

PLAN OF WORK AT LAKEELSE LAKE - 1949

A. Distribution of Personnel and General Outline

- April 10 - 20 McConnell - short trip to examine fence sites at low water immediately after break-up.
- May 10 - 31 McConnell and assistant - supplies, equipment and fence construction.
- 15 - 31 McKMahon and assistant - lake studies.
- Hourston^{2nd} " - preparation for Scully creek fence.
- June 1 - July 23 As above.
- Ragsdale and 3 others.
- With the exception of the lake studies party the work will be directly concerned with construction of the Scully fence first and later the Williams creek fence.
- July 23 - Sep. 15 McKMahon and assistant - lake studies.
- Hourston " " - Scully fence operation.
- Two assistants - Williams fence operation.
- McConnell (to August 25) - general administration, Lakelse river fence, odd man on fence operations.
- Ragsdale and 3 others - Lakelse river fence, Lakelse cabin.

B. Detail of Fence Construction Program.

April and May - Several factors such as high water, highway conditions and time of ice break-up on Lakelse may influence the exact timing of the early work. Essentially each fence site (Williams, Scully, Lakelse) will be examined at low water soon after the ice break-up (in normal years around April 12) and again at high water (usually the peak is reached in the latter part of May).

If a normal break-up is indicated by the climate the first examination will be made in the middle of April by McConnell. This will consist of photographing

the sites, examining the bottom, measuring the proposed lengths and setting up or recording water levels. Following this trip McConnell will ~~return to the Station to report on the situation and discuss it.~~ The actual summer field work

~~will begin May 3 when McConnell and Withler leave by truck, stopping at Babine on May 7. McConnell will proceed to Lakeelse with the truck, a winter-built boat and outboard motors.~~ *Around May 15 McConnell will proceed to Babine to pick up the clinker - built boat, and outboard motors + pile driver equipment.*

The usual work of setting up camp, painting boats, bringing in supplies including fuel, floating the two rafts, etc., will ~~occupy the remainder of May~~ *be done in April & Goodhead?* (except for the lake work instituted by McMahon). McMahon, ~~Kourston~~ and three assistants arrive May 15 (?).

The high water examination of the fence sites will be made after May 15 ~~the arrival of Withler (from Babine with the pile driver equipment) and possibly~~ *with the help of* an engineer.

June 1 - July 23. Otto Ragsdale and 3 men arrive after June 1 (here again high water may determine the exact time) to construct (1) a permanent fry-adult fence in Scully creek and (2) temporary adult fences in Williams creek. These fences and their accessories are to be ready for counting adults by July 23.

(1) Scully creek fence. It is proposed to install a "Wolf" type fry fence and standard picket adult fence as near to the mouth of Scully creek as possible. The adult count for 1949 will be the start of a stream ~~study~~ *Survival* study and the work will be left in the hands of ~~Mr. Kourston~~ *Goodhead*. In general his work will consist of examining the fence site (after a study of a similar fence at Fort John) and designing the Scully fence by June 1. During June and July he will be occupied with supervising construction, cutting trails, mapping the creek etc. The fence will be no longer than 40 feet with an adult trap to handle a ^{maximum} run of about 5,000 fish. Cedar lumber and piling will be used wherever possible. Operation will resemble that for Williams creek.

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(2) Williams creek fence. To complete the adult count for Lakelse lake it is intended to reconstruct the three old fences in the mouths of Williams creek if this appears at all feasible when examined in April. It is assumed that the bulkheads and platforms are still in good repair and that it will be necessary to rebuild only the pylon or A-frame structure and add new panels. It may be necessary to do some recking below and around the platforms. If possible the traps from the defunct Lakelse river adult fence will be used placing two of these in the main channel and one in each of the others. Probably the safest and most economical reconstruction would be replacement of the pylons and cross timbers as support for fairly short panels made of dressed 1"x4" slats on edge (spaced 1 1/4" apart). Work on this fence will probably occupy the first three weeks of July and when ready to operate two assistants will be chosen to run it under McConnell's supervision. *(It may be necessary to add another crew Epps?)*

July 23 - September 15. After completion of the Scully and Williams fences, Ragsdale and his crew will swing over to construction of the Lakelse river adult-yearling fence. This fence, to be located a short distance below Herman creek, will probably be about 250 feet long (depending on the height of the north bank and the necessity of damming to set up a Wolf fence). It should be driven with cedar piling and the platform sheet piled on both faces. Water conditions may prohibit work in the river itself during July and early August; however, many preparations can be made including cutting piling, transporting lumber and equipment, building a small cabin at the site. Following this the actual construction could begin timed to reach completion before the advent of the fall high water which occurs usually between October 15 and November 15. It will be best to complete the job by October 15 because of the difficulties of transportation during the winter low water period. There will be about three weeks of open water in April, 1950 to set up the fence for the yearling run.

C. Operation of Williams Creek Fence.

Records from the old fence (1939) showed the run into the creek starting on July 23 and building up to daily runs of from 1,000 to 3,000 per day between August 7 to August 20, thereafter dropping to zero on September 16. The total count that year was 24,000 and we might expect up to 50,000 in 1949 and consequently twice as many in the peak days. Apparently the fish tend to hold off the creek mouth and enter late in the afternoon on clear, calm, sunny days and also when the water is rising.

Objectives:

1. To keep a daily numerical record of the total number of sockeye.
2. To examine all fish for marks and record the length, sex and scales of the marked fish.
3. To sample the run randomly by measuring and sexing two percent. of each day's run (on the following day). *(about 1000)*
4. Some type of "jack count" should be instituted. Probably every jack should be counted as well as every serious injury, net mark and gaff mark.
5. To keep a daily record of water level and temperature.

The two men assigned to this fence will keep all the records and operate the fence with the help of McGonnell and men from the other crews if the need arises. It will be necessary to dip every fish and if the run tends to come in surges some assistance may be necessary. *from other groups at Lakeelse*

The division of responsibilities and duties is fairly exact but the program will require a certain amount of cooperation and integration especially between the fence construction and operation crews.

All measurements will be taken in the metric system.

LAKE STUDIES - LAKELSE, 1949.

Because of its reasonably small size, mesotrophic conditions and relative accessibility, Lakelse has been chosen as the most suitable lake on the Skeena system for the testing of fish culture methods.

The object of the new phase of the investigation is to develop methods of increasing salmon production and survival in fresh-water systems. A series of changes in the environments of the fish will be carried out and the effects of these changes on salmon production calculated. Before any changes are put into effect, however, it will first be necessary to learn more about the natural production and its controlling factors. Much of the data collected from the lake in the past will be useful in this regard. Such studies as:

Chemical-physical and climatological

Fish populations and feeding habits.

Plankton studies

Bottom fauna studies

should be brought together and summarized for future use. Such a procedure should show up weaknesses in the data and give a better indication of what more should be done along these lines.

For the 1949 season on Lakelse it is planned to make more comprehensive quantitative studies of the plankton and fish populations and to extend these studies throughout more months of the year. In addition to these an attempt will be made to learn more about the young sockeye during their lake residence, and a partial chemical analysis of the lake's waters will be made.

In the past, winter analyses have never been able to keep up with the collection of data in the field. As a result a back log of untouched data and samples have accumulated at the station. In order to avoid this in the future it has been decided to curtail collection of data to the point where we have reasonable assurance of its being analyzed and written up during the current year. Some of the analyses

will be carried out in the field this year.

In detail, the suggested studies are listed as follows:

I. Plankton Studies - Using plankton net (#10 silk) and trap (#10 silk).

Vertical and horizontal distribution -

1. Sample at Station I as in past years - twice monthly throughout the sampling year.
2. Sample at 5 or 10 metre contour intervals in lines from shore out to maximum depth. Two lines run diagonally across the lake will assure sampling at both ends and both sides of the lake. This will involve about 6 stations. *Total vertical (bottom to surface) & partial vertical (any desired depth to surface) hauls, involving a total of about 12 samples will be taken once per week throughout the sampling year.*

Standardization of nets -

Net catches will be checked against those of a plankton trap once per month at one of the above stations throughout the sampling year.

II. Fish Population Studies (other than salmon)

1. Since catch per net-night is still our best index of relative abundance, standard netting will be continued. Five or six sets will be made every two weeks at the standard positions already set up in previous years.
2. A creel census will be kept throughout the fishing season.
3. The stomachs of all predator fish taken in nets and by fishermen and a portion of the stomachs from all other fish will be preserved.
4. Length, weight, sex and scale data will be kept for all fish taken.
5. The creeks and lake shore will be checked for signs of spawning fish and the best methods of elimination of predator and competitor fish will be investigated.

III. Young Sockeye Studies

Every possible attempt will be made to capture young sockeye, with a view to determining their vertical, horizontal and temperature distribution as well as their feeding habits and growth rates. In 1949 this experiment will be exploratory - designed to test the feasibility of different methods of capture.

Daytime and nighttime tows will be made with a large hoop net, and other means of possible capture may be employed such as trapping or seining.

If and when any method of capture appears practical, then monthly collections in various parts of the lake will be established.

IV. Chemical Studies - using water bottle.

Oxygen concentration -

1. The dissolved oxygen content of the bottom, central and surface waters at the deep hole stations will be determined from monthly collections.
2. The unmodified Winkler method will be used as in past years and the results will be checked against those obtained using the Miller method. The more accurate and practical method will be adopted for future use.

Total phosphorus and nitrogen content -

1. Two 2-litre samples of bottom, central and surface water will be collected in conjunction with the O₂ sampling.
2. The samples will be sterilized with teluene or chloroform and sent south for analysis.

V. Temperature Studies - using reversing thermometer.

Temperature records will be kept in conjunction with all other lake studies.

VI. Analysis

It is hoped that much of the plankton and fish population data can be analyzed in the field.