



Appendix XXI Fish Inventory

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NIMPKISH FISH AND FISH HABITAT INVENTORY

Rationale

Forestry activities may alter stream channel morphology, and hydrological and sediment regimes by creating increased siltation, temperature changes and hydrological changes. In causing these alterations, forestry activities may modify life histories and success of various riparian and aquatic species, and may alter the distribution of fish. Correct management of riparian areas is therefore essential, and consistent with the objectives for Riparian Management Areas (RMAs). Accurate classification of streams is a critical component for minimising the effects of land-use practices upon stream channels and aquatic ecosystems including fish populations, their habitats, and water quality. RMAs around streams consist of a Riparian Management Zone, and where required, a Riparian Reserve Zone. The width of these zones is determined by the physical and biological attributes of streams and adjacent terrestrial ecosystems. An important attribute of streams is the presence or absence of fish species and barriers that inhibit fish movement. A fish inventory in the Nimpkish Valley will assist in fish stream identification on TFL 37, FL A19233, and TL TO860. Fish species include anadromous species such as Chum Salmon, Pink Salmon, Sockeye Salmon, Chinook Salmon, Coho Salmon and Steelhead, and resident fish species (Dolly Varden, and Cutthroat Trout).

Objectives

- To inventory and map fish distribution, by species, in previously unsurveyed subdrainages of TFL 37, FL A19233, and TL TO860 with priority given to areas where logging is proposed within the next five years.
- To inventory barriers which restrict salmon and resident trout distribution in unsurveyed subdrainages within TFL 37, FL A19233, and TL TO860.

Proposed Inventory Approach

The first step that would have to be completed is a GIS analysis of all the creeks on TFL 37. By using the GIS, we can determine the stream reach breaks based on gradient and creek width. Creeks which have a gradient of less than 25% will be classified as having fish potential and creeks greater than 25% will be classed as no fish potential. Only a limited number of creeks greater than 25% will be surveyed.

Data on fish and fish habitat have been collected for over 20 years in the Nimpkish Valley by various groups, such as Canfor, 'Namgis First Nations, MELP and DFO. Most of the data appears to be from main drainages within the Nimpkish system. Under Watershed Restoration Program, Canfor has hired a consultant to compile all existing fish data for the Nimpkish drainage. His report should be available by March, 1998. Data from the watershed restoration project will be incorporated to ensure that duplication of data does not occur. Once this information is available, we can prioritise subdrainages for surveys and determine the level of survey intensity required.

Two different survey methods will be used. The first follows the Resource Inventory Committee's Reconnaissance Fish and Fish Habitat Inventory Manual. This method involves sampling fish and fish habitat very intensely on a few randomly selected creeks. The second survey technique involves collecting only the fisheries data that industry needs to meet the Code. This method will allow us to survey a greater number of creeks for fish presence than by following the RIC standards would allow.

Reconnaissance Fish and Fish Habitat Inventory

RIC developed the reconnaissance inventory to cover entire watersheds. Due to the high cost of this inventory, funding is not available to sample all the creeks within a watershed. A sampling program based on statistical protocols must be developed. After the sampling program has been designed, it must be approved by MELP prior to conducting field work.

The following habitat information will be collected from each stream sampling site: site length, channel width, stream cover, crown cover, large woody debris, in-stream vegetation, bank characteristics (i.e., shape, texture, vegetation stage), flood signs, depth at channel bankfull width, stage of discharge, temperature, pH, conductivity, turbidity, bed material (size and description), largest movable particle, channel morphological, classification, disturbance indicators, creek patterns, islands, bars, coupling, confinements, features (i.e. beaver dams), fish community, wildlife community, and 4 site photographs.

The following habitat information will be collected from each lake: terrain characteristics (lake setting, lake basin genesis, aspect, hillside coupling and land use), shoreline characteristics (shoreline type, shoreline cover, and recreation facilities), lake access category, describe lake inlet and outlet (including a full stream survey), fish community, water quality, bathymetric survey, aquatic vegetation, aquatic wildlife, and photographs.

Two sampling techniques must be carried out on each creek and lake chosen to be surveyed. Most of the time we will be using electro-shocking and fry trapping to determine the fish community in creeks. The following information will be collected from the fish: species, length, weight, age, sex maturity, parasites, and photographs.

Operational Fish Inventory

The reconnaissance fish and fish habitat inventory allows a certain degree of bias in the random sample of creeks. This bias will allow us to target creeks with fish potential that are within proposed cutblocks. This inventory is designed to ensure the correct classification of fish creeks that are not surveyed by the random sample.

For each identified area, we will:

- Determine stream reaches, reach breaks, and gradients if not already identified for streams in question.
- Identify and map fish streams that were located in the field.
- All potential barriers to fish movements (e.g. canyons, waterfalls, debris jams, and dams) will be noted.

Fish surveys will then be conducted to confirm fish presence or absence, and identify all fish species sighted. Fish sampling methods will be consistent with those recommended by the Resources Inventory Comm (RIC). These may include visual sightings of identifiable species (i.e. adult salmonids during spawning periods trapping, and electro-fishing.

The following information will be recorded at each survey site: water temperature and flow conditions (wh high, moderate, or low), sampling methods used, list of species observed and caught, any potential barriers to movement, floodplain areas not already noted, and any problem areas such as sources of sediment that could to impacts downstream if disturbed.

Community Stability

The Nimpkish Fish Inventory will provide stable employment for residents of the North Vancouver Island Area for at least 2 months per year for 3 to 5 years depending on funding availability. After the workers have completed this project, I expect they could obtain future employment doing fish inventories for other forest companies, or government. Forest companies will usually have creeks in proposed cutblocks that

will need to be checked for fish presence. Also, forest companies will have a need for reconnaissance level fish and fish habitat inventories to provide information on habitat availability and accurate fish creek classification and mapping.

Deliverables

- A monthly progress report will be submitted on the fifteenth of each month.
- A draft annual report will be produced by February 1, 1998 and a final annual report by March 31, 1998. The report will outline:
 - (i) 1:20,000 or 1:50,000 maps identifying all fish streams surveyed in the area, fish distribution (separated by resident and migratory species) stream reaches and gradients, reach boundaries, barriers to fish movement, and species detected in each. All information collected for reconnaissance level surveys will be summarised. Digital information, in ArcInfo format, will be provided to provincial ministries to integrate with existing provincial inventory data.
 - (ii) trends in species number and distribution.
 - (iii) detailed financial statement