PACIFIC SALMON COMMISSION
TRANSBOUNDARY TECHNICAL
COMMITTEE REPORT

SALMON MANAGEMENT AND ENHANCEMENT PLANS FOR THE STIKINE, TAKU AND ALSEK RIVERS, 1999

REPORT TCTR (99)-2

This plan was finalized at the June 1999 meeting of the Transboundary Technical Committee

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ACRONYMS

ADFG	Alaska Department of Fish and Game
DFO	Department of Fish and Oceans, Canada
DIPAC	Douglas Island Pink and Chum, Inc.
NSRAA	Northern Southeast Regional Aquaculture Association
TFN	Tahltan First Nation
TRTFN	Taku River Tlingit First Nation
CAFN	Champagne/Aishihik First Nations

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INTRODUCTION

Management of transboundary river salmon to achieve conservation, allocation and enhancement objectives, as stipulated by the Pacific Salmon Treaty, requires a co-operative approach by Canada and the United States. It is important that both Parties have a clear understanding of the objectives and agree upon procedures to be used in managing the fisheries, including the criteria upon which modifications of fishing patterns will be based. This document is intended to facilitate co-operative salmon management and research on transboundary stocks of the Stikine, Taku, and Alsek rivers conducted by the Canadian Department of Fisheries and Oceans (DFO), the Tahltan First Nation (TFN), the Iskut First Nation (IFN), the Taku River Tlingit First Nation (TRTFN), and the Alaska Department of Fish and Game (ADF&G).

The report contains, by river system and species, the 1999 salmon forecasts, spawning escapement goals, a summary of harvest sharing objectives, and an outline of management procedures to be used during the conduct of the 1999 fisheries. With the exception of Stikine sockeye salmon, for which a numerical forecast is required by the Pacific Salmon Treaty and by the Stikine Management Model and Taku River sockeye salmon, forecasts are given qualitatively, with reference to brood year escapement data where available. The report also contains joint enhancement plans for fry plants and egg collections in 1999 and proposed transboundary field projects for the year, identifying agency responsibility and contacts for the various functions within the projects.

STIKINE RIVER

Sockeye Salmon

Stock Definitions

Stikine sockeye salmon are, for management, enhancement, and monitoring purposes, subdivided into four stock groups: 1) **wild Tahltan stock** which are those fish originating from naturally spawning sockeye in Tahltan Lake; 2) **enhanced Tahltan stock** which are those fish originating from broodstock collected at Tahltan Lake and whose fry are backplanted into Tahltan Lake; 3) **Tuya stock** which are those fish originating from broodstock collected at Tahltan Lake and whose fry are backplanted into Tuya Lake; and 4) **mainstem stock** which are all remaining sockeye populations in the Stikine River. For management purposes, the collective wild and enhanced Tahltan stocks are referred to as the **total Tahltan stock** or, sometimes, just Tahltan stock.

Preseason Forecast

For 1999, the total run forecast for Stikine sockeye salmon is 126,000 fish, which constitutes a below average run and one similar to the 1998 run. For comparison, the recent ten-year average (1989-1998) total Stikine sockeye run size is approximately 197,890 fish. The 1999 forecast

includes approximately 61,000 wild Tahltan sockeye (48%), 3,000 enhanced Tahltan sockeye (2%), 29,000 Tuya sockeye (23%), and 33,000 mainstem sockeye (26%).

The 1999 prediction is based on the following components:

1. a sibling-based forecast of 64,000 for the total Tahltan stock of which approximately 3,000 are expected to originate from the enhanced component;
2. a forecast of 29,000 Tuya sockeye, which is the average of a sibling-based forecast (21,000) and a forecast based on 1998 fry-to-adult survival (37,000); and
3. a sibling-based forecast of 33,000 mainstem stock.

Given an escapement goal of 24,000 sockeye for the total Tahltan stock, 30,000 for the mainstem stock, and an expected terminal escapement of 18,000 enhanced Tuya stock, the preseason forecast of total allowable catch (TAC) is 51,000 Stikine sockeye salmon. The 1999 outlook is characterized as below average for both the mainstem stock and the Tahltan stock and a weak return of the enhanced Tuya stock.

Tahltan Sockeye Forecast

The sibling forecast technique used for the Tahltan stock is based on the relationship between the return of age-4 fish in one year and the subsequent total run in the following year. Since enhanced Tahltan fish are free to spawn naturally each year, no distinction is made for wild versus enhanced Tahltan components in this forecast. Using data from both enhanced and wild Tahltan returns, the relationship between the return of age-1.2 (4 year olds with two years in marine waters, also designated as $4_{(2)}$) fish in one year and the subsequent total (all ages) run in the following year is described by the following equation:

$$N_t = 14{,}191 + 9.4693 \bullet N_{1.2,t-1} \qquad [1]$$

where: N_t = total Tahltan run in year(t); and
$N_{1.2,t-1}$ = total Tahltan age-1.2 return in year(t-1).

The return of age 1.2 Tahltan sockeye in 1998 was estimated to have been approximately 5,300 fish. Using equation [1], a run size of approximately 64,000 Tahltan sockeye is expected in 1999. The estimated wild component of this forecast is 61,000 sockeye; the estimated enhanced portion is 3,000 sockeye.

The other forecast method examined for Tahltan sockeye, but not used in 1999, was based on smolt data and average survival rates for individual age classes. Average rates of return for 1999 age classes were estimated as follows: 6.9% of the 1.485 million age 1+ smolt counted in 1996 are expected to return as age 5(2) in 1999; 3.8% of the 0.480 million age 1+ smolt counted in 1997 expected to return as age 4(2) in 1999; 6.5% of the 74,000 age 2+ smolt counted in 1996 expected to return as age 6(3) in 1999; and 12% of the 38,000 age 2+ smolt counted in 19967 expected to return as age 5(3) in 1999. Using average smolt-to-adult survival rate data, the 1999 expected return is 130,286 total Tahltan sockeye. The estimated wild component of this forecast is about 119,000 sockeye; the estimated enhanced portion is 11,000 sockeye. Using 1998 smolt-to-adult survival rate gives an expected return of 62,000 total Tahltan sockeye, 57,000 wild and

5,000 enhanced fish. The smolt-base estimate was not used in 1999 due to the uncertainty in the survival estimates. The low recent survivals are incorporated in the sibling-based forecast that was used.

The 1999 preseason Tahltan sockeye forecast that will be used for management purposes at the beginning of the season is 64,000 sockeye derived from sibling relationships. A run of this magnitude would be below the previous 10-year average of 100,494 sockeye and below the previous 5-year average of 128,627 sockeye. Last year's return of 43,000 was 68% below the preseason forecast of 63,500.

Tuya Sockeye Forecast

A sibling forecast based on 2,000 age-4 fish in 1998 gives a forecast of 21,306 Tuya sockeye for 1999.

A fry-to-adult survival-based forecast for the 1999 run of Tuya sockeye applied the 1998 age-specific sockeye fry-to-adult survivals observed at Tuya Lake to the estimated number of fry outplanted in Tuya Lake in 1994 (BY 1993), 1995 (BY 1994) and 1996 (BY 1995). This gave predicted returns of 4,000 age-4 sockeye, 18,000 age-5 sockeye, and 15,000 age-6 sockeye for a total forecast of approximately 37,000 Tuya sockeye for 1999.

The forecast used, an average of the above two estimates, is 29,000 Tuya sockeye for 1999, which is below average. The average run size (1995-1998) is 38,379 fish. The preseason forecast for last year was 59% below the postseason estimated run size.

Mainstem Sockeye Forecast

The method used to produce the mainstem sockeye salmon forecast for 1999 is based on a sibling forecast technique using regression data from 1983 through 1997. Annual runs were reconstructed using marine catch estimates based on ADF&G scale pattern analysis and lower inriver catch estimates based on a variety of stock identification techniques (SPA, egg diameters, parasite frequency, electrophoretic data); the contribution of mainstem stocks to upper river commercial and aboriginal fisheries has been assumed to be 10% for years prior to 1997 and has been estimated from egg diameter since 1997. Mainstem escapement was calculated through the subtraction of the reconstructed inriver Tahltan run and the estimated inriver catches of mainstem sockeye from the total inriver run estimates.

Linear regression of age-1.2 mainstem sockeye salmon ($N_{1.2}$) on the following year's total run (catch and escapement, all ages) of mainstem sockeye salmon (N) for the years 1983 to 1997 yielded the following equation:

$$N_t = 26{,}711 + 5.7836 \bullet N_{1.2,t-1} \qquad [2]$$

Based on equation [2] and a preliminary total return estimate of 1,100 age-1.2 mainstem sockeye in 1998, the 1999 sibling forecast for mainstem sockeye salmon is 33,000 fish.

A second method examined, but not used in 1999, was forecasting the mainstem run using the stock-recruitment relationship for the mainstem component from 1979-1993 as described by equation:

$$N = 1.5049 + 0.000020768 \bullet S \qquad [3]$$

Where N = return, and
S = spawners.

The forecast estimate for the 1999 return from this method is about 77,000 fish; the correlation coefficient for this relationship is 0.71. In 1998 the actual run size was 43% the forecast given by this method, likely due to reduced ocean survival. Assuming the same reduced survival in 1999 as 1998, the run would be estimated at 44,000 mainstem sockeye.

For 1999, the forecast run size was taken from the sibling-based procedure and is 33,000 mainstem sockeye. Relative to the previous 10-year (1989-1998) average estimated run size of 82,044 sockeye, the mainstem sockeye component of the 1999 run is expected to be well below average.

The over two-fold difference in the forecasts by the two methods (sibling and stock-recruitment) for all three components of the Stikine run indicate a high level of uncertainty in these preseason forecasts. The various preseason forecast techniques also suffer from a relatively short time series of data and, therefore, not surprisingly, there have been wide discrepancies between past forecasts and actual runs. For example in 1998, the total run was forecast as 218,500 whereas the preliminary estimate of actual return was 128,000; this poor survival could be due to both poor survival in the marine and returning freshwater environment. It was also noted in 1998 that the return of 4-year olds was the lowest observed since sibling forecasts have been used, which may be indicating poor marine survival. Despite problems with preseason forecasting, these forecasts are useful for management until we have inseason data with which to revise our forecasts.

Spawning Escapement Goals

Escapement goals have been established by the Transboundary Technical Committee (TTC) for two of the Stikine sockeye stocks: the total Tahltan and the mainstem stocks. The Tahltan and mainstem stocks are considered to be independent; surpluses or deficits in escapement realized in one stock are not used to balance deficits or surpluses in the other. In theory, the Tuya stock, an enhanced stock with no current available spawning ground, has a spawning escapement goal of zero. In practice, since the Tahltan and Tuya stocks commingle and have the same run timing, they are harvested at the same rate as the Tahltan so as not to over harvest the Tahltan stock.

Spawning escapement goals have been established as ranges which reflect biological data regarding stock productivity, the ability of existing management systems to deliver established goals, the accuracy and precision of estimates of escapement generated by stock assessment programs, and the degree of risk considered acceptable.

Management subjective categories have been defined for various escapement levels. A postseason estimate of escapement that falls within the Green Management Category shall be considered fully acceptable; one that falls within the Yellow Management Category shall be considered acceptable but not desired; and, one that falls within the Red Management Category shall be considered undesirable. The escapement goal ranges by management category represent our best judgement of desired escapement levels.

Tahltan Stock

In 1993 the TTC established an escapement goal of 24,000 fish for the Tahltan stock, which takes into account an escapement goal of 20,000 naturally spawning fish and the approximately 4,000 fish needed for broodstock to meet the objectives of the current Canada/U.S. Stikine enhancement program. Management escapement goal ranges for the various management categories for the Tahltan stock are:

	TARGET = 24k				
Escapement	0 - 12k	13k - 18k	18k - 30k	30k - 45k	>45k
Mgmt. Category	Red	Yellow	Green	Yellow	Red

Mainstem Stock

Management escapement goal ranges for the various management categories for the mainstem stock are:

	TARGET = 30k				
Escapement	0 - 15k	15k - 20k	20k - 40k	40k - 75k	>75k
Mgmt. Category	Red	Yellow	Green	Yellow	Red

Data Exchange

The following data for the Tahltan sockeye stock will be collected and exchanged for use in evaluating escapement goals:

1. spawning escapements, separated by wild and enhanced components;
2. smolt production, separated by wild and enhanced components; and
3. stock specific catches in the various fisheries.

The following relationships for the Tahltan stock will be examined:

1. total run as a function of spawning escapement level;
2. smolt production as a function of the number of spawners and outplanted fry;

3. adult production as a function of the number of smolts; and
4. total run as a function of the return of age-4 sockeye in the previous year.

The following data for the mainstem stock will be collected and exchanged for use in evaluating escapement goals:

1. survey counts of mainstem stock escapements;
2. the mainstem stock component of catches from the various fisheries; and
3. inventory and assessment data regarding the historical pattern of distribution, abundance, and timing of spawning fish.

The following relationships for the mainstem stock will be examined:

1. total escapement as a function of survey counts of escapement;
2. total run as a function of total spawning escapements;
3. total run as a function of the return of age-4 sockeye in the previous year; and
4. relation of total run to patterns of distribution and timing.

Methodology for evaluating escapement goals is being developed by the TTC and will be used in reviewing escapement goals.

Harvest Sharing Objectives

The Pacific Salmon Commission negotiated long-term Pacific salmon harvest sharing agreements in June 1999, although the text of the agreements are not available at this writing. Stock assessment and harvest arrangements for Stikine sockeye stocks are found in Annex IV, Chapter 1, of the Pacific Salmon Treaty and in three associated joint enhancement Understandings dated February 1988 and February 1989, the third being developed in 1999. Harvest sharing in 1999 for Stikine sockeye salmon is similar to recent years.

Management plans for the 1999 Stikine harvest are for the TAC of Stikine sockeye, both natural and enhanced, to be shared 50/50 between the Parties in the usual fisheries. However, if the usual fisheries do not manage to catch the entire TAC, terminal catches in Canada taken under "Excess Salmon to Spawning Requirement" (ESSR) licenses will be allowed to avoid over escapement (relative to escapement goal ranges).

Management Procedures

United States

The District 106 drift gillnet fishery occurs in the waters of northern Clarence Strait and Sumner Strait, in regulatory Sections 6-A, 6-B and 6-C, and portions of Section 6-D (Figure 1). The District 108 fishery encompasses the waters surrounding the terminus of the Stikine River (Figure 1). Due to their close proximity, management of these fisheries is interrelated, resulting in some major stocks being subject to harvest by both fisheries. Two distinct management areas exist within each district: the Frederick Sound (Section 8-A) and Wrangell (Section 8-B) portions of District 108, and the Sumner Strait (Subdistricts 106-41/42) and Clarence Strait (Subdistrict

106-30) portions of District 106. Fishing gear used in Districts 106 and 108 is similar, with common sockeye net sizes of between 5 and 5½ inches (130-140 mm) stretched mesh, 60 meshes deep and 300 fathoms (549 m) long. The sockeye salmon fishery in both districts will be managed in accordance with recent transboundary Pacific Salmon Treaty (PST) annex provisions.

The fishing season will start at noon on Sunday, June 20 (statistical week 26) for a 48-hour open period in both Districts 106 and 108. District 108 will open at the same time as District 106 rather than open during the second week of June, as occurred during the 1995-1997 period.

Management actions during the sockeye fishing season will be based on analysis of commercial gillnet CPUE and stock identification data to determine the availability of Stikine fish. These stock abundance indicators, along with fishery performance and stock composition data obtained from Canadian commercial, test, and subsistence fisheries will be incorporated into the Stikine Management Model. As the season progresses, this model will be the primary tool used to estimate the availability of sockeye salmon for harvest by the Alaskan fishery in District 108.

Management actions to reduce the harvest of Stikine sockeye salmon are expected in 1999 because of the small forecasted run size of Tahltan and mainstem sockeye, relative to the 1993-1997 period. If inseason forecasts of run strength indicate that conservation actions are needed, the following measures could implemented: no mid-week openings, no extensions to the early week openings, restrictions in fishing time in District 108, closure of District 108, time restrictions in Sumner Strait, and, finally, closure of Sumner Strait. If the sockeye runs to local Alaskan island systems are determined to be weak, area and time restrictions may be necessary in District 106. Should the Tahltan sockeye run appear to be stronger than projected, then fishery extensions and/or mid-week openings will be allowed as necessary to harvest surplus sockeye while meeting the provisions of the PST Transboundary annex. Any additional openings or extensions will be based upon the most recent Stikine sockeye model update and the cumulative estimated U.S. harvest. Open areas and fishing time during mid-week openings may not necessarily be the same as the general weekly openings if adjustments are needed to reduce chinook salmon or other species catches.

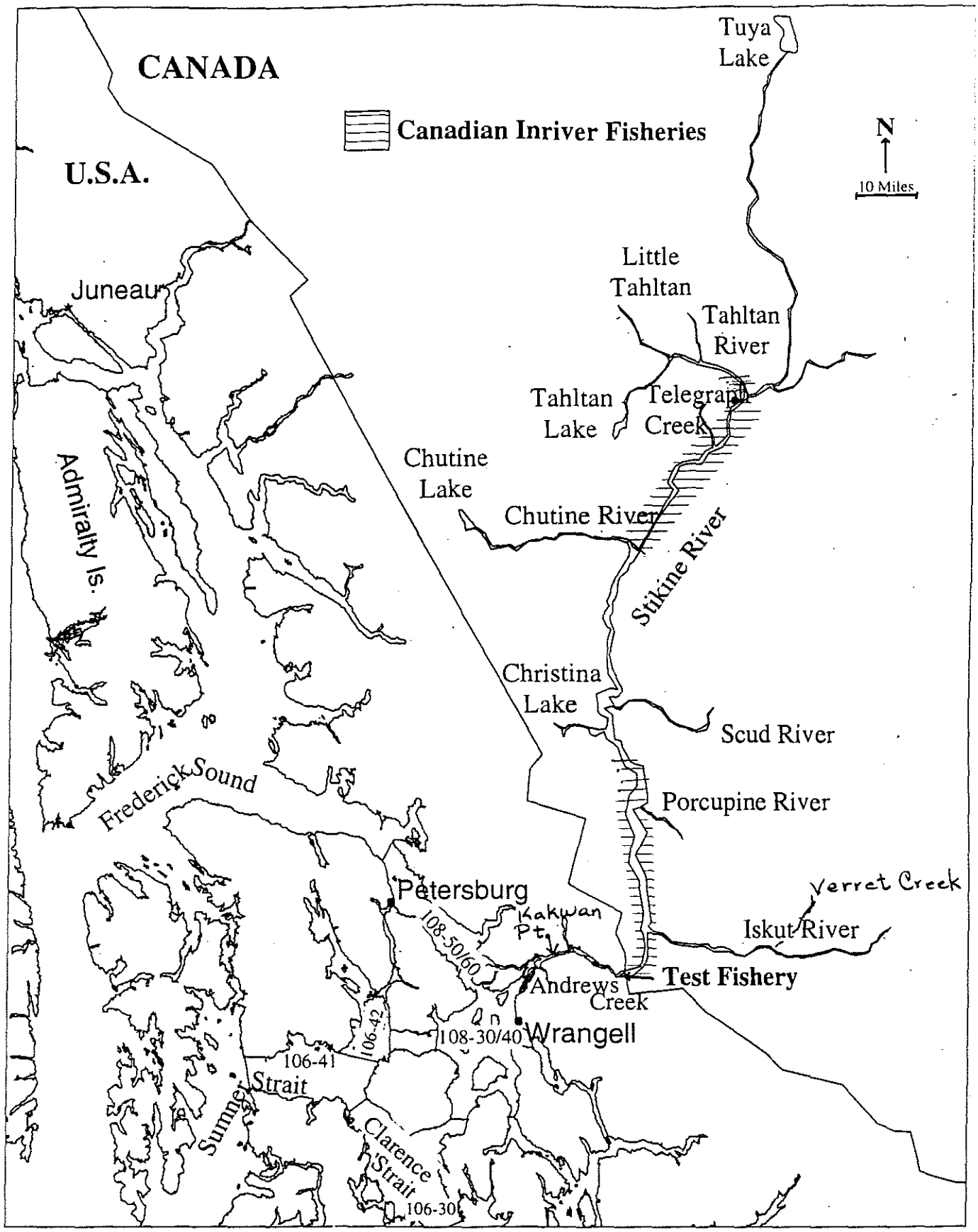

Figure 1. The Stikine River and principal U.S. and Canadian fishing areas.

Announcements for fishery openings throughout Southeast Alaska are made on Thursday afternoons for gillnet fisheries, which begin the following Sunday. Announcements for any mid-week openings will be made on the fishing grounds by 10:00 a.m. of the last day of the regular fishery opening in order to adjust the mid-week period to best follow the most current catch data.

To avoid harvesting chinook salmon, the Stikine flats will not open until the first Sunday in July. Due to the late opening of the gillnet season on June 20, the expected reduced fishing times in District 108 and the expected good run of upper Stikine chinook, the area restrictions during initial openings, implemented during the 1995-1997 period, will not be necessary. If fishing effort and the incidental harvest of chinook is high during the first opening then additional area restrictions will again be implemented.

Pink salmon should begin entering District 106 in significant numbers by the third or fourth week of July. The early portion of the pink salmon fishery will be managed primarily on CPUE. By mid-August, pink salmon destined for local systems will begin to enter the fishery in greater numbers and at that time, management will be based on observed local escapements. In District 108, chum salmon runs into Frederick Sound are a management consideration beginning the end of June. Chum salmon run strength assessments are based upon CPUE in test and commercial fishery catches.

The coho salmon season will occur during late August and early September. Limited directed fishing in terminal areas are anticipated in District 108. Management of the District 106 fishery will be based predominantly on wild stock CPUE. Substantial contributions from several Alaskan hatcheries and from the remote release site at Neck Lake in upper Clarence Strait are expected to contribute coho salmon in the District 106 and 108 fisheries. Inseason estimates from coded wire tag recovery data will be used to identify the hatchery component of the catch. Only the catch of wild coho will be used for fishery performance evaluation.

Troll fishery regulations for the 1999 experimental chinook fisheries in Frederick Sound and Stikine and Clarence Straits are similar to those used in 1998. During the period May 3 to 31, the experimental fishery in the District 110 portion of Frederick Sound will encompass the waters of District 110 south and east of a line extending from near Turnabout Island to Hobart Bay, and north and west of a line from Boulder Pt. (east entrance to Portage Bay) to Point Highland (north of Farragut Bay). For the remainder of the experimental openings the District 110 area will be expanded southward to the southern boundary of District 110. The District 109 experimental areas along the Kuiu Is. shoreline at Kingsmill Pt. and along the southern Admiralty Is. shoreline east of Pt. Gardner is also in effect in 1998 from May 3 to June 23. A new experimental fishery was established in the waters of Tebenkof Bay in Lower Chatham Strait. A new experimental area was also established in District 107 that expands the Earl West Cove area west to the longitude of Babbler Pt. The District 107 area will be open beginning May 17.

There will be a news release each Friday throughout the spring experimental fisheries announcing the number of open fishing days for the following week. The summer general chinook fishery is still being formulated and the details are not available at this time.

A personal use fishery in U.S. portions of the Stikine River will be open in 1999 as in recent years. Fishing will be allowed in the main channel of the river between the ADF&G cabin at Kakwan Point upstream to the Canadian border. The fishery is structured to allow the harvest of Tahltan sockeye salmon while limiting the harvest of other sockeye stocks and species. The fishery will be open only from July 1 to July 15, with a limit of 25 sockeye salmon per permit. This fishing period coincides with the peak of the Tahltan sockeye run in the lower river. Gillnet gear restrictions will include a maximum 5 ½ inch stretched mesh size and 15 fathom net length.

A subsistence drift gillnet fishery, targeting sockeye salmon and encompassing the waters of Sumner Strait near Point Baker, will again be allowed in 1999. The fishery is permitted in the waters of Sumner Strait within three nautical miles of the Prince of Wales shoreline north of "Hole-in-the-Wall" at 56°15'42" N. Lat. and west of the longitude of the western entrance to Buster Bay at 133°29; W. Long. The fishery is restricted to Alaska residents only and will be open each week from Thursday through Saturday during the period June 15 through July 31, with a limit of 25 fish (of any salmon species) per family per year. Gillnet gear restrictions include a maximum net length of 50 fathoms. It is anticipated that approximately 500 sockeye will be harvested in this fishery.

Canada

The Canadian lower Stikine River commercial fishery (Figure 1) will be managed on a weekly basis with management actions driven by results of stock, catch, and escapement projections derived from the Stikine Management Model. Weekly inputs to the model will include: effort data and stock specific catch from Alaska Districts 106 and 108; catch, effort and inseason stock composition data from the Canadian lower Stikine commercial and test fishery; and escapement requirements.

The lower river commercial fishery will open June 20 (statistical week 26). Consideration for Tahltan sockeye stock management objectives should persist from the fishery opening, 12:00 noon June 20, to the end of July. Thereafter, management attention will be focused primarily on mainstem stock objectives. Actual time frames of responses to specific stock compositions will be fine-tuned inseason according to the weekly results of the stock identification program.

The achievement of escapement objectives is the foremost priority in management considerations. Inriver allocation priority will be to fulfill the requirements of the traditional aboriginal fishery. The commercial fisheries, therefore, will be managed to accommodate these fundamental priorities. The area of most intense management will be within the lower Stikine commercial fishery.

Fishing time in the lower Stikine fishery will depend upon stock assessment and international and domestic catch allocation considerations. Fishing periods will be adjusted accordingly. As in recent previous years, the use of two gillnets, of which only one may be a drift gillnet, will be permitted from the start of the fishing period each week. The maximum allowable net length will remain at 135 meters and there will be a maximum mesh size restriction of 150 mm through mid July to conserve chinook salmon. Fishing boundaries will remain unchanged from those established in 1997, i.e., from the international border upstream to boundary markers located near

the Stikine-Flood River confluence, and in the Iskut River to a marker located approximately 2 km upstream from the mouth. In 1997 the upstream fishery boundary in the Stikine River was moved approximately 25 km upstream to increase the available fishery area over previous years. Prior to 1997 the boundary was located near the Stikine-Porcupine confluence.

In the upper Stikine commercial fishery, fishing times will generally follow those of the lower river lagged by one week. As in past years, weekly fishing times in the aboriginal fishery will not normally be restricted. Subject to conservation requirements, terminal catches in the lower Tuya River and/or at Tahltan Lake may be allowed to be taken under the ESSR license.

Restrictive management responses that could be used to reduce the sockeye harvest in the lower Stikine commercial fishery, in order of implementation, include: reducing fishing time, the major tool used in the regulation of the fishery; and, reducing the fishing area by relocating boundaries to protect isolated spawning populations. In the aboriginal fishery, reductions in fishing time would be considered only if no other adjustments could be made in the lower and upper river commercial fisheries.

In the event that a more liberal management regime is justified, extensions to fishing time in the commercial fisheries would be granted, dependent on stock specific escapement and catch considerations.

Summary

Attainment of escapement goals for both the Tahltan and mainstem stocks is the primary objective of Stikine sockeye management. Harvest sharing will be based upon the TAC projections derived from the Stikine Management Model. The TAC estimates will likely change from week to week as the model forecasts a new total run size from the cumulative CPUE each week. Variations in the TAC estimate will likely be larger early in the season, when CPUE is high, than later in the season. Management actions will reflect these week-to-week changes in the TAC estimates. Fishery managers from both countries will keep in weekly contact in order to evaluate the output from the Stikine Management Model and the outcome of their respective management actions.

Inseason Data Exchange and Review

Canada and the U.S. will conduct data exchanges by telephone on Wednesday afternoon or Thursday morning of each week during the fishing season. At that time, current catch statistics and stock assessment data will be updated, exchanged, and reviewed. Management plans for the next week for each country will be discussed at this time. It is anticipated that additional communications will be required each week. Weekly decision deadlines will be: a) for Districts 106 and 108, 11:00 a.m., Thursday, Alaska Daylight Time; and, b) for the Canadian Stikine fishery, 10:00 a.m., Friday, Pacific Daylight Time. A final weekly summary of the fisheries will be conducted Friday afternoon through a conference call between management offices of DFO and ADF&G.

DFO and ADF&G field personnel will work out an acceptable schedule for the delivery of otolith samples from the lower Stikine River after the fisheries start in June.

Stock Assessment Program

This section summarizes agreements regarding the data which will be collected by each National Section and, when appropriate, procedures that will be used for analysis.

Catch Statistics

The U.S. shall report catches and effort in the following strata for each statistical week:

1. Subdistricts 106-41&42 (Sumner Strait);
2. Subdistrict 106-30 (Clarence Strait); and
3. District 108; and
4. any test fish catches in District 108.

Canada shall report catch and effort statistics in the following strata for each statistical week:

1. the lower river commercial fishery;
2. the upper river commercial fishery;
3. the aboriginal fishery;
4. the lower Stikine River test fishery conducted near the international border; and
5. ESSR fishery catches will be reported as data become available.

Age Composition of Sockeye in Catches

Scales will be collected and used to age fish. Associated fish length and sex composition data will also be collected. The U.S. shall provide scale samples from Subdistricts 106-41&42, Subdistrict 106-30 and District 108 for each fishing week. Canada shall provide scale samples, matched with length and egg diameter data, collected from the lower river commercial and test fisheries each week. Scale samples may be collected from the upper river commercial and aboriginal fisheries; if not, samples collected at the Tahltan Lake weir will be used to characterize the age composition of catches of sockeye salmon in the upper river. Scale impressions will be available to ADF&G.

Stock Composition of Alaska Catches

During the season, otolith samples are taken from the catches in District 106-41/42, District 106-30, and District 108 and processed inseason to determine the contribution of enhanced Tahltan and Tuya sockeye salmon. The contributions of naturally spawning Tahltan and mainstem sockeye in district catches will be made by assuming the same ratio of enhanced to naturally spawning Tahltan as in the inriver fisheries in the following week; for the current week the same weeks inriver estimates will be used.

After the fishing season, SPA will be used to recalculate actual contributions of Tahltan and mainstem sockeye stocks to the catches made each week in each subsection of District 106

(Clarence Strait and Sumner Strait), and District 108. Scales will be collected inseason and the desired sample size from each of these strata is 600 fish per week. It is recognized that small catches in District 108 may preclude temporal stratification at the desired level. A test fishery may be conducted in District 108 to assess run strength and stock composition if the commercial fishery is not open. If test fisheries occur, samples will be collected for stock assessment.

To evaluate the contribution of enhanced sockeye to Alaskan gillnet catches, 400 otolith samples will be collected per week in District 108, and 300 otolith samples will be collected from each sub-area in District 106 for inseason analyses. Besides indicating the relative strength of the enhanced Stikine stocks, results from the otolith sampling will also serve as a check on the validity of the stock composition estimates used to apportion catches in District 106 and 108 in the SMM.

Stock Composition of the Inriver Canadian Catch

Egg diameter data will be used inseason to estimate the combined Tahltan and Tuya component versus the mainstem contribution to the lower river sockeye catches during the fishing season. Tahltan fish generally have smaller diameter eggs compared to mainstem fish. The Tuya component will be determined from the analysis of otolith samples collected each week. Weekly sampling targets are 150 matched egg diameter, scale, and otolith samples and 50 otolith samples matched with scales from male fish. ADF&G will analyze the thermal marks from a subsample of at least 60 fish each week. Arrangements will be made prior to the beginning of the season to ensure timely transfer of samples and notification of results for use in management decisions no later than the week following when the samples are collected.

This will also be the data used postseasonally in conjunction with results from additional thermal mark analyses to estimate Tahltan wild and enhanced, and Tuya enhanced contributions. A total of 350 sockeye salmon will be randomly sampled each week for scales, size and sex. It is necessary to match the scale and egg data by fish to develop postseason stock-specific age-composition estimates, and for the development of postseason scale pattern standards.

Stock Composition and Run Timing in the Canadian Test Fishery

The proportions of Tahltan/Tuya and mainstem sockeye salmon in test fishery catches in the lower Stikine River will be estimated inseason in a similar manner to the commercial fishery. All sockeye caught using test fishery gear will be sampled for scales and otoliths, and all females for egg diameter (all data to be matched). If the commercial fishery does not open in any one week, the test fishery samples will be transferred to ADF&G, as per the arrangements made for the commercial samples, for inseason analysis. Additional sampling requirements will include the collection of spaghetti tags applied in the chinook mark-recapture program, and heads from any fish exhibiting adipose clips.

The postseason, sockeye stock composition estimates will be based on egg diameter data and associated thermal mark analyses. As per the commercial fishery, the enhanced portion of the catch will be determined postseasonally from otolith sample.

Spawning Escapement Estimates

An adult enumeration weir will be used to determine the Tahltan sockeye escapement. The age composition will be estimated from scale samples and enhanced sockeye contributions will be determined from otolith samples. Approximately 800 fish will be sampled during the season for scales, length, and sex; 400 otolith samples will be taken at the weir and an additional 400 otolith samples from the spawning grounds. The mainstem escapement will be estimated postseasonally using migratory timing information obtained from CPUE and stock ID data from the commercial and/or test fishery, combined with weekly stock compositions estimated from the commercial and/or test fishery catches. Tuya escapement will be calculated postseasonally in a similar way.

Postseason SPA Standards

Scale pattern standards for Tahltan and mainstem sockeye stocks will be made from scale samples collected inriver. For the Tahltan stock, samples will be taken from both male and female sockeye at the Tahltan Lake weir, and from female sockeye caught in the lower river fisheries having small-diameter eggs. For the mainstem stock, samples will be taken from female sockeye caught in the lower river fisheries having large-diameter eggs. Standards for classifying marine catches will therefore be developed from scale samples collected from the Tahltan Lake weir and from both the commercial and test fishery catches in Canada.

Since the weekly proportion of Tahltan to mainstem sockeye salmon in the commercial or test fishery is used postseasonally to determine both the proportion of these two stocks in the entire run, and, the mainstem escapement, it is important to get the best estimate possible. It is agreed that egg diameters from both the commercial and test fishery sampled fish will be used to determine stock proportions in the test fishery catches for both inseason and postseason analyses.

Data Evaluation Procedures

Historical Database

Although Canadian commercial fishing began in the Stikine River in 1975, the methodology for estimating sockeye run sizes was not well standardized until 1982. Therefore, estimates of run size after this time are considered to be better than those made prior to 1982. The historical database from 1985 to 1997, used as input to the Stikine Management Model for 1999, is presented in Tables 1 to 4. The 1998 stock composition estimates are not complete as of this writing and, therefore, will not be used in the forecast regressions. The 1999 run size estimated by the model at the end of the fishing season will be updated in the fall of 1999 using postseason stock composition data for use in the database in future years.

Stikine Management Model

A model based on the linear relationship between CPUE and run size has been constructed and updated to make weekly inseason predictions of the total run and the TAC during the 1999 season. A description of the original model is given in the Transboundary Technical Committee Report: **TCTR (88)-2, Salmon Management Plan for the Transboundary Rivers, 1988**. Many subtle changes have been made in the model since that documentation was written and a new documentation is in progress. The purpose of the model is to aid managers in making weekly harvest decisions to meet U.S./Canada treaty obligations for harvest sharing and conservation of Stikine sockeye salmon.

The model for 1999 is based on CPUE data from 1985 to 1997 from District 106 and the Canadian commercial fishery in the lower river and from 1986 to 1997 from the lower Stikine test fishery. Linear regression is used to predict run size from cumulative CPUE for each week of the fisheries beginning in week 26 for all three fisheries. For the first time, the intercept was forced to be zero in order to correct for a tendency to overestimate the run size in the earlier weeks during years of low abundance. The parameters from the linear regressions are presented in Table 5. In the past, three sets of CPUE data have been used to predict the total run. These include:

1. The District 106 cumulative CPUE of Stikine sockeye stocks is used to predict the total run of Stikine sockeye.

2. The cumulative CPUE from the Canadian lower river commercial fishery is used to predict the inriver Stikine sockeye run. Starting with this year's analysis, the CPUE from 1994 on, when additional nets were introduced into the fishery, is reduced to 75% of the actual CPUE. The total run is then determined as the inriver run plus the estimated total season catch of Stikine sockeye salmon in District 108 (the minimum of 1) cumulative catch proportioned out to end of season using average run timing or 2) the TAC minus the assumed 106 catch of 10% of the run) and 106 (assumed to be 10% of the run). District catches will be determined from inseason model estimates of weekly Stikine catches for past weeks and using average migratory timing to determine catch for the remainder of the season.

3. Starting in 1995, the cumulative CPUE from the Canadian test fishery has been used to predict the inriver Stikine sockeye. The inriver run estimate was expanded as per item 2 above to project total run size.

The 1999 inseason model predictions will be based on the second method as described above. The reason for this is that weekly regressions of CPUE on run size using the inriver data usually have higher coefficients of correlation compared to those based on the District 106 and test fishery CPUE data for corresponding weeks (Table 5). Predictions from the District 106 data and the test fishery data will continue to be made to verify inseason estimates and provide postseason comparisons.

The TAC of Stikine sockeye salmon for the 1999 season will be determined each week from run size estimates (run size minus escapement goal) according to the following schedule:

1. prior to week 28 (<July 4): the preseason forecast of run size will be used;

2. weeks 28 and after (July 4 to end of season): estimates of run size will be determined each week from the cumulative CPUE of sockeye salmon in the lower river commercial fishery. In the event that the commercial fishery is closed for a given week, the CPUE data from the lower Stikine test fishery will be used. In this case, the average test fishery CPUE from Monday through Wednesday will be used and translated into a comparative commercial CPUE value from the regression of past years commercial on test CPUE.

Separate projections of run size will be made for the total Stikine sockeye run (wild plus enhanced), Tahltan stock (wild plus enhanced), the enhanced Tuya stock, and the mainstem stock. This information will be used inseason to help management and, postseasonally, to help evaluate the performance of the model.

The part of the model which determines total and weekly TAC levels for the U.S. and Canadian fisheries has been formulated in EXCEL 5.0 for use by managers inseason. This part of the model uses the coefficients from the linear regression model, the established escapement goals, and PST provisions of harvest sharing to determine the total TAC for each country. Estimates of weekly TAC and effort are provided as guidelines for the managers and are derived from the 1985-1997 average run timing of the stocks and the corresponding average CPUE levels of each fishery.

Inseason Use

For 1999, the model predictions will set the TAC levels; however, managers may use additional information on which to make decisions on the openings of their respective fisheries. They will evaluate the output of the model and look for discrepancies with other information they may have on run strength. The information and evaluation will be used to improve the model for the next year.

Postseason Evaluation

After the fishing season is over, the Transboundary Technical Committee will evaluate how well the model performed in predicting the entire run, where discrepancies occurred, and what might have caused them. The committee will also determine whether escapement goals were met according to the Spawning Escapement Goals section of this report. This information is presented in the annual catch and escapement reports prepared by the committee. For 1998, the preliminary evaluation may be found in: **Preliminary Estimates of Transboundary River Salmon Production, Harvest, and Escapement and a Review of Joint Enhancement**

Activities, 1998 , Transboundary Technical Committee, April, 1999[3]. The summarized output of the Stikine Management Model during the 1998-fishing season is presented in Table 6.

Coho Salmon

Preseason Forecast

A qualitative prediction of the 1999 run of coho salmon is that it will be about average in magnitude. This outlook is based on the test fishery CPUE, or extrapolated Stikine test fishery CPUE, of coho salmon in the two principal brood years, 1995 and 1996. Based on a comparison of test fishery CPUE for coho versus CPUE for sockeye, the latter which is well correlated with the inriver sockeye run size, the coho escapement was judged to be below average in 1995 but above average in 1996. The escapement in 1996 was estimated to have been above the interim escapement goal range of 30,000 to 50,000 coho, whereas, in 1995, it did not appear the escapement goal range was achieved.

Escapement Goal

The interim escapement goal range for Stikine coho salmon is 30,000 to 50,000 fish.

Harvest Sharing Objectives

Harvest objectives will be guided by the newly signed annex agreement for the Treaty (June 1999).

Stock Assessment Program

Each country shall:

1. report catch statistics for the same strata as sockeye salmon are reported;
2. sample its fisheries for appropriate tags, e.g., spaghetti and/or coded-wire tags; and
3. conduct escapement programs as resources permit.

Management Procedures

United States

If there is a conservation concern, the District 108 fishery will be restricted.

Canada

If there is a conservation concern, the Canadian fishery will be restricted.

[3] This report will be finalized within about a year's time and published in the PSC series.

Chinook Salmon

Preseason Forecast

The Little Tahltan chinook weir count in 1993, the primary contributing brood year for the 1999 run, was 11,500 large chinook, a record high count for this system and about twice the 1989-1998 average. The escapement in 1994, which should also contribute significantly to this year's run, was above average, at 6,387 chinook. On average, age-6 chinook account for 72% of the age composition of Little Tahltan chinook whereas, age-5 fish comprise 20%. The above-average primary-parent year escapements in 1993 and 1994 suggest that the 1999 chinook run to the Stikine River will be above average.

Escapement Goal

The interim index (Little Tahltan, approx. 19% of total Stikine) escapement goal has been 5,300 chinook salmon (excluding jack chinook) through the Little Tahltan River weir. A new goal of 3,500 chinook for the index systems was proposed in a joint paper (Bernard, McPherson, Pahlke, & Etherton. 1999 draft). Optimum production of chinook salmon from the Stikine River) and was tentatively accepted by the TTC at their April 1999 meeting in Juneau.

PSARC (Canadian) review did not recommend accepting the new goal range, but instead recommended developing an escapement floor and a target exploitation rate of 30%, in order to get a wider range of returns per spawner for subsequent analyses. At the current time we have no way of managing for exploitation rates, but hope that a CWT program can be developed and funded so that we may begin to estimate ocean harvest.

ADF&G (U.S.) review recommended going with the paper's escapement goal range, although some minor errors in the data used were pointed out to the authors.

In response to the above reviews, the TTC has accepted an escapement floor of 4,000 chinook salmon for Little Tahltan or 20,000 for the total Stikine system until the goal analysis can be redone including returns off recent high escapement levels. These escapement floors are near the midpoint of the ranges recommended by the Bernard et al. paper. The Little Tahltan adult escapement has been over 4,000 chinook every year since 1987 except for 1995 (3,000 fish). The highest escapement was in 1993 with 11,400 adult chinook counted at the weir. Returns of adult chinook are mostly age 5 and 6; age-6 chinook from the 1993 escapement will be returning this year.

Harvest Sharing Objectives

Both parties are to take appropriate management actions to ensure that the escapement floor for chinook salmon bound for the Canadian portions of the Stikine River is achieved in 1999. Given

the above analysis and review concerning the escapement floor for 1999, no changes in recent management procedures are required.

Management Procedures

United States

Initial openings in District 108 will not include the Stikine River flats in order to minimize the interception of adult chinook salmon. Chinook salmon catches will also be a management concern in District 106 throughout the season and, if large numbers of small feeder chinook are caught, night closures may be instituted.

Canada

Chinook will be harvested in the commercial fisheries incidentally during the early sockeye fishery. Mesh size restrictions (maximum 150 mm) will be in effect through mid-July to conserve chinook salmon.

Stock Assessment Program

Each country shall:

1. report catch statistics for the same strata as sockeye salmon are reported;
2. sample its fisheries for coded-wire tags; and
3. conduct escapement programs as resources permit.

A CWT program on wild chinook fry/smolt will be developed and funds sought in order to develop a program to estimate marine harvest on Stikine chinook.

Table 1. Stikine sockeye run sizes, 1985 to 1998. The 1997 & 1998 estimates are preliminary.

Year	Inriver Run Size	Inriver Catch	Escape-ment [a]	Marine Catch	Total Run
1985	184,747	26,804	157,943	29,747	214,494
1986	69,036	17,846	51,190	6,420	75,456
1987	39,264	11,283	27,981	4,077	43,342
1988	41,915	16,538	25,377	3,181	45,096
1989	75,054	21,639	53,415	15,492	90,546
1990	57,386	19,964	37,422	9,856	67,242
1991	120,152	25,138	95,014	34,199	154,351
1992	154,542	29,242	125,300	77,394	231,936
1993	176,100	52,698	123,402	104,630	280,730
1994	127,527	53,380	74,147	80,509	208,036
1995	142,308	66,777	75,531	76,420	218,728
1996	184,400	90,148	94,252	188,385	372,785
1997	125,657	68,197	57,460	101,258	226,915
1998	86,750	50,486	36,264	40,879	127,629
Tahltan sockeye run size					
1985	86,008	18,682	67,326	25,197	111,205
1986	31,015	10,735	20,280	2,757	33,771
1987	11,923	4,965	6,958	2,255	14,178
1988	7,222	4,686	2,536	2,129	9,351
1989	14,110	5,794	8,316	1,561	15,671
1990	23,923	8,996	14,927	2,307	26,230
1991	67,394	17,259	50,135	23,511	90,905
1992	76,681	16,774	59,907	28,218	104,899
1993	84,068	32,458	51,610	40,036	124,104
1994	77,239	37,728	39,511	65,101	142,340
1995	82,290	50,713	31,577	51,665	133,955
1996	95,706	57,545	38,161	147,435	243,141
1997	37,319	25,214	12,105	43,408	80,727
1998	28,355	16,087	12,268	14,619	42,974
Tuya sockeye run size					
1995					2,802
1996					38,600
1997					66,258
1998					45,854

[a] Escapement includes fish later captured for broodstock.

Table 2. CPUE for all sockeye salmon and the proportion of Tahltan and Tuya stocks in the catch from the Canadian lower Stikine River commercial fishery from 1985 to 1997.
For periods when the fishery was closed, values were filled in with averaging and interpolation techniques (these values are italicized and underlined in the table). Estimates for 1997 are preliminary.

Week	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Inriver Commercial Fishery CPUE on all sockeye:													
25	*3.2*	*1.7*	*1.2*	*1.6*	*2.0*	*1.9*	*2.1*	*3.1*	*3.2*	*3.0*	*2.9*	*4.2*	3.3
26	67.6	2.8	*17.8*	*24.2*	25.5	13.0	14.8	*47.5*	*49.7*	*45.9*	79.9	119.2	57.8
27	*108.9*	18.8	11.9	21.8	48.1	49.6	120.3	111.1	163.2	45.2	123.2	312.2	150.1
28	100.1	79.8	10.6	35.5	23.1	78.6	121.0	155.0	185.4	164.6	126.0	224.4	130.0
29	260.0	58.1	57.9	69.2	105.5	110.3	114.4	144.0	135.4	147.6	120.1	142.2	90.7
30	147.9	84.7	67.8	71.9	140.8	81.4	53.7	166.0	118.3	145.5	106.5	142.6	131.5
31	104.7	81.9	27.6	61.9	73.9	62.1	83.8	88.3	71.6	111.0	86.0	74.9	128.7
32	73.6	55.6	76.6	89.2	60.8	54.4	31.6	91.5	83.7	81.8	51.3	54.1	90.5
33	58.6	34.1	32.3	33.3	28.4	16.2	15.7	43.2	31.1	42.4	26.3	29.4	21.7
34	18.2	25.9	16.5	23.1	16.4	12.4	1.0	12.5	39.3	32.5	19.1	7.7	25.9
35	10.3	9.4	5.4	11.0	6.2	13.1	4.2	4.5	11.5	10.3	11.7	2.3	12.6
Tahltan as proportion of catch													
25													0.833
26	0.890	0.730			0.650	0.730	0.800				0.970	0.808	0.632
27		0.770	0.740	0.770	0.490	0.800	0.830	0.870	0.793	0.944	0.921	0.731	0.544
28	0.900	0.830	0.880	0.690	0.380	0.690	0.860	0.780	0.831	0.881	0.814	0.555	0.346
29	0.790	0.730	0.660	0.420	0.210	0.350	0.750	0.550	0.677	0.793	0.665	0.429	0.321
30	0.420	0.520	0.240	0.270	0.030	0.250	0.370	0.240	0.464	0.631	0.440	0.256	0.183
31	0.290	0.190	0.110	0.100	0.020	0.060	0.120	0.260	0.342	0.426	0.261	0.201	0.180
32	0.200	0.090	0.050	0.040	0.020	0.030	0.080	0.090	0.149	0.253	0.157	0.125	0.163
33	0.200	0.020	0.040	0.070	0.020	0.030	0.000	0.020	0.073	0.126	0.134	0.102	0.121
34	0.000	0.010	0.070	0.090	0.020	0.030	0.000	0.000	0.166	0.063	0.130	0.037	0.030
35	0.000	0.010	0.080	0.000	0.000	0.000	0.000	0.000	0.000	0.024	0.000	0.000	0.050

Table 2. continued.

Week.	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Tuya as proportion of catch													
25													0.000
26											0.000	0.122	0.279
27											0.030	0.128	0.339
28											0.044	0.164	0.489
29											0.012	0.102	0.237
30											0.010	0.063	0.136
31											0.000	0.013	0.133
32											0.000	0.026	0.120
33											0.000	0.000	0.089
34											0.000	0.037	0.022
35											0.000	0.000	0.037

Table 3. CPUE of all sockeye salmon and the proportion of the three Stikine stock components, Tahltan, mainstem, and Tuya, in the catch from the U.S. District 106-41/42 commercial fishery from 1985 to 1997.
For periods when the fishery was closed, values were estimated using averaging and interpolation techniques (these values are italicized and underlined in the table). Estimates for 1997 are preliminary.

Week.	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
District 106-41 Commercial Fishery: All Sockeye Stocks													
25	91.0	14.1	*42.6*	*34.0*	46.8	29.2	51.4	*40.3*	*41.8*	*47.1*	53.9	29.8	40.0
26	*106.1*	16.9	29.1	22.9	51.9	33.6	117.0	56.6	27.4	61.2	72.9	200.8	99.2
27	162.9	62.9	52.2	58.7	66.1	78.2	52.9	110.2	95.6	96.8	61.1	77.6	96.1
28	173.8	*66.2*	103.9	66.8	147.1	83.4	98.1	108.8	96.9	131.2	111.3	60.6	64.7
29	114.5	*67.4*	83.9	103.6	109.4	116.1	73.5	111.4	109.7	165.1	76.6	124.7	60.0
30	110.0	100.5	155.9	87.6	89.4	176.9	95.5	103.6	94.2	104.8	125.3	105.4	70.3
31	293.6	105.7	106.6	59.3	93.4	78.4	74.1	70.2	99.3	95.3	95.3	96.2	53.9
32	69.0	82.1	115.4	92.2	36.2	45.1	40.0	59.6	87.6	47.3	98.3	73.5	25.0
33	100.5	60.1	88.3	67.6	33.5	30.6	65.4	41.0	55.1	65.3	58.5	37.1	30.0
34	37.8	28.3	*25.9*	20.5	7.7	12.3	16.6	21.3	40.4	36.6	25.8	18.1	34.3
35	12.0	8.6	3.4	11.0	2.9	4.1	4.4	15.8	15.0	9.8	6.9	8.4	30.3
Tahltan as proportion of catch													
25	0.103	0.000			0.032	0.018	0.231				0.390	0.436	0.173
26		0.020	0.013	0.085	0.085	0.026	0.396	0.438	0.460	0.466	0.424	0.672	0.280
27	0.347	0.090	0.013	0.071	0.027	0.025	0.256	0.180	0.410	0.501	0.391	0.459	0.231
28	0.240		0.051	0.050	0.000	0.012	0.099	0.140	0.313	0.380	0.130	0.343	0.160
29	0.129		0.008	0.011	0.000	0.008	0.012	0.030	0.162	0.179	0.018	0.169	0.066
30	0.000	0.000	0.008	0.006	0.000	0.001	0.100	0.010	0.078	0.113	0.003	0.070	0.032
31	0.000	0.037	0.000	0.000	0.000	0.000	0.000	0.016	0.045	0.019	0.005	0.000	0.010
32	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.012	0.013	0.060	0.003	0.021	0.010
33	0.000	0.009	0.000	0.000	0.000	0.000	0.052	0.000	0.057	0.049	0.013	0.000	0.015
34	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.069	0.083	0.000	0.000	0.014
35	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.034	0.077	0.000	0.000	0.009

Table 3. continued.

Week.	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Mainstem as proportion of catch													
25	0.000	0.000			0.060	0.055	0.094				0.040	0.000	0.300
26		0.000	0.000	0.000	0.100	0.022	0.018	0.060	0.036	0.018	0.053	0.019	0.300
27	0.013	0.032	0.000	0.000	0.160	0.020	0.028	0.153	0.036	0.015	0.000	0.039	0.300
28	0.005		0.003	0.000	0.045	0.022	0.012	0.064	0.091	0.017	0.016	0.000	0.300
29	0.008		0.000	0.000	0.005	0.005	0.085	0.030	0.280	0.048	0.014	0.000	0.300
30	0.029	0.005	0.015	0.000	0.004	0.008	0.031	0.044	0.083	0.056	0.072	0.000	0.300
31	0.000	0.001	0.000	0.000	0.015	0.039	0.054	0.113	0.301	0.047	0.020	0.000	0.300
32	0.000	0.000	0.000	0.009	0.011	0.049	0.010	0.090	0.173	0.000	0.089	0.000	0.300
33	0.015	0.000	0.000	0.000	0.012	0.004	0.000	0.258	0.183	0.000	0.034	0.043	0.300
34	0.042	0.000		0.000	0.012	0.016	0.000	0.155	0.102	0.005	0.134	0.005	0.300
35	0.042	0.000	0.000	0.000	0.012	0.016	0.000	0.155	0.102	0.005	0.134	0.005	0.300
Tuya as proportion of catch													
25											0.000	0.046	0.300
26											0.000	0.093	0.300
27											0.000	0.125	0.300
28											0.000	0.061	0.300
29											0.010	0.010	0.300
30											0.000	0.010	0.300
31											0.000	0.000	0.300
32											0.000	0.000	0.300
33											0.000	0.000	0.300
34											0.000	0.000	0.300
35											0.000	0.000	0.300

Table 4. CPUE of all sockeye salmon and the proportion of Tahltan and Tuya stocks in the catch from the Canadian lower Stikine River test fishery from 1986 to 1997.
For periods when the fishery was closed, values were estimated using averaging and interpolation techniques (these values are italicized and underlined in the table).

Week	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
CPUE of all sockeye in catch												
25	0.10	*0.05*	*0.03*	0.42	0.03	0.04	*0.31*	*0.43*	*0.06*	0.67	0.35	0.66
26	0.29	0.13	0.10	0.48	0.38	0.50	0.91	1.25	0.18	1.90	1.93	1.40
27	0.48	0.08	0.60	0.70	1.28	2.92	1.32	2.00	1.47	3.16	3.85	3.00
28	2.24	0.93	0.58	0.37	2.18	2.08	2.75	2.50	2.40	1.47	1.93	1.73
29	2.07	1.18	1.15	1.57	1.70	1.56	2.30	2.75	1.80	1.33	2.53	1.80
30	2.17	1.67	0.92	1.76	1.77	1.48	2.37	3.15	*1.77*	1.00	1.53	1.80
31	3.17	1.15	2.55	1.16	0.90	1.25	1.75	1.85	*1.74*	0.96	1.13	1.00
32	1.89	0.76	2.20	0.63	0.70	0.57	1.45	2.20	*1.70*	0.60	0.73	1.20
33	1.23	0.52	1.15	0.23	*0.30*	0.50	1.10	1.46	*1.67*	0.35	0.40	0.47
34	0.66	*0.10*	0.18	0.10	0.18	0.48	0.50	0.63	1.64	0.55	0.20	0.53
35	0.00	0.02	0.12	0.03	0.00	0.22	0.07	0.15	1.30	0.39	0.12	0.15
Proportion Tahltan stock in catch												
25	0.90	0.60	0.67	0.76	0.67	0.75	0.94	0.88	1.00	0.90	0.74	0.83
26	0.90	0.77	0.60	0.63	0.89	0.96	0.93	0.89	0.89	0.93	0.91	0.63
27	0.90	0.75	0.68	0.51	0.82	0.88	0.93	0.80	0.90	0.94	0.90	0.54
28	0.52	0.73	0.47	0.24	0.62	0.77	0.83	0.69	0.90	0.93	0.84	0.35
29	0.79	0.51	0.31	0.17	0.41	0.58	0.62	0.66	0.83	0.65	0.21	0.32
30	0.66	0.25	0.16	0.03	0.14	0.39	0.37	0.46	0.82	0.43	0.31	0.18
31	0.44	0.06	0.08	0.00	0.10	0.23	0.18	0.28	0.82	0.22	0.12	0.18
32	0.15	0.08	0.05	0.00	0.11	0.07	0.14	0.10	0.82	0.18	0.00	0.16
33	0.04	0.00	0.06	0.00	0.07	0.06	0.06	0.12	0.81	0.09	0.00	0.12
34	0.09	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.04	0.00	0.15	0.03
35		0.00	0.00	0.00		0.00	0.00	0.00	0.04	0.00	0.00	0.05

Table 5. The 1998 Stikine Management Model parameters, including average run fraction by week, average weekly CPUE, and regression parameters for run size regressed on cumulative CPUE. The intercept parameter was confined to be zero.

Stat week	Run fraction	Intercept	Slope	R-sq	Ave. CPUE
LOWER INRIVER COMMERCIAL FISHERY (1985-1997)					
		TOTAL SOCKEYE SALMON			
26	0.059	0	2704	0.44	37.5
27	0.138	0	805	0.51	87.5
28	0.154	0	481	0.75	97.9
29	0.173	0	340	0.90	110.0
30	0.161	0	267	0.90	102.1
31	0.116	0	231	0.89	73.6
32	0.100	0	207	0.84	63.5
33	0.046	0	197	0.82	29.4
34	0.028	0	192	0.81	17.6
35	0.013	0	189	0.80	7.9
36	0.007	0	188	0.80	4.4
TOTAL	1.00				
		TAHLTAN STOCK			
26	0.102	0	2704	0.44	30.1
27	0.232	0	489	0.73	68.6
28	0.246	0	303	0.90	72.7
29	0.221	0	223	0.88	65.2
30	0.112	0	197	0.88	33.1
31	0.052	0	187	0.88	15.3
32	0.024	0	183	0.88	7.0
33	0.008	0	181	0.88	2.4
34	0.004	0	180	0.88	1.1
35	0.000	0	180	0.88	0.1
36	0.000	0	180	0.88	0.0
TOTAL	1.000				
DISTRICT 106-41/42 FISHERY (1985-1997)					
		TOTAL SOCKEYE SALMON			
26	0.280	0	3258	0.33	29.8
27	0.249	0	2404	0.51	26.4
28	0.180	0	1937	0.69	19.1
29	0.107	0	1680	0.69	11.4
30	0.059	0	1582	0.70	6.2
31	0.047	0	1517	0.73	5.0
32	0.029	0	1478	0.74	3.1
33	0.027	0	1439	0.75	2.9
34	0.014	0	1418	0.75	1.5
35	0.005	0	1411	0.75	0.5
36	0.001	0	1410	0.75	0.1
TOTAL	1.000				

Table 5. continued.

Stat week	Run fraction	Intercept	Slope	R-sq	Ave. CPUE
DISTRICT 106-41/42 FISHERY (1985-1997)					
		TAHLTAN STOCK			
26	0.340	0	2239	0.42	25.5
27	0.279	0	1609	0.83	20.9
28	0.204	0	1254	0.83	15.3
29	0.096	0	1104	0.80	7.2
30	0.042	0	1058	0.80	3.1
31	0.012	0	1052	0.81	0.9
32	0.007	0	1023	0.80	0.6
33	0.011	0	1033	0.80	0.8
34	0.006	0	1025	0.80	0.5
35	0.002	0	1023	0.80	0.1
36	0.000	0	1023	0.80	0.0
TOTAL	1.000				
TEST FISHERY (1987-1996)					
		TOTAL SOCKEYE SALMON			
26	0.07	0	103277	0.00	0.848
27	0.14	0	36456	0.33	1.738
28	0.15	0	24348	0.73	1.763
29	0.15	0	17863	0.82	1.812
30	0.15	0	14124	0.79	1.753
31	0.13	0	11913	0.66	1.505
32	0.10	0	10555	0.57	1.150
33	0.06	0	9863	0.52	0.687
34	0.04	0	9492	0.54	0.469
35	0.02	0	9335	0.55	0.201
36	0.01	0	9269	0.55	0.086
TOTAL	1.00				
		TAHLTAN STOCK			
26	0.10	0	103277	0.00	0.47
27	0.28	0	22432	0.00	1.37
28	0.26	0	15890	0.23	1.25
29	0.17	0	13192	0.30	0.81
30	0.09	0	11883	0.31	0.46
31	0.05	0	11263	0.30	0.25
32	0.03	0	10981	0.29	0.12
33	0.01	0	10848	0.29	0.06
34	0.00	0	10797	0.29	0.02
35	0.00	0	10784	0.29	0.01
36	0.00	0	10779	0.29	0.00
TOTAL	1.00				

Table 6. Evaluation of the Stikine Management Model for the 1998 sockeye fishery as run by both the U.S. and Canada.
Weekly forecasts of run size are given along with the predicted total allowable catch (TAC) for Stikine sockeye salmon.

Statistical	Start	Forecasts		TAC		Cumulative Catch[a]	
Week	Date	Run Size	Total	U.S.	Canada	U.S.	Canada
Model Runs Generated by Canada							
25	14-Jun	218,500	122,500	61,250	61,250		61
26	21-Jun	218,500	122,500	61,250	61,250	8,038	2,478
27	28-Jun	218,500	122,500	61,250	61,250	18,259	8,930
28	5-Jul	218,500	122,500	61,250	61,250	22,319	14,643
29	12-Jul	196,746	113,765	56,883	56,883	29,417	24,961
30	19-Jul	205,453	125,272	62,636	62,636	31,319	28,037
31	26-Jul	197,234	118,679	59,340	59,340	35,859	40,605
32	2-Aug	207,431	128,168	64,084	64,084	37,055	42,977
33	9-Aug	208,755	130,025	65,013	65,013	38,684	43,787
34	16-Aug	208,737	130,261	65,130	65,130		
Model Runs Generated by the U.S.							
25	14-Jun	218,500	122,500	61,250	61,250		282
26	21-Jun	218,500	122,500	61,250	61,250	5,652	2,200
27	28-Jun	219,938	120,500	60,250	60,250	10,973	6,327
28	5-Jul	212,171	117,396	58,698	58,698	22,319	14,643
29	12-Jul	196,746	113,765	56,883	56,883	27,190	21,020
30	19-Jul	196,899	117,970	58,985	58,985	31,352	25,487
31	26-Jul	200,189	120,738	60,369	60,369	35,593	33,676
32	2-Aug	206,675	127,248	63,624	63,624	36,741	42,817
33	9-Aug	209,393	130,520	65,260	65,260	38,684	43,787
34	16-Aug	208,737	130,261	65,130	65,130		
Preliminary End-of -Season Estimate							
		127,629				38,200	43,803

[a] Does not include test or ESSR fishery catches.

TAKU RIVER

Preseason Forecasts

Sockeye

The TTC has not developed a joint preseason forecasting method for Taku sockeye salmon. Both ADF&G and DFO agree that joint work needs to be done in the future to develop a single committee forecast. ADF&G does not make numeric forecasts for Taku sockeye but is expecting an average run based on parent year escapements.

The DFO preseason forecast for the 1999 Taku sockeye salmon total run is approximately 202,900 fish; this constitutes a below average run size. For comparison, the recent 10-year average (1989-1998) estimated run size is 235,400 sockeye salmon. The 1999 forecast is the average of a sibling-based forecast of 158,700 sockeye, and a forecast of 247,000 sockeye based on stock-recruitment data. If the run comes in as expected, the 1999 TAC will be approximately 128,000 sockeye salmon.

The sibling forecast is based on the historical relationship between the number of age-5 sockeye in year (t) and the number of age-4 sockeye in year (t-1). The relationship for the 1989-1998 period is described as follows:

$$N_{5(t)} = 67{,}202 + 1.71 \bullet N_{4(t-1)} \qquad [4]$$

where: $N_{5(t)}$ = return of age-5 in year(t); and
$N_{4(t-1)}$ = return of age-4 in year(t-1).

The correlation coefficient for this relationship for data from 1989-1998 is $r=0.72$ and it is significant at a level of $\alpha=0.05$. The preliminary estimate of the return of age-4 in 1998 is approximately 21,300 fish, which, when substituted into equation [43] above, gives a predicted age-5 return of approximately 103,700 fish in 1999. On average, approximately 65.5% of the run is composed of age-5 sockeye. Assuming the 1999 age-5 proportion of the run will be average, the predicted 103,700 age-5 return translates into a total run forecast of approximately 158,700 sockeye in 1999.

The 1999 stock-recruitment forecast is based on the historical relationship between the number of spawners (composite of all Taku stocks) and the subsequent returns described by the following equation:

$$\ln (R/S) = 2.14 - 0.0000124 \bullet S \qquad [5]$$

where: R = total adult return; and
S = number of spawners.

Equation [5] above is based on the estimated return of spawners from the 1984 to 1993 brood years and the subsequent age-specific returns from these escapements.[4] The correlation coefficient for this relationship is $r=0.75$ and it is significant at a level of $\alpha=0.05$. The estimated numbers of spawners from the principal brood years were 108,600 in 1993 and 102,600 in 1994 and 113,700 in 1995; calculated returns per spawner for these years based on equation [5] are 2.3, 2.4, and 2.1, respectively. Assuming that the age composition of the 1999 run will be average (65.5% 5-year olds, 26.1% 4-yearr olds, 5.9% 6-year olds, and 2.5% 3-year olds), the total predicted return is 247,000 sockeye for 1999.

The Taku sockeye run in 1995 was very close to the preseason predictions. Ocean conditions, particularly for the 1996 run, appeared to be exceptionally favorable, however ocean conditions for the 1997 and 1998 runs were not favorable. It is not known if these unfavorable conditions will continue in 1999. A trend in return per spawner has been noted showing a consistent decline for brood years 1988 to 1993 (3.9, 2.9, 2.3, 2.3, 1.8, 1.6, respectively).

Coho Salmon

Coho salmon runs to the Taku River from 1991 through 1994 appeared to have benefited from high marine survivals and other factors. This trend does not appear to be continuing; there has been a trend towards declining run strength since 1994 as the result of some years of poor freshwater survival and some years of poor marine survival.

The estimated spawning escapements in the two primary brood years contributing to the 1999 run were 55,700 fish in 1995, and 44,600 fish in 1996. The escapement in both years exceeded the interim escapement goal range for Canadian-origin Taku coho of 27,500 to 35,000 fish. Taku coho salmon escapement has averaged approximately 72,000 over the 1989 to 1998 period. In 1998 the estimated smolt emigration from the Taku River was 1.01 M. Assuming marine survival is about average (13% for 1993-1998, range 7-23%) the 1999 run should be about 131,000 coho salmon. Average run size is 203,000 coho (1989-1998). Therefore, the 1999 coho run is expected to be below average.

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Chinook Salmon

The principal brood years contributing to the 1999 chinook salmon run are 1993, 1994, and 1995. The 1993 aerial survey count of the escapement was a record high and the 1994 and 1995 counts were above average. However, very poor returns of 2- and 3-year ocean fish last years suggest a poor return this year. It is, therefore difficult to forecast the run of Taku chinook salmon for 1999.

[4] Escapement estimates for 1981 and for all years after 1984 were based on the Canyon Island mark-recapture program. Annual age-specific returns were estimated assuming the in-river age composition, as determined from sampling in the Canadian commercial fishery, was representative of the entire run.

Pink Salmon

A below average run of pink salmon is expected in 1999. Pink salmon returning in 1999 are the progeny of the 1997 escapement, which is believed to have been below average based on the Canyon Island fishwheel catch of 4,962 pink salmon that year. There was almost a complete failure of the pink salmon return to the Taku River in 1993 as evident by the 1993 and 1995 Canyon Island fish wheel counts of only 1,625 and 1,712 fish, respectively. In recent years, the odd-year runs have been less abundant than the even-year runs.

Chum Salmon

Low fall chum catches and CPUE in the District 111 fishery and Canyon Island fish wheels catches in 1994 and 1995 suggest that the spawning escapement that will produce the 1999 run was poor. Consequently, a below average to poor fall chum run is expected in 1999.

Escapement Goals

Escapement goals are currently under review by the TTC. An analysis and review of the chinook escapement goal has been presented in a report presented to the TTC[5]. The TTC reviewed the recommendations from this report and has adopted the proposed escapement goal of 30,000 to 55,000 large spawners pending agency and other peer review. Current escapement goals accepted by the Transboundary Technical Committee for salmon spawning in Canadian portions of the Taku River are as follows:

Species	Yr establ. or status	Interim Escapement Goal Ranges	
		From	To
Sockeye	1985	71,000	80,000
Coho	To be reviewed	27,500	35,000
Chinook	1999	30,000	55,000
Pink	1985	150,000	250,000
Chum	1985	50,000	80,000

Harvest Sharing Objectives

Long-term annex harvest sharing agreements are being negotiated for the Pacific Salmon Treaty in June 1999, but these agreements are not available at the time of finalizing this report. Harvest

[5] McPherson and Bernard January 1999 (draft for review). Optimal production of chinook salmon from the Taku River.

sharing for the Taku River reflected in these agreements will be incorporated into inseason management. When available, the new annex will be appended to this report.

It is assumed that both Parties will continue to take appropriate management actions to ensure that the escapement goals for chinook and other species of salmon bound for Canadian portions of the Taku River are achieved in 1999.

Management Procedures

The management co-ordination between U.S. and Canadian fishery managers will involve weekly conferences between designated members or alternates.

United States

The sockeye salmon drift gill net fishery in District 11 will be managed in accordance with provisions of the Pacific Salmon Treaty. A comprehensive PST harvest sharing arrangement between the U.S. and Canada has not been reached by the date this management plan was drafted, hence this management plan is subject to change.

Section 11-B (Figure 2) will initially open for a 72-hour period on the third Sunday of June (June 20, statistical week 26). The fishery will be managed through mid-August primarily on the basis of sockeye salmon abundance. Run strength will be evaluated using fishery catch and CPUE data and weekly inriver run size estimates derived from the Taku River fish wheel mark-recapture project operated jointly by ADF&G and DFO. Contribution of enhanced stocks of sockeye salmon will be estimated inseason by analysis of salmon otoliths sampled from the commercial harvests. The age and stock compositions of the harvest of wild stock sockeye salmon will be estimated after the fishing season by analysis of scale pattern and brain parasite incidence data from commercial catch samples.

Nighttime fishing closures may be imposed to limit incidental catches of immature chinook salmon. Harvests in the Juneau recreational fishery and initial gill net openings will be evaluated to determine the need for night closures during the 1999 season.

Returns from domestic hatchery programs are expected to contribute significantly to the District 11 fishery in 1999. Extended fishing time is expected in Stephens Passage to harvest enhanced returns of summer chum salmon to Limestone Inlet. Substantial returns of summer chum salmon and coho salmon are also expected to Douglas Island Pink and Chum, Inc. hatcheries in Gastineau Channel. Portions of these returns will be available for incidental harvest in the directed wild stock sockeye and coho salmon fisheries. Enhanced sockeye salmon production from Port Snettisham in 1999 is expected to be lower than the last several years, with approximately 49,000 sockeye expected to return from hatchery smolt and lake stocking programs. These sockeye salmon will be harvested in the traditional District 11 sockeye fishery, terminal Special Harvest Areas (SHA's) inside Port Snettisham, and in a personal use fishery in Sweetheart Creek.

Pink salmon will be harvested in Section 11-B incidental to the sockeye and enhanced summer chum salmon fisheries. Fishing time for pink salmon in Section 11-C will depend on the strength of returns in lower Stephens Passage, Seymour Canal, and the northern portions of District 10. Parent-year pink salmon escapements in Stephens Passage and Seymour Canal were good and some surplus to escapement needs may occur.

In 1989, the Alaska Board of Fisheries reopened the purse seine fishery in a small area in northern Chatham Strait (a portion of Subdistrict 112-16) during the month of July in order to harvest pink salmon stocks migrating northward to Taku River, Lynn Canal, and upper Stephens Passage. The area encompasses waters along the western shore of Admiralty Island north of Point Marsden (Figure 3). If a harvestable surplus of pink salmon returning to this area occurs in 1999, a July seine fishery may occur in the Hawk Inlet shore area. During August, fishery openings along the Hawk Inlet shore may extend northward to the latitude of Hanus Reef Light when north-migrating pink salmon stock strength warrants. In addition, if north-migrating pink salmon returns are poor, and south-migrating stocks are strong, seining may be allowed only south of Point Marsden.

Beginning in mid-August management of the Taku/Snettisham gillnet fishery will be based on the run strength of coho and fall chum salmon. Inseason management will be based on evaluation of the fishery catch, effort, and CPUE relative to historical levels, recovery of coded-wire tags from fishery sampling, and inriver run size estimates from the Taku River mark-recapture project.

The chinook sport fishing season will be open in marine waters near Juneau throughout the year. However, Taku Inlet, north of a line from Cooper Point to Dorothy Creek, will be closed to sport fishing from April 16 through June 14 to protect returning Taku River chinook salmon.

A personal use fishery in U.S. portions of the Taku River was established by the Alaska Board of Fisheries in 1989 and will operate during the month of July in 1999. A seasonal bag limit of five sockeye salmon per person or ten sockeye salmon per household will be allowed to be taken using set gill nets.

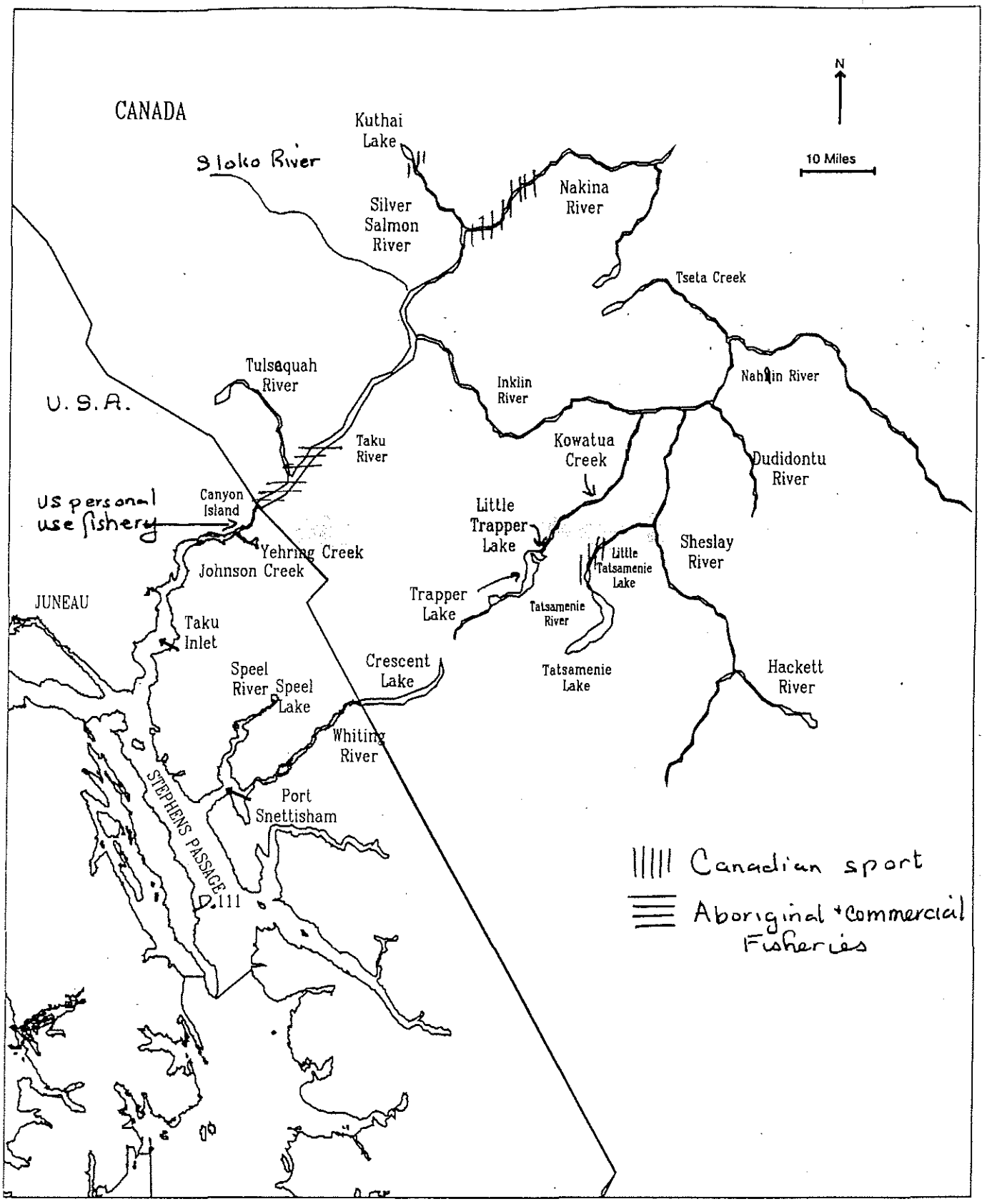


Figure 2. The Taku River and principal U.S. and Canadian fishing areas.

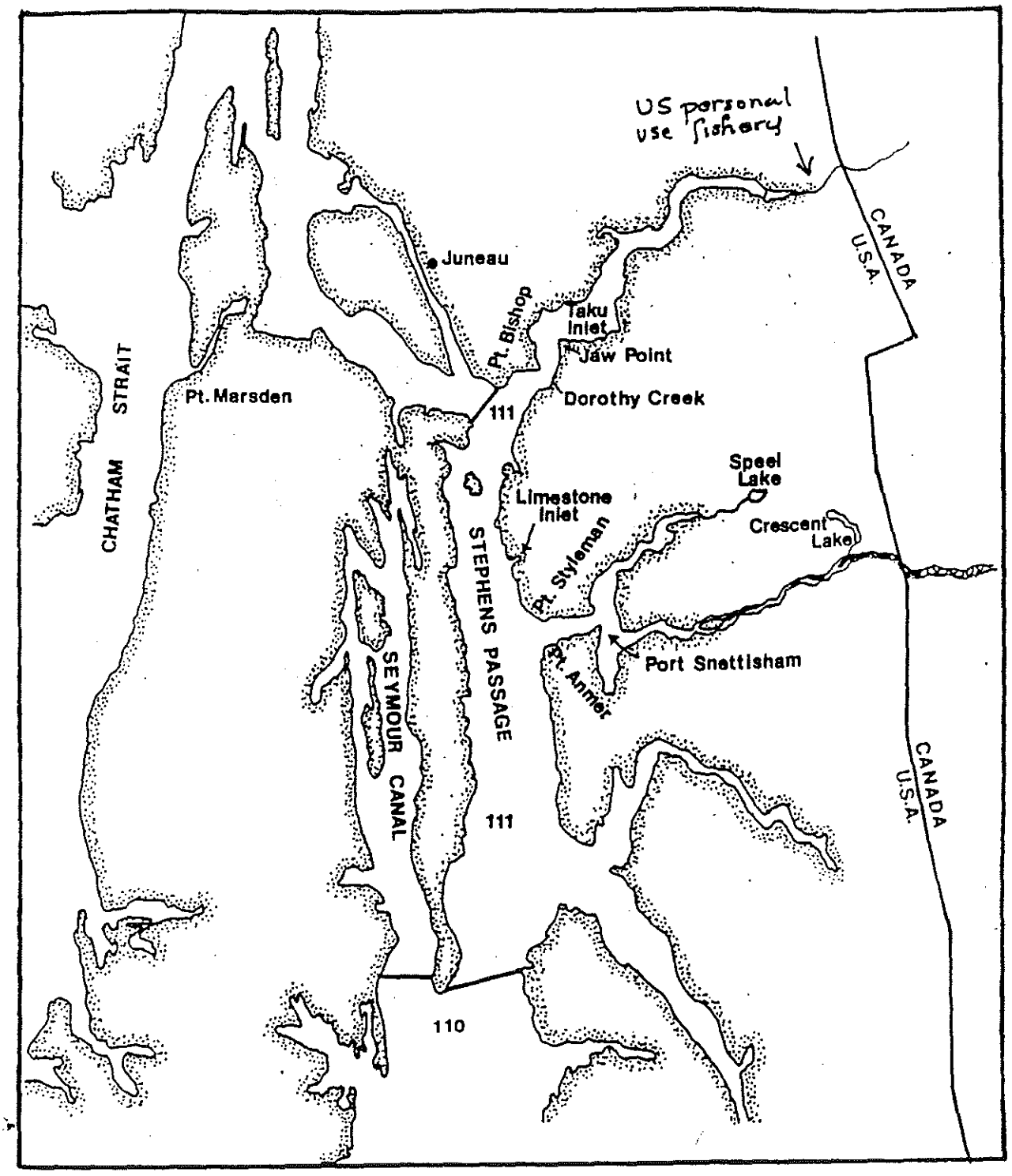


Figure 3. U.S. fishing areas adjacent to the Taku River.

Canada

The Canadian fishery will open 12:00 noon Sunday, June 20 for an initial 48-hour period to target early sockeye runs. A maximum mesh size restriction of 150 mm (approximately 6 inches) will be in effect through mid-July to conserve chinook salmon during the early season sockeye fishery.

Canadian sockeye management decisions for the Taku River fishery (Figure 2) will be based on weekly projections of total run size, TAC and escapement. The weekly projections will be made using the following calculations:

$$TAC = [(E_w + E_w + AC_{w-1}) / \rho_w] - Eg \qquad [5]$$

Where: TAC = the projected total allowable catch for the season;

E_w = the cumulative escapement to week w based on mark-recapture data;

CC_w = the cumulative Canadian catch to week w;

AC_{w-1} = the estimated cumulative Alaskan catch of Taku sockeye to the preceding week $w-1$ (preceding week used to allow for migration time). Catches in Districts 111 and 112 will be considered for inclusion in this estimate;

ρ_w = the estimated proportion of run through to week w determined from the average inriver run timing based on historical CPUE data from the Canadian fishery. (Run timing estimates will be adjusted inseason according to inseason CPUE data relative to historical data in both U.S. and Canadian fisheries); and

Eg = the system-wide escapement goal. (A value of 75,000 will be used reflecting the midpoint in the interim range of 71,000 to 80,000).

Weekly TAC and U.S. catch projections for sockeye salmon will be used to guide the management of the commercial fishery. Run timing will be used to project the total escapement and U.S. harvest; the Canadian catch will be adjusted with the objective of meeting escapement and agreed Canada/US harvest sharing objectives.

Modification to the fishing area implemented in 1998 to include a 50 metre closed section just upstream of the Canada/US border will be continued in 1999. The upper boundary near Yellow Bluff will remain unchanged from previous years.

To ensure prompt release of pink salmon and address chum salmon conservation concerns, the retention of pink and chum salmon will be prohibited. Fishers will also be encouraged to live release any steelhead caught as per previous years.

The Canadian fishery will be monitored daily by DFO personnel who will collect catch and tag recapture data. Catch information will be relayed to the DFO office in Whitehorse, collated, and exchanged with a designated ADF&G contact person during weekly, more often if needed, telephone contacts.

ALSEK RIVER

Fisheries

Salmon stocks returning to the Alsek River drainage (Figure 4) are jointly managed by the Canadian Department of Fisheries and Oceans (DFO) and the Alaska Department of Fish and Game (ADFG) through the joint Transboundary Technical Committee (TTC) of the Pacific Salmon Commission.

The principal U.S. fishery that targets Alsek stocks is a commercial set gillnet fishery which operates in Dry Bay. A small subsistence fishery also operates in Dry Bay. U.S. fishers harvest the full mixture of Alsek stocks. The principal Canadian fisheries occur in the upper Tatshenshini drainage. A traditional aboriginal fishery takes place in the Klukshu River and Village, Goat and Blanchard creeks. At present, between 100-150 members of the Champagne Aishihik First Nations harvest salmon via fish traps and gaffs, primarily in the Klukshu River, and to a lesser extent at Village, Blanchard and Goat Creeks. Sport fisheries take place in the Klukshu/Dalton Post area and on Takhanne and Blanchard rivers. The Canadian fisheries harvest upper Tatshenshini River salmon stocks.

Most Alsek chinook salmon appear to spawn in Canada, but some spawners have been observed in U.S. tributaries. Most sockeye and coho salmon probably also spawn in Canada, but substantial spawning has been documented in U.S. tributaries as well.

Preseason Forecasts

The overall sockeye return to the Klukshu River in 1999 is expected to be average in strength. Principal contributing brood years to this years' run will be 1994 (escapement of 13,892 sockeye) and 1995 (escapement of 19,817 sockeye); the 1988-97 average escapement is approximately 17,000 fish. Based on historical stock-recruitment analyses, the range of escapements that appear most likely to produce maximum sustained yields is 7,500 to 15,000 sockeye (Clark and Etherton *in prep.*). The 1999 overall Klukshu run is expected to be approximately 24,600 sockeye based on the overall historical stock - recruitment relationship, similar to the 1988-1997 average (i.e., 24,600 sockeye). The early run escapements in 1994 and 1995 were 3,000 and 2,300, respectively. Both years were above average and were close to the optimum level of 2,500 sockeye spawners as determined through separate stock-recruitment analyses by DFO of the early run. Because of this, it is expected the early run component will be above average in strength. However, the 1998 sockeye run was much lower than forecast.

The Klukshu chinook escapements in 1994 and 1995, 3,600 and 5,400 chinook, respectively, were above average with the 1995 escapement being the highest on record. However, the escapements were above the optimum escapement range of 1,100 to 2,300 chinook as determined from current stock-recruitment analysis. As a result, the preliminary outlook is for a below average return.

The coho escapements observed at the Klukshu River in 1995 (3,600 coho) and 1996 (3,500 coho) suggests the return in 1999 will be average to above average. The recent 10-year average escapement is 2,700 coho.

Management Approach for the 1999 Season

Sockeye Salmon

The principal escapement monitoring tool for sockeye salmon stocks on the Alsek River is also the Klukshu weir. A joint report that recommends a biologically-based escapement goal for the Klukshu stock is in preparation and is expected to be peer reviewed for the 2000 fishing season. The preliminary analyses were used to develop targets for the 1999 season.

Canadian and U.S. managers have set a minimum total spawning escapement goal of 9,500 sockeye salmon for 1999 including a minimum goal of 1,500 sockeye for the early run.

United States

U.S. fisheries will operate similar to regimes in 1995-1998, with the first opening the first week in June for one day. The remainder of this fishery will be operated on sockeye run strength. The fishery will be managed on run strength judged by comparison of CPUE to historical averages. A cautious approach will be taken recognizing that fishery CPUE is poorly correlated with run size. As noted above the U.S. fisheries target the full mixture of Alsek River sockeye stocks, which include stocks in the U.S. such as Tanis and Basin creeks, as well as Canadian upriver stocks such as Klukshu River and Village Creek. The proportion of the Alsek River sockeye run represented by the Klukshu stock is not known on an annual basis. A sockeye tagging study in 1993 indicated that approximately 37% of the "upriver escapement" (McBride and Bernard 1984) was bound for the Klukshu; however, the tagging study did not cover the entire sockeye run. That estimate was, however, expanded to represent the entire run by assuming normal timing and proportions for the early run.

The initial opening for the Alsek River fishery (Dry Bay, Figure 4) occurs on or after the first Monday in June by regulation; prior to 1963 the fishery opened in May. In 1999 the fishery will initially open for 24 hours on the first Monday in June (June 7, statistical week 24). The next week's opening will be for a 24-hour period starting the following Monday. An extension of fishing time may be allowed if sockeye salmon run strength is judged sufficient. The duration of fishing periods during the remainder of the sockeye salmon season will be based on a comparison of current year fishery performance with historical performance. Gill nets will be restricted to a maximum mesh size of 6 inches (152 mm) through July 1 to minimize chinook salmon harvests.

The Alsek sockeye salmon run in the lower river is nearly over by early to mid-August. Management emphasis will then be switched to coho salmon. Fishing time during the coho salmon fishery will be based on a comparison of current year fishery performance with historical performance.

The Alsek River surf fishing area will be open during the same time period as the inriver fishery. The surf fishery areas include the shoreline, 3/4 of a mile (1.2 km) in each direction from the river mouth to the outermost bar where the surf breaks.

Canadian Fisheries

Canadian fisheries for sockeye will proceed similar to regimes in recent years. In the event that the run size into the Klukshu is above the minimum targets, Canadian managers will liberalize harvest opportunities, similar to the plan for chinook salmon.

Chinook Salmon

The principal escapement monitoring tool for chinook salmon stocks on the Alsek River is the Klukshu weir, operated by DFO and the Champagne-Aishihik First Nation. A joint report for an escapement goal for the Klukshu stock has been reviewed and accepted by both Canada and ADF&G, which recommends an escapement goal range of 1,100 to 2,300 chinook spawners in the Klukshu drainage (McPherson, Etherton and Clark 1998). Canadian and U.S. managers have agreed to a minimum escapement goal of 1,100 spawners in the Klukshu drainage in 1999.

U.S. fisheries will operate similar to regimes in 1995-1998, with the fishery opening the first week in June for one day. The remainder of this fishery will be operated on sockeye run strength (see below). The U.S. fishery will likely have little effect on the Klukshu weir count. The U.S. fishery is operated after the peak of the chinook have passed through Dry Bay; the peak timing appears to be in late May based on past fishery data (McPherson, Etherton and Clark, 1998). Chinook tagging studies in 1997 and 1998 indicated that approximately 18-23% of the chinook passing through Dry Bay were bound for the Klukshu drainage. U.S. Alsek chinook harvests have been less than 1,000 chinook each year since 1981, and the 1999 harvests most likely will not be greater than this figure.

Canadian fisheries for chinook salmon will proceed similar to regimes in recent years. In the event that the run size into the Klukshu River is above the minimum targets, Canadian managers may liberalize harvest opportunities. If run forecasts are below minimum weir targets, fishery restrictions will be considered beginning in the sport fishery.

Coho Salmon

Coho salmon in U.S. and Canadian fisheries will be managed by monitoring fishery performance data and comparing it to historical fishery performance data. In the U.S. fisheries, the 1999 CPUE will be compared to historical CPUE for a given opening; time and area openings will be adjusted, similar to the plan for sockeye salmon.

Stock Assessment Program

The escapement of chinook, sockeye, and coho salmon through the Klukshu weir and sockeye through the Village Creek electronic counter serves as an inseason indicator of stock strength and adjustments to the fishery may be made on the basis of these counts. Aerial surveys are used to augment escapement information on sockeye and chinook stocks in the Alsek drainage and are reported in the TTC postseason annual report. A sockeye and chinook adult tagging project is being conducted to determine the distribution of these stocks within the drainage with the aim of determining the proportion of the spawning that occurs in the Klukshu drainage. A summary of the field projects on the Alsek River is presented in Appendix Table A3.

Management Planning for the 2000 Season

A more extensive management plan will be developed for the year 2000 fishing season. Joint preseason forecasts for the 2000 fishing season will be developed for Klukshu chinook and Klukshu sockeye salmon. An improved inseason forecasting method for sockeye salmon particularly in the lower Alsek River is needed.

A mark-recapture project will take place during 1999 to estimate total escapement of chinook salmon in the Alsek drainage and estimate the fraction represented by the Klukshu stock. Fish will be tagged in the lower Alsek River in Alaska and recoveries will be made in tributaries primarily in the Tatshenshini watershed. The Klukshu weir will also be used for tag recovery. During the chinook tagging project, early-run sockeye salmon will also be tagged (through June 30). This should estimate the abundance of the early-run sockeye component and timing between Dry Bay and Klukshu weir.

Radio telemetry will be used in 1999 to examine the spawning distribution of early and late run sockeye in the Klukshu system. Approximately 40 tags will be deployed, half during the early run and half during the late run. Depending on funding, additional studies may be conducted to examine the feasibility of stock identification for Alsek sockeye, e.g. scale patterns, GSI.

A joint report is being prepared to estimate an escapement goal range for Klukshu River sockeye salmon in time for it to be peer reviewed before the 2000 fishing season. This will estimate optimum spawning requirements for this stock and will have provisions for spreading the target escapements over all run segments through Klukshu weir. This report will include recommendations for an improved stock assessment program for sockeye salmon in the Alsek River, to be shared between DFO, ADF&G and the Champagne Aishihik First Nations.

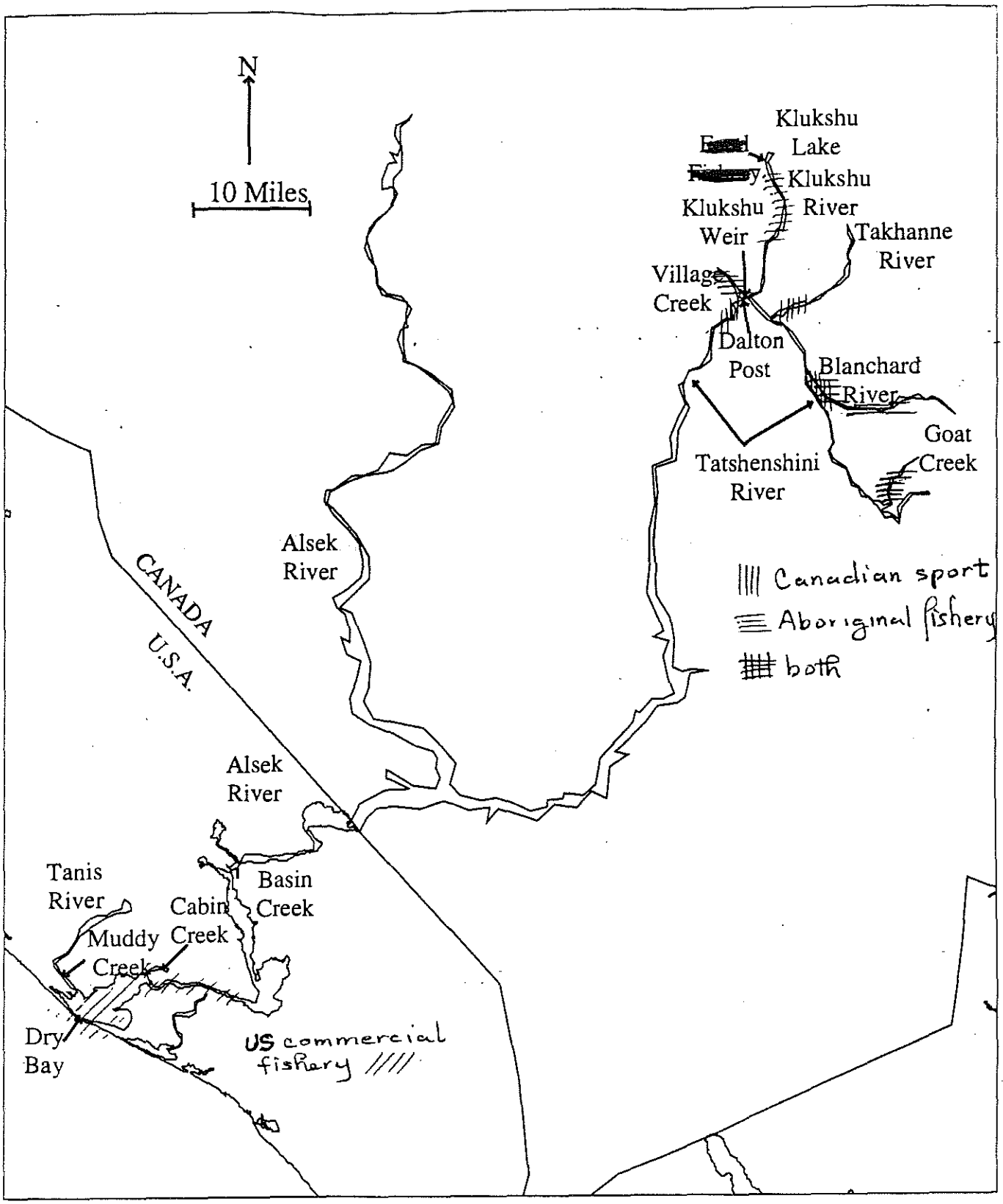


Figure 4. The Alsek River and principal U.S. and Canadian fishing areas.

TRANSBOUNDARY ENHANCEMENT PLANS

Overview

Joint sockeye enhancement projects are conducted on the Stikine and Taku rivers. Broodstock are taken at Tahltan Lake on the Stikine and from Tatsamenie Lake on the Taku; the eggs are incubated and thermally marked at the Snettisham Central Incubation Facility; and the fry are back planted into Tahltan and Tuya lakes on the Stikine and into Tatsamenie Lake on the Taku. In addition, plankton samples are taken from the various lake systems and analyzed. A summary of the enhancement field and incubation projects is presented in Appendix Table A4.

Fry Plants

Fry plants are scheduled to occur in May and June. The following numbers of sockeye fry produced from the transboundary sockeye enhancement program are expected to be outplanted in 1999:

Stikine drainage:	Tahltan Lake	1.8 million
	Tuya Lake	1.8 million
Taku drainage:	Tatsamenie Lake	2.2 million

Egg-Take Goals

Target sockeye egg-takes for the fall of 1999 are as follows:

Tahltan Lake	6.0 million
Tatsamenie Lake	5.0 million

APPENDIX: 1999 TRANSBOUNDARY FIELD PROJECTS

Proposed projects regarding the Stikine, Taku, and Alsek salmon stocks are summarized in Appendix Tables A1 to A3. Enhancement projects are given in Table A4. For each project listed, information regarding the dates of operation, primary objectives, and agency roles are described. Contacts are listed at the bottom of each table.

Table A1. Proposed Stikine River field projects, 1999.

Project/Dates	Function	Agency	Involvement
Stikine Chinook Study			
5/1 - 8/30	• Tag up to 800 Stikine River chinook salmon captured from the Kakwan point drift net site.	ADF&G	All aspects except tag recovery
	• Recover tags from the Canadian fisheries and from the Little Tahltan weir and from Verrett Creek. Tags may also be recovered from other spawning sites.	DFO/TFN	All aspects
Tahltan Lake Smolt Estimation			
5/5 - 6/30	• Enumerate Tahltan Lake sockeye smolts.	DFO/TFN	All aspects
	• Sample up to 800 smolts for age, size, and otoliths.		
Upper Stikine Sampling			
6/14 - 8/27	• Sample up to 800 sockeye for age, sex, size, otoliths proportionally from the Aboriginal and commercial fishery at Telegraph Creek.	TFN	Collect data
		DFO	Data analysis
	• Sample up to 500 chinook for age, sex, size, and tags.		
Little Tahltan Chinook Enumeration			
6/11 - 8/18	• Enumerate Little Tahltan chinook salmon from a weir located at the mouth of the river.	DFO/TFN	All aspects
	• Sample up to 1100 fish for age, sex, size, and tags.		
	• Enumerate and record tags observed during the enumeration of the fish.		
Test Fishery in Lower Stikine			
6/13 - 10/22 *	• Conduct a test fishery as required (to fill in when no commercial fishing) to assess run size and run timing of sockeye and coho salmon. (*If funding permits, a coho mark-recaptured study may be conducted.) Collect age-sex-size information and recover CWTs from all salmon. Collect tagged salmon.	DFO/TFN	All aspects
		ADF&G	Inseason processing of otoliths

Table A1. continued.

Project/Dates	Function	Agency	Involvement
	• Sample all sockeye from test fishery for scales and all female sockeye for egg diameters (used for stock ID). • Otolith sampling requirements are 150/week for weekly samples (matched with scales) and with egg diameters for females. Transfer otolith samples to ADF&G for inseason processing.		
Commercial Inriver Fishery Stock ID Sampling			
6/20-9/4	• Commercial catch sampling for sockeye to include 350/week for age-sex-size, including up to 150 matched egg-diameter/otolith samples and otoliths from 50 males (if possible). • Transfer up to 200 otolith samples per week to ADF&G for inseason processing.	DFO ADF&G	All aspects Inseason processing of otoliths
District 106 &108 Stock ID Sampling			
6/21 - 9/20	• Sample 20% of chinook, coho, chum and sockeye catches per district for CWTs; sample sockeye and coho for scales (for aging), sex, and size (scale sampling goals are 600 sockeye per D108, D106-41, D106-30 per week and 600 coho from D106 during the season). • Collect 400 otoliths/week in District 108, 300 in Subdistrict 106-41 (100 matched with scale samples), 300 in Subdistrict 106-30.	ADF&G	All aspects
District 108 Test Fishery			
13/6- 7/3	• Gillnet selectivity study using varied mesh sizes, sample up to 100 sockeye/week for thermal marks, size and age	ADF&G	All aspects
Andrew Creek Salmon Enumeration			
7/25 - 9/10	• Survey Andrew Creek , enumerate chinook salmon and recover tags.	ADF&G	All aspects
Tahltan Lake Salmon Enumeration			
7/5 - 9/10	• Enumerate Tahltan Lake sockeye entering the lake at weir. • Sample up to 800 fish for age, sex and size. • Sample up to 400 sockeye for both otoliths and egg diameters (400 will be sampled from the brood stock take)	DFO/TFN	All aspects

Table A1. continued.

Project/Dates	Function	Agency	Involvement
Tuya ESSR Fishery & Sampling			
7/12 - 8/27	• Continue feasibility study for terminal sockeye fishery at Tuya River.	TFN	Fishery feasibility/ collect data
	• Sample up to 100 sockeye for otoliths, scales, and size.		
	• Sample up to 400 female sockeye for egg diameters.	DFO	Data analysis
Chinook at Shakes Creek			
7/26 - 8/20	• Collect age and size data from spawned out chinook	TFN	All aspects
	• Enumerate spawning escapement of chinook		
Chinook Aerial Surveys			
8/10 - 8/15	• Enumerate chinook salmon spawning in Little Tahltan, Beattie, and Andrew tributaries.	ADF&G	All aspects
Coho and Sockeye Aerial Surveys			
9/4 - 10/31	1. Enumerate Stikine River coho and sockeye salmon spawning in select index areas within the Canadian portion of the Stikine River.	TFN/DFO	All aspects
10/05 - 10/31	2. Enumerate coho salmon spawning in the US section of the Stikine River	ADF&G	All aspects

Contacts:

Sandy Johnston or Pete Etherton (DFO) -------- All DFO projects.
Cherri Frocklage or Richard Inkster (TFN) ----- Inriver sampling projects.
Keith Pahlke (ADF&G) ---------- Chinook tagging and surveys; Andrew Creek Weir.
Kathleen Jensen (ADF&G) ---------- District 106&108 samples & stock assessment.
Brian Lynch (ADF&G) ---------- Coho aerial surveys.

Canadian staff that may be crossing the Canadian/US border:

Wayne Dennis, Peter Etherton, Cherri Frocklage, Alex Joseph, Martin Kienzler, Chuck Shewen, others

US staff that may be crossing the Canadian/US border:

Tom Rockne, Alicia Bachinsky, Kathleen Jensen, Brian Lynch, Keith Pahlke, Tim Sands, others

Table A2. Proposed Taku River field projects, 1999.

Project/Dates	Function	Agency	Involvement
Canyon Island Marking Program			
mid April	1. Set up fish wheel/camp, including 2 boats & motors, camp supplies, food/tagging equipment.	ADF&G	All aspects
4/26 - 9/30	2. Fishwheel operation • Mark all fish (chinook) captured in wheel through mid-June with spaghetti tags. • Sample for age-sex-length information, 260 sockeye/week throughout sockeye run, 600 coho salmon for the entire season, and about 1 in 4 chinook salmon. • Recover all adipose-clipped chinook and coho caught in wheel.	ADF&G TRTFN DFO (tentative)	3 personnel 1 staff member 1-2 staff
Smolt Tagging			
4/7-6/27	• Tagging (CWT) up to 40,000 chinook and 20,000 coho smolt.	ADF&G	All aspects
Canadian Aboriginal Fishery Sampling and Chinook Fishwheel Operation			
5/1 - 9/30	• Collect and record AFS catch information. • Record tag number for any Canyon Island chinook that are recaptured; release all tagged chinook salmon. • The fishwheel component will take place 05 May to 10 June	TRTFN	All aspects
Nahlin Sampling			
6/1- 8/20	• Adult chinook and opportunistic sampling of sockeye salmon at Nahlin; sample for age-sex-length (600 chinook and 600 sockeye), recover and record all spaghetti tags. Recover heads of all adipose-clipped chinook salmon.	TRTFN	All aspects
Canadian Fishery Sampling			
6/15- 10/16	• Collect and record commercial catch information Catch information shall be sent to DFO Whitehorse; whose staff will provide/relay catch information to management staff, ADF&G (Juneau). • Sample sockeye and coho salmon for age-sex-length; 200 samples per week for sockeye; 520	DFO	All aspects

Table A2. continued

Project/Dates	Function	Agency	Involvement
	per season for coho; 300 scale samples per season for chinook. • Recover CWTs from coho and chinook (i.e., those heads returned by fishers or taken in adipose fish samples). • Examination of sockeye and coho salmon for secondary mark, minimum 400 per week each species. • Collect 60 sockeye otolith samples per week for determination of contribution of enhanced fish; send otolith samples to ADF&G for processing. • Collect and record all spaghetti tags caught in inriver fisheries, pay fishers for tag recoveries and maintain receipt book.		
District 111 Fishery Sampling			
6/21 - 9/30	• Sample a minimum of 20% of chinook and coho catches for CWT; all species except pinks for age-sex-length (goals are 600 per week for sockeye and 600 per season for chinook, chum, and coho). • Collect 400 matched brain-parasite/scale/otolith samples per week from sockeye	ADF&G	All aspects
Kuthai Sockeye Sampling			
7/10- 9/01	• Maintain adult sockeye salmon weir at Kuthai Lake; enumerate and sample for age-sex-length (600 samples) and recover spaghetti tags.	TRTFN	All aspects
Little Trapper Sampling			
7/16- 9/12	• Maintain adult sockeye salmon weir at Little Trapper Lake; enumerate and sample for age-sex-length (750 samples) and recover spaghetti tags. • Examine chinook salmon for tags & secondary marks.	DFO	All aspects

Table A2. continued

Project/Dates	Function	Agency	Involvement
Aerial chinook surveys			
7/25- 8/25	• Aerial surveys of spawning chinook salmon in index tributaries of Nakina, Nahlin, Dudidontu, Tatsatua, Kowatua, and Tseta rivers	ADF&G	All aspects
Nakina Chinook Escapement Estimation			
7/28 - 8/28	• Maintain chinook carcass weir enumerate chinook. • Sample every fourth (minimum 600) chinook for age-sex-length and all other chinook for sex-length. • Recover and record all spaghetti tags, examination of fish for secondary mark, examination of all chinook salmon for adipose clips and recover all heads from adipose clipped fish for coded wire tags.	TRTFN	All aspects
Sockeye Sampling			
7/28 - 8/28	• Sample Nakina and Silver Salmon origin sockeye for age-sex-length.	TRTFN	All Aspects
Tatsamenie Sampling			
8/5- 9/30	1. Maintain adult sockeye salmon weir • Enumerate sockeye, sample for age-sex-length (750 samples) and recover spaghetti tags. • Collect otoliths from sockeye broodstock taken at weir. • Examine chinook salmon for tags & secondary marks.	DFO	All aspects
8/23- 9/7	2. Chinook salmon carcass weir at Lower Tatsamenie • Sample for age-sex-size and • examine for tags and secondary marks on all chinook salmon recovered	ADF&G	All aspects
Sockeye Escapement Sampling			
9/5- 9/25	• Sample sockeye escapement in mainstem areas for age-sex-length (400 samples per area) and recovery of spaghetti tags.	ADF&G	All aspects

Table A2. continued

Project/Dates	Function	Agency	Involvement
Chum Aerial Survey			
10/15	• Aerial survey for chum on mainstem, King Salmon Flats	TRTFN	All aspects

Contacts:

Scott McPherson (ADF&G)	Lower river smolt tagging, adult chinook/coho tagging.
Rich Yanusz (ADF&G)	Adult chinook and coho tagging.
Dave Barto (ADF&G)	Canyon Island adult sockeye tagging.
Kathleen Jensen (ADF&G)	District 111 sampling and stock assessment.
Keith Pahlke (ADF&G)	Chinook surveys.
Ian Boyce (DFO)	All DFO Taku programs
Sandy Johnston (DFO)	All DFO Taku programs.
Terry Jack or Richard Erhardt (TRTFN)	All TRTFN programs.

Canadian staff that may be crossing the Canadian/US border: Ian Boyce, Pat Milligan, others.

US staff that may be crossing the Canadian/US border: Clyde Andrews, Dave Barto, Mark Olsen, Kent Crabtree, Ben Van Allen,Kathleen Jensen, Ed Jones, Keith Pahlke, Rich Yanusz, others.

Table A3. Proposed Alsek River field projects, 1999.

Project/Dates	Function	Agency	Involvement
Sockeye Radio Telemetry			
6/7-10/15	• Radio tag early and late run sockeye to determine run timing and spawning sites	CAFN DFO	Tracking Tagging
Chinook Tagging Project			
5/8-9/30	• Tag chinook and sockeye salmon to determine distribution.	ADF&G	All aspects
	• Tag recovery at various locations (see below)	DFO	Tag recovery
Klukshu River Sampling			
6/03 - 10/15	• Enumerate chinook, sockeye and coho salmon at adult weir. • Estimate sport and aboriginal fishery catches. • Collect age-sex-length information from salmon caught by First Nations (live sampling discontinued) (750 scale samples per species) except chinook, see below. • Sample 300 chinook in sport harvest for scales, sex, length (MEF), CWTs and spaghetti tags. • Sample 1100 chinook at weir for sex, length (MEF), CWTs and spaghetti tags. • Look for chinook and sockeye tagged fish.	DFO	All aspects
Village Creek sockeye enumeration			
6/10- 10/18	• Enumerate sockeye salmon using an electric counter at Village Creek.	DFO	All aspects
Lower Alsek Sampling			
6/14- 9/15	• Sample commercial catches of all salmon at lower Alsek and East River. • Collect age-sex-length (MEF) data (sockeye-600, chinook-600, coho-500); recover tags from chinook and sockeye.	ADF&G	All aspects
Escapement Surveys			
8/01- 8/15	1. Aerial surveys of spawning sockeye salmon in index areas of Cabin, Tanis Muddy and Basin creeks (in Canada)	ADF&G	All aspects
8/10	2. Aerial surveys of spawning chinook salmon in index areas of Blanchard, Takhanne, Klukshu rivers and Goat Creek (in Canada)	ADF&G	All aspects

Table A3. continued

Project/Dates	Function	Agency	Involvement
10/01- 10/15	3. Aerial surveys of spawning coho salmon in index areas of Cabin, Tanis, Muddy and Basin creeks (in Canada)	ADF&G	All aspects

Contact:

Peter Etherton (DFO)	All DFO projects
Sandy Johnston (DFO)	All DFO projects
Keith Pahlke (ADF&G)	Chinook aerial surveys, and tagging
Kathleen Jensen (ADF&G)	Lower Alsek and East Rivers commercial catch sampling
Alan Burkholder (ADF&G)	Adult chinook tagging, sockeye and coho aerial surveys
Linaya Workman (CAFN)	Sockeye Radio Tagging

Canadian staff that may be crossing the Canadian/US border: Frances Naylen, Liz Fillatre, Jim Dolsen, Fred Brown. Peter Etherton, others

US staff that may be crossing the Canadian/US border: Al Burkholder, Robert Johnson Keith Pahlke, others

Table A4. continued.

Project	Function	Agency	Involvement

Table A4. Proposed enhancement projects for transboundary Stikine and Taku rivers, 1999.

Project	Function	Agency	Involvement
Tahltan/Tuya Enhancement Project			
5/1 - 6/15	1. Enumeration and sampling of smolts from Tahltan and Tuya lakes (sample only) (Stikine River, in Canada) and collection of otolith samples to determine enhanced contribution.	DFO	All aspects
15/55 - 6/20	2. Backplant sockeye fry from Snettisham Hatchery into Tahltan and Tuya lakes and collect plankton data from Tuya Lakes.	DIPAC & ADF&G	All aspects
6/1 - 7/1	3. Plankton samples from Tahltan Lake.	DFO	All Aspects
6/1 - 9/30	3. Hydroacoustic/limnological surveys of Tahltan and Tuya lakes to evaluate success of fry outplant.	DFO	All aspects
9/1 - 9/30	4. Collect 6.0 million sockeye eggs from Tahltan Lake and transport to Snettisham Hatchery in Alaska.	DFO	Egg-take and transport
9/6 - 10/8	5. Sample 200 male and 200 female adult sockeye from Tahltan Lake broodstock for otolith samples.	DFO	All aspects
Tatsamenie Lake Enhancement Project			
5/10 - 6/4	1. Sample smolt outmigration from Tatsamenie (Taku River, in Canada) and conduct mark-recapture program on smolt from Tatsamenie Lake.	DFO	All aspects
5/15 - 5/30	2. Backplant sockeye fry from Lake Snettisham Hatchery into Tatsamenie Lake.	DIPAC & ADF&G	All aspects
6/1 - 9/30	3. Collect plankton samples from Tatsamenie Lake; conduct hydroacoustic/limnological surveys in Tatsamenie Lake to evaluate success of fry outplants.	DFO	All aspects
8/15 - 10/15	4. Collect up to 5.0 million sockeye eggs from Tatsamenie Lake and transport to Snettisham Hatchery in Alaska.	DFO	Egg-take and transport

Table A4. continued.

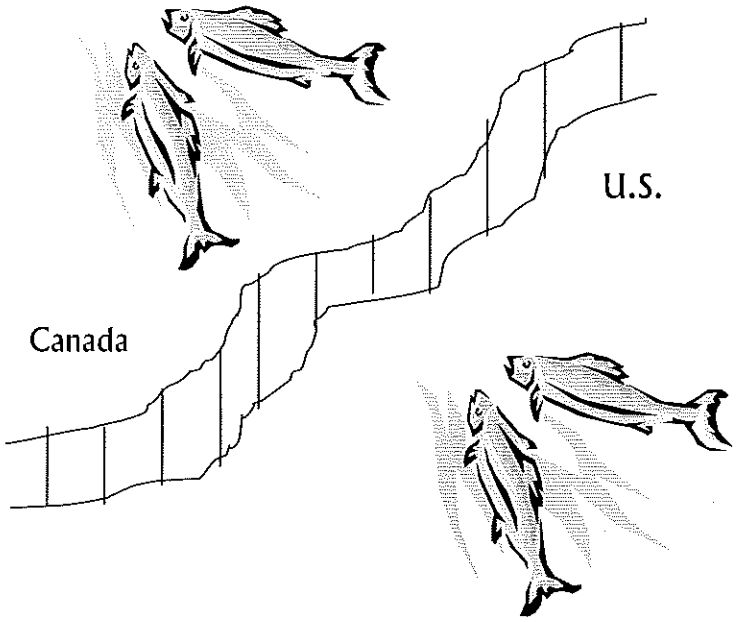
Project	Function	Agency	Involvement
9/6 - 10/8	5. Sample 400 adult sockeye from Tatsamenie Lake egg-take for otolith samples.	DFO	All aspects
Salmon Egg Incubation			
9/97 - 6/98	• Incubation and thermal marking of juvenile sockeye (eggs & alevins) collected from Tahltan (Stikine River) and Tatsamenie (Taku River) lakes at the Snettisham Incubation Facility in Alaska.	DIPAC/ ADF&G	All aspects

Contacts:

Pete Hagen or Kris Munk (ADF&G)	Otolith marking
Ron Josephson (ADF&G)	Snettisham Hatchery
Kathleen Jensen (ADF&G)	Inseason & postseason estimates of enhanced fish in marine catches.
Eric Prestegard (DIPAC)	Snettisham Hatchery/DIPAC programs
Steve Reifenstuhl (NSRAA)	Snettisham Hatchery
Sandy Johnston, Pat Milligan, or Doug Lofthouse (DFO)	All DFO projects
Peter Etherton (DFO)	Stikine River drainage programs
Ian Boyce (DFO)	Taku River drainage programs
Kim Hyatt (DFO)	Hydroacoustic and evaluation program
Cheri Frocklage (TFN)	All TFN programs

Canadian staff that may be crossing the Canadian/US border:
flight crew and egg-take crew

US staff that may be crossing the Canadian/US border:
Eric Prestegard, Kevin Stack, flight crew from Alaska Coastal airline



Got your passport? There's the border.