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Fisheries Problems and Requirements Relating to the Kemano
Development

This report presents a brief outline of the major fishery problems associated with the Kemano development and suggests possible methods of overcoming these problems. The report is of a preliminary nature and is intended only as an aid to initial project planning. A comprehensive study is now being undertaken by the Department to supplement the 1951 report on the development and more conclusive information will be presented in a report later this year.

1. Nechako River below Kenney Dam

a) Minimum flows for transportation, spawning and incubation:

While the Nechako reservoir was being filled between 1952 and 1957 flows were regulated in the Nechako River above Fort Fraser by means of a temporary dam at the outlet of Murray Lake. Attempts were made to provide minimum flows from the Chestlatta system of 600 cfs during the migration and spawning period and 150 cfs during the incubation period.

Observations of the river during this time indicated that flows were adequate for the migration of sockeye runs through the Nechako River into Fraser Lake.

Escapement records show a decline in the number of chinook salmon spawning in the Nechako above Fort Fraser in the years following closure of the Kenney Dam. However, there is some indication that part of the run may have transferred to the Stellako River, although this will have to be investigated more extensively before any conclusions can be reached.

Depending upon the outcome of the study relating to chinook salmon, it can be assumed that the above minimum flows would closely satisfy requirements after ultimate development. Since migration and spawning occurs over a period of three months, the total annual release required from the Chestlatta system would be in the order of 189,000 acre feet.

b) Temperature control water

During July 1956 the average discharge of the Nechako River above Stuart was 1740 cfs as compared to approximately 17,000 cfs during pre-development years. Air temperatures were relatively high during the month and in one 12 day period the mean daily temperature remained above 60°F.

Consequently, the mean daily water temperature over the same period remained above 68°F and reached as high as 74°F. Fortunately this occurred prior to the period of upstream migration and no harm was experienced by the runs. Water temperatures in this range are considered to be lethal to adult salmon and if the high atmospheric

temperatures were experienced two weeks later, serious losses could have been incurred.

Based on 30 years of air temperature records at Vanderhoof, it has been determined that the average monthly air temperatures which occurred in 1956 would be equalled or exceeded on 4 out of 10 years in July and 3 out of 10 years in August. This could also be expected to apply to water temperatures if cold water is not released into the river and discharges are similar. Climatological data has been received from the Meteorological Service and is now being analyzed in conjunction with the water temperature records obtained on the river since 1952. The study will re-evaluate the predictions made in the 1952 report on temperature changes in the Nechako River. Until the results are known, however, we can do no more than reiterate the conclusions of the original report, which stated that up to 70,000 acre feet of 40°F cooling water may be required annually to maintain sub-lethal temperatures in the Nautley-Stuart reach of the river.

2. Nanika River

To maintain the Nanika River spawning grounds it will be necessary to release water immediately below the proposed dam. In order to provide a preliminary estimate of the quantity of water required, we must refer to the original Fisheries report on the development, which concluded that an annual release of 60,300 acre feet would maintain a large proportion of the Nanika sockeye runs.

The report also recommended that provisions be made to control water temperatures by incorporating surface and low level outlets in the dam, each capable of releasing up to 200 cfs.

Investigations will be carried out during the summer of 1971 to re-evaluate flow requirements in the Nanika and assess the effects of the diversion on the Morice and Bulkley rivers.

3. Dean River

The Dean River is utilized by all species of salmon with a total estimated annual escapement in the order of 30,000. The river also supports large runs of steelhead trout. All runs are confined to the Lower reaches of the river below Salmon House Falls, which is located approximately two miles above the confluence of the Dean and Takia River.

Flow records obtained at the mouth of the Dean River from 1923 to 1932 show an average annual discharge between 3370 and 6940 cfs. Therefore a continuous diversion of 530 cfs into the Nechako reservoir would represent from 8 to 16 percent of the total flow. However, without knowing the contribution of the various tributaries below Salmon House Falls, it is difficult to establish the magnitude of the effect of the diversion on the fisheries. Bio-engineering studies will be required to identify and assess potential problems relating to this diversion.

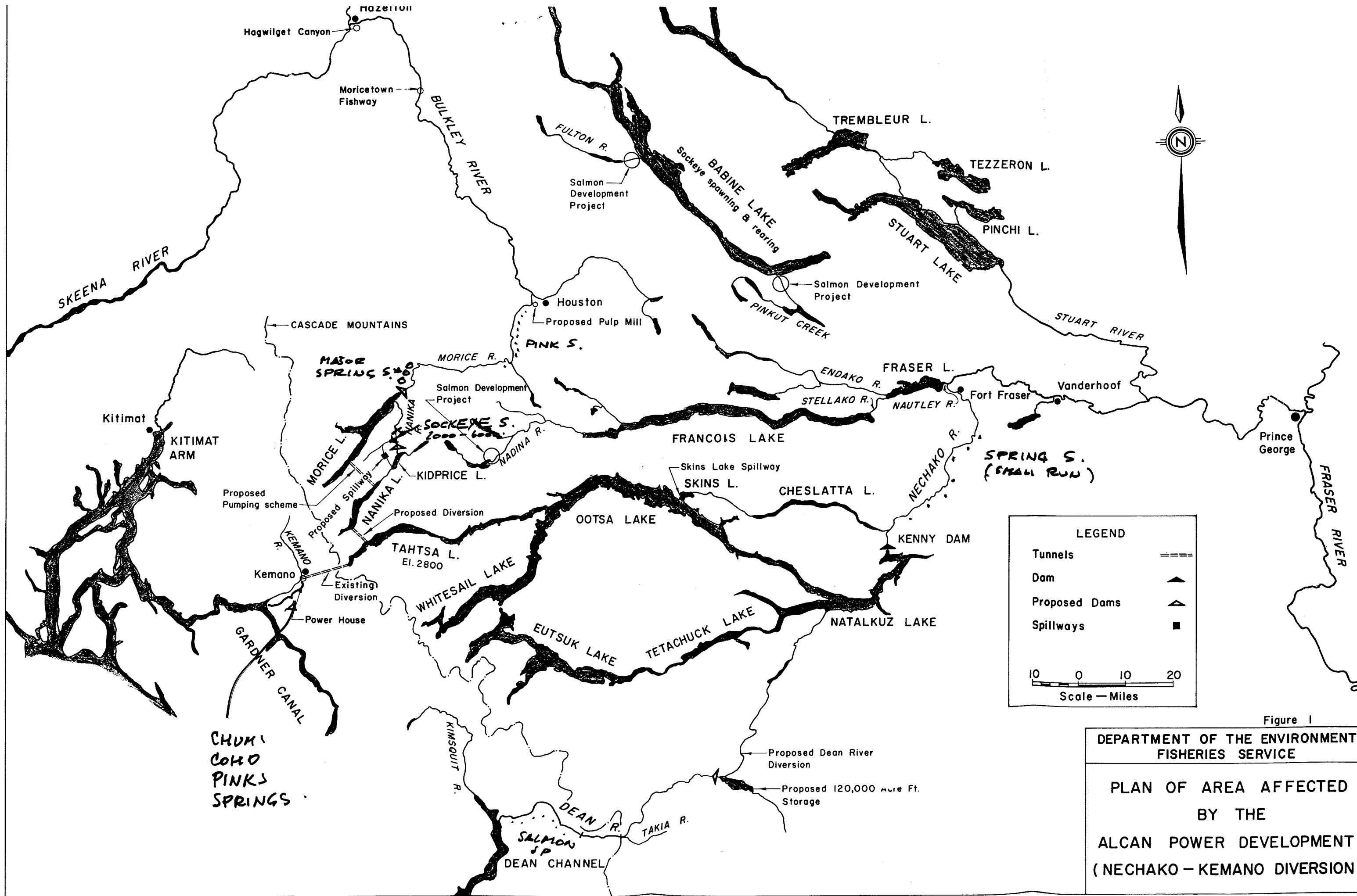


Figure 1
 DEPARTMENT OF THE ENVIRONMENT
 FISHERIES SERVICE
 PLAN OF AREA AFFECTED
 BY THE
 ALCAN POWER DEVELOPMENT
 (NECHAKO - KEMANO DIVERSION)