PACIFIC SALMON COMMISSION
TRANSBOUNDARY TECHNICAL
COMMITTEE REPORT

SALMON MANAGEMENT AND ENHANCEMENT PLANS FOR THE STIKINE, TAKU AND ALSEK RIVERS, 2004

REPORT TCTR (04)-01

This plan was finalized at the February 25-27, 2004 meeting of the
Transboundary Technical Committee
Douglas, Alaska

ACRONYMS

ADF&G	Alaska Department of Fish and Game
CAFN	Champagne & Aishihik First Nation
CPUE	Catch per unit of effort
CTC	Chinook Technical Committee of the Pacific Salmon Commission
CWT	Coded-wire tag
DFO	Department of Fish and Oceans, Canada
DIPAC	Douglas Island Pink and Chum, Inc.
ESSR	Excess Salmon to Spawning Requirements
FN	First Nation
PSARC	Pacific Scientific Advice Review Committee of DFO
PSC	Pacific Salmon Commission
PST	Pacific Salmon Treaty
SMM	Stikine Management Model
SPA	Scale pattern analysis
TAC	Total Allowable Catch
TCTR	Transboundary Technical Committee
TIFN	Tahltan & Iskut First Nation
TRTFN	Taku River Tlingit First Nation

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INTRODUCTION

Management of transboundary river salmon to achieve conservation, allocation and enhancement objectives, as stipulated by the Pacific Salmon Treaty (PST), 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 and Iskut First Nations (TIFN), the Taku River Tlingit First Nation (TRTFN), the Champagne & Aishihik First Nation (CAFN) and the Alaska Department of Fish and Game (ADF&G).

The report contains, by river system and species, the 2004 salmon run outlooks, spawning escapement goals, a summary of harvest sharing objectives, and an outline of management procedures to be used during the conduct of the 2004 fisheries. Numerical forecasts are presented for: Stikine sockeye, which is required by the PST, and Chinook salmon; Taku Chinook, sockeye and coho; and Alsek sockeye salmon. Outlooks for other stocks are given qualitatively with reference to brood year escapement data where available. The report also contains joint plans for fry plants and egg collections and a detailed list of proposed field projects for 2004, identifying agency responsibility and contacts for the various functions within the projects.

STIKINE RIVER

Sockeye Salmon

Stock Definitions

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

Preseason Forecast

For 2004, the terminal run[1] outlook for Stikine sockeye salmon is 289,500 fish, which constitutes an above average run. For comparison, the recent ten-year average (1994-2003) total Stikine sockeye run size is approximately 183,000 fish. The 2004 forecast includes approximately 112,300 wild Tahltan (39%), 105,000 planted Tahltan (36%), 21,400 enhanced Tuya (7%), and 50,900 wild mainstem sockeye salmon (18%). However, as can be seen below, there are wide discrepancies in each of the individual run component outlooks depending on which method is used.

The 2004 overall Stikine sockeye prediction is based on the following components:

[1] Terminal run size = total run excluding allowance for harvests in marine areas outside the terminal Alaskan gillnet fisheries (e.g. Districts 106, 108 and 111).

1. an outlook of approximately 217,300 Tahltan wild + enhanced sockeye of which 105,000 are expected from the enhancement project. This is the average of: a sibling-based prediction of 322,700 sockeye for the total Tahltan stock, which includes approximately 171,600 enhanced sockeye; and, a smolt prediction of 111,803 Tahltan sockeye of which 38,300 are expected to originate from the enhancement project;
2. an outlook of 31,400 Tuya sockeye salmon, which is based on 1997-03 average age-specific fry-to-adult survival data for Tuya sockeye; and
3. an outlook of 50,900 mainstem sockeye based on the average of a sibling-based prediction of 93,700 and a stock-recruitment outlook of 8,000 sockeye salmon.

For most of the analyses conducted to produce the run outlooks, age and stock-specific catch and escapement estimates are used to reconstruct annual runs for the Stikine sockeye stocks. Marine catch estimates from Districts 106 and 108 are based on ADF&G scale pattern analysis (SPA); estimates of catch occurring outside these areas do not currently exist. In-river catch estimates from the lower Stikine River are based on a variety of stock identification techniques (SPA, egg diameter and otolith data). The contribution of Tahltan stocks to upper river commercial and FN fisheries had been assumed to be 90% prior to 1997 and has been estimated from egg diameter analysis since 1997. The contributions of planted Tuya and Tahltan fish to various harvests are estimated from analysis of otoliths for thermal marks combined with analysis of scale patterns and/or egg diameters. Tahltan Lake sockeye escapements are enumerated at the Tahltan Lake weir whereas, mainstem and Tuya escapements are calculated through the subtraction of the reconstructed in-river Tahltan run and the estimated in-river catches of Tuya and mainstem sockeye stocks from the total in-river run estimates.

Due to fluctuations in survival for Stikine sockeye, there is a high level of uncertainty in these preseason outlooks. For the terminal run outlook in 2004, the predicted range is from a low of 142,000 to a high of 438,700 sockeye - this is the range that includes the sum of the lower predictions vs. the sum of the highest predictions as calculated above. The various preseason outlook techniques 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 preseason run forecast was 218,500 sockeye, whereas the estimate of actual run was only 121,400 sockeye; this unexpectedly low run size was due to poor marine and freshwater survival. However, in 1999, the preseason forecast of 126,000 Stikine sockeye salmon was very close to the post-season estimate of approximately 124,600 sockeye. The performance of the preseason forecasts relative to final post-season estimates is summarized in Table 1. Despite problems with preseason forecasting, the outlooks are useful for management until in-season data becomes available for in-season projections.

The 2004 sockeye run outlook is characterised as above average. The preseason outlook translates into an expected total allowable catch (TAC) for all Stikine sockeye salmon of 212,000 fish. Of this, approximately 3,000 sockeye are expected to be harvested in test fisheries (stock assessment) leaving approximately 209,000 sockeye to be shared 50:50 between Canada and the U.S., i.e. 104,500 to each country, excluding terminal Tuya catches in Canada. The TAC outlook is comprised of the following components:

1. a predicted total allowable catch (TAC) of 187,000 Tahltan sockeye with an allowable maximum exploitation rate on this stock of 0.65 at a the predicted stock size of 290,000 fish and an escapement target of up to 30,000 sockeye salmon for the total Tahltan stock;
2. a predicted TAC of 13,800 Tuya fish estimated by applying the allowable Tahltan exploitation rate to the Tuya stock prediction of 21,400 fish (since Tuya stocks are mixed with Tahltan Lake stocks). This leaves a predicted 7,600 fish surplus for the Tuya stock which potentially would be available for Canadian terminal harvest in the Tuya R.; and
3. a projected TAC of 12,000 mainstem sockeye which allows for an escapement target of up to 40,000 spawners.

Table 1. Stikine River sockeye salmon preseason run forecasts vs. post season run size estimates, 1982 to 2003.

Year	Pre-season Forecast (a)	Post Season Run Size	Forecast Performance (b)
1982	84,000	111,507	-24.67%
1983	62,900	77,465	-18.80%
1984	37,500	84,014	-55.36%
1985	91,000	214,494	-57.57%
1986	262,000	98,373	166.33%
1987	114,000	43,350	100.00%
1988	123,500	45,096	173.86%
1989	80,500	90,546	-11.10%
1990	94,000	67,242	39.79%
1991	94,000	154,351	-39.10%
1992	127,338	231,936	-45.10%
1993	135,000	280,730	-51.91%
1994	312,000	208,036	49.97%
1995	169,000	218,728	-22.74%
1996	329,000	372,785	-11.75%
1997	211,000	226,915	-7.01%
1998	218,500	121,448	79.91%
1999	126,000	119,138	5.76%
2000	138,000	94,311	46.32%
2001	113,000	141,000	-19.86%
2002	80,000	87,724	-8.80%
2003	184,000	241,362	-23.77%
1982-2003			12.02%
1994-2003			8.80%

a) preseason forecast based on a combination of sibling, smolt and stock-recruitment forecast methods.

b) the forecast expressed as % deviation from post season estimate. Negative numbers indicates the projection was lower than the actual run.

Spawning Escapement Goals

Escapement goals have been established by the Transboundary Technical Committee (TCTR) for two of the Stikine sockeye stock groups: 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, which is planted and has no natural access to spawning and rearing grounds, has a spawning escapement goal of zero. In practice, since the Tahltan and Tuya stocks co-mingle and have the similar migratory timing and distribution, the harvest rate on Tuya fish should not exceed that which can be sustained by the Tahltan fish so as not to over harvest the latter 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.

Subjective management categories have been defined for various escapement ranges. A post-season 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 judgment of desired escapement levels.

Tahltan Stock

In 1993, the TCTR established an escapement goal of 24,000 fish for the Tahltan stock (Wood et al unpublished data), 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 fry planting program. 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

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 planted components;
2. smolt production, separated by wild and planted components; and
3. stock specific catches in the various fisheries.

The following relationships for the Tahltan stock will be examined:

1. terminal run as a function of spawning escapement level;
2. smolt production as a function of the number of natural spawners and planted fry;
3. adult production as a function of the number of smolts;
4. terminal run as a function of the return of age-4 sockeye salmon in the previous year; and
5. the relationship between the terminal run estimates to patterns of distribution and timing. This will include comparisons of various estimates (Stikine Management Model (SMM), mark-recapture, test fishing vs commercial fishing CPUE, different stock ID results).

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

1. survey counts, mark-recapture estimates of mainstem stock escapements and escapement estimates based on reconstructions of in-river runs apportioned by stock ID data;
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. terminal run as a function of total spawning escapements; and
3. terminal run as a function of the return of age-4 sockeye salmon in the previous year; and
4. the relationship of terminal run estimates to patterns of distribution and timing. This will include comparisons of various estimates (SMM, aerial surveys, mark-recapture, test fishing vs commercial fishing CPUE, different stock ID results).

The following data for the Tuya sockeye stock will be collected and exchanged for use in evaluating adult returns:

1. escapement estimates generated from stock ID, CPUE, and inriver run estimates (including mark-recapture estimates);
2. number of planted fry; and
3. stock specific catches in the various fisheries.

The following relationships for the Tuya stock will be examined:

1. adult production as a function of the number of fry planted;
2. terminal run as a function of the return of age-4 sockeye salmon in the previous year; and
3. the relationship of terminal run estimates to patterns of distribution and timing. This will include comparisons of various estimates (SMM, aerial surveys, mark-recapture, test fishing vs. commercial fishing CPUE, different stock ID results).

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

Harvest Sharing Objectives

The Pacific Salmon Commission (PSC) re-negotiated Pacific salmon harvest sharing provisions in June 1999 for the period 1999 through 2008. Stock assessment and harvest arrangements for Stikine sockeye stocks are found in Annex IV, Chapter 1, of the PST and Appendix to Annex IV, Chapter 1 entitled "*Understanding on the Joint Enhancement of Transboundary River Sockeye Stocks*".

Management plans for the 2004 Stikine harvest are for the TAC of Stikine sockeye salmon, both natural and planted, to be shared 50/50 between the Parties in existing, i.e. customary, fisheries. The Transboundary Panel has agreed to a new sockeye subsistence fishery occurring in the U.S. section of the Stikine River in 2004, and discussions are continuing on Chinook and coho provisions. The subsistence catches will be part of the existing harvest sharing arrangements unless otherwise agreed. However, if the existing fisheries do not manage to catch the entire TAC, terminal catches in Canada will be allowed to target surpluses (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 5 ½ 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 season will start at 12:00 noon on Sunday, June 13 (statistical week 25) for a 48-hour open period in Districts 106 and 108. The opening date for District 108 may be modified pending the conclusion of negotiations within the Transboundary River Panel related to renewing directed fisheries for Stikine River Chinook salmon. Extended fishing time and midweek openings in both districts may occur depending upon run abundance indicators. Generally, openings will be based on in-season catches, CPUE, stock proportion data and run projections when available.

Management actions during the sockeye fishing season will be based on analysis of in-river gillnet test fishery CPUE and stock identification data to determine the availability of Stikine fish. These stock abundance indicators will be incorporated into the Stikine Management Model. Model predictions based on D-108 CPUE will also be computed. As the season progresses, the model based on in-river test fishery data 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 will occur if it appears escapement targets and/or harvest sharing agreements will not be achieved. If the in-season run projections indicate that the Tahltan sockeye run is as large, or larger than anticipated, and that additional fishing time would not constitute a risk to the health of the stock, more liberal fishing periods may be allowed. If the sockeye runs to local Alaskan island systems are determined to be weak, area and time restrictions may be necessary in District 106.

Pink salmon typically begin entering District 106 in significant numbers by the third or fourth week of July. The S.E. Alaska pink salmon run outlook is above average (50 million total harvest). The early portion of the pink salmon fishery will be managed primarily on CPUE. By early to 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. If runs are not evenly dispersed throughout the district, area restrictions may be necessary. 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 commercial fishery catches. The run outlook for S.E. Alaska chum salmon is average.

Announcements for fishery openings throughout S.E. Alaska are made on Thursday afternoons for gillnet fisheries which begin the following Sunday. Announcements for any fishery extensions or mid-week openings will be made on the fishing grounds by 10:00 a.m. of the last day of the regular fishery opening.

A U.S. Federal Stikine River subsistence fishery may occur in 2004. At the time of writing, the Transboundary River Panel, at the February meeting, had agreed to a subsistence harvest up to 600 sockeye salmon in this fishery; discussions regarding Chinook and coho salmon were still in negotiation. It was agreed the fishing area for this fishery will exclude stock assessment sites identified prior to each season: for 2004, the areas excluded will include the tagging sites located near Rock Island, Shakes Slough and Red Slough.

The State personal use fishery in the Stikine River was closed in the 2002 and 2003 seasons due to concerns related to the strength of the Tahltan Lake sockeye salmon run. The State personal use fishery was previously allowed in the main channel of the river between the ADF&G cabin at Kakwan Point upstream to the Canadian border. The 2001 season was the first time this area was placed on the actual permit. In 2001, there were 28 sockeye harvested and 3 permits fished. The personal use fishery will not open in 2004.

A subsistence drift gillnet fishery, targeting sockeye salmon and encompassing the waters of Sumner Strait near Point Baker (portions of Districts 105 and 106), will again be allowed in 2004. 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°29'00"; W. Long. The fishery is restricted to Alaska residents only and will be open each week from Wednesday noon through Sunday noon during the period June 15 through July 31, with a limit of 25 sockeye per family per year. Gillnet gear restrictions include a maximum net length of 50 fathoms. It is anticipated that fewer than 100 sockeye will be harvested in this fishery. The harvest for the past 5 years ranged from 14 to 43 sockeye with 2 to 5 permits fished.

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 SMM and in-season mark-recapture results. Weekly inputs to the model will include: effort and catch data from Alaska District 106 and 108 gillnet fisheries; catch, effort and in-season stock composition data from the Canadian lower Stikine commercial and test fisheries; and escapement requirements.

The lower river commercial fishery will open at 12:00 noon June 20 (statistical week 26) for an initial period of 48 hours. The opening date may be modified pending the conclusion of negotiations within the Transboundary River Panel related to directed fisheries for Stikine River Chinook salmon. Consideration for Tahltan Lake sockeye stock management objectives should persist through the end of July. Thereafter, management attention will be focused primarily on mainstem sockeye stock objectives. Actual time frames of responses to specific stock compositions will be fine-tuned in-season 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 food, social and ceremonial requirements of the traditional First Nation 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.

It is anticipated the three primary fishery management responses to in-season sockeye run size projections will include:

1. Adjusting fishing time. Fishing time in the lower Stikine fishery generally depends upon stock assessment and international and domestic catch allocation considerations. Although the preseason expectation is for a run size capable of providing commercial fishing opportunities,

initial fishing periods will likely be of shorter duration due to uncertainty over the preseason run outlook. Once in-season projections become available, caution will be exercised in providing extensions to fishing times.

2. Adjusting the fishing area. Initially, fishing boundary locations will be the same as in 2003. The section of the Stikine River upstream from the Porcupine – Stikine confluence will be closed until further notice. Consideration for increasing the fishing area to the boundary sign located approximately 2 km above the Stikine-Flood confluence will only be given if the in-season indicators indicate a strong run, escapement targets are expected to be exceeded and harvests are below allocation targets. In the Iskut River, the area will remain unchanged from previous years, i.e. from the mouth to a marker located approximately 2 km upstream from the mouth.
3. Adjusting the quantity of fishing gear. Initially, only one gillnet, either a drift net or a set net, will be permitted per licence. The maximum allowable net length will remain at 135 meters and, in the absence of directed Chinook fishery, there will be a maximum mesh size restriction of 150 mm through noon July 13 to conserve Chinook salmon.

In the upper Stikine commercial fishery, the fishery will open for the season at noon June 20 for 48 hours. Thereafter, weekly fishing times will generally follow those of the lower river lagged by one week. 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. This would be followed by increasing the gear allocation to two, and/or increasing the fishing area.

As in past years, weekly fishing times in the First Nation fishery will not normally be restricted. Subject to conservation requirements, terminal catches in the lower Tuya River and/or at Tahltan Lake may occur under ESSR or other authorizations. In the First Nation fishery, reductions in fishing time would be considered only if no other adjustments could be made in the lower and upper river commercial fisheries.

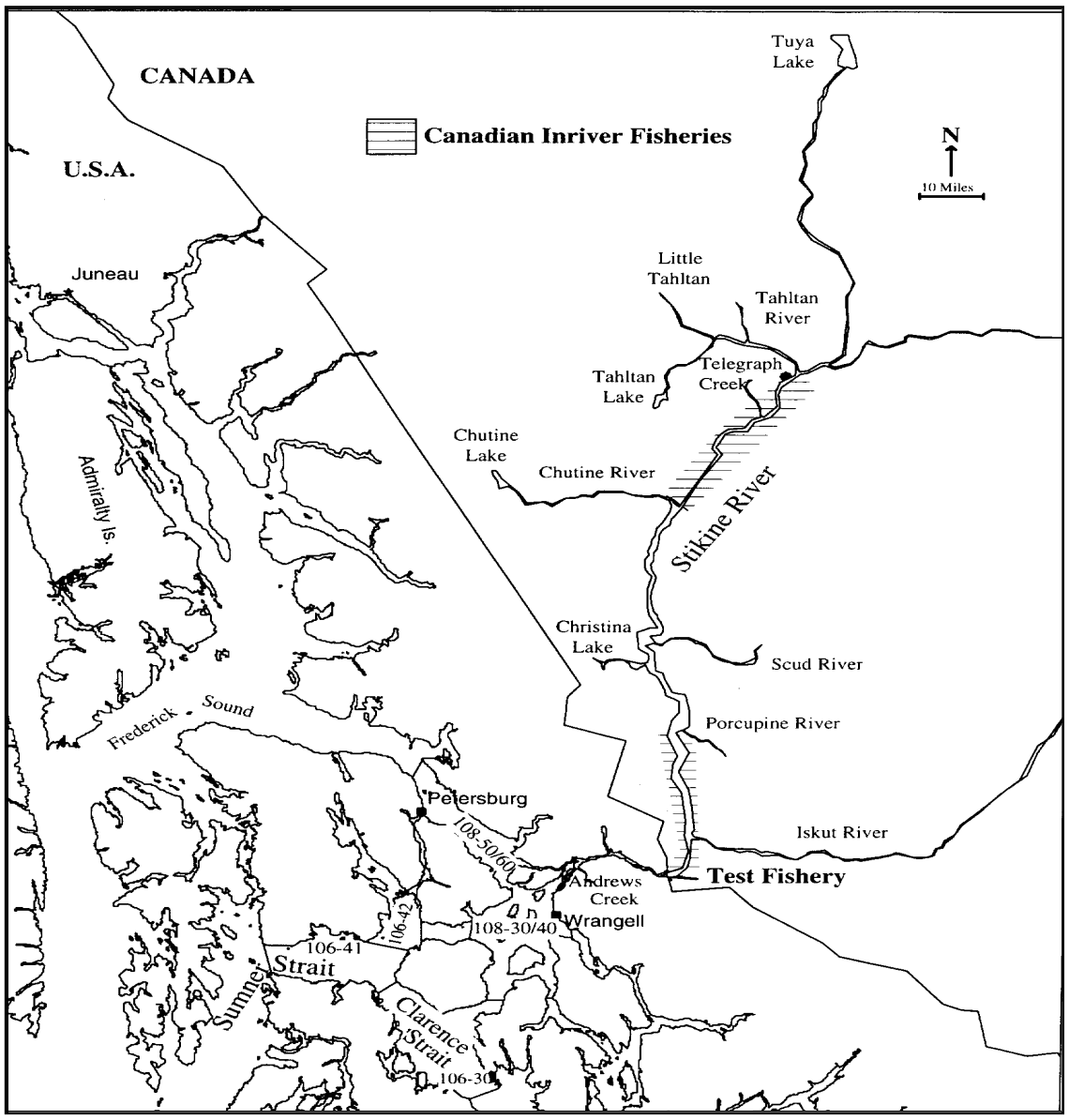

Figure 1. The Stikine River and principal U.S. and Canadian fishing areas.

Summary

Attainment of escapement goals for both the Tahltan Lake and mainstem stocks is the primary objective of Stikine sockeye management. Harvest sharing will be based upon the TAC projections derived primarily from the SMM. Other factors that may influence harvest management include results from in-season mark-recapture program and in-season escapement projections, e.g. projected Tahltan Lake weir counts. The TAC estimates will likely change from week to week as the SMM updates the projected run sizes from the cumulative CPUE's each week. Variations in the TAC estimates 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 SMM and the outcome of their respective management actions.

In-season 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. Weekly summaries of the fisheries results will be conducted frequently throughout fishing periods through telephone calls between management offices of DFO and ADF&G.

DFO field personnel will endeavor to provide weekly otolith samples from the lower Stikine commercial and test fisheries for pick-up by ADF&G on Tuesday each week for processing and analysis in Juneau; results from preliminary analysis can be expected by Thursday.

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);
3. District 108; and
4. Stikine subsistence fishery.

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

1. the lower river commercial fishery (all areas);
2. the lower river commercial fishery located near Flood Glacier (if it opens);
3. the upper river commercial fishery;
4. the First Nation fishery;
5. the lower Stikine River test fishery conducted near the international border; and
6. ESSR or other terminal 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 will be collected from the upper river commercial and the First Nation fisheries. Scale impressions will be available to ADF&G.

Stock Composition of U.S. Catches

Otolith samples will be taken from the catches in District 106-41/42, District 106-30, and District 108 and processed in-season to determine the contribution of planted Tahltan and Tuya sockeye salmon. The in-season run forecast will be characterised as small, average or large and the contributions of Tahltan sockeye stocks to marine catches will be assumed to be similar to historical average stock compositions characterised by: small run sizes (1986-1990, 1998, 2000-2002); medium run sizes (long term average); and, large runs (1985, 1991-1997, 2003). The estimated contribution of wild Tahltan sockeye will be determined by subtracting the enhanced contribution, determined from in-season otolith analyses, from whichever historical average total Tahltan contribution is being used. For mainstem stock contributions, a low run forecast will use the average of the contributions from 1987, 1988, 1990, 1998-2000, 2002. An average run size will use the long-term average contributions, and for high run size forecasts, the average of the contributions from 1985, 1992, 1993, 1995, 1996, and 2003 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 in-season 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.

To evaluate the contribution of planted sockeye salmon to U.S. 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 in-season analyses. Inseason processing of thermal marks will be completed within 2 days of the end of the fishing period. Besides indicating the relative strength of the planted Stikine stocks, results from the otolith sampling will also serve as a check on the validity of the stock composition estimates (based on historical averages) used to apportion catches in District 106 and 108 in the SMM. One hundred of the weekly otolith samples from District 106-41 will be matched with scale data for post-season assessment of stock composition accuracy.

Stock Composition of the Inriver Canadian Catch

Egg diameter data will be used in-season to estimate the combined Tahltan and Tuya sockeye 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 sub-sample of at least 60 fish each week. Arrangements will be made 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. As stated above, weekly pickup times for the otolith samples from the river will be on Tuesday unless otherwise agreed.

Egg and otolith data will be used post-seasonally to estimate wild Tahltan and mainstem sockeye and the planted Tahltan and Tuya 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 post-season stock-specific age-composition estimates, and for the development of post-season 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 in-season in a similar manner to the commercial fishery. Up to 400 sockeye caught in the test fishery will be sampled for scales and otoliths, and all females in that sample will be examined for egg diameter (all data to be matched). The test fishery otolith samples will be transferred to ADF&G, as per the arrangements made for the commercial samples, for in-season analysis. Additional sampling requirements will include the collection of spaghetti tags applied in the mark-recapture program. DNA samples collected in previous years from females matched with egg diameter measurements will be analyzed to confirm stock ID results from egg measurements.

The post-season sockeye stock composition estimates will be based on egg diameter data and associated thermal mark analyses. As per the commercial fishery, the planted portion of the catch will be determined post-seasonally from otolith samples.

Spawning Escapement Estimates

An adult enumeration weir will be used to estimate the Tahltan Lake sockeye escapement. The age composition will be estimated from scale samples, and contributions of planted sockeye salmon 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 (subject to conservation concerns) and an additional 400 otolith samples will be taken from the spawning grounds and/or broodstock.

The mainstem escapement will be estimated post-seasonally 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.

The Tuya sockeye escapement will be estimated post-seasonally in a similar way. Mark-recapture results will be used to qualify these estimates.

Post-season SPA Standards

Scale pattern standards for Tahltan and mainstem sockeye stocks will be derived from scale samples collected inriver. For the Tahltan stock, samples will be taken from both male and female sockeye salmon at the Tahltan Lake weir, and from female sockeye salmon caught in the lower river fisheries having small-diameter eggs, i.e. <3.7 mm, and no thermal marks. For the mainstem stock, samples will be taken from female sockeye salmon 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 post-seasonally 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 samples collected from both the commercial and test fishery will be used to determine stock proportions in the inriver fishery catches for both in-season and post-season analyses. DNA results will be used to verify and estimate error rates in the stock composition estimates derived from egg data.

Data Evaluation Procedures

Historical Database

Although Canadian commercial fishing began in the Stikine River in 1975, the methodology for estimating sockeye terminal 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 (Table 2). Due to possible changes in efficiency in the commercial fishery, the CPUE data from the lower river *test* fishery will be used as the main predictor of in-season run strength. The historical databases from 1985 to 2003 for the Canadian lower Stikine and Alaskan District 106-41/42 commercial fisheries, and 1986 to 2003 for the Canadian test fishery, used in the development of the SMM for 2004, are presented in Tables 3 to 5. The 2004 run size estimated by the model at the end of the fishing season will be updated in the fall/winter of 2004 using post-season stock composition data for use in the database in future years.

Stikine Management Model

A model based on the relationship between CPUE and run size has been constructed and updated to make weekly in-season predictions of the total terminal run size and the TAC during the 2004 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 2004 is based on CPUE data from 1985 to 2003 from District 106 and the Canadian commercial fishery in the lower river and from 1986 to 2003 from the lower Stikine test fishery. Linear regression is used to predict terminal run sizes from cumulative CPUE's for each week of the fisheries beginning in statistical week 26 for all three fisheries. Since the run abundance is expected to be above average in 2004, the intercept will not be forced to be zero as it has been in years of low abundance. There is a tendency to over-estimate the run size in the earlier weeks during years of low abundance unless it is forced to zero. As in 2003, the model in 2004 will use adjusted data for 1997-2000 in the lower Stikine commercial CPUE which excludes catch and effort data from the Flood Glacier area, i.e. the new area fished during 1997 through 2000. In addition, the weekly CPUE data from 1994-2000 (excluding the Flood area CPUE data) were decreased by 25% to account for the extra gear allowed during this period. This makes the historical CPUE data comparable with the 2004 data.

The parameters from the linear regressions are presented in Table 6. In the past, three sets of CPUE data have been used to predict the terminal run. These included:

1. The District 106 cumulative CPUE of Stikine sockeye stocks was used to predict the terminal run of Stikine sockeye salmon;
2. The cumulative CPUE from the Canadian lower river commercial fishery was used to predict the inriver Stikine sockeye run. In this year's analysis, the CPUE from 1994 to 2000 (excluding the upper fishing area catches), when additional nets were introduced into the

fishery, is reduced to 75% of the actual CPUE. The terminal run is then determined as the inriver run plus the projected total season catch of Stikine sockeye salmon in Districts 108 and 106. Projections of the District 108 catch will be based on the minimum of: i) the cumulative catch expanded using average run timing; or ii) the U.S. TAC minus the projected District 106 catch. The projected District 106 catch will be based on an assumed harvest rate of 10% on Stikine sockeye, i.e. catch = 10% of the terminal run size; and

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

The 2004 in-season forecasts of abundance and TAC will be based on the following datasets:

1. Projections for week 25 will be based on the preseason forecast;
2. Projections for weeks 26 and 27 will be based on the preseason forecast augmented with inseason CPUE data from D-108 and inriver;
3. The forecasts for weeks 28 through 30 will be based on the SMM with inputs from the inriver test fishery for weeks 27 through 29. If the test fishery is shortened to less than four days/week due to commercial fishery extensions (note: the test fishery does not operate during commercial openings), commercial data will be used to augment the test fishery data;
4. After week 30, the SMM will continue to be updated from the lower Stikine inriver test/commercial fishery data, however run forecasts tend to be less reliable after week 30 and should be viewed accordingly;
5. The lower river commercial CPUE data will be presented in the model for comparison with historical data but will not be substantively used for management decisions unless test fish data is inadequate;
6. Historical timing data will be used in the generation of weekly guideline harvests for each country;
7. Results from the mark-recapture program may be used in conjunction with the SMM to guide decisions in respective fisheries at the manager's discretion. Decisions about which dataset(s) will be used each week will be coordinated by the managers during weekly teleconferences between the Parties.

The reason for excluding forecasts from District 106 data is that weekly regressions of CPUE on terminal run size using the inriver data usually have higher coefficients of correlation compared to those based on the District 106 (Table 6). Predictions from the District 106 data will continue to be made to verify in-season estimates and provide post-season comparisons.

Separate projections of terminal run size will be made for the combined Stikine sockeye stocks (wild plus planted), the Tahltan Lake stock (wild plus planted), the planted Tuya stock, and the mainstem stock. This information will be used in-season to assist in fisheries management and, post-seasonally, will be evaluated along with other measures of abundance.

The part of the model which determines total and weekly TAC levels for the U.S. and Canadian fisheries has been formulated in EXCEL for use by managers in-season. This part of the model uses the coefficients from the linear regression model, the established escapement goals, and PST harvest sharing provisions to determine the TAC for each country. Estimates of weekly TAC and effort are provided as guidelines for the managers and are derived from the 1986-2003 average run timing of the stocks and the corresponding average CPUE levels of each fishery.

Table 2. Stikine sockeye run sizes: 1979 - 2003

Year	Inriver Run Size	Inriver Catch[a]	Escapement[b]	Marine Catch	Terminal Run Size[c]
a) Total Stikine Sockeye Stocks					
1979	40,353	13,534	26,819	8,299	48,652
1980	62,743	20,919	41,824	23,206	85,949
1981	138,879	27,017	111,862	27,538	166,417
1982	68,761	20,540	48,221	42,804	111,565
1983	71,683	21,120	50,563	5,782	77,466
1984	76,211	5,327	70,884	7,810	84,021
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	4,085	43,350
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	34,323	154,476
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	90,459	50,486	39,973	30,989	121,448
1999	65,879	47,202	18,677	58,735	124,614
2000	53,145	31,535	21,610	25,359	78,504
2001	103,755	29,341	74,414	23,500	127,255
2002	71,256	22,607	48,649	8,076	79,332
2003	193,451	69,571	123,880	48,209	241,660
b) Tahltan sockeye run size					
1979	17,472	7,261	10,211	5,076	22,548
1980	19,137	8,119	11,018	11,239	30,376
1981	65,968	15,178	50,790	16,189	82,157
1982	42,493	14,236	28,257	20,890	63,383
1983	32,684	11,428	21,256	5,072	37,757
1984	37,571	4,794	32,777	3,097	40,668
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	2,259	14,182
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	23,612	91,006
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	27,941	15,673	12,268	7,086	35,027
1999	35,918	25,599	10,319	23,431	59,349
2000	13,803	8,133	5,670	5,340	19,143
2001	20,983	6,224	14,761	6,339	27,324
2002	25,681	8,341	17,340	2,055	27,736
2003	81,379	27,846	53,533	15,890	97,269

Note: [a]Inriver catch includes test fishery catches.
[b] Escapement includes fish later captured for broodstock, sampled and/or taken in ESSR fisheries.
[c]Excludes marine catches outside Districts 106 and 108.

Table 2 (continued).

Year	Inriver Run Size	Inriver Catch	Escapement	Marine Catch	Total Run Size
c) Tuya sockeye run size					
1995	2,216	1,112	1,104	586	2,802
1996	19,158	8,919	10,239	19,442	38,600
1997	28,738	20,819	7,919	37,520	66,258
1998	31,442	22,911	8,531	15,941	47,383
1999	16,165	13,877	2,288	15,217	31,382
2000	20,779	14,971	5,806	13,255	34,034
2001	27,783	8,983	18,798	12,968	40,751
2002	10,078	5,924	4,154	4,058	14,136
2003	27,095	19,042	8,054	9,473	36,568
d) Mainstem sockeye run size					
1979	22,880	6,273	16,608	3,223	26,103
1980	43,606	12,800	30,806	11,967	55,573
1981	72,911	11,839	61,072	11,349	84,260
1982	26,267	6,304	19,964	21,914	48,182
1983	38,999	9,692	29,307	710	39,709
1984	38,640	533	38,107	4,714	43,354
1985	98,739	8,122	90,617	4,550	103,289
1986	38,022	7,111	30,910	3,663	41,685
1987	27,342	6,318	21,023	1,826	29,168
1988	34,693	11,852	22,841	1,052	35,745
1989	60,944	15,845	45,099	13,931	74,875
1990	33,464	10,968	22,495	7,549	41,013
1991	52,758	7,879	44,879	10,712	63,470
1992	77,861	12,468	65,393	49,176	127,037
1993	92,033	20,240	71,792	64,594	156,627
1994	50,288	15,652	34,636	15,408	65,696
1995	57,802	14,953	42,850	24,169	81,971
1996	69,536	23,684	45,852	21,508	91,044
1997	59,600	22,164	37,436	20,330	79,930
1998	31,077	11,902	19,175	7,962	39,039
1999	13,797	7,726	6,071	20,087	33,884
2000	18,563	8,431	10,132	6,764	25,327
2001	54,987	14,132	40,855	4,191	59,180
2002	35,497	8,342	27,155	1,963	37,460
2003	84,977	22,684	62,293	22,846	107,823

Note: [a]Inriver catch includes test fishery catches.
[b] Escapement includes fish later captured for broodstock, sampled and/or taken in ESSR fisheries.
[c]Excludes marine catches outside Districts 106 and 108.

Table 3. CPUE for all sockeye salmon and the proportion of Tahltan, Tuya, and Mainstem stocks in the catch from the Canadian lower river commercial fishery, 1985-2003.

Stat. Wk.	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
25	*3.8*	*2.0*	*1.4*	*1.9*	*2.4*	*2.2*	*2.5*	*3.7*	*3.8*	*2.7*	*2.5*	*3.8*	2.5	3.9	*2.6*	*2.9*	*4.9*	*3.3*	*6.1*
26	67.6	2.8	*17.3*	*23.5*	25.5	13.0	14.8	*46.1*	*48.2*	*33.4*	59.9	89.4	43.3	67.3	0.4	*36.3*	23.7	93.8	83.2
27	*131.6*	18.8	11.9	21.8	48.1	49.6	120.3	111.1	163.2	33.9	92.4	234.2	112.6	111.3	41.3	125.0	378.0	178.0	186.4
28	*100.1*	79.8	10.6	35.5	23.1	78.6	121.0	155.0	185.4	123.5	94.5	168.3	97.5	137.1	112.9	185.9	232.4	146.2	346.4
29	260.0	58.1	57.9	69.2	105.5	110.3	114.4	144.0	135.4	110.7	90.0	106.6	68.0	116.0	164.4	105.4	168.6	152.2	239.7
30	147.9	84.7	67.8	71.9	140.8	81.4	53.7	166.0	118.3	109.1	79.9	106.9	98.6	111.0	140.9	113.3	114.5	99.3	228.2
31	104.7	81.9	27.6	61.9	73.9	62.1	83.8	88.3	71.6	83.3	64.5	56.2	96.5	64.7	54.5	37.2	120.9	54.4	127.2
32	73.6	55.6	76.6	89.2	60.8	54.4	31.6	91.5	83.7	61.4	38.5	40.6	67.9	51.0	46.1	52.3	37.9	2.5	62.0
33	58.6	34.1	32.3	33.3	28.4	16.2	15.7	43.2	31.1	31.8	19.7	22.1	16.3	21.7	3.4	19.6	5.8	0.6	60.8
34	18.2	25.9	16.5	23.1	16.4	12.4	1.0	12.5	39.3	24.3	14.4	5.8	19.4	17.3	20.8	5.2	0.0	0.1	13.7
35	10.3	9.4	5.4	11.0	6.2	13.1	4.2	4.5	11.5	7.7	8.8	1.8	9.4	4.6	0.0	0.9	0.3	*8.4*	16.0
Proportion Tahltan Lake sockeye salmon																			
25													0.619	0.182					
26	0.890	0.730			0.650	0.730	0.800				0.970	0.808	0.545	0.337	0.720		0.599	0.726	0.679
27		0.770	0.740	0.770	0.490	0.800	0.830	0.870	0.793	0.944	0.921	0.731	0.503	0.382	0.552	0.384	0.331	0.602	0.621
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	0.429	0.386	0.566	0.218	0.207	0.561	0.616
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	0.410	0.452	0.604	0.278	0.265	0.315	0.444
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	0.282	0.304	0.563	0.289	0.076	0.114	0.263
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	0.288	0.158	0.392	0.131	0.056	0.023	0.136
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	0.179	0.073	0.194	0.155	0.016	0.000	0.067
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	0.114	0.077	0.088	0.168	0.000	0.000	0.000
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	0.110	0.043	0.019	0.154	0.000	0.000	0.009
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	0.045	0.008	0.038	0.133	0.000		0.000
Proportion Tuya sockeye salmon																			
25													0.286	0.818					
26											0.000	0.122	0.354	0.635	0.200		0.316	0.185	0.246
27											0.030	0.128	0.339	0.566	0.405	0.551	0.515	0.250	0.286
28											0.044	0.164	0.358	0.504	0.407	0.648	0.452	0.300	0.198
29											0.012	0.102	0.276	0.298	0.345	0.442	0.132	0.164	0.183
30											0.010	0.063	0.239	0.228	0.245	0.140	0.101	0.009	0.093
31											0.000	0.013	0.110	0.165	0.150	0.107	0.009	0.001	0.058
32											0.000	0.026	0.117	0.084	0.049	0.027	0.011	0.000	0.015
33											0.000	0.000	0.059	0.000	0.038	0.019	0.000	0.000	0.000
34											0.000	0.037	0.017	0.000	0.019	0.051	0.000	0.000	0.009
35											0.000	0.000	0.023	0.016	0.000	0.000	0.000		0.000
Proportion mainstem Stikine sockeye salmon																			
25													0.095	0.000					
26	0.110	0.270			0.350	0.270	0.200				0.030	0.071	0.102	0.028	0.080		0.084	0.089	0.075
27		0.230	0.260	0.230	0.510	0.200	0.170	0.130	0.207	0.056	0.049	0.141	0.158	0.051	0.043	0.065	0.154	0.148	0.093
28	0.100	0.170	0.120	0.310	0.620	0.310	0.140	0.220	0.169	0.119	0.142	0.281	0.214	0.109	0.026	0.134	0.341	0.140	0.186
29	0.210	0.270	0.340	0.580	0.790	0.650	0.250	0.450	0.323	0.207	0.323	0.469	0.315	0.250	0.051	0.280	0.603	0.521	0.373
30	0.580	0.480	0.760	0.730	0.970	0.750	0.630	0.760	0.536	0.369	0.550	0.681	0.479	0.468	0.192	0.572	0.822	0.877	0.644
31	0.710	0.810	0.890	0.900	0.980	0.940	0.880	0.740	0.658	0.574	0.739	0.786	0.601	0.677	0.458	0.761	0.935	0.977	0.806
32	0.800	0.910	0.950	0.960	0.980	0.970	0.920	0.910	0.851	0.747	0.843	0.850	0.704	0.843	0.757	0.818	0.974	1.000	0.918
33	0.800	0.980	0.960	0.930	0.980	0.970	1.000	0.980	0.927	0.874	0.866	0.898	0.827	0.923	0.875	0.813	1.000	1.000	1.000
34	1.000	0.990	0.930	0.910	0.980	0.970	1.000	1.000	0.834	0.937	0.870	0.926	0.873	0.957	0.962	0.795	1.000	1.000	0.982
35	1.000	0.990	0.920	1.000	1.000	1.000	1.000	1.000	1.000	0.976	1.000	1.000	0.932	0.976	0.962	0.867	1.000		1.000

Note: For periods when the fishery was closed, values were filled in with averaging and interpolation techniques (these values italicized and underlined in the table).

Table 4. CPUE for all sockeye salmon and the proportion of Tahltan, Tuya, and Mainstem stocks in the catch from the U.S. District 106-41/42 commercial fishery, 1985-2003.

Stat. Wk.	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
25	91.0	14.1	*49.2*	*39.2*	46.8	29.2	51.4	*46.5*	*48.2*	*54.4*	53.9	30.5	40.0	*28.8*	*23.8*	*32.7*	92.0	33.5	20.2
26	*114.0*	16.9	29.1	22.9	51.9	33.6	116.5	56.6	27.4	61.2	72.9	200.8	99.2	41.1	52.6	40.3	114.4	38.7	98.2
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	47.7	38.3	95.8	77.9	62.7	72.5
28	176.2	*69.5*	103.9	66.8	147.1	84.5	99.6	108.8	96.9	131.2	112.7	62.6	64.7	79.5	46.3	80.4	96.5	82.3	91.8
29	114.5	*70.2*	83.9	103.6	109.4	116.1	73.5	111.4	109.7	165.1	79.5	124.7	60.0	59.4	59.8	64.8	125.6	82.6	98.4
30	110.0	100.5	155.9	87.6	89.4	176.9	95.5	103.6	94.2	104.8	125.3	107.4	70.3	62.9	61.3	63.0	94.9	55.1	73.6
31	293.6	105.7	106.6	59.3	93.4	78.4	74.1	70.2	99.3	95.3	95.3	98.1	53.9	59.2	41.6	73.8	56.8	46.6	77.2
32	69.0	82.1	115.4	92.2	36.2	45.1	40.0	59.6	87.6	47.3	98.3	77.3	25.0	40.2	29.2	37.1	16.1	55.2	46.6
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	22.4	14.6	25.9	6.8	13.0	25.5
34	37.8	28.8	*21.6*	20.5	7.7	12.6	16.7	21.3	40.4	36.6	25.8	18.1	34.3	10.9	9.9	5.1	2.5	4.9	9.2
35	12.0	8.9	3.4	11.0	2.9	4.2	4.4	15.8	15.0	9.8	6.9	8.4	30.3	7.9	3.2	2.1	0.6	1.4	2.2
Proportion Tahltan Lake sockeye salmon																			
25	0.103	0.000			0.032	0.018	0.231				0.390	0.458	0.150				0.010	0.112	0.293
26		0.020	0.013	0.085	0.085	0.026	0.396	0.438	0.460	0.466	0.424	0.742	0.146	0.054	0.419	0.062	0.163	0.313	0.432
27	0.347	0.090	0.013	0.071	0.027	0.025	0.256	0.180	0.410	0.501	0.391	0.525	0.263	0.182	0.182	0.130	0.082	0.115	0.329
28	0.240		0.051	0.050	0.000	0.012	0.099	0.140	0.313	0.380	0.130	0.366	0.091	0.005	0.099	0.005	0.010	0.037	0.243
29	0.129		0.008	0.011	0.000	0.008	0.012	0.030	0.162	0.179	0.018	0.170	0.016	0.008	0.086	0.044	0.025	0.000	0.112
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	0.017	0.007	0.045	0.003	0.025	0.016	0.001
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	0.002	0.003	0.004	0.000	0.000	0.000	0.003
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	0.000	0.009	0.000	0.006	0.000	0.000	0.000
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	0.000	0.001	0.000	0.000	0.000	0.000	0.000
34	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.069	0.083	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000
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	0.008	0.001	0.000	0.000	0.000	0.000	0.000
Proportion Tuya sockeye salmon																			
25											0.000	0.046	0.181				0.220	0.233	0.080
26											0.000	0.093	0.215	0.507	0.203	0.273	0.256	0.315	0.128
27											0.000	0.125	0.183	0.293	0.206	0.313	0.236	0.169	0.165
28											0.000	0.061	0.175	0.076	0.140	0.221	0.148	0.044	0.148
29											0.010	0.010	0.007	0.061	0.131	0.015	0.093	0.029	0.100
30											0.000	0.010	0.010	0.035	0.029	0.010	0.004	0.019	0.042
31											0.000	0.000	0.000	0.014	0.004	0.034	0.000	0.000	0.021
32											0.000	0.000	0.000	0.001	0.001	0.005	0.000	0.000	0.000
33											0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.000
34											0.000	0.000	0.000	0.022	0.009	0.000	0.000	0.000	0.000
35											0.000	0.000	0.000	0.022	0.009	0.000	0.000	0.000	0.000
Proportion mainstem Stikine sockeye salmon																			
25	0.000	0.000			0.060	0.055	0.094				0.040	0.000	0.003				0.000	0.014	0.003
26		0.000	0.000	0.000	0.100	0.022	0.018	0.060	0.036	0.018	0.053	0.019	0.000	0.000	0.000	0.010	0.021	0.068	0.018
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	0.018	0.002	0.009	0.029	0.012	0.015	0.017
28	0.005		0.003	0.000	0.045	0.022	0.012	0.064	0.091	0.017	0.016	0.000	0.053	0.000	0.036	0.009	0.016	0.041	0.042
29	0.008		0.000	0.000	0.005	0.005	0.085	0.030	0.280	0.048	0.014	0.000	0.006	0.000	0.041	0.011	0.069	0.056	0.098
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	0.007	0.002	0.182	0.036	0.007	0.047	0.089
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	0.013	0.000	0.286	0.051	0.024	0.013	0.004
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	0.009	0.000	0.185	0.004	0.019	0.005	0.009
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	0.003	0.000	0.152	0.000	0.011	0.001	0.043
34	0.042	0.000		0.000	0.012	0.016	0.000	0.155	0.102	0.005	0.134	0.005	0.016	0.000	0.129	0.015	0.034	0.000	0.000
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	0.000	0.000	0.129	0.000	0.034	0.016	0.009

Note: For periods when the fishery was closed, values were filled in with averaging and interpolation techniques (these values italicized and underlined in the table).

Table 5. CPUE for all sockeye salmon and the proportion of Tahltan, Tuya, and Mainstem stocks in the catch from the Canadian lower river test fishery, 1986-2003.

Week	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
25	*0.46*	*0.22*	*0.33*	0.42	0.03	0.04	*0.50*	*0.62*	*0.31*	0.67	0.35	0.66	0.58	0.00	*0.26*	*0.49*	*0.33*	0.98
26	*1.11*	0.13	0.10	0.48	0.38	0.50	0.91	1.25	0.18	1.90	1.93	1.40	1.23	0.22	*0.62*	1.83	1.53	2.78
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	1.40	2.08	0.76	3.20	2.01	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	1.07	2.60	2.10	3.40	1.63	3.98
29	2.06	1.18	1.15	1.57	1.70	1.56	2.30	2.75	1.80	1.33	2.53	1.80	0.80	2.17	1.48	1.65	2.13	4.81
30	2.17	1.67	0.92	1.76	1.77	1.48	2.37	3.15	*1.39*	1.00	1.53	1.80	1.00	1.60	1.00	2.02	1.19	4.21
31	3.17	1.15	2.55	1.16	0.90	1.25	1.75	1.85	*1.11*	0.96	1.13	1.00	0.50	1.13	1.10	1.36	0.60	2.29
32	1.89	0.76	2.20	0.63	0.70	0.58	1.45	2.20	*0.75*	0.60	0.73	1.20	0.20	0.38	0.76	0.62	0.20	1.43
33	1.00	0.52	1.15	0.23	*0.44*	0.50	1.10	1.46	*0.44*	0.35	0.40	0.47	0.37	0.33	0.34	0.16	0.23	0.39
34	0.52	0.10	0.18	0.10	0.18	0.48	0.50	0.63	1.64	0.55	0.20	0.53	0.13	0.33	0.02	0.04	0.11	0.50
35	*0.18*	0.02	0.12	0.03	0.00	0.23	0.07	0.15	1.30	0.00	0.12	0.15	0.00	0.05	0.00	0.03	0.05	0.20
Proportion Tahltan Lake sockeye salmon																		
25				0.756	0.583	0.763				0.900	0.710	0.696	0.517	0.000		*0.400*	*0.592*	0.662
26		0.882	0.875	0.632	0.906	0.958	0.927	0.888	0.876	0.910	0.745	0.886	0.595	0.444		0.411	0.586	0.636
27	0.770	0.714	0.759	0.519	0.821	0.885	0.931	0.793	0.908	0.905	0.760	0.511	0.214	0.585	0.401	0.226	0.512	0.666
28	0.830	0.761	0.406	0.237	0.623	0.775	0.846	0.687	0.903	0.891	0.787	0.346	0.656	0.587	0.222	0.235	0.420	0.473
29	0.730	0.463	0.324	0.165	0.406	0.584	0.571	0.660	0.826	0.400	0.136	0.185	0.625	0.573	0.267	0.159	0.279	0.417
30	0.520	0.192	0.132	0.036	0.143	0.384	0.256	0.457		0.438	0.231	0.333	0.050	0.482	0.193	0.108	0.180	0.312
31	0.190	0.063	0.055	0.000	0.104	0.236	0.221	0.282		0.291	0.155	0.200	0.000	0.346	0.180	0.096	0.098	0.207
32	0.090	0.038	0.068	0.011	0.129	0.073	0.184	0.103		0.218	0.000	0.458	0.000	0.207	0.135	0.017	0.039	0.076
33	0.020	0.010	0.111	0.000		0.050	0.078	0.118		0.135	0.000	0.143	0.000	0.113	0.071	0.019	0.000	0.068
34	0.010	0.061	0.000	0.000	0.037	0.016	0.278	0.010	0.037	0.000	0.100	0.125	0.000	0.041	0.000	0.000	0.000	0.048
35		0.111	0.000	0.000	0.000	0.000	0.056	0.048	0.042	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.052
Proportion Tuya sockeye salmon																		
25										0.000	0.029	0.217	0.345	0.000		*0.400*	*0.256*	0.234
26										0.009	0.159	0.086	0.378	0.543		0.386	0.255	0.211
27										0.015	0.145	0.444	0.643	0.371	0.533	0.453	0.232	0.145
28										0.055	0.057	0.462	0.188	0.323	0.655	0.302	0.177	0.202
29										0.000	0.026	0.074	0.125	0.232	0.329	0.199	0.082	0.108
30										0.000	0.000	0.037	0.100	0.181	0.132	0.116	0.040	0.008
31										0.000	0.000	0.050	0.000	0.062	0.011	0.030	0.000	0.005
32										0.000	0.000	0.000	0.000	0.018	0.000	0.077	0.000	0.038
33										0.000	0.000	0.000	0.000	0.000	0.000	0.037	0.000	0.000
34										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
35										0.000	0.000	0.000	0.000	0.000	0.000	0.032	0.000	0.000
Proportion mainstem Stikine sockeye salmon																		
25				0.244	0.417	0.237				0.100	0.261	0.087	0.138	1.000		*0.200*	*0.152*	0.104
26		0.118	0.125	0.368	0.094	0.042	0.073	0.112	0.124	0.080	0.095	0.029	0.027	0.012		0.203	0.159	0.154
27	0.230	0.286	0.241	0.481	0.179	0.115	0.069	0.207	0.092	0.080	0.095	0.044	0.143	0.044	0.066	0.321	0.256	0.189
28	0.170	0.239	0.594	0.763	0.377	0.225	0.154	0.313	0.097	0.055	0.156	0.192	0.156	0.090	0.123	0.463	0.402	0.325
29	0.270	0.537	0.676	0.835	0.594	0.416	0.429	0.340	0.174	0.600	0.838	0.741	0.250	0.195	0.403	0.642	0.639	0.475
30	0.480	0.808	0.868	0.964	0.857	0.616	0.744	0.543		0.563	0.769	0.630	0.850	0.337	0.675	0.777	0.780	0.680
31	0.810	0.937	0.945	1.000	0.896	0.764	0.779	0.718		0.709	0.845	0.750	1.000	0.592	0.809	0.874	0.902	0.788
32	0.910	0.962	0.932	0.989	0.871	0.927	0.816	0.897		0.782	1.000	0.542	1.000	0.775	0.865	0.906	0.961	0.885
33	0.980	0.990	0.889	1.000		0.950	0.922	0.882		0.865	1.000	0.857	1.000	0.887	0.929	0.944	1.000	0.932
34	0.990	0.939	1.000	1.000	0.963	0.984	0.722	0.990	0.963	1.000	0.900	0.875	1.000	0.959	1.000	1.000	1.000	0.952
35		0.889	1.000	1.000	1.000	1.000	0.944	0.952	0.958	1.000	1.000	1.000	1.000	1.000	1.000	0.968	1.000	0.948

Note: For periods when the fishery was closed, values were filled in with averaging and interpolation techniques (these values italicized and underlined in the table).

Table 6. The 2004 Stikine Management Model parameters, including average run fraction by week, average weekly CPUE, and regression parameters for run size regressed on cumulative CPUE.

	All Stikine Sockeye Stocks						Tahltan Sockeye Stock					
Week	Run Fraction	Intercept	Slope	R Square	Slope for 0 incpt	Ave. CPUE	Run Fraction	Intercept	Slope	R Square	Slope for 0 incpt	Ave. CPUE
Lower River Commercial Fishery, 1985-2003												
26	0.059	63,699	1092	0.364	2,118	36.3	0.099	20,144	919	0.482	1,345	25.9
27	0.161	67,423	268	0.301	550	101.8	0.237	13,983	331	0.523	428	65.3
28	0.181	58,160	180	0.353	336	115.0	0.254	4,701	241	0.683	260	70.3
29	0.177	44,833	157	0.401	250	109.1	0.216	-1,033	200	0.743	197	57.3
30	0.159	34,402	143	0.423	204	97.4	0.117	-4,561	187	0.766	174	31.1
31	0.105	27,046	138	0.447	181	67.5	0.047	-5,632	182	0.785	166	13.1
32	0.080	15,409	144	0.474	167	51.7	0.021	-6,139	180	0.790	163	5.9
33	0.037	11,110	145	0.499	162	25.4	0.006	-6,097	178	0.790	162	2.2
34	0.021	6,753	148	0.513	159	14.1	0.003	-6,230	178	0.790	162	1.0
35	0.010	5,559	148	0.517	158	6.5	0.000	-6,260	178	0.790	162	0.1
36	0.005	4,446	149	0.525	157	3.2	0.000	-6,268	178	0.790	162	0.0
District 106-41/42 Commercial Fishery 1985-2003												
25	0.095	76,070	7,461	0.392	11,875	11.0	0.091	25,796	7,795	0.674	9,695	6.1
26	0.262	80,205	1,888	0.633	2,956	30.2	0.323	29,057	1,593	0.841	2,011	21.8
27	0.226	50,816	1,595	0.771	2,090	26.0	0.252	17,417	1,249	0.929	1,439	17.0
28	0.160	41,340	1,362	0.812	1,691	18.4	0.178	17,210	990	0.904	1,141	12.0
29	0.106	43,583	1,170	0.807	1,470	12.2	0.089	18,663	872	0.888	1,018	6.0
30	0.055	41,995	1,114	0.804	1,388	6.3	0.037	18,551	841	0.885	981	2.5
31	0.041	40,308	1,081	0.808	1,335	4.7	0.010	18,147	838	0.886	975	0.7
32	0.022	39,680	1,062	0.815	1,307	2.5	0.006	18,267	831	0.886	968	0.4
33	0.019	39,869	1,041	0.819	1,281	2.2	0.009	18,291	824	0.883	959	0.6
34	0.010	40,221	1,027	0.819	1,267	1.1	0.005	18,478	817	0.881	953	0.3
35	0.004	40,207	1,024	0.820	1,262	0.4	0.001	18,508	816	0.880	952	0.1
36	0.001	40,201	1,023	0.820	1,262	0.1	0.000	18,518	816	0.880	951	0.0
Lower River Test Fishery, 1986-2003												
26	0.085	59,467	44,249	0.460	82,180	1.0	0.149	19,332	35,307	0.408	52,479	0.7
27	0.153	42,993	21,526	0.565	32,606	1.9	0.248	7,680	19,250	0.698	21,992	1.2
28	0.165	25,862	16,224	0.583	20,572	2.0	0.243	-6,391	16,398	0.873	14,822	1.2
29	0.160	15,669	13,116	0.621	15,060	1.9	0.171	-9,580	13,745	0.870	11,831	0.8
30	0.147	10,810	10,965	0.624	12,044	1.8	0.103	-6,824	11,577	0.819	10,379	0.5
31	0.114	5,048	10,019	0.582	10,464	1.4	0.048	-5,851	10,793	0.797	9,818	0.2
32	0.079	3,346	9,295	0.565	9,566	1.0	0.024	-6,028	10,569	0.788	9,586	0.1
33	0.045	1,056	9,051	0.561	9,133	0.5	0.008	-6,124	10,501	0.787	9,509	0.0
34	0.031	-2,524	9,066	0.591	8,876	0.4	0.004	-6,136	10,461	0.789	9,472	0.0
35	0.012	-3,664	9,048	0.602	8,776	0.1	0.001	-6,148	10,454	0.791	9,464	0.0
36	0.005	-3,776	9,009	0.608	8,730	0.1	0.000	-6,161	10,454	0.791	9,462	0.0

Table 7. Weekly forecasts of run size and total allowable catch for Stikine River sockeye salmon as estimated inseason by the Stikine Management Model, 2003.

Stat.	Start	Forecast	TAC			Cumulative Catches [a]	
Week	Date	Run Size	Total	U.S.	Canada	U.S.	Canada
Model runs generated by Canada							
26	22-Jun	183,600	122,900	61,450	61,450	4,597	832
27	29-Jun	183,600	122,900	61,450	61,450	9,167	8,145
28	06-July	191,194	127,341	63,670	63,670	23,561	22,001
29	13-Jul	222,657	160,543	80,271	80,271	30,339	28,516
30	20-Jul	214,002	151,419	75,710	75,710	41,139	45,260
31	27-Jul	283,822	220,618	110,309	110,309	49,368	50,720
32	03-Aug	276,600	213,577	106,788	106,788	50,406	57,740
33	10-Aug	272,118	209,107	104,554	104,554	54,505	59,478
Model runs generated by the U.S.							
25	15-Jun	184,000	123,108	61,554	61,554	461	0
26	23-Jun	184,000	123,108	61,554	61,554	4,597	832
27	30-Jun	184,000	123,108	61,554	61,554	8,972	8,145
28	06-July	149,977	86,579	43,289	43,289	23,561	21,674
29	13-Jul	214,024	151,517	75,759	75,759	30,339	28,516
30	20-Jul	214,002	151,154	75,577	75,577	41,139	45,260
31	27-Jul	283,822	220,328	110,164	110,164	49,368	55,294
32	03-Aug	276,600	213,294	106,647	106,647	54,505	54,700
33	10-Aug	272,118	208,825	104,413	104,413		
Postseason run estimate (Table 2) = 245,127							

[a] does not include test fishery catches

In-season Use

For 2004, the model predictions will set the TAC levels; however, managers may use additional information to make decisions regarding the openings in their respective fisheries. They will evaluate the output of the model and look for discrepancies with other information they may have on run strength (e.g. mark-recapture results). The post-season evaluation will be used to improve the model for the next year.

Post-season Evaluation

After the fishing season is over, the TCTR will evaluate how well the model performed in predicting the terminal run, where discrepancies occurred, and what might have caused them. The TCTR will also determine whether escapement goals were met according to the Spawning Escapement Goals section of this report. Results from the evaluation will be presented in the annual catch and escapement report prepared by the committee. For 2003, the preliminary evaluation may be found in: Preliminary Estimates of Transboundary River Salmon Production, Harvest, and Escapement and a Review of Joint Enhancement Activities, 2003, Transboundary Technical Committee, February, 2004. The summarized output of the Stikine Management Model during the 2003 fishing season is presented in Table 7.

Coho Salmon

Preseason Forecast

A qualitative prediction of the 2004 run of coho salmon is that it will be 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, 2000 and 2001. Based on a comparison of test fishery CPUE for coho salmon vs. the CPUE for sockeye salmon, the coho escapement of 14,000 in 2000 was judged to be below average, while the 2001 coho escapement of 46,000 fish was above average and within the interim escapement goal range of 30,000 to 50,000 coho salmon. Aerial surveys of several index coho spawning sites followed suit with the test fish estimates, in that the 2000 and 2001 counts were also below and above average respectively.

Escapement Goal

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

Harvest Sharing Objectives

The United States' management intent is to ensure that sufficient coho salmon enter the Canadian section of the Stikine River to meet the agreed spawning objective, plus an annual Canadian catch of 4,000 coho salmon in a directed coho salmon fishery (PST, Transboundary Rivers, Annex IV, para. 3(a)(2)(ii)).

Stock Assessment Program

Each country shall:

1. report catch statistics for the same strata as sockeye salmon;
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

The coho salmon drift gillnet fishery season will start during late August and early September. 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. In-season estimates from CWT recovery data will be used to identify the hatchery component of the catch. Primarily the catch of wild coho will be used for fishery performance evaluation.

By regulation, coho salmon may not be retained in the salmon troll fishery until June 15. Spring salmon troll fisheries (May 1 to June 30) are managed to target Alaskan hatchery Chinook salmon and must stay within certain Treaty Chinook salmon harvest limits adopted by the Alaska Board of Fisheries. Coho salmon are harvested incidentally during the last two weeks of the spring troll fishery and harvests during that time period are very low. During the summer salmon troll fishery (July 1 to September 30) the

salmon troll fishery in District 108 is open only on days when the drift gillnet fishery is open. When first opened, the summer fishery targets Chinook and coho salmon. When the Chinook salmon harvest target is reached, the fishery is closed to Chinook salmon retention but remains open for coho salmon. The coho season usually remains open through September 20 but may be closed earlier for conservation and/or allocative reasons in July or August. An extension of the coho season to September 30 may occur during years of high abundance as specified by regulations adopted by the Alaska Board of Fisheries.

If there is a conservation concern for Stikine River coho salmon, the District 108 drift gillnet and troll fisheries will be restricted.

Canada

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

Chinook Salmon

Preseason Forecast

Unlike past year's preseason forecasts whereby the estimated Stikine Chinook run was based on the average of sibling and stock-recruitment forecasts, the 2004 forecast is based solely on the sibling forecast. The sibling forecast predicts the following components: the inriver return of age-5 fish based on the number of age-4 fish in 2003; the inriver return of age-6 fish based on the number age-5 fish in 2003; and the inriver return of age-7 fish based on the number of age-6 fish in 2003. The sum of the age-specific predictions (age 5 to age 7) generates an estimate of the total inriver run.

The age-specific outlooks are based on the following linear regressions:

- age-4 in 2003 ($N_{age\text{-}4(y\text{-}1)}$) to predict the number of age-5 in 2004 ($N_{age\text{-}5(y)}$):

$$N_{age\text{-}5(y)} = 3.553 * N_{age\text{-}4(y\text{-}1)} + 3{,}964 \quad [1]$$

The correlation coefficient (r^2) of this relationship = 0.90, n=8;

- age-5 in 2003 ($N_{age\text{-}5(y\text{-}1)}$) to predict the number of age-6 in 2004 ($N_{age\text{-}6(y)}$):

$$N_{age\text{-}6(y)} = 0.577 * N_{age\text{-}5(y\text{-}1)} + 10{,}244 \quad [2]$$

The correlation coefficient (r^2) of this relationship = 0.85, n=8;

- age-6 in 2003 ($N_{age\text{-}6(y\text{-}1)}$) to predict the number of age-7 in 2004 ($N_{age\text{-}7(y)}$):

$$N_{age\text{-}7(y)} = 0.036 * N_{age\text{-}6(y\text{-}1)} - 182 \quad [3]$$

The correlation coefficient (r^2) = 0.53, n=8.

The total estimated number of inriver Stikine Chinook age-4 in 2003 was 7,807; age-5 was 28,739; and age-6 was 12,476. Substituting these values into each of the respective equations [1] – [3] above and summing the results, yields a predicted inriver run of 58,800 large Chinook salmon in 2004. To account for the typical 12% estimated harvest rate in U.S. fisheries the total expected run in 2004 is approximately 66,000 large Chinook. This forecast does not include Chinook salmon of age-4 or less.

Escapement Goals

The target escapement range for Little Tahltan River Chinook is 2,700 to 5,300 large fish with a point target of 3,300 large fish. The total Stikine escapement target range is 14,000 to 28,000 large Chinook with a point target of 17,400 large fish.

Escapement Goal Background

Prior to 1999, the interim index escapement goal was 5,300 large Chinook salmon through the Little Tahltan River weir (L. Tahltan represented approximately 19% of total Stikine Chinook escapement). A new goal of 3,500 L. Tahltan Chinook salmon was proposed to the TCTR in a joint paper: Bernard, D., S. McPherson, K. Pahlke, and P. Etherton. 1999 draft. *Optimum production of Chinook salmon from the Stikine River.* The TCTR recommended the paper be subjected to additional peer reviews by the Pacific Scientific Advice Review Committee (PSARC) of DFO and internal ADF&G review.

ADF&G (U.S.) peer review recommended accepting the paper's escapement goal range, although some minor errors in the data used were pointed out to the authors. On the other hand, PSARC did not accept 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. In response to the above reviews, the TCTR agreed to an escapement floor of 4,000 Chinook salmon for Little Tahltan or 20,000 for the total Stikine system for 1999. These escapement floors were near the midpoint of the ranges recommended by the Bernard et al. paper. The TCTR concluded that due the paucity of data regarding marine harvests, it was not yet possible to manage by exploitation rates (hence the development of the Stikine Chinook CWT program which commenced in 2000).

Later in 1999, the Joint Chinook Technical Committee (CTC) of the PSC re-examined the Stikine escapement goal. Results of the analysis appear in the following report:

> **Pacific Salmon Commission Joint Chinook Technical Committee Report TCCHINOOK (99)-3. 1999.** *Maximum sustained yield or biologically-based escapement goals for selected Chinook salmon stock used by the Pacific Salmon Commission's Chinook Technical Committee for escapement assessment.*

The goal recommended in this report was 14,000 to 28,000 total Stikine River (above border) Chinook salmon and the point estimate of escapement that produced MSY was approximately 17,400 Chinook salmon. These targets were adopted by the TCTR in 2000. Based on mark-recapture data, the overall escapement goal range translates into a Little Tahltan River escapement goal of 2,700 to 5,300 large Chinook salmon with a point target of 3,300 fish. Since 1985, when the weir was first installed, the escapement has not fallen below the lower end of this range. The escapement has however, exceeded the upper end of the range in nine years (1988, 1992, 1993, 1994, 1997, 2000, 2001, 2002, 2003).

Harvest Sharing Objectives

According to the PST, the Parties are to take appropriate management actions to ensure that the escapement goal range for Chinook salmon bound for the Canadian portions of the Stikine River is achieved in 2004. Given the past success in achieving the escapement goal range, no changes in management procedures are required. The Parties have agreed not to initiate any new directed fisheries until an appropriate abundance-based management regime is developed and implemented. The target date for this is 2004 and at the time of this writing, the Transboundary River Panel is actively negotiating terms for abundance based directed Chinook salmon fisheries on transboundary river stocks.

Management Procedures

United States

At the time of this writing, the Transboundary River Panel is actively negotiating terms for abundance based directed Chinook salmon fisheries on transboundary river stocks. Early season management of U.S. fisheries may be modified based on the outcome of those negotiations.

If there are early gillnet fishery openings in District 108 for Chinook salmon, they will depend on the pre-season forecast and inseason abundance estimates. Chinook harvests will be monitored in the District 106 and 108 drift gillnet fishery throughout the season and, if large numbers of small feeder Chinook salmon are caught, night closures may be instituted.

The CTC will finalize the 2004 Chinook salmon preseason abundance index for S.E. Alaska during the week of March 22. The 2004 all-gear harvest target and domestic gear allocations will not be known until that time. The S.E. Alaska troll allocation is 80% of the all-gear harvest target after the net allocations are subtracted. The remaining 20% is allocated to the sport fishery.

Spring salmon troll fisheries target Alaska hatchery Chinook salmon. Harvests of non-Alaska hatchery Chinook salmon are capped at levels based on the percentage of Alaska hatchery fish in the catch; at higher Alaska hatchery percentages the non-Alaska hatchery Chinook salmon harvest caps increase. If in-season CWT results indicate a high proportion of Alaska hatchery fish in any given area, fishing time will be increased as appropriate. If tag results demonstrate low Alaska hatchery Chinook salmon harvests, then fishing time will be restricted.

The department is planning to re-open the following two spring troll areas in 2004 that had been open in previous years: Craig Point, which is located in Sumner/Stikine Straits in District 108 west of Wrangell; and, Ernest Sound in District 107 south of Wrangell. An additional two to three new areas will likely open in the Wrangell area to target hatchery Chinook returning to the remote release facility at Anita Bay in District 107. The department does not anticipate eliminating any existing spring fisheries in 2004.

The Alaska Board of Fisheries, during its November 2003 meeting, changed the date when the spring fishery can open. Now the spring fishery can open immediately following a closure of the winter fishery should the winter Chinook troll fishery guideline harvest level be reached prior to April 30.

The sport Chinook bag limits will be set once the final preseason Chinook salmon abundance index is adopted by the CTC and may be affected by the outcome of ongoing negotiations within the Transboundary Panel on new Chinook salmon fisheries.

Canada

Unless new directed Chinook salmon fisheries are approved by the PSC, Chinook salmon will be harvested in 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. Recreational harvest will be monitored through a creel census program on the Tahltan River.

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 and spaghetti tags; and
3. conduct escapement programs as resources permit.

A CWT program on wild Chinook fry/smolt was initiated in 2000 and will continue to be developed as part of a program to estimate the marine harvest of Stikine Chinook salmon and contribute to the development of an abundance-based management regime for Chinook salmon.

TAKU RIVER

Preseason Forecasts

Sockeye Salmon

The TCTR 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.

The DFO preseason forecast for the 2004 Taku sockeye salmon total run is approximately 231,000 fish and constitutes an average run size. For comparison, the recent 10-year average (1994-2003) estimated run size is 265,000 sockeye salmon. The 2004 forecast is the average of a sibling-based forecast of 199,270 sockeye, and a stock-recruitment based forecast of 263,036 sockeye. If the run comes in as expected, the 2004 TAC will be approximately 156,000 sockeye salmon.

The 2004 sibling forecast is based on the historical (1989-2003) relationship between the number of age-5 sockeye in year (t) and the number of age-4 sockeye in year (t-1):

$$N_{5(t)} = 30{,}443 + 1.80 \bullet N_{4(t-1)} \quad [4]$$

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

This relationship is significant at a level of α=0.05; the coefficient of determination (r^2) is 0.61. The preliminary estimate of the return of age-4 sockeye in 2003 is approximately 50,600 fish, which, when substituted into equation [4], gives a predicted age-5 return of approximately 121,650 fish in 2004. On average, approximately 61% of Taku River sockeye return at age-5. Assuming that this applies to the brood years contributing to the 2004 run, the predicted 121,600 age-5 return translates into a total run forecast of approximately 199,270 sockeye in 2004.

The 2004 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:

$$\ln (R/S) = 2.5 - 0.000015 \bullet S \quad [5]$$

where: $\boldsymbol{R}$ = total adult return; and
$\mathbf{S}$ = number of spawners.

Equation [5] above is based on the estimated return of spawners from the 1984 to 1998 brood years and the subsequent age-specific returns from these escapements.[2] The relationship is significant at a level of α=0.05, with r^2=0.49. The estimated numbers of spawners from the principal brood years were 98,200 in 1999 and 75,500 in 2000. The calculated returns per spawner for these years based on equation [5] are 2.6 and 3.7, respectively. Assuming that the fish from these brood years mature as per the average age-at-maturity (61% age-5, 29% age-4, 5% age-6, and 5% age-3), the forecast total run size for 2004 is 263,000 sockeye based on stock-recruitment data.

A declining trend in return per spawner was noted over the brood years 1988 to 1994 (3.9, 2.9, 2.3, 2.3, 1.9, 1.8, 1.6, respectively), with a slight improvement for the 1995 brood year (1.8). Significantly higher returns were observed for the 1996, 1997, and 1998 brood years (4.6, 3.7, and a record 6.3 returns per spawner, respectively). However, the return of age-4 fish from the 1999 brood year was somewhat lower than expected.

Tatsamenie sockeye salmon: Escapement of sockeye salmon to Tatsamenie Lake has occasionally limited the magnitude of the joint U.S./Canada egg take program. Based on the 1993–2002 average fecundity of 4,000 eggs per female, equal sex ratios and the Canadian guideline that no more than 30% of the escapement can be utilized for enhancement purposes, an escapement of at least 8,300 sockeye salmon will be needed to reach the egg take target of 5 million sockeye salmon in 2004. Tatsamenie Lake escapements (excluding broodstock) have averaged 7,300 fish during the last 5 years, and have ranged from a high of 21,100 (2001) to a low of 1,900 (1999) fish. A below-average run of Tatsamenie sockeye is expected in 2004 based on a below-average primary parent-year escapement of 1,900 in 1999, and estimated Tatsamenie Lake smolt out-migrations of 62,000 and 144,000 in 2001 and 2002, respectively.

Coho Salmon

The estimated spawning escapements in the two primary brood years that will contribute to the 2004 coho run were 64,700 fish in 2000 and 104,460 in 2001. These both greatly 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 92,000 over the 1993 to 2003 period.

Based on catch rates in the Taku River CWT program, an estimated 2.8 million coho smolt emigrated during the spring of 2003; these fish will be returning as adults in 2004. If the marine survival rate for these fish is similar to the recent 5-year average (9%), a total run of 268,000 should be observed in 2004; if U.S. exploitation rates are also average (34%), the border escapement should be greater than 177,000 fish. Current depressed market conditions suggest the exploitation rate will be below average in 2004.

Chinook Salmon

The principal brood years contributing to the 2004 Chinook run are 1998, 1999 and 2000. The 1998 and 2000 brood year escapements fell within the escapement goal range of 30,000-50,000 large fish while the 1999 escapement was below the lower bound of the escapement goal. The preliminary forecast for large (typically 3-ocean age and older) Chinook salmon in 2004 is based on sibling returns and is 56,774 fish

[2] 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 inriver age composition, as determined from sampling in the Canadian commercial fishery, was representative of the entire run.

(range 31,287 to 82,346). This is a forecast for spawning escapement and assumes exploitation rates consistent with those observed in previous years. An escapement of 56,774 large fish is above average.

Pink Salmon

Pink salmon returning in 2004 will be the product of the 2002 escapement. Based on the 2002 Canyon Island fish wheel catch of 5,672 pink salmon, this is believed to have been below average (1994 to 2002 the even-year fish wheel catches averaged 16,850 pink salmon). Therefore, a below-average run is expected in 2004.

Chum Salmon

Canyon Island fish wheel chum salmon catches in 1999 and 2000 (164 and 423, respectively) suggest that the 2004 parent year spawning escapements were poor. The 1993-2002 average Canyon Island catch of chum salmon was 302 fish; the run appears to have been depressed for some time. Consequently, a below-average to poor fall chum run is again expected in 2004.

Escapement Goals

Annex IV, Chapter 1 of the PST required the Parties to review an appropriate escapement goal for Taku Chinook salmon by May 1999 and thereafter establish a new goal as soon as practicable. Detailed analyses of harvest and spawning abundance by age class and smolt production were used to generate a recommendation for a 30,000 to 55,000 adult fish (3-5 ocean) escapement goal range. This analysis and recommendation has been reviewed and approved by the previously referenced CTC report (TCCHINOOK (99)-3), internal review committees of ADF&G and DFO and by the TCTR.

Escapement goals for other Taku River salmon species are based on limited analyses of historic catch and escapement data. These escapement goals are considered as 'interim goals' and are subject to change as additional stock-recruitment data and detailed analyses are performed. The PST also calls for developing a revised escapement goal for coho salmon no later than May 1, 2004. At this time analysis of existing data for Taku River coho salmon production is nearing completion and the resulting biological escapement goal will be reviewed by the TCTR and PSARC in the spring of 2004.

Current escapement goals accepted by the TCTR for salmon spawning in Canadian portions of the Taku River are as follows:

Species	Year established or status	Interim escapement goal ranges	
		from	to
Sockeye	1985	71,000	80,000
Coho	Review by May 1, 2004	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 harvest sharing agreements between Canada and the United States for Taku River salmon are in place as a result of negotiations of Annex IV, Chapter 1 of the PST. The arrangements that are expected to apply for the 1999 to 2008 period are as follows:

1. Sockeye salmon:

    (i) Except as noted below, Canada shall harvest no more than 18% of the TAC of the wild sockeye salmon originating in the Canadian portion of the Taku River each year;

    (ii) If the projected inriver escapement is greater than 100,000 sockeye salmon, Canada may, in addition harvest 20% of the projected inriver escapement above 100,000 sockeye salmon;

    (iii) The Parties agree to manage the runs of Taku River sockeye salmon to ensure that each country obtains catches in their existing fisheries equivalent to each country's share of wild sockeye salmon and a 50% share of fish originating from Taku fry plants;

    (iv) The Parties agree to continue the existing joint Taku enhancement program designed to produce annually 100,000 returning sockeye salmon.

2. Coho salmon:

    (i) The Parties agree to develop and implement an abundance-based approach to managing coho salmon on the Taku River no later than May 1, 2004. The Parties commit to developing a revised MSY escapement goal to be implemented no later than May 1, 2004.

    (ii) Until a new abundance-based approach is developed, the management intent of the United States is to ensure a minimum above-border inriver run of 38,000 coho salmon, and the following arrangements will apply:

        a. no numerical limit on the Taku coho catch will apply in Canada during the directed sockeye salmon fishery (through statistical week 33);

        b. if in-season projections of above-border run size are less than 50,000 coho salmon, a directed Canadian harvest of up to 3,000 coho salmon is allowed for assessment purposes as part of the joint Canada/U.S. Taku River mark-recapture program;

        c. if in-season projections of above-border run size exceed 50,000 coho salmon, a directed Canadian harvest of 5,000 coho salmon is allowed;

        d. if in-season projections of above-border run size exceed 60,000 coho salmon, a directed Canadian harvest of 7,500 coho salmon is allowed;

        e. if in-season projections of above-border run size exceed 75,000 coho salmon, a directed Canadian harvest of 10,000 coho salmon is allowed.

3. Chinook salmon:

(i) Both Parties shall take appropriate management action to ensure that the necessary escapement goals for Chinook salmon bound for Canadian portions of the Taku River are achieved.

(ii) The Parties agree that new fisheries on Taku River Chinook salmon will not be developed without the consent of both Parties. Management of new directed fisheries will be abundance-based through an approach to be developed by the Committee no later than May 1, 2004. The Parties agree to implement assessment programs in support of the development of an abundance-based management regime.

Both Parties intend 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 2004.

Management Procedures

The management co-ordination between U.S. and Canadian fishery managers will involve weekly communication between designated members or alternates. The agencies have agreed to coordinate management of their respective fisheries to increase the likelihood that Tatsamenie escapements are adequate to achieve escapement and broodstock needs. Based on Tatsamenie Lake smolt out-migration data, the run of enhanced fish in 2004 may be even lower than 2003. If, however, in-season data does not support this and the enhanced run appears to be significant, attempts will be made to manage it in addition to the wild and total sockeye runs, as follows:

1. For purposes of calculating the TAC of the enhanced fish, because Tatsamenie stocks overlap wild stocks, the appropriate wild stock exploitation rate will be applied to the total enhanced run forecasts. The Taku sockeye exploitation rate has averaged 59% from 1993-2002.

2. The stock composition in D-11 (inseason otolith analysis combined with historical, i.e. previous 10-year average, contributions of wild Snettisham and wild Taku sockeye) will be used to initially estimate the proportion of run projections produced from the joint Canada/US mark-recapture program attributed to the enhanced fish. When available, inriver stock ID data (otolith data) will be used to update the estimates.

3. Average run timing of the Tatsamenie stock, from historical tagging and/or stock ID data, will be used in the Tatsamenie projections.

United States

At the time of this writing, the Transboundary River Panel is actively negotiating terms for abundance based directed Chinook salmon fisheries on transboundary river stocks. Early season management of U.S. fisheries may be modified based on the outcome of those negotiations.

Section 11-B (Figure 2) will open for a 72-hour fishing period beginning at noon on the third Sunday in June (June 20, statistical week 26) unless otherwise modified based on the outcome of Chinook salmon negotiations. The fishery will be managed through mid-August primarily on the basis of sockeye

abundance. Run strength will be evaluated using fishery catch and CPUE data and weekly inriver run size estimates from the Taku River mark-recapture program operated jointly by ADF&G and DFO. Contributions of enhanced sockeye salmon will be estimated inseason by analysis of salmon otoliths sampled from the commercial harvests. For purposes of inseason run size estimation, average weekly historical stock composition data will be used to estimate the contribution of wild Taku River and Port Snettisham sockeye contributions to the catch. The above data will be used to generate weekly estimates and total season projections of total Taku sockeye run size, U.S. Taku TAC and U.S. harvest. The age and stock compositions of the harvest of wild sockeye stocks will be revised after the fishing season by analysis of scale pattern and brain parasite incidence data from samples from the commercial catch and escapements.

A coordinated management focus will occur to increase numbers of Tatsamenie sockeye returning to the lake in 2004. To ensure stocks pass through for escapement, management actions may include reduced fishing time in Taku Inlet in the U.S. drift gillnet during statistical weeks 30-32 (July 18-August 07) followed by similar measures staggered by one week in the Canadian fishery, i.e. restrictions during weeks 31-33. Extensions of fishing time in each country's fisheries will be discussed by the fishery managers of the two countries prior to implementation.

Nighttime fishing closures may be imposed to limit incidental catches of immature Chinook salmon. Results from the adult Chinook tagging program at Canyon Island, harvests in the Juneau recreational fishery, and initial drift gillnet openings in Taku Inlet will be evaluated to determine the need for night closures during the 2004 season.

Returns from domestic hatchery programs are expected to contribute significantly to the District 11 fishery in 2004. For example, the run of Snettisham hatchery sockeye salmon is expected to be over 400,000 sockeye and the summer chum run is expected to be 476,000 chum salmon. Substantial runs of coho salmon are also expected to the Macaulay Hatchery in Gastineau Channel. Portions of these runs will be available for incidental harvest in the directed wild sockeye and coho fisheries in Taku Inlet. Extended fishing time is expected in Stephens Passage south of Circle Point during July to harvest hatchery runs of summer chum salmon to Limestone Inlet and during August to harvest runs of Snettisham Hatchery sockeye salmon.

Pink salmon will be harvested in Section 11-B incidental to the sockeye and summer chum fisheries. Fishing time for pink salmon in Section 11-C will depend on the strength of runs to lower Stephens Passage, Seymour Canal, and the northern portions of District 10. Parent-year pink escapements in Stephens Passage and Seymour Canal were above the long-term average; some surplus to escapement needs may occur in 2004.

In 1989 the Alaska Board of Fisheries reopened the purse seine fishery in a small area in northern Chatham Strait (a portion of sub district 112-16) during the month of July in order to harvest pink 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 2004, a July seine fishery may occur in the Hawk Inlet shore area. The purse seine fishery in this area has an Alaska Board of Fisheries mandated sockeye salmon total harvest cap of 15,000 fish during July. During August, fishery openings along the Hawk Inlet shore may extend northward to the latitude of Hanus Reef when north-migrating pink stock strength warrants. If north-migrating runs are poor and south-migrating stocks are strong, seining may be limited to south of Point Marsden.

Beginning in mid-August management of the District 11 gillnet fishery will be based on the run strengths of coho salmon. Inseason management will be based on evaluation of 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 program. As specified in the Annex IV, Chapter 1 agreement, the U.S. will manage its fishery to achieve a minimum above-border run of 38,000 Taku coho salmon.

To increase numbers of fall chum salmon returning to the Taku River, management will focus on statistical weeks 35-36 (August 22– September 4). Actions may include limited fishing time in Taku Inlet in the U.S. drift gillnet, in conjunction with measures taken in the Canadian fishery to ensure stocks pass through for escapement. Fishing time in Taku Inlet may be limited to not exceed historical effort as expressed in boat-days during weeks 35-36.

The sport Chinook bag limits will be set once the final preseason Chinook salmon abundance index is adopted by the CTC and may be affected by the outcome of ongoing negotiations within the Transboundary Panel on new Chinook salmon fisheries. The Chinook sport fishing season will be open in marine waters near Juneau throughout the year. Sport fishing inside Taku Inlet, however, is closed north of a line from Cooper Point to Dorothy Creek from April 16 to June 14 to protect returning Taku 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 2004. The legal gear type is set nets, not to exceed 15 fathoms in length. The seasonal bag limit is five sockeye salmon per person or ten sockeye salmon per household. Fishing is not allowed within 100 yards of the U.S./Canada research fish wheels.

Canada

The Taku River commercial fishery will open 12:00 noon Sunday, June 20 for an initial 72-hour period to target early sockeye runs unless otherwise modified based on the outcome of Chinook salmon negotiations. Unless a directed Chinook fishery is implemented, 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 terminal run size, TAC and escapement for wild stocks. The weekly projections (wild stocks) will be made using the following calculations:

$$TAC_{(w)} = [(E_{w(t)} + C_{w(t)} + A_{w(t-1)}) / \rho_{w(t)}] - E_w \qquad [6]$$

Where:
- $TAC_{(w)}$ = the projected total allowable catch of wild *w* sockeye for the season;
- $E_{w(t)}$ = the cumulative wild escapement to week *t* based on mark-recapture data;
- $C_{w(t)}$ = the cumulative Canadian wild catch to week *t*;
- $A_{w(t-1)}$ = the estimated cumulative U.S. catch of wild Taku sockeye salmon to the preceding week t-1 (preceding week used to allow for migration time). Catches in Districts 111 and 112 will be considered for inclusion in this estimate;
- $\rho_{w(t)}$ = the estimated proportion of run through to week *t* determined from the average inriver run timing based on historical CPUE data from the Canadian fishery. (Run timing estimates will be adjusted in-season according to in-season CPUE data relative to historical data in both U.S. and Canadian fisheries); and
- E_w = the system-wide escapement goal for wild stocks. (A value of 75,000 will be used reflecting the midpoint in the interim range of 71,000 to 80,000).

The PST harvest sharing provisions will be applied to the weekly wild sockeye TAC projections to guide the management of the commercial fishery. Run timing will be used to apportion the projected Canadian allowable catch each week and to make projections of the total escapement. The Canadian catch will be adjusted with the objective of meeting escapement and agreed Canada/US harvest sharing objectives.

During statistical weeks 31-33 (July 25-August 14), management attention will focus on Tatsamenie sockeye. Management decisions during these weeks will take into account the objectives of providing sufficient fish to meet broodstock targets for the joint enhancement project, and increasing escapement into Tatsamenie Lake. It is anticipated fishing time will be limited to a maximum of two days during this period. This will be accompanied by the U.S. management actions described in the previous section. Extensions of fishing time beyond two days in each country's fisheries will only be allowed after consultation and agreement between fishery managers of the two countries.

After mid-August, management actions will shift to coho salmon. Early indications of total run strength will be based on the projected Alaskan troll catch of "Above Canyon Island" (ACI) Taku River coho salmon based on in-season CWT sampling data. The relationship between the troll catch and total run size for the 1992 to 2000 period is described by the following equation:

$$R_{(ACI)} = 3.0079C_T + 34{,}936 \qquad [7]$$

where: $R_{(ACI)}$ = projected total run size of ACI coho salmon;
C_T = projected troll catch of ACI Taku coho salmon.

The coefficient of determination for this relationship is $r=0.952$. The projected troll catch will be estimated by expanding the catch-to-date by historical timing. The troll-based in-season run forecasts will be used for consideration in management decisions until reliable in-river abundance estimates are available, usually by early September. The in-river forecasts will be based on the following simplified formula:

$$R_{IR(ACI)} = R_{IR(ACI)}t/T \qquad [8]$$

where: $R_{IR(ACI)}$ = projected total inriver run above Canyon Island;
$R_{IR(ACI)}t$ = estimated run size to time "t" based on mark-recapture data;
T= average cumulative run timing at Canyon Island through time "t".

Adjustments to fishing time will be made based on the in-season run projections and the PST coho harvest sharing provisions.

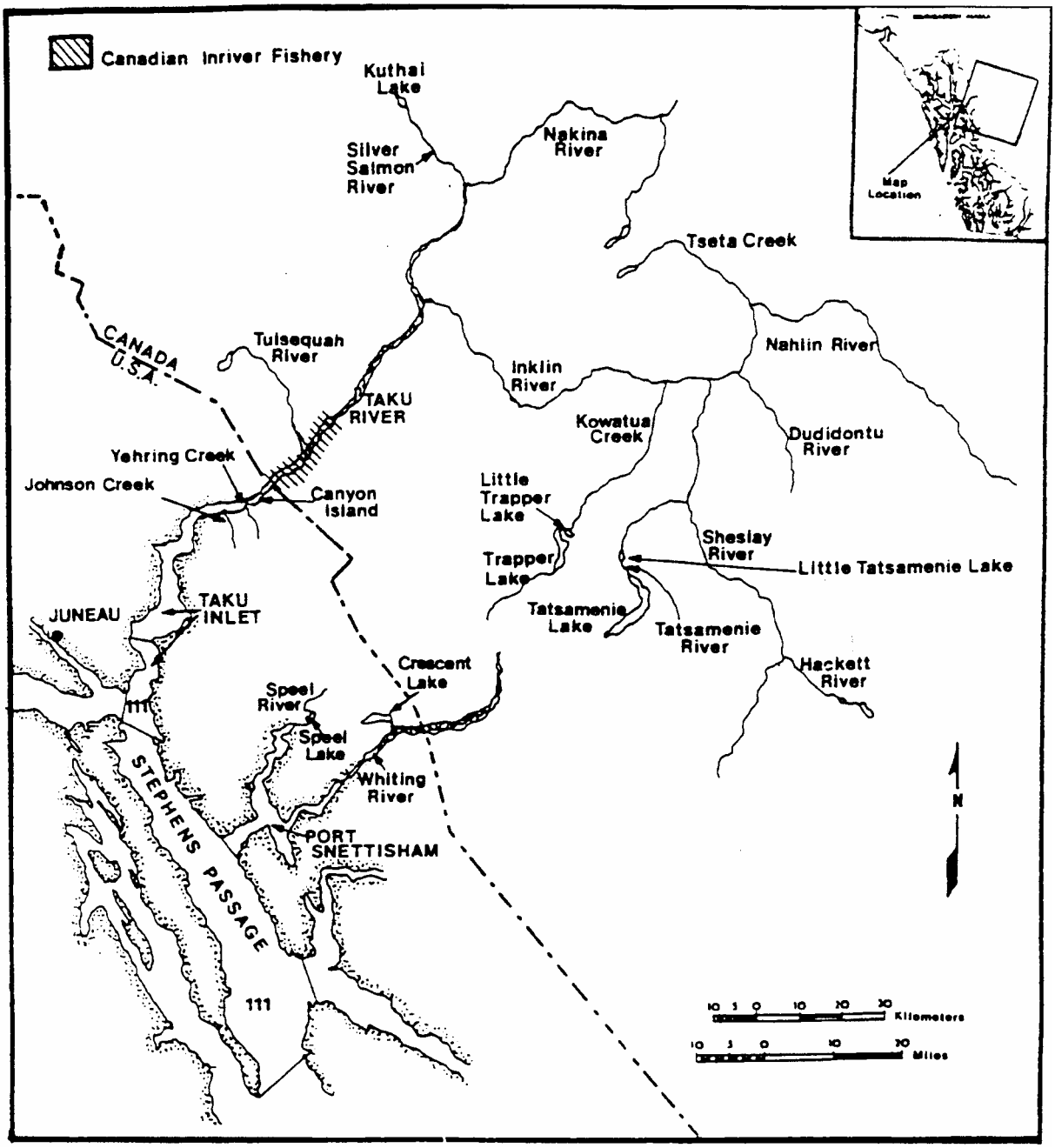

Figure 2. The Taku River and principal U.S. and Canadian fishing areas.

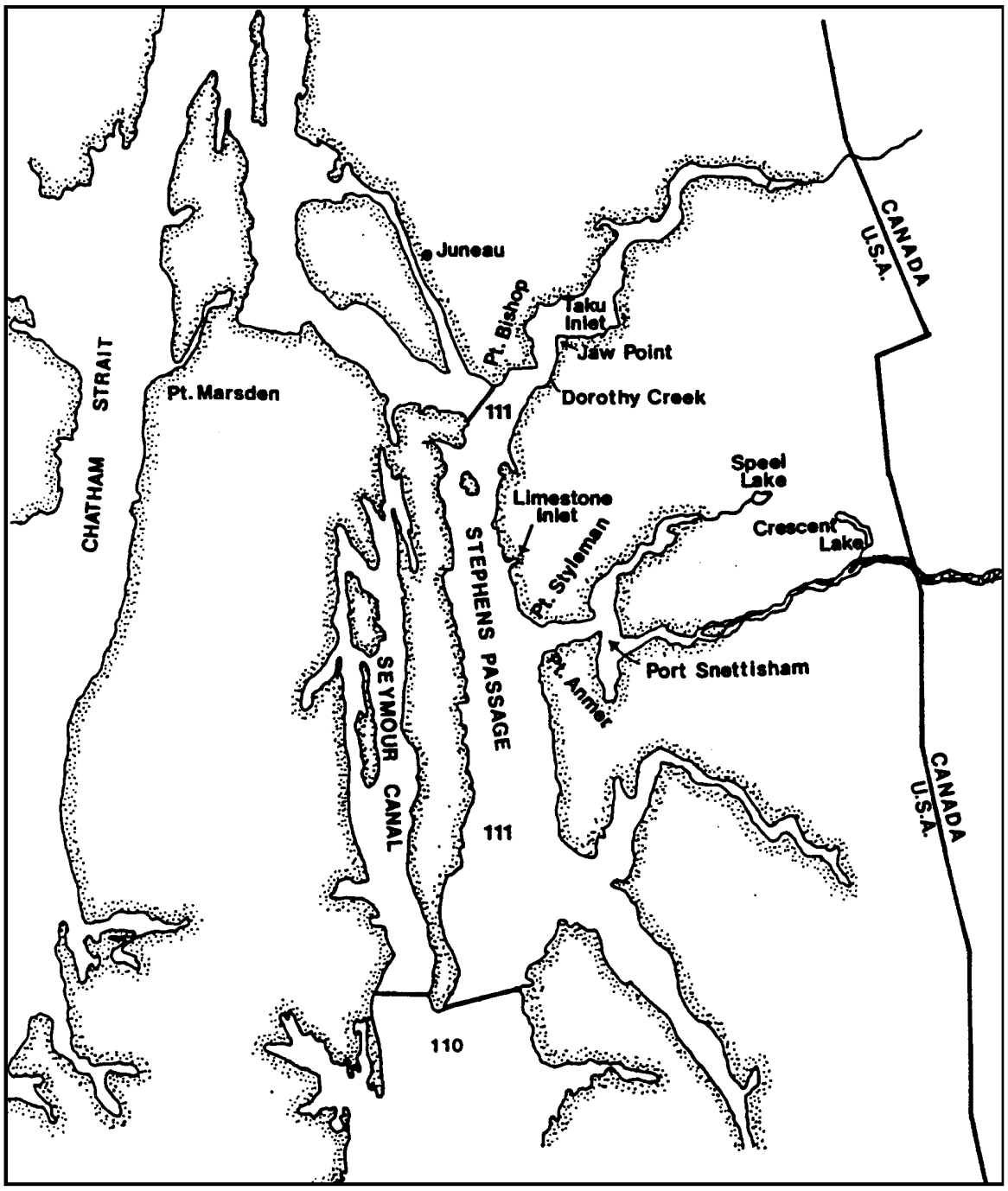

Figure 3. U.S. fishing areas adjacent to the Taku River.

To address chum salmon conservation concerns, the retention of chum salmon will be prohibited throughout the season. In addition, fishers will be encouraged to live-release any steelhead caught as per previous years to protect steelhead stocks.

Modifications to the fishing area implemented in 1998 to include a 50 meter closed section just upstream of the Canada/US border will continue to be in effect in 2004. The upper boundary near Yellow Bluff will remain unchanged from previous years.

The Canadian fishery will be monitored by DFO personnel. Both catch and tag recapture data will be collected daily. This 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 or email communication.

ALSEK RIVER

Fisheries

Salmon stocks returning to the Alsek River drainage (Figure 4) are jointly managed by DFO, the Champagne and Aishihik First Nation (CAFN) and ADF&G through the joint TCTR of the PSC.

The principal U.S. fishery that targets Alsek stocks is a commercial set gillnet fishery that operates in Dry Bay at the mouth of the Alsek River. 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 upper Tatshenshini drainage. At present, between 100-150 members of CAFN harvest salmon via fish traps and gaffs, primarily in the Klukshu River, and to a lesser extent in Village, Blanchard and Goat creeks. Recreational fisheries take place primarily on the Tatshenshini River in the Dalton Post area and on the Takhanne and Blanchard rivers. Specific closed/open times were modified in 2003 in an attempt to streamline the management of the recreational fishery. The following changes will be in effect again in 2004: the weekly closure in the Dalton Post area of the Tatshenshini River which, prior to 2003, was 12:00 noon Tuesday to 6:00 a.m. Saturday, has been eliminated; the closed times for Klukshu River, Nesketaheen Lake and Village Creek have been aligned to June 15 to November 30; the salmon non-retention periods on the Takhanne and Blanchard rivers have been aligned to July 24 to August 31; and the dates for salmon non-retention in Klukshu Lake have been eliminated (it is now year round).

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 spawning has been documented in U.S. tributaries as well.

Preseason Run Outlooks

The 2004 overall Alsek drainage sockeye run is expected to be approximately 44,700 sockeye; this is well below the recent 10-year average run size estimate of approximately 77,200 sockeye (based on the Klukshu weir count expanded by 1/0.27 to account for other in-river escapement and an assumed U.S.

harvest rate of 0.20). The outlook for 2004 is based on a predicted run of 12,100 Klukshu sockeye derived from historical Klukshu stock-recruitment data and an assumed Klukshu contribution to the total run of 27%, based on preliminary radio telemetry and mark-recapture results. Principal contributing brood years will be 1999 (Klukshu escapement of 5,101 sockeye salmon) and 2000 (Klukshu escapement of 9,329 sockeye salmon); the 1994-2003 average Klukshu sockeye escapement is approximately 14,200 fish. Based on historical stock-recruitment analysis, the range of Klukshu escapements that appear most likely to produce maximum sustained yields is 7,500 to 15,000 sockeye salmon.

The Klukshu early sockeye run escapements in 1999 and 2000 were below average: 371 and 237, respectively. The principal brood year, 1999, was well below the optimum level of 2,500 sockeye spawners as determined through separate stock-recruitment analyses of the early run conducted by DFO. The weir count in 2000, a minor contributor of age-4 sockeye to the 2004 run, was also well below the optimum escapement goal, as determined from the analysis. The early run return to the weir is expected to be 900 fish in 2004, which falls well below the optimum escapement goal of 2,500 and well below the recent ten year average of 3,100 sockeye salmon.

The Klukshu Chinook escapements in 1998 and 1999, 1,347 and 2,168 Chinook salmon, respectively, were well below and slightly below average. The escapements were both within the optimum escapement range of 1,100 to 2,300 Chinook salmon as determined from current stock-recruitment analysis. Based on these primary brood year escapements, the outlook is for 2,540 Klukshu Chinook, slightly below the recent ten year average (2,840) but still above the optimum escapement range.

The coho escapements at the Klukshu River weir in 2000 (4,791 coho salmon) and 2001 (746) suggest the run in 2004 will be average. (Note: although Klukshu coho weir counts are incomplete, they may serve as a reasonable indicator of escapement.) The recent 10-year average weir count is 3,200 coho salmon.

Management Approach for the 2004 Season

Sockeye Salmon

The principal escapement monitoring tool for sockeye stocks on the Alsek River is the Klukshu weir, operated by DFO and the CAFN. The biologically-based escapement goal for the Klukshu stock is 7,500 to 15,000 fish (Clark and Etherton, 2000). As a result of this analysis, Canadian and U.S. managers have set a spawning escapement goal range of 7,500 to 15,000 sockeye salmon for 2004.

United States

U.S. fisheries will operate similar to regimes in 1999-2003, with the first opening scheduled by regulation to be the first Monday in June (June 7 in 2004) for 24 hours. The remainder of this fishery will be managed based on fishery performance data for sockeye salmon run strength and to a lesser extent escapement information from the Klukshu River weir. The fishery will be managed on run strength judged by comparison of CPUE to historical averages as well as any new information originating from the recent-years mark-recapture program. A cautious approach will be taken recognizing that fishery CPUE may be poorly correlated with run size. As noted above, the U.S. fisheries target the full mixture of Alsek 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, Blanchard River and Village Creek. Prior to 1963, the fishery opened in May.

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.

Canada

Canadian fisheries for sockeye salmon will proceed similar to regimes in recent years. Next to conservation, the priority in management will be to provide for the basic food, social and ceremonial needs of the CAFN. The basic needs level for sockeye is 3,000 fish, as documented in the CAFN final land claim agreement. Similar to 2003, some First Nation's harvest will be allowed to occur at the weir which will also provide biological samples and tag recovery information. In the sport fishery, non-retention of sockeye will generally be in effect through mid August to conserve early runs and address domestic allocation priorities. However, if the early sockeye run size into the Klukshu River is projected to be greater than 4,500 sockeye, Canadian managers may allow sockeye retention in the sport fishery prior to August 15.

The Klukshu weir was relocated in 2001 approximately 500 meters upstream from its previous location. A new area closed to fishing has been created below the weir to protect holding fish.

Chinook Salmon

The principal escapement monitoring tool for Chinook stocks on the Alsek River is also the Klukshu weir. A joint report for an escapement goal for the Klukshu stock has been reviewed and accepted by both DFO 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 2004.

United States

At the time of this writing, the Transboundary River Panel is actively negotiating terms for abundance based directed Chinook salmon fisheries on transboundary river stocks. Early season management of U.S. fisheries may be modified based on the outcome of those negotiations.

U.S. fisheries will operate similar to regimes in 1999-2003, with the fishery opening the on June 7 for one day unless otherwise modified based on the outcome of Chinook salmon negotiations. The remainder of this fishery will be managed based on sockeye run strength (see above). The U.S. fishery will likely have little effect on the weir count since it opens after the peak of the Chinook salmon run has passed through Dry Bay; the peak timing appears to be in late May based on past fishery data (McPherson, Etherton and Clark, 1998) and recent tagging data. Chinook salmon tagging studies conducted from 1997 through 2003 indicated that approximately 15-30% of the Chinook salmon passing through Dry Bay were bound for the Klukshu drainage. U.S. Alsek Chinook harvests have been less than 1,000 Chinook salmon each year since 1981, and the 2004 harvests most likely will not be greater than this amount. Gill nets will be restricted to a maximum mesh size of 6 inches (152 mm) through July 1 to minimize Chinook harvests, unless there is agreement between the Parties to remove this restriction.

Canada

As with sockeye management, the priority in management will be to achieve escapement goals and provide for the basic needs harvest of the CAFN. According to the CAFN land claims agreement, the basic needs level for Chinook salmon is 200 fish. 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 recreational 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 2004 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. In Canada, additional harvesting opportunities through increased catch limits in the recreational may be provided subject to conservation concerns.

Stock Assessment Program

The escapement of Chinook, sockeye, and coho salmon through the Klukshu weir and sockeye salmon through the Village Creek electronic counter serves as an in-season indicator of stock strength. Adjustments to fisheries may be made on the basis of these counts. Aerial surveys are used to augment escapement information on Chinook and sockeye stocks in the Alsek drainage and are reported in the TCTR post-season annual report.

The Alsek sockeye mark-recapture project will be conducted again this year to determine the overall abundance of Alsek sockeye and the relative contribution and timing of Klukshu, Nesketaheen and other stocks to the inriver run. The proportion of the Alsek sockeye run represented by the Klukshu River stock is not known in-season. Estimates from the radio telemetry program conducted in 2001-2003 indicated that approximately 22-31% of the inriver run into Canada was comprised of Klukshu sockeye. Estimates of Klukshu contribution to the inriver run based on the mark-recapture studies conducted from 2000-2003 ranged from 14-42%. The mark-recapture study will be used to develop improved in-season measures of run abundance for sockeye salmon particularly in the lower Alsek River. To this end, DFO and ADF&G will assess the feasibility of obtaining inriver run size estimates in the lower Alsek River. Post season analysis of tag recoveries will provide stock specific run timing information. The development of historical run timing models could be useful in developing an abundance-based management regime as required by the Treaty.

Another mark-recapture project will take place again in 2004 to estimate total escapement of Chinook salmon in the Alsek drainage and estimate the fraction represented by the Klukshu stock. This project was initiated in 1997 by ADF&G with assistance from DFO in tag recovery and will be used to improve in-season management of Chinook salmon. 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. A trap has been incorporated into the weir to facilitate sampling for tagged fish (both Chinook and sockeye). Chinook tagging studies conducted from 1997 through 2003 indicated that approximately 14-32% of the Chinook salmon passing through Dry Bay were bound for the Klukshu drainage.

A summary of the anticipated field projects in the Alsek River drainage is presented in Appendix Table A3.

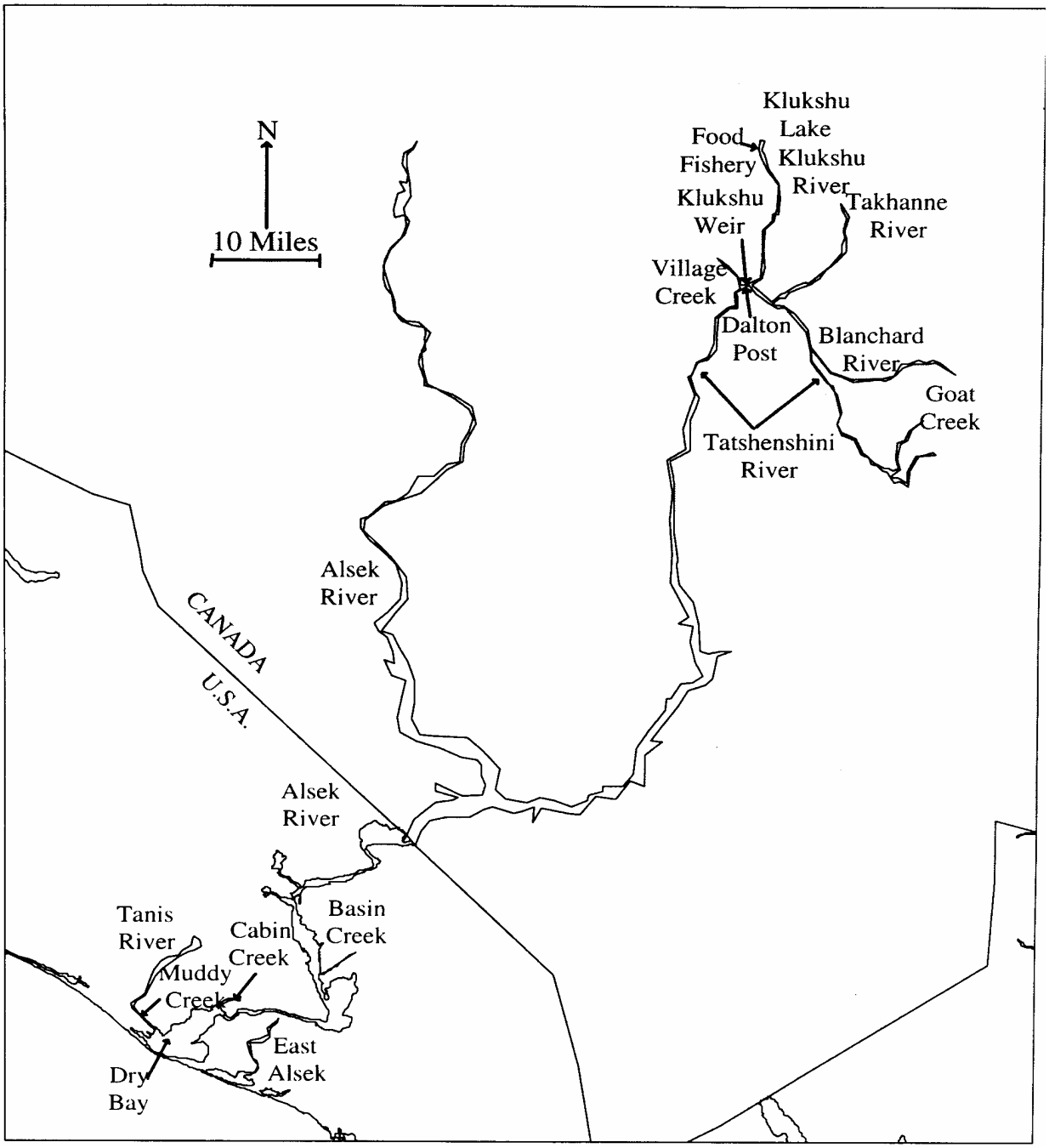

Figure 4. The Alsek River and principal U.S. and Canadian fishing areas.

TRANSBOUNDARY ENHANCEMENT PLANS

Overview

Joint sockeye enhancement projects are conducted on the Stikine and Taku rivers. Broodstock are taken in Canada at Tahltan Lake in the Stikine drainage and from Tatsamenie Lake in the Taku drainage. The eggs are incubated and thermally marked at the Snettisham Central Incubation Facility in Alaska. The fry originating from Tahltan Lake broodstock are back-planted into Tahltan and/or Tuya lakes (both Stikine drainage); fry from the Tatsamenie Lake egg-take are returned to their lake of origin. A number of assessment projects are conducted to monitor the recipient lakes (e.g. plankton, water chemistry) and the survival of outplanted fry (e.g. smolt enumeration, hydro-acoustic surveys, fry sampling). A summary of the enhancement field and incubation projects is presented in Appendix Table A4.

Fry Plants

Fry plants from the transboundary sockeye egg-takes in 2003 are scheduled to occur in May and June 2004. It is expected the following number of sockeye fry will be out-planted:

Stikine drainage:	Tahltan Lake 2.5 million
	Tuya Lake – 2.5 million
Taku drainage:	Tatsamenie Lake 2.2 million

At Tahltan Lake, we plan to transport fry on three flights during the period from May 15 to May 25. Fry will be held for approximately 24 hours in net pens for observation. Fry destined for Tuya Lake are expected to be transported in five flights the first week in June.

At Tatsamenie Lake, the plan is to transport fry on four flights during the period from May 15 to May 25. There will be two groups of fry, a north shore release and a south shore release. Fry will be held for approximately 24 hours in net pens for observations.

Egg-Take Goals

Target sockeye eggtakes for the fall of 2004 are as follows:

Tahltan Lake: 6.0 million.

- In consideration of the desire for some natural spawning to take place at the adult collection sites; the last date that eggs will be collected at Tahltan Lake is September 25.

Tatsamenie Lake: 5.0 million.

- The recommended egg-take goal is 5.0 million (or a maximum of 30% of the escapement)
- Up to 0.8 million of the eggs will be incubated in a passive flow incubator in Tatsamenie Lake; the remainder will be incubated at Snettisham Hatchery.
- The sockeye run outlook for Tatsamenie is not good and the enhancement committee has developed a sliding plan for incubation locations. If only 2.0 million eggs are available they will be incubated at Snettisham hatchery. If 2.5 million eggs are available 500,000 will be placed in a passive flow incubator in Tatsamenie Lake; the remainder will be incubated at Snettisham Hatchery. If 3.3 million are available 800,000 will be placed in a passive flow incubator in Tatsamenie Lake; the remainder will be incubated at Snettisham Hatchery.

Special Studies

At the February 2004 Transboundary Panel meeting, the Parties committed to address number of enhancement related issues. These included:

1. the development of an improved terminal harvest structure in the Tuya River. A joint proposal was prepared by the TCTR for submission to the Northern Fund for funding commencing 2004. It is anticipated that this will be implemented this year.

2. examination of straying of Tuya enhanced sockeye. A joint proposal to investigate this issue was prepared by the TCTR for submission to the Northern Fund for funding commencing 2004. The planned sockeye radio telemetry program in 2004 will also serve to provide information on straying. Surveys at Shakes Creek are planned to address the questions of whether Tuya sockeye are successfully spawning there.

3. a risk analysis of Stikine sockeye enhancement. The Enhancement Sub-committee developed a list of items to be examined in the analysis which will be prioritized and assigned to various Committee members or other experts. A proposal to the Northern Fund for funding assistance was prepared.

4. the development of a review process by the TCTR for Transboundary enhancement projects and to further conduct a review of the Tatsamenie project to address, amongst other things:
    a. the lack of success of the project;
    b. the costs associated with the project;
    c. procedures for evaluation;
    d. biological risks of the project (Appendix to Annex IV, Chapter 1, paragraph 4(a));
    e. and recommend appropriate actions.

    The target date for completion of the review of the Tatsamenie project is the 2005 January meeting of the PSC

The TRTFN plans to do some monitoring of salmon access at King Salmon Lake in the Taku drainage.

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APPENDIX: 2004 ANTICIPATED 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.

Appendix Table A1. Proposed Stikine River field projects,

Project/Dates	Function	Agency	Involvement
Stikine Chinook Mark-Recapture			
5/8 - 7/15	• Tag a target of 940 large Stikine River Chinook salmon captured from Kakwan Point drift net site.	ADF&G/ DFO/TIFN	All aspects except tag recovery.
	• Tag a target of 300 large Chinook salmon at Rock Island set net site.	ADF&G	All aspects except tag recovery.
	• Recover spaghetti tags and CWT's from: Canadian fisheries; Little Tahltan weir; Shakes Cr. and from Iskut tributaries (Verrett, Craig). Tags may also be recovered from other spawning sites.	DFO/TIFN	All aspects
	• Recover CWT's from the fish caught at the tagging site.	ADF&G/ DFO/TIFN	All aspects
Tahltan Lake Smolt Estimation			
5/6 - 6/27	• Enumerate Tahltan Lake sockeye smolts. • Sample up to 800 smolts for age, size, and otoliths.	DFO/TIFN	All aspects
Upper Stikine Sampling			
6/30 - 8/25	• Sample up to 600 sockeye for age, sex, size, egg diameters and otoliths proportionally from the TIFN and commercial fishery at Telegraph Cr.; collect spaghetti tags.	TIFN/	Collect samples and data.
		DFO	Data analysis
	• Sample up to 500 Chinook for age, sex, size, and tags.	TIFN	Sampling
		DFO	Data analysis
Stikine Sockeye Mark-recapture			
6/10- 9/5	• Tag a minimum of 1,200 Stikine River sockeye, as well as incidental Chinook and coho captured at the Rock Island set net site; collect weekly DNA (pooled) samples.	DFO/ ADF&G/ TIFN	All aspects except tag recovery
	• Recover tags from the Canadian fisheries and from the Tahltan weir and at Tuya. Tags may also be recovered from other spawning sites.	DFO/TIFN	All aspects

Appendix Table A1. (cont'd)

Project/Dates	Function	Agency	Involvement
	• Tag up to 500 sockeye with radio and spaghetti tags at Rock Island in proportion to run timing. Collect DNA matched with radio tags from all.	DFO/ ADF&G/ TIFN	All aspects
Little Tahltan Chinook Enumeration			
6/13 - 8/15	• Enumerate Little Tahltan Chinook salmon from a weir located at the mouth of the river.	DFO/TIFN	All aspects
	• Sample 1,300 fish for tags, sex and size; sample 650 of these fish for age. Attempt to sample all clipped fish for CWT recoveries. CWT samples to go to DFO, unless other arrangements are made.	DFO/TIFN	All aspects
	• Enumerate and record tags observed.	DFO/TIFN	All aspects
Stikine Coho Mark-Recapture			
9/6 - 10/17	• Tag a minimum of 1,500 Stikine River coho salmon captured from the Rock Island set net site; collect weekly DNA samples.	DFO/ ADF&G/ TIFN	All aspects except tag recovery
	• Recover tags from the Canadian fisheries. Tags may also be recovered from other spawning sites.	DFO/TIFN	All aspects
	• Recover CWT's from the fish caught at the tagging site. CWT samples to go to ADF&G lab.	ADF&G/ DFO/TIFN	All aspects
Test Fishery in Lower Stikine			
5/8 - 10/17	• Conduct a test fisheries for Chinook, sockeye and coho as required (to fill in when no commercial fishing) to assess run size and run timing. Collect age-sex-size information and recover CWT's from all salmon. Recover spaghetti and/or radio tags.	DFO/TIFN	All aspects
	• Sample all Chinook for tags/ tag loss, CWT's and for age-sex- size. CWT samples to go to DFO lab in Vancouver, unless other arrangements are made. Target for large Chinook retention is 1,400 fish.	DFO	All aspects
	• Sample up to 400 sockeye per week for otoliths matched with scales and, for females, with egg diameters. Transfer otolith samples to ADF&G weekly for in-season processing.	DFO/TIFN	All aspects
	• Sample all coho for spaghetti tags, tag loss and CWT's; 500 for age–sex-size. CWT samples to go to DFO lab in Vancouver, unless other arrangements are made	DFO/TIFN	All aspects

Appendix Table A1. (cont'd)

Project/Dates	Function	Agency	Involvement
Commercial Inriver Fishery Stock ID Sampling			
6/22 - 9/4	• Commercial catch sampling for sockeye to include 350/week for age-sex-size, plus up to 150 matched egg-diameter/otolith samples. Otoliths to be picked up by ADF&G.	DFO/TIFN	All aspects
	• Recover spaghetti and radio tags, CWT's. . CWT samples to go to DFO, unless other arrangements are made		
Commercial Inriver Fishery Stock ID Sampling (Cont'd)			
	• Analyse 60 to 200 otolith samples per week.	ADF&G	In-season processing of otoliths
District 106 &108 Stock ID Sampling			
6/15 - 10/7	• Sample 20% of Chinook and coho catches per district for CWT's; sample Chinook, 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 and Chinook from D108 and D106 during the season).	ADF&G	All aspects
	• Collect 400 sockeye otoliths/week in District 108 (if open), 300 in Sub district 106-41 (100 matched with scale samples), 300 in Sub district 106-30.	ADF&G	All aspects
Andrew Creek Salmon Enumeration			
7/25 - 9/13	• Survey Andrew Creek, count all species and recover tags opportunistically.	ADF&G	All aspects
	• Sample minimum 250 Chinook for age-sex-size, spaghetti- and coded-wire tags.	ADF&G	All aspects
Tahltan Lake Salmon Enumeration			
7/7 - 9/12	• Enumerate Tahltan Lake sockeye entering the lake at weir.	DFO/TIFN	All aspects
	• Live-sample a minimum of 600 fish for age, sex and size and 125 fish per day for tags and sex.	DFO/TIFN	All aspects
	• If escapement goal is achieved, sample up to 400 sockeye for both otoliths and egg diameters (400 additional fish will be sampled from the brood stock take). If the run is weak, fish will not be sacrificed for otoliths. Attempts will be made to obtain samples from broodstock or carcass samples.	DFO/TIFN	All aspects
	• Sample 150 post-spawn Chinook in Johnny Tashoots Creek for age, size, sex and tags.	DFO/TIFN	All aspects
	• Conduct ESSR fishery at Tahltan Lake if escapement targets likely to be exceeded (schedule as per ESSR license).	DFO/TIFN	All aspects

Appendix Table A1. (cont'd)

Project/Dates	Function	Agency	Involvement
7/12 - 8/27	• Harvest as many sockeye as possible in Tuya River. • Examine all fish caught for tags (spaghetti radio) and tag loss. • Sample up to 600 sockeye for otoliths, age-sex-size, and egg diameters.	DFO/TIFN	All aspects
3/15 – 5/31	• Install flow diversion structure at capture site.	DFO/	All aspects
		ADF&G	Funding support
3/1 -	• Develop proposal to be submitted to Northern Fund for design, construction and testing of new capture structure. Start work immediately if proposal approved.	DFO with support from ADF&G	
Chinook and Coho CWT			
4/15 - 6/09	• Targets are 22k Chinook smolts and 20k coho smolts.	ADFG/ DFO/TIFN	All aspects
	• Sample minimum 300 coho and Chinook for age-length-weight.	ADFG/ DFO/TIFN	All aspects
Chinook and Sockeye DNA Stock ID Baseline			
8/1 - 9/30	• Target is 150 samples/stock • Up to four separate stocks to be sampled/spp.	DFO	All aspects
Chinook Creel Census			
6/5 - 8/6	• Survey anglers in the Tahltan River • Sample for spaghetti- and coded-wire tags, age, size, sex.	TIFN/DFO	All aspects
Shakes Creek Chinook & Sockeye sampling			
8/11 - 8/20	• Collect spaghetti and coded-wire tags, age-sex-size data from spawned out Chinook	TIFN	All aspects
	• Enumerate spawning escapement of Chinook and sockeye	TIFN	All aspects
	• Sample all incidental sockeye for age-sex-size and tags and up to 100 for otoliths.	TIFN	All aspects
Chinook Aerial Surveys			
7/30 - 8/15	• Enumerate Chinook salmon spawning in Little Tahltan and Andrew Cr tributaries.	ADF&G	All aspects
Coho and Sockeye Aerial Surveys (funding permitting).			
9/4 - 11/01	• Enumerate Stikine River coho and sockeye salmon spawning in select index areas within the Canadian portion of the Stikine River.	TIFN/DFO	All aspects

Appendix Table A1. (cont'd)

Project/Dates	Function	Agency	Involvement
10/5 - 10/31	• Enumerate coho salmon spawning in the US section of the Stikine River.	ADF&G	All aspects

Contacts:	**Stikine Projects**		
	Pete Etherton/ Bill Waugh	(DFO)	All DFO projects.
	Sandy Johnston	(DFO)	All DFO projects.
	Cheri Frocklage or Marilyn Norby	(TIFN)	Inriver sampling projects.
	Keith Pahlke, John Der Hovanisian	(ADF&G)	Chinook tagging and surveys; Andrew Creek sampling.
	Kathleen Jensen/ Jim Andel	(ADF&G)	106&108 samples, stock assessment, sockeye and coho tagging.
	Scott Forbes	(ADF&G)	Coho aerial surveys.

Canadian staff associated with Stikine projects that may be crossing the Canadian/US border:

Peter Etherton, Cheri Frocklage, Alex Joseph, Gerald Quash, Ivan Quock, Andy Carlick, Bill Waugh, Daniel McPherson, Faron Quock, Frances Naylen, others

US staff associated with Stikine projects that may be crossing the Canadian/US border:

Tom Rockne, Kathleen Jensen, Keith Pahlke, Jim Andel, William Bergman, Troy Thynes, Scott Forbes, John Der Hovanisian, Peter Bransen, Greg Vaughn, Stephen Todd, Roger Wagner, Alex Blaine, Ed Jones, others

Appendix Table A2. Proposed Taku River field projects.

Project/Dates	Function	Agency	Involvement
Canyon Island Marking Program			
mid April	• Set up camp, build and place fishwheels.	ADF&G/ DFO/ TRTIFN	All aspects
4/21 - 10/5	• Fishwheel/ gillnet operation.	ADF&G	3 staff
	• Mark all Chinook, sockeye, coho and chum salmon with spaghetti tags. Tagging goals for each species are:	DFO	2 staff
	- at least 1000 large, 500 medium and 250 small Chinook – 25-30% precision goal;	TRTFN	1 staff
	- 4000-5000 sockeye – precision goals 50% for weekly estimates, 10% for post season;		
	- 2,500 coho – try for 25% precision, (95% rp)		
	- all chum		
	• Sample for age-sex-length information:	ADF&G/ DFO	
	- 260 sockeye/week throughout sockeye run,		
	- 634 coho for the entire season,		
	- all Chinook.		
	• Scan all adipose-clipped Chinook and coho caught for CWT's and sample all Chinook and subset of coho (30-50). CWT samples to go to ADF&G lab.	ADF&G/ DFO/TRT	
8/1 – 10/31	• Radio-tag up to 200 chum; spaghetti tag as well.	ADF&G	All aspects
	• Conduct tracking flights	ADFG/DFO	
Chinook Stock ID sampling			
	• Collect DNA samples from fishery and escapement samples	ADF&G/ DFO	
	- fishery samples: Juneau area sport (350 samples), D-11 gn (400 samples);		
	- escapement samples: up to 200/stock. Target stocks subject to examination of baseline database.		
	- samples to be shared between DFO & ADF&G labs.		
Smolt Tagging – CWT lower Taku			
4/12 - 6/15	• CWT-ing goals are 40,000 Chinook and 25,000 coho smolt.	ADF&G	All aspects
	• Sample every 100th CN and CO smolt for length (FL)		5 staff
	• Measure length of every 8th CO smolt (FL)		
	• Sample 300 CO smolt for age (12-15 scales)	DFO	2 staff
Canadian Aboriginal Fishery Sampling			
5/1 - 10/15	• Collect and record FN catch information.	TRTFN	All aspects
5/1 - 6/15	• Capture 500 Chinook and sample for spaghetti- and coded-wire tags as well as age-sex-size. CWT samples to go to DFO, unless other arrangements are made	TRTFN/ DFO	Fishing Sampling
	• Recover spaghetti and CWT's from any coho harvested.		

Appendix Table A2. (cont'd)

Project/Dates	Function	Agency	Involvement
Nahlin Sampling			
7/20 - 8/15	• Sample 200 sockeye and up to 600 Chinook in Nahlin River for age-sex-length, spaghetti- and coded-wire tags. CWT samples to go to DFO lab in Vancouver, unless other arrangements are made	TRTFN/ DFO/ ADF&G	All aspects
Dudidontu Sampling			
8/10 - 8/30	• Sample up to 400 Chinook in Dudidontu River for age-sex-length, spaghetti- and coded-wire tags. CWT samples to go to DFO lab in Vancouver, unless other arrangements are made.	DFO/ TRTFN/ ADF&G	All aspects
Tseta and Hackett Chinook sampling (tentative)			
	• Sample up to 400 Chinook in each river for age-sex-length, spaghetti- and coded-wire tags. CWT samples to go to DFO lab in Vancouver, unless other arrangements are made.	ADF&G/ TRTFN/ DFO	
Canadian Commercial 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).	DFO	All aspects
	• Sample commercial Chinook, sockeye and coho salmon for age-sex-length and tag loss; 200 samples per week for sockeye; 520 per season for coho; 300 scale samples per season for Chinook. CWT samples to go to DFO lab in Vancouver, unless other arrangements are made.	DFO	All aspects
Canadian Commercial Fishery Sampling (cont'd)			
	• Collect 96 sockeye otolith samples per week to estimate contribution of enhanced fish; send otolith samples to ADF&G for processing.	DFO	All aspects
	• In-season otolith analysis	ADF&G	All aspects
	• Collect and record all spaghetti tags caught in commercial fisheries, pay fishers for tag recoveries.		
Canadian Chinook Test Fishery			
5/2 - 6/14	• Capture and examine a total of 1400 large (>660mm MEF) Chinook for spaghetti tags and adipose-clips. Use same weekly goals as 2003. CWT samples to go to ADF&G lab.	DFO	All aspects
	• Sample all fish for age-sex-size, spaghetti- and coded-wire tags as well as spaghetti-tag loss.	DFO	All aspects
	• Collect 600 lbs (275kg) Chinook roe for CWT program.	DFO	All aspects

Appendix Table A2. (cont'd)

Project/Dates	Function	Agency	Involvement
Canadian Coho Test Fishery			
End of comm. fishery to 10/7	• Capture and sample approximately 400 coho per week for spaghetti- and coded-wire tags. Sample 50 coho per week for age-sex-size. CWT samples to go to ADF&G lab.	DFO	All aspects
District 111 Fishery Sampling			
6/15 - 9/30	• Sample a minimum of 20% of Chinook and coho catches for CWT's; all species except pinks for age-sex-length, as well as Chinook for maturity (goals are 800 per week for sockeye and 600 per season for Chinook, chum, and coho).	ADF&G	All aspects
	• Collect 400-800 matched brain-parasite/scale/otolith samples per week from sockeye with sub-district specific goals (includes 11-31 samples).	ADF&G	All aspects
Kuthai Sockeye Sampling			
7/2 - 8/30	• Maintain adult sockeye salmon weir at Kuthai Lake; enumerate and sample for age-sex-length (750 samples) and recover spaghetti tags.	TRTFN	All aspects
	• Sample up to 50 sockeye (food fish perhaps) for brain parasites.	TRTFN	All aspects
mid-Sept.	• Conduct an aerial survey in Kuthai Lake to enumerate sockeye and compare with weir count.	TRTFN	All aspects
Little Trapper Weir			
7/20 - 9/12	• Maintain adult sockeye salmon weir at Little Trapper Lake; enumerate and sample for age-sex-length (750 samples) and recover spaghetti tags.	DFO	All aspects
	• Sample Chinook salmon for age-length-sex, tags, secondary marks and adipose-clips, collect CWT heads. CWT samples to go to DFO lab in Vancouver, unless other arrangements are made.	DFO	All aspects
Aerial Chinook surveys			
7/21 - 8/25	• Aerial surveys of spawning Chinook salmon in the Nakina, Nahlin, Dudidontu, Tatsatua, Kowatua, and Tseta rivers.	ADF&G	All aspects
Sport Fishery Sampling			
	• Conduct creel censuses and sample Juneau, Ketchikan, Sitka sport fisheries and sample for CWT's, age, sex, length and maturity.		
	• Sample Petersburg and Wrangell sport fisheries for hatchery contribution (CWT's) and conduct post season surveys (State-wide survey) to obtain harvest data. Target is to sample 20% of catch for CWT's. Includes derby sampling.		

Appendix Table A2. (cont'd)

Project/Dates	Function	Agency	Involvement
Troll sampling			
	• Sample 20% of troll catch for CWT's	ADF&G	
Nakina Chinook Escapement Sampling			
8/1 - 8/28	• Maintain Chinook carcass weir.	TRTFN	All aspects
	• Sample every fourth (minimum 600; ideally 1,000) Chinook for age-sex-length and all other Chinook for sex-length and tags.	TRTFN	All aspects
	• Examine all Chinook salmon for tags, secondary marks and adipose clips; collect heads from all clipped fish. CWT samples to go to DFO lab in Vancouver, unless other arrangements are made.	TRTFN	All aspects
Tatsamenie Smolt and Adult SO Enumeration & Sampling			
5/15 - 6/24	• Conduct sockeye smolt mark-recapture study to estimate abundance of wild and enhanced smolt. • Sample for age, size and stock (wild vs enh'd).	DFO	All aspects
8/5 - 9/30	• Enumerate adult sockeye salmon through weir • Sample for age-sex-length (750 samples) and recover spaghetti tags. • Collect otoliths from all sockeye broodstock taken at weir.	DFO	All aspects
	• Collect 50 heads and send on egg-take flight for brain parasite analysis.	ADF&G	Parasite analysis
Tatsamenie Area Chinook sampling			
9/1 - 10/1	• At upper Tatsamenie, sample 100-200 Chinook salmon for CWT's, size, tags and tag loss. CWT samples to go to DFO lab in Vancouver, unless other arrangements are made.	DFO	All aspects
8/23 - 9/15	• Chinook salmon carcass weir at Lower Tatsamenie - sample for age-sex-size and examine for CWT's, tags and secondary marks on all Chinook salmon recovered. Target sample size is 600-900 all sizes. CWT samples to go to DFO lab in Vancouver, unless other arrangements are made.	DFO/ ADF&G	All aspects
Kowatua Sampling			
9/1 - 10/1	• Sample a minimum of 200 Chinook for CWT's, size, tags and tag loss. CWT samples to go to DFO lab in Vancouver, unless other arrangements are made.	DFO	All aspects
Mainstem Escapement Sampling			
9/5 - 10/15	• Sample sockeye escapement in mainstem areas for age-sex-length (600 samples) and recovery of spaghetti tags. • Obtain brain samples from any spawned out sockeye	DFO/ ADF&G	All aspects

Appendix Table A2. (cont'd)

Project/Dates	Function	Agency	Involvement
Mainstem Escapement Sampling (Cont'd)			
	• Examine all chum encountered for tags and tag loss subject to marking.	DFO/ ADF&G	All aspects

Contacts:

Ed Jones	(ADF&G)	Smolt tagging, adult Chinook escapement sampling.
Jim Andel	(ADF&G)	Canyon Island adult tagging, chum telemetry.
Kathleen Jensen	(ADF&G)	All ADF&G Com Fish Research Programs.
Keith Pahlke	(ADF&G)	Chinook surveys.
Ian Boyce/ Rick Ferguson	(DFO)	All DFO Taku programs
Sandy Johnston	(DFO)	All DFO Taku programs.
Jason Williams or Richard Erhardt	(TRTFN)	All TRTFN programs.

Canadian staff associated with Taku projects that may be crossing the Canadian/US border:

Ian Boyce, Rick Ferguson, Matthew Waugh, Jason Williams, Sean Stark, Zack Dixon, Mike Smarch, Mark McFarland, others

US staff associated with Taku projects that may be crossing the Canadian/US border:

Jim Andel, Kathleen Jensen, Ed Jones, Keith Pahlke, Clyde Andrews, Jarbo Crete, Al Demartini, Krista Kissner, Jamie Kissner, Dale Brandenburger, Shane Rear, Jerry Owens, Mark Olsen, Kent Crabtree, Scott Duffy, Dave Magnus, Scott McPherson, Jodi White, Tony Florendo, Kevin Monagle, Dave Harris, Scott Kelley, Doug Mecum, others

Appendix Table A3. Proposed Alsek River field projects.

Project/Dates	Function	Agency	Involvement
Sockeye Mark-Recapture			
5/14 - 8/22	• Spaghetti tag all fish captured; target is 1,500; 600 age-sex-size. Collect DNA from all fish tagged, pool by week.	DFO/ADF&G	All aspects
	• Recover tags at Klukshu weir and other headwater tributaries Nesketaheen Lake, upper/lower Tatshenshini, Alsek/ Turnback Canyon, Blanchard Lake, Basin Creek, and fisheries ; minimum sampling goal is 2,400 fish.	DFO/CAFN	All aspects
Chinook Mark-Recapture			
5/10 - 9/30	• Spaghetti tag Chinook salmon. • Collect DNA from all fish tagged, pool by week (opercular punch). Sample 500 large fish for age, size, and sex.	ADF&G	All aspects
	• Tag recovery (minimum 1,100) at various locations (Klukshu, Blanchard, Takhanne, Lo Fog, lower Tatshenshini)	DFO/ADF&G	Tag recovery
Klukshu River Sampling			
6/6 - 10/15	• Enumerate Chinook, sockeye and coho salmon at weir.	DFO/CAFN	All aspects
	• Estimate sport and aboriginal fishery catches.	DFO/CAFN	All aspects
	• Collect age-sex-length information from sockeye caught by First Nations (600 scale samples per species) except Chinook, see below.	CAFN	All aspects
	• Sample 200 Chinook in each of sport and aboriginal harvest for scales, sex, length (MEF), CWT's and spaghetti tags.	DFO/CAFN	All aspects
	• Sample 1,100 Chinook (minimum) and 1,600 sockeye (minimum) at weir for sex, length (MEF), CWT's (Chinook only), spaghetti tags and DNA.	DFO/CAFN	All aspects
	• Continue to examine the feasibility of using video to enumerate passage through the weir; test technology also on Village Cr. and Blanchard R.	CAFN	All aspects
	• Sample 600 coho at weir for age, sex, length (MEF).	DFO/CAFN	All aspects
Village Creek sockeye enumeration			
6/10 - 9/30	• Enumerate sockeye salmon using an electric counter at Village Creek.	DFO/CAFN	All aspects
Chinook and Sockeye DNA Stock ID Baseline			
8/1 - 9/30	• Target is 150 samples/stock	DFO	All aspects
	• Up to four separate stocks to be sampled/spp		

Appendix Table A3. (cont'd)

Project/Dates	Function	Agency	Involvement
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			
8/1 - 8/15	• Aerial surveys of spawning sockeye salmon in index areas of Cabin, Tanis, Muddy and Basin creeks (in Alaska)	ADF&G	All aspects
8/1 - 8/10	• Aerial surveys of spawning Chinook salmon in index areas of Blanchard, Takhanne, Klukshu rivers and Goat Creek (in Canada)	ADF&G	All aspects
10/1 - 10/15	• Aerial surveys of spawning coho salmon in index areas of Cabin, Tanis, Muddy and Basin creeks (in Canada) – subject to aircraft availability.	ADF&G	All aspects

Contact:

Peter Etherton/ Bill Waugh	(DFO)	All DFO projects
Sandy Johnston	(DFO)	All DFO projects
Keith Pahlke	(ADF&G)	Chinook aerial surveys, and tagging
Kathleen Jensen/ Jim Andel	(ADF&G)	Lower Alsek and East Rivers commercial catch sampling
Gord Woods	(ADF&G)	Adult Chinook tagging, sockeye and coho aerial surveys
Linaya Workman	(CAFN)	CAFN projects

Canadian staff associated with Alsek projects that may be crossing the Canadian/US border:

Mark McFarland, Frances Naylen, Bill Waugh, Peter Etherton, Robert Jackson, Linaya Workman, others

US staff associated with Alsek projects that may be crossing the Canadian/US border:

Gordie Woods, Robert Johnson, Keith Pahlke, Kathleen Jensen, Jim Andel, Randy Ericksen, Chris Chapell, others

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

Project	Function	Agency	Involvement
Tahltan/Tuya Enhancement Project			
5/8 - 6/30	• Enumeration and sampling of smolts from Tahltan Lake (Stikine River, in Canada) and collection of otolith samples to determine planted contribution.	DFO	All aspects
5/15 - 6/30	• Back plant sockeye fry from Snettisham Hatchery into Tahltan and Tuya lakes.	DIPAC/ ADF&G	All aspects
	• Smolt sampling	DFO	All Aspects
6/1 - 8/30	• Limnological samples from Tahltan Lake monthly.	DFO	All Aspects
6/1 - 9/30	• Hydro acoustic/limnological surveys of Tuya Lake to evaluate success of fry outplant.	DFO	All aspects
	• Beach seining and gillnetting at Tuya Lake	DFO	All aspects
9/1 - 9/25	• Collect up to 6.0 million sockeye eggs from Tahltan Lake and transport to Snettisham Hatchery in Alaska.	DFO	Egg-take and transport
9/6 - 10/8	• Sample 200 male and 200 female adult sockeye from Tahltan Lake broodstock for otolith samples.	DFO	All aspects
Tuya Straying Assessment			
3/1	• Develop proposal to be submitted to Northern Fund to examine straying of Tuya sockeye and potential impacts on wild spawning stocks. Conduct study if funding approved including sampling of spawning populations (Porcupine, Scud, Chutine, mainstem) for Tuya thermal marks. Proposed Stikine sockeye radio telemetry project may provide additional information.	DFO with support from ADF&G	
5/1 – 5/30	• Survey Shakes Creek spawning area for incidence and success of sockeye spawning by redd sampling and fry collection.	DFO	All aspects
8/15 - 8/30	• Conduct adult sockeye dead pitch and biosample at Shakes Creek.	DFO	All aspects
Risk Analysis – Stikine Sockeye Enhancement			
	• Conduct a risk analysis by the Transboundary Technical Committee with respect to potential long-term impacts of the enhancement program on wild stocks.		
Tatsamenie Lake Enhancement Project			
5/10 - 6/30	• Sample smolt out-migration from Tatsamenie (Taku River, in Canada) and conduct mark-recapture program on smolt from Tatsamenie Lake.	DFO	All aspects

Appendix Table A4. (cont'd)

Project/Dates	Function	Agency	Involvement
5/22 - 7/15	• Conduct feeding experiments with a proportion of planted fry.	DFO	All aspects
5/15 - 5/30	• Back-plant sockeye fry from Snettisham Hatchery into Tatsamenie Lake.	DIPAC/ ADF&G	All aspects
6/1 - 9/30	• Collect plankton samples from Tatsamenie Lake; conduct hydro acoustic and limnological surveys at Tatsamenie Lake to evaluate the success of fry outplants.	DFO	All aspects
8/15 - 10/30	• Collect up to 5.0 million sockeye eggs from Tatsamenie Lake and transport to Snettisham Hatchery in Alaska.	DFO	Egg-take and transport
Fall-winter	• Subject to egg availability, load passive flow incubator in Tatsamenie Lake with fertilised sockeye eggs. Incubate eggs over winter.	DFO	All aspects
5/15 - 6/15	• Conduct index gillnet survey at Trapper Lake.	TRTFN	All aspects
9/6 - 10/8	• Sample 400 adult sockeye from Tatsamenie Lake egg-take for otolith samples.	DFO	All aspects
King Salmon Sockeye Restoration			
	• Enumerate sockeye entering King Salmon Lake; • Sample for age-size-sex and spaghetti tags; • If possible, obtain 50 heads for brain parasite analysis – fresh samples only;	TRTFN	All sampling
	• Obtain up to 200 DNA samples.	ADF&G	Parasite analysis
8/1 - 9/30	• Install water gauge and collect sockeye smolt biosample from King Salmon Lake.	TRTFN	All aspects
Salmon Egg Incubation			
9/3 - 6/4	• 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

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, Ron Josephson and Renate Riffe