under which the ground is deeply carpeted with moss, characteristic of the rainy forest belt along the coast.

Swan lake, the largest and uppermost of the lakes in the system, exhibits the most irregular shoreline and bottom configuration of the three. This is reflected by the forty-nine odd-shaped islands, which vary in size from over a mile in length to mere pinnacles of the underlying bedrock whose ridges, running in an east-west direction, project erratically above the surface.

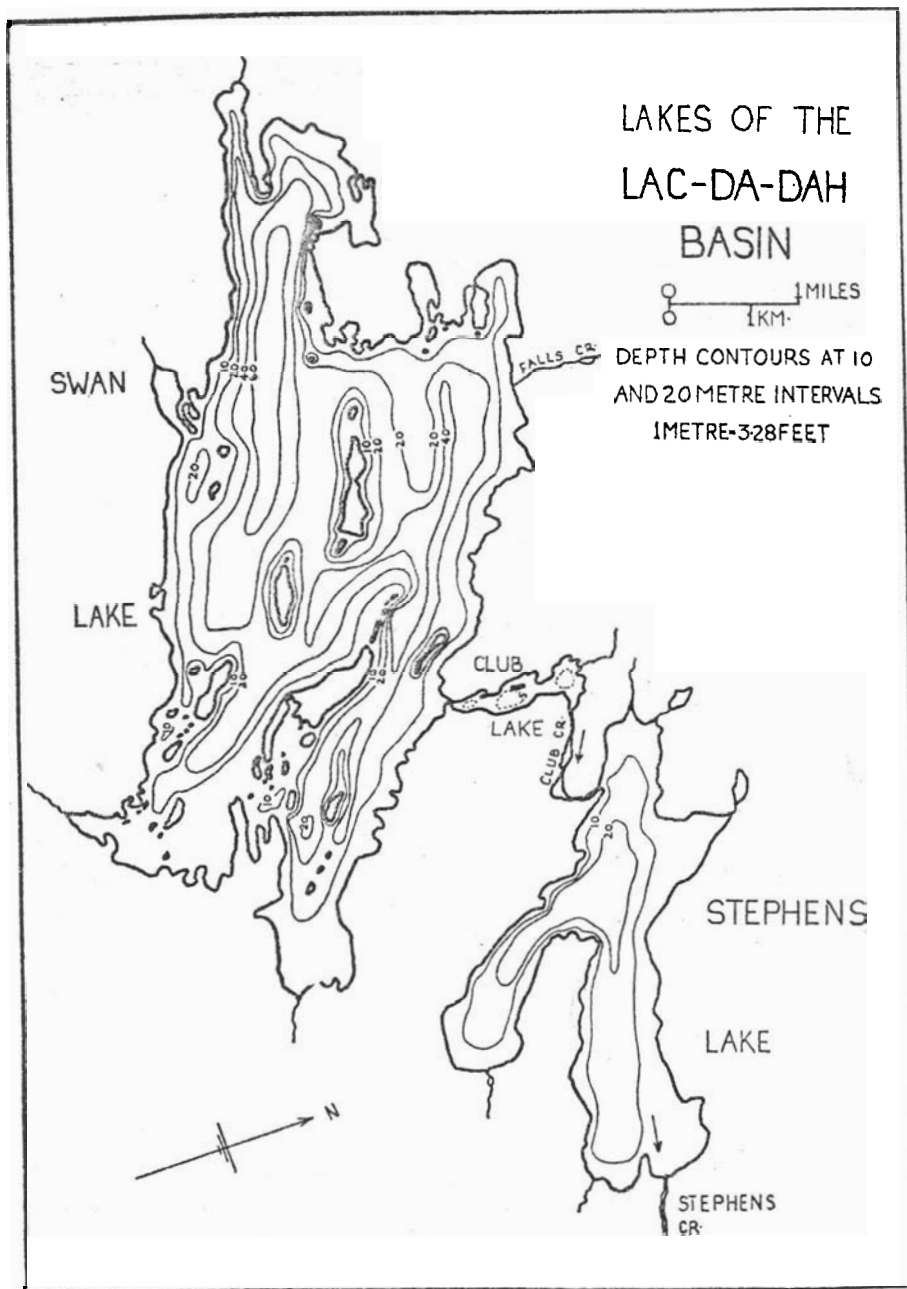
By comparison with the seven-mile length of *Swan lake*, *Stephens lake* is only four miles in length, and as can be seen from the accompanying map, is shallower and somewhat more regular in shape. *Club lake*, with a shallow muddy bottom, out of which flows Club creek, forms the intermediate link in the chain.

With their arrival in the area, the three species of salmon which migrate as far as the Lac-da-dah distribute themselves over the spawning grounds according to the inclination of the species. Accordingly, Stephens creek, draining out of Stephens lake, supports a small run of spring salmon, *O. tshawytscha*, and coho, *O. kisutch*, on approximately a quarter mile of good spawning redds. The sockeye, *O. nerka*, proceed through Stephens lake to Club creek, where the majority of this species arriving in the area tends to spawn. Although a considerable portion of Club creek is given over to gravel suitable for salmon redds, the sockeye can be seen in places actively spawning over boulders six to eight inches in diameter. This unusual behaviour is seldom observed in other streams of the Skeena.

For those sockeye passing through Club lake into Swan lake, the remaining stream of any size is Falls creek which, because of its limited spawning area, probably supports no more than a thousand fish at any time. Since sockeye in numbers considerably greater than this can be seen at the creek mouth in late August, and are often caught in net-sets widely dispersed over the lake, it is quite likely that those which do not utilize the aforementioned creeks spawn on the gravelly shores of Swan lake. Of all the limiting factors of sockeye production in the Lac-da-dah, the most obvious is that of restricted spawning ground area.

For the sockeye fry which hatch from the redds in the following spring, the lake environment which they enter is abundantly charged with food. Plankton hauls taken during August show that the plankton community tends to be dominated by copepods, represented by *Heterocope septentrionalis* and *Cyclops sp.* Cladocerans are fewer and probably provide a smaller portion of the young sockeye diet. *Heterocope* is unusual in its distribution in the Skeena drainage, being present in the Babine, Bear and Lac-da-dah lakes, but being absent in Lakelse or Morice lakes.

Both Swan and Stephens lakes exhibit a tenacious thermal stratification during the summer months. The surface temperature of Swan lake reaches 16.8°C. (60.5°F.), while at 64 metres (210 feet), the greatest depth discovered in the lake, the temperature is only 4.3°C. (40°F.). Probably



Map of the Lac-da-dah lakes showing tributary streams and bottom contours at 10-, 20-, 40- and 60-metre intervals.

because of the greater surface exposed to wind action, this body of water shows more heat transfer than Stephens lake whose surface reaches 20.3°C. (60°F.) and whose bottom water remains as cold as 5.0°C. (41°F). At all depths and temperatures, young salmon would find a sufficient supply of dissolved oxygen under summer conditions.

The presence of two predator fish in the lake environment may be a limiting factor in the survival of sockeye fry. For the dolly varden char, *Salvelinus malma*, and the rainbow trout, *Salmo gairdnerii*, which are taken fairly abundantly in nets set in both Swan and Stephens lakes, the average volume of young sockeye in the stomachs may reach 30% and 20% respectively. These amounts could certainly account for a large number of fry throughout the year. A bizarre feature of the dolly's diet is its predation on a land mammal, the red-backed mouse, *Eutamias sp.* In some years these mice are quite plentiful in the Lac-da-dah area and those which accidentally fall into the lake are eaten by the char.

No direct competitor for the plankton food supply exists in the Lac-da-dah drainage. The most common fish in both lakes is the long-nosed sucker, *Catostomus catostomus*, which is particularly abundant in Stephens lake where a shallow muddy bottom and abundant growth of water-weed, *Potamogeton sp.*, favour a large number of bottom organisms. Other bottom feeders, the Rocky mountain whitefish, *Prosopium williamsoni*, and eastern whitefish, *Coregonus clupeaformis*, are also abundant, as if to fill in the niche occupied by the peamouth, *Mylocheilus caurinus*, which is present in most of the lakes of the Skeena drainage, but notably absent in the favourable conditions of Stephens lake. Rarely caught in gill nets, but taken readily by hand seine, is the bull-head, *Cottus asper*, which occupies the shallow water of the shoreline.

Because the area is remote and quite untrammelled except for the occasional passing Indian trapper, the wild-life is relatively untouched. In the late summer and fall, such ordinarily solitary animals as the grizzly bear and eagle gather to feed on the spawned-out salmon on the redds (somewhat to the dismay of the nervous investigator). Ravens keep up a raucous chorus during the day, and owls continue the calls at night. Wolf and coyote can be heard ranging the foothills at dusk, and in autumn the moose emerge to feed on the water weeds on the lake shore. Beaver and mink can be seen along the lake shore and the creek beds.

Stephens lake belongs to the second category of lakes of the Skeena drainage since it is one of the "rather shallow bodies of water, clear, of moderate temperature, and abundant in plant life." Because Swan lake is relatively deep, it could better be called Intermediate. It is clear and of moderate temperature, but does not have the glacial characteristic of the first category of lakes.

The writer wishes to thank Mr. Oscar Schmuland who made the initial trip to the area in 1945, also Mr. Tommy Jack, who worked so conscientiously as guide and general camp-life advisor. Dr. A. L. Pritchard, in charge of the Skeena river investigation, arranged the numerous details of transportation and supplies.

Pacific Biological Station

F. C. Withler