PACIFIC SALMON COMMISSION
TRANSBOUNDARY TECHNICAL COMMITTEE

SALMON MANAGEMENT AND ENHANCEMENT PLANS FOR THE STIKINE, TAKU, AND ALSEK RIVERS, 1995
REPORT TCTR (97)-1

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PREFACE

This report is produced annually at the beginning of the fishing season so that each nation understands the objectives and procedures to be used in managing relevant transboundary fisheries and assessing stock status. While this report was published postseason, it was drafted at the spring, 1995, meeting of the Transboundary Technical Committee. No report was produced in 1994.

EXECUTIVE SUMMARY

Management of the transboundary Stikine, Taku, and Alsek rivers to achieve conservation and allocation objectives stipulated by the Pacific Salmon Treaty requires close cooperation between Canada and the United States. This plan has been developed to assure that each Party has a clear understanding of objectives and procedures that will be used in managing relevant fisheries in the current year.

This report is organized by river system and salmon species. For each species within each drainage, the preseason forecast, spawning escapement goal, harvest sharing objective, and management procedure are presented. For sockeye salmon stocks of the Stikine River, details of the stock assessment program are also presented.

The preseason forecast for the Stikine River sockeye salmon run in 1995 is approximately 169,000 fish. This is an above average run which forecasts a total allowable catch of 115,000 fish to be shared by the two Parties. The Stikine River escapement goal for sockeye salmon is 54,000 fish, composed of 24,000 Tahltan sockeye and 30,000 non-Tahltan sockeye. Inseason predictions of run size will be determined by the Stikine Management Model based on historical data, catch, effort, and stock composition data from 1982 to 1994. The stock assessment program for the Stikine River run is being adapted to take into consideration the introduction of enhanced fish. Additional sampling will be undertaken in 1995 to determine enhanced sockeye contributions to fisheries and escapements.

The 1995 run of chinook salmon to the Stikine River is expected to be below average, while the return of coho salmon is expected to be average to above average. There are no major changes to the management plans for salmon originating in the Stikine River.

It is expected that run sizes of Taku River chinook and coho salmon will be above average; the sockeye salmon run is expected to be average; and the pink and chum salmon runs are expected to be below average.

Alsek River run sizes of chinook, sockeye and coho are expected to be above average in 1995. However, the early sockeye run is expected to be below average. No major changes to the management plan for Alsek salmon are anticipated.

Sockeye salmon enhancement will continue in 1995 in the Stikine and Taku drainages. The following fry outplants from the 1994 egg takes are anticipated in June and July: 1.1 million to Tahltan Lake; 2.3 million to Tuya Lake; 0.9 million to Tatsamenie Lake; and 0.8 million to Trapper Lake. Green-egg to outplanted fry survival rates were 81.5% for Tahltan Lake eggs; 73.1% for Tatsamenie Lake eggs, and 69.2% for Trapper Lake eggs. Egg-take targets for the fall of 1995 are as follows: 6.0 million at Tahltan Lake; and, 2.5 million at Tatsamenie Lake. No eggs will be taken from Little Trapper Lake in 1995 due to concerns that juvenile production is below expectations.

Most of the stock assessment and research programs conducted in 1994 will be continued in 1995. Notable exceptions include the initiation of a chinook mark-recapture and radio tagging program on the lower Stikine River.

INTRODUCTION

Management of transboundary river salmon to achieve conservation, allocation, and enhancement objectives, as stipulated by the Pacific Salmon Treaty, requires a cooperative 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 cooperative salmon management and research on transboundary stocks of the Stikine, Taku, and Alsek rivers conducted by the Canadian Department of Fisheries and Oceans (DFO), the Tahltan First Nation (TFN), the Iskut First Nation (IFN), and Taku River Tlingit First Nation (TRTFN), the Alaska Department of Fish and Game (ADF&G), and the National Marine Fisheries Service Auke Bay Laboratory (NMFS-ABL).

The report contains, by river system and species, the 1995 salmon forecasts, spawning escapement goals, a summary of harvest sharing objectives, and an outline of management procedures to be used during the conduct of the 1995 fisheries. With the exception of Stikine sockeye salmon, for which a numerical forecast is required by the Pacific Salmon Treaty and by the Stikine Management Model and Taku River sockeye salmon, forecasts are given qualitatively, with reference to brood year escapement data where available. The report also contains joint enhancement plans for fry plants and egg collections in 1995 and proposed transboundary field projects for the year, giving agency responsibility and contacts for the various functions within the projects.

STIKINE RIVER

Sockeye Salmon

Preseason Forecast

For 1995, the total run forecast for Stikine River sockeye salmon is 169,000 fish of which approximately 155,000 sockeye (91%) are predicted to be of Tahltan Lake origin. For comparison, the 1985-1994 average total Stikine sockeye run size is approximately 148,300 sockeye. The 1995 prediction is based on the average of a sibling (161,580) and smolt-based (148,236) forecast for the Tahltan Lake stock (average = 154,908 fish) plus a sibling-based forecast of 14,000 sockeye for the non-Tahltan stock grouping. The preseason forecast of total allowable catch (TAC) is 115,000 sockeye salmon. The 1995 outlook is characterized as above average for the Tahltan Lake stock but below average to poor for the non-Tahltan, or mainstem, component. Strict conservation actions may be required from late July through August to protect mainstem stocks.

Tahltan Lake Sockeye Forecast

In recent years, one of the preseason forecast techniques used for the Tahltan Lake stock has been based on the relationship between the return of age-4 fish in one year and the subsequent total return in the following year. The relationship is described by the following equation:

$$N = 16{,}597 + 9.067 \text{ X } (N_{1.2}); \quad (1)$$

where:

N = total return; and

$N_{1.2}$ = return of 4-year-olds in previous year.

The correlation coefficient for this relationship for data from 1983-1993 is *r=0.858* and it is significant at a level of a=0.01. The return of 4-year olds in 1994 was estimated to have been approximately 15,900 fish. Using the sibling forecast technique, a run size of approximately 161,580 Tahltan sockeye is expected in 1995.

The other forecast method employed for Tahltan Lake sockeye is based on smolt data and observed survival rates for individual age classes. Expected rates of return for 1995 age classes are follows: 6.53% of the 1.429 million age-1+ smolt counted in 1992 are expected to return as age 1.3 in 1995; 1.35% of the 3.169 million age-1+ smolt counted in 1993 are expected to return as age 1.2 in 1995; 7.68% of the 120,947 age-2+ smolt counted in 1992 are expected to return as age 2.3 in 1995; and 3.19% of the 85,546 age-2+ smolt counted in 1993 are expected to return as age 2.2 in 1995. Using average smolt-to-adult survival rate data, the 1995 expected return is 148,236 Tahltan Lake sockeye.

The 1995 preseason Tahltan Lake sockeye forecast that will be used for management purposes at the beginning of the season is 154,908 sockeye, the average of the forecasts derived from sibling relationships and smolt data. A run of this magnitude would be a record and would be approximately 2.2 times the 1985-1994 average run size of 70,772 sockeye.

Non-Tahltan Sockeye Forecast

The method used to produce the non-Tahltan Lake sockeye salmon forecast for 1995 is based on a sibling forecast technique using regression data from 1983 through 1993. Annual runs were reconstructed using marine catch estimates based on ADF&G scale pattern analysis, and lower inriver catch estimates based on a variety of stock identification techniques (scale pattern analysis (SPA), egg diameters, parasite frequency, electrophoretic data); the contribution of non-Tahltan stocks to upper river commercial and aboriginal fisheries was assumed to be 10%. Non-Tahltan escapement was calculated through the subtraction of the reconstructed inriver Tahltan run and the estimated inriver catches of non-Tahltan sockeye from the total inriver run estimates.

Linear regression of age-1.2 non-Tahltan sockeye salmon ($N_{1.2}$) on the following year's total run (catch and escapement, all ages) of non-Tahltan sockeye salmon (N) for the years 1983 to 1993 yielded the following equation:

$$N = 2{,}057 + 9.352 \text{ X } (N_{1.2}). \quad (2)$$

The coefficient of correlation (r) of this relationship is 0.838 and it is statistically significant at a level of a=0.01. Based on the above equation and a preliminary total return estimate of only 1,325 age-1.2 non-Tahltan sockeye in 1994, the 1995 sibling forecast for non-Tahltan sockeye salmon is 14,448 fish. This compares poorly with the 1984-1993 average estimated run size of 43,991 sockeye (Table 1). If this forecast is verified by inseason data, stringent management actions will be taken for conservation purposes.

The various forecast techniques employed for Stikine sockeye suffer from a relatively short time series of data and, therefore, not surprisingly, there have been wide discrepancies between past forecasts and actual runs. Nevertheless, the 1995 forecasts indicate the likelihood for an above average Tahltan run but a poor mainstem run.

Spawning Escapement Goals

Two sockeye stocks are recognized for the Stikine River: the Tahltan Lake stock which spawns in Tahltan Lake; and, the non-Tahltan stock which is a conglomerate of stocks which spawn elsewhere throughout the drainage. These 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.

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. At present, our best judgment of the escapement goals for these stocks are as follows:

Tahltan Lake Stock

In the spring of 1993, the Transboundary Technical Committee (TRTC) revised the escapement goal for Tahltan Lake sockeye based on recommendations of an analysis conducted by DFO staff and reviewed by the Pacific Stock Assessment Review Committee (PSARC). The previous target of 30,000 fish was based largely on "professional judgment." Separate adult and fry stock-recruitment analyses conducted on extensive data sets developed in recent years indicate that maximum sustained yield of wild fish is more likely achieved at escapements of 15,000 - 19,000 spawners. The PSARC review recommendations lead to the establishment of a conservative goal of 24,000 fish, which takes into account an escapement goal of 20,000 wild fish and the approximately 4,000 fish needed for broodstock to meet the objectives of the current Canada/U.S. Stikine River enhancement program. Management goals for Tahltan Lake sockeye are:

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

Non-Tahltan Stocks

NON-TAHLTAN	ESCAPEMENT GOAL TARGET = midpoint = 30k				
Escapement	0 - 15k	15k - 20k	20k - 40k	40k - 75k	>75k
Mgmt. Category	Red	Yellow	Green	Yellow	Red

A postseason estimate of escapement that falls within the Green Management Category shall be considered fully acceptable; one that falls within the Yellow Management Category shall be considered acceptable but not desired; and, one that falls within the Red Management Category shall be considered undesirable.

Escapement Goal Review

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

1. spawning escapements;
2. smolt production; and
3. stock specific catches in the various fisheries.

The following relationships for the Tahltan stock will be examined:

1. total return as a function of spawning escapement level;
2. smolt production as a function of the number of spawners; and
3. adult production as a function of the number of smolts.

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

1. survey counts of non-Tahltan stock escapements;
2. the non-Tahltan 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 non-Tahltan stock will be examined:

1. total escapement as a function of survey counts of escapement;
2. total return as a function of total spawning escapements;
3. relation of total return to patterns of distribution and timing.

Methodology for evaluating escapement goals is being developed by the Transboundary Technical Committee (TRTC) and will be used in reviewing escapement goals.

Harvest Sharing Objectives

Stock assessment and harvest arrangements for Stikine River sockeye stocks are found in Annex IV, Chapter 1, of the Pacific Salmon Treaty as negotiated by the Pacific Salmon Commission in February of 1988, and in two associated joint enhancement Understandings dated February 1988 and February 1989. The 1989 Understanding states that the "Parties agree to manage the returns of Stikine River sockeye to ensure that each country obtains equal catches in their existing fisheries beginning in 1993. In 1993, 1994, and 1995, Canada may also utilize any fish surplus to escapement and broodstock requirements."

For management of harvest shares in 1995, the TRTC interprets this statement to mean that the TAC will be shared 50/50 between the Parties; however, terminal catches in Canada taken under "Excess Salmon to Spawning Requirement" (ESSR) licenses will be excluded from the Canadian allotment. The 1989 Understanding also requires that the harvest arrangement be evaluated in 1996.

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 Stikine River fishery encompasses the waters of District 108 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 (Section 6-A) and Clarence Strait (Sections 6-B, 6-C, and 6-D) portions of District 106. Fishing gear used in Districts 106 and 108 is similar, with common sockeye net sizes of between $5^1/_8$ and 5½ inches (130-140 mm) stretched mesh, 60 meshes deep and 300 fathoms (549 m) long.

The sockeye salmon fishery in both districts will be managed in accordance with recent transboundary PST annex provisions. Discussions between the U.S. and Canada regarding these annex agreements are ongoing at this time, hence the exact provisions are subject to change.

The fishing season will start at noon on Monday, June 12 (statistical week 24) for a 24-hour open period in District 108, and at noon Sunday, June 18 for a 48-hour open period in District 106 and District 108. During the second week in June, only the outer portions of District 108 will be open to evaluate the run strength of Stikine River sockeye and the availability of chinook salmon. Depending upon the number of sockeye salmon harvested, and the numbers of chinook salmon incidentally harvested, additional fishing time may be granted during the first fishing week.

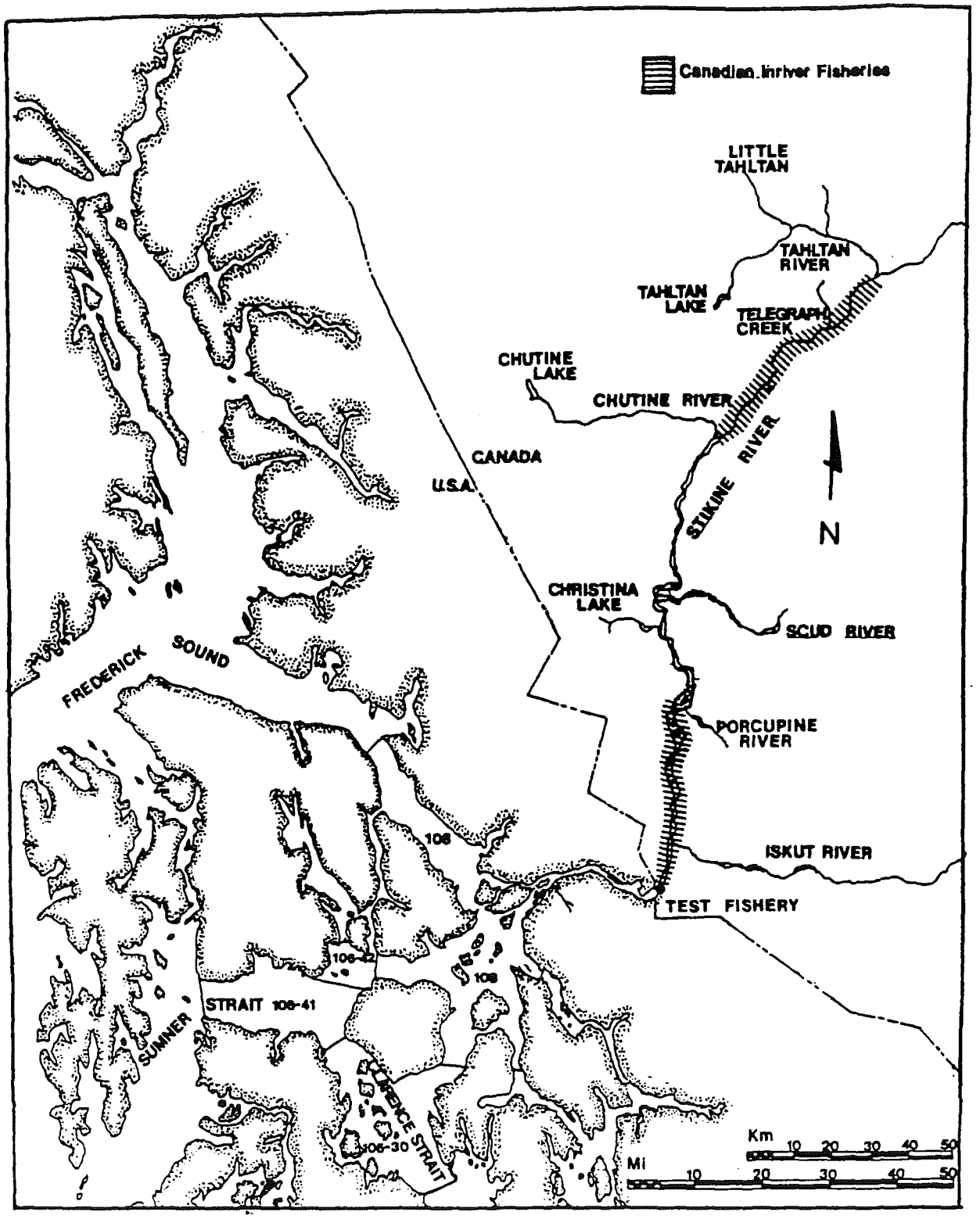

Figure 1. Location of principal U.S. and Canadian fishing areas where Stikine River salmon stocks are caught.

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

Any increased fishing measures required for Stikine River sockeye salmon will first be implemented in District 108, followed by Sumner Strait in District 106. Mid-week openings will be used when additional fishing time is needed. These additional openings will be based upon the most recent Stikine sockeye model update and the cumulative estimated U.S. harvest. Open area and fishing time may not necessarily be the same as the general weekly opening if adjustments are needed to reduce chinook salmon catches or adjust fishing times. Although management actions to reduce the harvest of Stikine River sockeye salmon are not expected in 1995 because of the large forecasted run size, if measures had to be implemented they would begin with restrictions in fishing time in District 108. Next, closures of that district would be used followed by restrictions in fishing time in Sumner Strait. Finally, the most complete restriction would be the additional closure of Sumner Strait. If the sockeye returns to local Alaskan island systems are determined to be weak, area and time restrictions may be necessary in District 106.

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

The area adjacent to the Stikine River mouth, and outer milling areas for Stikine River chinook salmon in District 108, will be closed during the early portions of the sockeye season to reduce the incidental harvest of Stikine River chinook. Area restrictions will be maintained during sockeye directed fishing periods through early July. As the season progresses, the restrictions will generally be reduced. If areas of high concentrations of chinook are identified during initial openings they will be closed during subsequent mid-week openings. To avoid harvesting chinook salmon, the Stikine flats will not open until the first Sunday in July.

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

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

Troll fishery regulations for the 1995 Experimental chinook fisheries in Frederick Sound and Stikine and

Clarence Straits are similar to 1994. An additional area has been added in northern Frederick Sound/Stephens Passage for Hobart Bay and Port Houghton and the Beacon Pt. fishery was extended southward approximately 1½ miles. The Big Creek fishery on the north shore of Kupreanof Island will open for 48 hours at 12:01 a.m. on May 22 and all other experimental areas will open for 48 hours on May 30. There will be a news release each Friday throughout June announcing the number of open fishing days for the following week. As the percentage of Alaskan hatchery chinook increases, fisheries may be extended. The summer general chinook fishery is still being formulated and the details are not available at this time.

A personal use fishery in U.S. portions of the Stikine River will be allowed again in 1995. Fishing will be allowed in the main channel of the river between the ADF&G cabin at Kakwan Point upstream to the Canadian border. The fishery will be structured to allow the harvest of Tahltan sockeye salmon while limiting the harvest of other sockeye stocks and species. The fishery will be open only from July 1 to July 15, with a limit of 25 sockeye salmon per permit. This fishing period coincides with the peak of the Tahltan sockeye run in the lower river. Gillnet gear restrictions will include a maximum 5½ inch mesh size and 15 fathom net length.

Canada

The Canadian lower Stikine River commercial fishery (Figure 1) will be managed on a weekly basis with management actions driven by results of stock, catch, and escapement projections derived from the Stikine Management Model. Weekly inputs to the model will include: catch and/or effort data from Alaskan districts 106 and 108 and corresponding average weekly stock composition estimates (since inseason SPA will not be available); catch, effort and inseason stock ID data from the Canadian lower Stikine commercial and test fishery; and escapement requirements. Consideration for Tahltan Lake sockeye stock management objectives should persist from the fishery opening, 12:00 noon June 25, to the end of July. Thereafter, management attention will be focused primarily on non-Tahltan stock objectives. Actual time frames of responses to specific stock compositions will be fine-tuned inseason according to the weekly results of the stock identification program.

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

Fishing time in the lower Stikine fishery will depend upon stock assessment and international and domestic catch allocation considerations. Fishing periods will be adjusted accordingly; however, whenever the fishing time in a particular week is extended to more than four days, the section of river from Boundary House to the Canada/U.S. border will be closed from 8:00 am to 11:00 am on days five (Friday), six (Saturday) and seven (Sunday) of that week. This closure is required to allow the test fishery to operate to obtain essential data for management and stock assessment. Gear limitations in the lower Stikine commercial license will be modified in 1995 as follows: the 48-hour single gear period that was in effect in 1994 at the beginning of each week will be discontinued. The use of two gillnets, of which only one may be a drift gillnet, will be permitted from the start of the fishing period each week. The maximum allowable net length will remain at 135 meters and there will be a maximum mesh size restriction of 150 mm through mid July to conserve chinook salmon. Fishing boundaries will remain

unchanged from those established in previous years, i.e. from the international border upstream to boundary markers located near the Stikine-Porcupine confluence, and in the Iskut River to a marker located approximately 2 km upstream from the mouth.

In the upper Stikine commercial fishery, fishing times will generally follow those of the lower river lagged by one week. As in past years, weekly fishing times in the aboriginal fishery will not normally be restricted.

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

In the event that a more liberal management regime is justified, extensions to fishing time in the commercial fisheries for up to 24 hours would be granted. Additional fishing time beyond this would be dependent on stock escapement and catch considerations.

Summary

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

Inseason Data Exchange and Review

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

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& 106-42 (Sumner Strait);
2. Subdistrict 106-30 (Clarence Strait); and
3. District 108.

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

1. the lower river commercial fishery;
2. the upper river commercial fishery;
3. the aboriginal food fishery; and
4. the lower Stikine River test fishery conducted near the international border.

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 & 106-42, 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 fishery each week. Scale samples will not be collected from the upper river commercial and subsistence fisheries. Instead, samples collected at the Tahltan Lake weir will be used to characterize the age composition of catches of sockeye salmon in the upper river. Sockeye salmon caught in the lower Stikine River test fishery will be sampled for scales and for egg diameter, sex, and length data. Scale impressions will be available to ADF&G.

Stock Composition of Alaska Catches

During the season, stock composition estimates of district 106-41, 106-30, and 108 sockeye catches will be based on average weekly estimates from 1986 to 1994. For District 106-41/106-42 and 106-30, if the run size in the previous week is <90,000, the average weekly stock composition estimates from 1986-1990 will be used; if the run forecast in the previous week falls in the range of 90,000 to 154,999, the 1986-1992 average will be used; if the run forecast in the previous week is 155,000 or greater, the 1991-1992 average will be used. For District 108, the 1986-1992 average weekly stock composition estimates will be used to estimate catches of Stikine sockeye.

After the fishing season, SPA will be used to recalculate actual contributions of Tahltan Lake and non-Tahltan sockeye stocks to the catches made each week in each subsection of District 106 (Clarence Strait and Sumner Strait), and District 108. Scales will be collected inseason and the desired sample size from

each of these strata is 600 fish per week. It is recognized that small catches in District 108, similar to previous years, may preclude temporal stratification at the desired level. A test fishery will be conducted in Frederick Sound beginning in statistical week 25. When a commercial fishery does not operate, stock composition estimates will be made using samples collected from the test fishery. In District 106, when a commercial fishery does not operate, a test fishery will be instituted for scale sample collection and abundance estimation.

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

Stock Composition of the Inriver Canadian Catch

Egg diameter data will be used inseason to estimate the Tahltan Lake versus non-Tahltan contribution to the sockeye catches during the fishing season. This will also be the data used postseasonally. Egg diameters will be measured from a desired sample size of 100 female sockeye salmon each week to determine stock composition; a total of 350 sockeye salmon will be randomly sampled each week for scales and sex. It is necessary to match the scale and egg data by fish to develop postseason stock-specific age composition estimates, and for the development of postseason scale pattern standards.

The contribution of enhanced sockeye to lower river catches will be determined postseasonally through the analysis of otolith samples. The target sample size will be 150 per week to be taken from small egged sockeye (Tahltan Lake origin).

Stock Composition and Run Timing in the Canadian Test Fishery

The proportion of Tahltan Lake and non-Tahltan Lake sockeye salmon in test net catches in the lower Stikine River will be estimated inseason based on egg diameter data. All sockeye caught using test fishery gear will be sampled for scales and all females for egg diameter (data to be matched with scale samples). The postseason estimate will be based on the egg diameter data. As per the commercial fishery, the enhanced portion of the catch will be determined postseasonally from otolith samples.

Spawning Escapement Estimates

An adult enumeration weir will be used to determine the Tahltan Lake sockeye escapement. The age composition will be estimated from scale samples and enhanced sockeye contributions will be determined from otolith samples. Approximately 800 fish will be sampled during the season for scales, length, and sex. The non-Tahltan escapement will be estimated using migratory timing information obtained from CPUE data from the drift test fishery located near the international border combined with weekly stock compositions estimated from the combined drift and set net test fishery catches.

Postseason SPA Standards

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

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

Data Evaluation Procedures

Historical Database

Although Canadian commercial fishing began in the Stikine River in 1975, the methodology for estimating sockeye run sizes was not well standardized until 1982. Therefore, estimates of run size after this time are considered to be better than those made prior to 1982. The historical database from 1982 to 1994, used as input to the Stikine Management Model for 1995 is presented in Tables 1 to 3. The 1995 run size estimated by the model at the end of the fishing season will be updated in the fall of 1995 using postseason stock composition data for use in the database in future years.

Stikine Management Model

A model based on the linear relationship between CPUE and run size has been constructed and updated to make weekly inseason predictions of the total run and the TAC during the 1995 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**. 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 River sockeye salmon.

The model for 1995 is based on eleven years of historical CPUE data from District 106 and ten years from the Canadian commercial fishery in the lower river. (There was no commercial fishing inriver in 1984.) A FORTRAN program has been written to determine the coefficients of the linear model of run size regressed on cumulative CPUE for each week of the fisheries beginning in week 26 for the District 106 fishery, and week 27 for the lower river fishery. The parameters from the linear regressions are presented in Table 4. Three sets of CPUE data have been used to predict the total run. These include:

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

run of Stikine River sockeye salmon.

2. The cumulative CPUE from the Canadian lower river commercial fishery which is used to predict the inriver Stikine River sockeye run. The total run is then determined as the inriver run plus the catch of Stikine River sockeye salmon in District 106, which is estimated as 10% of the total run (i.e. inriver estimate/0.9), plus the projected Stikine River sockeye catch in District 108.

3. The cumulative CPUE from the inriver test fishery which is used to predict the inriver Stikine River sockeye run. The total run is then determined as the inriver run plus the catch of Stikine River sockeye salmon in District 106, which is estimated as 10% of the total run (i.e. inriver estimate/0.9), plus the projected Stikine River sockeye catch in District 108.

The 1995 inseason model predictions will be based on the second method as described above. The weekly regressions of CPUE on total run using the inriver data usually have higher coefficients of correlation compared to those based on the District 106 CPUE data for corresponding weeks (Table 4). Predictions from the District 106 and test fishery data will continue to be made to verify inseason estimates and provide postseason comparisons.

The TAC of Stikine sockeye salmon for the 1995 season will be determined each week from run size estimates according to the following schedule:

1. prior to week 28 (<July 08): the preseason forecast of run size will be used;

2. weeks 28 and after (7/08-end of season): estimates of run size will be determined each week from the cumulative CPUE of sockeye salmon in the lower river commercial fishery, the lower river test fishery and the District 106-41/106-42 drift gillnet fishery.

Separate projections of run size will be made for the Tahltan Lake stock and for the entire Stikine sockeye run. This information will be used postseasonally to help evaluate the performance of the model.

The estimates of TAC made each week after statistical week 27 will be based on CPUE data from the lower Stikine commercial fishery. In the event that the commercial fishery is closed for a given week, the CPUE data from the lower Stikine test fishery will be used. In this case, the average test fishery CPUE from Monday through Wednesday will be used.

The part of the model which determines total and weekly TAC levels for the U.S. and Canadian fisheries has been written on a Lotus worksheet for use by managers inseason. This part of the model uses the coefficients from the linear regression model, the established escapement goals, and Annex provisions of harvest sharing to determine the total TAC for each country. Weekly estimates of TAC and effort are provided as guidelines for the managers and are derived from the 1982-1991 average run timing of the stocks and the corresponding average CPUE levels of each fishery.

Inseason Use

For 1995, the model predictions will set the TAC levels; however, managers may use additional

information on which to make decisions on the openings of their respective fisheries. They will evaluate the output of the model and look for discrepancies with other information they may have on run strength. The information and evaluation will be used to improve the model for the next year.

Postseason Evaluation

After the fishing season is over, the Transboundary Technical Committee will evaluate how well the model performed in predicting the entire run for 1995, where discrepancies occurred, and what might have caused them. The committee will also determine whether escapement goals were met according to the Spawning Escapement Goals section of this report. This information is presented in the annual catch and escapement reports prepared by the committee.

The summarized output of the Stikine Management Model during the 1994 fishing season is presented in Table 5. For 1994, the preseason forecasts of returning Stikine sockeye salmon ranged from 312,000 (Canada) to 346,000 (U.S.) fish. Inseason predictions of total run were well above average but below the preseason estimate and ranged from 141,130 to 382,386 sockeye salmon; U.S. and Canadian weekly predictions varied depending upon which forecast each country chose to use. For example, Canada used forecasts based on inriver test fishery data through week 29, and thereafter used forecasts based on the inriver commercial CPUE. The United States, on the other hand, used the inriver commercial catch based forecasts through week 30 and thereafter switched to forecasts based on the CPUE in District 106. The differences in the forecasts used are summarized in table 5. Both countries chose to abandon the forecasts based on test fishery data because of the limited amount of fishing effort allowed in the test fishery after week 27. The forecasts based on inriver and District 106 CPUE differed widely throughout the season although both indicated an above average return of sockeye to the Stikine River. By the end of the fishing season, the SMM predicted a total run of 249,261 (based on inriver CPUE) to 356,217 sockeye (based on District 106 CPUE) with a TAC ranging from 195,261 to 302,217 fish, and a Canadian and U.S. allowable harvest of 97,631 to 151,109 sockeye salmon each.

Coho Salmon

Preseason Forecast

A qualitative prediction of the 1995 run of coho salmon is that it will be average to above 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, 1991 and 1992. Based on a comparison of test fishery CPUE for coho vs. the CPUE for sockeye, the latter which is well correlated with inriver sockeye run size, the coho escapement was judged to be slightly above average in both 1991 and 1992. The escapement in each of these years was estimated to have been within the interim escapement goal range.

Escapement Goal

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

Harvest Sharing Objectives

Unfortunately, the Pacific Salmon Commission and the governments of Canada and the U.S. have so far been unable to agree to a regime which would replace the Stikine coho harvest sharing arrangements that were in place for the 1988 to 1992 period. Government-to-government talks are still in progress however, it is unlikely that resolution of all of the Stikine issues will occur prior to the start of the 1995 season.

Stock Assessment Program

Each country shall:

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

Management Procedures

United States

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

Canada

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

Chinook Salmon

Preseason Forecast

The Little Tahltan chinook escapement in 1989, the primary contributing brood year for the 1995 return, was 4,715 large chinook, 16% below the 1985-1994 average of 5,612 chinook and 11% below the interim escapement goal of 5,300 chinook for this system. Similarly, the escapement in 1990, which should also contribute significantly to this year's run, was below average. The number of jack chinook through the weir in 1994 was also below average, 121 jacks in 1994 compared to an average of 282 jacks. Although the data base regarding the relationship between jack returns and subsequent cohort returns is insufficient to draw conclusions at this time for the Little Tahltan stock, significant relationships exist for chinook stocks in other drainage systems. Consequently, the below average parent-year escapements, and jack return in 1994 suggest that the 1995 chinook return to the Stikine River will be below average.

Escapement Goal

The Transboundary Technical Committee recently revised the interim escapement goal range for Stikine River chinook salmon to make it more relevant to the current index escapement monitoring system. The former goal of 19,800 to 25,000 chinook salmon was a system-wide goal. Unfortunately, there is not an annual program to estimate the system-wide escapement. There is, however, an annual index escapement monitoring program using an enumeration weir on the Little Tahltan River. Therefore, it seemed more appropriate to express the goal in terms of the Little Tahltan River chinook count, for which annual data is collected, than in terms of a total system escapement which requires a number of unquantified and variable assumptions to be made in order to arrive at an annual estimate.

The new interim index escapement goal is 5,300 chinook salmon (excluding jack chinook) through the Little Tahltan River weir. Management systems have not yet evolved to actively target chinook escapement goals, although both countries have adopted conservative management plans with respect to chinook salmon to enable stocks to rebuild by 1995.

Harvest Sharing Objectives

According to the PSC agreement for 1995, Canada is allowed to harvest Stikine chinook salmon as an incidental harvest in the directed fishery for sockeye and coho salmon. Both Parties are to take appropriate management actions to ensure that escapement goals for chinook salmon bound for the Canadian portions of the Stikine River are achieved by 1995.

Management Procedures

United States

Initial openings in District 108 will be restricted to the outer areas of the district in order to minimize the interception of adult chinook salmon. Chinook salmon catches will also be a management concern in District 106 throughout the season and, if large numbers of small feeder chinook are caught, night closures will be instituted.

Canada

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

Stock Assessment Program

Each country shall:

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

Table 1. Stikine River sockeye run sizes, 1979 to 1994.

Inriver run size estimates							
Year	Canada	U.S.	Average	Inriver Catch	Spawning Escapement	Marine Catch[a]	Total Run
All Stikine Sockeye							
1979		40,353	40,353	13,534	26,819	8,299	48,652
1980		62,743	62,743	20,919	41,824	23,206	85,949
1981		138,879	138,879	27,017	111,862	27,538	166,417
1982		68,761	68,761	20,540	48,221	43,415	112,176
1983	77,260	66,838	71,683	21,120	50,563	5,799	77,482
1984	95,454	59,168	76,211	5,327	70,884	7,928	84,139
1985	237,261	138,498	184,747	26,804	157,943	29,747	214,494
1986			69,036	17,846	51,190	6,420	75,456
1987			39,264	11,283	27,981	4,077	43,342
1988			41,915	16,538	25,377	3,181	45,096
1989			75,054	21,639	53,415	15,492	90,546
1990			57,386	19,964	37,422	9,856	67,242
1991			120,152	25,138	95,014	34,199	154,351
1992			154,542	29,242	125,300	77,385	231,927
1993			176,100	50,946	125,154	104,630	280,730
Averages							
1979-1993			91,789	21,857	69,931	26,745	118,533
1984-1993			99,441	22,473	76,968	29,291	128,732
1994			133,980	53,377	80,603	144,720	278,700
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	24,785	67,278
1983			32,684	11,428	21,256	5,094	37,778
1984			37,571	4,794	32,777	3,251	40,822
1985			86,008	18,682	67,326	25,197	111,205
1986			31,015	10,735	20,280	2,757	33,771
1987			11,923	4,965	6,958	2,255	14,178
1988			7,222	4,686	2,536	2,129	9,351
1989			14,110	5,794	8,316	1,561	15,671
1990			23,923	8,996	14,927	2,307	26,230
1991			67,394	17,259	50,135	23,511	90,905
1992			76,681	16,774	59,907	28,214	104,895
1993			84,068	30,706	53,362	40,036	124,104
Averages							
1970-1993			41,178	11,974	29,204	12,907	54,085
1984-1993			43,991	12,339	31,652	13,122	57,113
1994			76,685	37,174	39,511	100,140	176,825

[a] The marine catch includes test fishery catches.

Table 2. CPUE for all sockeye salmon and the proportion of Tahltan stock in the catch from the Canadian lower Stikine River commercial fishery from 1982 to 1991. For periods when the fishery was closed, values were filled in with averaging and interpolation techniques (these values are underlined in the table). For the 1992 regressions of total run on cumulative CPUE, the cumulative CPUE started with week 27, the week the fishery opens in 1992.

CPUE of all Sockeye Salmon in Catch												
Week	1994	1993	1992	1991	1990	1989	1988	1987	1986	1985	1983	1982
26	16.1	58.3	39.7	14.8	13.0	25.5	3.0	3.0	2.8	67.6	12.8	13.3
27	45.2	163.1	111.1	120.3	49.6	48.1	21.8	11.9	18.8	75.0	39.3	49.5
28	164.6	185.3	154.9	121.0	78.6	23.1	35.5	10.6	79.8	100.1	62.2	46.9
29	147.5	135.4	144.0	114.4	110.3	105.5	69.2	57.9	58.1	260.0	72.8	24.0
30	145.6	118.3	166.0	53.7	81.4	140.8	71.9	67.8	84.7	147.9	53.3	29.1
31	111.0	71.6	88.3	83.8	62.1	73.9	61.9	27.6	81.9	104.7	92.0	13.6
32	81.8	83.7	73.2	31.6	54.4	60.8	89.2	76.6	55.6	73.6	64.3	20.5
33	42.4	31.1	43.2	15.7	16.2	28.4	33.3	32.3	34.1	58.6	54.7	7.7
34	32.5	39.3	12.5	1.0	12.4	16.4	23.1	16.5	25.9	18.2	14.7	3.6
35	10.3	11.5	4.5	4.2	13.1	6.2	11.0	5.4	9.4	10.3	11.9	1.3

Proportion Tahltan Stock in Catch												
Week	1994	1993	1992	1991	1990	1989	1988	1987	1986	1985	1983	1982
26				0.80	0.73	0.65	0.77	0.74	0.73	0.89	0.83	0.93
27				0.83	0.80	0.49	0.77	0.74	0.77	0.90	0.86	0.93
28				0.86	0.69	0.38	0.69	0.88	0.83	0.90	0.83	0.89
29				0.75	0.35	0.21	0.42	0.66	0.73	0.79	0.62	0.67
30				0.37	0.25	0.03	0.27	0.24	0.52	0.42	0.48	0.42
31				0.12	0.06	0.02	0.10	0.11	0.19	0.29	0.24	0.16
32				0.08	0.03	0.02	0.04	0.05	0.09	0.20	0.14	0.20
33				0.00	0.03	0.00	0.07	0.04	0.02	0.20	0.11	0.21
34				0.00	0.03	0.00	0.09	0.07	0.01	0.20	0.09	0.21
35				0.08	0.01	0.00	0.00	0.08	0.00	0.20	0.02	0.21

Table 3. CPUE of all sockeye salmon and the proportion of Stikine River Tahltan and non-Tahltan stocks in the catch from the U.S. District 106-41/106-42 commercial fishery from 1982 to 1991. For periods when the fishery was closed, values were estimated using averaging and interpolation techniques (these values are underlined in the table). For the 1992 regressions of total run on cumulative CPUE, the cumulative CPUE started with week 26, the week the fishery opens in 1992.

CPUE of all Sockeye Salmon in Catch													
Week	1994	1993	1992	1991	1990	1989	1988	1987	1986	1985	1984	1983	1982
25				51.4	29.2	46.8	16.5	19.3	14.1	91.0	45.3	38.2	101.9
26				117.0	33.6	51.9	22.9	29.1	16.9	126.9	69.6	57.7	119.1
27				52.9	78.2	66.1	58.7	52.2	63.0	162.9	89.4	38.6	124.9
28				90.8	84.5	147.1	66.8	103.9	75.5	117.4	80.9	65.9	156.9
29				87.5	116.1	109.4	103.6	83.9	88.0	113.3	79.7	76.1	160.5
30				95.5	176.9	89.4	87.6	155.9	100.6	108.7	148.3	69.9	164.1
31				100.7	78.4	93.4	59.3	106.6	105.8	189.1	53.0	44.4	137.3
32				52.7	45.1	36.2	92.2	115.4	82.1	69.0	45.6	40.5	95.2
33				24.7	30.6	33.5	67.7	88.3	60.1	100.5	14.9	18.2	53.1
34				12.9	12.6	7.7	20.5	45.9	28.8	37.8	5.4	6.2	11.1
35				8.4	4.2	2.9	11.0	3.4	8.9	5.9	1.1	5.7	4.4

Proportion Tahltan Stock in Catch													
Week	1994	1993	1992	1991	1990	1989	1988	1987	1986	1985	1984	1983	1982
25				0.23	0.02	0.03	0.04	0.04	0.00	0.10	0.07	0.04	0.01
26				0.40	0.03	0.09	0.09	0.01	0.02	0.11	0.08	0.10	0.15
27				0.26	0.03	0.03	0.07	0.01	0.09	0.35	0.11	0.19	0.11
28				0.10	0.01	0.00	0.05	0.05	0.11	0.24	0.11	0.12	0.19
29				0.01	0.01	0.00	0.01	0.01	0.06	0.13	0.02	0.08	0.17
30				0.10	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.13	0.06
31				0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.02	0.08
32				0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00
33				0.05	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.05	0.00
34				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00
35				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00

Proportion Non-Tahltan Stock in Catch													
Week	1994	1993	1992	1991	1990	1989	1988	1987	1986	1985	1984	1983	1982
25				0.09	0.06	0.06	0.00	0.00	0.00	0.00	0.01	0.01	0.01
26				0.02	0.02	0.10	0.00	0.00	0.00	0.03	0.05	0.02	0.03
27				0.03	0.02	0.16	0.00	0.00	0.03	0.01	0.04	0.01	0.02
28				0.01	0.02	0.05	0.00	0.00	0.02	0.01	0.01	0.01	0.08
29				0.09	0.01	0.01	0.00	0.00	0.04	0.01	0.13	0.06	0.09
30				0.03	0.01	0.00	0.00	0.02	0.01	0.03	0.02	0.01	0.17
31				0.05	0.04	0.02	0.00	0.00	0.00	0.00	0.03	0.00	0.09
32				0.01	0.05	0.01	0.01	0.00	0.00	0.00	0.02	0.03	0.00
33				0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.04	0.03	0.00
34				0.00	0.02	0.01	0.00	0.00	0.00	0.04	0.04	0.00	0.00
35				0.01	0.02	0.01	0.00	0.00	0.00	0.05	0.04	0.02	0.00

Table 4. Model parameters from the linear regression of run size on cumulative CPUE for the 1995 Stikine Management Model. (Due to rounding, the run fraction column may not total 1.0).

Lower River Commercial Fishery Catch of Stikine River Sockeye Salmon								
WEEK	R^2	RUN F.	INTERCEPT	SLOPE	SD(R.F.)	SD(INT)	SD(SLOPE)	AVE. CPUE
25								
26	0	0.04	50171.15	2138.69	0.022	10961.17	356.81	23.05
27	0	0.11	37695.28	719.47	0.068	12770	121.8	62.81
28	0	0.15	27004.25	415.48	0.067	12121.44	59.12	88.55
29	0	0.18	10965.75	313.1	0.045	8609.7	26.85	108.26
30	0	0.17	2260.33	256.23	0.047	10941.04	25.99	96.71
31	0	0.13	-4302.15	229.54	0.039	12795.79	25.85	72.7
32	0	0.12	-12253.97	216.58	0.054	15690.06	28.18	63.77
33	0	0.06	-14616.82	207.81	0.028	16564.34	28.05	33.14
34	0	0.03	-15190.01	202.49	0.017	17533.51	28.84	17.26
35	0	0.02	-15710.37	200.48	0.008	18053.04	29.31	8.26

Lower River Commercial Fishery Catch of Tahltan Sockeye Salmon								
WEEK	R^2	RUN F.	INTERCEPT	SLOPE	SD(R.F.)	SD(INT)	SD(SLOPE)	AVE.CPUE
25								
26	0	0.07	22259.17	1230.85	0.054	8738.99	333.78	19.14
27	0	0.2	11669.81	483.08	0.092	8120.46	93.03	51.55
28	0	0.25	4025.38	292.17	0.083	5568.24	32.58	72.36
29	0	0.25	619.12	215.22	0.088	3417.71	13.78	66.97
30	0	0.13	-439.04	189.74	0.055	3481.18	12.17	33.78
31	0	0.05	-268.58	178.11	0.029	3550.04	11.68	14.96
32	0	0.03	-248.68	173.55	0.012	3669.05	11.78	6.68
33	0	0	-212.15	171.87	0.01	3775.56	12.01	2.39
34	0	0	-227.27	171.25	0.006	3853.65	12.22	1.05
35	0	0	-206.26	170.97	0.002	3875.46	12.27	0.32

District 106-41 Fishery Catch of Stikine River Sockeye Salmon								
WEEK	R^2	RUN F.	INTERCEPT	SLOPE	SD(R.F.)	SD(INT)	SD(SLOPE)	AVE.CPUE
25	0	0.09	87171.8	4232.76	0.049	23420.61	1169.23	12.75
26	0	0.14	58473.97	3235.37	0.127	19781.41	576.49	12.8
27	0	0.21	46576.31	2029.71	0.107	11416.26	186.78	21.03
28	0	0.23	49044.91	1394.73	0.108	14775.39	170.36	19.44
29	0	0.12	61826.28	960.11	0.088	19603.6	173.65	16.57
30	0	0.08	65049.47	839.22	0.086	20917.85	167.26	8.06
31	0	0.06	66022.33	763.17	0.059	20549.91	150.22	7.76
32	0	0.04	66052.19	730.63	0.04	20149.39	140.69	4.34
33	0	0.02	66127.24	705.55	0.018	19799.02	133.29	3.55
34	0	0	66272.96	693.56	0.01	19632.6	129.94	1.63
35	0	0	66159.96	691.13	0.006	19539.3	128.68	0.54

-Continued-

Table 4. (page 2 of 2)

District 106-41 Fishery Catch of Tahltan Sockeye Salmon

WEEK	R^2	RUN F.	INTERCEPT	SLOPE	SD(R.F.)	SD(INT)	SD(SLOPE)	AVE.CPUE
25	0	0.11	29510.12	4003.71	0.064	10277.88	707.98	9.43
26	0	0.2	17795.22	2442.6	0.192	9466.59	342.55	10.82
27	0	0.26	13191.77	1412.65	0.122	5867.67	114.47	18.02
28	0	0.22	13716.34	1022.47	0.162	5476.57	77.64	14.09
29	0	0.11	18737.28	780.25	0.085	7679.69	88.66	9.82
30	0	0.05	21269.11	690.54	0.053	8642.86	91.48	4.41
31	0	0.02	21533.05	669.9	0.05	8888.81	91.73	1.66
32	0	0	22041.77	655.58	0.008	9051.21	92.07	0.72
33	0	0	21799.73	651.66	0.015	8953.1	90.2	0.79
34	0	0	21803.57	648.81	0.006	8922.13	89.48	0.3
35	0	0	21802.87	648.68	0	8920.22	89.44	0.02

Inriver Test Fishery Catch of Stikine River Sockeye Salmon

WEEK	R^2	RUN F.	INTERCEPT	SLOPE	SD(R.F.)	SD(INT)	SD(SLOPE)	AVE.CPUE
25	0	0.01	68633.05	165381	0.017	21012.76	91351.68	0.16
26	0	0.04	48718.31	74098.24	0.023	18036.67	22347.67	0.47
27	0	0.10	28728.26	36404.32	0.069	17596.44	8174.48	1.21
28	0	0.14	8097.82	24192.43	0.058	18546.85	4613.57	1.78
29	0	0.15	-12762.94	20056.30	0.032	19908.30	3420.98	1.79
30	0	0.17	-24759.07	16495.26	0.054	21847.94	2816.95	1.89
31	0	0.15	-43083.67	15375.18	0.060	30014.77	3186.18	1.72
32	0	0.11	-40586.56	13140.01	0.051	34390.29	3182.89	1.34
33	0	0.07	-34730.13	11564.29	0.031	34869.25	2961.27	0.91
34	0	0.04	-30951.95	10755.15	0.027	33435.37	2711.66	0.50
35	0	0.01	-28888.87	10392.85	0.026	32559.73	2589.27	0.21

Inriver Test Fishery Catch of Tahltan Sockeye Salmon

WEEK	R^2	RUN F.	INTERCEPT	SLOPE	SD(R.F.)	SD(INT)	SD(SLOPE)	AVE.CPUE
25	0	0.03	51769.19	-124526.2	0.073	12875.58	114651.80	0.06
26	0	0.08	18414.82	53621.94	0.062	15577.10	26803.01	0.41
27	0	0.19	4308.51	26686.46	0.114	11795.52	6739.06	1.01
28	0	0.23	-6879.39	18446.02	0.094	7891.90	2509.47	1.27
29	0	0.20	-12490.98	14984.80	0.050	6700.40	1587.00	1.01
30	0	0.12	-11508.79	12381.44	0.061	7311.29	1453.39	0.71
31	0	0.07	-8417.12	10538.62	0.065	9275.66	1653.79	0.49
32	0	0.04	-6193.51	9559.27	0.038	9507.78	1593.67	0.27
33	0	0.02	-3122.11	8642.24	0.040	9850.06	1572.02	0.20
34	0	0	-3072.10	8583.93	0.006	9811.77	1556.35	0.03
35	0	0	-2951.81	8549.15	0.002	9829.68	1556.15	0

Table 5. Evaluation of the Stikine Management Model for the 1994 season. Weekly forecasts of run size for 1994 are given along with the total allowable catch for Stikine River sockeye salmon.

Week	Start Date	Forecasts Run Size	Forecasts TAC	U.S. TAC	Canada TAC	Cumulative Catch U.S.	Cumulative Catch Canada
Model Runs Generated in the U.S. Management Office in Petersburg[a]							
25	12-Jun	345,540	291,540	145,770	145,770	41	0
26	19-Jun	345,540	291,540	145,770	145,770	1,837	0
27	26-Jun	345,540	291,540	145,770	145,770	7,464	443
28	03-Jul	174,388	120,388	60,194	60,194	25,603	5,878
29	10-Jul	180,259	126,259	63,130	63,130	55,864	11,515
30	17-Jul	197,832	143,832	71,916	71,916	93,080	16,660
31	24-Jul	382,386	328,386	164,193	164,193	129,097	34,486
32	31-Jul	362,959	308,959	154,480	154,480	136,297	41,536
33	07-Aug	357,006	303,006	151,503	151,503	140,614	42,528
34	14-Aug	356,217	302,217	151,109	151,109	142,884	44,617

Week	Start Date	Forecasts Run Size	Forecasts TAC	U.S. TAC	Canada TAC	Cumulative Catch U.S.	Cumulative Catch Canada
Model Runs Generated in Canadian Management Office in Whitehorse[b]							
26	19-Jun	312,000	258,000	129,000	129,000	2,239	0
27	26-Jun	312,000	258,000	129,000	129,000	18,330	1,148
28	03-Jul	141,130	87,130	43,565	43,565	32,646	9,059
29	10-Jul	151,334	97,334	48,667	48,667	62,666	16,907
30	17-Jul	192,697	138,697	69,349	69,349	107,879	27,466
31	24-Jul	212,287	158,287	79,144	79,144	132,911	36,968
32	31-Jul	231,339	177,339	88,670	88,670	136,179	40,885
33	07-Aug	240,678	186,678	93,339	93,339	136,179	41,579
34	14-Aug	242,551	188,551	94,276	94,276	143,240	44,627
35	21-Aug	249,261	195,261	97,631	97,631	144,017	44,837
	Final	249,261	195,261	97,631	97,631	144,017	44,837

[a] U.S. forecast were as follows: the preseason forecast was used for weeks 25, 26, and 27; the forecast based on inriver commercial catch was for weeks 28, 29, and 30; and the forecast based on District 6 CPUE was used for the remainder of the sockeye season.

[b] Canadian forecasts were as follows: the preseason forecast was used for weeks 25, 26, and 27; the forecast based on test fishery data was used in weeks 28 and 29; and the forecasts based on inriver commercial CPUE were used for the remainder of the sockeye season.

TAKU RIVER

Preseason Forecasts

Sockeye

Compared to the recent ten-year-average run size, an average run of sockeye salmon to the Taku River is expected in 1995. The total return in 1995 is expected to approach 211,300 sockeye, which is close to the 1984-1993 average of 212,050 sockeye salmon. If the run returns as expected, the TAC would be about 136,000 sockeye.

The 1995 sockeye forecast is based on the historical relationship between the number of female spawners and the subsequent returns described by the following equation:

$$\ln (R/S) = 2.77 - 0.0267 (S); \quad (3)$$

where:

R = adult return; and
S = number of female spawners in 1000s.

Equation (3) above is based on the estimated number of female spawners in the 1979 to 1988 brood years and the subsequent age-specific returns from these escapements.[1] The correlation coefficient of this relationship is r = 0.85; it is statistically significant at a level of significance of a = 0.01. The estimated number of female spawners in 1990 was 44,200 fish and 60,900 in 1991. Projected returns per female spawner for these two principal brood years are 4.94 for 1990 and 3.15 for 1991. Overall escapements in 1990 and 1991 were 92,780 and 125,127 fish, respectively.

Coho Salmon

An above average return of coho salmon is expected in 1995; it should be noted that current cycle averages have been inflated by the exceptional returns observed in recent years. The estimated spawning escapements in the two primary brood years contributing to the 1995 run were 127,500 fish in 1991, and 96,400 fish in 1992; the escapement in both years far exceeded the interim escapement goal range for Canadian-origin Taku River coho salmon of 27,500 to 35,000 fish. Taku River coho salmon escapement has averaged 73,800 over the 1985 to 1994 period.

Coho salmon returns in Southeast Alaska since 1991 have benefited from outstanding marine survivals. If this trend continues, a good coho return is expected in 1995.

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[1] Escapement estimates prior to 1983 were based on assumed harvest rates and after 1982 were based on the Taku mark-recapture program. Annual age-specific returns were estimated assuming the in-river age composition, as determined from sampling in the Canadian commercial fishery, was representative of the entire run.

Chinook Salmon

The overall return of Taku chinook is expected to be above average in 1995 as a result of the above average index escapement counts in 1989 through 1991. The number of chinook observed in the three principal brood years were 9,480 (1989), 12,249 (1990), and 10,153 (1991). The 1990 return was the second highest recorded while the 1991 was the fourth highest; the 1989 return was the seventh highest. The chinook salmon return to the Taku River has been building in recent years.

Pink and Chum Salmon

A poor return of pink salmon is expected. Pink salmon returning in 1995 will be the product of the 1993 brood year escapement. Prior to 1993, odd-year returns of Taku River pink salmon were dominant cycle years. The average number of pink salmon live-captured in the Canyon Island fish wheels for the 1985 to 1991 period (odd years only) was 31,299; however, only 1,625 pink salmon were counted in the fish wheels in 1993. This represents an almost complete failure of this cycle year. Although the total pink salmon escapement in 1993 is unknown, it is believed to have been far below the spawning escapement goal of 150,000 to 250,000 fish.

Low chum catches and CPUE in the District 111 fishery, Canyon Island fish wheels and Canadian inriver test fishery in 1990 and 1991 suggested that the spawning escapement that will produce the 1995 return was poor. Consequently, a below average to poor return is expected in 1995.

Escapement Goals

Interim escapement goals set by the Transboundary Technical Committee for salmon spawning in Canadian portions of the Taku River are as follows:

Species	Interim Escapement Goal Ranges	
	From	To
Sockeye	71,000	80,000
Coho	27,500	35,000
Chinook	13,200 (index count)[a]	13,200 (index count)
Pink	150,000	250,000
Chum	50,000	80,000

[a] The Transboundary Technical Committee recently revised the interim escapement goal range for Taku River chinook salmon to make it more relevant to the current index escapement monitoring system. The former goal of 25,600 to 30,000 chinook salmon was a system-wide goal. Unfortunately, there is not an annual program to estimate the system-wide escapement. There is, however, an annual index escapement monitoring program using aerial surveys of some key spawning areas. Therefore, it seemed more appropriate to express the goal in terms of the index, for which annual data is collected, than in terms of a total system escapement which requires a number of unquantified and variable assumptions to be made in order to arrive at an annual estimate.

The new interim index escapement goal is 13,200 chinook salmon which was developed by summing the peak counts between 1965 and 1981 for each of six index areas including the Nakina, Nahlin, Dudidontu, Kowatua and

Tatsamenie rivers, and Tseta Creek. Management systems have not yet evolved to actively target chinook escapement goals, although both countries have adopted conservative management plans with respect to chinook salmon to enable stocks to rebuild by 1995.

Harvest Sharing Objectives

The Pacific Salmon Commission and the governments of Canada and the U.S. have so far been unable to agree to a regime which would replace the Taku wild sockeye and coho harvest sharing arrangements that were in place for the 1988 to 1992 period. Government-to-government talks are still in progress however, it is unlikely that resolution of all of the issues will occur prior to the start of the 1995 season. It is assumed that both Parties will continue to take appropriate management actions to ensure that the escapement goals for chinook salmon bound for Canadian portions of the Taku River are achieved by 1995.

Management Procedures

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

United States

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

Section 11-B (Figure 2) will initially open for a 72-hour period on the third Sunday of June (June 18, statistical week 25). The fishery will be managed through mid-August primarily on the basis of sockeye salmon abundance. Run strength will be evaluated from fishery CPUE data and from weekly inriver run size estimates derived from the Taku River fish wheel mark-recapture project operated jointly by ADF&G and DFO. Contribution of enhanced stocks of sockeye salmon will be estimated in-season by analysis of salmon otoliths sampled from the commercial harvests. The age and stock compositions of the harvest of natural stock sockeye salmon will be determined after the fishing season by analysis of scale pattern and brain parasite incidence data from commercial catch samples.

Harvest rates on Snettisham natural sockeye salmon in outer portions of Taku Inlet and in Stephens Passage are expected to be sufficient to harvest available surpluses of these stocks. Port Snettisham will again be closed to commercial fishing inside a line from Point Anmer to Point Styleman through approximately August 12 to limit harvest rates on Snettisham sockeye stocks and rebuild escapements of these stocks to historic levels.

To minimize the harvest of mature wild stock chinook salmon, Taku Inlet will be closed north of the latitude of Jaw Point during the first week of the fishery (Figure 3). If necessary, night closures may be imposed during the early portion of the season to limit incidental catches of immature chinook salmon.

Pink salmon will be harvested in Section 11-B during the summer fishing season. Fishing time for pink salmon in Section 11-C will depend on the strength of returns in lower Stephens Passage, Seymour Canal, and the northern portions of District 10. Pink salmon escapements into most of the areas were very poor in 1993 and fishing time in Section 11-C is not expected in 1995.

Returns from domestic hatchery programs are expected to contribute significantly to the District 11 fishery in 1995. Extended fishing time is expected in Stephens Passage to maximize the harvest of enhanced chum salmon returning to Limestone Inlet (return projection of 131,000 summer chum salmon). Terminal area returns to Gastineau Channel facilities of the Douglas Island Pink and Chum (DIPAC) corporation are expected to total 600,000 summer chum and 100,000 coho salmon. Portions of these returns will be available for incidental harvest in the directed wild stock sockeye and coho salmon fisheries. Returns to Sweetheart Creek are expected to total 20,000 sockeye salmon. Harvest of these fish will occur in the District 11 commercial fishery, a cost recovery fishery in Gilbert Bay near the mouth of the creek, and in a personal use fishery in the creek.

In 1989, the Alaska Board of Fisheries re-opened the purse seine fishery in a small area in northern Chatham Strait (Subdistrict 112-16) during the month of July in order to harvest pink salmon stocks migrating northward to Taku River, Lynn Canal and upper Stephens Passage. The area encompasses waters along the western shore of Admiralty Island north of Point Marsden (Figure 3). A harvestable surplus of pink salmon returning to this area is not expected in 1995 and a July seine fishery will probably not occur in the Hawk Inlet Shore area. During August, fishery openings along the Hawk Inlet Shore may extend northward to the latitude of Hanus Reef Light when north-migrating pink salmon stock strength warrants. In addition, if north-migrating pink salmon returns are poor, and south-migrating stocks are strong, seining may be allowed only south of Point Marsden.

Beginning in mid-August, management emphasis of the Taku/Snettisham gillnet fishery will switch to fall chum and coho salmon. Inseason management will be based on evaluation of catch, effort, and CPUE relative to historical levels, analysis of coded-wire-tag recoveries from fishery sampling, and on escapement estimates from the Taku River mark-recapture project.

The chinook sport fishing season will be open in the marine waters near Juneau throughout the year. However, Taku Inlet, north of a line from Point Bishop to Dorothy Creek, will be closed to sport fishing from April 16 through June 14 to protect returning Taku River chinook salmon. The daily bag and possession limits are two chinook salmon per person. Further restrictions in the Southeast Alaska sport fishery may be implemented if the sport harvest exceeds the limit necessitated by the Pacific Salmon Treaty.

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 1995. A seasonal bag limit of five sockeye salmon per person or ten sockeye salmon per household will be allowed to be taken using set gillnets.

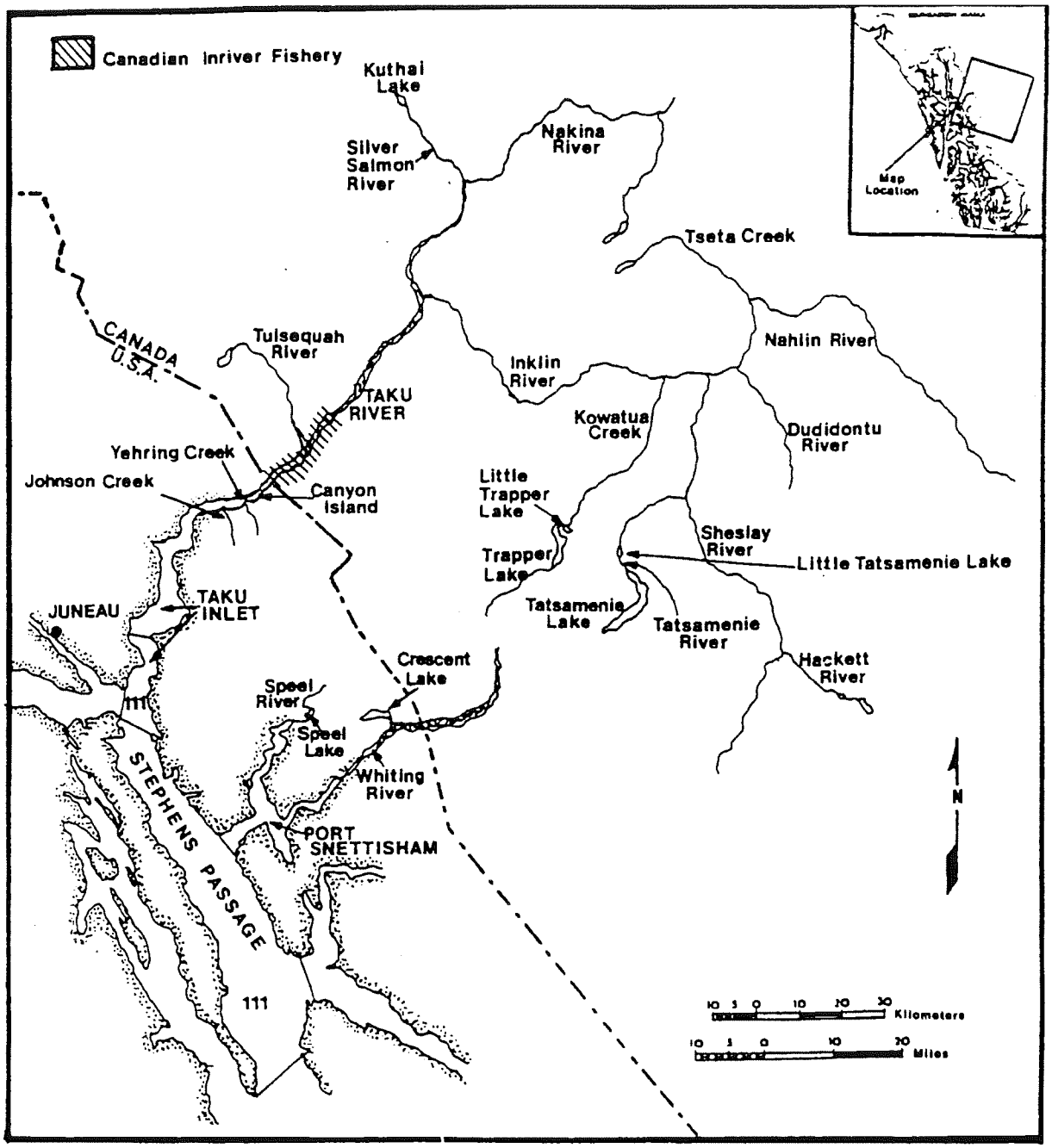

Figure 2. The Taku River and principal U.S. and Canadian fishing areas.

Canada

The Canadian fishery will open 12:00 noon Sunday, June 18 for an initial 48-hour period to target early sockeye runs. A maximum mesh size restriction of 150 mm (5¾ inches) will be in effect through mid-July to conserve chinook salmon during the early season sockeye fishery.

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

$$TAC = \frac{E_w + CC_w + (AC_{w-1})}{PRT_w} - Eg; \quad (4)$$

Where:

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

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

The Canadian fishery will be monitored daily by a resident DFO Fishery Officer who will collect catch information. Catch information will be relayed to the DFO office in Whitehorse, collated, and exchanged with a designated ADF&G contact person during weekly telephone contacts.

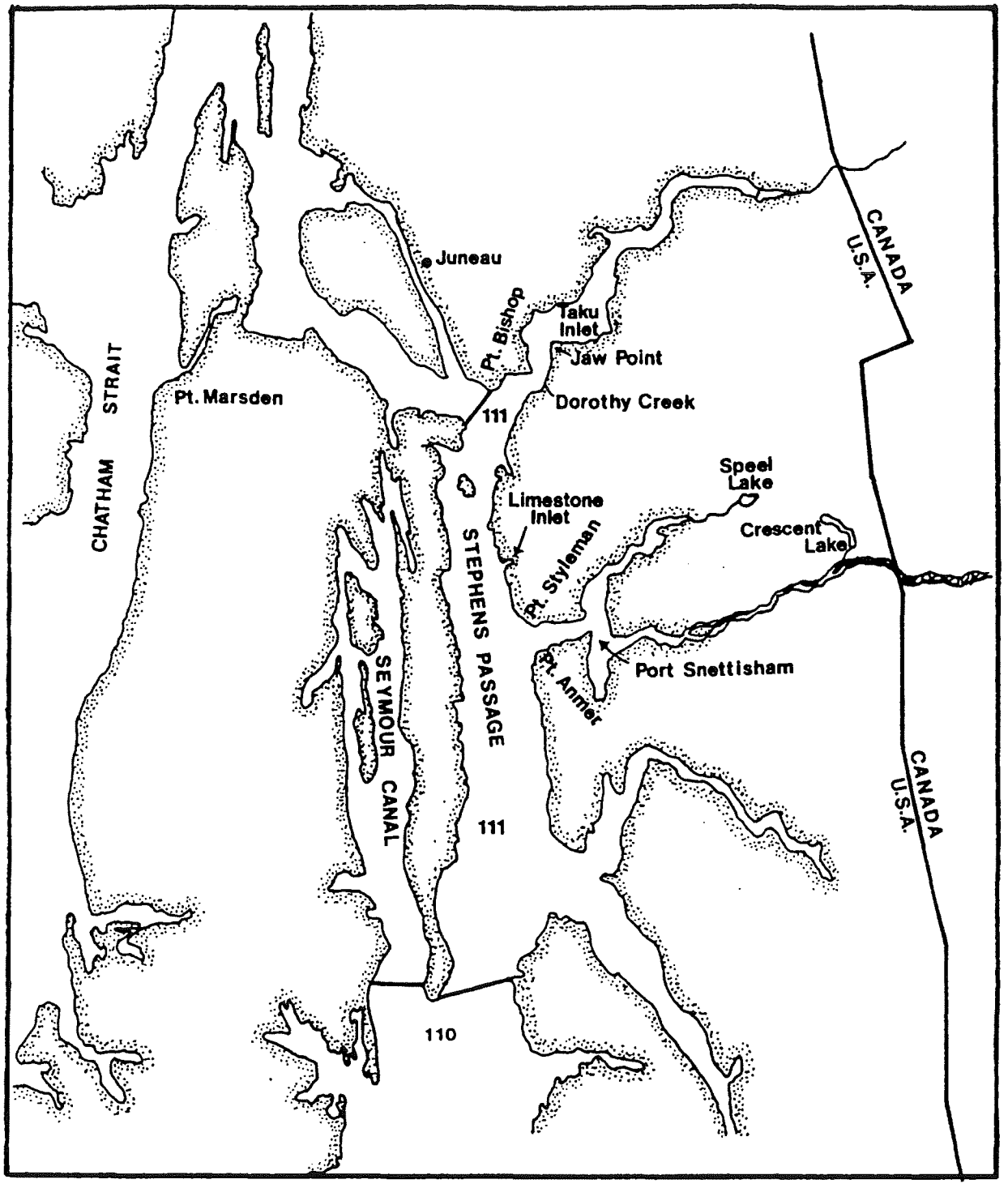

Figure 3. Location of U.S. fishing areas adjacent to the Taku River.

ALSEK RIVER

Preseason Forecasts

Based on the above average parent-year sockeye escapement to the Klukshu River in 1990, an above average sockeye run is expected in 1995. However, the early component is expected to be below average due to the weakness in the early escapement observed in 1990.

Although the chinook escapement from 1989-1991 was average to below average, the chinook return to the Alsek is expected to be above average. This outlook is based on preliminary stock-recruitment analyses which suggests greater production occurs at escapement levels below current averages.

The above average coho escapement observed at the Klukshu River in 1991 suggests the return in 1995 will be above average.

Escapement Goals

Interim escapement goals set by the Transboundary Technical Committee for salmon spawning in the Canadian portion of the Alsek River drainage are:

Species	Interim Escapement Goal Ranges	
	From	To
Sockeye	33,000	58,000
Coho	5,400	25,000
Chinook	4,700 (Klukshu only)[a]	4,700 (Klukshu only)

[a] The TRTC revised the interim escapement goal range for Alsek River chinook salmon in 1991 to make it more relevant to the current index escapement monitoring system. Prior to 1991, the goal of 5,000 to 12,500 chinook salmon was a system-wide goal. As with the other Transboundary Rivers, there is no annual program established to estimate the system-wide escapement. It seemed more appropriate to develop a goal which had direct relevance to data collected consistently on an annual basis and was free of a number of unquantified expansion factors (which were necessary to estimate system-wide escapement). The new interim index escapement goal is 4,700 chinook salmon in the Klukshu River (weir count minus IFF catch upstream); this represents the average of the preliminary Canadian goal of 5,000 chinook, and the preliminary U.S. goal of 4,400 chinook. These goals are being reviewed in light of current stock-recruitment data which indicates they may be too high.

Harvest Sharing Objectives

Annex IV of the Pacific Salmon Treaty requires that the Parties take the necessary management actions to rebuild Alsek chinook and early-run sockeye salmon stocks.

Management Procedures

United States

The initial opening for the Alsek River fishery (Dry Bay, Figure 4) during the 1995 season will be for 12 hours on the first Monday in June (June 7). The initial opening is in statistical week 24. Prior to 1963 the fishery opened in May. The next week's opening will be for a 24-hour period starting the following Monday. An extension of fishing time may be allowed if sockeye salmon run strength is sufficient and the harvest of chinook salmon can be kept low. The duration of fishing periods during the remainder of the sockeye salmon season will be based on evaluation of sockeye salmon catches and effort levels. Gillnets will be restricted to a maximum mesh size of six inches (152 mm) through July 1 to minimize incidental chinook salmon harvests.

After the first several weeks of the fishing season, U.S. managers will use inseason sockeye salmon abundance models to predict the Dry Bay catch and the total index run size (Dry Bay catch plus Klukshu weir count). Total season abundance predictions generated inseason with these models have generally been very accurate as early as the third week of the season.

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

The Alsek River surf fishing area will likely 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

Management of both the sport and aboriginal fisheries in the Alsek River (Figure 4) will be similar to that of the last several years with conservation measures in place to protect chinook and early-run sockeye salmon. Reduced effort in the aboriginal food fishery and sockeye non-retention in the sport fishery will be instituted prior to August 15 to protect early run sockeye. Conservation catch limits (one chinook/day) and weekly closed periods will be implemented in the sport fishery to conserve chinook salmon. The escapement of chinook and sockeye salmon through the Klukshu weir serves as an inseason indicator of stock strength and adjustments to the fishery may be made on the basis of weir counts.

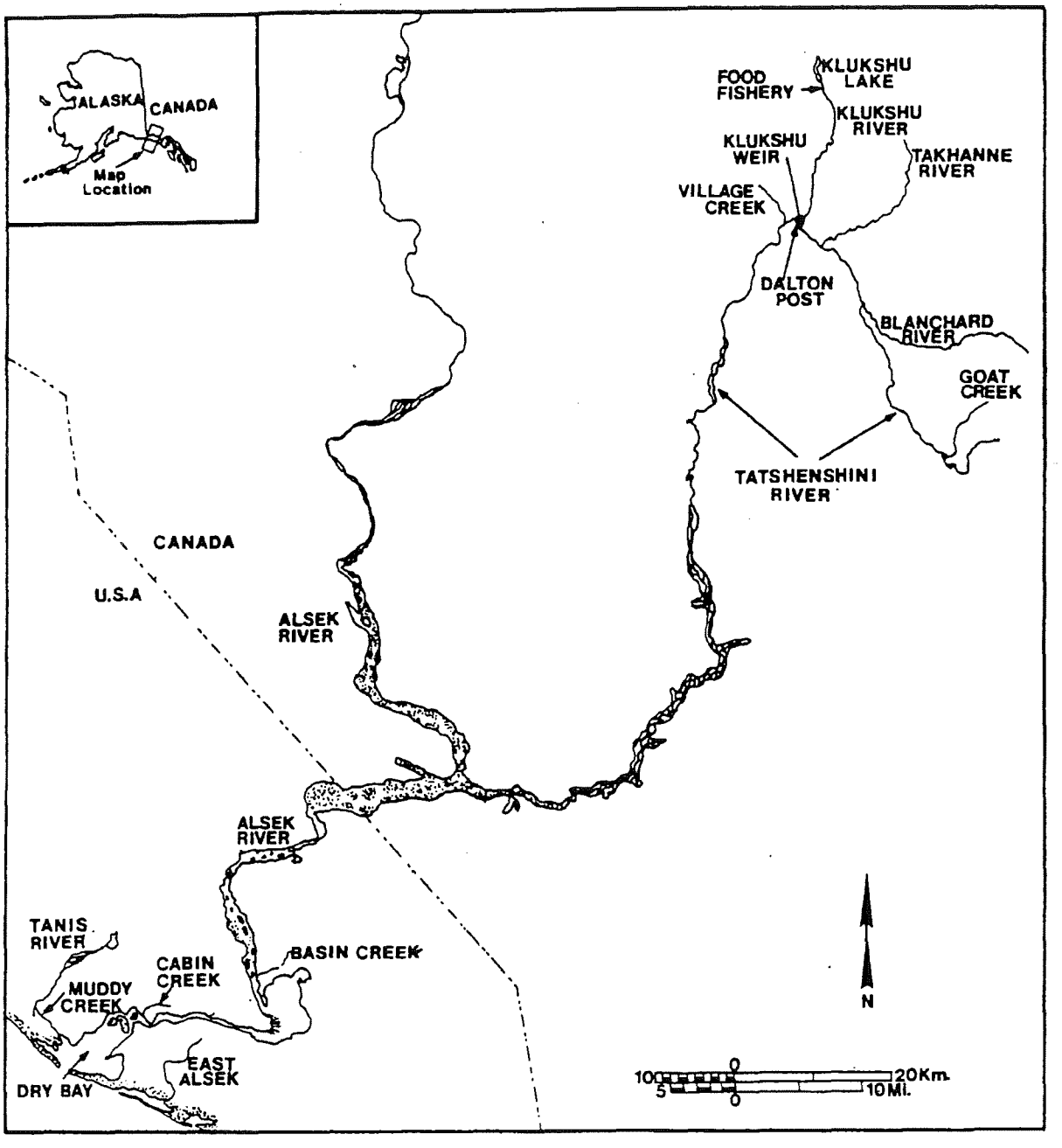

Figure 4. Location of the principal U.S. and Canadian fishing areas where Alsek River salmon stocks are caught.

1995 TRANSBOUNDARY ENHANCEMENT PLANS

Fry Plants

The following numbers of sockeye fry produced from the transboundary sockeye enhancement program are expected to be outplanted in 1995:

Stikine drainage:

Tahltan Lake	1.1 million
Tuya Lake	2.3 million

Taku drainage:

Tatsamenie Lake	0.9 million
Trapper Lake	0.8 million

Fry plants are scheduled to occur in June and July.

Eggtake Goals

Planned sockeye eggtake targets for the fall of 1995 are as follows:

Tahltan Lake	6.0 million
Tatsamenie Lake	2.5 million.

After careful review, the Transboundary Technical Committee, on advice from the Enhancement Subcommittee, made a decision to suspend egg takes at Little Trapper Lake commencing 1995. The primary reasons for this decision were as follows:

1. apparent poor smolt emigration from Trapper Lake and inability to demonstrate significant smolt production;
2. spillage of fry from Trapper Lake to Little Trapper Lake and concern that enhanced fry would be competing with the wild Little Trapper Lake fry for a limited food supply;
3. lower in-hatchery survival compared to the other transboundary stocks.

The committee recommends that adult returns to Little Trapper continue to be monitored and assessed for enhanced contributions. If enhanced adult production warrants it, egg takes at Little Trapper could be reconsidered in the future.

PROPOSED TRANSBOUNDARY FIELD PROJECTS FOR 1995

Stikine River

Proposed projects regarding Stikine River salmon stocks are summarized in Table 6. For each project listed, corresponding information regarding the primary objectives, dates of operation, and agency roles and contacts are described. Several changes are proposed in the Stikine River field programs from those conducted in 1992 including eliminating the marine inseason scale pattern analysis and implementing an otolith sampling program in District 108 to estimate contribution of enhanced sockeye salmon to that fishery.

Taku River

Proposed projects regarding Taku River salmon stocks are summarized in Table 7. For each project listed, corresponding information regarding the primary objectives, dates of operation, and agency roles and contacts are described. Several changes are proposed in the Taku River field programs from those conducted in 1992 including delaying the second year of the coho salmon radio tagging program until 1994 and eliminating operation of the Little Tatsamenie weir for coho salmon enumeration.

Alsek River

Proposed projects regarding Alsek River salmon stocks are summarized in Table 8. For each project listed, corresponding information regarding the primary objectives, dates of operation, and agency roles and contacts are described. The overall Alsek field program is similar to 1994.

Transboundary Enhancement

Proposed projects regarding joint transboundary river salmon enhancement are summarized in Table 9. For each project listed, corresponding information regarding the primary objectives, dates of operation, and agency roles and contacts are described. Several expanded assessment projects related to joint Stikine and Taku river enhancement are planned for 1995.

Table 6. Proposed Stikine River field projects, 1995.

Location	Function	Dates	Agency	Responsibility*
District 106 & 108 Fishery	Sample 20% of chinook, coho, chum, and sockeye catches per district for CWTs; all species except pinks for age-sex-length (scale sampling goals are 600 per district per season for chinook, coho, and chum). Sockeye otolith sample goals are 600 per week for District 106 (Subdistricts 106-41 and 106-30) and 400 per week for District 108 (Subdistricts 108-30, 108-40, 108-50 and 108-60).	6/17-9/20	ADF&G	All aspects
Lower Stikine	Conduct test fishery to assess size and timing of sockeye coho. Collect age-sex-length-weight information and recover CWTs from all salmon species. Sample all sockeye for scales and all female sockeye for egg diameter (used for stock ID). U.S. otolith sampling requirements are 150/week for weekly samples (matched with scales) and with eggs diameters for females.	6/17-9/15	DFO/TFN	All aspects
	Commercial catch sampling for sockeye will include 350/week for AWL with 150 matched otolith samples (if possible) and 100 matched egg diameter samples.		DFO/TFN	All aspects
	Chinook Tagging. Conduct site selection, work on drift gillnet and tagging techniques.	5/95-8/95	DFO/ ADF&G	Agencies have agreed to supply equipment, supplies, personnel etc.
	Study mark-recapture, radio telemetry application (40 tags), installation & operation of remote tracking station, spawning ground tag recovery program and planning for subsequent larger program.		NMFS/TFN	All aspects

-Continued-

Table 6. (page 2 of 2)

Location	Function	Dates	Agency	Responsibility
Tahltan Lake	Estimate age, size and timing of sockeye smolt outmigration.	5/4-6/14	DFO/TFN	All aspects
	Enumerate adult sockeye and collect age-sex-length data from 800 fish.	6/15-9/06	DFO/TFN	All aspects
	Sample smolts for otoliths and matching scale samples.*	5/4-6/14	DFO/TFN	Smolt Collection
			DFO/ADF&G	Otolith analysis
	Analyze Tahltan Lake otoliths for thermal otolith mark.*		DFO/ADF&G	All aspects
Little Tahltan	Enumerate adult chinook salmon and collect age-sex-length data (800 samples).	6/23-8/21	DFO/TFN	All aspects
	* DFO/ADF&G may be required to provide otolith subsamples for verification of reading standards.			
Tahltan River, Little Tahltan, Beatty Creek	Aerial survey estimates of spawning chinook salmon in index areas.	8/10-8/15	ADF&G	All aspects
Lower Stikine	Aerial surveys of spawning coho salmon in mainstem tributaries from mouth to U.S./Canada border.	10/5-10/31	ADF&G	All aspects
	Aerial surveys of spawning coho salmon in tributaries located upstream of U.S./Canada border.	10/5-10/31	DFO/TFN	All aspects

[a]Contacts:

Pete Etherton	(DFO)	All DFO projects.
Sandy Johnston	(DFO)	All DFO projects.
Keith Pahlke	(ADF&G)	Chinook aerial surveys.
Brian Lynch	(ADF&G)	District 106 & 108 fishery sampling.
Kathleen Jensen	(ADF&G)	District 106 & 108 sockeye stock ID.
John Eiler	(NMFS)	Chinook radio telemetry (all aspects).
Scot McPherson	(ADF&G)	Chinook tagging program.
Ray Quock	(Tahltan First Nation (TFN))	TFN projects.

Table 7. Proposed Taku River field projects, 1995.[a]

Location	Function	Dates	Agency	Responsibility
District 111 Fishery	Sample 20% of chinook, coho, and chum catches for CWT; all species except pinks for age-sex-length (goals are 600 and 300 per week for sockeye and chum, and 600 per season for chinook and coho). Collect 400 matched brain parasite/scale/otolith samples per week.	6/18-9/30	ADF&G	All aspects
Canyon Island	Mark-recapture studies to estimate chinook salmon escapement.	4/26-6/14	ADF&G/ TRTFN	Two to three personnel (ADF&G) One staff member (TRTFN). ADF&G Tag recovery, Dudidontu & Hackett rivers.
	Mark-recapture studies to estimate sockeye and coho escapement. Sample 260 sockeye/week for age-sex-length information, and 520 coho and chum salmon for the entire season	6/15-15/10	ADF&G/ DFO	Two to three personnel (ADF&G) including two boats & motors, camp supplies, food/tagging equipment.
		6/15-10/15	DFO	Two field personnel, June 15-Sept. 30 and to Oct. 15 if funding available. One boat & motor, and field equipment.
		6/15-10/15	TRT	One field person for this time period.
Canadian Fishery	Sample sockeye and coho salmon for age-sex-length; sockeye, 200 samples /week; coho,:520 per season; as many as possible for other species. Recover CWTs from coho (i.e. heads returned by fishers or samplers). Examination of sockeye and chinook salmon for secondary mark.	6/21-8/31	DFO/ ADF&G/ TRTFN	Sampling will be conducted by Canyon Island crew.

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Table 7. (page 2 of 3)

Location	Function	Dates	Agency	Responsibility
	Collect 100 sockeye otolith samples per week for determination of contribution of enhanced fish.	6/26-8/30	DFO/ADF &G/ TRTFN	Sampling will be conducted by Canyon Island crew, samples processed by DFO.
	Collect and record all spaghetti tags caught, pay fishers for tag recoveries and maintain receipt book.	6/26-10/01	DFO	Tags will be recovered by DFO personnel with assistance by ADF&G Personnel.
	Collect and record commercial catch information	6/26-9/7	DFO	Catch information shall be sent to DFO Whitehorse; whose staff will provide/relay catch information to management staff, ADF&G (Juneau).
	Collect and record AF catch information.	8/1-9/30	TRTFN	All aspects
Nakina River	Chinook carcass weir; enumerate and sample 1,000 chinook for age-sex-length and all other chinook for sex-length. Recover and record all spaghetti tags, examination of fish for secondary mark, examination of all jack chinook salmon (>650 mm POHL) for adipose clips and recover all heads from adipose clipped fish for coded wire tags.	7/26-8/26	TRTFN	All Aspects
	Sample Nakina and Silver Salmon origin sockeye for age-sex-length.	7/26-8/26	TRTFN	All Aspects
	Creel census, catch and release video production.	6/20-7/20	TRTFN	All Aspects
Little Trapper Lake	Adult sockeye salmon weir; enumerate and sample for age-sex-length (750 samples) and recover spaghetti tags.	7/16-9/12	DFO	All aspects
	Examine chinook salmon for tags & secondary marks.	8/95	DFO	All aspects

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Table 7. (page 3 of 3)

Location	Function	Dates	Agency	Responsibility
Tatsamenie Lake	Adult sockeye salmon weir will be operated during broodstock collection; enumerate and sample for age-sex-length (750 samples) and recover spaghetti tags.	8/5-9/30	DFO	All aspects
	Examine chinook salmon for tags & secondary marks.	8/95	DFO/ ADF&G	All aspects
Kuthai Lake	Adult sockeye salmon weir; enumerate and sample for age-sex-length (600 samples) and recover spaghetti tags.	7/10-9/01	TRTFN	All aspects
Nahlin River	Adult chinook and sockeye salmon weir; enumerate and sample for age-sex-length (600 chinook and 600 sockeye), recover and record all spaghetti tags, examination of all jack chinook salmon (>650 mm POHL) for adipose clips and recover all heads from adipose clipped fish for coded wire tags.	6/1-9/30	TRTFN	All aspects
Escapement sampling	Sample sockeye escapement in mainstem areas for age-sex-length (400 samples per area) and recovery of spaghetti tags.	9/5-9/25	ADF&G/ DFO	1 day sampling per site
Nakina, Nahlin, Dudidontu, Tatsatua, Kowatua, and Tseta	Aerial surveys of spawning chinook salmon in index tributaries.	7/25-8/25	ADF&G	All aspects

[a]Contacts:

Scott McPherson	(ADF&G)	Lower river coho smolt tagging, adult chinook/coho tagging, coho aerial surveys.
Scot Kelley	(ADF&G)	Canyon Island sockeye/coho tagging.
Keith Pahlke	(ADF&G)	Chinook aerial surveys.
Pat Milligan	(DFO)	Contact for all DFO Taku programs.
Sandy Johnston	(DFO)	Contact for all DFO Taku programs.
Kathleen Jensen	(ADF&G)	Sockeye stock identification.
Cecil Anderson	(TRTFN)	Contact for all TRTFN programs.
Phil Timpany	(TRTFN)	Contact for all TRTFN programs.

Table 8. Proposed Alsek River field projects, 1995.a

Location	Function	Dates	Agency	Responsibility
Klukshu River	Enumerate chinook, sockeye, and coho salmon at adult weir; estimate sport and aboriginal Fishery catches; collect age-sex-length information (750 scale samples per species) and CWTs for all salmon species.	5/23-10/20	DFO	All aspects
	Release of approximately 1,000-3,000 coded-wire-tagged juvenile chinook salmon reared at Klukshu incubation box.	6/15-7/15	DFO	All aspects
Village Creek	Enumerate sockeye salmon using an electric counter.	6/10-10/18	DFO	All aspects
Blanchard, Takhanne, and Klukshu rivers and Goat Creek	Aerial surveys of spawning chinook salmon in index areas.	8/10	ADF&G	All aspects
Lower Alsek	Sample commercial catches of all salmon at lower Alsek and East River. Collect age-sex-length data (sockeye-600, chinook-600, coho-500); recover CWTs from chinook catches.	6/14-9/15	ADF&G	All aspects
Cabin, Tanis, Muddy, and Basin Creeks	Aerial surveys of spawning sockeye salmon in index areas.	8/1-8/15 10/1-10/15	ADF&G	All aspects

[a]Contacts:

Peter Etherton	(DFO)	All DFO projects.
Sandy Johnston	(DFO)	All DFO projects.
Keith Pahlke	(ADF&G)	Chinook aerial surveys & wild stock coded-wire tagging.
Kathleen Jensen	(ADF&G)	Lower Alsek and East Rivers commercial catch sampling.

Table 9. Proposed enhancement projects for transboundary Stikine and Taku rivers, 1995.

Location	Function	Dates	Agency	Responsibility*
Tahltan Lake	Backplant sockeye fry from Snettisham Hatchery.	6/1-7/1	ADF&G	All aspects
	Collect 6.0 million sockeye eggs.	9/1-9/30	DFO	Egg take and transport
	Hydroacoustic/limnological surveys to evaluate success of fry outplant.	6/1-9/30	DFO	All aspects
	Sample 250 male and 250 female adult sockeye from Tahltan Lake broodstock for otolith samples.	9/6-10/8	DFO	All aspects
	Enumeration and sampling of smolts and collection of otolith samples to determine enhanced contribution.	5/4-6/14	DFO	All aspects
	Incubation and thermal marking of juvenile sockeye at Snettisham Hatchery.	9/95-6/96	ADF&G	All aspects
Tatsamenie Lake	Backplant sockeye fry from Snettisham Hatchery.	6/1-7/01	ADF&G	All aspects
	Hydroacoustic/limnological surveys to evaluate success of fry outplants.	6/1-9/30	DFO	All aspects
	Collect up to 5.0 million sockeye eggs.	8/15-10/15	DFO	Egg take and transport
	Sample 500 adult sockeye from Tahltan Lake egg take for otolith samples.	9/6-10/8	DFO	All aspects
	Sample smolt outmigration.	5/10-6/4	DFO	All aspects
Trapper Lake	Backplant sockeye fry from Snettisham Hatchery.	6/1-7/01	ADF&G	All aspects
	Hydroacoustic/limnological surveys to evaluate success of fry outplants.	6/1-9/30	DFO	All aspects

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Table 9. (page 2 of 2)

Location	Function	Dates	Agency	Responsibility
Trapper & L. Trapper Lakes	Sample smolt outmigration.	Spring	DFO	All aspects
Tuya Lake	Backplant sockeye fry from Snettisham Hatchery.	6/1-7/1	ADF&G	All aspects
	Seasonal plankton sampling.	6/1-9/30	DFO	All aspects
	Enumeration and sampling of outmigrant smolts.	5/1-6/15	TTC/DFO	All aspects
Snettisham Hatchery	Incubation and thermal marking of juvenile sockeye (eggs & alevins) collected from Tahltan and Tatsamenie lakes at Snettisham Hatchery.	9/95-6/96	NSRAA/ ADF&G	All aspects

*Contacts:

Bruce Morley	(DFO)	All DFO programs.
Pete Hagen	(ADF&G)	Otolith marking.
Peter Etherton	(DFO)	Stikine River.
Kris Munk	(ADF&G)	Otolith marking.

Drainage Programs:

Ron Josephson	(ADF&G)	Snettisham Hatchery.
Pat Milligan	(DFO)	All DFO programs.
Scott Kelley	(ADF&G)	Snettisham Hatchery.
Doug Lofthouse	(DFO)	All DFO programs.
Steve Reifenstuhl	(Northern Southeast Regional Aquaculture Association, Inc.)	NSRAA projects.
Sandy Johnston	(DFO)	All DFO projects.
Ray Quock	(Tahltan First Nation (TFN))	TFN projects.