

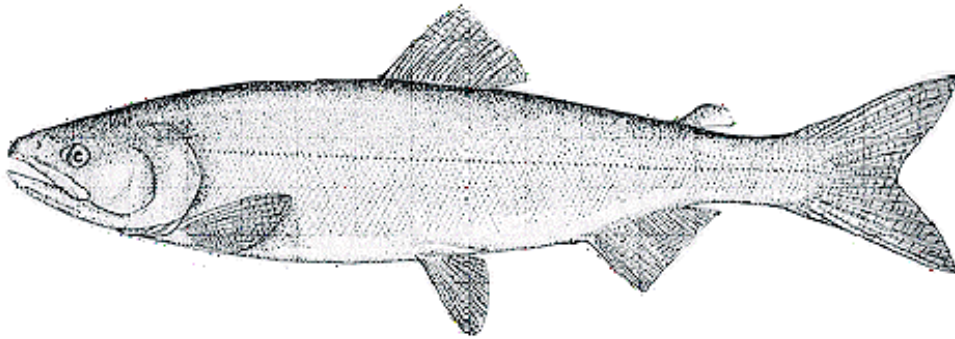
PACIFIC REGION

**INTEGRATED FISHERIES
MANAGEMENT PLAN**

SALMON

TRANSBOUNDARY RIVERS
(ALSEK, STIKINE, AND TAKU)

April 1st 2015 to March 31st 2016



Genus Oncorhynchus



Fisheries and Oceans
Canada

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This Integrated Fisheries Management Plan is intended for general purposes only. Where there is a discrepancy between the Plan and the Fisheries Act and Regulations, the Act and Regulations are the final authority. A description of Areas and Subareas referenced in this Plan can be found in the Pacific Fishery Management Area Regulations, 2007.

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DEPARTMENTAL CONTACTS

A more comprehensive list of contacts can be found online at:

www.pac.dfo-mpo.gc.ca/ops/fm/toppages/contacts_e.htm

24 Hour Recorded Information (Commercial)	Vancouver	(604) 666-2828
	Toll Free	(888) 431-3474

Pacific Salmon Commission (PSC) Office		(604) 684-8081
PSC Test Fisheries (Recorded, In-Season Information)		(604) 666-8200

Recreational Fishing: www.pac.dfo-mpo.gc.ca/fm-gp/rec/index-eng.htm

Commercial Fishing: www.pac.dfo-mpo.gc.ca/fm-gp/commercial/index-eng.htm

Regional Headquarters

Regional Director, Fisheries Management Branch	Rebecca Reid	(604) 666-0753
Director, Resource Management, Program Delivery	Paul Ryall	(604) 666-0115
Salmon and PICFI Director	Lisa Kerr	(604) 666-0208
Regional Resource Manager - Salmon	Jeff Grout	(604) 666-0497
Regional Salmon Officer	Kelly Binning	(604) 666-4902
Regional Recreational Fisheries Co-ordinator	Devona Adams	(604) 666-3271
Regional Director, Conservation and Protection	Tom Hlavac (Acting)	(604) 666-0604
Regional Director, Ecosystem Management	Bonnie Antcliffe	(604) 666-6532
Director, Aquaculture Management Division	Diana Trager	(604) 666-7009

Pacific Fishery Licence Unit (by appointment only)	Toll free	1-877-535-7307
200-401 Burrard Street		
Vancouver, B.C. V6C 3S4	Email: fishing-peche@dfo-mpo.gc.ca	

Yukon Transboundary Rivers Area

Area Director	Steve Gotch	(867) 393-6719
Manager, Treaties and Fisheries (Transboundary)	Steve Smith	(867) 393-6724
Fishery Manager (Transboundary)	Pete Etherton	(867) 393-6726
Fishery Manager (Transboundary)	Bill Waugh	(867) 393-6764
Area Chief, Conservation and Protection	Cliff Todd (Acting)	(250) 851-4922
Detachment Supervisor, Conservation and Protection	Katherine Pelletier	(867) 393-6820
AFS Coordinator/ Fishery Manager (Yukon)	Mary Ellen Jarvis	(867) 393-6815
Stock Assessment, Aquatic Science Biologist	Ian Boyce	(867) 393-6739
Salmonid Enhancement Program, Enhancement Ops	Sean Collins	(867) 393-6745
Salmonid Enhancement Program, Enhancement Ops	Corino Salomi	(604) 666-8712

24 Hour Recorded Information (Salmon Hot Line)	Whitehorse	(867) 393-3133
	Toll Free	1-877-725-6662
Turn in Poachers (TIPP)	Toll Free	1-800-661-0525

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Our Vision, Latest News, Current Topics

Acts, Orders, and Regulations (<http://www.dfo-mpo.gc.ca/acts-loi-eng.htm>)

Canada Shipping Act, Coastal Fisheries Protection Act, Department of Fisheries and Oceans Act, Financial Administration Act, Fish Inspection Act, Fisheries Act, Fisheries Development Act, Fishing and Recreational Harbours Act, Freshwater Fish Marketing Act, Navigable Waters Protection Act, Oceans Act.

Reports and Publications (<http://www.dfo-mpo.gc.ca/reports-rapports-eng.htm>)

Administration and Enforcement of the Fish Habitat Protection and Pollution Prevention Provisions of the *Fisheries Act*, Audit and Evaluation Reports - Audit and Evaluation Directorate Canadian Code of Conduct for Responsible Fishing Operations, Departmental Performance Reports, Fisheries Research Documents, Standing Committee's Reports and Government responses, Sustainable Development Strategy.

Waves (<http://waves-vagues.dfo-mpo.gc.ca/waves-vagues/>)

Fisheries and Oceans Canada online library catalogue

Pacific Salmon Treaty (www.psc.org)

Background information; full text of the treaty; Technical Committee Reports.

PACIFIC REGION - GENERAL

Main Page (www.pac.dfo-mpo.gc.ca/)

General information, Area information, Latest news, Current topics.

Policies, Reports and Programs

(<http://www.pac.dfo-mpo.gc.ca/fm-gp/species-especes/salmon-saumon/pol/index-eng.htm>)

Reports and Discussion Papers, New Directions Policy Series, Agreements.

Oceans Program (<http://www.pac.dfo-mpo.gc.ca/oceans/index-eng.htm>)

Integrated Coastal Management; Marine Protected Areas; Marine Environmental Quality; Oceans Outreach; Oceans Act.

PACIFIC REGION - FISHERIES MANAGEMENT

Main Page (<http://www.pac.dfo-mpo.gc.ca/fm-gp/index-eng.htm>)

Commercial Fisheries, New and Emerging Fisheries, Recreational Fisheries, Maps, Notices and Plans.

Aboriginal Fisheries Strategy (<http://www.pac.dfo-mpo.gc.ca/abor-autoc/index-eng.htm>) Aboriginal Fisheries Strategy (AFS) principles and objectives; AFS agreements; Programs; Treaty Negotiations.

Aquaculture Management (<http://www.pac.dfo-mpo.gc.ca/aquaculture/index-eng.htm>) The new federal regulatory program for aquaculture in British Columbia. Program overview and administration, public reporting, and aquaculture science.

Recreational Fisheries (<http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/index-eng.htm>) Fishery Regulations and Notices, Fishing Information, Recreational Fishery, Policy and Management, Contacts, Current B.C. Tidal Waters Sport Fishing Guide and Freshwater Supplement; Rockfish Conservation Areas, Shellfish Contamination Closures; On-line Licensing.

Commercial Fisheries (<http://www.pac.dfo-mpo.gc.ca/fm-gp/commercial/index-eng.htm>) Links to Groundfish, Herring, Salmon, Shellfish and New and Emerging Fisheries homepages; Selective Fishing, Test Fishing Information, Fishing Areas, Canadian Tide Tables, Fishery Management Plans, Commercial Fishery Notices (openings and closures).

Initiative to update the Commercial Salmon Allocation Framework

Website: <http://www.pac.dfo-mpo.gc.ca/consultation/smon/saf-crrs/index-eng.html>

Links to the Departments' consultation website which provides an overview of the process to update the commercial Salmon Allocation Framework (CSAF), including links to summary reports and submissions with recommendations.

Fisheries Notices (<http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/fns/index.cfm?>)

Want to receive fishery notices by e-mail? If you are a commercial fisher, processor, recreational sport licence vendor, multiple boat owner or re-distribute fishery notices, register your name and/or company at the web-site address above. Openings and closures, updates, and other relevant information regarding your chosen fishery are sent directly to your registered email. It's quick, it's easy and it's free.

Integrated Fishery Management Plans

(<http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/MPLANS/MPlans.htm>)

Current Management Plans for Groundfish, Pelagics, Shellfish (Invertebrates), Minor Finfish, Salmon; sample Licence Conditions; Archived Management Plans.

Salmon Test Fishery - Pacific Region

(<http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/salmon/testfish/default.htm>)

Definition, description, location and target stocks.

Licensing (<http://www.pac.dfo-mpo.gc.ca/fm-gp/licence-permis/index-eng.htm>)

Contact information; Recreational Licensing Information, Commercial Licence Types, Commercial Licence Areas, Licence Listings, Vessel Information, Vessel Directory, Licence Statistics and Application Forms.

Salmon (<http://www.pac.dfo-mpo.gc.ca/fm-gp/species-especies/salmon-saumon/index-eng.htm>)

Salmon Facts; Salmon Fisheries; Enhancement and Conservation; Research and Assessment; Consultations; Policies, Reports and Agreements; Glossary of Salmon Terms.

National On-line Licencing System (NOLS)

Web: www.dfo-mpo.gc.ca/fm-gp/sdc-cps/index-eng.htm

E-mail: SDC-CPS@dfo-mpo.gc.ca (please include postcode)

Telephone: 1-877-535-7307

Fax: 613-990-1866

TTY: 1-800-465-7735

Fraser River/B.C. Interior Area Resource Management and Stock Assessment (<http://www.pac.dfo-mpo.gc.ca/fraserriver/default.htm>)

Contact information; Test fishing and survey results (Albion, creel surveys, First Nations); Fraser River sockeye and pink escapement updates; Important notices; Recreational fishing information.

Salmon (<http://www.pac.dfo-mpo.gc.ca/fm-gp/species-especies/salmon-saumon/index-eng.htm>)

Salmon Facts; Salmon Fisheries; Enhancement and Conservation; Research and Assessment; Consultations; Policies, Reports and Agreements; Glossary of Salmon Terms

North Coast Resource Management (<http://www.pac.dfo-mpo.gc.ca/northcoast/default.htm>)

First Nations fisheries, Recreational fisheries; Commercial salmon and herring fisheries; Skeena Tye test fishery; Counting facilities; Post-season Review; Contacts.

Yukon/Transboundary Rivers Area Main Page

(<http://www.pac.dfo-mpo.gc.ca/yukon/index-eng.htm>)

Fisheries Management; Recreational fisheries; Fisheries Management; Licensing; Contacts.

PACIFIC REGION – SALMONID ENHANCEMENT PROGRAM

Main Page (<http://www.pac.dfo-mpo.gc.ca/sep-pmvs/index-eng.html>)

Publications (legislation, policy, guidelines, educational resources, brochures, newsletters and bulletins, papers and abstracts, reports); GIS maps and Data (Habitat inventories, spatial data holdings, land use planning maps); Community involvement (advisors and coordinators, educational materials, Habitat Conservation and Stewardship Program, projects, Stream talk).

PACIFIC REGION - POLICY AND COMMUNICATIONS

Main Page (<http://www.dfo-mpo.gc.ca/media-eng.htm>)

Media Releases; Salmon Updates, Backgrounders, Ministers Statements, Publications; Contacts.

Consultation Secretariat

(<http://www.pac.dfo-mpo.gc.ca/consultation/index-eng.htm>)

Consultation Calendar; Policies; National; Partnerships; Fisheries Management, Oceans, Science and Habitat and Enhancement Consultations; Current and Concluded Consultations.

Publications Catalogue

(<http://www.pac.dfo-mpo.gc.ca/publications/index-eng.htm>)

Listing of information booklets and fact sheets available through Communications branch.

Species at Risk Act (SARA)

(<http://www.dfo-mpo.gc.ca/species-especes/index-eng.htm>)

SARA species; SARA permits; public registry; enforcement; Stewardship projects; Consultation; Past Consultation; First Nations; Related Sites; For Kids; News Releases.

PACIFIC REGION - SCIENCE

Main Page (<http://www.pac.dfo-mpo.gc.ca/science/index-eng.htm>)

Science divisions; Research facilities; PSARC; International Research Initiatives.

FOREWARD

The purpose of this Integrated Fisheries Management Plan (IFMP) is to identify the specific objectives and requirements for the management of the Pacific salmon fisheries in the Transboundary Rivers of northwestern British Columbia and southwestern Yukon, as well as the measures that will be used to achieve these objectives. This document also serves to communicate the basic information on the fishery and its management to Fisheries and Oceans Canada (DFO, the Department) staff, legislated co-management boards and committees, First Nations, advisory groups, harvesters, and other interested parties. This IFMP provides a common understanding of the basic “rules” for the sustainable management of the fisheries resource.

The IFMP also provides a Pacific Regional context and highlights a number of initiatives of DFO and other partnering agencies that are being undertaken in the Pacific Region to conserve and manage the culturally, socially and economically important fisheries resources of British Columbia and the Yukon.

The document is organized so that the over-arching Regional considerations are presented first, followed by specific details pertaining to the salmon management, enhancement, stock assessment and compliance plans for each of the Transboundary rivers. Since the detailed watershed-specific plans tend to change frequently, they are included as Appendices 1 to 3 to facilitate prompt updating when necessary.

This IFMP is not a legally binding instrument which can form the basis of a legal challenge. The IFMP can be modified at any time and does not fetter the Minister's discretionary powers set out in the Fisheries Act. The Minister can, for reasons of conservation or for any other valid reasons, modify any provision of the IFMP in accordance with the powers granted pursuant to the Fisheries Act.

Where DFO is responsible for implementing obligations under land claim treaties and agreements, the IFMP will be implemented in a manner consistent with those obligations. In the event that an IFMP is inconsistent with these obligations, the provisions of the land claim treaties and agreements will prevail to the extent of the inconsistency.

Highlights/Key Changes for the 2015/16 Transboundary IFMP

- a) Alsek River: no substantive changes from 2014/15.
- b) Stikine River:
 - Limited directed Chinook salmon fishery to commence May 3.
 - Normal directed fisheries for sockeye and coho salmon expected with adjustments in sockeye harvest guidelines to reduce risk of exceeding Canadian Pacific Salmon Treaty harvest share.
 - Concerns over Little Tahltan River Chinook salmon stock abundance and potential impedance of Chinook and sockeye salmon migration in the Tahltan River resulting from the 2014 landslide in the lower river.
 - Sockeye fry outplants to Tuya Lake are not anticipated to occur in 2015.
- c) Taku River:
 - No directed fishery anticipated for Taku Chinook salmon unless warranted by in-season assessment (assessment fishery commences May 3).
 - Normal directed fisheries for sockeye and coho salmon expected with a new coho salmon escapement goal range and interim harvest arrangement.
 - concerns for Chinook escapement, and Kuthai and Tatsamenie sockeye.
- d) Mandatory use of the National Online Licensing System to purchase commercial fishing licences, and licence conditions (see: Licencing Service Changes under Regional Highlights below).

Regional Highlights

Catch Monitoring

Electronic Logbooks:

E-log pilot programs have been successfully in place in several commercial, recreational and First Nations fisheries. DFO is now advancing an initiative to expand the current e-log initiative to a national program. The vision of the project is to develop and implement, over a phased multi-year approach, a national integrated electronic catch and effort system designed to enable ongoing solutions for the fishing industry to meet their evolving data capture and traceability needs. Under a national e-log system, DFO will no longer fund regional specific software programming. DFO will develop specific standards for e-log software in partnership with the Canadian General Standards Board (CGSB) along with a certification process to ensure that all e-log software meets these standards. Harvesters can continue to use their e-logs as long as no software changes are required to meet licence conditions. If software changes are required to meet licence conditions, harvesters can select to use paper logbooks or arrange to pay for any associated costs for software updates with a service provider.

Commercial Pilots:

Commercial pilot programs initiated under the Strategic Framework for Fishery Monitoring and Catch Reporting in the Pacific Fisheries (see Section 1.6.5) in 2013 are planned to continue in order to address the minimum catch monitoring requirements identified by DFO and the Commercial Salmon Advisory Board Catch Monitoring Working Group (CSAB CMWG). The pilot programs will occur in competitive (full-fleet) fisheries in Area A seine for pink and sockeye (PFMA 3 and 6); Area C gill net for sockeye (Skeena and Nass), Area D gill net for sockeye (Johnstone Strait), Area E gill net for sockeye (Fraser River) and Area G troll for Chinook (WCVI).

Recreational:

The Sport Fishing Advisory Board (SFAB) and the recreational fishing sector strongly support effective fishery monitoring and catch reporting programs in recreational fisheries. The SFAB has been working with DFO on initiatives to strengthen fishing monitoring and catch reporting in the recreational fishery for a number of years and has developed a plan to meet the objectives of the *Strategic Framework for Fishery Monitoring and Catch Reporting in the Pacific Fisheries* (see Section 1.6.5).

Since 2013, as a condition of the Tidal Waters Sport Fishing License, licence holders in the recreational fishery have been required to provide accurate information regarding their catch and fishing activities upon request of a Creel Surveyor or an online surveyor, authorities designated under s.61 (5) of the Fisheries Act. In 2012, an internet survey (iRec) was initiated to conduct a monthly sample of a cross section of licence holders. This survey provides valuable catch and effort information throughout the entire year for all areas and all methods of recreational fishing, including angling, trapping, beach collecting and diving. A mail survey is also conducted nationally by DFO every 5 years.

Information on the internet recreational survey is available at:
<http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/irec/index-eng.html>.

First Nations:

The *Strategic Framework for Fisheries Monitoring and Catch Reporting in the Pacific Fisheries* (see Section 1.6.5) is being applied across the Region including First Nation food-social-ceremonial (FSC) fisheries. Work towards this includes assessing current monitoring practices, programs and gaps. The First Nations Fishery Council (FNFC) and other area aggregate groups have assisted in engagement to communicate the requirements of the Framework and importance of improving catch information. In addition, a significant focus has been on the development of integrated and coordinated data management and data entry systems within DFO and First Nation Band offices.

Licencing Service Changes

Fisheries and Oceans Canada (DFO) introduced the web-based National Online Licensing System (NOLS) in the spring of 2013. This web-based system replaces in-person counter services at Pacific Fishery Licencing Units. Fish harvesters/Licence Holders/vessel owners will now use the new online system to view, pay for and print their commercial fishing licences, licence conditions and/or receipts.

Fish harvesters received a one-time use only DFO Passcode in 2013, allowing them to log into NOLS to register and activate their accounts. At that time, they created their own unique Username and Password; fish harvesters must use this Username and Password each time to access their NOLS accounts in order to pay licence fees and request issuance of a licence.

Licence renewal and payment of fees is mandatory on an annual basis prior to the expiry date of each fishery, in order to maintain the eligibility to be issued the licence in the future. Please note the licence eligibility will cease if it is not renewed annually.

In March 2015, documentation will be provided by email detailing full procedures for salmon licence renewal/fees payment via NOLS, including the new 'Submit Request' feature allowing communal commercial licence eligibility holders to designate a vessel (application forms no longer required). Upon the Department receiving the required payment and all necessary information (i.e. logbook clearance), the licence will be issued and notification will be sent via email to advise Licence Holders/vessel owners that a change has been made to the licence holder's NOLS account. The licence documents, licence conditions and receipt will be available to be printed from NOLS at that time.

For queries, NOLS access problems or transactions that are not yet available in NOLS (e.g. vessel replacements and nominations); licencing services will continue to be available via:

Telephone: 1-877-535-7307 (ask for the 'Pacific Region')

Fax: 604-666-5855

E-mail: fishing-peche@dfo-mpo.gc.ca (specify 'Pacific Region' in the subject line)

Please visit the Pacific Region Licencing website and subscribe to fishery notices for updates on NOLS and licencing services: <http://www.pac.dfo-mpo.gc.ca/fm-gp/licence-permis/index-eng.html> . Information on NOLS may be found on the DFO internet site at: <http://www.dfo-mpo.gc.ca/fm-gp/sdc-cps/licence-permis-eng.htm>.

Use of Fish for Financing Salmon Science and Management Activities

Since the 1980's, the Minister of Fisheries and Oceans regularly assisted resource users to finance their part of some collaborative science and management activities through use-of-fish arrangements. This ended in June 2006 when the Federal Court of Appeal ruled that the Minister of Fisheries and Oceans did not have this authority under the existing Fisheries Act. In 2012, an amendment to the Fisheries Act granted the Minister the authority to allocate fish for financing science and management purposes.

DFO has adopted a two-track approach to the implementation of this new authority to address the immediate and long-term needs.

Where feasible for existing projects, track one includes a transition to the new use-of-fish authority for a period (starting April 1, 2013 to March 31, 2015 pending completion of Track 2).

Track two includes the development of a national policy framework to provide a standardized, rigorous and transparent process for all existing and new project evaluations and approvals.

DFO will work in close collaboration with resource users to ensure that the fisheries data collections necessary to set total allowable catch (TAC) levels and to ensure conservation will continue to be undertaken.

1 OVERVIEW

1.1 Introduction

This 2015/2016 Pacific Region Salmon Integrated Fisheries Management Plan (IFMP) covers the period of April 1, 2015 to March 31, 2016 for salmon stocks originating in the three principal Pacific drainage, Transboundary rivers originating in northwestern British Columbia and southwest Yukon, namely the Alsek, Stikine and Taku rivers.

The IFMP provides a broad context to the management of the Pacific salmon fishery in the Pacific Region and the interrelationships of all fishing sectors involved in this fishery. Section 2 considers stock assessment, science and traditional knowledge, while Sections 3 and 4 consider the social, cultural, and economic performance of the fishery and its broader management issues. Section 5 describes the objectives to address the general issues identified in Section 4. Sections 6 through 9 describe the overall foundations of planning, consultation and compliance regarding allocation and management procedures and plans.

Appendices 1 to 3 of this IFMP provide the specific integrated fishing plans for each of the Transboundary river systems in addition to providing other information such as run outlooks, spawning escapement goals, decision guidelines and a post season review.

1.2 History

For thousands of years, the history, culture and economy of Canada's west coast have been inextricably linked to Pacific salmon.

1.3 Types of Fishery and Participants

This plan describes the management of First Nations (FN), recreational and commercial fisheries for Pacific salmon that inhabit watersheds that originate in north-western B.C. and flow into south-eastern Alaska. Management of fisheries in this area is guided by the Transboundary Rivers Chapter 1 of Annex IV of the Canada-U.S. Pacific Salmon Treaty (PST) and recent interim arrangements agreed to by the Transboundary Rivers Panel that have been accepted by the Parties.

The transboundary (international) distribution of salmon stocks in this area requires that a cooperative approach to management is employed by Canada and the U.S. This document is intended to facilitate cooperative management, stock assessment, research and enhancement of Transboundary salmon stocks in the Alsek, Stikine and Taku rivers conducted by Fisheries and Oceans Canada (DFO), the Tahltan and Iskut First Nation (TIFN), the Taku River Tlingit First Nation (TRTFN), the Champagne & Aishihik First Nation (CAFN), Alaska Department of Fish and Game (ADFG) and the United States Department of Agriculture – Forest Service.

1.4 Location of Fishery

This IFMP is designed to describe the approach to fisheries in the Alsek, Stikine and Taku River watersheds (Transboundary Rivers). Locations of respective watersheds and fisheries are described in the introductory sections of Appendices 1-3 of this document.

1.5 Fishery Characteristics

Pacific salmon species covered in the plan include sockeye, coho, pink, chum and Chinook salmon. Fisheries include those undertaken by First Nations as well as recreational and commercial fisheries.

Section 35(1) of the Constitution Act, recognizes and affirms the existing Aboriginal and treaty rights of the Aboriginal peoples in Canada; however it does not specify the nature or content of the rights that are protected. In 1990, the Supreme Court of Canada issued a landmark ruling in the *Sparrow* decision. This decision found that the Musqueam First Nation has an Aboriginal right to fish for Food, Social and Ceremonial (FSC) purposes. The Supreme Court found that where an Aboriginal group has a right to fish for FSC purposes, it takes priority, after conservation, over other uses of the resource. The Supreme Court also indicated the importance of consulting with Aboriginal groups whenever their fishing rights might be affected.

Pre-season, DFO engages in a variety of consultation and collaborative harvest planning processes with First Nations at the community level, or at broader tribal or watershed levels. Fisheries are then authorized via a Communal Licence issued by the Department under the *Aboriginal Communal Fishing Licences Regulations*. These licences are typically issued to individual bands or tribal groupings, and describe the details of authorized fisheries including dates, times, methods, and locations of fishing. Licences and Aboriginal Fisheries Strategy (AFS) agreements (where applicable) include provisions that allow First Nations' designation of individuals to fish for the group and in some cases, vessels that will participate in fisheries.

Fishing techniques used in FSC fisheries are quite varied, ranging from traditional methods such as dip nets and traps to modern commercial methods such as gill nets fished from specialized vessels.

Separate from FSC fisheries, some First Nations have communal access to commercial opportunities as follows:

- Commercial fisheries access through communal commercial licences acquired through the Allocation Transfer Program (ATP). These licences are fished in a manner that is comparable to the general commercial fishery.
- Inland demonstration fisheries (e.g. Nass River and Skeena River) to date are supported through licences relinquished from the commercial salmon fleet from the ATP and Pacific Integrated Commercial Fisheries Initiative (PICFI) programs and private business arrangements from industry.
- At some enhancement facilities, surplus stocks not required for conservation or enhancement purposes are made available to First Nations for food or for sale.

Fisheries and Oceans Canada regulates recreational fishing for Pacific salmon in both tidal and non-tidal waters. Anglers wishing to retain salmon taken from either tidal or non-tidal waters in B.C. must also have an appropriate salmon conservation stamp affixed to their valid recreational fishing licence. Part of the proceeds from the sale of stamps is used to fund salmon restoration projects supported by the non-profit Pacific Salmon Foundation. In the Yukon, besides having a Yukon Angling Licence, salmon anglers are also required to have a Salmon Conservation Catch Card.

Fishing techniques used in the recreational fishery largely focus on casting with bait, lures or artificial flies. Anglers most commonly fish from shore, however boats are used to access many fishing sites. Only barbless hooks may be used when fishing for salmon in British Columbia and in many areas of the Yukon.

Commercial salmon licences in the Transboundary rivers have been issued for two gear types: gill nets and fish wheels. Salmon gill nets are rectangular nets that hang in the water and are set from shore, or drifted in the current still attached to either the stern or bow of the vessel. Fish swim headfirst into the net, entangling their gills in the mesh. Altering mesh size and the way in which nets are suspended in the water affects efficiency and is sometimes used to reduce impacts on non-target species. Fish wheels are an active fish-capture device powered by the flow of water (current) past the wheel. The wheel mechanism is outfitted with large baskets and paddles attached to a frame that rotates on an axis mounted on a floating platform. As the wheel rotates, the baskets are successively dipped into the water and capture fish traveling upstream. The fish caught in the baskets fall into a holding tank where they are usually held live until removed.

Licence conditions and commercial fishing plans lay out allowable gear characteristics such as mesh size, net dimensions and the methods by which gear may be used.

1.6 Governance

Departmental policy development related to the management of fisheries is guided by a range of considerations that include legislated mandates, judicial guidance and international and domestic commitments that promote conservation, biodiversity and a precautionary, ecosystem-based approach to the management of aquatic resources. Policies were/are developed with considerable consultation from those with an interest in salmon management. While the policies themselves are not subject to annual changes, implementation details are continually refined where there is general support.

1.6.1 Sustainable Fisheries Framework

The Sustainable Fisheries Framework (SFF) is a toolbox of existing and new policies for DFO to sustainably manage Canadian fisheries by conserving fish stocks while supporting the fisheries and industries that rely on healthy fish populations as much as practicable. The SFF provides planning and operational tools that allow these goals to be achieved in a clear, predictable, transparent, and inclusive manner, and provides the foundation for new conservation policies to implement the ecosystem and precautionary approaches to fisheries management. These new policies include:

- Managing the Impacts of Fishing on Sensitive Benthic Areas;
- New Fisheries for Forage Species;
- A Fishery Decision-Making Framework Incorporating the Precautionary Approach.

For more information on the Sustainable Fisheries Framework and its policies, please visit: <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm>

1.6.2 Policy Framework for the Management of Pacific Salmon Fisheries

Salmon management programs continue to be guided by the following policies: *Canada's Policy for Conservation of Wild Pacific Salmon*, *An Allocation Policy for Pacific Salmon*, *Pacific Fisheries Reform*, *A Policy for Selective Fishing*, *A Framework for Improved Decision Making in the Pacific Salmon Fishery*, and the *Pacific Region Fishery Monitoring and Reporting Framework*.

Canada's Policy for Conservation of Wild Pacific Salmon (the Wild Salmon Policy or WSP) sets out the vision regarding the importance and role of Pacific wild salmon as well as a strategy for their protection. More information on this can be found in Section 4.1.1 of this plan or at: <http://www.pac.dfo-mpo.gc.ca/publications/pdfs/wsp-eng.pdf>.

An Allocation Policy for Pacific Salmon, announced in 1999, contains principles to guide the management and allocation of the Pacific salmon resource between First Nations, commercial and recreational harvesters, and forms the basis for general decision guidelines outlined in Section 6.5 of this plan. The *Allocation Policy for Pacific Salmon* can be found on-line at: <http://www.dfo-mpo.gc.ca/Library/240366.pdf>.

Pacific Fisheries Reform, announced by the Department in April of 2005, provides a vision of a sustainable fishery where the full potential of the resource is realized, Aboriginal rights and title are respected, there is certainty and stability for all, and fishery participants share in the responsibility of management. Future treaties with First Nations are contemplated, as is the need to be adaptive and responsive to change. This policy direction provides a framework for improving the economic viability of commercial fisheries, and to addressing First Nations' aspirations with respect to FSC and commercial access and involvement in management. The "*Vision for Recreational Fisheries in B.C 2009-20.*" was approved January 2010 by DFO, the Sport Fishing Advisory Board (SFAB) and the Province of B.C. Guided by this vision, an action and implementation plan is being developed to build upon the collaborative process established by the Federal and Provincial governments and the SFAB. The document can be found on the DFO Pacific Region website at: <http://www.pac.dfo-mpo.gc.ca/consultation/smon/sfab-ccps/docs/rec-vision-eng.pdf>.

In May 1999, the Department released *A Policy for Selective Fishing in Canada's Pacific Fisheries*. Under the Department's selective fishing initiative, harvester groups in the Pacific Region have experimented with a variety of methods to reduce the impact of fisheries on non-target species, with a number of measures reaching implementation in

various fisheries. A copy of *A Policy for Selective Fishing in Canada's Pacific Fisheries* can be downloaded at: <http://www.pac.dfo-mpo.gc.ca/fm-gp/species-especes/salmon-saumon/pol/index-eng.html>.

1.6.3 First Nations and Canada's Fisheries

The Government of Canada's legal and policy frameworks identify a special obligation to provide First Nations the opportunity to harvest fish for food, social and ceremonial purposes. The Aboriginal Fisheries Strategy (AFS) was implemented in 1992 to address several objectives related to First Nations and their access to the resource. These included:

- improving relations with First Nations;
- providing a framework for the management of First Nation fisheries in a manner that is consistent with the 1990 Supreme Court of Canada's *Sparrow* decision;
- greater involvement of First Nations in the management of fisheries; and
- increased participation by First Nations in commercial fisheries.

The AFS continues to be the principal mechanism that supports the development of relationships with First Nations including the consultation, planning and implementation of fisheries, and the development of capacity to undertake fisheries management, stock assessment, enhancement and habitat protection programs.

In addition to fishing opportunities for FSC purposes, DFO acknowledges that in *Ahousaht Indian Band et al. v. Canada and British Columbia*, the courts have found that five Nuu-chah-nulth First Nations located on the West Coast of Vancouver Island - Ahousaht, Ehattesaht, Hesquiaht, Mowachaht/Muchalaht, and Tla-o-qui-aht – have “*aboriginal rights to fish for any species of fish within their Fishing Territories and to sell that fish, with the exception of geoduck*”. The Department is working with the First Nations pursuant to the rights found by the courts, to find “the manner in which their rights can be accommodated and exercised without jeopardizing Canada's legislative objectives and societal interests in regulating the fishery.”

The Aboriginal Aquatic Resources and Oceans Management (AAROM) program has been implemented to fund aggregations of First Nation groups to build the capacity required to coordinate fishery planning and program initiatives. AAROM is focused on developing affiliations between First Nations to work together at a broad watershed or ecosystem level where there are common interests and where decisions and solutions can be based on integrated knowledge of several Aboriginal communities. In the conduct of their activities, AAROM bodies are working to be accountable to the communities they serve, while working to advance collaborative relationships between member communities, DFO and other interests in aquatic resource and oceans management. For 2015-2016, there are 20 AAROM agreements in the Pacific Region. The 20 AAROM Organizations include: Aboriginal Aquaculture Association, A-Tlegay Fisheries Society, Canadian Columbia River Inter-Tribal Fisheries Commission, First Nations Fishery Council, Fraser River Aboriginal Fisheries Secretariat, Central Coast Indigenous Resource, Q'ul'thanumtsun Aquatic Resources Society, Island Marine and Aquatic Working Group (IMAWG), Sumas First Nation (LFFA), Nlaka'pamux Nation Tribal

Council, North Coast Skeena FNs Stewardship Society, Nuu-chah-nulth Tribal Council, Okanagan Nation Alliance, Pacific Salmon Commission – FNFC, Secretariat of the Haida Nation, Shuswap Nation TC (Secwepemc), Skeena Fisheries Commission, Sto:lo Nation, Sto:lo Tribal Council, and Upper Fraser Fisheries Conservation Alliance.

As part of the reform of Pacific fisheries, DFO is looking for opportunities to increase First Nation participation in economic fisheries through an interest-driven business planning process. New planning approaches and fishing techniques may be required to ensure an economically viable fishery. In recent years, some First Nations' inland "demonstration fisheries" have occurred in order to explore the potential for inland fisheries targeting terminal runs of salmon. The Department is also working with First Nations and others with an interest in the salmon fishery to improve collaboration in the planning of fisheries and to improve fisheries monitoring, catch reporting and other accountability measures for all fish harvesters.

1.6.4 Pacific Integrated Commercial Fisheries Initiative

The Pacific Integrated Commercial Fisheries Initiative (PICFI) was announced in 2007 and is aimed at achieving environmentally sustainable and economically viable commercial fisheries, where conservation is the first priority and First Nations' aspirations to be more involved are supported as well as improving the overall management of fisheries. In its first 5 years, the Government of Canada committed \$175 million to implement the initiative. It was renewed for 2012-13 and again for the 2013-2014 fiscal years. PICFI has supported fisheries reforms by targeting on the following outcomes: 1) greater stability of access for commercial harvesters through increasing First Nation participation in commercial fisheries; 2) increased compliance with fishing rules and greater confidence in catch data through strengthened fisheries monitoring, catch reporting and enforcement and improved collection and storage of catch information; 3) collaborative management mechanisms for all harvest sectors, including the growing aboriginal commercial participants. To continue to build on the progress achieved to date and to continue promoting the integration of commercial fisheries, the Economic Action Plan 2014 announced a two year renewal of the PICFI until the end of 2015-16.

1.6.5 Fishery Monitoring and Catch Reporting

A complete, accurate and verifiable fishery monitoring and catch reporting program is required to successfully achieve conservation, ecosystem and socio-economic and other management objectives. Across all fisheries, strategies are being developed to improve catch monitoring programs by clearly identifying information requirements and their supporting rationale for each specific fishery and evaluating the current monitoring programs to identify gaps. Managers and harvesters will annually work together to address those gaps. The Department finalized the "*Strategic Framework for Fisheries Monitoring and Catch Reporting in the Pacific Fisheries*" (the Framework) in the spring of 2012. The Framework outlines how consistent risk assessment criteria can be applied to each fishery to determine the level of monitoring required, while allowing for final monitoring and reporting programs to reflect the fishery's unique characteristics. More

information is available at: http://www.pac.dfo-mpo.gc.ca/fm-gp/docs/framework_monitoring-cadre_surveillance/page-1-eng.html.

1.7 Consultation

Fisheries and Oceans Canada will continue to consult with First Nations and recreational and commercial harvesters through the Salmon Coordinating Committee (SCC) and/or other regional, Territorial (e.g. Yukon Salmon Subcommittee) and bilateral processes, to further co-ordinate fishing activities as the season unfolds.

Consultative elements of an Improved Decision Making discussion paper have been implemented through establishment of the Consultation Secretariat, which works to improve the flow of information between stakeholders and the Department. Up-to-date information pertaining to on-going consultations can be found on the Secretariat's website at: <http://www.pac.dfo-mpo.gc.ca/consultation/index-eng.htm>.

This plan incorporates the results of ongoing consultations and input from international and First Nation treaty processes, and local salmon management advisory committees. Consultation processes for Alsek, Stikine and Taku salmon fisheries are described in respective Sections 4 of Appendices 1-3 of this document.

1.8 Approval Process

This plan is approved by the Pacific Region Director General of Fisheries and Oceans Canada.

2 STOCK ASSESSMENT, SCIENCE AND TRADITIONAL ECOLOGICAL KNOWLEDGE

2.1 Biological Synopsis

Pacific salmon include five species belonging to the genus *Oncorhynchus* family Salmonidae: pink (*O. gorbuscha*), chum (*O. keta*), sockeye (*O. nerka*), coho (*O. kisutch*) and Chinook (*O. tshawytscha*). The native range of Pacific [salmon](#) includes the North Pacific Ocean, Bering Strait, southwestern Beaufort Sea and surrounding fresh waters. They occur in an estimated 1300 -1500 rivers and streams in B.C. and Yukon; notably, the [Yukon River](#), [Skeena River](#) and [Nass River](#) in the north, and the [Fraser River](#) in the south. In total, these rivers account for more than 75% of the total salmon numbers in the Region.

Pacific salmon are anadromous; salmon breed and spend varying portions of their life in fresh water, then travel to the ocean to feed until maturity before returning to freshwater to spawn. Physical characteristics, life histories and spawning habits vary from species to species. Total life spans range from two years (for pink) up to six or eight years (for some sockeye and Chinook, respectively). Pacific salmon migrate into rivers and streams to spawn from spring to late fall; after courtship, eggs are released, fertilized and then

buried in gravel. Both adults die after spawning. In mid-winter the eggs hatch into alevins. In spring, the young emerge and stay in freshwater streams and lakes from 1 week to 2 years. Most then go to sea for 1-5 years, undertaking a large ocean-feeding migration, although sockeye have also developed a land-locked form (kokanee). In the ocean, the [sockeye](#), [pink](#) and [chum](#) feed primarily on plankton and crustaceans such as tiny shrimp. [Chinook](#) and [coho](#) also eat smaller fish such as herring. At sea, the species attain the following average adult weights: 1-3 kg, pink; 5-7 kg, chum; 3.5-7 kg, coho; 2-4 kg, sockeye; 6-18 kg, Chinook (the largest recorded Chinook was 57.27 kg).

Pacific salmon complete their life cycle by returning to their natal stream to spawn, in many cases to the particular gravel bed where they were hatched. Homing of Pacific salmon to their natal stream is an important biological characteristic of salmon stocks. Each stock is genetically adapted to the environment in which it resides, and exhibits unique characteristics such as life history, migration route, migration timing, and productivity. Sockeye and Chinook generally travel the farthest upstream to spawn; whereas, in B.C., chum, coho and pink salmon usually spawn closer to the sea. Chum and coho of the Yukon River undergo much longer upstream migrations.

The numbers of Pacific salmon returning to Canadian waters varies greatly from year to year and decade to decade, often with pronounced population cycles. For example, many sockeye salmon populations are very abundant every third or fourth year. This is seen most dramatically in the Fraser River, where the abundance of some populations in abundant years is many times larger than that of other years. Longer term cycles are also apparent, but less regular, and seem to be associated with changes in ocean conditions that affect survival during the feeding migration.

Chinook are the largest of the species and live the longest. Chinook migrate upstream from the spring through the fall as far as 1,500 kilometres inland in B.C., but up to 3,000 km in the Yukon. Chinook fry may go to sea soon after hatching or, after one to two years in freshwater. Chinook mature at age three to eight years. Jacks, defined as 2-year-old sexually mature adults that return to spawn, are common among Chinook, coho and sockeye salmon.

Adult coho generally return from mid to late summer and early fall. Most choose streams close to the ocean, although some journey as far as 1,500 kilometres inland in B.C. and more than 2,000 km in the Yukon. In contrast to other salmon, young coho fry remain in their spawning stream for a full year or two after emerging from the gravel. Their age at maturity is normally three to four years.

Sockeye generally spawn in streams with lakes in their watershed or in lakes. Young sockeye usually spend between one and three years in a lake before migrating to sea; whereas, fry produced from some mainstem spawning populations in the Transboundary rivers migrate to sea in the year of emergence. Juvenile sockeye move rapidly out of the estuaries and may migrate thousands of kilometres in the Gulf of Alaska and the North Pacific where they feed. They return to their natal spawning stream at ages 3 to 6 years. Sockeye that live exclusively in fresh water are called kokanee.

In B.C., chum salmon generally spawn in the fall, usually in the lower tributaries along the coast and rarely more than 150 kilometres inland. However, some Yukon River fall chum salmon migrate well over 2,500 km to spawning grounds in the Yukon, whereas very few summer chum migrate into Canadian portions of this watershed. Chum salmon generally mature at ages 3 to 5. Fry emerge in the spring and go directly to sea.

Pink salmon live only two years almost entirely in ocean feeding areas. Adults leave the ocean in the summer and early fall and usually spawn in streams not fed by lakes, a short distance from the sea. Fry migrate to the sea as soon as they emerge from the gravel.

All five Pacific salmon species are harvested in First Nations fisheries in coastal and inland areas. Coho and Chinook are the preferred species in the B.C. coastal mixed-stock recreational and commercial hook and line fisheries, and, to a lesser extent, are caught by gill and seine nets. Sockeye, pink and chum are harvested primarily by First Nations and commercial net fishers, but also in some recreational fisheries.

Salmon Life Cycle

Salmon deposit and bury their eggs in nests called redds, which are normally constructed in gravel. Generally the size of gravel chosen will depend on the size of the female parent. The embryos incubate and hatch within the redd and usually remain in the gravel until they have depleted their yolk supply and have become "buttoned-up". Embryo development rates and timing of fry emergence from the gravel is determined primarily by the water temperatures during incubation. Fry normally emerge in the spring and, depending on the species and the stock, can remain in freshwater streams or lakes from just a few hours up to two years prior to migrating to the ocean. Once at sea, the species undertake migrations of varying distance lasting up to several years (Figure 1). Within a species, different stocks can display markedly different migration patterns

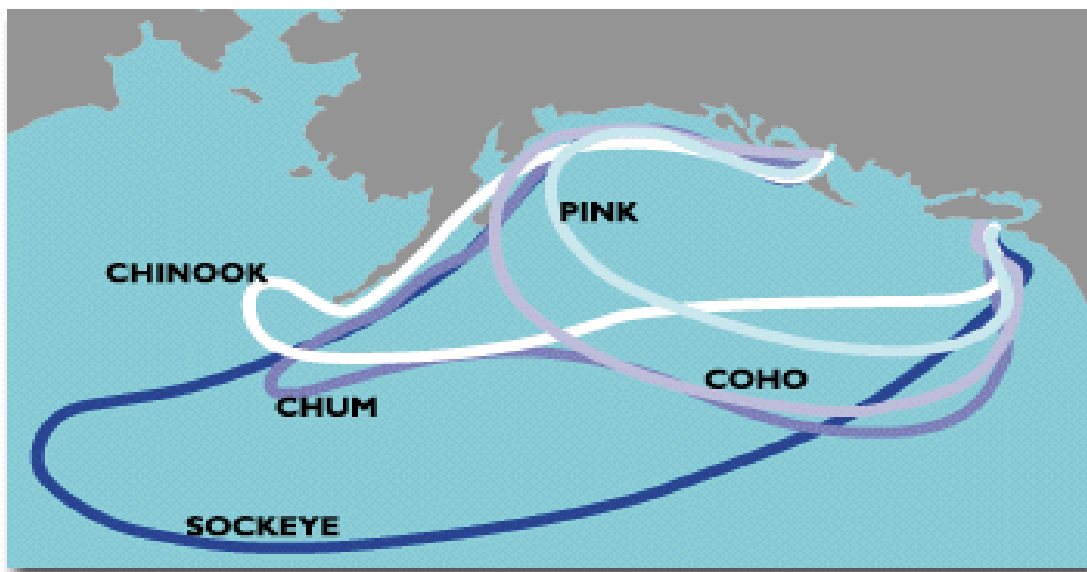


Figure 1. Typical ocean habitat of B.C. salmon in the Pacific Ocean.

[from Agriculture & Agri-Food Canada, see: <http://www.ats.agr.gc.ca/sea-mer/4810-eng.htm>]

An example of the contrasts in some life history characteristics of salmon appears in Table 1 (from Haig-Brown Kingfisher Creek Restoration Project, 1998-99). Once the salmon have reached maturity in the ocean, they migrate back to their natal rivers. Only a fraction of eggs will survive to adulthood to deposit their eggs to continue the cycle.

Table 1. Summary of life history characteristics for five Pacific salmon.

	Coho <i>O. kisutch</i>	Sockeye <i>O. nerka</i>	Pink <i>O. gorbuscha</i>	Chum <i>O. keta</i>	Chinook <i>O. tsawytscha</i>
Season when eggs hatch	Spring	Spring	Spring	Spring	Spring
Length of stay in freshwater	1–2 years; 1 year is common.	1 month to 2 years.	Virtually none; often straight to ocean.	Virtually none; often straight to ocean.	1 to 2 years
Primary rearing habitat	Stream	Lake/stream	Estuary	Estuary	Stream
Size at ocean migration	10cm or more	Variable, 6.5 to 12cm	About 3.3cm	2.8 to 5.5cm	5 to 15cm
Ocean voyage	4–18 months	16–52 months	18 months	2 to 5 years	4 mths to 5 years
Age at return to freshwater	During 2nd to 4th year.	During 3rd to 5th years	During 2nd year	During 3rd to 5th years.	During 2nd to 6th years.
Season/month of return	Late summer to January.	Midsummer to late autumn.	July to September	July to October	Spring to fall; some rivers support >one run.
#eggs/female	2,000–3,000	2,000–4,500	1,200–2,000	2,000–3,000	2k-17k (generally 5k-6k)
Preferred spawning area	Small streams	Near and in lake systems.	Close to ocean	Above turbulent areas or upwellings.	Very broad tolerances

2.2 Ecosystem Interactions

As a consequence of their anadromous life history, salmon are sensitive to changes in both the marine and freshwater ecosystems. Salmon are an ecologically important species supporting vast food webs in oceanic, estuarine, freshwater and terrestrial ecosystems by providing nutrients every year during their return migration to the rivers and lakes to spawn.

DFO is moving away from management of salmon as a single species and moving towards an integrated ecosystem approach to science as called for in the *Wild Salmon Policy* (see Section 4.1.1).

For strategic planning and successful management of Pacific salmon, it will be essential to link variation in salmon production with changes in climate and their ecosystems. Salmon productivity in the Pacific is clearly sensitive to climate-related changes in freshwater, estuary and ocean conditions. Historically, warm periods in the coastal ocean have coincided with relatively low abundances of salmon, while cooler ocean periods have coincided with relatively high salmon numbers. In the past century, most Pacific salmon populations have fared best in periods having high precipitation, deep mountain

snowpack, cool air and water temperatures, cool coastal ocean temperatures, and abundant north-to-south “upwelling” winds in spring and summer.

The Department conducts programs to monitor and study environmental conditions. These programs include:

- the Georgia Strait Ecosystem Research Initiative:
<http://www.pac.dfo-mpo.gc.ca/science/oceans/detroit-Georgia-strait/index-eng.htm>;
- the Fraser River Watershed Watch;
- monitoring of physical, biological and chemical characteristics of fresh and marine waters; and
- chlorophyll production and phytoplankton timing and abundance.

The annual State of the Oceans Report reports on changes in atmospheric and oceanic conditions which have the potential to affect Pacific salmon populations and informs science-based decision-making and DFO’s management of fisheries and marine resources in the Pacific Region (see: <http://www.dfo-mpo.gc.ca/science/coe-cde/soto/index-eng.asp>). The International Programme on the State of the Oceans (IPSO) also produces status reports, the most recent of which was in 2013. This report identifies a serious deterioration in the state of the oceans (e.g. acidification) as a result of climate change and other anthropogenic stressors (see: <http://www.stateoftheocean.org/>).

2.3 Aboriginal Traditional Knowledge/Traditional Ecological Knowledge

Both Aboriginal Traditional Knowledge (ATK) and Traditional Ecological Knowledge (TEK) are cumulative knowledge gathered over generations and encompass regional, local cultural and spiritual connections to ecosystems and all forms of plant and animal life. ATK is knowledge held by Aboriginal peoples and First Nation (FN) communities, while TEK is local knowledge held by Aboriginal and non-Aboriginal people and communities, including industry, academia, and public sectors. While qualitatively they may be different, both represent cumulative knowledge that may be gathered over many generations and can be regionally and/or locally specific, and can often be utilized to improve the management process, and the foundation upon which it is based.

The growing awareness of the value of ATK and TEK is reflected in the increasing requirements for both to be included in environmental assessments, co-management arrangements, species at risk recovery plans, and coastal management decision-making processes. ATK and TEK may inform and fill knowledge gaps related to the health of salmon stocks and to aid decision making related to development and resource use. Government and the scientific community acknowledge the need to access and consider ATK and TEK in meaningful and respectful ways. However, the challenge for resource managers is how to engage knowledge holders and how to ensure that the information can be accessed and considered in a mutually acceptable manner, by both knowledge holders, and the broader community of First Nations, stakeholders, managers, and policy makers involved in the fisheries.

As summarized in Section 1.6.3, the Aboriginal and Aquatic Resource and Oceans Management program initiated in 2004 is focused on establishing and enhancing collaborative management structures that contribute to integrated ecosystem/watershed management and planning processes. One of the main objectives of this program is to improve information-sharing among Aboriginal communities, DFO and stakeholders.

The Wild Salmon Policy (WSP) acknowledges the importance of integrating ATK and TEK into the strategic planning process and the Department is exploring best practices to develop an approach for incorporating ATK and TEK into WSP integrated planning. The Department will also consider identifying potential partnerships with First Nation organizations to develop an approach for integrating ATK into WSP, particularly in planning initiatives.

The federal Species at Risk Act (SARA) makes a special reference to the inclusion of Traditional Knowledge in the recovery of species at risk. The Department has developed an operational guidance document for SARA practitioners (*Guidance on Considering Traditional Knowledge in Species at Risk Implementation, 2011*). Aboriginal groups have participated in the development and implementation of species recovery strategies, e.g. Interior Fraser River coho salmon, and Cultus and Sakinaw sockeye salmon.

An example of TEK utilization in the Transboundary Rivers Area was the successful location of principal salmon spawning sites on the Stikine and Taku rivers. Some of these sites now serve as key index areas for assessing the current run strength and to compare and complement historical run size estimates to these index areas. For example, enumeration weirs at Tahltan Lake and Little Tahltan River have been operated since 1959 and 1985, respectively – sites that were selected based on TEK shared with government agencies.

2.4 Stock Assessment

Salmon stock assessment is primarily concerned with providing scientific information for conservation and management of salmon resources. Stock assessment describes the past and present status of salmon stocks and forecasts future status of stocks under different scenarios. Stock assessment programs contribute information to the fisheries management process, from the setting of biologically based objectives (and policies) to providing expert advice in the implementation of management plans. Stock assessment information also supports First Nation and associated Treaty obligations, integrated ocean management planning, development of marine and freshwater protected areas, protection and recovery of species at risk, and international Treaty obligations and negotiations.

Historically, stock assessment has primarily focused on population dynamics of individual exploited stocks, the biological and population processes such as growth, reproduction, recruitment and mortality. As DFO moves to implementation of the WSP and an ecosystem approach, populations must be considered in a broader context and all activities impacting status, not just fishing, must be considered. For example, programs are required to monitor ecosystem status, species interactions, variations in conditions in freshwater and marine environments and biodiversity.

In the Pacific Region, salmon stock assessment advice is provided through the Stock Assessment Section of the Salmon and Freshwater Ecosystem Division. The Stock Assessment Coordinating Committee (SACC) serves as the principal forum in the Region for regional planning and coordination of salmon stock assessment programs across the Region's Organizational Areas, while the operational programs are delivered by the Area-based staff. Delivery of the region-wide salmon assessment program requires scientific and technical expertise to: design, lead and/or participate in assessment projects; conduct related research and development; analyse data and report information; provide advice; and communicate internally and externally.

In order to standardize stock monitoring, determination of status, and development of benchmarks and management strategies to achieve them, the Stock Assessment Section has championed the development of the *Salmon Stock Assessment Framework* which is shaped by the WSP. Further information about this framework and its tie to the WSP appears in Section 4.1.1

The vast number of stocks and the complex life cycle of salmon present substantial assessment and management challenges. Stock assessment activities are largely project based and are required on a continual basis because populations are dynamic and subject to shifts in productivity and abundance in response to environmental, biological, and human-induced factors. Responsible management requires continual updating of assessment information and advice. Scientists use a variety of techniques to generate estimates and forecasts of abundance (enumeration of juvenile "recruits", females or adults on the spawning grounds, tagging and mark recapture studies, etc.). For most species, several methods may be used to generate the estimates and forecasts of abundance.

External partners and clients play an increasing role in delivery of the stock assessment activities. Some First Nations, and recreational and commercial harvesters contribute directly through data collection and reporting. First Nations and community groups conduct field data collection projects. Universities and non-government organizations (NGOs) are active in the analytical and peer review elements. Stock assessment staff collaborate with other regional, national and international organizations and government agencies, and conduct numerous cooperative and/or joint programs. For example, many of the Transboundary river stock assessment programs are conducted jointly with local First Nations and ADFG.

The Centre for Science Advice Pacific (CSAP) Salmon Subcommittee serves as the primary regional forum for peer review and evaluation of scientific research and literature, including TEK, on wild Pacific salmon. CSAP fosters national standards of excellence and coordinates the peer review of scientific assessments and advice for the DFO in the Pacific region. This review body allows for participation by outside experts, First Nations, fisheries stakeholders and the public. CSAP also coordinates communication of the results of the scientific review and advisory processes. Reports on the status of salmon, environmental and ecosystem overviews, and research documents are available from CSAP web site. <http://www.pac.dfo-mpo.gc.ca/science/psarc-ceesp/index-eng.html>.

Data Sources

Sources of data are documented in existing reports on the status of salmon, and in environmental and ecosystem overviews, that are available from the CSAP publication web site: <http://www.isdm-gdsi.gc.ca/csas-sccs/applications/Publications/index-eng.asp>. In addition, comprehensive salmon stock assessment databases have been developed for decades by DFO and are maintained in the Region.

Annually, DFO provides a preliminary qualitative Regional outlook of status for salmon management units, the Salmon Outlook, for planning purposes prior to formal forecasts of abundance. The Outlook is available on the DFO website: http://www.pac.dfo-mpo.gc.ca/fm-gp/species-especies/salmon-saumon/outlook-perspective/salmon_outlook-perspective_saumon-2015-eng.html. Formal salmon abundance forecasts are generally completed by April.

DFO is continuing to implement WSP Strategy 1.2, i.e. determination of biological benchmarks and assess status. [Benchmarks for Fraser Sockeye Conservation Units](#) were developed in 2010 and [Status of Fraser River Conservation Units](#) were reviewed in 2011, both through Canadian Science Advisory Secretariat (CSAS) Regional Peer Review (RPR) processes. DFO completed a CSAS RPR review of WSP benchmarks and status for Southern BC Chinook in February 2014, an assessment of WSP benchmarks and status for Interior Fraser Coho in November 2014, and estimates of a biologically-based spawning goal and biological benchmarks for Taku coho in November 2014. Work is ongoing to develop a habitat based approach to determine benchmarks for Strait of Georgia and Lower Fraser River Coho Conservation Units.

Additional information about CSAS, the CSAS schedule of RPRs and publications can be found at: <http://www.dfo-mpo.gc.ca/csas-sccs/index-eng.htm>.

2.5 Precautionary Approach

Generally, science advice to fisheries management considers data quality and incorporates uncertainty (e.g. a stock status forecast is frequently presented as a statistical distribution rather than a point estimate). WSP benchmarks of biological status will inform the continuation of the precautionary approach to management of salmon resources. Decisions on recovery and fisheries objectives will be made as part of the Strategic Planning Process described under WSP Strategy 4. To date, benchmarks have been reviewed for Fraser sockeye CUs and work is underway on WSP pilots in Barkley Sound and the Skeena watershed. Until benchmarks are determined for each CU, DFO must rely on indicators of status and existing species and stock-specific constraints established for escapement goals and harvest rates by domestic (e.g. Interior Fraser Coho Conservation Strategy, Cultus Lake Sockeye Conservation Strategy) and international (e.g. Pacific Salmon Treaty) processes.

2.6 Research

An overview of the science & research in the Pacific Region is available on the regional website: <http://www.pac.dfo-mpo.gc.ca/science/index-eng.htm>.

Current research projects on salmon and environmental and human induced factors affecting status include:

- Climate change impacts on Pacific salmon are being investigated by multiple sectors within DFO and in collaboration with external partners: university, other organizations and agencies. In 2011, DFO implemented a science-based climate change program focused on adaptation in decisions and activities to consider the vulnerabilities, risks, impacts, and opportunities associated with a changing climate. More information is available at: <http://www.pac.dfo-mpo.gc.ca/science/oceans-eng.html>. The Aquatic Climate Change Adaptation Services Program (ACCASP) has an emphasis on the development of new science knowledge to support the development of adaptation tools and strategies that will enable the integration of climate change considerations into the delivery of the Department's programs and policies. More information on this program is available at: <http://www.dfo-mpo.gc.ca/science/oceanography-oceanographie/accasp/index-eng.html>.
- The Salmon in Regional Ecosystems (SIRE) program investigates the mechanisms controlling recruitment variations and changes in productive capacity of salmon stocks within freshwater and/or marine ecosystems.
- Ongoing research related to improving forecasting ability for salmon stocks and CU's is being conducted by DFO Stock Assessment and the Fisheries & Oceanography Working Group. The annual State of the Pacific Ocean Report is published by the Canadian Science Advisory Secretariat (CSAS) and is available at: <http://www.pac.dfo-mpo.gc.ca/science/oceans/reports-rapports/state-ocean-etat/index-eng.html>.
- The Fraser River Environmental Watch program provides scientific advice on the impact of different environmental factors on the migration success of Pacific salmon in fresh water <http://www.pac.dfo-mpo.gc.ca/science/habitat/frw-rfo/index-eng.html>.
- DFO scientists and in collaboration with other organizations (North Pacific Anadromous Fish Commission (NPAFC), Pacific Salmon Commission (PSC)) are studying salmon production, distribution and survival in the north Pacific Ocean.
- Annual juvenile salmon surveys monitor the distribution and survival of salmon in their early marine life history.
- The coded wire tag improvement program is a five-year program that began in 2009 to improve the quality and quantity of data used to monitor the survival, production, and fishing impacts on chinook salmon stocks in Canada and U.S. as part of the 2008 Pacific Salmon Treaty Agreement.
- In the sentinel stocks program, spawning escapements for natural Chinook salmon stocks in Northern B.C. (Skeena and Nass rivers), Fraser River, and West Coast of Vancouver Island are being closely monitored to provide critical information and assessment of the salmon resource as part of the 2008 Pacific Salmon Treaty Agreement.

3 SOCIAL CULTURAL AND ECONOMIC IMPORTANCE

The intent of this section is to provide a socio-economic review of the salmon fishery in British Columbia. In future years, more information on the social and cultural context of the various fisheries can be added, where available. This summary addresses salmon in the context of the Aboriginal food, social, and ceremonial fishery, the Aboriginal communal commercial fishery, the recreational and commercial fishing sectors, the processing sector and the export market. DFO recognizes the unique values of each of the fisheries described here. The overview provided in this profile is intended to help build a common understanding of the socio-economic dimensions of each fishery rather than compare the fisheries.

First Nation culture recognizes the importance of stewardship and responsibility to care for salmon, a responsibility which has been handed down over time. Part of this stewardship responsibility is to ensure that salmon are available for future generations (for example, see: <http://www.ictinc.ca/blog/seventh-generation-principle>). Through their fishing activities, First Nation communities are able to maintain a physical, spiritual and cultural linkage to the salmon and gain knowledge of the salmon stock's abundance and health. This continued awareness allows First Nation people to contribute to, and support the development of, effective management strategies through the provision of information on local and regional observations.

First Nation people in the Alsek, Taku and Stikine watersheds have depended on the salmon as a key food source for countless generations. To this day, First Nation people continue to utilize and rely on salmon as a key resource that is fundamental to their culture, lifestyle and well-being.

3.1 Aboriginal Participation

Generally, DFO manages aboriginal fisheries to provide access for both food, social, and ceremonial (FSC) and for commercial purposes. With respect to fishing for FSC purposes, DFO manages this fishery to ensure that after conservation needs are met, the FSC fishery has priority over other fisheries. DFO seeks to provide priority for the FSC fishery in order to ensure that its management is consistent with the Supreme Court of Canada decision in *R. v. Sparrow*, and subsequent case law, which specify that where there is an aboriginal right to fish for FSC purposes, this fishery must be given priority over other uses.

Fisheries chapters in modern First Nation treaties may articulate a treaty fishing right for FSC purposes that could be protected under Section 35 of the Constitution Act, 1982. Commercial access may be provided either through the general commercial fishery or a Harvest Agreement, which is negotiated at the same time as the treaty and is referenced in the treaty, but is not protected under the Constitution Act.

Three modern treaties (Nisga'a Final Agreement, Tsawwassen First Nation Final Agreement, and Maa-nulth First Nations Final Agreement) have been ratified in British

Columbia. In the Yukon, the Umbrella Final Agreement (UFA) between the Government of Canada, the Council for Yukon Indians and the Government of the Yukon was signed in May 1993. Subsequent to this, the following Final and Self-Government Agreements have been reached with 11 of the 14 Yukon First Nations:

- Champagne and Aishihik First Nations (1995);
- Teslin Tlingit Council (1995);
- First Nation of Na-Cho Nyäk Dun (1995);
- Vuntut Gwitchin First Nation (1995);
- Little Salmon/Carmacks First Nation (1997);
- Selkirk First Nation (1997);
- Tr'ondëk Hwëch'in (1998);
- Ta'an Kwäch'an Council (2002);
- Kluane First Nation (2004);
- Kwanlin Dün First Nation (2005);
- Carcross/Tagish First Nation (2006).

The remaining Yukon First Nations (Liard First Nation, Ross River Dena Council, and White River First Nation) have not settled land claims and remain Indian Bands under the federal *Indian Act*.

These agreements articulate a treaty right to food, social and ceremonial harvest of fish and describe the role for First Nations in fisheries management.¹

Fisheries and Oceans Canada consults with First Nations, stakeholders and other Canadians on matters of interest and concern to them. Consulting is an important part of good governance, sound policy development and decision-making. In addition to good governance objectives, Canada has statutory, contractual and common law obligations to consult with Aboriginal groups.

Consultation and engagement with First Nations includes participation on a number of levels and in a variety of ways. Consultation protocols and expectations are frequently outlined in final agreements and treaties. These exchanges and involvement may include bilateral consultations, advisory processes, management boards and committees, technical groups and other roundtable forums. Further details on the consultation processes for Alsek, Stikine and Taku salmon fisheries are described in section 4 of Appendices 1-3.

Through the AFS Program, the Department provides FSC fishery access to aggregate groups or individual First Nations through fisheries agreements and communal licences. Where requests are put forward by First Nations for changes in FSC access arrangements, these are evaluated against a common set of criteria. FSC access should reflect some balance between the diversity and abundance of resources that are locally available, community needs and preferences, and operational management considerations.

¹ Details of the Yukon Umbrella Final Agreement and Yukon First Nation Final Agreements can be found at: <http://www.eco.gov.yk.ca/landclaims/about.html>. The Nisga'a Final Agreement can be found at <http://www.ainc-inac.gc.ca/al/lldc/ccl/fagr/nsga/nis/nis-eng.asp>. Details of the TFA and MNA agreements can be found on the B.C. Treaty Commission website at www.bctreaty.net.

AFS agreements serve as a guide for DFO and First Nations on the collaborative management of First Nations fisheries, and support a range of fishery co-management arrangements. Currently the Pacific Region accounts for roughly two-thirds of these agreements Canada-wide. In the Region in 2014-2015, there were 85 AFS agreements, representing 164 First Nations that contain provisions relating to salmon management including, but not limited to, FSC fishery arrangements. Among the areas, BC Interior had 18 agreements, Lower Fraser had 13, North Coast had 18, South Coast had 32, and the Yukon and Transboundary Area had 4.

In addition to AFS, the AAROM Program provides funding to qualifying Aboriginal groups to form aquatic resource and oceans management organizations capable of hiring or contracting skilled personnel to allow them to participate effectively in decision-making and advisory processes used for aquatic resource and oceans management. For 2014-2015, there were 20 AAROM agreements in the Pacific Region, 4 of which were in the North Coast, 4 in South Coast, 3 in Lower Fraser and 6 in the BC Interior. There were no AAROM programs in the Yukon and Transboundary Area.

3.2 Recreational Sector

Recreational fishing for salmon may occur to provide food for personal use, as a leisure activity, or as a combination of the two. These activities provide a range of benefits to the participants as well as contribute directly and indirectly to the economy.

In the Pacific Region, according to the 2010 Survey of Recreational Fishing in Canada (http://www.dfo-mpo.gc.ca/stats/rec/can/2010/RECFISH2010_ENG.pdf), and as summarized in Table 2 below, nearly \$1.3 billion was estimated to have been spent in direct expenditures, and major purchases or investments wholly attributable to recreational fishing in 2010.

Table 2. Estimated value of direct and indirect expenditures in the 2010 recreational fishery

Jurisdiction	Estimated value (millions\$) of direct expenditures, and major purchases/investments wholly attributable to recreational fishing by all anglers in 2010
B.C. – freshwater	\$572.2
B.C. – tidal waters	\$705.8
Yukon	\$21.2
Total for Region	\$1,299.2

[note: based on the 2010 Survey of Recreational Fishing in Canada].

The Survey of Recreational Fishing in Canada provides an estimate of individual expenditures and investment for recreational fishing. Historically, the combined tidal and freshwater fisheries of B.C. constituted the second largest recreational fishery in Canada in terms of direct and package expenditures, and third largest in terms of investments. While resident anglers have the largest expenditures, recreational fishing by non-residents

contributes significantly to the Provincial and Territorial economies. In 2010, non-resident (“Canadian non-resident” plus “other non-residents”) direct expenditures, including fishing packages and investments, totalled \$143 million in B.C. (Table 3). This number understates the contribution of non-resident tidal water anglers, however, as it only includes expenditures directly attributable to their fishing experience². Fishing opportunities in B.C.’s tidal waters draw Canadian and international tourists to the province: of 47,269 non-resident anglers surveyed in 2010, 40% reported that they would not have come to British Columbia at all if there had been no opportunities for tidal water angling³. A further 19% would have shortened their stay in the province.

Table 3. Recreational Fishing Direct and Package Expenditures and Investments In B.C.

	2000			
	Direct Expenses*	Packages	Investments	Total
Resident	\$ 132,541,159.85	\$ 21,316,825	\$ 238,863,192	\$ 392,721,177
Canadian nonresident	\$ 28,954,992	\$ 24,803,927	\$ 29,504,129	\$ 83,263,048
Other nonresident	\$ 62,584,071	\$ 51,397,057	\$ 14,775,795	\$ 128,756,923
Total	\$ 224,080,223	\$ 97,517,809	\$ 283,143,116	\$ 604,741,147
	2005			
	Direct Expenses	Packages	Investments	Total
Resident	\$ 157,375,516.04	\$ 44,316,442	\$ 274,110,155	\$ 475,802,113
Canadian nonresident	\$ 35,432,857	\$ 41,459,989	\$ 13,025,827	\$ 89,918,674
Other nonresident	\$ 50,783,457	\$ 68,195,312	\$ 8,509,694	\$ 127,488,463
Total	\$ 243,591,830	\$ 153,971,744	\$ 295,645,676	\$ 693,209,250
	2010			
	Direct Expenses	Packages	Investments	Total
Resident	\$ 197,927,777	\$ 50,135,233	\$ 314,717,439	\$ 562,780,448
Canadian nonresident	\$ 32,843,079	\$ 24,942,920	\$ 18,536,662	\$ 76,322,661
Other nonresident	\$ 33,003,549	\$ 28,721,219	\$ 4,992,473	\$ 66,717,241
Total	\$ 263,774,405	\$ 103,799,372	\$ 338,246,574	\$ 705,820,350

[Source: Survey of Recreational Fishing in Canada, multiple years]

Table 3 (above) shows the expenditures by resident and non-resident anglers from 2000 to 2010, adjusted to reflect constant 2010 dollars. Though recreational fishing continues to be important to the B.C. economy, the rate of growth is slowing: total expenditures and investments grew by nearly 15% from 2000 to 2005, but by only 1.82% from 2005 to 2010. This slowdown is due mainly to a drop in visits (and therefore expenditures) to B.C. by non-resident anglers, particularly other (i.e. international) non-resident anglers whose total expenditures in B.C. dropped by 47% between 2005 and 2010. Expenditure on fishing packages by resident anglers has increased considerably over the past decade;

² British Columbia’s Fisheries and Aquaculture Sector (2007) reports that non-resident participants in recreational tidal water fishing also spend money on, for example, shopping, cultural events and attractions (such as museums and the theatre), and sightseeing at locations other than where they go fishing.

³ This can be further broken down into Canadian non-residents and international non-residents. Opportunities for tidal water recreational fishing are more important to international visitors: 47% of them reported they would not have come to BC had there not been tidal water fishing opportunities, while 32% of Canadian visitors would not have come.

in real terms, it increased by over 135% between 2000 and 2010 and B.C. residents are now the primary consumers of fishing trip packages in the province. North Coast salmon are a significant draw for fishing lodges and other businesses offering fishing packages, accounting for 42% of package expenditures in 2010⁴.

The present-day economic value of recreational salmon fisheries in the Alsek, Stikine and Taku river systems is difficult to quantify due to limited available information. Economic benefits from the recreational fishers include, but are not limited to the purchase of: angling licences, Salmon Conservation Catch Cards (in Yukon), Salmon Conservation Stamps (in British Columbia), angling and camping equipment, accommodation and travel / air charter services. In addition to economic benefits, recreational fishing also has added social and cultural benefits as it is considered a tradition and lifestyle for many people. Fishing provides people with the opportunity to interact with the natural environment and increases their awareness of salmon resources. The increased awareness is commonly associated with an enhanced sense of stewardship as well as determining the overall social value.

3.3 Commercial Sector

In B.C., the salmon fishery is a limited access, competitive fishery⁵; however, several parts of the fishery have operated under individual quotas during the past five years. Since 2005, five areas using seine, troll and gill net troll gear participated in demonstration fisheries with alternative implementations of individual quotas or pooling arrangements. In addition, there have been several commercial First Nations' Economic Opportunity and Demonstration Fisheries in inland areas. Commercially-harvested salmon supports B.C.'s seafood processing sector, much of which is ultimately exported, bringing new money into the province. The B.C. central statistics agency (BC Stats) estimates that the commercial salmon fishery directly contributed \$15.2 million to the gross domestic product (nominal) in 2011 (BC Stats, 2013⁶).

During the last decade, wild salmon contributed an average of 12% of the landed value and 10% of the volume of B.C. wild caught seafood (Figure 2 below). In 2013 dollars, the value ranged from a high of \$75.1 million in 2010, to a low of almost \$23.3 million in 2008. BC-wide, sockeye was the most important species in terms of landed value, followed by Chinook and then chum.

⁴ DFO Internal analysis

⁵ Other names for this style of fishery include derby and Olympic style fishery.

⁶ BC Stats (2013). British Columbia's Fisheries and Aquaculture Sector, 2012 edition. Prepared for the Department of Fisheries and Oceans by BC Stats.

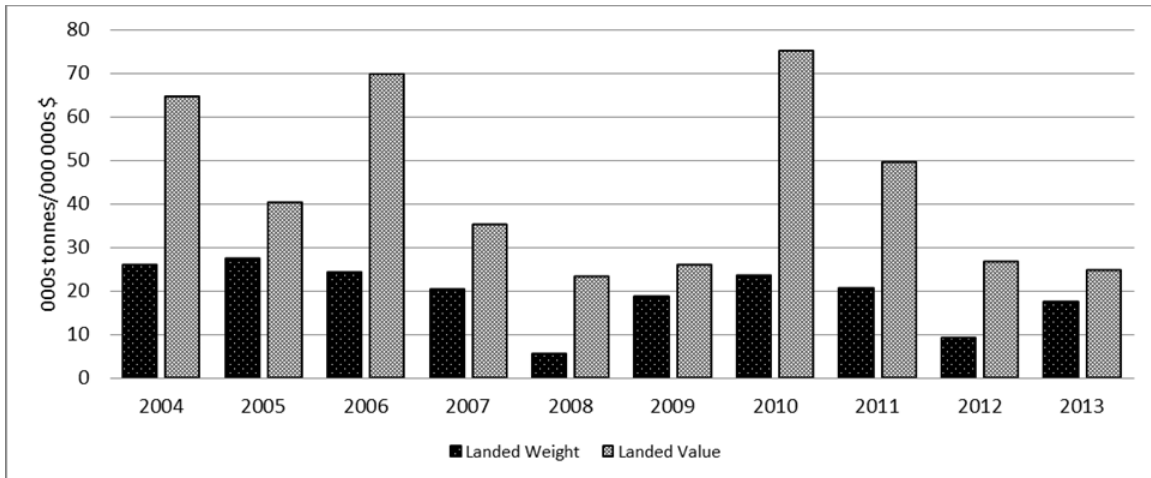


Figure 2. Landed value (2013 dollars) and harvest of “wild salmon” in B.C.

(Source: British Columbia Seafood Industry Year in Review, multiple years). Note: “wild salmon” here refers to salmon (species combined) harvested by commercial fisheries and does not include aquaculture production.

Commercial fishing is a significant source of income for fishers on both the Stikine and Taku rivers. More than 2.6 million salmon have been harvested through the commercial salmon fisheries on the Stikine and Taku rivers since their inception in 1975 and 1979, respectively. Many fishers participate in these fisheries as part of their lifestyle. Fishers may also derive benefits from the social aspects of the fishery, such as interactions with other fishers and fishery managers.

3.4 Processing Sector

Since 2000, salmon accounted for an average of 25% of the total wholesale value from seafood processing in B.C.⁷ Processing wild caught salmon provided about 1,394 positions in 2011, or about 30% of the B.C. total⁸. A 2008 report estimates that approximately 80% of this employment was to process domestic landings, with processing occurring primarily in the Greater Vancouver (47%) and the Skeena-Queen Charlotte (38%) regional districts.⁹ Primarily due to logistics (lack of ground transportation) and transportation costs, most processing of commercially harvested Transboundary salmon occurs in facilities in Alaska where deliveries of fresh-caught salmon can be made via boat. However, some fresh product is either transported by aircraft or boat, and then trucked to local population centres for sale in northern B.C. and Yukon (e.g. Whitehorse, Atlin, Dease Lake).

⁷ British Columbia Seafood Industry Year in Review. Various years. BC Ministry of Environment.

⁸ BC Ministry of Environment. 2011. 2008 British Columbia Seafood Processing Employment Survey Results. <http://www.env.gov.bc.ca/omfd/fishstats/proc/employ-05.html>

⁹ Fraser and Associates. 2008. Linkages Between the Primary Fish Production and Fish Processing Sectors in British Columbia.

4 REGIONAL MANAGEMENT ISSUES

4.1 Conservation

Given the importance of Pacific salmon to the culture and socio-economic fabric of Canada, conservation of these stocks is of utmost importance. In order to achieve this, specific actions are taken to not only ensure protection of fish stocks, but also freshwater and marine habitats. Protecting a broad range of stocks is the most prudent way of maintaining biodiversity and genetic integrity.

Management of a natural resource like salmon has a number of inherent risks. Uncertain forecasting, environmental and biological variability, dynamic and evolving geomorphic features, as well as changes in harvester behavior, all add risks that can threaten conservation. Accordingly, management actions will be precautionary and risks will be specifically evaluated where possible.

4.1.1 Wild Salmon Policy

The goal of *Canada's Policy for Conservation of Wild Pacific Salmon* (WSP), which was released in 2005, is to restore and maintain healthy and diverse salmon populations and their habitats for the benefit and enjoyment of the people of Canada in perpetuity. Since 2005, the Department has taken an incremental approach to WSP implementation, with the focus in the first years principally on the development of technical methods and tools to support the identification and assessment of salmon conservation units, supplemented by more modest efforts to assess habitat and ecosystems as part of integrated strategic planning pilots in key areas. Currently, the Department is preparing a new Wild Salmon Policy Implementation Plan, which was one of the recommendations from the 2012 Cohen Commission Final Report. This work will allow alignment with changes to legislation and programs since the policy was released in 2005, such as recent changes to the Fisheries Act, implementation of the Fisheries Protection Program, and release of the Sustainable Fisheries Framework. The intention is to begin to engage First Nations and stakeholders on this work in 2015.

Additional details regarding WSP and its implementation can be found at: <http://www.pac.dfo-mpo.gc.ca/fm-gp/species-especes/salmon-saumon/wsp-pss/index-eng.html>.

The *Salmon Stock Assessment Framework*, mentioned previously in Section 2.4 of this document, is shaped by the WSP Strategy 1 which specifies requirements for standardized monitoring, status and management predicated on benchmarks. Strategy 1 identifies three elements:

- WSP Strategy 1 provides a standardized process for organizing Pacific salmon into Conservation Units (CUs), groups of wild salmon living in an area that are sufficiently isolated from other wild salmon such that the area is unlikely to be recolonized naturally in an acceptable period of time if they are extirpated. Scientists have grouped the greater than 9,600 Pacific salmon stocks into 457 discreet Conservation Units.

- DFO has developed criteria to assess CUs and has identified a range of metrics for setting upper and lower CU benchmarks of status, dependent on data quality and availability (Holt et al 2009)¹⁰. For each metric, lower and upper benchmarks will delimit three status zones of a CU. Management actions will be determined based on a CU's biological status relative to these benchmarks. Management will focus on conservation measures for CUs in the red zone (below the lower benchmark), shift to cautionary management in the amber zone (between the lower and upper benchmark), and emphasize sustainable use in the green zone (above the upper benchmark).
- A key requirement of the WSP is ongoing monitoring and assessment of the status of wild salmon CUs. Monitoring wild salmon status in a cost-effective manner poses a challenge. It is not practical or cost effective to monitor all salmon demes. (A deme, as defined in the WSP, is a term for a local population of organisms of one species that actively interbreed with one another and share a distinct gene pool.) When groups of CUs are exposed to common threats, the approach will be to monitor a subset of these units. Annually, the assessment monitoring plans are updated by the SACC based on CU status determination and risks. The CU status will generally determine the frequency and intensity of the assessment effort. For example, when a CU falls within the Red Zone, ongoing annual assessment of its status including fishery and habitat impacts may be required. The SACC is developing a database that describes benchmarks, status, major risk factors, resource management objectives, and assessment requirements. Assessment procedures will build on existing programs and local partnerships.

Table 4 summarizes the number of CUs identified to date for the Alsek, Stikine and Taku drainages. With the establishment of the CUs, over time DFO will monitor and assess their status, develop benchmarks and complete identification of habitat and ecosystem indicators. Currently however, CU's are utilized for management purposes only on a broad scale as baseline data are still being collected, or only very recently analyzed.

Strategy 3 of the Wild Salmon Policy (WSP), "Inclusion of Ecosystem Values and Monitoring", states the Department's intent to progressively incorporate ecosystem values in salmon management. Strategy 3 further identifies the actions required to incorporate ecosystem values such as:

- Identify indicators (biological, physical and chemical characteristics) to use in monitoring the status of freshwater ecosystems; and
- Monitor annual variation in climate and ocean conditions, integrate the monitoring with assessments of marine survival of Pacific salmon, and incorporate this knowledge into the annual forecasts of salmon abundance and management processes.

¹⁰ Holt, C., Cass, A., Holtby, B., and Riddell, B. 2009. Indicators of status and benchmarks for conservation units in Canada's Wild Salmon Policy. DFO Can. Sci. Advis. Sec. Res. Doc. 2009/058. viii + 74 p.

Table 4. Conservation Units identified for the Alsek, Stikine and Taku drainages.

Species	Drainage	Number of CUs
Chinook	Stikine	2
	Taku	3
	Alsek	1
River Type Sockeye	Stikine & Taku	1
	Alsek	1
Lake Type Sockeye	Lower Stikine	3
	Taku	4
	Alsek	3
Coho	Lower Stikine	1
	Taku	1 (potentially 3)
	Alsek	1
Chum	Lower Stikine	1
	Taku	1
Odd- Year Pink	Transboundary	1
Even-Year Pink	Transboundary	1

One of the greatest challenges in implementation of the WSP is balancing the goals of maintaining and restoring healthy and diverse salmon populations and their habitats, with social and economic objectives that reflect people’s values and preferences. Standardized monitoring and assessment of wild salmon populations, habitat and eventually ecosystem status will facilitate the development of comprehensive integrated strategic plans (as per WSP Strategy 4) that will address the goals of the WSP while considering the needs of people. Outcomes of these plans will include biological objectives for salmon production from Conservation Units and, where appropriate, anticipated timeframes for rebuilding, as well as management plans for fisheries and watersheds, which reflect open, transparent, and inclusive decision processes involving First Nations, communities, environmental organizations, fishers and governments.

Additional details regarding WSP and its implementation can be found at: <http://www.pac.dfo-mpo.gc.ca/fm-gp/species-especes/salmon-saumon/wsp-pss/index-eng.html>.

4.2 International Commitments – Pacific Salmon Treaty

In March 1985, the United States and Canada agreed to co-operate in the management, research and enhancement of Pacific salmon stocks of mutual concern by ratifying the Pacific Salmon Treaty (PST). Various chapters in Annex IV of the Treaty have been renegotiated and ratified since 1985, including Chapter 1: Transboundary Rivers.

The Pacific Salmon Commission (PSC), established under the PST, provides regulatory and policy advice as well as recommendations to Canada and the U.S. with respect to interception salmon fisheries. Under the terms of the PST, the responsibility for in-season management of all species rests with the Parties to the agreement. One exception

is the in-season management of Fraser River sockeye and pink salmon which is specifically delegated to the Fraser River Panel with assistance from the PSC.

To properly account for the full coast-wide impact of fishing on Chinook and coho stocks, the PST specifies that all parties develop programs to monitor all sources of fishing related mortality on Chinook and coho. Catch monitoring programs are being modified to include estimates of encounters of all legal and sub-legal Chinook and coho, as well as other salmon species, in all fisheries.

Coded-wire tag (CWT) data are essential to the coast-wide management of Chinook and coho salmon stocks under the Pacific Salmon Treaty. In 1985, the United States and Canada entered into an August 13, 1985 Memorandum of Understanding in which “the Parties agree to maintain a coded-wire tagging and recapture program designed to provide statistically reliable data for stock assessments and fishery evaluations”. Both countries recognize the importance of the coded-wire tag program to provide the data required to evaluate the effectiveness of bilateral conservation and fishing agreements. An expert panel review concluded the coded-wire tag system is the only technology currently capable of providing the data required for PST management regimes for Chinook and coho salmon, thus confirming the approach being employed. The Expert Panel’s full report may be found at <http://www.psc.org/pubs/psctr18.pdf>. In response to the Expert Panel’s recommendations, the PSC appointed a CWT Workgroup to develop recommendations to correct deficiencies and to improve analysis of CWT recovery data. The Workgroup’s full report may be found at <http://www.psc.org/pubs/psctr18.pdf>. As the CWT system is central to the ability to implement the 2009 PST Chinook Agreement, the Parties agreed to provide \$7.5 million each in their respective currencies over a five year period to implement critical improvements to the CWT programs operated by their respective management agencies (Annex IV, Chapter 3, paragraph 3(b)). The Five Year Synthesis Report of the PSC Coded Wire Tag Improvement Program may be found at <http://www.psc.org/pubs/psctr33.pdf>.

The chapters in Annex IV outline the joint conservation and harvest sharing arrangements between Canada and the U.S. for key stocks and fisheries subject to the Treaty. On December 23, 2008, Canada and the U.S. ratified new provisions for five chapters, including the Transboundary Rivers chapter. The new provisions in these chapters came into effect on January 1, 2009 and are in effect through December 31, 2018. Chapter 1: Transboundary Rivers, outlines the conservation, harvest sharing and enhancement arrangements for Alsek, Stikine and Taku River Chinook, sockeye and coho salmon. It governs the fisheries covered in this Transboundary Rivers area Integrated Fisheries Management Plan. Chapter 4, which covers Fraser River sockeye and pink salmon, was renegotiated in 2013, with formal ratification by both Parties occurring on May 16, 2014. The provisions contained within Chapter 4 are in effect through December 31, 2019.

All management regimes under Annex IV continue to be implemented by Fisheries and Oceans Canada and U.S. agencies for the 2015 season.

4.3 Oceans and Habitat Considerations

The following subsections describe the major marine and habitat considerations and initiatives that have an influence on management of the salmon resources of the Pacific Region.

4.3.1 Oceans Act

In 1997, the Government of Canada enacted the *Oceans Act*. This legislation provides a foundation for an integrated and balanced national oceans policy framework supported by regional management and implementation strategies. In 2002, Canada's Oceans Strategy was released to provide the policy framework and strategic approach for modern oceans management in estuarine, coastal, and marine ecosystems. As set out in the *Oceans Act*, the strategy is based on the three principles of sustainable development, integrated management, and the precautionary approach. For more information on the *Oceans Act*, please visit: <http://www.dfo-mpo.gc.ca/oceans/oceans-eng.htm>.

The *Oceans Act*, the *Canada Wildlife Act*, and the *National Marine Conservation Areas Act* have given rise to several initiatives on the BC coast, which are listed below. As goals, objectives, and management plans are finalized for these initiatives, the Department's management of fisheries will be adapted as appropriate, in consultation with interested parties through Integrated Fisheries Management processes.

4.3.2 Pacific North Coast Integrated Management Area

An integrated management plan for the Pacific North Coast Integrated Management Area (PNCIMA) has been developed to help coordinate various ocean management processes and to complement and link existing processes and tools including IFMPs. The PNCIMA is one of five national Large Ocean Management Areas identified in Canada's 2005 Oceans Action Plan. The plan is the product of a collaborative process led through an oceans governance agreement between the Government of Canada, British Columbia and First Nations, and contributed to by a diverse group of organizations, stakeholders and interested parties. High level and strategic, the plan provides direction on, and commitment to, integrated, ecosystem-based and adaptive management of marine activities and resources in the planning area as opposed to detailed operational direction for management.

The plan outlines a framework for ecosystem-based management (EBM) for PNCIMA that includes assumptions, principles, goals, objectives and strategies. This EBM framework has been developed to be broadly applicable to managers, decision-makers, regulators, community members and resource users alike, as federal, provincial and First Nations governments, along with stakeholders, move together towards a more holistic and integrated approach to ocean use in the planning area.

Implementation of the plan is the shared responsibility of all signatories to the planning process and will be undertaken within existing programs and resources.

An electronic copy of the plan will be available online at: <http://www.pncima.org/>.

4.3.3 Marine Protected Area Networks

The *Oceans Act* mandates the Minister of Fisheries and Oceans with leading and coordinating the development and implementation of a national system (or network) of marine protected areas (MPAs). The *National Framework for Canada's Network of Marine Protected Areas (National Framework)* provides strategic direction for the design of a national network of MPAs that will be composed of a number of bioregional networks. This is an important step towards meeting Canada's domestic and international commitments to establish a national network of marine protected areas by 2012. Regionally, the draft *Canada-British Columbia Marine Protected Area Network Strategy* has been developed jointly by federal and provincial agencies and reflects the need for governments to work together to achieve common marine protection and conservation goals. Bioregional marine protected area network planning will identify new areas of interest for protection by DFO, Parks Canada, Environment Canada, the Province of B.C., and any other agencies with a mandate for protecting marine spaces. Future networks of MPA's may overlap and/or include salmon fishing areas, depending on the type and nature of the MPA.

More information on MPA Network Planning can be found at:

<http://www.dfo-mpo.gc.ca/oceans/planning/marineprotection-protectionmarine/index-eng.htm>; and

<http://www.dfo-mpo.gc.ca/oceans/planning/marineprotection-protectionmarine/bc-mpa/index-eng.html>

4.3.4 Marine Protected Areas

DFO is also responsible for designating Marine Protected Areas (MPAs) under Canada's *Oceans Act*. Under this authority, DFO has designated two MPAs in the Pacific Region. The "Endeavour Hydrothermal Vents", designated in 2003, lie in waters 2,250m deep 250 km southeast of Vancouver Island. The "SGaan Kinghlas-Bowie Seamount Marine Protected Area" (SK-B MPA), designated in 2008, is 180 km west of Haida Gwaii (formerly known as the Queen Charlotte Islands). MPA regulations and management plans articulate any restrictions on activities taking place within the MPA, where applicable. At this time, all fisheries are restricted within the Endeavour and SK-B MPAs, except for a limited sablefish trap fishery within the SK-B MPA.

The SK-B MPA has been established to conserve and protect the unique biodiversity and biological productivity of the area's marine ecosystem. The Government of Canada and the Council of the Haida Nation signed a MOU in April 2007 which established the SK-B Management Board to facilitate the cooperative management and planning of the proposed MPA. As a result, DFO and the Council of the Haida Nation are collaboratively developing a management plan for the SK-B MPA which will consider advice from an advisory committee, stakeholders through existing processes, and the public. This management plan will elaborate on the regulations to implement the conservation and

management objectives for the MPA and will address matters such as monitoring, enforcement and compliance.

Commercial fishing activities within the SK-B MPA are managed through the Integrated Fisheries Management process. Three zones are identified, some of which involve fisheries closures which are used to manage the sablefish fishery (see the Groundfish IFMP for details). All other commercial fisheries are not permitted to occur in any zones of the MPA.

Work is ongoing to consider MPA designations for other areas along the Pacific Coast, including the Race Rocks area off Rocky Point south of Victoria (currently designated as a Provincial Ecological Reserve) and the Hecate Strait / Queen Charlotte Sound Glass Sponge Reefs. Changes to existing IFMPs with respect to fishing activities may be required upon designation of these MPAs. In addition, alignment of relevant IFMPs and MPA Management Plans will be necessary.

More information on integrated management planning, Pacific Region MPAs and Pacific MPA planning under Canada's *Oceans Act* can be found at: www.pac.dfo-mpo.gc.ca/oceans/index-eng.htm; and <http://www.dfo-mpo.gc.ca/oceans/marineareas-zonesmarines/mpa-zpm/index-eng.htm>.

4.3.5 National Marine Conservation Areas

Gwaii Haanas

Gwaii Haanas National Park Reserve, National Marine Conservation Area (NMCA) Reserve, and Haida Heritage Site is a 5000 km² land-and-sea protected area in the southern portion of Haida Gwaii (formerly the Queen Charlotte Islands), approximately 100 kilometres off the north coast of British Columbia. The Haida Nation declared the area a Haida Heritage Site in 1985. The terrestrial part of Gwaii Haanas was designated a National Park Reserve by the Government of Canada soon after, and the two parties have been managing the area cooperatively since 1993. In 2010, following an extensive public consultation process, the marine area of Gwaii Haanas was given the designation of National Marine Conservation Area Reserve.

Gwaii Haanas is managed by the Archipelago Management Board, a cooperative body made up of equal representation from the Government of Canada (represented by Fisheries and Oceans Canada and Parks Canada) and the Council of the Haida Nation. The Gwaii Haanas marine area is currently managed under the Interim Management Plan and Zoning Plan, which includes “balancing protection and ecologically sustainable use” in its guiding principles. The Zoning Plan identifies six areas that are closed to commercial and recreational fishing.

Development of a long-term management plan for the Gwaii Haanas marine area is underway and will be completed by 2015. This process will take place in consultation with the commercial and recreational fishing sectors through Fisheries and Ocean's

established integrated fisheries planning and advisory processes. Annual fishing plans will be developed in consultation with stakeholders.

Users of the Gwaii Haanas marine area should be aware that adjacent land is managed under the authority of the *Canada National Parks Act* and its regulations and, as specified in the *Gwaii Haanas Agreement* (1993), there is "no extraction or harvesting by anyone of the resources of the lands and non-tidal waters of the Archipelago for, or in support of, commercial enterprise" (s3.3). There are specific requirements for visiting the terrestrial portion of Gwaii Haanas, and advanced planning is necessary. For further information, please contact the Gwaii Haanas administration office at: 1-877-559-8818.

Southern Strait of Georgia

Parks Canada, in partnership with the Government of British Columbia, launched a feasibility assessment for an NMCA reserve in the southern Strait of Georgia in 2004. Since then, consultations with First Nations, key stakeholders, communities and the public have occurred. Informed by those discussions, a proposed boundary for consultation was announced by the provincial and federal Ministers of Environment in 2011. Since 2011, the two governments have been consulting with First Nations, local governments and industry. A preliminary concept is currently being developed to help advance consultations on the feasibility assessment. If the results of the feasibility assessment indicate that establishment of an NMCA reserve is practical and feasible, an establishment agreement between the Governments of Canada and British Columbia will be negotiated and an interim management plan developed. If the development of the reserve is determined to be feasible, further consultations related to establishment agreements and Aboriginal rights will also take place with First Nations. Commercial and recreational fishing sectors, communities, landowners, recreation and environmental organizations and other stakeholders will also have opportunities to provide input to the development of the interim management plan. More information on the proposed National Marine Conservation Area Reserve in the Southern Strait of Georgia is available on the internet at: www.pc.gc.ca/eng/progs/amnc-nmca/dgs-ssg/index.aspx.

DFO is also working with other federal and provincial agencies to coordinate efforts towards establishing a national system of Marine Protected Areas to fulfil Canada's commitments to the UN Convention on Biological Diversity.

More information on integrated management planning and Pacific MPAs under Canada's *Oceans Act* can be found at: <http://www.pac.dfo-mpo.gc.ca/oceans/index-eng.htm>.

4.3.6 Marine National Wildlife Areas

Under the *Canada Wildlife Act*, Environment Canada may establish marine National Wildlife Areas (NWAs). The Scott Islands marine NWA, located off the northern tip of Vancouver Island, has been proposed for designation through amendments to the *Wildlife Area Regulations*. Fisheries and Oceans Canada would continue to regulate and administer fisheries within the proposed area. Environment Canada and Fisheries and Oceans will develop a collaborative approach and agreement regarding management of fisheries in the area. More information on NWAs can be found at: <http://www.ec.gc.ca/ap-pa/default.asp?lang=En&n=2BD71B33-1>.

4.3.7 Terrestrial Parks and Protected Areas

A relatively high degree of protection is currently provided to the land within the geographic extent of the Alsek River drainage. In Canada, the majority of the drainage is located in the Tatshenshini-Alsek Provincial Park and Kluane National Park, while in Alaska, the entire portion of the drainage is located in Glacier Bay National Preserve.

The Stikine River has several parks and protected areas within its drainage. In British Columbia these include Stikine River Provincial Park (PP), Tuya Mountain PP, Mt. Edziza PP and Recreation Area, as well as a number of smaller protected areas such as Craig Headwaters Protected Area, Ningunsaw PP, Great Glacier PP and Choquette Hot Springs PP.

A portion of the Taku River headwater area is encompassed within Atlin Provincial Park and Recreation Area. Other protected and ecologically sensitive areas are described in the Atlin Taku Land Use Plan, 2011 (see: <http://www.for.gov.bc.ca/tasb/SLRP/plan5.html>). In Alaska, the lower portion of the watershed is encompassed within the Tongass National Forest.

4.3.8 Committee on the Status of Endangered Wildlife Species Assessments

The Committee On the Status of Endangered Wildlife Species In Canada (COSEWIC) was formed in 1977 to provide Canadians with a single, scientifically sound classification of wildlife species at risk of extinction. COSEWIC began its assessments in 1978 and has met each year since then to assess wildlife species.

With the implementation of SARA, COSEWIC has been established as an independent body of experts responsible for identifying and assessing wildlife species considered being at risk. This is the first step towards protecting wildlife species at risk. Subsequent steps include COSEWIC reporting its results to the Canadian government and the public, and the Minister of the Environment providing an official response to the assessment results. Wildlife species that have been designated by COSEWIC may then qualify for legal protection and recovery under SARA. For a full list of species identified and assessed by COSEWIC, please visit:

http://www.cosewic.gc.ca/rpts/Detailed_Species_Assessments_e.html.

4.3.9 Species at Risk Act

The *Species at Risk Act* (SARA) came into force in 2003. The purposes of the *Act* are: “to prevent wildlife species from being extirpated or becoming extinct, and to provide for the recovery of a wildlife species that are extirpated, endangered or threatened as a result of human activity and to manage species of special concern to prevent them from becoming endangered or threatened”. More information on SARA can be found at <http://www.sararegistry.gc.ca>.

In addition to the existing prohibitions under the *Fisheries Act*, under SARA, it is illegal to kill, harm, harass, capture, take, possess, collect, buy, sell or trade any listed endangered or threatened animal, or any part or derivative of an individual. These

prohibitions apply unless a person is authorized, by a permit, licence or other similar document issued in accordance with SARA, to engage in an activity affecting the listed species or the residences of its individuals. Species listed as special concern are not included in these prohibitions.

Endangered, threatened, and special concern marine species in Pacific Region currently listed under SARA can be found at: <http://www.dfo-mpo.gc.ca/species-especes/listing-eng.htm>.

In the Pacific Region, the following SARA-listed species may be encountered in marine and/or coastal areas:

Birds

- Ancient Murrelet – Special Concern
- Marbled Murrelet – Threatened

Fish

- Basking Shark - Endangered
- Green sturgeon – Special Concern
- Longspine Thornyhead – Special Concern
- Rougheyeye Rockfishes Types I & II – Special Concern
- Sixgill Shark – Special Concern
- Soupfin Shark (Tope) – Special Concern
- Yelloweye Rockfish – Special Concern
- White Sturgeon – Upper Fraser Designatable Unit – Endangered
- White Sturgeon – Upper Columbia Designatable Unit – Endangered
- White Sturgeon – Nechako Designatable Unit – Endangered
- White Sturgeon – Kootenay River Designatable Unit – Endangered

Mammals

- Blue Whale – Endangered
- Fin Whale – Threatened
- Grey Whale – Special Concern
- Humpback Whale – Threatened
- Killer Whale – Northern Resident Population – Threatened
- Killer Whale – Southern Resident Population – Endangered
- Killer Whale – Offshore Population – Threatened
- Killer Whale – Transient Population – Threatened
- North Pacific Right Whale – Endangered
- Sea Otter – Special Concern
- Sei Whale – Endangered
- Stellar Sea Lion – Special Concern

Reptiles/Invertebrates

- Leatherback Sea Turtle – Endangered

- Northern Abalone – Endangered
- Olympia Oyster – Special Concern

Some marine or anadromous species of fish designated by COSEWIC that are currently under consideration for listing under SARA include:

Fish

- Bocaccio Rockfish – Threatened
- Canary Rockfish – Threatened
- Darkblotched Rockfish – Special Concern
- Quillback Rockfish – Threatened
- Yellowmouth Rockfish – Threatened
- Eulachon – Fraser River Designated Unit – Endangered
- Eulachon - Central Pacific Coast Designated Unit– Endangered
- Eulachon - Nass/Skeena Rivers Designated Unit - Special Concern
- North Pacific Spiny dogfish – Special Concern

Mammals

- Northern Fur Seal – Threatened

White Sturgeon

In August of 2006, four populations of white sturgeon (Upper Fraser, Upper Columbia, Nechako, and Kootenay River) were listed as Endangered under SARA, while two populations (Lower Fraser and Mid Fraser) were not. Only those populations listed under SARA are subject to the general prohibitions.

A Recovery Strategy has been developed for the four listed populations, which provides a recovery goal, population and distribution objectives, as well as management activities for the two non-listed populations. The Recovery Strategy may be found at:

http://www.sararegistry.gc.ca/document/default_e.cfm?documentID=1774.

Humpback Whales

In 2003, the North Pacific Humpback Whale population was assessed by COSEWIC, and was subsequently listed as Threatened under SARA in January 2005. Humpback was re-assessed by COSEWIC as Special Concern in 2011 and a change to the listed status of this species is being considered. A Recovery Strategy has been developed for this species. Threats identified in the Recovery Strategy include entanglement, vessel strike, acoustic disturbance and prey reduction. The Recovery Strategy may be found at:

http://www.sararegistry.gc.ca/document/default_e.cfm?documentID=1344.

Salmon

Three populations of salmon have been designated as Endangered by COSEWIC: Cultus Lake sockeye (2003), Sakinaw Lake sockeye (2003), and Interior Fraser River coho (2002). In addition, one has been designated as Threatened, i.e. Okanagan Chinook (2006). Following extensive public and stakeholder consultation processes for each population, the Government of Canada did not list these populations on Schedule I of

SARA (Cultus Lake sockeye (2005), Sakinaw Lake sockeye (2005), Interior Fraser River coho (2006) and Okanagan Chinook (2010)). However, recovery efforts are continuing for each population.

DFO, in cooperation with the Interior Fraser Coho Recovery Team, have developed the *Conservation Strategy for Coho Salmon, Interior Fraser River Populations*. This strategy is an integral tool in effecting recovery of these unique coho populations. It is a science-based document that describes the species' biology, habitats and threats. The strategy also identifies a recovery goal, with accompanying principles and objectives designed to guide activities to achieve recovery. To view the conservation strategy, please visit: <http://www.dfo-mpo.gc.ca/Library/329140.pdf>.

Conservation Strategies for Sakinaw and Cultus Lake sockeye have also been finalized, and can be viewed at: http://www.pac.dfo-mpo.gc.ca/fm-gp/species-especies/salmon-saumon/conservation/docs/Sakinaw_conservation_jan08-eng.pdf; and, <http://www.pac.dfo-mpo.gc.ca/science/habitat/cultus/conservstrat.pdf>.

Shark Codes of Conduct

Out of the fourteen shark species in Canadian Pacific waters, three species are listed under SARA. The Basking Shark (*Cetorhinus maximus*) is listed as Endangered, and the Bluntnose Sixgill Shark (*Hexanchus griseus*) and Tope Shark (*Galeorhinus galeus*) are listed as Species of Special Concern. The primary threats to shark species have been identified as by-catch and entanglement. In order to address the conservation concerns with shark species, it is important that measures are taken to reduce the mortality of sharks resulting from these primary threats. As such, coastal commercial fishing licences have been amended to include a Condition of Licence for Basking Sharks that specify mitigation measures in accordance with SARA permit requirements. Additionally, two 'Code of Conduct for Shark Encounters' documents have been developed to reduce the mortality of Basking Shark, as well as other Canadian Pacific shark species such as Bluntnose Sixgill and Tope Shark resulting from entanglement and bycatch in commercial, aquaculture and recreational fisheries. These guidelines include boat handling procedures during visual encounters with Basking Sharks as well as best practices for handling Canadian Pacific shark species during entanglement encounters.

These documents have been posted online and can be found at the following URL links:

Code of conduct for sharks: http://www.pac.dfo-mpo.gc.ca/fm-gp/species-especies/shark-requin/conduct_shark-conduite_requin-eng.html;

Code of conduct for Basking Sharks: http://www.pac.dfo-mpo.gc.ca/fm-gp/species-especies/shark-requin/conduct_basking-conduite_pelerin-eng.html.

4.3.10 Whale, Turtle and Basking Shark Sightings

The Department welcomes assistance in the reporting of any whale, turtle, or Basking Shark sightings or entanglement. Sightings for Basking Shark, Leatherback and other turtle species, as well as many whale species, are infrequent in Pacific Canadian waters.

The collection of sightings data is very useful to scientists in determining population size and distribution. Establishing this information can in turn help in the recovery planning under SARA.

To report a whale sighting, contact the B.C. Cetacean Sighting Network:

Toll free: 1-866-I-SAW-ONE (1-866-472-9663)

Fax: (604) 659-3599

Email: sightings@vanaqua.org

Internet: <http://wildwhales.org/sightings/>

To report a turtle sighting, contact the Sea turtle Sighting Network:

Toll free: 1-866-I-SAW-ONE (1-866-472-9663)

Fax (604) 659-3599

Email: turtles@vanaqua.org

<http://www.bcreptiles.ca/reportsightings.htm#1>

To report sick, injured, distressed or dead marine mammals and sea turtles contact the Marine Mammal Incident Reporting Hotline:

Toll free: 1-800-465-4336

To report a Basking Shark contact the Basking Shark Sightings Network:

Toll free: 1-877-50-SHARK

Email: BaskingShark@dfo-mpo.gc.ca

<http://www.pac.dfo-mpo.gc.ca/science/species-especes/elasmobranch/sightings-signalz-eng.htm>

4.3.11 Northern and Southern Resident Killer Whales

Two distinct populations of killer whales, known as the northern and southern residents, occupy the waters off the west coast of British Columbia. Northern resident killer whales are listed as Threatened and southern resident killer whales are listed as Endangered in Schedule 1 of the *Species at Risk Act*. A Recovery Strategy for Northern and Southern Resident Killer Whales in Canada was finalized in March 2008, and amended in 2011. It can be viewed at:

http://www.sararegistry.gc.ca/document/default_e.cfm?documentID=1341.

Critical habitat and its associated features have been identified for both populations in the recovery strategy, and are protected from destruction under SARA Section 58 through the issuance of an order. The recovery strategy also identifies current threats as environmental contaminants, reduced prey availability, disturbance, noise pollution and mortality in fishing gear.

Prey:

Northern and southern resident killer whales are dietary specialists and feed primarily on salmon. DFO and other researchers continue to advance new scientific information and

analyses regarding the ecology of resident killer whales. Much of this new information focuses on their feeding habits and preference for Chinook salmon. Fisheries that occur within the range of the resident killer whales as well as fisheries outside their range that affect Chinook abundance within their range are both potentially implicated.

Because Southern Residents also are listed as Endangered pursuant to the *United States Endangered Species Act*, DFO has joined with the National Oceanic and Atmospheric Administration (NOAA) to collaboratively evaluate the status of the relevant science and analyses. The two agencies designed a series of three scientific workshops to undertake a transparent, collaborative and scientifically rigorous review of the available information about resident killer whales, their feeding habits, and the potential effects of salmon fisheries on the whales through prey reduction. A panel of independent scientists was selected to oversee and participate in the process and produce a report documenting its findings. The first of the three workshops occurred September 21-23, 2011 in Seattle; the second occurred March 13-15, 2012 in Vancouver, Canada, and the third occurred in the Seattle area September 18-20, 2012. A diverse and multidisciplinary group of approximately one hundred scientists actively participated in the workshop process. These experts were drawn from Canadian and U.S. Federal, Provincial and State management and research agencies, First Nations, Treaty Indian Tribes, academia, non-governmental environmental organizations and industry (e.g., fishing and whale-watch industries). The final report of the *Independent Science Panel of the Bilateral Scientific Workshop Process to evaluate the effects of salmon fisheries on Southern Resident Killer Whales* is available at: <http://www.nwr.noaa.gov/Marine-Mammals/Whales-Dolphins-Porpoise/Killer-Whales/ESA-Status/KW-Chnk-final-rpt.cfm>.

Contaminants:

There are numerous chemical and biological pollutants that may directly or indirectly impact resident killer whales, ranging from persistent organic pollutants to antibiotic resistant bacteria and exotic species. Recent studies indicate resident killer whales have high levels of some contaminants with males having the highest levels. PCBs and certain fire-retardant persistent organic pollutants have been banned in Canada. Canada and U.S. researchers continue to monitor resident killer whale populations.

Disturbance:

All cetaceans, including resident killer whales, are being subjected to increasing amounts of disturbance from vessels, aircraft and other anthropogenic noise. Industrial activities such as: dredging, pile driving, construction, seismic testing, military sonar and other vessel use of low and mid-frequency sonars impact the acoustic environment. The means by which physical and/or acoustic disturbance can affect resident killer whales at both the individual and population levels are not well understood, but may depend on whether the disturbance is chronic or acute.

The *Marine Mammals Regulations* under the *Fisheries Act* and prohibitions under *SARA* specifically prohibit the disturbance and harm of killer whales. Guidelines for marine mammal viewing have also been developed. To avoid disturbing killer whales and other marine mammals, fish harvesters are advised to follow the advice in: *Be Whale Wise*

(BWW); and, *Marine Wildlife Guidelines for Boaters, Paddlers and Viewers*. These are available from local Fishery Offices or on-line at: <http://www.pac.dfo-mpo.gc.ca/fm-gp/species-especes/mammals-mammiferes/index-eng.htm>.

Non-compliance with the BWW Guidelines may lead to charges under the *Marine Mammal Regulations* and/or SARA.

Critical Habitat:

Critical habitat for the northern and southern resident killer whales was defined in the March 2008 Recovery Strategy. On February 23, 2009, a Species at Risk Act Section 58(4) Order by the Ministers of Fisheries and Oceans, and Environment was posted to protect that critical habitat from destruction. The Recovery Strategy identifies the following specific actions intended to protect killer whale critical habitat and its attributes: enforcement, protection, management, research, stewardship and public education. These actions are undertaken by multiple DFO sectors and the outcomes will inform further actions.

Fisheries Depredation:

Depredation (the removal of fish from fishing gear) by killer whales has been reported by groundfish longline, salmon troll, and recreational harvesters in B.C. Depredation is a learned behaviour that can spread throughout whale social groups and, once established, is impossible to eliminate. It is critical that B.C. harvesters do not encourage this learning by allowing whales to associate obtaining fish with fishing activity. Encouraging this behaviour will quickly lead to significant losses for harvesters.

The most important approach to prevent this from spreading is by NOT feeding whales directly or indirectly and not hauling gear in the vicinity of killer whales and sperm whales. Typically, killer whales pass quickly through an area allowing fishing to resume. It is also recommended that you advise other fish harvesters in the area if you encounter depredation. Additional tips on avoiding depredation events can be found in the DFO Marine Mammal Bulletin #2.

(see: <http://www.pac.dfo-mpo.gc.ca/publications/marinemammals/depredation-4-2010-eng.pdf>).

If you experience depredation by whales, please report the incident by email to: MarineMammals@pac.dfo-mpo.gc.ca; or by calling (250) 756-7253. Reporting all incidents will assist DFO and fish harvesters in understanding this problem and help in developing strategies to avoid it.

Marine Mammal Incident Response Program and Marine Mammal Sightings Network:

Incidents with marine mammals comprise a range of occurrences which may include: live strandings, dead, sick or injured animals, entanglements or potential violations (disturbance, harm or harassment).

To report a marine mammal incident, including violations, call DFO's Observe Record, Report phone-in line at: 1-800-465-4336. Current log book/reporting requirements specify that all entanglement or by-catch of marine mammals must be reported.

Observations of orphaned seal pups may be reported to the Vancouver Aquarium Marine Mammal Rescue and Rehabilitation line at: (604) 258-SEAL (7325). In many cases, seal pups are not truly orphaned, and staff at these facilities will assess the circumstances.

To report sightings of cetaceans (whale, dolphin, or porpoise) or sea turtles, contact the B.C. Cetacean Sightings Network as soon as possible by phone at 1-866-I SAW ONE (472-9663) or www.vanaqua.org. You may also participate in a formalized logbook program by calling or contacting the Network.

More information on COSEWIC, SARA, and the listing process can be found at: www.cosewic.gc.ca/; www.dfo-mpo.gc.ca/species-especies/home_e.asp; and www.sararegistry.gc.ca/.

Contacts for marine mammal inquiries:

Fisheries and Oceans Canada Contacts:

MarineMammals@pac.dfo-mpo.gc.ca

Paul Cottrell (604) 666-9965

John Ford (250) 729-8375

4.3.12 Environment Canada Project: Assessing the Impact of Gill Nets on Seabirds

A number of seabird species around the world have declined in recent years; seabird by-catch is a part of the reason. Seabird by-catch has been reported in all types of fisheries in B.C. and in fisheries in Alaska and Washington states. However, the number of local seabirds getting entangled in gill nets as a result of the B.C. salmon gill net fishery is not well known. Environment Canada is looking for your help to measure the impact of fishing for salmon with gill nets on local seabird populations.

Environment Canada (EC) wants to know how, when and where gill net fishing may impact local seabirds and to find ways to reduce impacts. Environment Canada, with the Department of Fisheries and Oceans, fishermen, First Nations, non-government organizations, and other coastal communities, has started a program to answer these questions. Without this information, it will be difficult to determine if there is a significant impact. Should impacts be determined, this information helps support solutions that will benefit both the fishery and healthy bird populations.

To help out, EC would like to be informed about any dead birds found, or reported, in gill nets and/or found floating dead on fishing grounds. Please report all incidents to EC's 24-hour reporting line: 1-866-431-BIRD (2473).

For additional information, please contact:

Laurie Wilson, Wildlife Toxicologist, Environment Canada – Canadian Wildlife Service, Delta, B.C. Tel: (604) 940-4679; or, email: laurie.wilson@ec.gc.ca.

4.3.13 Aquaculture Management

Regulatory Regime:

In December 2010, the *Pacific Aquaculture Regulations* came into effect giving DFO the authority to govern the management and regulation of the aquaculture industry in BC, including marine finfish, shellfish, freshwater and enhancement facilities. The Province of British Columbia continues to have authority over land tenures and workplace safety related to aquaculture in BC. New applications, amendments and related referrals are coordinated through Front Counter BC. More information is available on the BC government's website: <http://www.frontcounterbc.gov.bc.ca/>.

DFO requires comprehensive environmental monitoring to be undertaken by the marine finfish industry, and the Department also conducts additional monitoring, audits and investigations (where warranted). Public reporting is undertaken to ensure the transparency and accountability of the management of aquaculture in BC. Associated reporting can be found on the DFO web pages: <http://www.pac.dfo-mpo.gc.ca/aquaculture/reporting-rapports/index-eng.html>.

Within the BC Aquaculture Regulatory Program there is a Compliance and Enforcement Unit, dedicated to aquaculture compliance, as well as an Aquaculture Environmental Operations Unit which monitors the activities of industry on an on-going basis. The Program provides oversight and works to ensure the orderly management of the industry, including planning and licencing, linkages with national and regional policy, as well as consultation and communications.

Integrated Management of Aquaculture Plans:

Integrated Management of Aquaculture Plans (IMAPs) provide an overview of each aquaculture sector and associated management and regulation. IMAPs are available at: <http://www.pac.dfo-mpo.gc.ca/consultation/aquaculture/index-eng.html>. IMAPs complement IFMPs and the two are reviewed periodically to ensure consistency of management approaches.

Opportunities will be provided for commercial and recreational fishing interests, along with First Nations, to become engaged in the IMAP development process. More details related to IMAP consultations are available on the DFO consultation web pages: <http://www.pac.dfo-mpo.gc.ca/consultation/aquaculture/index-eng.htm>.

Aquaculture Management Advisory Committees:

Aquaculture Management Advisory Committee meetings (AMACs) engage the aquaculture industry, First Nations and other stakeholders in the development of IMAPs and on-going feedback relevant to the management of aquaculture. Information relating to AMAC meetings is posted on the DFO Consultations web pages: <http://www.pac.dfo-mpo.gc.ca/consultation/aquaculture/index-eng.htm>. Meetings are open to the public.

4.3.14 Salmonid Enhancement Program

The Salmonid Enhancement Program (SEP) is comprised of nearly 300 projects across British Columbia and the Yukon and includes hatcheries, fishways, spawning and rearing channels, and small classroom incubators. Projects range in size from spawning channels producing nearly 100 million juvenile salmon annually, to school classroom incubators releasing fewer than one hundred juveniles.

SEP enhances Chinook, chum, coho, pink, and sockeye salmon at the population level throughout the Pacific Region, supporting sustainable fisheries through fish production that provides harvest opportunities. Fish production from the program also supports stock assessment and conservation, both of which enable harvest management as well as community involvement and public education.

The program is delivered through three components:

- Major Operations: SEP facilities that rebuild stocks and provide harvest opportunities through hatcheries and spawning channels;
- The Community Involvement Program: includes the Community Economic Development Program that operates contracted SEP facility operations with local community groups and First Nations; and the Public Involvement Program (PIP) projects that are divided into designated and non-designated categories. The latter are smaller projects that focus on outreach, stewardship and educational activities, and which do not produce large numbers of fish.
- The Resource Restoration Unit: supports habitat improvements, stock assessment, effectiveness monitoring, watershed planning, and partnerships related to habitat initiatives.

Steelhead and cutthroat trout are produced at some SEP facilities in partnership with the province of British Columbia; however, targets and release numbers are not included in SEP production planning as the Province is responsible for management of these species.

SEP facilities are subject to the *Pacific Aquaculture Regulations* (PAR) under the *Fisheries Act*. PAR licences for all SEP facilities include a production plan, which is developed within a formal integrated planning process. This production planning process operates within the consultative framework of an integrated harvest planning process that is used to develop the IFMP.

Production planning meetings involve most DFO sectors (SEP, Science, and Fisheries Management), and external consultation and involvement is achieved through the IFMP process. The outcome of production planning is a draft production plan that takes into account production priorities and the results of post-season reviews. This process operates on an annual planning cycle, while at the same time planning for the longer-term. Priorities are established annually based on the national and regional departmental priorities using a consistent approach across the program.

The production planning cycle establishes maximum numbers of eggs to be collected and juveniles to be released, using strategies that will produce the number of adults desired to meet specific objectives while considering species interactions, effects on existing stocks, harvest, habitat capacity, project capacity and overall conservation unit (CU) objectives. Operationally, SEP production targets for a given facility are set for individual populations or stocks. Each individual stock or population together with its run timing, release site, life-history stage and the associated release numbers, is known as a production group and has a specific production objective. A single regional production plan is produced, that comprises donor stocks, release sites, egg-take and juvenile salmon release targets, and stages at release for each SEP facility. Production targets are considered upper limits and will be documented as such in each Facility Pacific Aquaculture Regulation licence.

The risks of salmon enhancement to wild populations include undesirable genetic effects, disease implications, ecological interactions, harvest impacts and marine carrying capacity. DFO is aware of potential interaction of enhanced fish with wild stocks, and has developed an array of risk mitigation and management procedures, guidelines and practices. Hatchery programs are designed to avoid or minimize these risks.

The information available at the link below addresses production from major DFO Operations (OPS) facilities, contracted Community Economic Development Program hatcheries (CEDP), larger or more complex Public Involvement Projects (Designated Public Involvement or DPI) operated by volunteers, and Aboriginal Fisheries Strategy (AFS). Not included are smaller Public Involvement Projects (PIPs) that are focused toward stewardship, stock rebuilding or educational activities and do not release large numbers of fish that would affect fisheries. Facilities may also enhance steelhead and cutthroat trout; however, targets are not included as management of these species is under the authority of the Province of British Columbia.

There are two datasets available: **Post-Season Production** from the 2013 brood year (i.e. 2014 releases, and numbers on hand for 2015 release) and the **Production Plan** which includes proposed targets for the upcoming 2015 brood year. The Production Plan dataset is preliminary, and the final version will be available by June 1. <http://www.pac.dfo-mpo.gc.ca/sep-pmvs/ifmp-pgip-eng.html>.

Production targets for the joint Canada/U.S. Stikine sockeye enhancement program are summarized in Appendix 2, Section 7 of this document; the Taku program is summarized in Appendix 3, Section 7.

4.3.15 Fishing Vessel Safety

Commercial fishing is recognized as a very dangerous activity. Concerns over fishing related injuries and deaths have prompted DFO to proactively work with Transport Canada and WorkSafe B.C. to ensure coordinated approaches to improving fishermen's safety. See Appendix 5 of this plan for more information.

5 OBJECTIVES

5.1 Fisheries Management Objectives for Stocks of Concern

Conservation of Pacific salmon is the primary objective and will take precedence in managing the resource.

The primary fisheries management objective of DFO is the conservation of Canada's fish stocks for current and future generations through sustainable and responsible fisheries management that is science based, applies the precautionary approach, addresses ecosystem considerations and uses a risk based approach. When returns decline below sustainable levels, management actions are taken which may include reducing the impact of fisheries on specific stocks, strategic enhancement and habitat restoration.

Next to conservation, the objective is to manage fisheries in a manner that is consistent with the Pacific Salmon Treaty, First Nation treaty obligations and the Allocation Policy for Pacific Salmon. The Allocation Policy for Pacific Salmon identifies the priority for allocation of salmon harvests and sets quotas and allocations for each of the three different fishery types. The allocation priorities are described as follows:

Priority 1: Attain escapement targets and maintain fish habitat that will result in optimum production of the stocks.

Spawning escapement goals have been established as ranges which reflect biological data and professional judgment 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. In the Transboundary Rivers, spawning escapement goals and/or ranges have been established for those salmon species and stocks that are targeted in Canadian and U.S. fisheries and are subject to coordinated or cooperative management, as per the PST.

Priority 2: Provide for the basic needs of the First Nation fisheries for food, social and ceremonial purposes and for the Basic Needs Allocation where specified in First Nation final treaties; and

Priority 3: Provide salmon harvesting opportunities for recreational, commercial and domestic fishers. These fisheries are provided opportunities to fish providing there are no restrictions required in the First Nation FSC fishery.

In the Transboundary rivers area, management plans are focused on Chinook, sockeye and coho salmon in the Stikine and Taku rivers and Chinook and sockeye salmon in the Alsek-Tatshenshini rivers. These stocks all are managed under provisions of the PST. Stocks of concern in 2015 include: Little Tahltan Chinook salmon (Stikine); Taku Chinook salmon; Tatsamenie Lake sockeye salmon (Taku); and Kuthai Lake sockeye salmon (Taku). Details on how these stocks will be managed are provided in Appendix 2 (Sections 5 and 6), and in Appendix 3 (Sections 5 and 6) of this plan.

6 ACCESS AND ALLOCATION

The Minister can, for reasons of conservation or for any other valid reasons, modify access, allocations, and sharing arrangements as outlined in this IFMP in accordance with the powers granted pursuant to the *Fisheries Act*.

6.1 International Objectives

The objective is to manage Canadian treaty fisheries to ensure that obligations within the PST are achieved.

Details can be found at the Pacific Salmon Commission (PSC) website at:
<http://www.psc.org/Index.htm>.

Review of the performance of management actions relative to PST provisions occurs annually at two bilateral meetings of the Transboundary Panel of the PSC and those results are published post-season by the PSC. Summaries of Transboundary treaty performance for 2014 appear in the post season review sections of Appendix 1 (Section 8), Appendix 2 (Section 9) and Appendix 3 (Section 9).

6.2 Domestic Allocation Objectives

The objective is to manage fisheries in a manner that is consistent with the *Allocation Policy for Pacific Salmon*.

The *Allocation Policy for Pacific Salmon* can be found on-line at:
<http://www.dfo-mpo.gc.ca/Library/240366.pdf>

The Allocation Policy for Pacific Salmon sets out principals for allocation between the recreational and commercial sectors and also identifies sharing arrangements for each of the three commercial fishing gear groups in the Pacific Region.

6.3 First Nations Objectives

The objective is to manage fisheries to ensure that, after conservation needs are met, First Nations' food, social and ceremonial requirements and treaty obligations to First Nations have first priority in salmon allocation in accordance with the *Allocation Policy for Pacific Salmon*.

Feedback from consultation sessions is relied on to measure the performance of providing first priority to First Nations for opportunities to catch fish for FSC purposes and any treaty obligations.

The Department is working with the First Nations Fishery Councils' First Nations Salmon Coordinating Committees to develop information summaries to inform specific performance measures for incorporation in the future.

6.4 Recreational and Commercial Objectives

The objective is to manage fisheries for sustainable benefits consistent with established policies.

A primary objective in the recreational fishery is maintaining a predictable opportunity to fish with the expectation of catch. In the commercial fishery, the objective is to improve the economic performance of fisheries, to provide certainty to participants, and to optimize harvest opportunities. However, stocks of concern will continue to constrain opportunities in many fisheries resulting in less than optimal opportunities. Both fisheries will be managed to achieve maximum benefits where possible in accordance with conservation and allocation policies.

6.5 Allocation Guidelines

Allocation decisions in the Pacific Region are made in accordance with the *Allocation Policy for Pacific Salmon*.

Table 5 describes a generalized framework by which fishing opportunities are allocated to different fishing sectors at different abundance levels.

Table 5. Allocation guidelines for Salmon in the Pacific Region

	Low Abundance		High Abundance		
First Nations FSC	Non-retention / closed	By-catch Retention	Directed	Directed	Directed
Recreational	Non-retention / closed	Non-retention	Limited Retention	Directed	Directed
Commercial	Non-retention / closed	Non-retention	By-catch Retention	By-catch Retention	Directed

[note: This table describes conceptually how First Nations, recreational and commercial fisheries might be undertaken across a range of returns. It does not imply that specific management actions for all stocks exactly follow these guidelines, but rather is an attempt to depict the broad approach].

The allocation guidelines above refer to target stocks. The application of the *Allocation Policy for Pacific Salmon* for non-target species or stocks is case specific. The inadvertent harvest of different species of concern is referred to as *by-catch*. The inadvertent harvest of stocks of concern within the same species (i.e. Cultus Lake sockeye when harvesting Summer Run sockeye) is referred to as *incidental harvest*. Both *by-catch* and *incidental harvest* are factored into the calculation of exploitation rates on various stocks, and therefore, fishing plans are designed to be consistent with existing policies and to keep exploitation rates on stocks of concern within the limits described in the fishery management objectives.

All harvest groups have recommended that the Department consult on by-catch/incidental harvest allocations. However, the Department does not generally allocate by-catch or portions of the acceptable exploitation rate on stocks of concern. The Department considers a number of fishing plan options and attempts to address a range of objectives including minimizing by-catch and incidental catch.

6.6 First Nations – Food, Social and Ceremonial (FSC)

The *Allocation Policy for Pacific Salmon* provides that after requirements for conservation, the first priority in salmon allocation is to FSC for harvest opportunities under communal FSC licences issued to First Nations, and to treaty rights for harvest opportunities for domestic purposes (consistent with Treaty Final Agreements).

While these opportunities will be provided on a priority basis, it does not necessarily mean that fishery targets for First Nations will be fully achieved before other fisheries can proceed. For example, many First Nations conduct their FSC fisheries in terminal areas while other fisheries are undertaken in, or in close proximity to river mouths, or in marine areas or approach areas. The general guideline is that the fishing plan must adequately provide for the First Nations' FSC and/or domestic Treaty harvests that will occur further along the migration route over a reasonable range of potential run sizes.

6.7 Recreational Fisheries

Under the Department's *Allocation Policy for Pacific Salmon*, after FSC fisheries, the recreational sector has priority for directed fisheries for Chinook and coho salmon. For sockeye, pink and chum salmon, the policy states that recreational harvesters be provided predictable and stable fishing opportunities. Recreational harvest of sockeye, pink, and chum will be limited to a maximum average of 5% of the combined recreational and commercial harvest of each species on a coast-wide basis over time. In the Transboundary Rivers, retention of sockeye, pink and chum salmon in the recreational fishery is only permitted in the Alsek system.

If stock abundance information suggests that conservation objectives cannot be attained, closures or non-retention regulations will generally be applied. In some cases, recreational fisheries with a non-retention restriction in place may remain open provided the recreational fishery is not directed on any stocks of concern, nor is the impact on any stocks of concern significant in accordance with the *Selective Fishing Policy*.

Prior to a directed commercial fishery on specific Chinook and coho salmon stocks, the fishing plan will provide for full daily and possession limits for the recreational sector on those stocks. Decision guidelines may also identify considerations for changing the area of the fishery, modifying dates or changing daily limits.

6.8 Commercial Fisheries

The *Allocation Policy for Pacific Salmon* provides for a commercial harvest of sockeye, pink, and chum of at least 95% of the combined recreational and commercial harvest of each species on a coast-wide basis over time. Commercial harvest of Chinook and coho salmon will occur when abundance permits and First Nations' FSC, and recreational priorities are considered to have been addressed.

Specific sector target allocations on a coast-wide basis are: seine 40%, gill net 38%, and troll 22% expressed on a sockeye equivalent basis. The ability to achieve these targets is often compromised by conservation constraints and other factors. Allocation targets are not catch targets for each sector. While the Department will usually plan and implement fisheries to harvest fish in accordance with allocation targets, opportunities may be provided that are inconsistent with the allocation targets. When one commercial gear type is unlikely to achieve its allocation, the usual approach will be that options to harvest the uncaught balance by that gear type will be examined in a different area.

Low impact fisheries (limited number of vessels) generally occur prior to those having a higher impact (full fleet), particularly at low run sizes, at the start of the run when run sizes are uncertain or when stocks of concern have peaked but continue to migrate through an area.

6.9 Excess Salmon to Spawning Requirements Fisheries

Salmon fisheries are managed with the objective of reaching escapement targets or harvesting a certain proportion of the run. Uncertain forecasts, inaccurate in-season run size estimates and mixed-stock concerns can result in escapement to terminal areas that are in excess of their required habitat or hatchery spawning capacity. In these cases, Excess Salmon to Spawning Requirements (ESSR) fisheries may occur.

The Department will attempt, wherever practical, to eliminate or minimize ESSRs by harvesting in the FSC, recreational, and commercial fisheries. It is not the intention of the Department to establish new ESSR fisheries to displace existing fisheries.

First priority will be to use identified surpluses to meet outstanding FSC requirements which cannot be met through approved FSC fisheries. This may be done under a communal licence. As a second priority, the local band or Tribal Council may be offered the opportunity to harvest all or part of the surplus under an ESSR licence.

7 DECISION GUIDELINES AND SPECIFIC MANAGEMENT MEASURES

Comprehensive decision guidelines outline management responses that will be invoked under a range of pre-season and in-season circumstances, and the general rationale to be applied in making management decisions.

Decision guidelines are meant to capture general management approaches with the intention of working towards multi-year management plans.

Specific fishing plans and decision guidelines for the Transboundary rivers are described in Section 5 of Appendices 1 to 3.

7.1 General Decision Guidelines

7.1.1 Pre-season Planning

Development of decision guidelines is part of the pre-season planning process. Development is guided by relevant departmental policies, scientific advice, international considerations and obligations, consultation with First Nations, commercial and recreational harvesters, advisory groups and the experience of fishery managers.

Pre-season decisions include the development of run forecasts, escapement targets, exploitation rate limits, sector allocations and enforcement objectives. Generally the stock status provides the background for the types of decisions to contemplate with regards to prosecuting directed fisheries as summarized in Table 6 below.

Table 6. Status criteria for Pacific salmon as outlined by DFO stock assessment staff.

Status Category	Category Definition	Criteria	Fishery Consequences
1	Stock of concern	Stock is (or is forecast to be) less than 25% of target or is declining rapidly.	Directed fisheries are unlikely and there may be a requirement to avoid indirect catch of the stock.
2	Low	Stock is (or is forecast to be) well below target or below target and declining.	Directed fisheries are uncertain and likely to be small if permitted. Allocation policy will determine harvest opportunities.
3	Near Target	Stock is (or is forecast to be) within 25% of target and stable or increasing.	Directed fisheries subject to allocation policy.
4	Abundant	Stock is (or is forecast to be) well above target.	Directed fisheries subject to allocation policy.

7.1.2 In-season Decisions

In-season decision trigger points vary from fishery to fishery depending on type, availability and quality of in-season information and the established advisory, consultation and decision-making processes. Decisions include opening and closure of fisheries, level of effort deemed acceptable, gear type restrictions, deployment of special projects, etc.

Where possible, in-season decisions will be consistent with pre-season plans; however, the implementation and applicability of decision guidelines and pre-season plans can be influenced in-season by a number of factors. These include: unanticipated differences between pre-season forecasts and in-season run size estimates; unexpected differences in the strength and timing of co-migrating stocks; unusual migratory conditions; the availability and timeliness of in-season information; and unexpected environmental conditions.

7.1.3 Selective Fisheries

Selective fishing is defined as the ability to avoid non-target fish, invertebrates, seabirds, and marine mammals or, if encountered, to release them alive and unharmed (see *Policy for Selective Fishing in Canada's Pacific Fisheries*). Selective fishing technology and practices will be adopted where appropriate in all fisheries in the Pacific Region, and there will be attempts to continually improve harvesting gear and related practices.

All sectors have responded positively to the growing conservation consciousness. First Nations have embraced the principles of selective fishing by adopting more selective fishing gear, as often these types of gear reflect a traditional way of fishing. The Canadian commercial fishing sector has developed its own Canadian Code of Conduct for Responsible Fishing Operations. Over 80% of Canada's fishing organizations have signed on and ratified the Code that is overseen by a Responsible Fishing Board. Similarly, the recreational fishery in the Pacific Region developed a Code of Conduct. In addition, DFO has worked with the Sport Fishing Institute (SFI) on a Tidal Angling Guide certification program. The SFI (see: <http://www.sportfishing.bc.ca/>) and 'go2HR', the resource for people in B.C. Tourism (see: <https://www.go2hr.ca/>), have developed an Industry Training Authority approved Tidal Angling Guide certification program. The first of its kind in North America, this program encompasses Transport Canada requirements including the Small Vessel Operator Proficiency certification (SVOP). The SVOP and other certificates address federal requirements for non-pleasure, passenger carrying vessels operating on the B.C. coast.

7.1.4 Post-Release Mortality Rates

The salmon conservation and fisheries management measures in this IFMP are based on many considerations, including estimates of the mortality rates of salmon that are released from the various types of fishing gear that are used in commercial, recreational and First Nations fisheries. Post-release mortality rates can vary substantially and depend on many factors, including the location of the fishery, the unique characteristics of each type of fishing gear and method, and the species of salmon that is captured and released. In April 2001, DFO announced revisions to the post-release mortality rates that had been used by DFO in previous years. The mortality rates applied by DFO to each gear type and fishery prior to 2001, and the revised rates announced by DFO in 2001 with some more recent revisions are summarized in Table 7. The revised rates reflected the results of additional research on post-release mortality rates that were available at that time. DFO has generally continued to use these post-release mortality rates each year in the development of annual fishing plans.

DFO will review the post-release mortality rates currently used for salmon fisheries in Canadian waters and update Table 7 as new information becomes available. Since 2001, additional research has been conducted on post-release mortality rates of salmon, and additional fishing methods and gear types have been implemented (e.g. beach seining, recreational catch and release study for Fraser sockeye salmon) in some salmon fisheries. The pre-2001 post-release mortality rates are included for historical comparison indicating which fisheries rates have changed. The 2001 post-release mortality rates currently applied by DFO for salmon fisheries, in some cases, are not the same as the

rates that are currently applied by the bi-lateral Chinook Technical Committee under the Pacific Salmon Treaty. The results from the DFO review of mortality rates will be used to inform any additional revisions to the post-release mortality rates that are required to address these issues in the development of salmon IFMPs in future years.

Table 7. Post-Release Mortality Rates

Fishery	Pre 2001 Post-Release Rates (for historical comparison)	2001 Post Release Rates
First Nations Fisheries	Note: When using the same gear and methods noted below the same mortality rates were applied.	Various – Depending on gear used and fishery. Gill net – 60% same as commercial below. Beach seine – 5% for sockeye and coho in river Fraser. Modified Shallow Seine – 10% for sockeye and coho in-river Fraser. Fishwheel – 5% for sockeye and coho in-river Fraser.
Recreational troll gear – sockeye, coho, pink and chum.	10%	10% except 3% for sockeye in-river Fraser.
Recreational troll gear – Chinook	15%	15%
Recreational mooching gear – coho and Chinook.	10% for coho, 15% for Chinook.	20% for coho in Areas 1&2; 16% for coho in Areas 3 to 10; 10% for coho in other areas; 15% for Chinook in all areas.
Commercial Gillnet	60% to 70%	60% with provision for rates as low as 26%* where selective techniques warrant.
Commercial Seine – North Coast (Areas 1 to 10)	10% to 25%; 5% in Area 4 special seine fishery.	15% all areas, except 10% in the Area 4 special seine fishery.
Commercial Seine – South Coast (Areas 11 to 29)	15% to 25%	25% Johnstone Strait; 70% Area 20 – coho; 25% all areas for sockeye.
Commercial Troll – All Areas	26%	10% sockeye, 15% coho and Chinook.
Commercial tangletooth net 3.5” mesh	n/a	10% sockeye, 15% coho

*Revised from 40% to 26% for 2011 based on a study done specific to the Skeena in the North Coast

7.2 Chinook – AABM/ISBM Management

Chinook salmon fisheries in B.C. are managed under the umbrella of the PST, with domestic considerations for stocks of concern, allocation between sectors of the fishery, and application of selective fishing practices.

With the exception of the Transboundary rivers, which have separate provisions for Chinook salmon management (PST, Chapter 1, Annex IV), the basis for managing

fisheries impacting Chinook salmon from Alaska to Oregon is the Chinook abundance-based management system in Chapter 3 of the PST. This management system was adopted in 1999 and defined harvests of Chinook through 2008. Chapter 3 of the PST, revised for implementation in 2009, maintains the abundance-based management framework established under the 1999 Agreement.

Further explanation and the text of the Chinook salmon agreements can be found on the PSC website at: www.psc.org/Index.htm. Specific details of the arrangements for Stikine and Taku Chinook salmon management appear in Appendix 2, Section 5.1 (Stikine) and Appendix 3, Section 5.1 (Taku) of this document.

Two types of fisheries are identified in the PST, Chapter 3: Aggregate Abundance Based Management (AABM) fisheries; and, Individual Stock Based Management (ISBM) fisheries. Three mixed-stock aggregate fisheries make up the AABM fisheries identified by the PST including: 1) Southeast Alaska (SEAK) sport, net and troll fisheries; 2) Northern British Columbia troll and Haida Gwaii (Queen Charlotte Islands) sport fisheries; and 3) West Coast of Vancouver Island (WCVI) troll and WCVI outside sport fisheries. These fisheries are managed to an annual total allowable catch based on the forecast abundance of the aggregate of stocks that contribute to each fishery. Accounting of Chinook salmon fisheries for the PST occurs from October 1 in one calendar year, to September 30 in the next calendar year.

The Chinook Technical Committee (CTC) is responsible for completing a review of how AABM fisheries performed relative to preseason 2014 indices and to complete the final calibration of the Chinook Model for the upcoming 2015 fishing season. The preliminary calibration provides the Abundance Indices (AI) that are required for determining the preseason estimated allowable catches for the three AABM fisheries described above. The AIs and the associated allowable catches for 2014 and 2015 are shown in Table 8. **[Note - at the time of publication, the CTC had not yet reached bilateral agreement on the 2015 indices and as such those referenced within this report should be considered preliminary]**. Effective January 1, 2009, the renegotiated Pacific Salmon Treaty provisions were put into effect including, the implementation of a 15% reduction in SEAK and a 30% reduction in the Total Allowable Catch (TAC) for the WCVI AABM. The allowable catches in Table 8 reflect this change.

Table 8. Coast-wide Chinook salmon abundance indices and associated allowable catches for 2014 and 2015 AABM Fisheries. [Note: 2015 pre-season values are preliminary].

			SEAK	NBC	WCVI
Abundance Index	2014	Pre-season	2.57	1.99	1.20
		Actual	2.13	1.68	1.03
	2015	Pre-season	1.45	1.23	0.85
Allowable Catch	2014	Pre-season	439,415	290,326	205,356
		Actual	367,095	245,099	176,264
	2015	Pre-season	236,995	160,400	127,278

The remaining Canadian Chinook salmon fisheries identified in the PST agreements are considered ISBM fisheries. For Canadian ISBM fisheries, the agreement identifies a general obligation that limits the total adult equivalent mortality rate for individual stock groups to 63.5% of that which occurred in the 1979 to 1982 base period.

8 SHARED STEWARDSHIP ARRANGEMENTS

Stewardship refers to the care, supervision or management of something, especially the careful and responsible management of something entrusted to one's care.¹¹ In the context of fisheries management, stewardship is often considered in terms of "shared stewardship", whereby First Nations, fishery participants and other interests are effectively involved in fisheries management decision-making processes at appropriate levels, contributing specialized knowledge and experience, and sharing in accountability for outcomes.

Moving toward shared stewardship is a strategic priority for DFO. This is reflected in a number of policies and initiatives, including the Wild Salmon Policy (WSP), the Resource Management Sustainable Fisheries Framework (SFF), Fisheries Reform, Aboriginal Aquatic Resource and Oceans Management (AAROM) Program and the Aboriginal Fisheries Strategy (AFS).

Also referred to as "co-management," DFO is advancing shared stewardship by promoting collaboration, participatory decision making and shared responsibility and accountability with resource users and others. Essentially, shared stewardship means that those involved in fisheries management work cooperatively—in inclusive, transparent and stable processes—to achieve conservation and management goals.

In Pacific Region, DFO consults with and engages First Nations and other interests through a wide range of processes. For salmon, the focal point for DFO's engagement with First Nations, the harvest sectors and environmental interests is around the development and implementation of the annual IFMP. At a broad, Province-wide level, the Integrated Harvest Planning Committee (IHPC) brings together First Nations, commercial and recreational harvesters, and environmental interests to review and provide input on the draft Southern and Northern Salmon IFMPs, as well as coordinate fishing plans and (where possible) resolve potential issues between the sectors. The IHPC also meets post-season to review information regarding stocks and fisheries, and implementation of those IFMPs. For the Transboundary IFMP, consultation and input is primarily accomplished through individual watershed-based management committees, meetings with First Nation's and/or the Yukon Salmon Sub-committee (as described in Section 4 of Appendices 1-3).

Consultation and engagement with First Nations is central to DFO's approach to fisheries management (including the development of IFMPs) and fulfilling the Department's mandate. In addition to supporting good governance, sound policy and effective

¹¹ As defined in the Atlantic Fisheries Policy Review (AFPR): http://www.dfo-mpo.gc.ca/afpr-rppa/home_e.htm

decision-making, Canada has statutory, contractual and common law obligations to consult with Aboriginal groups. For example, The Crown has a legal duty to consult and, if appropriate, accommodate First Nations when the Crown contemplates conduct that might adversely impact Section 35 rights (established or potential) (source: *Aboriginal Consultation and Accommodation: Interim Guidelines for Federal Officials to Fulfill the Legal Duty to Consult*. February 2008).

Consultation and engagement with First Nations takes place at a number of levels and through a variety of processes. For example, a significant amount of consultation and dialogue takes place through direct, bilateral meetings between DFO and First Nations at a local level. This can include specific engagement on a draft IFMP or other issues during the pre-season, in-season or post-season. In addition to consultations at the local level, DFO works with First Nations at the aggregate or watershed level. For example, the Aboriginal Aquatic Resource and Oceans Management (AAROM) program supports Aboriginal groups in coming together to participate effectively in advisory and decision-making processes used for aquatic resource and oceans management.

Other processes, such as the First Nations Salmon Coordinating Committee (SCC) and the Forum on Conservation and Harvest Planning, are being developed in order to facilitate dialogue between First Nations and DFO. In the case of the Forum, representatives of First Nations from the Fraser Watershed and marine approach areas (e.g. Vancouver Island) and DFO meet to discuss stock and fisheries information, identify issues and develop management approaches to help meet food, social and ceremonial (FSC) needs of First Nations as they relate to Fraser salmon species. This type of engagement is critical with respect to migratory species such as Fraser salmon where management approaches in one area can have significant implications for management or fisheries in other areas. In the case of the First Nations SCC, First Nations representatives from 13 geographical areas within B.C. meet with DFO resource management staff to identify priority issues among B.C. First Nations as they relate to salmon. SCC priorities include: advancing First Nations concerns related to salmon; access to salmon for FSC needs across the province; and, working to improve First Nations economic opportunities in salmon fisheries.

Engagement between DFO and First Nations also takes place through a number of bilateral and “integrated” (multi-interest) advisory processes, management boards, technical groups and roundtable forums.

In addition to integrated dialogue through the IHPC, the Department also works directly with the commercial and recreational sectors, largely through the Commercial Salmon Advisory Board (CSAB) and Sport Fishing Advisory Board (SFAB), respectively. The Department also officially consults with the Marine Conservation Caucus, an umbrella group representing eight core environment groups.

9 COMPLIANCE PLAN

9.1 Compliance Objectives

The Conservation and Protection (C&P) program promotes and maintains compliance with legislation, regulations and management measures implemented to achieve the conservation and sustainable use of Canada's aquatic resources, and the protection of species at risk, fisheries habitat and oceans.

The program is delivered through a balanced regulatory management and enforcement approach. Details of the approach for 2015 appear in Appendix 4, Section 1.

9.2 Regional Compliance Program Delivery

For the salmon fisheries in the Pacific Region, C&P will be utilizing a broad scope and blend of tools and approaches to manage compliance towards achieving conservation and sustainability objectives, including:

- Maintain and develop relationships with First Nations communities, recreational groups and commercial interests through dialogue, education and shared stewardship.
- Intelligence-led investigations may specifically target repeat and more serious offenders for increased effectiveness of enforcement effort. Illegal sales of salmon will continue to be a regional priority.
- Prioritize enforcement efforts on those measures directed towards conservation objectives.
- Utilize 'Integrated Risk Management' to ensure Fishery Officer efforts are focused and directed at problems of highest risk.
- Continue to have Fishery Officer presence through patrols by vehicle, vessel and aircraft to detect and deter violators.
- Monitor and support at-sea observers and dockside monitors when possible to ensure accurate catch monitoring and reporting.
- Support traceability initiatives within the salmon fishery to enhance accountability. Monitor and verify catches and offloads of salmon to ensure accurate and timely catch reporting and accounting, including coverage of Dual Fishing opportunities.
- Priorities and direct compliance efforts where there is a risk to salmon stocks of concern.
- Use of enhanced surveillance techniques, and new available technology as well as covert surveillance techniques as a means to detect violations and gather evidence in fisheries of concern.
- Patrols during open timed fisheries to increase intelligence gathering, build relationships with stakeholders and ensure compliance to licence conditions.
- Inspect fish processors, cold storage facilities, restaurants and retail outlets for compliant products.
- Maintain a 24-hour, violation reporting hotline (phone: 1-800-465-4336) to facilitate the reporting of violations. Also see the DFO Observe, Record and

Report (ORR) program at: <http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/points/ORR-ONS-eng.html>.

- Continue to promote ‘Restorative Justice’ principles in all fisheries.

Appendix 4, Section 2 describes how the regional compliance program will be delivered in the Transboundary area.

Consultation

Conservation and Protection works closely within the Fisheries Management sector and Fisheries Protection Program to ensure that fishery management plans are enforceable and implemented in a controlled, fair, and professional manner and that habitat is protected. C&P has a multi-faceted role as educator, referee, mediator and law enforcer.

Conservation and Protection participates in consultations within the fishing community and general public. Education, information and shared stewardship are a foundation of C&P efforts. C&P participates in all levels of the advisory process from Regional Integrated Harvest Planning Committee through to individual fishery sectoral committees. The importance of local field level fishery officer input to these programs has proven invaluable and will continue.

C&P will continue meeting at the local level with individual First Nations, through the fishery officer First Nation Liaison Program and with planning committee meetings that involve First Nations’ groups and representatives from all fishery sectors.

C&P officers participate in local fishery management ‘roundtables’ and sport fishery recreational advisory committees in their respective areas and participate at Sport Fishery Advisory Board meetings.

Fishery officers are viewed as the public face of the department. During their day-to-day activities, the fishing community and general public provide comment and input that is promptly communicated to C&P managers, fisheries managers and habitat management staff. This public feedback is critical in identifying issues of concern and providing accurate feedback on emerging issues.

Consultation initiatives undertaken by C&P in the Transboundary area are described in Appendix 4, Section 3.

Compliance Strategy

In 2015, specific objectives for the salmon fishery will be to focus compliance management efforts on:

- Supporting the development and implementation of the Strategic Framework for Fishery Monitoring and Catch Reporting in Pacific Fisheries.
- Monitoring in-river and marine approach waters using intelligence to target priority fisheries and compliance issues.
- Working with stakeholders to improve regulatory compliance.

Salmon fishery compliance continues to be a priority for C&P in 2015. There are, however, other competing priorities such as supporting the fisheries Protection Program in protecting habitat, the Canadian Shellfish Sanitation Program, and the protection of Species at Risk. These priorities often occur during the same periods as the salmon fisheries.

In order to balance multiple program demands, C&P applies a risk-based integrated work planning process at the Regional and Area levels. This process ensures that resources are allocated appropriately. Fishery Officers may be deployed out of area to assist in Regional priorities. Resource utilization is dependent on availability of program funding. Conservation and Protection cannot be effective without the commitment of all salmon harvesters and the salmon industry to the conservation of this valuable resource.

The Compliance Strategy for the Transboundary rivers in 2015 is summarized in Appendix 4, Section 4.

10 PERFORMANCE/EVALUATION CRITERIA

This section is intended to outline measurable indicators to determine whether or not those management issues outlined in IFMP Section 4 are being addressed and those objectives outlined in IFMP Section 5 are being achieved. These indicators may include those specifically developed for the IFMP, as well as from existing evaluation processes.

Potential performance indicators will be required for: assessing conservation and fishery sustainability; Wild Salmon Policy objectives; domestic and international objectives; First Nations, commercial and recreational objectives; allocation objectives; enhancement objectives, as well as, other indicators of interest.

The Department intends to work collaboratively with First Nations and stakeholders to review existing and/or develop new performance indicators that should be included as part of the performance/evaluation criteria.

The results of the previous year's annual review (e.g. 2014 season) for the Transboundary Rivers are provided in: Appendix 1, Section 8 (for the Alsek); Appendix 2, Section 9 (for the Stikine); and, Appendix 3, Section 9 (for the Taku) of this document.

APPENDIX 1: ALSEK RIVER INTEGRATED SALMON FISHERIES MANAGEMENT PLAN, 2015.

1 INTRODUCTION

The Alsek River originates in the Yukon and northwestern British Columbia and flows into the Gulf of Alaska via Dry Bay, which is located approximately 80 km southeast of Yakutat, Alaska (Figure 3). Much of the watershed lies within the national parks and protected areas of the International Kluane/Wrangell-St. Elias/Glacier Bay/Tatshenshini-Alsek World Heritage Site (see: <http://whc.unesco.org/en/list/72>). Three ecoregions are represented in the area including the Yukon-Stikine Highland, Ruby Ranges and the St. Elias Mountain ecoregions. Coastal portions lie within the Pacific Maritime ecozone (Smith, *et al.* 2004¹²). The topography is diverse, from dynamic braided river valley flats, to extensive icefields bounded by the highest mountains in Canada, to the drier and highly variable temperatures of the interior highlands.

1.1 Description of the Alsek River Salmon Resources

The Alsek River drainage is a moderate producer of Chinook, sockeye and coho salmon most of which spawn in the Canadian portion; limited spawning activity has been observed and documented in U.S. tributaries in the lower river. Only low numbers of pink and chum salmon generally occur in this drainage. Salmon access to headwaters of the Alsek River proper is denied by a major velocity barrier at Turnback Canyon which is located roughly 130 km upstream from the Canada/U.S. border. As a result, spawning areas in Canada occur in the Tatshenshini River drainage and its headwater tributaries in the Yukon and northwestern B.C. and along the margins of lower Alsek River.

Salmon stocks returning to the Alsek River (also referred to as Alsek/Tatshenshini River) drainage are jointly managed by DFO, the Champagne-Aishihik First Nation (CAFN) and ADFG through the Transboundary Rivers Technical Committee (TTC) of the PSC.

1.1.1 Chinook Salmon

From 1997 to 2004, mark-recapture estimates of the total inriver run size of Alsek drainage adult Chinook salmon averaged approximately 9,900 fish (range: 5,580-15,856 fish). Although the tagging program terminated in 2004, total run size estimates have been made intermittently since that time using a combination of expanded Klukshu weir and genetic stock identification results. Estimates based on these data have ranged from 2,400 to 4,400 large Chinook salmon. The run generally enters the river mouth in early May, peaks early June and has vacated the lower river by early July.

¹² Smith, C.A.S., Meikle, J.C., and Roots, C.F. (editors). 2004. Ecoregions of the Yukon Territory: Biophysical properties of Yukon landscapes. Agriculture and Agri-Food Canada, PARC Technical Bulletin No. 04-01, Summerland, British Columbia, 313 p.

Although several spawning sites have been located throughout the Tatshenshini drainage, these populations have been aggregated into one Chinook CU (ALSEK) based on ecotypic and timing characteristics. Primary Chinook salmon spawning stocks include: Klukshu River; Blanchard River; Takhanne River; Goat Creek; and the mainstem Tatshenshini River.

The Klukshu River is the largest Chinook producing tributary of the Tatshenshini River. During years when system-wide population estimates were calculated from mark-recapture studies (1997-2004), Klukshu Chinook accounted for an average of 21.5% of the total escapement (range = 14.0% to 32.2%). However, since 2007, the Klukshu weir count on average has accounted for roughly 45% of the total escapement, as calculated from genetic stock identification (GSI) data. Based on weir counts, the spawning escapement in the Klukshu River over the past decade has averaged approximately 1,200 Chinook salmon (historical range since 1976: 466 to 5,394). Since 1976, the escapement has displayed a declining trend with current cycle averages roughly one-half those of the late 1970's and 1980's.

1.1.2 Sockeye Salmon

Over the past decade, the annual total run size of adult sockeye salmon in the Alsek drainage has averaged approximately 76,000 fish. The run generally enters the river mouth in early June, peaks early July and by early August has moved on to upstream spawning areas.

One River-type and three Lake-type sockeye Conservation Units have been identified for the Alsek River based on genetic and ecotypic attributes. The River-type CU is broadly distributed in the drainage from spawning populations in side-slough areas in the lower mainstem Alsek River to river spawning populations of the Takhanne, Blanchard and upper Tatshenshini River. The Lake-type CU's include: Klukshu, Blanchard and Neskatahin. Some populations exhibit bi-modal timing characteristics. For example, there is an early and late run into the Klukshu River with the early run peaking in mid-July, and the generally more abundant late run peaking early-to-mid September.

The status of Alsek sockeye salmon is monitored primarily through the operation of the Klukshu River weir where the recent 10-year average escapement is approximately 10,500 sockeye salmon (historical range since 1976: 2,741 in 2008, to, 32,120 in 2003). On average, Klukshu sockeye escapement accounts for approximately 21% of the above border drainage escapement (determined by mark-recapture or GSI programs). Smoothed weir counts (10-year moving averages) indicate a waning trend in the total count with early time series 10-year averages declining by 45% to current levels. The early run component exhibits a more stable trend over the long term. Both early and late run inter-annual counts are highly cyclic characterized by unsustained highs and deep lows.

1.1.3 Coho Salmon

System-wide population estimates for Alsek coho salmon are not available. For management purposes, Alsek coho salmon are treated as one stock. One coho CU has

been identified (Alsek) based on ecotypic characteristics confirmed by genetic data. Information regarding coho spawning distribution in the Alsek-Tatshenshini drainage is incomplete and not nearly as extensive as that for Chinook and sockeye salmon, which have the benefit of radio-tagging data and GSI baselines. Some of the known coho spawning locations include: Klukshu River, Takhanne River and Village Creek.

Counts of coho salmon through the Klukshu weir have averaged 1,993 fish over the 2004-2013 period and have ranged from 30 (1978) to 9,921 (2002) since enumeration commenced in 1976. Unfortunately, the coho salmon counts constitute an incomplete record of total abundance into the Klukshu River since the weir is pulled due to inclement weather conditions before the migration has finished. Nevertheless, since 1976, there is an overall increasing trend in the counts and current cycle averages (4-year average) exceed those in the late 1970's by a factor of more than 3.

1.1.4 Pink and Chum Salmon

Little information exists for Alsek pink and chum salmon. Based on very low and intermittent catches in the U.S. fishery in Dry Bay at the river mouth, combined with the lack of observations of these species in the Canadian section of the drainage, suggests production is low. No Alsek pink or chum salmon CU's have been identified.

1.1.5 Steelhead

Steelhead have been observed very infrequently and in low numbers in the upper Tatshenshini (Village Creek and Klukshu River). Information regarding this species in the Alsek drainage is limited.

1.2 Description of Alsek-Tatshenshini River Salmon Fisheries

There are two fisheries that target salmon in the Canadian section of the Alsek River: the First Nation (FSC) fishery and the recreational fishery (Figure 3). The principal U.S. fishery that targets Alsek stocks is a commercial set gillnet fishery that operates in Dry Bay, Alaska at the mouth of the Alsek River. A small subsistence fishery also operates in Dry Bay. Alsek River salmon stocks are also incidentally harvested (in unknown quantities) in Yakutat area marine and coastal areas, contributing to recreational, subsistence and commercial gillnet and troll fisheries.

1.2.1 Champagne and Aishihik First Nations (CAFN) Fishery

The longest standing fishery within the Alsek River drainage in Canada is the CAFN fishery, which has relied on the salmon resources from the watershed since pre-European contact. At present, approximately 100-150 members of the CAFN harvest primarily Chinook and sockeye salmon in the upper Tatshenshini drainage (Figure 3). Recent 10-year catches include 57 Chinook salmon, 1,109 sockeye and less than 10 coho salmon. Catches have generally declined over the past 3-4 decades. Although catches have been low, traditionally the preferred run is the early sockeye run due to its good condition and early timing which makes it most suitable for drying. The later, but more abundant late

summer Klukshu run occurs when the weather is generally becoming wetter and less suitable for drying. The main fishing locations include the Klukshu River (60 km south of Haines Junction, Yukon) at Klukshu Village, and near the mouths of Vand and Motherall creeks, Village Creek and to a lesser extent Goat Creek and Blanchard River.

Fishing generally commences in late June and continues until October. Traditional fish traps have been used to harvest salmon at the outlet of Klukshu Lake and gaffs are used in many other fishing areas. Set nets and angling have become more popular over time. In some years of low returns, special fishing arrangements for elders have occurred at the Klukshu weir.

1.2.2 Recreational Fishery

Recreational fisheries in the Alsek River occur both in British Columbia and in the Yukon with the majority of the effort occurring in the Yukon, on the Tatshenshini River near the abandoned settlement of Dalton Post (Figure 3). The number of anglers participating in the Alsek River recreational fisheries varies considerably from year to year, and is influenced by a number of factors such as run strength, river conditions and weather. For example, in 2014 only 33 recreational anglers participated in the Alsek River recreational fishery in the Yukon portion of watershed due to the weak Chinook salmon run; this was down considerably from 2012 when 280 anglers reported fishing there.

2 SPAWNING ESCAPEMENT GOALS FOR ALSEK SALMON

With the revision to the PST in January 2009, Canada and the U.S. agreed to undertake new analyses to identify and establish bilaterally agreed biological escapement goals, i.e. the number of spawners to produce maximum sustained yield (S_{MSY}), for Alsek River Chinook and sockeye salmon by 2014. This review has been completed and new ranges have been adopted by the Pacific Salmon Commission (PSC) following recommendation from the Transboundary Rivers Panel (TRP).

2.1 Chinook Salmon

In February 2013, the TRP recommended the escapement target range for the Klukshu River Chinook stock be revised from a range of 1,100 to 2,300 fish, to a new range of 800 to 1,200 fish, with an S_{MSY} point target of 1,000 fish. An overall escapement goal for the Alsek River was also identified, with a range of 3,500 to 5,300 and a S_{MSY} point target of 4,700 fish. The analyses and rationale for this goal had been peer-reviewed and accepted by the Centre for Scientific Advice Pacific (CSAP) in October of 2010. Based on a recommendation by the PSC, the Parties adopted the recommended approach effective 2013.

2.2 Sockeye Salmon

In February 2013, the TRP recommended the escapement target range for the Klukshu River sockeye stock be revised from a range of 7,500 - 15,000 fish, to a range of 7,500 - 11,000 fish, with a S_{MSY} point target of 9,700 fish. In addition, an overall escapement goal range of 24,000 - 33,500 and a S_{MSY} point target of 29,700 fish for Alsek River sockeye were recommended by the TRP as a result of their comprehensive review. This goal had also undergone CSAP peer-review. Based on a recommendation by the PSC, the Parties adopted the recommended approach effective 2013.

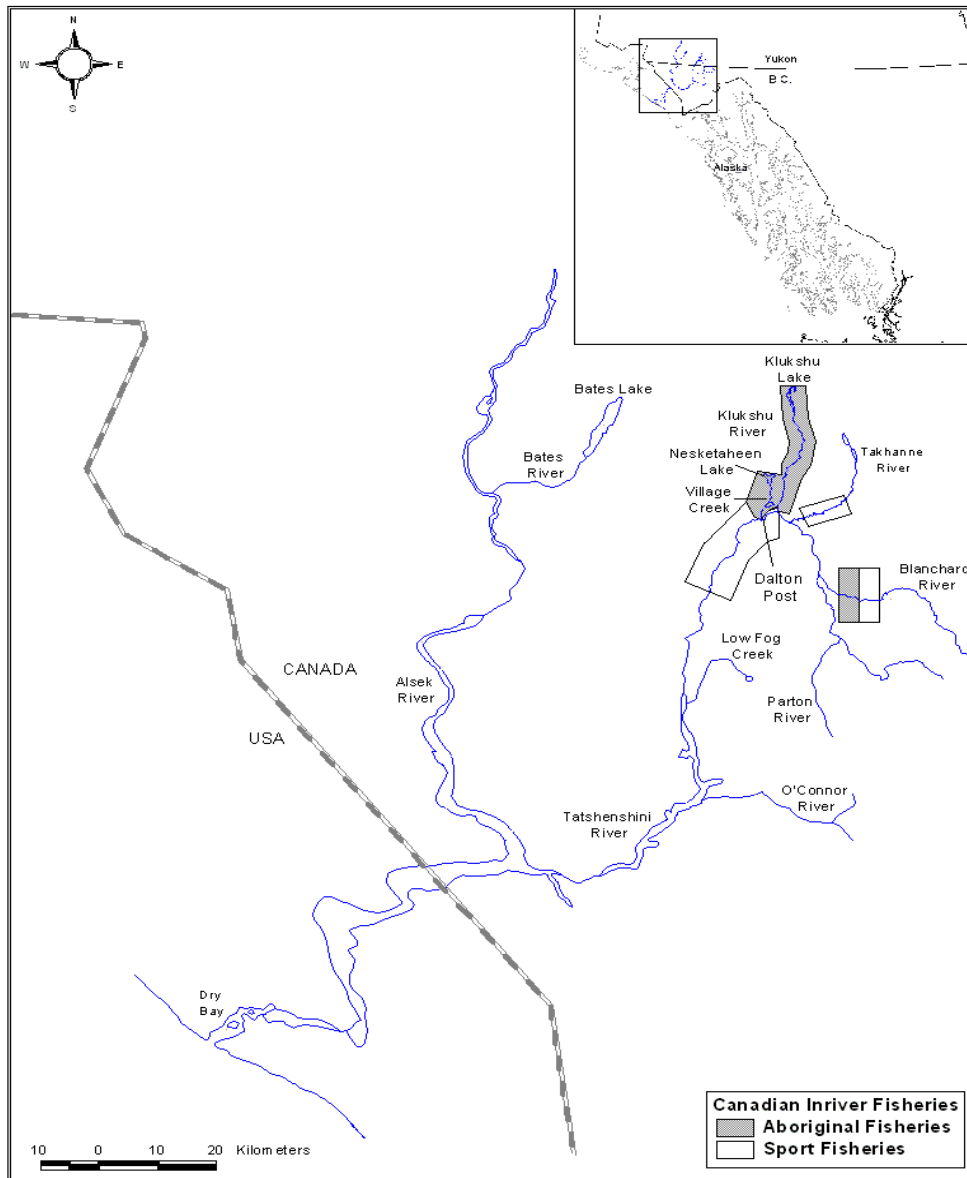


Figure 3. The Alsek River and principal Canadian fishing areas.

2.3 Coho Salmon

An escapement goal for coho salmon in the Alsek River has not yet been established.

3 RUN OUTLOOKS FOR ALSEK RIVER SALMON IN 2015

It is recognized that there is much uncertainty with pre-season forecasting in the Alsek River. Recent survivals of Chinook and sockeye have been highly variable which has created significant challenges in forecasting with certainty. Hence, the pre-season outlook serves to guide the Department and the Yukon Salmon Sub-committee Committee (YSSC) through the pre-season planning and early in-season management stages, eventually giving way to in-season run projections when they become available.

3.1 Chinook Salmon

The Klukshu River Chinook escapements in 2009 and 2010, the two principal brood years that will contribute to the 2015 run, were 1,518 and 2,259 Chinook salmon, respectively. Both were above the recent 10-year average of approximately 1,100 Chinook salmon and above the escapement goal range of 800 to 1,200 Chinook salmon as determined by the Transboundary Technical Committee. Based on these primary brood year escapements, the preseason outlook for Klukshu River Chinook salmon in 2015 is 2,000 fish (reduced by 15% to account for forecast error), which is above the recent 10-year average run size of approximately 1,400 Chinook salmon and above the escapement goal range.

3.2 Sockeye Salmon

The 2015 overall Alsek River drainage sockeye salmon run is expected to be approximately 92,000 fish; this is above the 2005-2014 average run size of approximately 76,000 sockeye salmon. The outlook for 2015 is based on a predicted run of 19,400 Klukshu River sockeye salmon derived from the latest Klukshu River stock-recruitment model (2011 Eggers et al.) and an assumed Klukshu River contribution to the total run of 21%, which is based on mark-recapture results (2000-2004) and run size estimates using GSI (2005-2006, 2011-2014). Principal contributing brood years will be 2010 (Klukshu River escapement of 18,546 sockeye salmon) and 2011 (Klukshu River escapement of 20,782 sockeye salmon); the recent 10-year average Klukshu River sockeye salmon escapement is approximately 10,500 fish. Based on the current stock-recruitment model, the range of Klukshu River escapements that appears most likely to produce optimum yields is 7,500 to 11,000 sockeye salmon.

The Klukshu River early sockeye salmon run counts in 2010 and 2011 were 5,073 and 5,635 fish, respectively. The recent 10-year average count is approximately 2,500 sockeye salmon which is above the minimum management target of 1,500 fish used by DFO. Hence, the early run to the weir is expected to be above average in 2015.

3.3 Coho Salmon

The coho salmon escapements at the Klukshu River weir in 2011 (2,110 fish) and 2012 (1,270 fish) suggest the run in 2015 will be above average. The recent 10-year average weir count is approximately 2,000 coho salmon.

4 CONSULTATION PROCESSES FOR ALSEK SALMON FISHERIES

The development of decision guidelines and specific fishery management plans for Alsek fisheries involves consultation with the YSSC, CAFN as well as consideration of DFO policies, deliberations of the Transboundary Rivers Panel, scientific advice and the experience of fishery managers. In the Yukon Territory, First Nation consultative processes have been established for some time, particularly through implementation of individual First Nation Final Agreements.

4.1 Yukon Umbrella Final Agreement and the CAFN Final Agreement

The Yukon First Nation Umbrella Final Agreement (UFA) was approved in 1993 by the Government of Canada, Government of Yukon and Yukon First Nations as represented by the Council of Yukon First Nations (CYFN). The UFA served as a framework for the establishment of individual Yukon First Nation Final Agreements. The Champagne-Aishihik FN (CAFN) Final Agreement was signed May 29, 1993 and ratified in 1995 (<https://www.aadnc-aandc.gc.ca/eng/1100100030683/1100100030691>). Yukon First Nation Final Agreements represent an exchange of undefined aboriginal rights for defined treaty rights. Specifically, a Yukon First Nation Final Agreement, which is a considered a modern-day treaty, sets out specific rights for the particular First Nation and its citizens.

The UFA and CAFN Final Agreement also clarify the roles and responsibilities of Governments, First Nations and the committees, sub-committees and councils created to implement the UFA and Final Agreement including protocols for consultation. “Consultation” means to provide:

- to the party to be consulted, notice of a matter to be decided in sufficient form and detail to allow that party to prepare its views on the matter;
- a reasonable period of time in which the party to be consulted may prepare its views on the matter, and an opportunity to present such views to the party obliged to consult; and
- full and fair consideration by the party obliged to consult of any views presented.

4.2 Yukon Salmon Sub-Committee (YSSC)

The YSSC, a public advisory body (a sub-committee) of the Yukon Fish and Wildlife Management Board, was established under the UFA as... “*the main instrument of salmon*

management in the Yukon". The mandate of the YSSC is to garner public input into matters related to salmon through its authority to make official recommendations to the Minister of DFO and to Yukon First Nations. These recommendations may apply to all matters related to salmon, their habitats and management including legislation, research, policies, and programs but tend to focus on salmon harvest management. In particular, the UFA specifies that the YSSC consult with First Nations on allocations and seek input from the public, and local Renewable Resource Councils (RRC) which were also established under the UFA, on salmon management plans. For example, the Alsek RRC can make recommendations to the YSSC on the timing and content of salmon management plans, allocation of commercial and other uses of salmon, and on other matters pertaining to the purview of the YSSC. Specific protocols including response options and timeframes for the Minister are outlined in the UFA and Final Agreements with respect to how the recommendations received from the YSSC are handled.

Unexpected threats to the well-being of salmon or salmon habitat may require emergency actions to be taken by the Department. Where time does not permit consultation with the YSSC, there is an obligation to inform the YSSC of such actions within 7 days and solicit their continuing advice and recommendations on actions taken and future options.

The members of the YSSC come from all regions of the Yukon and represent both First Nation and non-First Nation populations. The composition of the ten-member Committee is laid out in the UFA and is carefully structured to ensure diversity and balance. YSSC members consist of Yukon Fish and Wildlife Management Board appointees and nominees from Canada and the Yukon First Nations from the Alsek and Yukon River (including Porcupine) drainage basins. The YSSC has two seats allocated to provide input on matters affecting salmon in the Alsek River drainage.

4.3 Transboundary Rivers Panel of the Pacific Salmon Treaty

Canada/U.S. arrangements for the coordinated conservation and abundance-based management of salmon stocks originating in the Canadian portion of the Alsek River are specified in Chapter 1, paragraph 3(c), of Annex IV of the PST. The Transboundary Rivers Panel oversees the implementation of these arrangements with technical support from the joint Transboundary Technical Committee. Fishery management, conservation, enhancement and stock assessment plans are reviewed and discussed annually by the Panel and/or the Committee. Recommendations ensuing from the deliberations of the Panel can be made to the Pacific Salmon Commission which, upon review, may make recommendations to respective national governments.

The obligations and provisions contained in Chapter 1 and subsequent recommendations from the PSC adopted by the Parties provide the back-drop for the development of this IFMP. Management regimes under Annex IV will be implemented by Fisheries and Oceans Canada and U.S. agencies for the 2015 season.

5 ALSEK-TATSHENSHINI DECISION GUIDELINES FOR 2015

Although Canada/U.S. harvest sharing arrangements for Alek Chinook and coho salmon have yet to be negotiated, interim arrangements for sockeye salmon through 2018 are outlined in Chapter 1, Annex IV of the PST which states... *“the interim management intent of the United States is to pass sufficient sockeye salmon into Canada to achieve the agreed Klukshu River spawning escapement goal range plus 3,000 sockeye salmon”*.

Because of the uncertainty associated with pre-season outlooks, in-season data takes priority in supporting domestic management decisions. In-season management primarily focuses on the projections of abundance of salmon into the Klukshu River derived from Klukshu weir counts expanded by historical and/or in-season timing data. The following Table 9 (below) summarizes management thresholds, i.e. trigger points, for implementation of more stringent conservation actions. Trigger points refer to the projected season total weir counts below which additional restrictions, including closures, in the specified fishery can be expected. Dates reflect when in-season projections are expected to be used.

Table 9. Alek-Tatshenshini salmon management thresholds for conservation actions.

Run Component	First Nation Triggers	Recreational Triggers	Date	Potential First Nation Harvest
Chinook	800	1,000	>July 18	10% of weir count
Early Sockeye	1,500	4,500	>July 18	10% of weir count
Total Sockeye	7,500	10,500	>Sept.06	10% of weir count

[note: Trigger points are based on projected Klukshu weir counts; dates indicate when in-season information is expected to be available].

The trigger points outlined above are based on escapement requirements and Basic Needs Allocation (BNA) obligations. The general approach is to consider FN restrictions whenever it appears the lower end of respective biological escapement goal ranges will not be achieved. The triggers for the recreational fishery are intentionally set higher than the First Nation fishery to reflect the priority for the First Nation fishery. They are derived from the low end of the escapement goal range plus the BNA established in the CAFN Final Agreement. For example, the recreational trigger of 10,500 for overall sockeye management, is the sum of 7,500 (lower bound of the escapement goal range) plus the BNA for CAFN of 3,000 sockeye.

In addition to constraints that may be imposed on fisheries to achieve escapement targets, several additional factors may influence the prosecution of salmon fisheries on the Alek River. These factors may include environmental, stock abundance and fishery assessment program needs.

Fishery decisions are made by DFO based on the trigger points identified above and recommendations from the YSSC and the CAFN Government. Emergency actions will involve consultation with the YSSC and CAFN as per the protocol established in the CAFN Final Agreement.

6 ALSEK-TATSHENSHINI FISHERY PLANS FOR 2015

6.1 First Nation Fishery

6.1.1 Champagne-Aishihik First Nation Basic Needs Allocation

The CAFN Basic Needs Allocation (BNA) has been identified as 200 Chinook salmon and 3,000 sockeye salmon. There is no BNA for coho salmon, although occasional harvest of this species by the CAFN does occur.

6.1.2 Alsek-Tatshenshini First Nation Controls and Monitoring of Removals

Based on the pre-season run outlooks, restrictions in the FSC fishery are not anticipated to be required in 2015. Subject to conservation concerns, CAFN fishing activities are permitted 7 days a week. Any changes to the fishery management strategy will occur in accordance with the Alsek River Decision Guidelines. Action triggers and subsequent management actions for CAFN FSC fisheries include:

- a) In-season projections of Chinook salmon into the Klukshu River will be made after July 18. If the projection is less than 800 Chinook salmon, Chinook non-targeting restrictions, fishing time restrictions and, or, area closures may be necessary in the First Nation fishery. In the event of a closure, special consideration will be given to allowing up to 10% of the weir count of Chinook salmon to be harvested for CAFN Elders. As in past years, the harvest of Chinook salmon on the Parton River, Goat and Stanley creeks will be limited by the CAFN to CAFN Elders;
- b) In-season projections of the early sockeye run into the Klukshu River will also be made after July 18. If the projection is less than 1,500 sockeye, similar restrictions as described for Chinook may be required. In the event of a closure, consideration will be given to allowing up to 10% of the weir count of sockeye salmon to be harvested for Elders;
- c) In-season projections of the total sockeye run into the Klukshu River will be made after September 6. In this case, a projection of less than 7,500 sockeye would result in restrictions in the First Nation fishery being considered. In the event of a closure, consideration will be given to allowing up to 10% of the weir count of sockeye salmon to be harvested for CAFN Elders.

In the event that in-season restrictions in the FSC fishery are required, management actions will only be implemented after consultation with the CAFN. In most cases, such actions will be precluded with additional limitations imposed on the recreational fishery. If CAFN harvesting at the Klukshu weir is necessitated due to low returns, cooperative attempts to collect biological data and samples from the catch may be contemplated.

Harvest monitoring in the FSC fishery is conducted by CAFN, and is reported through the Yukon Salmon Sub-Committee as per Paragraph 16.7.20 of the CAFN Final Agreement. This is an important function that informs the YSSC and DFO as to whether obligations to meet BNA requirements are being achieved.

6.1.3 Alsek-Tatshenshini First Nation Fishery Licencing

The CAFN has a communal fishing license for FSC purposes which authorizes persons designated by the First Nation to fish for Chinook, sockeye and coho salmon.

6.2 Alsek-Tatshenshini Recreational Fishery

Since portions of the Alsek River drainage occur in the Yukon and British Columbia, both the *British Columbia Sport Fishing Regulations* and *Yukon Territory Fishery Regulations*, which were created under the federal *Fisheries Act*, apply to recreational angling in respective areas of the Alsek-Tatshenshini watershed.

Recreational angling restrictions and requirements are subject to change in-season if additional conservation concerns arise, or if additional recreational opportunities become available. Changes are communicated through Fishery Notices, media reports, telephone information lines and/or postings on the Pacific Region Fisheries and Oceans Canada website at: <http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/index-eng.htm>.

6.2.1 Alsek-Tatshenshini Recreational Fishery Control and Monitoring of Removals

Controls for the Alsek-Tatshenshini recreational salmon fishery include daily and possession limits, hook restrictions, area closures, catch record keeping requirements, catch reporting requirements and licencing requirements. Since the regulations governing the fishery differ by jurisdiction, the following sub-sections outline the main features for the Yukon and British Columbia portions of the drainage; generally most of the fishing effort occurs in the former.

Controls and Monitoring in those portions of the drainage located in the Yukon

Notwithstanding in-season variation orders, information on recreational fisheries for salmon in the Yukon, including possession limits, gear and area restrictions are outlined in the *Yukon Fishing Regulations Summary: 2015-2016*, which is available from: Fisheries and Oceans Canada, Whitehorse; Environment Yukon, Fish and Wildlife Branch of the Yukon Government, Whitehorse and district offices; and many angling license vendors in Yukon (see: <http://www.env.gov.yk.ca/hunting-fishing-trapping/fishingregulations.php>). Contingent upon conservation and First Nation FSC fishery requirements being achieved, the daily catch and possession limits for the recreational fishery in the Yukon portion of the Alsek watershed are summarized in Table 10 below.

Table 10. Species Daily Catch limit and Possession Limit (Yukon Recreational Fisheries).

Species	Daily Catch Limit	Possession Limit
Chinook	1	2
Sockeye	0 prior to Aug. 15 / 2 after	0 prior to Aug. 15 / 4 after
Coho	2	4
Aggregate (species combined)	2	4

The gear, catch and area restrictions outlined in the 2015-2016 Yukon Fishing Regulations Summary booklet will apply to the recreational fishery unless in-season projections fall below the trigger points as outlined in the Decision Guidelines for 2015 as described previously. In particular:

- a) If in-season projections of the Klukshu weir Chinook count fall below 1,000 Chinook, the daily catch and possession limits for Chinook will likely be varied to 0;
- b) Retention of sockeye salmon is generally prohibited prior to August 15. However, should the in-season projection of the early sockeye run through the Klukshu weir exceed 4,500 fish, consideration will be given to allowing sockeye retention prior to August 15;
- c) After September 6, if the total projection of Klukshu sockeye falls below 10,500 fish, the daily catch and possession limits for sockeye of 2 and 4, respectively, will likely be varied to 0.

Although daily retention and possession limits for Chinook and sockeye salmon are not expected to be increased over normal levels, consideration will be given to increasing them if the respective run projections exceed the upper end of the escapement goal ranges plus the anticipated FN harvest. Similarly, recreational harvest opportunities may be liberalized for coho salmon should a strong return materialize. Factors that will influence liberalization of recreational coho salmon harvest limits include:

- the status of the sockeye run and potential impacts of by-catch of sockeye during a directed coho recreational fishery.
- the status of the coho run and overall projected weir count.

In the recreational salmon fishery, the following closed/open times will be in effect for 2015:

- the Dalton Post area of the Tatshenshini River will be open seven days per week;
- the closed times for Klukshu River, Nesketahin Lake and Village Creek will be from June 15 to November 30;
- the salmon non-retention periods on the Takhanne and Blanchard rivers will be from July 24 to August 31;
- salmon non-retention in Klukshu Lake will be in effect year round; and
- the area between the DFO Klukshu enumeration weir and the bridge crossing the Klukshu River is closed to recreational fishing to provide protection for salmon preparing to pass through the weir.

The above-noted closed areas are highlighted in Figure 4 which also draws attention to single hook and artificial fly only restrictions in specific waters.

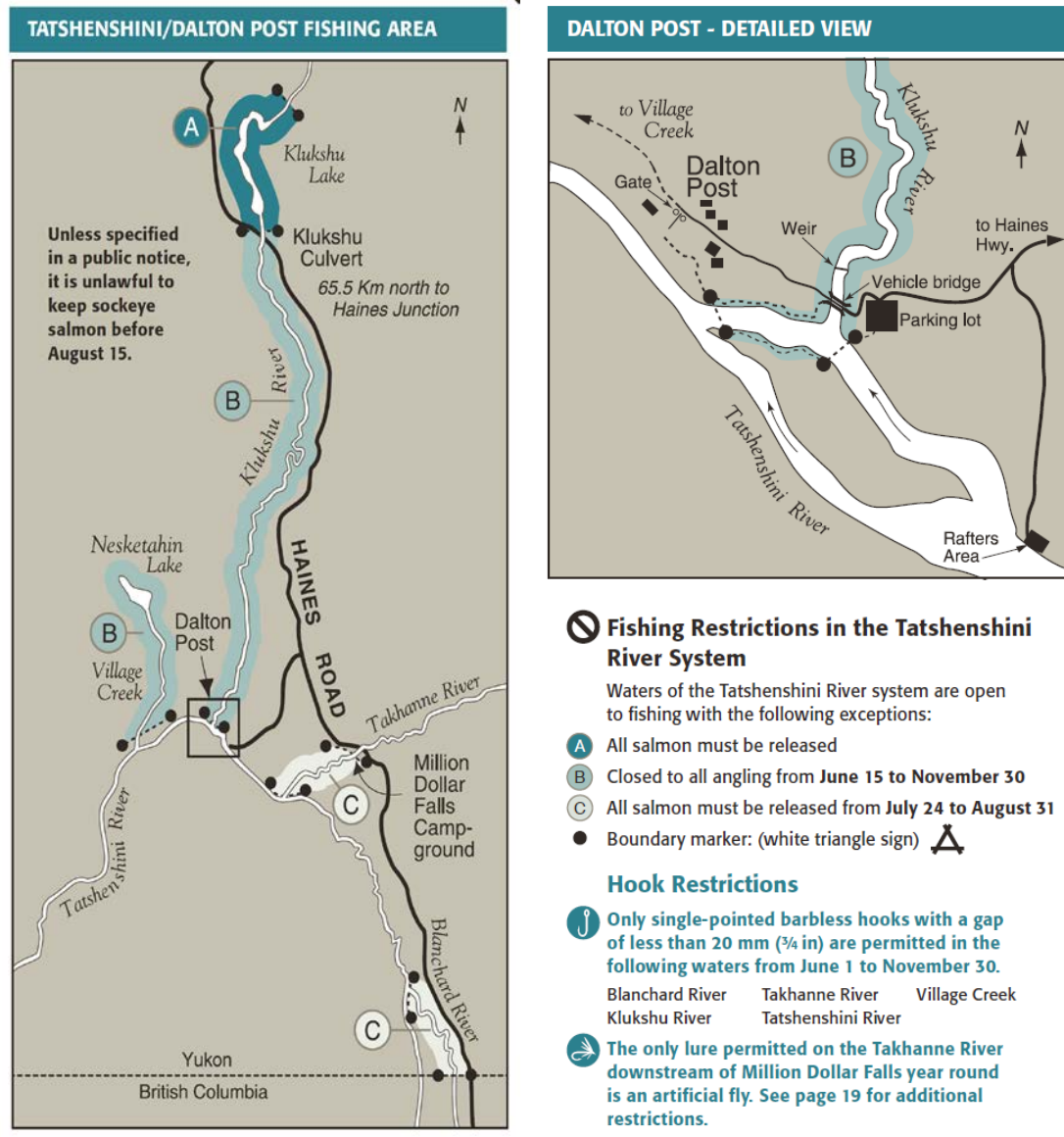


Figure 4. Area closures and gear restrictions on the Tatshenshini River and tributaries in the Alsek drainage in the Yukon Territory.

[see: <http://www.environmentyukon.gov.yk.ca/fishing/fishingregulations.php>].

In-season recreational fishery monitoring will be conducted by Departmental weir personnel through the conduct of a creel census in the Dalton Post area. Fishery Officers and other partnering government enforcement personnel (e.g. Conservation Officers of the Yukon Territorial Government (YTG)) will conduct enforcement patrols in the recreational fishery. Post-season catch estimates will be derived from information collected through the submission of Yukon Salmon Conservation Catch Card (mandatory) and in-season creel census.

Controls and Monitoring in those portions of the drainage located in B.C.

Daily and possession limits, hook restrictions, area closures, catch record keeping requirements, catch reporting requirements and licencing requirements in the B.C. portions of the Alsek-Tatshenshini drainage can be found in the 2015-2017 B.C. *Freshwater Fishing Regulations Synopsis* (see:

http://www.env.gov.bc.ca/fw/fish/regulations/docs/1517/fishing_synopsis_2015-17_region6.pdf), and in the Fisheries and Oceans Sport Fishing Guide for Region 6 (<http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/fresh-douce/region6-eng.html>). Some of the highlights include the following:

- The daily limit for Chinook salmon is 2 per day;
- The daily limit for coho salmon is 2 per day;
- The daily limit for sockeye salmon is 2 per day;
- The maximum number of salmon (species combined) that can be retained in any one day is 4;
- The possession limit is 8 salmon (in the aggregate, species combined);
- The annual catch limit for Chinook salmon in non-tidal waters is 10;
- All retained salmon must measure 30 cm or more;
- All Chinook retained must immediately be recorded in ink on the B.C. angling licence;
- It is illegal to catch or attempt to catch salmon by wilfully foul hooking. Any accidentally foul-hooked salmon must be released;
- Only single barbless hooks are allowed;
- All steelhead must be released;
- Annual fishing closures include:
 - The Blanchard River is closed to Chinook fishing from July 24 to December 31;
 - Kwatini Creek, Stanley Creek and Goat Creek are closed to Chinook, sockeye and coho fishing.

Additional restrictions in the recreational salmon fishery in the B.C. portion of the Alsek watershed are not anticipated. However, if in-season conservation concerns arise, additional limitations such as reduced catch limits and area closures may be required. Increases in the possession limits could be considered if conservation and FSC objectives will be exceeded.

Compliance monitoring and enforcement will be undertaken by enforcement personnel of DFO and/or the province of BC.

6.2.2 Alsek-Tatshenshini Recreational Fishery Licencing

All anglers (except as noted in the either British Columbia or Yukon regulations) must obtain a valid Angling Licence for the jurisdiction they plan to fish in. In addition, all recreational anglers fishing for salmon in the Yukon must also possess a Yukon Salmon Conservation Catch Card. The card requires the angler to record and report the number, sex, size, date and location of any salmon caught and retained or released.

When fishing for salmon in British Columbia portions of the Alsek drainage, anglers are required to have a B.C. Non-Tidal Angling Licence. This licence must be validated with a Salmon Conservation Surcharge Stamp if any salmon are, or expected to be, retained. In order to fish for steelhead, a Steelhead Conservation Surcharge Stamp is required.

7 ALSEK-TATSHENSHINI STOCK ASSESSMENT PLAN FOR 2015

The Alsek stock assessment program planned for 2015 includes the enumeration of Chinook, sockeye, and coho salmon through the Klukshu River weir, which is located just upstream from the confluence of the Tatshenshini River near Dalton Post (Figure 4 – detailed view). The weir has been in operation since 1976 and is the principal salmon escapement monitoring tool in the Alsek drainage. Annual weir counts for Chinook, sockeye and coho are displayed in figures 5, 6 and 7. The weir program includes the collection of baseline biological data, e.g. age, gender, size. Sockeye salmon will also be enumerated (using an electronic and/or video counter) through a weir on Village Creek, another Tatshenshini River tributary, which drains Nesketahin Lake (Figure 4).

Recreational and FSC fishery monitoring will occur in the Klukshu River area in order to estimate the harvest and to collect biological data from salmon captured in these fisheries.

Aerial surveys to augment escapement information on Canadian Chinook and sockeye stocks in the Alsek drainage have not been conducted in recent years. Surveys funded by ADF&G have not been conducted since 2008; surveys conducted by DFO in conjunction with GSI sampling programs, ended in 2012. It is unlikely these will be flown in 2015. Aerial surveys of U.S. sockeye and coho salmon index spawning sites, historically conducted by ADF&G, were discontinued in 2002.

The PST arrangements for the Alsek River require the Transboundary Technical Committee (TTC) to annually produce an estimate of the in-river abundance of Chinook salmon. To assist in this, subject to recommendations of the TTC, the U.S. should administer an assessment test fishery over the duration of the run in the lower Alsek River to collect GSI and other biological information on Chinook salmon (no test fishery is planned for 2015). In place of a test fishery, a U.S. sampling program that will collect biological data from the Dry Bay commercial fishery will be conducted. It is anticipated that GSI, commercial fishery harvest and escapement data will be integral to the development of a 2015 Chinook salmon run estimate. An estimate of the total Alsek River sockeye salmon run will also be made using GSI analysis of samples collected from U.S. commercial fisheries and an expansion of the Klukshu River run reconstruction.

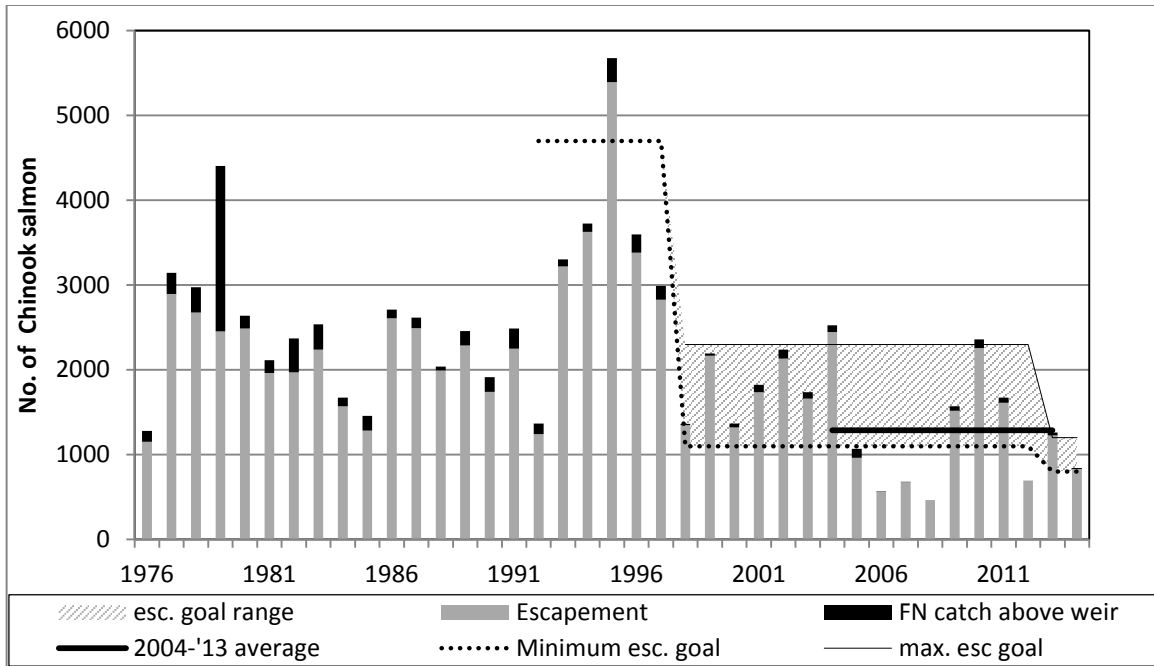


Figure 5. Weir counts of Klukshu River Chinook salmon, 1976 to 2014 (including jacks). [Note: Annual weir counts are represented by the stacked bars which include escapement plus the First Nation catch that occurred upstream of the weir].

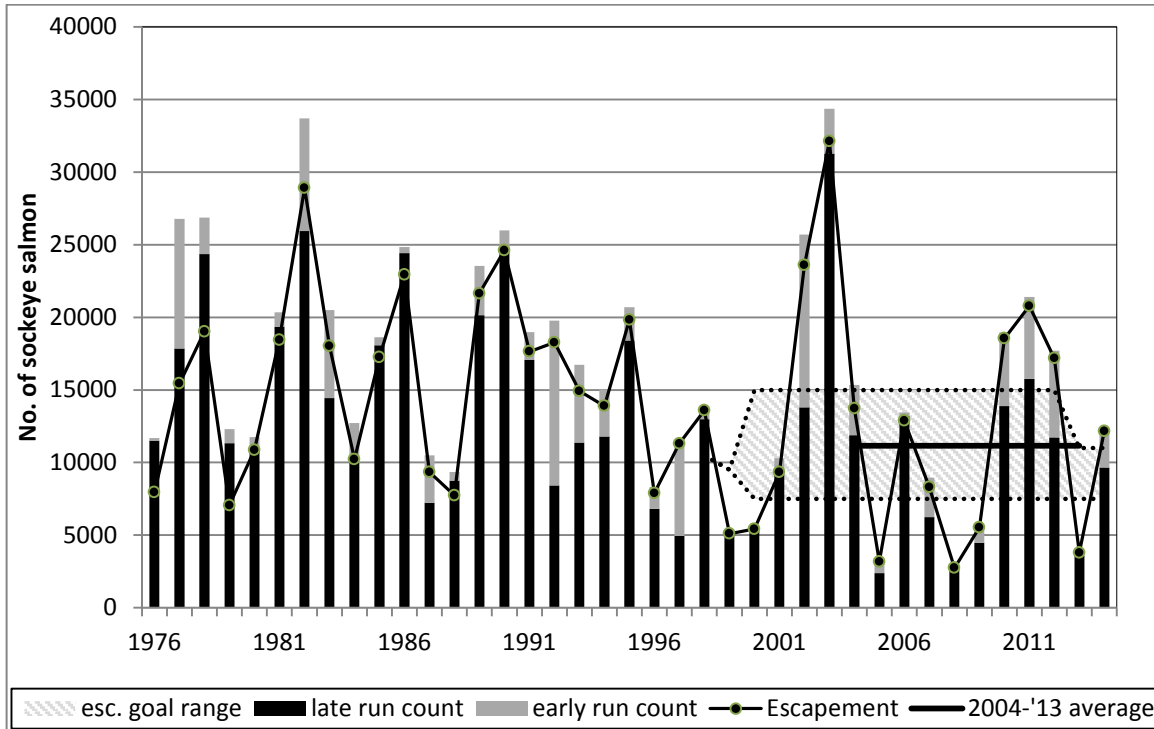


Figure 6. Weir counts of Klukshu River sockeye salmon, 1976 to 2014. Total weir counts are portrayed by the stacked bars which include the early (<15 August) count plus the late count (≥15 August). Escapement is the total weir count minus fish harvested upstream of the weir.

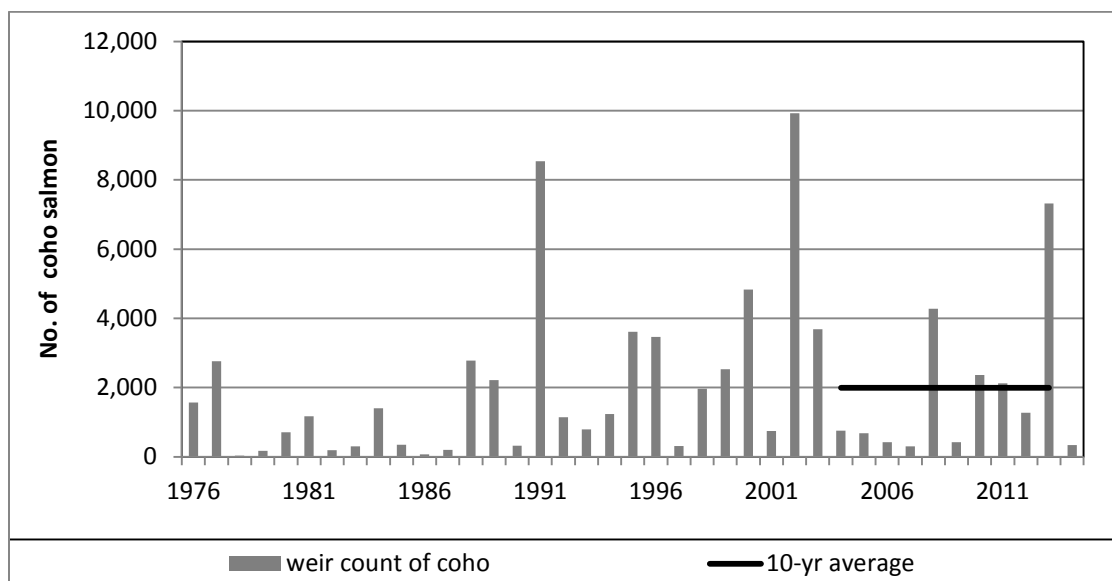


Figure 7. Weir counts of Klukshu River coho, 1976 to 2014. [Note: due to the timing of weir removal, counts do not cover the entire coho salmon run for all years].

8 ALSEK-TATSHENSHINI POST SEASON REVIEW

8.1 Conservation

The 2014 Klukshu Chinook salmon weir count of 841 fish was near the lower end of the escapement goal range of 800 - 1,200 fish (Table 11). Above average weir counts of early (2,732 fish) and late (9,652 fish) run sockeye salmon resulted in the overall Klukshu escapement goal range of 7,500 - 11,000 being exceeded (Figure 6). The Klukshu coho salmon weir count of 341 was well below average (Figure 7).

Table 11. Salmon escapement through the Klukshu River weir in 2014.

Species	2014 Pre-season Outlook	Weir Count (Total)		Estimated Spawners (Total)		Escapement Goal Range	Esc./Management Target Achieved?
		2014	2004-13 Avg.	2014	2004-13 Avg.		
Chinook	>average	841	1,286	832	1,242	800 – 1,200	Yes
Sockeye	<average	12,384	11,155	12,148	10,665	7,500 - 11,000	Yes
Coho	>average	341	1,993	NA	NA	NA	NA

8.2 First Nation Fishery

Due to the absence of a harvest monitor in 2014, catches in the FSC were estimated from reported catches of fish taken at the weir (Elders only) combined with estimates of the

catches taken upstream and downstream of the weir based on the relationship between historical catches and weir counts. The CAFN harvested an estimated 17 Chinook and 1,140 sockeye salmon in 2014, with no reported coho salmon harvest. The BNA of 200 Chinook and 3,000 sockeye salmon were not achieved although the CAFN fishery was given priority in management and provided opportunities to harvest the BNA's. The below average run of Klukshu Chinook salmon into Canada was insufficient to fulfill the BNA for this species.

8.3 Recreational Fishery

In 2014, an estimated 26 Chinook, 0 sockeye and 0 coho were retained by recreational fishers. Live-release of fish caught in the recreational fishery was estimated at 166 Chinook, 8 sockeye and 1 coho salmon. Due to below average inseason run projections, Chinook non-retention provisions were implemented on July 26. As per the management plan, non-retention of sockeye salmon was maintained through August 15 after which the normal daily quota of two sockeye was allowed. Once escapement objectives for sockeye salmon were achieved (September 6) daily catch limits were liberalized to 4 sockeye/day commencing September 6.

8.4 PST Harvest Sharing Performance

There are no specific harvest sharing arrangements in the PST for Alsek salmon although the U.S. management intent for sockeye salmon as specified in the PST is *“to achieve the agreed Klukshu River spawning escapement goal range plus 3,000 sockeye salmon”*. With a total count of 12,384 sockeye through the weir in 2014, there was a sufficient number of fish to achieve a BNA harvest of 3,000 and the midpoint of the escapement goal range of 7,500 - 11,000 Klukshu River sockeye salmon.

An above average catch of 33,668 sockeye salmon (2004 - 2013 average = 13,400) was taken in the U.S. Alaskan Dry Bay commercial fishery with an additional 60 taken in the subsistence fishery. The U.S. harvest of Alsek River Chinook salmon totaled 1,086 fish, of which 1,074 were taken in the Dry Bay commercial fishery (well above the previous decadal commercial average of 440 Chinook salmon).

Canadian catches were below average in both the First Nation and recreational fisheries. Combined fishery catches of 43 Chinook and 1,140 sockeye salmon were below respective 2004 - 2013 averages of 116 Chinook and 1,222 sockeye salmon.

APPENDIX 2: STIKINE RIVER INTEGRATED SALMON FISHERIES MANAGEMENT PLAN, 2015

1 INTRODUCTION

The headwaters of the Stikine River are located in northern British Columbia with the river flowing southwesterly and terminating about 20 km north of the town of Wrangell in southeast Alaska (the Gulf of Alaska). There are three main population centres in this watershed in B.C.: Telegraph Creek, Dease Lake and Iskut. The drainage covers an area of approximately 52,000 km² of which roughly 97% lies in Canada and is characterized by two main ecoregions: the moist, rugged, mountainous and glacier-rich (e.g. Great Glacier) Boundary Ranges Ecoregion; and the drier, continental climate of the sub-Arctic Yukon –Stikine Highlands Ecoregion which includes the Spatsizi Plateau. There are numerous protected areas within the watershed, e.g. Stikine Provincial Park which includes the Grand Canyon of the Stikine, Spatsizi Plateau Wilderness Provincial Park, Mt. Edziza Provincial Park (<http://www.env.gov.bc.ca/ecology/ecoregions/index.html>).

1.1 Description of Stikine Salmon Resources

The Stikine River is a major producer of Transboundary Chinook, sockeye and coho salmon and steelhead. Due to velocity barriers in the Grand Canyon of the Stikine River and in Forrest Kerr Canyon on the Iskut River, salmon access is limited to approximately the lower 40% of the drainage (Figure 8).

Salmon stocks returning to the Stikine River drainage are jointly managed by DFO, the Tahltan-Iskut First Nation (TIFN) and the Alaska Department of Fish and Game (ADFG) through the joint Transboundary Technical Committee (TTC) of the Transboundary Rivers Panel (TRP) which were both established pursuant to the Pacific Salmon Treaty (PST).

1.1.1 Chinook Salmon

Amongst the Transboundary rivers, the Stikine River is considered to be a major producer of Chinook salmon. Over the past decade, the annual total run size has averaged approximately 35,600 large Chinook salmon, i.e. fish with a mid-eye to fork length measuring ≥ 660 mm, with a historical run size range since 2002 of 16,500 (2009) to 87,800 fish (2005). The run generally enters the river mouth in early May, peaks mid-June and has vacated the lower river by mid-July.

Two Chinook Conservation Units have been identified in the Stikine River based on timing and habitat characteristics: Stikine-early (LSTK-early); Stikine-late (LSTIK-late). Primary Chinook salmon spawning locations include: Little Tahltan River; Tahltan River; mainstem Stikine River; Iskut River and tributaries (Verrett and Craig rivers); Christina Creek; Tuya River; Chutine River; and Shakes Creek.

The longest time series of Stikine Chinook salmon escapement data stems from the Little Tahltan River with weir counts dating back to 1985. Five-year moving averages increased from roughly 4,600 large Chinook in the late 1980's to a peak 5-year average of approximately 9,500 fish in the 2001 - 2005 period. Since that time, the stock has been in a noticeable decline with the current 5-year average escapement having dropped to approximately 800 large Chinook salmon. This trend was exacerbated in 2014 by a major landslide on the Tahltan River near the mouth which is believed to have prevented the majority of adult Chinook salmon from reaching spawning areas in the Little Tahltan River. The resulting Little Tahltan weir count was only 169 large Chinook salmon.

Although the times series of total run estimates of Stikine Chinook salmon is shorter, declining overall abundance is also apparent in this dataset. Since 2002, the total run sizes of large Chinook have decreased from a range of 54,000 – 88,000 during the 2002-2006 period, to a range of 19,000 to 30,000 fish during the 2009-2014 period. Prior to 1999, directed terminal gillnet fisheries of Stikine Chinook salmon had been curtailed for a couple of decades to allow stocks to rebuild. New arrangements for directed harvest, if/when warranted by abundance, commenced in 2005 following re-negotiation of the Transboundary Chapter of the PST.

1.1.2 Sockeye Salmon

The Stikine River is also considered to be a major producer of Transboundary sockeye salmon. Over the past decade, the annual total run size has averaged approximately 180,000 adult sockeye salmon (historical range since 1979: 43,300 in 1987 to 372,800 in 1996). The run generally enters the river mouth in early June, peaks mid-July and has migrated upstream beyond the lower river by late August.

One River-type and three Lake-type sockeye Conservation Units have been identified for the Stikine River based on genetic attributes. The River-type CU is part of the broadly distributed Northern Transboundary Fjord CU; the Lake-type CU's include the Tahltan, Chutine and Christina lake stocks.

Based on weir counts from 1959-present, escapement of Tahltan Lake sockeye salmon generally quadrupled from 5-year cycle averages of approximately 10,000 sockeye in the early 1960's, increasing steadily to average 40,000 fish in early 1980's. Since then, cycle averages exhibit a decadal oscillation with low cycle averages of approximately 10,000 followed by peak cycle averages of approximately 50,000 sockeye. Total Stikine sockeye run size estimates are available since 1979 and they generally follow a similar trend over the past three decades. Five-year averages have fluctuated from a low of approximately 64,000 to peak cycle-averages in excess of 260,000 fish. The current cycle-average is approximately 153,500 fish.

As on the Taku River, PST arrangements for Stikine River sockeye include a joint Canada-U.S. enhancement project. Eggs are collected at Tahltan Lake, incubated and hatched at a central incubation facility at Port Snettisham Alaska, and resultant fry are outplanted into Tahltan and/or Tuya lakes in the Stikine headwaters in Canada.

For management and monitoring purposes, Stikine River sockeye salmon are subdivided into three distinct stock groups:

- the **Tahltan stock**, which is composed of the *wild Tahltan* stock (fish originating from naturally spawning sockeye salmon in Tahltan Lake) and the *planted Tahltan* stock (fish originating from broodstock collected at Tahltan Lake and subsequently returned as fry into Tahltan Lake);
- the **Tuya stock**, which includes those fish originating from broodstock collected at Tahltan Lake and subsequently returned as fry into Tuya Lake; and
- the **Mainstem stock** conglomeration which comprises all other natural sockeye populations in the Stikine River. The principal spawning sites of this stock group include numerous side channels and sloughs of the mainstem Stikine and Iskut rivers, and the Verrett, Scud, Porcupine and Chutine rivers.

1.1.3 Coho Salmon

Estimates of the total run size of Stikine coho salmon are less reliable than either Chinook or sockeye salmon being primarily based on comparisons of test fishery and/or commercial catch-per-unit-effort data with that of sockeye salmon. Over the recent decade, the coho run size has averaged an estimated 65,000 fish (historical range since 1985: 15,000 to 113,000 coho salmon). Based on limited aerial survey data, the run status appears to have been relatively stable over the past three decades. Coho salmon generally cross the international border at the Stikine River into Canada in August with the peak of the run arriving in early to mid-September. For research and management purposes all spawning groups (stocks) of coho salmon in the Stikine River are considered one management unit.

One coho CU has been identified for the Stikine River based on ecotypic characteristics (Lower Stikine, LSTIK). The principal coho spawning stock groupings include: Iskut (Verrett and Craig rivers); Katete River; Porcupine River; Scud River; and streams located in the U.S. section of the Stikine River.

1.1.4 Pink and Chum Salmon

A number of pink salmon spawning sites in Canada have been documented in the Stikine mainstem near the Porcupine and the Iskut River near Zappa Creek. Pink salmon production from the Stikine River is relatively minor. Based on ecotypic characteristics, Stikine pink salmon form part of the broader Transboundary Fjord pink salmon CU (TBFj).

Chum salmon spawning sites have been documented in the Stikine and Iskut rivers (mainstem locations), although Stikine River chum salmon production is also considered to be low. Based on ecotypic characteristics, Stikine chum salmon constitute one CU, i.e. Lower Stikine (LSTIK).

Currently, there are no programs in place to assess pink or chum salmon border escapements or drainage-wide spawning escapements within the Stikine River.

1.1.5 Steelhead salmon

Steelhead salmon (fall run) are present in the Stikine River drainage although data regarding abundance and life history are limited. Spawning locations have been identified in the Tahltan River and tributaries of the Iskut River.

1.2 Description of Stikine Salmon Fisheries

There are three fisheries that target salmon in the Canadian section of the Stikine River: a First Nation FSC fishery, a recreational fishery, and a commercial gillnet fishery. Fisheries in Alaska that also target Stikine salmon stocks include: Alaska District 108 (adjacent to the mouth of the Stikine River) and Alaska District 106 (Sumner and Clarence straits) commercial gillnet fisheries; the Wrangell and Petersburg area sport fishery; and, a subsistence fishery in the lower Stikine River in Alaska. S.E. Alaskan troll and seine fisheries also intercept Stikine salmon stocks of which Chinook and coho are of primary interest to the troll fleet.

1.2.1 Tahltan and Iskut First Nations Fishery

The Tahltan and Iskut First Nations (TIFN) have been actively fishing on the Stikine River since well before European contact. The Tahltan First Nation is mainly centred around the community of Telegraph Creek, B.C., while Iskut First Nation members mostly reside in Iskut, just south of Dease Lake, B.C. Subject to achieving spawning escapement requirements, eligible First Nation people or designated fishers are permitted to practice traditional food, social and ceremonial (FSC) fishing activities throughout the Stikine River drainage in Canada.

The First Nation FSC fishery predominantly occurs in the Telegraph Creek area. The fishery commences when Chinook salmon begin to appear in upper Stikine portions of the watershed, usually in May. Steelhead are also encountered during May and June as late over-wintering adults or downstream migrants. Fishing for sockeye salmon occurs from mid-June through early August with most fishing activity completed by late August. Gear primarily involves set gillnets (10-15 m in length) with an average mesh of 13.3 to 15.2 cm (5.25 to 6 inches). In some cases, mesh sizes up to 20.3 cm (8 inches) are employed when targeting Chinook salmon. Most gillnets are secured to, and serviced from, shore by boom poles. Sport fishing gear is also used in tributaries such as the Tahltan River.

Over the past decade, the FSC fishery has annually harvested an average of approximately 5,800 sockeye (range since 1972 of approximately 2,000 to 10,000 sockeye), 600 large Chinook (range: 100 to 1,400 fish); and 200 small Chinook (range: <100 to 600 fish). Generally, sockeye catches have been increasing over the past four decades and have roughly doubled over that time period; the highest reported catch occurred in 2014. Chinook catches increased to peak levels in the late 1980's and have since declined. Few, if any, coho, pink or chum salmon are encountered in the First Nation FSC fishery.

1.2.2 Recreational Fishery

The most prominent recreational fishery on the Stikine River in Canada focuses on Chinook salmon, with fishing effort primarily occurring on the Tahltan River near its confluence with the Stikine River. Minor recreational fishing efforts for both Chinook and coho salmon also occur in the mainstem of the Stikine River as well as the Iskut River. Fishing for steelhead occurs in a few upstream tributaries (e.g. Tahltan River) in the fall.

The TIFN controls recreational access on Reserve Lands and frequently conducts a creel census program on the Tahltan River to monitor recreational fishing activity. Over the 2004-2013 period, recreational fishers retained an average of 53 large Chinook per year, ranging from 0 (2009) to 420 (2002) since 1979.

1.2.3 Commercial Fishery

Currently, there are twenty-three limited entry party-based licences allocated to fish commercially on the Stikine River. Of these, four commercial licenses are designated to fish in the upper Stikine River near Telegraph Creek, while the remaining licenses are designated for the lower Stikine River fishery. Most commercial licence holders on the Stikine River hire an additional fisher to assist them with their fishing.

Commercial fishing occurs in two principle fishing areas (Figure 8) described as follows:

- The upper Stikine River fishing area, which has been fished since 1975, occurs from the confluence of the Chutine River, upstream to the confluence of the Tuya River, excluding any other tributaries of the Stikine River; and
- The lower Stikine River fishing area which first opened in 1979 and includes:
 - the portion of the Stikine River, from the Canadian / U.S. international border upstream to the boundary signs located approximately 2 km above the Stikine River confluence with the Flood River;
 - the portion of the Iskut River from its confluence with the Stikine River to fishing boundary signs located approximately 1.5 km upstream from the water survey station on the lower Iskut River, excluding any other tributaries of the Stikine or Iskut Rivers.

Most of the commercial fishing activity and catch originates in the lower river. Average lower river commercial catches over the past decade include: 47,100 sockeye (range since 1979: 6,100 to 95,800 sockeye salmon), 6,200 large Chinook (range of 300 to 19,100 Chinook salmon); 3,800 coho salmon (range of 100 to 15,900 coho); 100 pink salmon; and 200 chum salmon.

Over the past decade, the upper Stikine commercial catch has averaged: 900 sockeye (range since 1975: 200 to 2,500 sockeye); 14 large Chinook salmon; and 12 small Chinook salmon.

Since 2005, the PST established the conditions (abundance-based) under which the Parties may prosecute directed commercial fisheries for Stikine River Chinook salmon.

The management and harvest of sockeye and coho salmon is also subject to terms and conditions outlined in the PST.

If the run strength is deemed sufficient, the Chinook salmon fishery typically commences in early May and continues through late-June overlapping with the beginning of the sockeye salmon fishery. The sockeye salmon fishery typically commences mid-June in statistical week (SW) 26 and terminates in late August (SW 35). The early portion of the coho salmon return is subject to harvest in the later periods of the directed sockeye commercial fishery in the lower Stikine. Improved market conditions in recent years have rekindled commercial interest in harvesting of coho salmon which has extended the fishing season into September. Few coho salmon migrate upstream into the upper Stikine commercial fishing area. Pink and chum salmon are caught as bycatch during the lower Stikine sockeye fishery but are seldom encountered in the upper Stikine fishing area. Also in the lower river, although not targeted, steelhead are encountered during the sockeye and coho fisheries in late summer and fall. All steelhead intercepted in commercial fisheries must be released.

Salmon captured in the lower Stikine River are processed (gutted and blast frozen) at a federally registered processing plant located on the banks of the Stikine River near the Canada/U.S. border. Salmon are also marketed in the round to buyers located in Wrangell, Alaska. Marketed products include fresh frozen, fresh and smoked salmon. Commercially caught salmon in the upper Stikine are generally sold fresh or fresh-frozen to local buyers.

1.2.4 Fisheries for Excess Salmon to Spawning Requirements (ESSR)

The intended purpose of ESSR fisheries is to facilitate the harvest of salmon deemed surplus to spawning escapement requirements. ESSR fisheries have occurred at Tahltan Lake in 1993 to 1996, and in 2002, when sockeye salmon numbers exceeded the upper end of the spawning escapement goal range. ESSR catches in excess of 14,300 sockeye (1996) have been recorded during this period.

ESSR fisheries have also been conducted on the Tuya River for enhanced sockeye salmon from 1996 to 2000, as well as in 2003 and 2004 with catches of over 7,000 occurring (2004). Tuya River sockeye salmon mostly originate from fry outplants into Tuya Lake as part of the joint Canada/ U.S. Stikine sockeye enhancement program. Adults returning to the Tuya River are considered surplus since they are unable to return to the lake due to impassable water falls located near the mouth of the river.

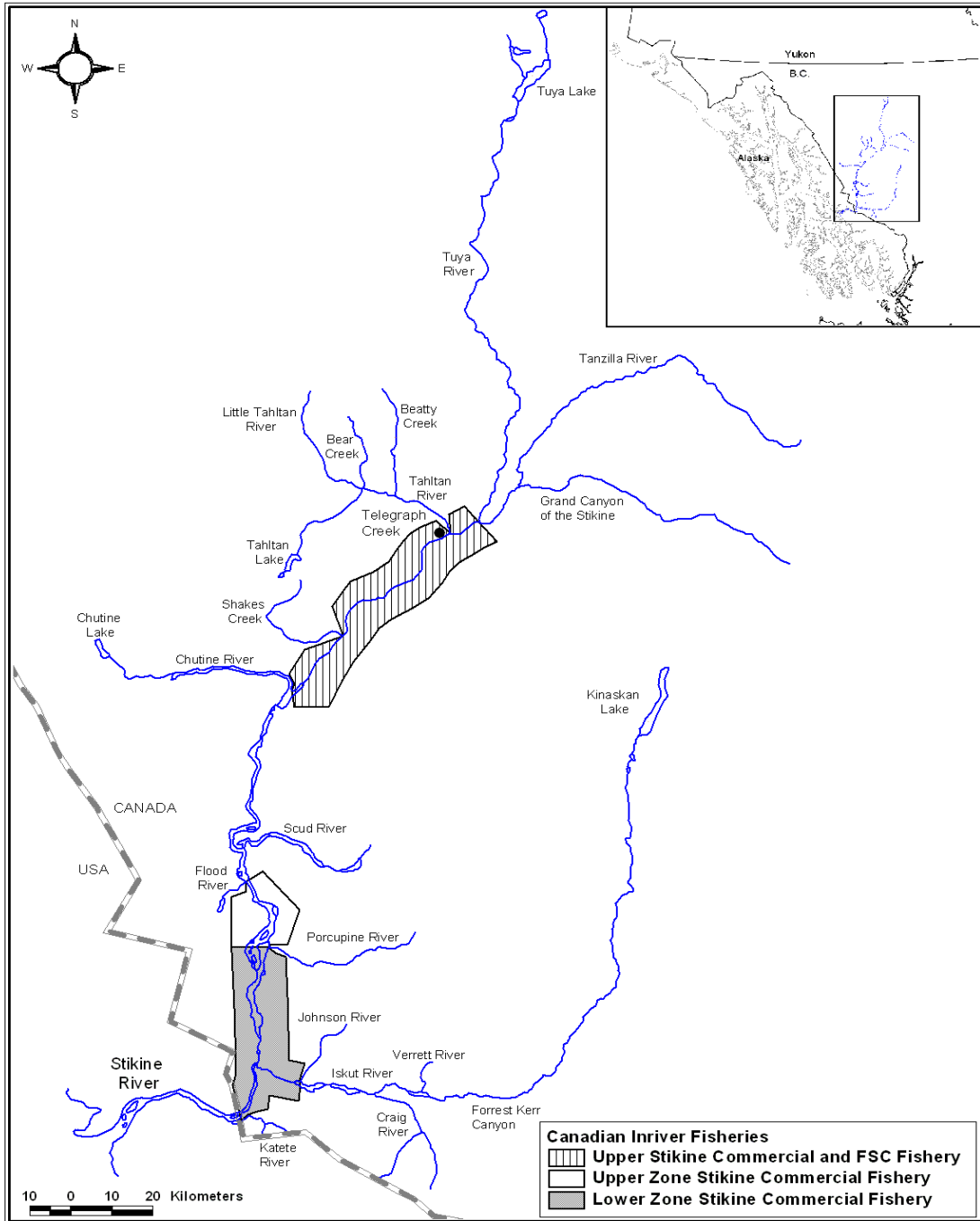


Figure 8. The Stikine River and Canadian fishing areas.

2 RUN OUTLOOKS FOR STIKINE SALMON IN 2015

2.1 Chinook Salmon

The 2015 outlook for the terminal run of Stikine River Chinook salmon is 30,200 large fish, which is approximately 15% below the recent ten-year average run size of approximately 35,600 large Chinook salmon. This outlook is based on a sibling forecast model with the initial output of 40,600 large Chinook salmon being adjusted downward by 26% to reflect the tendency of the model to overestimate the run size in recent years. On average, the run consists of 8% age-4, 36% age-5 and 54% age-6 Chinook salmon while other ages (age-3 and age-7) comprise the remaining 2%.

2.2 Sockeye Salmon

The 2015 total Stikine River sockeye run outlook is approximately 171,200 fish and is characterized as slightly below average. For comparison, the recent ten-year average run size is roughly 179,800 fish. The components of this forecast are summarized below.

Tahltan Lake Sockeye

The outlook for Tahltan Lake sockeye is approximately 81,500 fish of which 31,100 are expected from the enhancement project and 50,400 are expected from natural spawners. For comparison, the 2005-2014 average run size of Tahltan Lake sockeye salmon is roughly 94,300 fish. This outlook is primarily based on the number of smolts emigrating from Tahltan Lake in 2012 (324,900 natural, 314,600 hatchery) and 2013 (1,671,400 natural, 716,300 hatchery) combined with the recent 5-year average survival rates of age-2 and age-3 smolts.

Tuya Sockeye

The outlook for Tuya sockeye salmon is 34,000 fish which is close to the recent 10-year average of 34,600 sockeye. This prediction is based on the primary brood year outplants of fry into Tuya Lake factored by recent 5-year average age-specific fry-to-adult survival data. The primary contributing brood years for the 2015 Tuya run are 2010 and 2011. Approximately 1.24 million sockeye salmon fry were outplanted into Tuya Lake from brood year 2010, and 1.6 million fry were released from the 2011 brood year.

Mainstem Sockeye

The outlook of 55,700 mainstem sockeye salmon is based on the average of a sibling-based prediction of 58,600 and a stock-recruitment outlook of 52,800 sockeye salmon. This constitutes an above average run size (2005-2014 average = 50,900 fish).

2.3 Coho Salmon

Based on the 2011 and 2012 estimated brood year escapements of 39,600 and 28,000 respectively, the 2015 Stikine River coho salmon run size is expected to be below

average. However, brood year aerial survey results for 2011 indicated that the spawning escapement in index areas was above average. The 2012 survey was aborted due to poor viewing conditions. Aerial surveys are conducted once annually and are subject to various surveying and run timing variables.

The lack of reliable escapement and marine survival data for Stikine River coho salmon precludes the development of a reliable numerical outlook for this stock in 2015.

2.4 Pink and Chum Salmon

A pre-season outlook for Stikine River pink or chum salmon has not been developed due to limited data on historical escapement and abundance pertaining to these species.

3 SPAWNING ESCAPEMENT GOALS FOR STIKINE SALMON

3.1 Chinook salmon

The Canada/U.S. bilaterally agreed escapement goal range for Stikine River Chinook salmon is 14,000 to 28,000 large Chinook salmon with a S_{MSY} point estimate goal of 17,400 large Chinook salmon. The escapement goal for Little Tahltan River Chinook salmon is 2,700 to 5,300 large fish with a point target of 3,300 large fish. These goals are based on a peer-reviewed analyses conducted by U.S. and Canadian TTC members and associates and reported in: *Bernard, D.R., S.A. McPherson, K.A. Pahlke, and P. Etherton. 2000. Optimal production of Chinook salmon from the Stikine River. Alaska Department of Fish and Game, Fishery Manuscript No. 00-1, Anchorage.*

Escapements goals for other stock groupings, such as the Tahltan, mainstem Stikine (between Butterfly and Flood rivers), and Iskut rivers have not yet been established. A 2005 radio telemetry project indicated that these three stock groupings represented 41%, 8% and 14%, respectively, of the combined Stikine River spawning population. This same report attributed 13% of the total escapement to the Little Tahltan River. In the future, based on improved definition of specific stocks through GSI and external tagging, management considerations may be directed at other spawning groups.

3.2 Sockeye salmon

Escapement goals have been bilaterally agreed by Canada and the U.S. for two Stikine River sockeye stock groups: the total Tahltan Lake stock and the mainstem stock conglomerate. The Tahltan and mainstem stocks are considered to be independent. Surpluses or deficits in escapement realized in one stock are not used to balance deficits or surpluses in the other. In theory, the Tuya stock, which is planted and has no natural access to spawning and rearing grounds, has a spawning escapement goal of zero. In practice, since the Tahltan and Tuya stocks co-mingle and have similar migratory timing and distribution, the harvest rate on Tuya fish in mixed stock fisheries should not exceed that which can be sustained by the Tahltan fish to avoid over-harvesting the Tahltan stock.

Tahltan Stock

In 1993, Canada and the U.S. adopted a bilateral escapement target of 24,000 fish for the Tahltan River sockeye salmon stock which included an escapement goal of 20,000 naturally spawning fish and up to 4,000 sockeye for broodstock to meet the objectives of the current Canada/US sockeye enhancement program. Escapement goal ranges for the various management categories for the Tahltan stock are summarized in Table 12 below.

Table 12. Tahltan sockeye escapement goals for 2015.

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

Mainstem Stock

The target escapement goal for the mainstem stock is 30,000 sockeye salmon. Escapement goal ranges for the various management categories for this stock are summarized in Table 13 below.

Table 13. Mainstem sockeye escapement goals for 2015.

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

A post-season estimate of escapement that falls within the green escapement goal range will be considered fully acceptable, while one that falls above the escapement range will be considered acceptable but not desirable. Finally, a return that falls below the escapement range is considered undesirable. These scenarios translate to Management Categories employed by DFO with Green considered fully acceptable, Yellow considered acceptable but not desired and the Red Management Category undesirable.

3.3 Coho salmon

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

3.4 Pink and Chum salmon

Escapement goals for Stikine pink and chum have not been developed due to the limited abundance of these species.

4 CONSULTATION PROCESSES FOR STIKINE SALMON FISHERIES

The development of decision guidelines and specific fishery management plans for Stikine River fisheries involves consultation with the Stikine River Salmon Management Advisory Committee (SRSMAC) and the Tahltan-Iskut First Nation. Recommendations of the Transboundary Rivers Panel (TRP) of the PSC provide an overarching back-drop for decision guidelines as do DFO policies, scientific advice and the experience of fishery managers.

4.1 Tahltan and Iskut First Nation: Aboriginal Fisheries Strategy Consultation

Consultations with the TIFN relating to the Aboriginal Fisheries Strategy (AFS) occur throughout the year. Results of these consultations are contained within a multi-year DFO/TIFN Fisheries Agreement. The Agreement details fish management and stock assessment programs, enforcement protocols, communal and commercial licenses, ESSR fishing opportunities and the First Nations' fishery and communal license provisions. The TIFN also participate actively in the Stikine River Salmon Management Advisory Committee and have representation on the Transboundary Rivers Panel.

4.2 Stikine River Salmon Management Advisory Committee (SRSMAC)

The SRSMAC is comprised of representatives of DFO and Stikine River salmon resource stakeholders, specifically the TIFN, commercial and recreational fish harvesters. Membership was established by DFO through consultation with the stakeholder groups which chose their representatives. Transboundary Rivers Panel members with Stikine interests also participate in SRSMAC meetings to ensure continuity and coordination in domestic and international discussions and recommendations. The committee endeavours to meet twice annually to develop recommendations pertaining to management plans, conduct post-season reviews, and to address issues such as licensing, allocations and licence conditions.

4.3 Transboundary Rivers Panel (TRP) of the Pacific Salmon Treaty

Canada/U.S. arrangements for the coordinated conservation and abundance-based management of salmon stocks originating in the Canadian portion of the Stikine River are specified in Chapter 1, paragraph 3(a), of Annex IV of the PST. The TRP oversees the implementation of these arrangements with technical support from the joint Transboundary Technical Committee. Fishery management, conservation, enhancement and stock assessment plans are reviewed and discussed annually by the Panel and/or the Committee. Recommendations ensuing from the deliberations of the Panel can be submitted to the Pacific Salmon Commission which, upon review, may make recommendations to respective national governments.

The obligations and provisions contained in the PST and subsequent recommendations from the PSC adopted by the Parties provide the foundation for development of this IFMP. Management regimes under Annex IV will be implemented by Fisheries and Oceans Canada and US agencies for the 2015 season.

5 DECISION GUIDELINES FOR STIKINE SALMON MANAGEMENT

Fishery decisions are made by DFO based on the trigger points identified in the decision guidelines and recommendations from the TRP, the SRSMAC and the TIFN. The following sections describe the various decision guidelines for Stikine salmon.

5.1 Chinook Salmon Decision Guidelines

Provisions for harvest sharing and management of directed fisheries for Stikine River large Chinook salmon (Chinook ≥ 660 mm mid-eye to fork length) were successfully negotiated by the TRP and implemented commencing 2005.

The catch sharing provisions were developed to acknowledge the traditional catches in existing fisheries, referred to as base level catches (BLCs), which had occurred prior to current arrangements. Considerations for traditional catches included incidental catches and bycatch in Canadian and U.S. commercial gillnet fisheries, U.S. and Canadian sport fisheries, the Canadian First Nation fishery and the Canadian test fishery. For new directed fisheries, it was agreed the allowable catch (AC) would be calculated as follows:

- AC = Terminal run - Base terminal run (BTR);
- BTR = escapement target + BLC (combined):
 - The S_{MSY} escapement target for Stikine River Chinook salmon is 17,400 large fish; the agreed escapement goal range is 14,000 to 28,000 large Chinook (mid-point = 21,000 fish);
 - BLCs are as follows:
 - US Stikine BLC: 3,400 large Chinook;
 - Canadian Stikine BLC: 2,300 large Chinook;
 - Test fishery: 1,400 large Chinook.

In order to conduct directed Chinook salmon fisheries based on the preseason outlook, the outlook must be greater than, or equal to, the mid-point of the agreed escapement goal range plus the combined Canada, U.S. and test fishery base level catches. Therefore the preseason outlook must be $\geq 28,100$ large Stikine Chinook salmon in order to prosecute directed fisheries before in-season projections are available. Once the in-season projections become available, the AC available for directed fisheries is based on calculations employing the S_{MSY} point estimate; hence, the trigger is reduced to 24,500 large Chinook salmon.

Harvest sharing and accounting of the AC for Stikine River large Chinook salmon is summarized in Table 14.

Table 14. U.S. and Canadian allowable catches of Stikine Chinook salmon for directed fisheries.

Allowable Catch Range		Allowable Catch Share			
		US		Canada	
Lower	Upper	Lower	Upper	Lower	Upper
0	5,000	0	500	0	4,500
5,001	20,000	501	11,000	4,500	9,000
20,001	30,000	11,001	17,500	9,000	12,500
30,001	50,000	17,501	30,500	12,500	19,500
50,001	100,000	30,501	63,000	19,500	37,000

Within each Allowable Catch Range, each Party's Allowable Catch Share will be calculated proportional to where the AC occurs within the range. Guided by this information, each Party shall determine the domestic allocation of their respective harvest shares.

Should the terminal run of Chinook salmon be insufficient to provide for the Party's Stikine BLC and the lower end of the escapement goal range, the reductions in each Party's base level fisheries (i.e. the fisheries that contributed to the BLC) will be proportionate to the BLC shares, excluding the test fishery.

The US catch of the Stikine Chinook salmon AC will not count towards the South East Alaska (SEAK) aggregate abundance based management (AABM) allocation (as described in Chapter 3 of the PST). In particular:

- non-Stikine Treaty Chinook salmon harvested in District 108 will continue to count toward the SEAK AABM harvest limit;
- the US BLC of Stikine Chinook salmon in District 108 will count toward the SEAK AABM harvest limit;
- the US catch of Stikine Chinook salmon in District 108 above the US BLC will not count towards the SEAK AABM allocation.

The bilaterally agreed pre-season forecast of 30,200 large Chinook exceeds the threshold of 28,100 large fish which is the trigger point for implementing a directed Chinook commercial fishery based on the preseason forecast as described in the decision rules above. The AC based on the pre-season forecast is therefore 2,100 Chinook salmon (expected run, minus mid-point of escapement goal, minus US BLC, minus Canadian BLC, minus the test fishery allowance: $30,200 - 21,000 - 3,400 - 2,300 - 1,400$). According to the harvest sharing formula, Canada's share of the AC is 1,890 large Chinook salmon which can be taken in a directed Chinook fishery. The Canadian catch allocation will be adjusted according to the in-season projections once they become available.

The pre-season forecast is expected to serve as the principal run size estimator to approximately May 26 (an in-season run estimate before this time is considered unlikely but may be adopted if agreed to by Canada and the U.S.). The pre-season forecast will be replaced with in-season run projections once reliable, in-season estimates become

available based on the Stikine Chinook Management Model (SCMM) which primarily uses Kakwan catch-per-unit-effort (CPUE) data; mark-recapture estimates expanded by historical timing data may be used in conjunction with the model projections. It should be noted that reliable, weekly mark-recapture estimates are expected to be available by SW23 (31 May - 05 June). Managers will need to decide whether to use weekly mark-recapture estimates as the principal run size estimator or use them in concert with the SCMM in assessing weekly run sizes.

Providing that in-season run size projections exceed 24,500 large Chinook salmon, the directed Chinook fishery will be managed on a weekly basis with management actions driven by the SCMM and in-season mark-recapture results combined with pre-season decision rules (conservation and allocation objectives). Weekly inputs to the model will include: catch data from Alaska District 108 gillnet; troll and sport fisheries; catch data from the Canadian Stikine commercial, test, First Nation, and sport fisheries; catch and effort from the Kakwan tagging site; and escapement requirements. The in-river run timing model for 2015 will be based on the average run timing of large Chinook salmon observed in the Canadian test fisheries in 2000-2003 and the 2005-14 run timing observed in the Canadian commercial/assessment fishery.

Should the in-season run projections fall below the 24,500 threshold for allowing a directed Chinook salmon fishery, the directed fishery will be suspended and a test/assessment fishery will be initiated to gather the data necessary to update the run projections.

5.2 Sockeye Salmon

Under the current PSC harvest sharing provisions, the TAC sharing provisions for Stikine sockeye salmon were 50/50 for the 2009 – 2013 period. For the period from 2014 to 2018, this catch sharing provision continues to apply however it may be adjusted if it is determined by the TRP that enhancement activities of either Party contributing to years 2014-2018 did not follow those agreed to in the bilaterally approved annual Stikine Enhancement Production Plans (SEPP). No catch share adjustments relative to past enhancement activities (SEPP) are in effect in 2015 as the 2010 SEPP was deemed by the TRP to have been successfully adhered to by both Parties.

A modification to the management of Canadian Stikine River sockeye salmon fisheries is required in 2015 as a result of Canada's exceedance of its sockeye salmon allocation in three out of the five previous years. Under the terms of the PST, Canada must take corrective actions to align catches with Treaty provisions. Accordingly, Canada will reduce its guideline catch of sockeye salmon by approximately 10 percent. This translates into a reduction approximately 5,300 fish relative to the preseason run size estimate. If it appears this adjustment is overly conservative and escapement goals are likely to be exceeded (as determined by inseason indicators (e.g. weir count)), Canada may consider targeting a full TAC allocation.

The pre-season forecast of 171,200 sockeye salmon translates into an expected TAC of 105,700 fish (excluding an estimated 1,800 for test fisheries) and a 50% harvest share for

Canadian fisheries of 52,800 sockeye salmon (excluding terminal Tuya catches). The Canadian TAC will be reduced by 10% to account for management error in recent years. Therefore, the preseason expected allowable catch for Canada is approximately 47,500 sockeye. This estimate will be adjusted once inseason run size projections become available and incorporated into weekly management decisions.

Weekly management actions will consider data from stock assessment projects (including the CPUE from the fisheries) and the projected run sizes, catch and escapements from the Stikine Management Model (SMM) and the Stikine Forecast Management Model (SFMM). Descriptions of these models are summarized in:

- *Pacific Salmon Commission Transboundary Technical Committee Report. [in prep]. Salmon Management and Enhancement Plans for the Stikine, Taku and Alsek rivers, 2015.*
- *Pacific Salmon Commission Transboundary Technical Committee Report: TCTR (88)-2, Salmon Management Plan for the Transboundary Rivers, 1988.*

The part of the SMM model which determines total and weekly TAC levels for the U.S. and Canadian fisheries has been formulated in EXCEL® for use by managers inseason. This part of the model uses the coefficients from the SFMM and SMM linear regression models, the established escapement goals, and PST harvest sharing provisions to determine the TAC for each country. Estimates of weekly TAC and effort are provided as guidelines for the managers and are derived from the 1986–2011 average run timing of the stocks and the corresponding average CPUE levels of each fishery.

The 2015 inseason predictions of abundance and TAC will be based on the following datasets:

1. Management actions for sockeye salmon will be based on the preseason forecast from the opening of the season through SW26 (June 27).
2. The forecasts for SW27–30 (June 28 through July 25) will be based on the SMM with consideration given to the preliminary SFMM produced forecasts.
3. After SW30, the management models will continue to be updated using the cumulative harvest data from Alaska subdistrict 106-41/42 fishery data; however, run projections are typically less reliable after SW30 and will be viewed accordingly.
4. Historical timing data will be used to provide weekly guideline harvests for each country.
5. Weekly management decisions may include other considerations such as:
 - a. The lower river commercial CPUE of the Tahltan Lake stock grouping may be used to calculate the inriver run size by a linear regression equation independent of the model. The run size of the Tuya and mainstem stock grouping will be determined based on the proportion of the CPUE of these stock groupings in the current statistical week and expanded by run timing (note: water levels and associated changes in exploitation rates will be monitored and used in assessing the run size);
 - b. The current week's inriver run size of Tahltan Lake sockeye salmon may be calculated based on the estimated harvest rate in the lower Stikine River commercial fishery expanded by run timing. The harvest rate is

estimated based on the historical relationship between effort and inriver run size. The run size projections for the Tuya and mainstem stock groupings will be determined based on the proportion of the CPUE of these stock groupings through the current statistical week and expanded by run timing (note: water levels and associated changes in exploitation rates will be monitored and used in assessing the run size);

- c. Harvest rates in existing fisheries compared to historical averages, run sizes, and water levels;
- d. Comparison of current year inriver harvest performance by stock grouping against past harvest performance and run size, and perceived changes in current year run timing information from the run timing regime identified in the management models.

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

Consideration for Tahltan Lake sockeye stock management objectives should persist through July 18 (SW 29) when the contribution of Tahltan stocks typically drops to below 25%. Thereafter, management attention will be focused primarily on mainstem sockeye stock objectives. As in 2010-2014, the mainstem sockeye management period will be moved one week earlier in an attempt to rebuild this stock component, which has only met the point estimate escapement goal in three of the last ten years. Actual time frames of responses to specific stock compositions may be fine-tuned in-season according to the weekly results of the stock ID program.

In concert with the SMM, managers may use other in-season information such as a comparison of current year in-river catch performance by stock grouping against past catch performance and run size, and perceived changes in current year run timing.

Table 15 and Table 16 identify the Canadian management reference points for Tahltan Lake sockeye and mainstem sockeye salmon, respectively.

Table 15. Key Decision Points for Tahltan Lake sockeye salmon.

In-river run size: Tahltan Lake sockeye	FN Fishery	Commercial Fishery
>30,000	Unrestricted	Normal 2-3 day fishery with possible extensions
24,000 – 30,000	Unrestricted	Restricted fishery 1-2 days – possible gear/area restrictions
18,000 - 24,000	Unrestricted	Closure considered
12,000 – 18,000	Restricted – days reduced	Closed
5,000 - 12,000	Closure considered	Closed
<5,000	Closed*	Closed

[note: a FN fishery closure is imposed only if the commercial fishery closed for at least one week prior].

Table 16. Key Decision Points for Stikine mainstem sockeye salmon.

In-river run size	FN Fishery	Commercial Fishery
>40,000	Unrestricted	Normal 2-3 day fishery with possible extensions.
30,000 – 40,000	Unrestricted	Restricted fishery 1-2 days – possible gear/area restrictions.
20,000 - 30,000	Unrestricted	Closure considered
<20,000	Unrestricted	Closed

5.3 Coho salmon

Pursuant to the PST, management efforts of the U.S. are intended to ensure that sufficient coho salmon are allowed to pass into the Canadian section of the Stikine River to meet the agreed spawning objective, plus an annual Canadian catch of 5,000 coho salmon in a directed coho salmon fishery. Coho salmon taken as bycatch during the directed sockeye fishery in Canada do not count towards this quota. In 2015, Canadian coho salmon management will commence in SW35 (August 23-29).

5.4 Pink and Chum Salmon

As pink and chum salmon are currently not targeted in lower Stikine fisheries, and are seldom encountered in the First Nation fishery, harvest sharing arrangements have not been developed for these stocks.

6 STIKINE FISHERY PLANS FOR 2015

6.1 First Nation Fishery

6.1.1 Stikine River First Nations Basic Needs Allocation (BNA)

The Communal Fishing Licence for the Tahltan and Iskut First Nation (TIFN) allows for a BNA of up to 10,000 sockeye, 2,000 Chinook, and 200 coho salmon.

6.1.2 Stikine River First Nations Control and Monitoring of Removals

Although additional restrictions in FSC fisheries are not anticipated in 2015, adjustment of this strategy may need to occur should conservation issues arise. Changes to the FSC fishery management strategy such as reductions in fishing time and/or area closures will

only be considered if sufficient adjustments cannot be accomplished through reductions or closures in commercial or recreational fisheries and will be made through application of the Stikine River Decision Guidelines and consultation with the TIFN.

Catches will be recorded in-season by Fisheries and Oceans Canada from specific harvest data submitted to the Department on a weekly basis by the TIFN Fisheries Program. Biological sampling to assess age, size and stock identification will be conducted during the latter portion of the Chinook salmon fishery and throughout the sockeye fishery.

6.1.3 Stikine River First Nations Communal Licensing

Communal licences are issued to First Nations that have rights to fish in the Stikine River watershed for FSC purposes. The First Nation maintains control of these licenses and has the authority to designate all persons fishing in this category.

6.2 Stikine River Salmon Recreational Fishery

In British Columbia, recreational fishing opportunities for salmon are regulated by the *British Columbia Sport Fishing Regulations* pursuant to the federal *Fisheries Act*. Salmon fishing in the Stikine River watershed in B.C. is covered under the Region 6 fishing regulations (see: the *2015-2017 B.C. Freshwater Fishing Regulations Synopsis* at: http://www.env.gov.bc.ca/fw/fish/regulations/docs/1517/fishing_synopsis_2015-17_region6.pdf; or, the Fisheries and Oceans Sport Fishing Guide for Region 6 at: <http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/fresh-douce/region6-eng.html>).

Recreational angling restrictions and requirements are subject to change in-season if additional conservation concerns arise or if additional recreational opportunities become available. Changes are communicated through Fishery Notices, media reports, telephone information lines, Twitter (@sportfishingbc) and/or the inseason decisions website: <http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/season-saison/index-eng.html>.

6.2.1 Stikine Recreational Control and Monitoring of Removals

The controls for the Stikine recreational fishery for salmon include daily and possession limits, hook restrictions, area closures, catch record keeping requirements, catch reporting requirements and licencing requirements. These are described at: <http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/fresh-douce/region6-eng.html>. Some of the highlights include the following:

- The daily limit for Chinook salmon is 4 per day, with 2 over 65 cm (nose to fork of tail) except for the Iskut River where 1 Chinook salmon over 65 cm is allowed;
- The daily limit for coho salmon is 4 per day, with 2 over 50 cm (nose to fork of tail);
- The daily limit for each of sockeye, pink and chum salmon is 0;
- The maximum number of salmon (species combined) that can be retained in any one day is 4;
- The possession limit is 8 salmon (in the aggregate, species combined);
- The annual catch limit for Chinook salmon in non-tidal waters is 10;

- All retained salmon must measure 30 cm or more;
- All retained Chinook salmon must immediately be recorded in ink on the angling licence;
- It is illegal to catch or attempt to catch salmon by wilfully foul hooking. Any accidentally foul-hooked salmon must be released;
- Only single barbless hooks are allowed to be used when fishing for salmon in streams;
- All steelhead must be released;
- Annual fishing area openings include:
 - The Tahltan River is open to recreational fishing July 1 to November 30.
 - The Iskut River is open from May 01 to November 30.

Additional restrictions are not anticipated in 2015 other than those currently outlined in the B.C. Freshwater Salmon regulations. However, if the in-season run size projections of Chinook and/or coho salmon indicate a conservation or FSC concern, reductions in quotas or non-retention may be implemented. Increases in the possession limits could be considered if the conservation and FSC objectives will be significantly exceeded.

Fishing activity in the Telegraph Creel area will be monitored by a TIFN field technician stationed near the Tahltan River to collect catch and release data. The technician will also be tasked with the collection of baseline biological data including sex, size and age of harvested fish as well as the collection and collation of fish tags recovered by the fishery.

Compliance monitoring and enforcement will be undertaken by enforcement personnel with the Province of B.C. and/or DFO.

6.2.2 Stikine River Recreational Fishery Licensing

Recreational fishing on the Stikine River is permitted provided the angler is the holder of a current BC “Non-Tidal Angling Licence”. A “Salmon Conservation Stamp” must be validated with the basic angling licence if the fisher intends to keep salmon. In order to fish for steelhead, a “Steelhead Conservation Surcharge Stamp” is required (see: <http://www.env.gov.bc.ca/fw/fish/licences/surcharge.html>).

Residents under the age of sixteen may fish without a licence unaccompanied by a licence holder. Non-residents under the age of sixteen may fish without a licence but must be accompanied by a valid licence holder. Catches must be counted towards the possession limit of the licence holder.

Fees vary depending on the type of licence required.

6.3 Stikine Commercial Salmon Fishery

The commercial fishery is allowed to operate providing conservation, FSC, recreational and PST harvest sharing objectives are likely to be met. The Canadian catch will be managed with the objective of meeting escapement and agreed Canada/US and domestic harvest sharing objectives.

The 2015 preseason Chinook salmon forecast is sufficient to proceed with a directed commercial fishery for Stikine Chinook salmon. The lower Stikine commercial Chinook salmon fishery will commence at 12:00 noon, Sunday, May 03. The initial opening will be for 24 hours. Daily and weekly catches will be collected by a DFO representative on site with catches reported to DFO's Whitehorse office on a daily basis.

The upper Stikine River commercial fishery will commence at 12:00 noon Sunday, May 24. The openings will generally be based on the amount of time fished in the lower Stikine River commercial fishery, lagged one week. An exception to this, for example, would be a specific conservation concern for upper river spawning stocks (such as Little Tahltan River Chinook salmon). The upper Stikine River fishers are permitted to use one net of the same dimensions as that used by fishers participating in the lower Stikine River commercial fishery (see Section 6.3.8). Daily and weekly catches will be collected by a DFO representative on site with catches reported to DFO's Whitehorse office on a weekly basis (of particular note is historical commercial fishing activity demonstrates that this fishery is largely inactive through late June (SW26).

The management focus of the lower river commercial fishery will switch to sockeye salmon at approximately 12:00 noon June 21 (SW 26), which is typically the initiation period for this fishery. As with Chinook salmon, the lower Stikine River commercial sockeye salmon fishery will be managed on a weekly basis according to abundance.

In general, a slightly reduced Canadian fleet size targets coho salmon. Management regimes directed at coho salmon will commence in SW 35 (23-29 August).

6.3.1 Stikine Commercial Chinook Fishery Controls

The three primary fishery management actions to control weekly commercial harvests will include:

- Adjusting fishing time: Fishing time in the lower Stikine River fishery generally depends upon stock assessment and international and domestic catch allocation considerations. Although the preseason expectation is for a run size capable of providing directed commercial fishing opportunities, initial fishing periods will likely be of short duration due to uncertainty over the preseason run outlook. Once inseason projections become available, extensions to fishing times may be provided.
- Adjusting the fishing area: Initially, the lower commercial Chinook salmon fishing area will extend from the Canada/U.S. boundary upstream to a location near the mouth of the Porcupine River. Consideration for increasing the fishing area upstream to the boundary sign located approximately 9 km below the Stikine-Scud confluence will only be given if: the inseason indicators for both Chinook and sockeye salmon indicate a strong run; escapement targets are expected to be exceeded; and, harvests are below allocation targets. In the Iskut River, the area will remain unchanged from previous years, i.e. from the mouth to a marker located approximately 10 km upstream from the mouth. For the upper Stikine commercial fishery, the fishing zone in the Stikine River is bounded in the

south by the confluence of the Chutine and Stikine rivers, and in the north by the confluence of the Tuya and Stikine rivers.

- Adjusting the fishing gear: Initially, only one net per license will be permitted and may be deployed as a set or drift gillnet. Gear may be increased to two gillnets should an increase in exploitation rate be warranted based on inseason terminal run size estimates. The maximum allowable net length will remain at 135 meters. Additional gear limitations are described in Section 6.3.8. If Chinook salmon conservation concerns arise later in the season, a maximum mesh size restriction of 140 mm (5.5 in) may be implemented as in previous years to conserve Chinook during sockeye openings. Typically this restriction is removed after mid-July once Chinook salmon have migrated out of the fishing area.

6.3.2 Stikine Commercial Sockeye Fishery Controls

Conservation concerns generally result in fishing time and area restrictions. In the event that increased fishing effort is justified, extensions to fishing time would be granted first. If additional effort is warranted, there will be consideration for increasing gear and fishing area. Additional fishing effort will be dependent on stock status and precautionary principles.

The four primary fishery management responses to in-season sockeye salmon run size projections will include:

- Adjusting fishing time: Fishing time periods in the lower Stikine sockeye salmon fishery depend upon stock assessment and international and domestic catch allocation considerations. Although the pre-season expectation is for a run size capable of providing commercial fishing opportunities, initial fishing periods for sockeye salmon will likely be of shorter duration due to uncertainty over the pre-season run outlook. Once in-season projections become available, caution will be exercised in providing extensions to the fishing times. In the upper Stikine commercial fishery, weekly fishing times for sockeye salmon typically occur one week following openings in the lower river;
- Adjusting the fishing area: Initially, fishing boundary locations will extend from the Canada/US boundary upstream to a location near the mouth of the Porcupine River. The section of the Stikine River upstream from the Porcupine-Stikine confluence will be closed for the initial sockeye salmon fishing periods. Consideration for increasing the fishing area upstream to the boundary sign located approximately 9 km below the Stikine-Scud confluence will only be given if the in-season indicators for both Chinook and sockeye salmon indicate a strong run, escapement targets are expected to be exceeded and harvests are below allocation targets. In the Iskut River, the area will remain unchanged from previous years, i.e. from the mouth to a marker located approximately 10 km upstream from the mouth;

- Adjusting fishing gear: Initially, only one net per licence will be permitted and may be deployed as a set or drift gillnet. Gear may be increased to two gillnets, should an increase in exploitation rate be warranted based on in-season terminal run size estimates. If required to address Chinook salmon conservation concerns, there will be a maximum mesh size restriction of 140 mm (5.5”) through noon July 21 to conserve Chinook salmon while permitting harvest opportunities on sockeye salmon.
- Release of bycatch. The live-release of large Chinook salmon may also be required for conservation reasons during the course of the targeted sockeye fishery. An assumed mortality rate of 25-50% may be applied to the catch of large Chinook that are live-released to account for catch and release impacts.

6.3.3 Stikine Commercial Coho Fishery Controls

For the directed coho fishery, weekly harvest strategies after mid-August will be governed by the 5,000 piece allocation as prescribed by the PST for the Canadian targeted Stikine coho salmon fishery. If the effort level is low in 2015, the coho salmon fishery may see liberal openings during the targeted coho salmon fishery commencing SW 35 (23-29 August). The fleet is expected to harvest the allocated TAC of 5,000 pieces within a two-to-three week period.

An indication of the coho run strength is expected to be gathered over the course of the sockeye fishing season, which extends from late June through to mid-August. If there is a coho conservation concern, the Canadian fishery will be restricted primarily through reduced fishing time during the directed coho fishery.

6.3.4 Stikine Commercial Pink and Chum Harvest Controls

Pink and chum salmon are not targeted in the Stikine River; however some bycatch is anticipated during the directed fishery for sockeye salmon and to a lesser extent during the coho season. Due to the limited abundance of pink and chum salmon, few are expected to be encountered in the Stikine commercial fishery.

6.3.5 Stikine Commercial In-Season Catch Reporting Program

Commercial catch reporting requirements are detailed in the Conditions of Licence issued to all commercial fishers. While participating in the lower Stikine commercial fishery, fishers are required to land catches at a registered landing station within 2 hours of the daily closing time, except for the last calendar day on which fishing occurs in any given week, when the deadline will be 4 hours after closure. In the upper Stikine commercial fishery, commercial fishers have until 24 hours after the close of each weekly fishery to provide catch records to the Tahltan Fisheries Department official stationed at Telegraph Creek. Radio hail information collected throughout the openings will be used to justify extensions to fishing times. As in past years, catches shall be made available for sampling by Departmental staff or designates when requested.

Fish slips must be completed and provide the information required as defined in the Conditions of Licence (note: details regarding specific reporting requirements differ between lower Stikine and Upper Stikine commercial fishing areas). For example, this may include: the number and weight of each species caught separated by gill net mesh size and type (set net or drift net); whether fish were landed in the round or dressed; and the location where fishing occurred. Chinook salmon must also be separated by size (large and small). A small Chinook salmon is a fish with a fork length, i.e. tip of nose to fork of tail, of less than 735 mm. A fork length measurement is used in this case since it is easier and quicker to determine than the mid-eye to fork length, which is the standard length measurement for biological sampling programs for Stikine River Chinook salmon. A logbook is required to document the number of fish caught but subsequently released, and it is submitted along with harvest and tag recovery information after each 24-hour fishing period.

Targeting of pink and chum salmon in the commercial fishery does not occur; however, all catches of these species must be recorded on commercial catch cards (including those that are released). It is unlikely that close times would be varied for pink or chum salmon.

Any steelhead captured during commercial fishing must be live-released and records of release must be retained and submitted to DFO.

6.3.6 Stikine Commercial Non-Retention Species

All opening announcements will contain the species that will be allowed to be retained. If serious Chinook salmon conservation concerns arise during the early part of the sockeye fishery, fishers may be requested to live-release all Chinook salmon. All other species noted in the weekly announcements must be released to the water with the least possible harm (this requirement includes all steelhead).

6.3.7 Stikine Commercial Monitoring Plan

The Lower Stikine fishery will be monitored by DFO and/or TIFN Fisheries Program Technicians stationed at the Lower Stikine Field Office. The Upper Stikine fishery will be monitored by a TIFN Fisheries Department official stationed at Telegraph Creek. Personnel will collect daily catch and tag recovery data from landing stations on the Lower Stikine River and sample portions of the catch for biological samples and stock composition determinations. Catch and tag recovery data will be collected weekly in the upper fishery and will be recorded for each licence by species and hours fished. DFO Conservation and Protection personnel will monitor and enforce compliance in the fishery.

6.3.8 Stikine Commercial Gill Net Construction

Specific restrictions such as the specifications for net construction are found in the Conditions of Licence, which are attached to the licence. No changes from 2014 are anticipated. Fishers are urged to read these conditions carefully to ensure that their fishing gear and activities are in accordance with the rules under which they will operate.

The maximum allowable net length for the Stikine River commercial fishery is 135 metres. All gill nets (set or drift) must meet the following web specifications or those as revised by Public Notice:

- Have 30 or more filaments in each twine of the web, with all filaments in the web of equal diameter. (This is the web which has been typically fished on the Stikine River in Canada); or,
- Have 6 or more filaments in each twine of the web, with all filaments in the web a minimum of 0.20 mm in diameter. (This web is otherwise known as “Alaska twist”).
- The minimum allowable mesh size of gill nets used in this fishery shall not be less than 100 millimetres (4 inches).
- Subject to conservation or FSC concerns, the maximum allowable mesh size of gillnets used in this fishery shall not exceed 204 millimetres (8 inches).
- The maximum gill net depth shall not exceed 60 meshes.
- The maximum gill net hang ratio shall not exceed 3:1, i.e. three fathoms of mesh-to-one fathom of corkline.
- The minimum corkline-to-web distance may not exceed zero cm.
- The maximum corkline to web distance may not exceed zero cm.
- The distance between set nets shall be at least 150 metres, measured from any point between nets.

Set nets must be identified with an orange coloured buoy with the fisher’s licence number clearly marked on it. The buoy must be attached to the end of the net that is furthest from shore.

Specific restrictions for net configuration are found in the Fishery Notice issued prior to every commercial fishery. Fishers are urged to read these carefully to ensure that their fishing gear is in accordance with the provisions for each opening.

6.3.9 Stikine Commercial Licensing

All commercial licences are available through the National Online Licencing System which replaces the in-person payments of licensing fees at DFO offices (see: <https://fishing-peche.dfo-mpo.gc.ca/>). Harvesters will use the online licensing system to go online to pay for and print their commercial fishing licence and licence conditions. The cost of a commercial licence is \$200 regular fee and \$20 First Nation reduced fee. Seven of the 23 commercial licences on the Stikine River are currently held by the Tahltan Band Council who designates who can fish them.

Recommendations for a process regarding relinquishing commercial licences have been developed by the SRSMAC and were adopted in 2004.

6.4 Stikine ESSR Fisheries

6.4.1 Stikine ESSR Licensing

It is possible that the number of sockeye salmon reaching Tahltan Lake may exceed escapement requirements. In preparation for this possibility as per previous years, the Department intends to issue an ESSR licence to the Tahltan First Nation to harvest excess sockeye at the weir at Tahltan Lake, or in the Tahltan River. In accordance with Departmental policy, the Tahltan First Nation will be given the right of first of refusal for the 2015 ESSR for Tahltan Lake sockeye. If the Tahltan First Nation declines the ESSR, the opportunity may be offered to other groups or individuals.

The issuance of an ESSR licence must follow stringent policy guidelines. Some of the noteworthy principles and policy guidelines include:

- DFO will attempt to manage existing fisheries to minimise surpluses. Therefore, DFO will not manage for an ESSR. Fish taken under an ESSR licence are fish that are surplus to spawning requirements that could, or should, have been taken in existing fisheries. As a result, there is no guarantee that fish will be available for an ESSR fishery and there is no guaranteed amount of salmon that may be taken.
- In allocating an ESSR, the first priority will be to use the surplus to meet outstanding First Nation requirements for FSC purposes which cannot be met through approved Section 35 fisheries. This may be done under a communal licence or AFS agreement. Fish caught under this licence may be sold commercially or given away, traded or bartered. As a second priority, the local First Nation may be offered the first opportunity to harvest all, or part of the ESSR. Therefore, in accordance with DFO policy, the Tahltan First Nation will be given the right of first of refusal for the ESSR for Tahltan Lake sockeye.
- ESSR licence holders are required to invest profits from sales of the surplus into community-based fisheries projects and activities such as enhancement, stock restoration, habitat restoration, and, or, fishery or habitat management research.

6.4.2 Stikine ESSR Control and Monitoring of Removals

The ESSR fishery will only be initiated if it is expected that there will be excess sockeye salmon on the spawning grounds. The general operating conditions for harvesting Tahltan Lake sockeye under an ESSR licence are expected to include:

- a) harvesting will not commence until the weir count exceeds 15,000 sockeye salmon and the in-season projection is for more than 27,000 sockeye salmon to enter the lake. DFO will determine when the fishery commences and how many fish can be taken;
- b) for cumulative weir counts of less than 27,000, up to 25% of the daily sockeye salmon escapement into Tahltan Lake may be harvested subject to (a) above;
- c) once the weir count exceeds 27,000, the percentage may be increased to 75%. Consideration will be given to increasing this percentage depending on run size and fish quality;

- d) the licensee has the responsibility to inspect, record and report the catch as outlined in operating procedures determined between DFO and licence holder.

The above conditions will serve as general guidelines for 2015. However, consideration may be given for modifications to address logistical or other challenges, providing such modifications do not impair the achievement of conservation objectives. Due to the migration characteristics of Stikine River sockeye salmon, the actual implementation of fishing opportunities at Tahltan Lake would likely occur on very short notice.

7 STIKINE SOCKEYE ENHANCEMENT PLAN FOR 2015

Joint Canada /U.S. sockeye enhancement projects are conducted in the Stikine River watershed under terms outlined in the PST. Broodstock is captured in Canada at Tahltan Lake, with eggs and milt collected to fertilize eggs. Fertilized eggs are flown by small float-plane or helicopter to the Snettisham Central Incubation Facility south of Juneau, Alaska where they are incubated and thermally marked. The fry originating from Tahltan Lake broodstock are released (back-planted) into Tahltan and, or, Tuya lakes within the Stikine RIVER drainage as per plans recommended by the TRP.

The PST identifies the following commitments:

- A Stikine Enhancement Production Plan (SEPP) shall be prepared annually by the TTC by February 1. The SEPP will detail the planned enhancement activities to be undertaken by the Parties and the expected production from site specific egg takes, access improvements and all other enhancement activities outlined in the annual SEPP. The TTC will use this data to prepare an initial enhancement production forecast based on the best available information.
- The Transboundary Panel shall review the annual SEPP and make recommendations to the Parties as to whether the plan should be revised or accepted as is.

The agreed SEPP for 2015 is summarized in Table 17 below.

Table 17. Stikine Enhancement Production Plan (SEPP) 2015.

Enhancement Project	Activities	Expected Production	Technique to document production
Tahltan Lake	Egg take with target of 6.0 million Guideline for last fishing day will be Sept. 25 (Fry to be planted into Tahltan and/or Tuya lake(s) in spring 2015)	100,000 Adults (80% green egg – fry, 25% fry-smolt, 8% smolt-adult)	Thermal mark
Expected Total Production		100,000 adults	

Notably, outplant of sockeye salmon fry into Tuya Lake is likely to be suspended in 2015 due to ongoing concerns over the inability to harvest adequate numbers of fish

downstream of the velocity barrier in the Tuya River. The suspension of the outplant program may impact future Stikine River egg-take targets, and, as per paragraph 5(d) of Appendix to Annex IV, Chapter 1: *Understanding on the Joint Enhancement of Transboundary River Sockeye Stocks of the PST*, and in turn have an effect on harvest share allocations for Stikine River sockeye salmon in the future. DFO will continue to explore options that address these concerns as indicated in Section 7.1 below.

7.1 Tuya River Terminal Sockeye Harvest Feasibility Study

Access to terminal-run (enhanced) sockeye salmon in the Tuya River is currently limited, and a viable means of accessing these fish is required in order to realize the full potential of the enhancement program in Canada. With support from the Transboundary Technical Committee and the Transboundary River Panel (and funding from the PSC Northern Endowment Fund) DFO has examined design requirements and anticipated costs to improve harvesting of sockeye salmon in the Tuya River. Through this effort, a preliminary design for a “fish harvest device” was developed in addition to a baseline survey, design of an access road and an estimate of site development costs.

Prior to proceeding to the detailed design stage, DFO determined that the specifications that the department would be obligated to require as a federal department (and associated costs), would likely exceed what would be otherwise deemed appropriate and feasible by a third-party project proponent. Given this situation, the Department recognized that it would not be practical nor a responsible use of Northern Endowment funds to proceed with a detailed design proposal. Third-party proposals, however, are encouraged.

DFO will continue to work with the TIFN, the Transboundary Technical Committee and Transboundary River Panel to evaluate possible options for harvest of Tuya River sockeye salmon.

8 STIKINE STOCK ASSESSMENT PLAN FOR 2015

8.1 Chinook Salmon

Stikine Chinook salmon in-river stock assessment programs planned for 2015 include:

- The joint Canada/US mark-recapture project at Kakwan Point (15 km downstream of the Canada/U.S. border) involves live-capture, spaghetti tag application and release of the salmon. Tags will be recovered in the commercial fishery, Little Tahltan weir and potentially in FSC fisheries, as well as in escapement surveys of various spawning locations (e.g. Verrett and Craig rivers, and Shakes and Tashoots creeks).
- A radio telemetry program with a target tag application of 250-300 Chinook salmon live-captured at Kakwan Point. Seven towers will be deployed throughout the watershed to track movements.
- The collection of baseline biological information from biological samples, spaghetti tags and genetic stock identification (GSI) samples from catches taken in the Lower Stikine commercial and/or test fishery, the FSC fishery and the

upper Stikine commercial fishery. A test fishery will be conducted in the absence of a directed Chinook salmon fishery.

- The opportunistic collection of tissue samples from specific stocks drainage-wide in order to update baselines for GSI purposes.
- The weekly collection of GSI tissues from the Lower Stikine commercial fishery and from the Kakwan tagging site. GSI will be used to determine relative, perhaps absolute, stock-specific run strength on a weekly basis. This analysis may not be completed until 2016.
- Application of coded-wire tags (CWTs) with a target of 40,000 Chinook smolts in order to obtain information on production, ocean survival and marine distribution.
- The Chinook salmon escapement enumeration and tag observations at the Little Tahltan River weir. Baseline data (age, gender, size), spaghetti tags, CWT and secondary mark sampling will also be collected (see Fig.9 for historical counts).
- Chinook salmon spawning aerial surveys of Christina Creek, Verrett, Little Tahltan, Tahltan rivers.
- The collection of catch statistics and associated baseline biological information from the recreational fishery located at the Tahltan River.

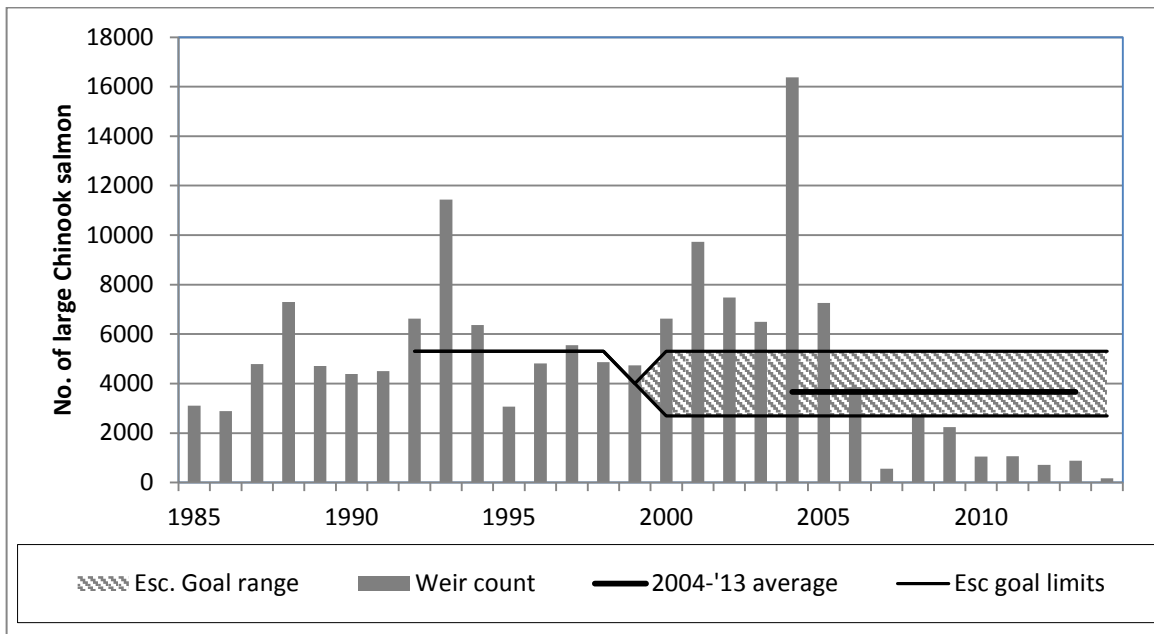


Figure 9. Weir counts of Little Tahltan River Chinook, 1985 to 2014 (does not include jacks). A landslide blocked access to the Tahltan R. drainage Chinook salmon spawning grounds in 2014.

8.2 Sockeye Salmon

The expected assessment program for Stikine sockeye salmon in 2015 will include the following:

- Catch monitoring and sampling in the lower Stikine commercial and test fisheries to obtain weekly inputs of catch, effort and stock composition for the Stikine Management Model (SMM). Matched otolith, scale and egg diameter data will be collected.
- Catch monitoring and sampling (age, gender, size, otoliths and egg diameters) from the upper Stikine FSC, commercial and ESSR fisheries.
- Sampling post-spawned sockeye salmon opportunistically from various spawning locations for genetic stock ID.
- Escapement enumeration and sampling (age, gender, size, otoliths and egg diameters) at the Tahltan Lake weir (see Figure 10).
- A radio telemetry program with a target tag application of 50-100 sockeye salmon live-captured at Kakwan Point or opportunistically at other site(s). Sockeye migration past the Tahltan River slide will be a focus.
- Aerial surveys of index sites to enumerate spawning of mainstem sockeye.
- A number of projects to evaluate the joint Canada/US sockeye enhancement program on Stikine sockeye including: fry outplant and smolt emigration studies at Tahltan Lake (see Figure 11); and analyses of catches, escapements and juvenile samples to determine enhanced and wild contributions.
- Estimating non-Tahltan Lake and Tuya inriver sockeye salmon run sizes and escapement. Tahltan Lake sockeye escapements are enumerated at the Tahltan Lake weir, whereas, mainstem and Tuya escapements are calculated. The calculations involve: estimating the total in-river run from the sampling programs on the lower Stikine (test and commercial fishery sampling); obtaining the stock composition results based on egg diameters (large egg) to estimate the mainstem component, and using otolith thermal marks to estimate the Tuya component; and, subtracting the estimated in-river catches of Tuya and mainstem sockeye stocks from the in-river run size estimates of the Tuya and mainstem components.

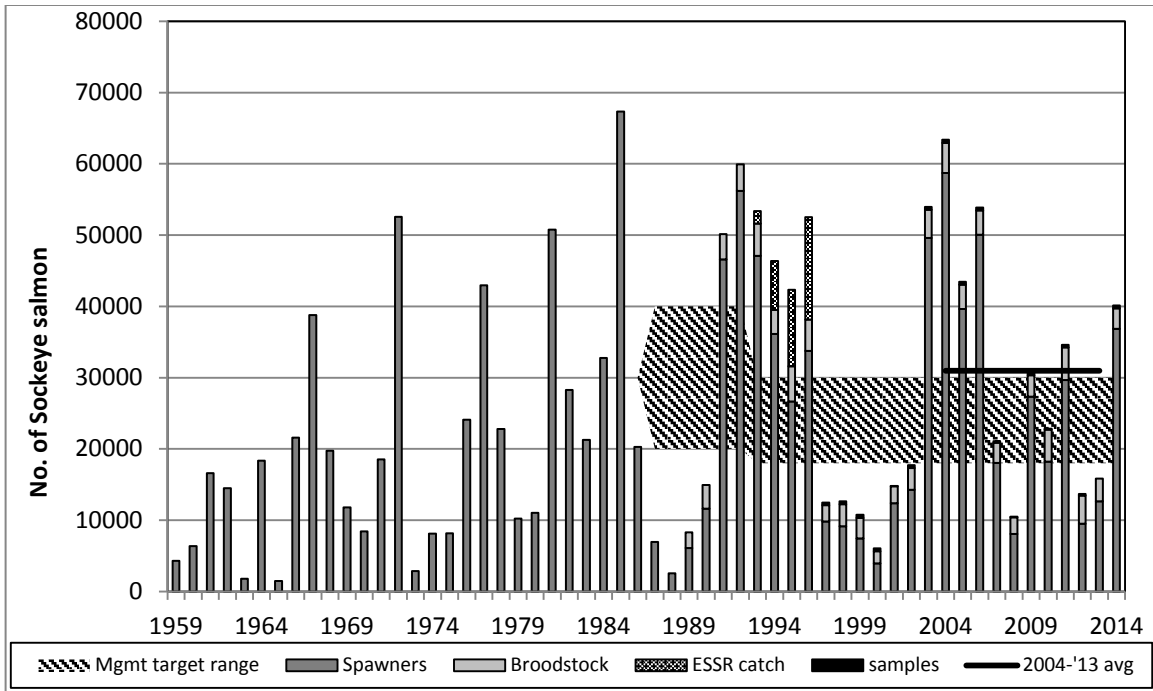


Figure 10. Weir counts of Tahltan Lake sockeye, 1959 to 2014. Note that annual weir count equals the sum of spawners+broodstock+ESSR catch+samples.

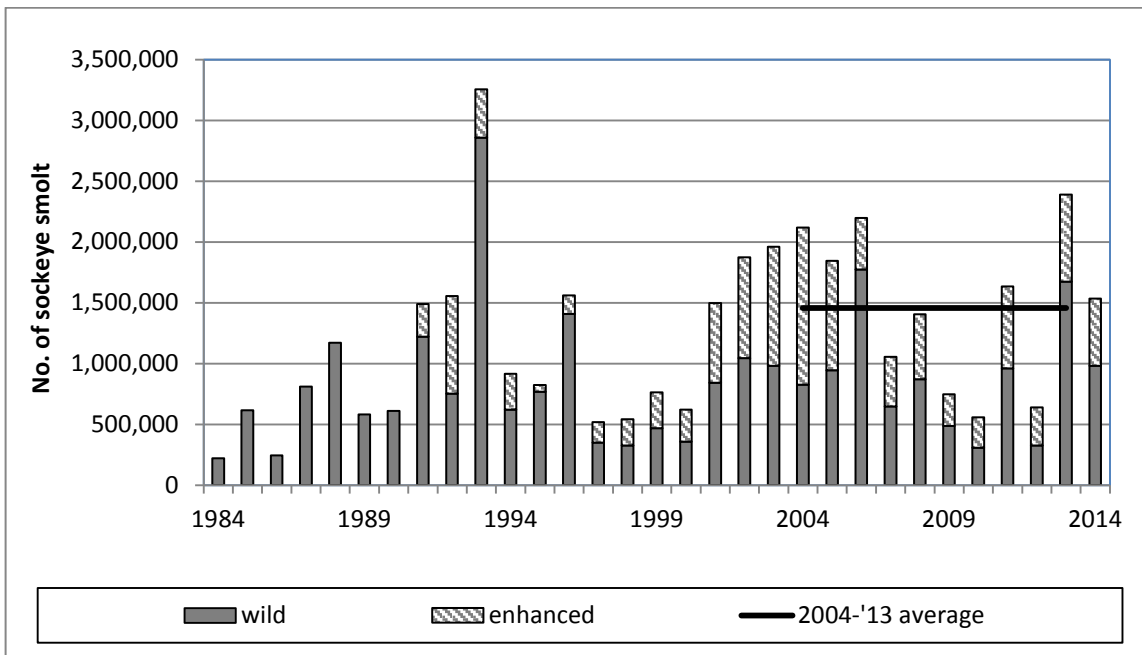


Figure 11. Weir counts of sockeye salmon smolt emigrating from Tahltan Lake, 1984 to 2014.

8.3 Coho Salmon

The expected stock assessment program for Stikine coho salmon in 2015 will include the following:

- A CWT program (target of 10,000 tags to be applied to coho smolt) to provide information on marine interception areas and run timing through approach water fisheries, and to provide a total smolt production estimate.
- Catch monitoring and sampling (age, gender, and size) of coho salmon taken in the lower Stikine commercial and test fisheries.
- The collection of CWT heads from all marked fish (adipose clipped) observed in the sampling pool.
- Aerial surveys to assess the spawning escapement of coho salmon at six select index sites (see Figure 12).

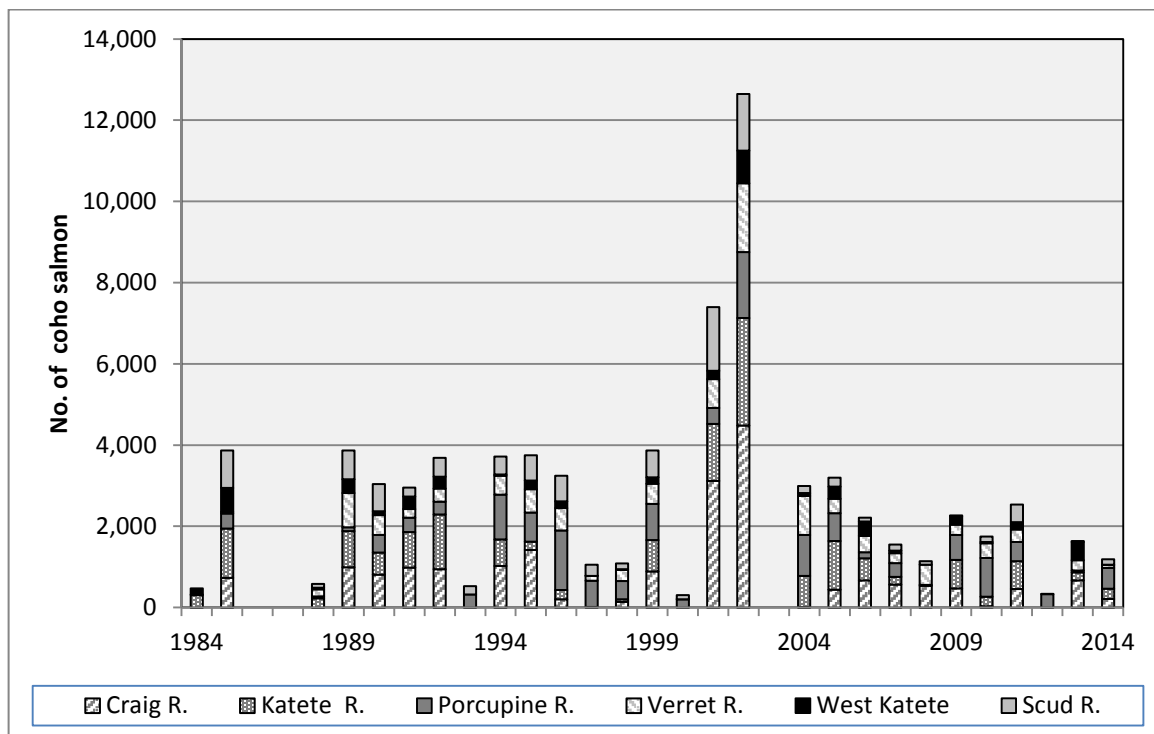


Figure 12. Aerial counts of coho salmon in Stikine R. spawning index areas: 1984-2014. Surveys are flown once annually the end of October or early November. A program to estimate total systemwide coho salmon escapement was discontinued in 2012.

8.4 Pink and Chum Salmon

The assessment program for Stikine pink and chum in 2015 will involve monitoring catch and effort in the lower Stikine River commercial fisheries.

9 STIKINE POST SEASON REVIEW

A comprehensive post season review is conducted annually by the Transboundary Technical Committee for the Transboundary Panel and the Pacific Salmon Commission. Results of the 2014 TTC review appear in:

Transboundary Technical Committee. In prep. *Preliminary estimates of Transboundary river salmon production, harvest and escapement and review of joint enhancement activities in 2014*. Pacific Salmon Commission.

The following sections summarizing the 2014 season are based substantially on the results of the TTC post season review and any recent updates.

9.1 Conservation

The spawning escapements of the Stikine Chinook and sockeye salmon are presented Table 18. Little Tahltan River Chinook salmon migration and spawning was significantly affected by a landslide which occurred in May 2014 and blocked the Tahltan River just upstream from the mouth (Figure 9). It is estimated that the vast majority of Chinook salmon of Tahltan River drainage origin (including Little Tahltan River Chinook) were unable to reach their spawning grounds due to the barrier created by the slide. Although the system-wide Chinook escapement goal was achieved, it is estimated that approximately 37% of the total escapement of 24,400 Chinook salmon did not reach the spawning grounds due to a barrier created by the slide. Although some fish may have spawned in sub-optimal habitats, it is estimated only 15,200 fish spawned successfully.

By late July, the barrier caused by the Tahltan River slide had eroded sufficiently to enable the majority of sockeye salmon to migrate upstream resulting in an exceedance of the 2014 Tahltan Lake sockeye salmon escapement goal (Figure 10). The spawning escapement for the mainstem Stikine sockeye stock conglomerate was estimated at approximately 30,000 fish, which is the midpoint of the escapement goal range for this group.

The coho escapement could not be quantified definitively but appeared to be below average based on limited aerial surveys of primary index streams (Figure 12). In prior years when a coho test fishery was used to estimate system-wide escapement, the correlation between aerial surveys and test fishing indices was determined to be weak.

Table 18. Escapement goals vs. observed escapement of Stikine River salmon, 2014.

Species/Stock	Escapement Goal		Escapement in 2014	Escapement Goal Met?
L. Tahltan CN (large)	2,700	5,300	169 ^a	No
Total Stikine CN (large)	14,000	28,000	24,366 ^b	Yes
Tahltan Sockeye	18,000	30,000	39,745 ^c	Exceeded
Mainstem Sockeye	20,000	40,000	30,007	Yes
Coho	30,000	50,000	?	?

^a a landslide on the Tahltan R. in May 2014 blocked most Chinook salmon from accessing the Little Tahltan River.

^b this number includes an estimated 9,100 Chinook salmon that did not reach the spawning grounds due to the Tahltan slide.

^c this excludes an estimated 3,500 sockeye that did not reach Tahltan lake due the Tahltan slide. With later run timing, Tahltan sockeye salmon were not as severely impacted by the slide which had eroded sufficiently to allow sockeye access later in the summer.

9.2 First Nation Fishery

The First Nation FSC harvests of sockeye and Chinook salmon were well above average in 2014 although the BNA was not fully achieved (Table 19). The sockeye catch was the highest recorded since 1972 when catch monitoring first began. The catch of large Chinook salmon was 50% above the previous ten-year average. To augment the First Nation catch, an additional 883 sockeye, 19 large Chinook and 5 small Chinook salmon harvested in the Tuya test fishery were distributed to members of the TIFN. These additional fish are not included in Table 19.

Table 19. First Nation harvest of Stikine River salmon, 2014.

Species	BNA	Harvested	Restrictions
Chinook (large)	2,000	1,020	No
(small)		103	
Sockeye	10,000	9,951	No
Coho	200	0	No

9.3 Recreational Fishery

Participation in the Stikine recreational fishery has declined over the past ten years. In 2014 approximate 50 Chinook salmon were harvested. The low catch rate is attributed to a weak return of upper Stikine River Chinook salmon as well as access restrictions imposed through Tahltan First Nation lands by the Tahltan First Nation. Access was limited by the First Nation due to concerns over declining Chinook salmon abundance in the Little Tahltan River over the past decade (Figure 9).

9.4 Commercial Fishery

The total commercial catch included 904 large (including an estimated 8 release mortalities) and 515 small Chinook salmon (including an estimated 4 release mortalities) in 2014. Of the catch of large Chinook salmon, 169 were taken during a directed fishery; the remainder were harvested as bycatch during the sockeye season (Table 20). One directed Chinook fishing period lasting 4 hours in mid-June (SW25) was permitted based on the in-season run projection (25,000 large fish) which at that time had surpassed the in-season decision threshold (24,500 large fish). Post-season retrospective analysis indicated the actual Canadian allocation for directed fisheries was 4,320 large Chinook salmon based on the post season estimated run size of 29,300 large Chinook salmon.

The total commercial sockeye salmon harvest of 31,035 fish was roughly 14% below the post-season estimated allocation (Table 20). The primary reason for this is attributed to adjustments made in the Canadian management approach which involved reducing inseason allowable harvest estimates by 27% to compensate for the tendency to exceed allocations as evident in three of the past five years.

The coho salmon allocation target for the commercial fishery was achieved in 2014 with a total catch of 5,409 fish, of which 4,992 coho were taken in the directed coho fishery

(Table 20). This was close the preseason commercial allocation of 4,800 coho salmon as determined by subtracting the TIFN BNA from the total Canadian PST allotment of 5,000 coho salmon in directed fisheries.

Table 20. Commercial salmon allocation and harvest on the Stikine River, 2014.

Species	Allocation	Harvest against allocation	Met/within 95%	Restrictions	Total Catch
Chinook - large	4,320 - directed	169 directed	No	Yes	904 ^a
Chinook - small	NA		NA	Yes	515 ^b
Sockeye	35,918 ^c	31,035	No	Yes	31,035
Coho	4,800 ^d - directed	4,992 directed	Yes	Yes	5,409
Pink	NA		NA	Yes	69
Chum	NA		NA	Yes	60

^a includes an estimated 8 release mortalities;

^b includes an estimated 4 release mortalities;

^c based on (post season estimate of TAC -BNA);

^d based on 5,000 PST allocation minus BNA.

9.5 PST Harvest Sharing Performance in 2014.

Chinook salmon

The post-season estimated run size of Stikine Chinook salmon is 29,300 large fish. A run size of this magnitude is sufficient to provide for the following: the agreed S_{MSY} escapement goal of 17,400 large Chinook salmon; the base-level catches (BLC) of large Chinook salmon outlined in Treaty (which total 7,100 large Chinook); and allow for a directed harvest of 4,800 large Chinook salmon. Canada's share of a directed allowable catch of 4,800 fish is 4,320 large Chinook salmon.

Canada had a limited directed fishery catch of 169 large Chinook salmon which was taken late in the Chinook season after the in-season run size projections had climbed above the threshold which allowed for directed harvests. The U.S. did not prosecute directed commercial Chinook fisheries but did allow a limited in-river directed harvest for Chinook salmon in the in-river subsistence fishery based on improving in-season run predictions towards the end of the Chinook season. The U.S. Stikine River subsistence catch included 44 large Chinook salmon, only 3 of which were taken during the June 14-20 directed fishing period (Table 21).

The total combined base level catch was 4,788 large Chinook salmon. Canada's BLC amounted to 1,805 large Chinook salmon, which was below the Treaty entitlement of 2,300 large fish. The test fishery catch included 1,361 large Chinook salmon, which occurred in Canada to assist in in-season run assessments. This catch was close to the Treaty allocation of 1,400 large Chinook salmon. The estimated U.S. BLC totalled 1,622 which is less than half the Treaty entitlement of 3,400 large Chinook salmon (Table 21).

Sockeye salmon

Under the PST, the Parties agreed that each country would manage its fisheries to achieve a 50% share of the TAC of Stikine sockeye salmon. How this is to be implemented is described annually in a management plan prepared by the Canada/U.S. Transboundary Technical Committee. Basically the plan stipulates that the Tahltan and mainstem components will be managed and accounted for independently. Surpluses or deficits in the escapement of one stock cannot be used to balance surpluses or deficits in the escapement of other stock. Further, the plan stipulates that since enhanced Tuya fish co-mingle with the Tahltan stock, harvesting of enhanced Tuya sockeye salmon in traditional fisheries will be constrained by the applicable harvest rate for the Tahltan stock.

The most recent post season estimate of the terminal run size of Stikine River sockeye salmon is 159,095 fish which includes: 80,191 Tahltan Lake sockeye (wild plus enhanced), 42,589 mainstem sockeye, and 36,315 (enhanced) Tuya sockeye salmon.

For the Tahltan stock component, the estimated TAC is 55,021 sockeye salmon (total run minus the escapement goal minus the test fishery catch) shared equally between the Parties, i.e. 27,510 Tahltan sockeye each. Canada's catch was 24,860 Tahltan sockeye (45% of the TAC and 90% of Canada's allocation), whereas, the U.S. catch was 10,521 (19% of the TAC and 38% of the U.S. allocation). The shortfall in catches by both countries resulted in an escapement surplus at Tahltan Lake (Figure 10).

For the mainstem stock conglomerate, the estimated TAC is 11,899 sockeye salmon. Canada's estimated catch of 6,976 mainstem sockeye represents approximately 59% of the TAC and 117% of its allocation. The U.S. estimated catch of 8,409 mainstem sockeye constitutes 71% of the TAC and 1.41 times the US allocation of 5,949 mainstem sockeye (Table 21).

The applicable harvest rate for Tahltan sockeye based on the post-season run size estimate was 0.686 ($TAC \div Total\ Run$). Applying this harvest rate to the Tuya stock gives a TAC of 24,917 Tuya sockeye. Canada harvested 9,149 Tuya sockeye representing 37% of the TAC and 73% of Canada's allocation of 12,458 Tuya sockeye. The U.S. caught 4,950 Tuya sockeye constituting 20% of the TAC and 40% of the US allocation (Table 21).

Overall, both Parties were below respective sockeye allocation targets for 2014. The Canadian total catch of 40,985 sockeye salmon (45% of the TAC) was 4,933 sockeye below Canada's allowable harvest; whereas, the U.S. catch of 23,881 sockeye (26% of the TAC) was 22,037 below the U.S. allowable catch (Table 21).

Coho salmon

The Canadian catch of Stikine coho salmon in directed fisheries was 4,992 fish just shy of the PST allocation of 5,000 coho salmon (Table 21).

Table 21. Harvest sharing report card for Stikine River salmon, 2014.

Sp.	Component	2014 Treaty-based allocation		2014 Actual		Obligations Met?	
		Canada	US	Canada	US	Canada	US
CN	Directed AC catch	4,320	480	169	0	yes	yes
	BLC- trad'l fisheries	2,300	3,400	1,805	1,622	yes	yes
	BLC – test fishery	1,400	na	1,361	na	yes	na
SO	%TAC (all Stikine)	50%	50%	45%	26%	yes	yes
	Catch (all Stikine	45,918	45,918	40,985	23,881	yes	yes
	%TAC (Tahltan stock)	50%	50%	45%	19%	yes	yes
	Catch (Tahltan)	27,510	27,510	24,860	10,521	yes	yes
	%TAC (mainstem)	50%	50%	59%	71%	no	no
	Catch (mainstem)	5,949	5,949	6,976	8,409	no	no
	%TAC (Tuya stock)	50%	50%	37%	20%	yes	yes
	Catch (Tuya)	12,458	12,458	9,149	4,950	yes	yes
CO	Directed catch	5,000	na	4,992	na	yes	na

note: primary obligations are in **bold** type

9.6 Stikine Sockeye Enhancement Activities in 2014

In January 2015, the Transboundary Rivers Panel reviewed the 2014 Sockeye Enhancement Production Plan for the Stikine River (SEPP). The review included actions that had been conducted in summer and fall of 2014 (egg takes); a review of the spring 2014 fry releases (brood year 2013) was also completed. Through this review the 2013 SEPP was deemed complete and an update of 2014 SEPP activities was completed which is summarized as follows:

Objectives:

- Spring 2014 release of incubated eggs (unfed fry) from the 2013 brood year collections;
- A collection target of up to 6.0 million sockeye eggs in the fall of 2014 (produced fry to be released in the spring of 2015).

Results:

- 2.066 million fry were released into Tahltan Lake by May 29, 2014;
- 462,000 fry were released into Tuya Lake by June 12, 2014;
- Green-egg to out-planted survival for the Tahltan Lake bound fry was 59% and 66% for the fry produced for Tuya out-plants;
- 3.7 million eggs were collected and delivered to the Port Snettisham hatchery by September 26, 2014. This was well below the 6.0 million target previously agreed to by the Panel primarily due to Canada subsequently deciding to reduce the target

to 5.0 million eggs because of opposition from the Tahltan First Nation over continuation of out-plants into Tuya Lake. Delayed run timing and in-lake maturation (largely attributed to the fish being held up by the Tahltan slide) and inability to catch the target numbers of broodstock prior to the agreed September 25 cut-off date for egg-takes contributed to the reduced target not being achieved. Additional factors included bear predation on holding broodstock and poor weather conditions.

- All fry were thermally marked.

APPENDIX 3: TAKU RIVER INTEGRATED SALMON FISHERIES MANAGEMENT PLAN, 2015.

1 INTRODUCTION

The Taku River drains an area of approximately 19,000 km² in northwestern British Columbia and S.E. Alaska. The mouth of the river is located approximately 45 km northeast of Juneau, Alaska. Close to 90% of the Taku River watershed is located in British Columbia encompassing two main ecoregions: the Boundary Ranges Ecoregion characterized by rugged mountains, ice fields and glaciers and moist climate strongly influenced by its proximity to the ocean; and the drier sub-Arctic climes of the Yukon-Stikine Highlands Ecoregion (<http://www.env.gov.bc.ca/ecology/ecoregions/>). The lower Taku River is highly braided, confined within a wide mountainous valley with major glacial influences in close proximity to the mouth (e.g. Tulsequah Glacier and its unique *jökulhlaup* or sudden release of glacially impounded melt-water). This is sharply contrasted by the small lakes and streams surrounded by boreal forests and upland meadows of the Stikine Highlands. Transition zones between the ecosystems are characterized by high gradient watercourses and deep canyons (e.g. Nakina River canyon).

1.1 Description of the Taku River Salmon Resources

Amongst the Transboundary rivers, the Taku River is a major contributor of Chinook, sockeye, coho, pink and chum salmon and steelhead with most of the spawning occurring in Canadian portions of the drainage. Salmon distribution is widespread throughout the Inklin River and its tributaries, whereas velocity barriers in the Nakina River drainage prevent salmon access to a greater proportion of the larger headwater lakes and streams, such as Sloko and Nakina lakes.

Salmon stocks returning to the Taku River drainage are jointly managed by DFO, the Taku River Tlingit First Nation (TRTFN) and the Alaska Department of Fish and Game (ADFG) through the Canada/U.S. Transboundary Technical Committee of the Transboundary Rivers Panel (pursuant to the PSC).

1.1.1 Chinook Salmon

The Taku River is major producer of Chinook salmon in northwestern B.C. and southeast Alaska. Over the past decade (2005-2014), the annual total run size of large Chinook salmon, i.e. fish with a mid-eye to fork length measuring 660 mm or more, has averaged approximately 34,900 fish. The historical range since 1995 is 18,650 (2007) to 126,202 (1997). The run generally enters the river mouth in early May, peaks early June and has moved upstream from the lower river by early July.

Three Chinook Conservation Units have been identified in the Taku River based on timing and habitat characteristics: TAKU-early; TAKU-mid; and TAKU-late. Primary

Chinook salmon spawning stocks include: Nakina River (TAKU-mid); Nahlin River (TAKU-early); Tseta Creek (TAKU-early); Dudidontu River (TAKU-early); Sheslay and Hackett rivers (TAKU-late); Tatsatua River (TAKU-late); and Kowatua River (TAKU-late).

Aerial survey data from select index spawning streams have been collected consistently over the past 4 decades. Smoothed counts over that period reflect a bell shaped curve with spawning escapements increasing from the mid 1970's to a peak in the mid-1990's and then declining through 2013 back to the low count levels of the early 1970's. The time series of in-river run and terminal run estimates based on mark-recapture data are shorter, commencing in 1989 and 1995, respectively. These data show a similar pattern with a sharp peak in abundance in 1997 followed by a marked decline in annual estimates and 5-year cycle averages since that time with the recent 5-year average terminal run size of 26,500 being the lowest cycle average. Prior to 1999, there had not been directed terminal commercial fisheries for several cycles and stocks were in rebuilding mode. New PST provisions commencing 2005 allowed for directed fisheries if warranted by abundance.

1.1.2 Sockeye Salmon

The Taku River is also a major producer of Transboundary sockeye salmon. Over the past decade, the annual terminal run size has averaged approximately 180,000 sockeye salmon. Since 1984 when estimates commenced, the run size has ranged from 119,329 (2009) to 396,678 (2001). Cycle (5-year) average escapements have been relatively stable undulating within 25% of the long term average total spawning escapement of approximately 103,000 fish. The run generally enters the river mouth in early June, peaks mid-late July and vacates the lower river by late August.

One River-type and four Lake-type sockeye Conservation Units have been identified for the Taku River based on genetic attributes. The River-type CU is part of the broadly distributed Northern Transboundary Fjord CU; the lake-type CU's include: Kuthai, Little Trapper, Tatsamenie, and King Salmon. Sockeye escapement assessment projects occur on these CU's. Besides these lake systems, other notable Taku sockeye spawning locations include: the mainstem Taku, Nakina, Hackett, and Nahlin rivers. Canada/U.S. cooperative management regimes focus on aggregate stock objectives, although consideration is given to specific CU's in some years, e.g. Tatsamenie.

As part of the PST arrangements, a joint sockeye enhancement program for sockeye salmon exists on the Taku River. The primary enhancement project involves egg-takes at Tatsamenie Lake, incubation in an Alaskan hatchery in Port Snettisham and out-planting of fry back into the system of origin. Various other projects have been/are being investigated including improving sockeye salmon access to Trapper and King Salmon lakes, extended rearing at Tatsamenie Lake and potential fry planting at King Salmon Lake.

1.1.3 Coho Salmon

The Taku River is the largest producer of coho salmon in the Transboundary rivers. Estimates of the total run size of Canadian-origin fish average approximately 178,400 coho over the recent decade, and range from 50,957 (1997) to 339,736 (1994) since 1992 when the time series began. Estimates of in-river abundance are available from 1987. The trend in 4-year cycle averages in this dataset show a near tripling of in-river abundance from the late-1980's cycle averages of roughly 60,000 coho salmon, to cycle averages in excess of 170,000 fish in the early-to-mid 2000's, followed by a progressive decline to the current 4-year cycle average of approximately 97,000 coho salmon. Trends in total run estimates closely resemble those of the in-river run estimates.

Coho salmon generally cross the international border in mid-July with the peak of the run arriving in early to mid-September. For international cooperative management and harvest sharing purposes, two run components are considered separately: the early part of the run (coho salmon that migrate prior to statistical week 34, roughly mid-August); and the late run (coho salmon that migrate into the river SW34 and thereafter). The late run has been subject to specific harvest sharing objectives outlined in Chapter 1 of Annex IV of the PST.

One coho CU was officially identified for the Taku River based on an initial examination of ecotypic characteristics. However, subsequent investigations have suggested three CU's might be more appropriate (TAKU-early timing, TAKU-mid-timing, and TAKU-late timing) based on run timing information and three dominant aquatic ecotypes in the drainage: the dynamic, highly braided and glacially influenced streams of the Taku mainstem and lower river; the lake-dominated streams on the eastern slopes of the Boundary Ranges; and, the high elevation streams and small lakes of the Stikine Plateau.

Coho salmon spawning areas in the Taku River watershed are widely distributed. Notable spawning locations include: mainstem Taku River; Nakina River; Hackett River; Nahlin River; Tatsatua River; Kowatua River; Tulsequah River; Sloko River; and streams located in the U.S. section of the Taku River.

1.1.4 Pink Salmon

The Taku River is the largest producer of pink salmon in the Transboundary area with more than a million spawners occurring in some years. Based on ecotypic characteristics, Taku pink salmon form the major component of the broader Transboundary Fjord pink salmon CU (TBFj). The run typically enters the river in late June, peaks in mid-July and has departed the lower river for upstream spawning grounds by mid-August. Pink salmon spawning areas documented in the Taku River include: Nakina River, tributaries to the lower Taku and Tulsequah rivers, Dudidontu and Nahlin rivers. Pink salmon are not targeted in the Canadian fisheries in the Taku River. Currently, there are no programs dedicated to assess pink salmon border escapement or drainage-wide spawning escapements. Inferences on abundance are obtained from catches (and subsequent release) of pink salmon in the Canyon Island fishwheels which are used to tag Chinook, sockeye and coho salmon as part of the joint Canada/U.S. mark recapture program.

1.1.5 Chum Salmon

Although abundance appears to be in a depressed state, the main production of chum salmon from the Transboundary area originates from the Taku River. This is a fall-run stock comprising one CU (TAKU) which typically enters the river mouth in August with peak abundance in mid- September. Spawning occurs primarily in groundwater fed areas of the lower Taku River; however, spawning may also occur in the lower reaches of the Nakina and Inklin rivers and tributaries. As with pink salmon, chum salmon are not targeted in the Canadian fisheries in the Taku River. Currently, there are no programs dedicated to assess chum salmon border escapement or drainage-wide spawning escapements however some information on relative abundance is available from catches of chum salmon in the Canyon Island fishwheels used in the joint Canada/U.S. mark-recapture program.

1.1.6 Steelhead

Steelhead salmon (primarily thought to be fall run) are present in the Taku River drainage although information on abundance and life history is limited. Spawning is known to occur in the Nakina River and in some of the headwater tributaries of the Inklin River (e.g. Sheslay River).

1.2 Description of Taku River Salmon Fisheries

There are three fisheries that target salmon in the Canadian section of the Taku River: the First Nation food, social and ceremonial (FSC) fishery, the recreational fishery and the commercial gillnet fishery. Fisheries in Alaska that also target Taku salmon stocks include the District 111 commercial drift gillnet fishery in Taku Inlet, the Juneau area sport fishery, and a limited personal use fishery in the lower Taku River in Alaska. S.E. Alaskan troll fishers also catch Taku salmon stocks of which Chinook and coho are of primary interest. Seine fisheries conducted along the migration routes also intercept Taku stocks, notably sockeye and pink salmon. Cooperative and coordinated management regimes for Taku Chinook, sockeye and coho salmon are contained in current PST, Annex IV, Chapter 1; these arrangements and recent updates to them (e.g. for coho) cover the 2009-2018 period.

1.2.1 Taku River Tlingit First Nation FSC Fishery

The Taku River Tlingit First Nation (TRTFN) has engaged in fishing activities on the Taku River since well before European contact. In recent years, TRTFN fisheries have primarily employed drift gillnets, although angling and gaffing are also utilized in certain headwater locations. First Nation food, social and ceremonial fisheries predominantly occur immediately upstream of the international border (in the same location as commercial fishery). Harvesting also occurs in the lower Nakina River as well as on the Silver Salmon River (near the outlet of Kuthai Lake). Over the past decade, FSC catches have averaged 144 Chinook, 152 sockeye and 146 coho salmon. Fishing generally commences in May and continues through October.

1.2.2 Recreational Fishery

The recreational fishery in the Taku River watershed is mostly focused around the lower Nakina River. Other sites frequented by recreational fishers include the Tatsatua River and the Sheslay River. Chinook salmon is the targeted salmon species. It is estimated the annual recreational catch of Chinook salmon averages approximately 105 fish. Low catches (mostly a catch and release fishery) and light fishing pressure are primarily due to the remote nature of the watershed which is accessed mostly by helicopter and fixed wing aircraft.

The number of anglers varies year to year, however based on information gathered through a recreational creel survey conducted in 2000 it is estimated that approximately 60 anglers per year take part in the recreational fishery on the Nakina River.

1.2.3 Commercial Fishery

The Canadian commercial fishery was established on the lower Taku River in 1979 and currently involves sixteen commercial licences, half of which are associated with the TRTFN. The TRTFN currently holds 6 commercial salmon licences issued with reduced annual fees, in addition to 2 communal commercial “F” licences issued at no cost to the First Nation.

The commercial fishing area on the Taku River in Canada extends from the point identified by the fishery boundary signs (located approximately 50 metres upstream of the international border) to the boundary signs erected near a geological feature locally known as Yellow Bluff, which is located approximately 18 kilometres upstream from the border (Figure 13). The commercial fishing area does not include Flannigan's Slough or South Fork Lake and outlet channel, which are marked with fishing boundary signs. Almost all commercial fishing activity takes place in the lower half of this area, downstream of the mouth of the Tulsequah River.

Since the inception of the fishery, targeted species in the Canadian commercial fishery have included sockeye and coho salmon. Commencing 2005, revised PST provisions allowed for a directed commercial fishery for Taku Chinook salmon. When warranted by the pre-season forecast (see decision rules in Appendix 3, Section 5.1), the Chinook fishery usually commences around the end of April (SW 18/19) and continues to late June (SW 25/26). The directed sockeye salmon fishery runs from mid/late June (SW 25/26) to August (SW 33). The directed coho fishery commences in August (SW 34) and concludes in October (SW 41). The early portion of the coho run is subject to bycatch in the directed sockeye fishery. Due to market, weather and transportation considerations, coho salmon are not actively harvested to the end of the run.

During the past decade, annual catches in the Taku River commercial fishery have averaged approximately 3,400 large and 600 small Chinook, 20,700 sockeye and 8,300 coho salmon. Fishing is primarily conducted with drift and/set gillnets set from small, outboard-driven riverboats. Landing stations to handle commercial caught salmon are operated in the lower river. Most salmon harvested on the Taku River are transported to commercial buyers via boat to Juneau, Alaska, while a small number are taken via air to

Atlin B.C. and sold locally there or in Whitehorse. Marketed products include fresh frozen, fresh and smoked salmon.

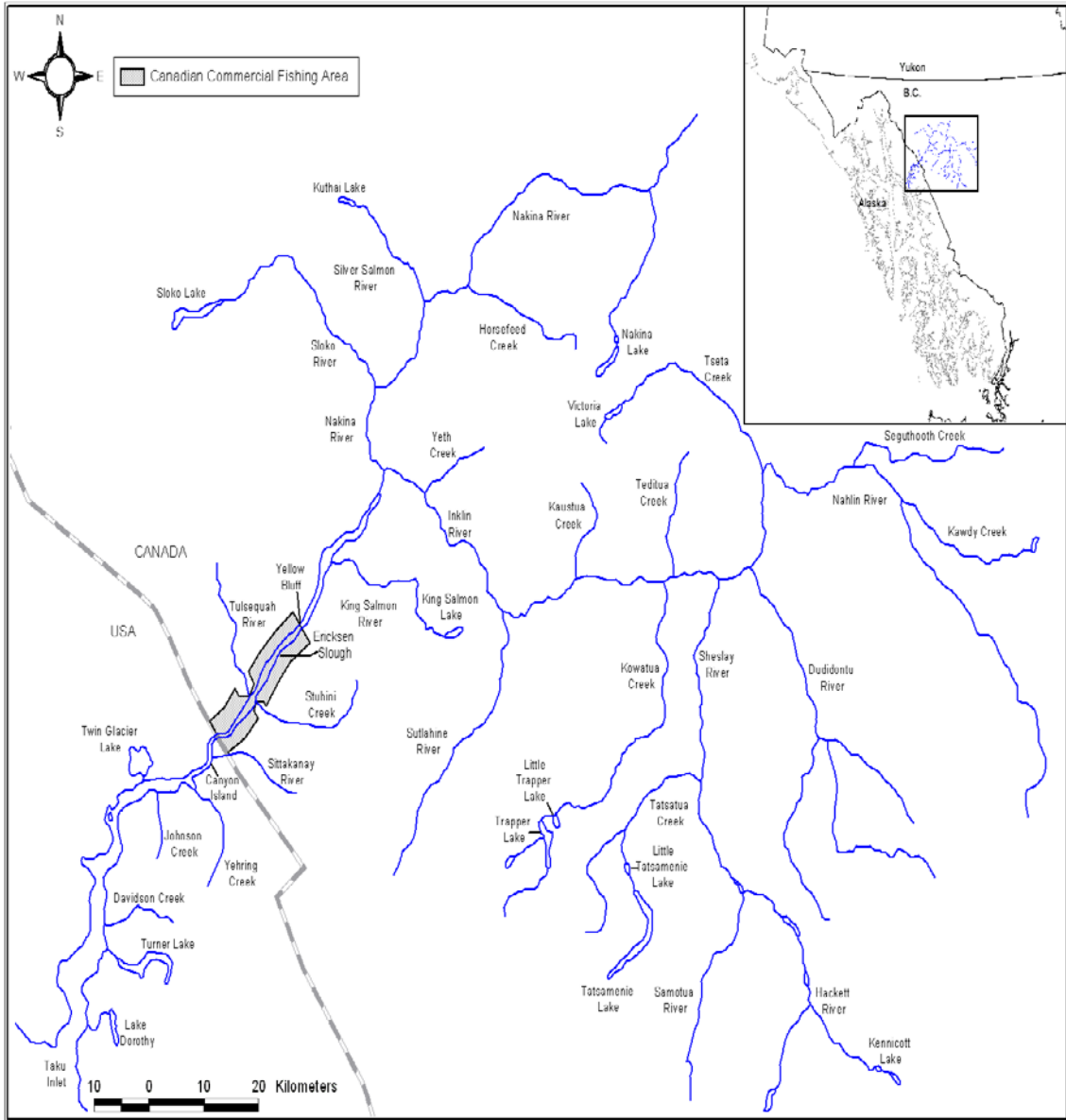


Figure 13. The Taku River watershed and the Canadian commercial fishing area.

2 RUN OUTLOOKS FOR TAKU SALMON IN 2015

As with other Transboundary salmon stocks, recent fluctuations in overall survival have resulted in uncertainty in the development of pre-season outlooks. Despite challenges with accuracy in forecasting, pre-season outlooks are useful when used in concert with fishery performance (e.g. CPUE) for management until such time as in-season data becomes available for in-season run size projections.

2.1 Chinook Salmon

The 2015 pre-season terminal run forecast for large Taku River Chinook salmon (Chinook ≥ 660 mm mid-eye-to-fork length) is 26,100 fish. This forecast includes a downward adjustment of an initial estimate (36,900 large Chinook) derived using an updated sibling forecast model. The initial estimate was reduced by approximately 29% to account for the tendency in the model to seriously over-estimate the total run sizes over the past 5 years. An additional consideration to support model adjustment is the recent depressed state of Chinook salmon stock health in the North Pacific and Bearing Sea (northern BC, the Yukon, and Alaska).

The forecast of 26,100 large Chinook salmon is roughly 35% below the ten-year average terminal run of 34,900 fish. This is disconcerting considering that the spawning escapements in the principal brood years contributing to the 2015 run all fell within the recently revised target escapement goal range of 19,000 to 36,000 fish and were close to the S_{MSY} point estimate of 25,500 fish. These escapements included: 22,761 in 2009, and 28,769 in 2010 and 27,523 in 2011. However, the sibling return data indicates that productivity is well below average (barely above replacement) and well below what would otherwise be expected based on historical spawner-recruitment relationships.

The 2015 preseason forecast is insufficient to trigger directed fisheries in either the U.S. or Canada and management will likely require a conservative approach throughout the duration of the run.

2.2 Sockeye Salmon

The 2015 pre-season forecast for the terminal run of wild Taku River sockeye salmon is approximately 216,000 fish, which is above the recent ten-year average run size of 175,000 fish. This forecast is the average of a sibling-based forecast of 214,300 sockeye, and a stock-recruitment -based forecast of 217,600 sockeye, both of which are briefly summarized below.

The sibling forecast is based on the historical (1989–2014) relationship between the number of age-5 sockeye salmon in year (t) and the number of age-4 sockeye salmon in year (t-1). The preliminary estimate of the return of age-4 sockeye salmon in 2014 was 62,584 fish, which gives a predicted age-5 return of 127,295 fish in 2015. On average, Taku River sockeye salmon returns are 59% age-5. Based on this, the predicted age-5 return expands to a total terminal run forecast (sibling forecast) of 214,342 wild sockeye salmon in 2015.

The stock-recruitment forecast for wild fish is based on the historical relationship between the number of spawners (composite of all Taku River stocks) and the subsequent age-specific returns from the 1984 to 2008 brood years. Annual age-specific returns were estimated assuming the inriver age composition, determined from sampling in the Canadian commercial fishery, was representative of the entire run. The estimated numbers of spawners in the principal brood years for 2015 were 85,950 fish in 2010, and 109,795 fish in 2011. The calculated returns per spawner for these years are 2.6 and 1.9, respectively. Assuming that the fish from these brood years mature as per the average age-at-maturity (61% age-5, 30% age-4, 4% age-6, and 5% age-3), the forecast terminal run size for 2015 is 217,628 wild sockeye salmon, based on stock-recruitment data.

Tatsamenie Sockeye

The outlook for Tatsamenie sockeye salmon is for a below average run. Combining the separate forecasts of wild and enhanced Tatsamenie sockeye described below gives a 2015 terminal run forecast of 12,800 fish which is below the average run size of 18,800 Tatsamenie sockeye salmon. The escapements to Tatsamenie Lake in 2010 and 2011, the primary brood years for 2015 run, were 3,513 and 7,880 fish, respectively. For comparison, the previous 10-year average escapement was approximately 9,000 fish.

Based on estimates of out-migrating wild smolt in 2012 (60,000 smolt) and 2013 (307,000 smolt) and average smolt-adult survival rates, a terminal run of about 6,100 wild Tatsamenie sockeye is expected in 2015. Assuming the annual exploitation rate is the same for both wild and enhanced sockeye (which can be calculated directly using the thermal marks to identify the enhanced fish in catches and escapement), the average run size of wild Tatsamenie sockeye is estimated to be approximately 10,200 fish.

The terminal run of enhanced Tatsamenie Lake sockeye salmon is forecast to be 6,700 fish in 2015, which is below the recent 10-year average of 7,600 fish. This outlook is the average of a smolt-based forecast (5,792 sockeye) and a combined smolt/sibling-based forecast (7,577 sockeye). As described in the sockeye decision guidelines in Section 5.2, the number of enhanced sockeye salmon has direct implications for the Canada/U.S. catch sharing objectives for 2015.

2.3 Coho Salmon

The forecast for the total run of Taku River coho salmon in 2015 is 158,500 fish which equates to an inriver run of about 99,900 fish assuming an average U.S. harvest rate of 37%. The 2015 total run forecast is similar to the 2014 and 2013 forecasts of 162,787 and 164,078 fish, respectively, and was generated using the relationship between the CPUE in smolt tagging and the total run estimates over the past eighteen years.

The estimated spawning escapements in the two primary brood years that will contribute to the 2015 coho run were 70,900 fish in 2011, and 70,800 fish in 2012. Taku coho salmon escapement has averaged approximately 99,200 over the 2005 to 2014 period.

However, results from recent analyses that involved a number of alternative stock-recruitment models, produced estimates of the number of spawning Taku coho salmon that produces maximum sustained yield (S_{MSY}) ranging from 59,000 to 81,000 coho salmon (see: http://www.dfo-mpo.gc.ca/csas-secs/Publications/SAR-AS/2015/2015_008-eng.pdf). Hence, the primary brood year escapements were close to S_{MSY} .

2.4 Pink Salmon

Pink salmon returning in 2015 will be the product of the 2013 escapement. Based on the 2013 Canyon Island fish wheel catch of 4,666 pink salmon, which was well below the recent ten even-year average catch of 10,300 fish, the return in 2015 is expected to be below average in magnitude.

2.5 Chum Salmon

Canyon Island fish wheel chum salmon catches in 2010 and 2011 (94 and 177, respectively) suggest that the 2015 parent year spawning escapements were below average. The previous ten-year average Canyon Island fish wheel chum salmon catch is 287 fish and the run appears to have been depressed since the early 1990's. The 2015 fall chum salmon run is expected to be below average.

3 SPAWNING ESCAPEMENT GOALS FOR TAKU SALMON

Escapement goals have been bilaterally identified by the Transboundary Technical Committee for all species of salmon spawning in Canadian portions of the Taku River watershed. Escapement goals for Chinook, sockeye and coho salmon are based on various analyses of historical harvest and biological data from catch, escapement and/or juvenile sampling programs. Escapement goals for pink and chum salmon are based primarily on much more limited databases and professional judgment. These escapement goals are considered as 'interim goals' and are subject to change as additional stock-recruitment data and detailed analyses are performed.

Goals in effect for the 2015 season are summarized in Table 22 below:

Table 22. Interim escapement goals for Taku River salmon in effect for 2015.

Species	Year established	Interim escapement goals/ ranges		
		from	Point target	to
Sockeye	1985	71,000	75,000	80,000
Coho	2015	50,000	70,000	90,000
Chinook	2009	19,000	25,500	36,000
Pink	1985	150,000	na	250,000
Chum	1985	50,000	na	80,000

3.1 Chinook Salmon

Annex IV, Chapter 1 of the PST required the Parties to review an appropriate escapement goal for Taku Chinook salmon by January 15, 2009 and to pass a jointly prepared technical report through accelerated domestic review processes in time for a revised goal to be applied to the 2009 season. Detailed analyses of harvest and spawning abundance by age class and smolt production were used to generate a recommendation for an escapement goal range of 19,000 to 36,000 large fish (marine age 3-5 and mid-eye to fork length of ≥ 660 mm), and, a point S_{MSY} goal of 25,500 large Chinook salmon. This goal was in place on an interim basis for the 2010 fishing season pending finalized review in the fall of that year. The escapement goal received thorough review by the Chinook Technical Committee and Centre for Science Advice Pacific (CSAP), the latter which has replaced the Pacific Scientific advice Review Committee (PSARC). Both committees concluded the analysis to be sound. The Transboundary Technical Committee (TTC) and Panel have since endorsed the revised goal.

3.2 Sockeye Salmon

The agreed spawning objective for wild Taku River sockeye salmon is a range from 71,000 to 80,000 fish with a point goal of 75,000 fish.

Although an escapement goal has not yet been established for Tatsamenie Lake, escapement of sockeye salmon to this location has bearing on the Canada/U.S. egg take program. Based on a fecundity of approximately 4,000 eggs per female, equal sex ratios, a broodstock holding success rate of 80%, along with the guideline that no more than 30% of the escapement can be utilized for enhancement purposes, an escapement of about 4,000 sockeye salmon would be needed to achieve the maximum egg take of 2.0 million eggs referred to in the 2015 Taku Enhancement Production Plan as outlined in Appendix 3, Section 7.

3.3 Coho Salmon

In 1999, the PST called for developing a revised escapement goal for coho salmon no later than May 1, 2004. A detailed analysis of the Taku River coho salmon escapement goal was completed in 2004. Staff who conducted that analysis recommended that a modified escapement goal not be adopted until production from the very high escapements in 2002 and 2003 could be included in the analysis.

The revised Transboundary Chapter of Annex IV of the PST obliged the Parties to develop an agreed MSY escapement goal prior to the 2010 fishing season. A preliminary report was reviewed by CSAP in the fall of 2010 and it was determined that additional information should be included in the analysis and the report was not finalized at that time. In 2013, DFO reconfirmed its commitment to conduct updated scientific analysis of the Taku River coho salmon escapement goal and completed that analysis in the fall of 2014. Based on that analysis which was reviewed and accepted by CSAS, the TTC recommended a point goal of 70,000 coho salmon with a range of 50,000 to 90,000 fish to the Transboundary Panel and this goal was adopted by the Panel in early 2015.

3.4 Pink and Chum Salmon

Interim escapement goal ranges for Taku pink and chum salmon are based on professional judgement informed by historical catches in terminal areas and limited in-river spawning escapement observations.

4 CONSULTATION PROCESSES FOR TAKU SALMON FISHERIES

The development of decision guidelines and specific fishery management plans for Taku River fisheries involves consultation with the Taku River Salmon Management Advisory Committee (TRSMAC) and the Taku River Tlingit First Nation (TRTFN). Recommendations of the Transboundary Rivers Panel (TRP) of the PSC provide an overarching back-drop for decision guidelines as do DFO policies, scientific advice and the experience of fishery managers.

4.1 Taku River Tlingit First Nation: Aboriginal Fisheries Strategy Consultation

Consultations with the TRTFN relating to the Aboriginal Fisheries Strategy (AFS) occur throughout the year. Meetings are generally arranged by the DFO AFS Coordinator. Results of these consultations are contained within a multi-year DFO/TRTFN Fisheries Agreement. The Agreement details fish management and stock assessment programs, enforcement protocols, commercial licences, selective fishing, as well as the First Nation fishery and communal licence provisions. The TRTFN also participates actively in the TRSMAC and in the Transboundary Rivers Panel.

4.2 Taku River Salmon Management Advisory Committee (TRSMAC)

The TRSMAC is comprised of DFO and representatives with interests in Taku River salmon resources, specifically the TRTFN and commercial and recreational fish harvesters. Membership is established by DFO through consultation with stakeholder groups which choose their representatives. The Committee endeavours to meet twice annually to develop recommendations pertaining to management plans, to conduct post-season reviews and to address issues such as licensing, allocations and license conditions. Participation of some PST Transboundary River Panel members in TRSMAC meetings assists to facilitate continuity and coordination in domestic and international discussions.

4.3 Transboundary Rivers Panel of the Pacific Salmon Treaty

Canada/U.S. arrangements for the coordinated conservation and abundance-based management of salmon stocks originating in the Canadian portion of the Taku River are specified in Chapter 1, paragraph 3(b), of Annex IV of the PST. The Transboundary Rivers Panel oversees the implementation of these arrangements with technical support from the joint Transboundary Technical Committee. Fishery management, conservation,

enhancement and stock assessment plans are reviewed and discussed annually by the Panel and/or the Committee. Recommendations ensuing from the deliberations of the Panel can be made to the Pacific Salmon Commission which, upon review, may make recommendations to respective national governments.

The obligations and provisions contained in the PST and subsequent recommendations from the PSC adopted by the Parties provide the foundation for development of this IFMP. Management regimes under Annex IV will be implemented by Fisheries and Oceans Canada and US agencies for the 2015 season.

5 TAKU RIVER DECISION GUIDELINES FOR 2015

Decision frameworks for the Taku River salmon fisheries are developed in consultation with the TRSMAC and TRTFN. The decision guidelines for Taku Chinook, sockeye and coho salmon reflect the current provisions for harvest sharing and cooperative abundance-based management as specified in the PST. In-season decisions are based on weekly calculations of run size, coupled with conservation requirements and Canada/U.S. harvest sharing objectives.

5.1 Chinook Salmon

Current Canada/U.S. catch sharing provisions were developed to acknowledge the traditional catches in fisheries, referred to as the base level catch (BLC), which occurred prior to the current arrangements. For directed fisheries, the allowable catch (AC) will be calculated as follows:

- $AC = \text{Terminal run} - \text{Base Terminal Run (BTR)}$;
- $BTR = \text{escapement target} + \text{test fishery BLC} + \text{U.S. BLC} + \text{Cdn BLC}$:
 - The S_{MSY} escapement target is 25,500 large Chinook salmon; the agreed escapement goal range is 19,000 to 36,000 large Chinook (mid-point = 27,500 fish);
 - BLC's are as follows:
 - US Taku BLC: 3,500 large Chinook salmon;
 - Canadian Taku BLC: 1,500 large Chinook salmon;
 - Test fishery: 1,400 large Chinook salmon.

In order to conduct directed fisheries based on the preseason outlook, the outlook must be greater than, or equal to, the mid-point of the agreed escapement goal range plus the combined Canada, U.S. and test fishery base level catches. Therefore the preseason outlook must be greater than, or equal to, 33,900 large Chinook salmon in order to prosecute directed fisheries before in-season projections are available. Once the in-season projections become available, the AC available for directed fisheries is based on calculations employing the S_{MSY} point estimate; hence, the trigger is reduced to 31,900 large Chinook salmon.

Harvest sharing and accounting of the AC are outlined Table 23.

Table 23. Canada/U.S. harvest sharing of the Allowable Catch of large, Taku River Chinook salmon.

Allowable Catch Range (# large Chinook)		Allowable Catch Share			
		U.S.		Canada	
Lower	Upper	Lower	Upper	Lower	Upper
0	5,000	0	0	0	5,000
5,001	20,000	1	11,000	5,000	9,000
20,001	30,000	11,001	17,500	9,000	12,500
30,001	50,000	17,501	30,500	12,500	19,500
50,001	100,000	30,501	63,000	19,500	37,000

Within each Allowable Catch Range, each Party's Allowable Catch Share will be calculated proportional to where the AC occurs within the range. Guided by this information, each Party shall determine the domestic allocation of their respective harvest shares.

Should the terminal run of Chinook salmon be insufficient to provide for the Party's BLC and the lower end of the escapement goal range, the reductions in each Party's base level fisheries (i.e. the fisheries that contributed to the BLC) will be proportionate to the BLC shares, excluding the test fishery.

The US catch of the Taku Chinook salmon AC will not count towards the SEAK AABM allocation (as described in Chapter 3 of the PST). In particular:

- non-Taku Treaty Chinook salmon harvested in District 111 will continue to count toward the SEAK AABM harvest limit;
- the US BLC of Taku Chinook salmon in District 111 will count toward the SEAK AABM harvest limit;
- the US catch of Taku Chinook salmon in District 111 above the US BLC will not count towards the SEAK AABM allocation.

Accounting for the SEAK AABM Chinook salmon catches as they pertain to Transboundary rivers harvests will continue to fall within the responsibility of the Chinook Technical Committee.

Table 24 identifies Canadian fisheries management reference points for Taku River Chinook salmon. The decision triggers are based on the following priorities: 1) escapement requirements (S_{MSY} of 25,500 large Chinook, an agreed escapement goal range of 19,000 to 36,000 with a mid-point of 27,500); 2) base level catches (6,400 combined Canada and U.S.) with the special obligation in Canada to provide for FSC needs; and, 3) the directed commercial fishery. The Red Zone reflects when closures in all Canadian fisheries are very likely to occur. The upper end of the Yellow Zone reflects the number of fish required to meet the low end of the escapement goal range plus the full

base level catches. In this zone, consideration will be given to reducing Canadian base level catches with the recreational fishery (e.g. reduced catch limits) and the commercial fishery (e.g. mesh restrictions) the first to be affected. Restrictions become more severe the closer the projection is to low end of this zone and whether efforts are being taken to curb base level catches in Alaskan fisheries. The Green Zone allows for full base level catches, i.e. normal First Nation and recreational fisheries occur and incidental catches occur in the commercial fishery targeting sockeye salmon as well as consideration for additional directed catches. A directed commercial fishery for Chinook salmon does not occur until the run is sufficient to meet the S_{MSY} escapement goal plus the full base level catches.

Table 24. Key Decision Points for Taku River Chinook salmon.

Zone	Terminal Run Projection	Fishery	Guideline Harvest	Anticipated Management Action
Red	<10,000	Aboriginal	0	Closure considered.
		Commercial	0	Delayed opening for sockeye fishery.
		Recreational	0	Closure considered.
Yellow	10,000 – 31,900	Aboriginal	0-500	Possible time restrictions.
		Commercial	0	Closed until June 20, then max. mesh 140mm (5.5") incidental only.
		Recreational	none specified	Possible time/quota restrictions.
Green	>31,900	Aboriginal	500	Unrestricted
		Commercial	100% - 37% of AC depending on run strength.	Directed fishery, AC targets reduced by 30%
		Recreational	none specified	Restrictions as per BC Freshwater Salmon Regs.

The in-season management of Taku River Chinook salmon depends on abundance estimates generated from the joint mark-recapture program in the lower Taku River with tags being applied at Canyon Island and recoveries typically being made in the Canadian test and/or commercial fisheries. Based the preseason forecast, directed Taku River Chinook salmon fisheries are not expected in 2015. However, as per similar situations in the past, the commercial fishery will operate in an assessment mode and serve as the test fishery identified in the PST agreement; the primary purpose of the test fishery is to collect data for the in-season run projections. The commercial fishery will remain in “assessment mode” until in-season terminal run projections consistently exceed 31,900 large Chinook salmon. This infers the switch to a directed fishery will require repeated projections above the trigger in succeeding week(s); the earliest that this is anticipated is mid-May (i.e. after SW21). If the in-season estimates support an AC, weekly guideline harvests will be established to apportion the allowable catch over the fishing season in order to avoid overharvesting any particular component of the run. As planned for in

2014, the AC will be reduced by 30% due to the low production of Taku River Chinook salmon observed in recent years and to address concerns over management error.

In order to achieve reliable abundance estimates for the early part of the run, the TTC has developed weekly assessment fishery catch guidelines which are linked to the number of tags applied and the season total assessment fishery target catch of 1,400 Chinook salmon agreed to by the TRP (Table 25). Shortfalls/overages will be apportioned over the remaining weeks of the assessment fishery. In the event that reliable in-season projections (i.e. estimates made post SW21) indicate escapement will be less 16,150 fish, suspension of the assessment fishery will be considered.

Table 25. Weekly guideline harvest limits for the Taku Chinook assessment fishery in 2015.

Stat. Week	Start (Sunday)	Assessment Fishery Weekly Catch Guidelines	
		Weekly target	Cumulative
19	03-May	150	150
20	10-May	280	430
21	17-May	320	750
22	24-May	170	920
23	31-May	180	1,100
24	7-Jun	160	1,260
25	14-Jun	140	1,400
Total		1,400	1,400

Note: Day 4 timing of each SW will be used to calculate the weekly harvest limits since a 3-day opening would typically end on the 4th day of the week. Weekly openings will be limited to a maximum 4 days unless otherwise agreed.

Since the assessment fishery will involve commercial fishers, details on how it will operate are described in Appendix 3, Section 6.3 regarding the Commercial Fishery Plan.

Inseason estimates of the inriver run will be made using a bilaterally agreed-to (by Canadian and U.S. managers) sulk rate for tagged fish released in event 1 of the two-event mark-recapture study. Sulk rates will be based on the analysis of inseason data. In the event bilateral agreement cannot be reached with respect to the sulk rate, an assumed 10-day sulk rate will be used. Inseason terminal run projections will be made using average run timing from catches at Canyon Island (or other bilaterally agreed-to timing). In addition, the terminal marine harvests will be lagged one week to account for travel time between Taku Inlet and the event 2 sampling area.

For inseason terminal run size estimates, a valid Petersen mark-recapture estimate will be sought based on the following equation:

$$TR = [(P_t + Cus_{(t-1)})/p_t]$$

Where:

- TR = the projected terminal run of large Chinook salmon for the season;
 P_t = the inriver population estimate from the mark-recapture program through week “t”;
 $Cus_{(t-1)}$ = the cumulative US Chinook salmon catch to week “t-1”, i.e. US catch lagged one week to account for migration timing;
 p_t = the estimated cumulative proportion of run through to week “t” determined from the inriver run timing based on historical catch data from Canyon Island. Adjustments to run timing estimates inseason will only be made by mutual agreement between Canadian and U.S. managers.

In the event a valid Petersen estimate is not available, upon agreement, another valid estimate may be used. Should there be no agreement on an alternate valid estimator then the most recent agreed valid estimate will be used. If no agreed-to valid estimate has been generated the preseason forecast will be used.

5.2 Sockeye Salmon

Canada/U.S. sharing arrangements for Taku River sockeye salmon during the 2009-2018 period, as outlined in the PST, include:

- Directed fisheries on Taku River sockeye will occur only in the Taku River drainage in Canada and in District 111 in the US;
- Annual abundance of the wild run of Taku River sockeye salmon will be estimated by adding the catch of wild run sockeye salmon in US District 111 to the estimated above-border passage of wild run sockeye salmon. The annual TAC of wild run Taku River sockeye salmon will be estimated by subtracting the spawning escapement goal from the annual abundance estimate;
- For in-season management purposes, identifiable enhanced Taku River origin sockeye salmon will not be included in the calculations of the annual TAC. Enhanced sockeye will be harvested in existing fisheries incidentally to the harvest of wild Taku sockeye salmon. Management actions required to ensure wild spawning escapement objectives will be met may result in surplus enhanced sockeye salmon that will remain un-harvested in existing commercial fisheries. Canada may implement additional fisheries upstream of the existing commercial fishery to harvest surplus enhanced sockeye salmon;
- If the projected in-river escapement of wild run sockeye salmon is >1.6 times (or other agreed factor) the agreed spawning escapement goal, Canada may, in addition to its share of the TAC, harvest the projected surplus in-river escapement apportioned by run timing.

The Parties annual TAC share of Taku River sockeye salmon is described in Table 26 below:

Table 26. U.S. and Canadian harvest shares of Taku River sockeye salmon.

Enhanced Production	U.S. TAC Share	Canadian TAC Share
0	82%	18%
1 – 5,000	80%	20%
5,001 – 15,000	79%	21%
15,001 – 25,000	77%	23%
25,001 – 35,000	75%	25%
35,001 – 45,000	73%	27%
45,001 – 55,000	71%	29%
55,001 – 65,000	69%	31%
65,001 – 75,000	68%	32%
75,001 – 85,000	67%	33%
85,001 – 95,000	66%	34%
95,001 – 100,000	65%	35%

In 2015, the enhanced production is expected to fall in the 5001-15,000 range based on the pre-season forecast of 6,700 enhanced Tatsamenie Lake sockeye salmon (Appendix 3, Section 2.2). Hence, Canada’s share of the sockeye TAC is expected to be 21%. In-season projections of the run size of enhanced fish may result in this share changing as per Table 26.

In-season management relies on projections of the TAC of wild Taku sockeye salmon determined as follows:

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

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

The projections of TAC are then apportioned by PST harvest sharing provisions and historical run timing data to provided weekly guideline harvests for the management of Canadian fisheries.

Table 27 identifies Canadian fisheries management reference points for Taku River sockeye salmon developed in consultation with the TRSMAC. When escapement projections are in the Red Zone, closures in all fisheries are likely to occur. The 50,000 trigger is not biologically based; rather, it reflects the tolerance limit of fishers and managers and a willingness to put all fish on the spawning grounds if escapement projections fall below it.

The top end of the Yellow Zone is based on the lower end of the escapement goal range. In the Yellow Zone, the only fishery allowed to operate is the FSC fishery which could face increasing restrictions the closer escapement projections fall towards the lower end of this zone. Decisions to restrict the FSC fishery will also take into account the management actions and catch taken to date in U.S. fisheries.

Escapement projections in the lower Green Zone signify when an unrestricted FSC fishery can occur and openings in the commercial fishery are considered. The primary guiding factor is the catch share provisions of the PST. If escapement projections exceed 120,000 sockeye (upper Green Zone), which is 1.6 times the point target escapement of 75,000, as per the PST agreement, Canada may harvest any surplus above this.

Table 27. Key Decision Points for Taku River sockeye salmon.

Zone	Escapement Projection	Fishery	Guideline Harvest	Anticipated Management Action
Red	<50,000	Aboriginal	0	Closure considered
		Commercial	0	Closed
Yellow	50,000 – 71,000	Aboriginal	0-2,000	Possible time restrictions
		Commercial	0	Closed
Green	71,000 – 120,000	Aboriginal	2,000	Unrestricted
		Commercial	18% - 35% of TAC dependent on size of enhanced return.	Normal 2-3 day fishery with possible extensions
Upper Green	>120,000	Aboriginal	2,000	Unrestricted
		Commercial	as per above plus the surplus escapement in excess of 120,000.	Normal 2-3 day fishery with possible extensions.

5.3 Coho Salmon

Initial interim arrangements for conservation and harvest sharing of Taku River coho salmon were specified in the PST. These included: an interim escapement goal range of 27,500 to 35,000 coho salmon; a US obligation to manage for an in-river run into Canada of at least 38,000 coho salmon, unrestricted bycatch of coho salmon in Canada prior to statistical week 34 during the directed sockeye fishery; and, a directed Canadian catch of up to 10,000 coho depending on specified in-river run abundance levels.

With the analyses of the coho salmon escapement goal recently being completed and the Transboundary River Panel recommendation to adopt an escapement goal range of 50,000 to 90,000 coho salmon and a S_{MSY} point target of 70,000 coho salmon commencing 2015, adjustments to the directed coho salmon harvest arrangements were also required. The Panel has recommended the following arrangement for 2015 which has been adopted by the Parties:

1. No numerical limit on the Taku River coho catch will apply in Canada during the directed sockeye salmon (through SW 33).
2. The escapement point target of 70,000 fish will be used in pre-season and in-season management decisions;
3. If in-season projections of above-border run size are less than 75,000 coho salmon, a directed Canadian harvest of up to 5,000 coho salmon is allowed for assessment purposes as part of the joint Canada/US Taku River mark-recapture program.
4. If in-season projections of above border run size exceed 75,000 coho salmon, Canada may harvest all the coho salmon in excess of this number.

The purpose of the assessment fishery is to obtain data required to make inseason abundance estimates, e.g. tagged:untagged ratios for mark-recapture estimates. In implementing paragraph 3 above, Canada plans to catch 60% of the assessment target of 5,000 coho salmon in a structured and closely monitored assessment fishery using commercial openings (similar to the approach followed in the Chinook assessment fishery). The remaining fish required for assessment purposes will be harvested by a contracted test fisher. This will ensure abundance estimates cover a greater portion of the overall run by prolonging the recapture effort.

In-season projections of the in-river run of coho salmon rely on the joint Canada/U.S. adult mark-recapture program where population estimates are expanded by historical run timing. The in-river coho projections will be based on the following simplified formula:

$$R_{IR(ACI)} = R_{IR(ACI)t} / T$$

Where :

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

Catch-per-unit-effort (CPUE) and CWT recoveries from the SE Alaska troll fishery are additional indicators of Taku R. coho run size that may be used for in-season management.

Table 28 summarizes the decision matrix and anticipated management actions to be taken given different border passage projections. These decision points are new for this year due to revisions to the coho management regime agreed to by the Transboundary Rivers Panel.

The Red Zone indicates when all fisheries could expect closures. A FSC fishery closure would only occur if previous actions had been taken to close the recreational and directed commercial fisheries.

In the Yellow Zone, it is expected the FSC fishery would proceed along with an assessment fishery involving commercial fishers.

For border passage projections above 70,000, i.e. the Green Zone, normal FSC and recreational fisheries will occur and commercial fishery opportunities will be liberalized to harvest fish surplus to escapement requirements.

Table 28. Key Decision Points for Taku River coho salmon, commencing statistical week 34.

Zone	Border Passage	Fishery	Guideline Harvest	Anticipated Management Action
Red	<50,000	Aboriginal	0	Closure considered
		Commercial	0	Closed
		Recreational	0	Closure considered
Yellow	50,000 to 70,000	Aboriginal	750	Unrestricted
		Commercial	5,000 (assessment fishery)	Restricted fishery driven by assessment guidelines.
		Recreational	none specified	Restrictions as per BC Freshwater Salmon.
Green	>70,000	Aboriginal	750	Unrestricted
		Commercial	5,000 assessment catch plus surplus escapement	Normal 2-3 day fishery with possible extensions.
		Recreational	none specified	Restrictions as per BC Freshwater Salmon. Possible increases in daily catch limits.

5.4 Pink and Chum Salmon

Pink and chum salmon are not actively targeted in Taku River fisheries, although pink salmon are caught as bycatch during the targeted sockeye fishery. It is unlikely that commercial close times will be varied for pink salmon. There is limited/no harvesting of pink salmon in recreational and FSC fisheries.

Bycatch of fall chum salmon also occurs later in the sockeye season and during the coho salmon fishery. Due to the currently depressed state of Taku River chum salmon stocks, all chum salmon encountered must be released.

6 TAKU RIVER FISHERY PLANS FOR 2015

6.1 First Nation Fishery Plan

6.1.1 Taku River Tlingit First Nation Basic Needs Allocation

The main guiding factor in the Taku River Tlingit First Nation (TRTFN) fishery will be conservation goals and the basic needs allocations as specified in the Communal Fishing Licence of the TRTFN, specifically: 500 Chinook, 2,000 sockeye and 750 coho salmon.

Although restriction of the TRTFN FSC fishery is not anticipated in 2015, adjustment of this strategy may need to occur should conservation issues arise. Any changes to the FSC fishery management strategy will occur in accordance with the Taku River Decision Guidelines and include consultation with the TRTFN.

6.1.2 Taku River Tlingit First Nation Control and Monitoring of Removals

The TRTFN collects and provides information on the total FSC fishery harvest to Fisheries and Oceans Canada on a weekly basis throughout the season. Any reductions in fishing time, if required, will only be considered if no other conservation-oriented harvest adjustments can be achieved in the commercial and/or recreational fisheries.

6.1.3 Taku River Tlingit First Nation Communal Licencing

Communal licences are issued to First Nations that have rights to fish in the Taku River watershed for FSC purposes. Individual First Nations maintain control of this licence and have the authority to designate all persons fishing in this category.

6.2 Recreational Fishery

In British Columbia, recreational fishing opportunities for salmon are regulated by the *British Columbia Sport Fishing Regulations* pursuant to the federal *Fisheries Act*. Regulations are generally summarized in the *2015 to 2017 British Columbia Tidal Waters Sport Fishing Guide*, and the *2015 to 2017 British Columbia Freshwater Salmon Supplement*. covered under the Region 6 (see:

http://www.env.gov.bc.ca/fw/fish/regulations/docs/1517/fishing_synopsis_2015-17_region6.pdf; or, the Fisheries and Oceans Sport Fishing Guide for Region 6 at: <http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/fresh-douce/region6-eng.html>).

Recreational angling restrictions and requirements are subject to change in-season if additional conservation concerns arise or if additional recreational opportunities become available. Changes are communicated through Fishery Notices, media reports, telephone

information lines, Twitter (@sportfishingbc) and/or the inseason decisions website: <http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/season-saison/index-eng.html>.

6.2.1 Taku River Recreational Control and Monitoring of Removals

The controls for the Taku Recreational Fishery for salmon include daily and possession limits, hook restrictions, area closures, catch record keeping requirements, catch reporting requirements and licencing requirements. These are described at: <http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/fresh-douce/region6-eng.html>. Some of the highlights include the following:

- The daily limit for Chinook salmon is 4 per day, with only 2 >65 cm (nose to fork of tail).
- The daily limit for coho salmon is 4 per day, with only 2 >50 cm (nose to fork of tail);
- The daily limit for each of sockeye, pink and chum salmon is 0;
- The maximum number of salmon (species combined) that can be retained in any one day is 4;
- The possession limit is 8 salmon (in the aggregate, species combined);
- The annual catch limit for Chinook salmon in non-tidal waters is 10;
- All retained salmon must measure 30 cm or more;
- All Chinook retained must immediately be recorded in ink on the angling licence;
- It is illegal to catch or attempt to catch salmon by wilfully foul hooking. Any accidentally foul-hooked salmon must be released;
- Only single barbless hooks are allowed to be used when fishing for salmon in streams;
- All steelhead must be released;
- Annual fishing closures include:
 - The outlet stream between Tatsamenie Lake and its confluence with Tatsatua Creek is closed to fishing from December 01 to June 30, and from August 20 to September 15;
 - The Nakina River is closed to fishing from July 20 to August 15.

Fishers are encouraged to read the regulations regarding closures closely and check for updates. Additional restrictions in fishing time are not anticipated in the Taku recreational fishery. However, if the in-season projections of Chinook and/or coho salmon indicate a conservation or FSC concern, non-retention, reduction in possession limits and/or closure of the recreation fishery will be considered. Increases in the possession limits could be considered if the conservation and FSC objectives will be exceeded.

Compliance monitoring and enforcement will be undertaken by enforcement personnel with the province of BC and, or, DFO.

6.2.2 Taku River Recreational Fishery Licensing

Recreational fishing on the Taku River is permitted provided the angler is the holder of a current BC Non-Tidal Angling Licence if they are over the age of sixteen. A Non-Tidal Salmon Conservation Stamp must be validated with the basic angling licence if the fisher

intends to retain salmon. In order to fish for steelhead, a Steelhead Conservation Surcharge Stamp is required.

Residents under the age of sixteen may fish without a licence unaccompanied by a licence holder; whereas, non-residents under the age of sixteen may fish without a licence but must be accompanied by a valid licence holder. Catches must be counted towards the possession limit of the licence holder. Daily quotas and other regulations apply (see: <http://www.env.gov.bc.ca/fw/fish/regulations/>).

Fees vary depending on the type of licence required.

6.3 Taku River Commercial Fishery

If conservation, FSC, recreational and PST harvest sharing objectives are likely to be met, the commercial fishery will open. The Canadian catch will be managed with the objective of meeting escapement targets and agreed Canada/US and domestic harvest sharing objectives.

In years when a directed commercial fishery for Chinook salmon is sanctioned, the date of the earliest commercial opening is typically the last Sunday in April; this is determined in consultation with the TRSMAC and with the U.S. through the TTC. The sockeye season generally commences mid-June and lasts through mid-August after which time coho salmon management takes precedence.

The 2015 preseason Chinook salmon forecast is not sufficient to proceed with a directed commercial fishery for Taku Chinook salmon; however, an assessment fishery involving commercial fishers will be prosecuted to obtain in-season data on run status.

The assessment (test) fishery will open at 12:00 noon Sunday, May 3. Extensions and adjustments to weekly fishing periods will be made with the intention of achieving the guideline assessment targets outlined in Table 25. Attempts will be made to spread the weekly harvest over three daily openings, to a maximum of four. Mesh sizes will be restricted to between 100 mm (four inches) and 204 mm (8 inches) and net length will be up to 36.6 m (120 ft). Use of set nets will be prohibited during the assessment fishery. As mentioned above, if reliable inseason run projections are greater than 31,900 large Chinook salmon, a directed Canadian commercial fishery may be considered in accordance with weekly projections of terminal run size and guideline harvests.

If in-season run projections support the initiation of a directed Chinook fishery, it will not commence at least until the week following whenever the triggering run assessment is made and subsequent run projections confirm directed fishing is warranted. As in previous years, weekly guideline harvests will be established to apportion the Canadian allowable catch (AC) over the fishing season in order to avoid overharvesting any particular component of the run. As a precautionary measure, the weekly guideline harvests will include a 30% reduction to address the uncertainty associated with in-season run projections and to help ensure that the AC is not exceeded.

For the sockeye season, the directed commercial sockeye fishery will commence at 12:00 noon Sunday, June 21 (SW 26) restricted to an initial 48-hour period. Canadian sockeye management decisions will be based on weekly projections of terminal run sizes of wild and enhanced fish, TAC, and the escapement of wild stocks, and will follow the decision guidelines outlined in Appendix 3, Section 5.2. The PST harvest sharing provisions will be applied to the weekly wild sockeye TAC projections to guide the management of the commercial fishery. Run timing will be used to apportion the projected Canadian allowable catch each week and to make projections of the total escapement. The Canadian catch will be adjusted with the objective of meeting escapement and agreed Canada/U.S. harvest sharing objectives.

Prior to mid-August (SW 34), bycatch of coho salmon occurs in the directed sockeye commercial fishery. Management focus generally shifts to coho salmon in mid-August with the evaluation of the coho catch, effort and CPUE in the commercial fishery relative to historical levels and in-river run size estimates from the Taku River mark-recapture program. The duration of weekly openings will be based on the in-season run projections and the new coho salmon harvest provisions for Canada recommended by the Transboundary Rivers Panel for 2015.

It is anticipated that the commercial fishery will not target pink salmon unless markets are developed, which isn't expected to occur soon. Chum salmon will also not be targeted.

6.3.1 Taku Commercial Fishery Controls

The primary commercial fishery management control will be through adjustments in weekly fishing times. Duration of openings will be based on weekly guideline harvests developed in consideration of spawning escapement requirements and /or specific stock conservation concerns, Canada/U.S. catch sharing provisions, domestic allocation priorities, and fishery performance parameters (e.g. effort, catch, historical run timing).

For example, poor sockeye returns to Kuthai Lake continue to be of concern. The duration of commercial openings in SW 26-27 (June 21 – July 4) may be limited to augment the escapement of the Kuthai Lake stock. During SW 31-33 (July 26 - August 15), fishing times may also be limited to ensure adequate numbers of sockeye salmon escape to Tatsamenie Lake to support escapement and egg-take objectives.

Additional Taku commercial fishery controls include:

1. Adjusting the fishing gear: For the first few weeks of the directed sockeye fishery, if efforts are required to reduce the bycatch of Chinook salmon, a maximum mesh restriction of 140 mm (approximately 5.5 inches) may be in effect through SW27 (week ending July 04). Other restrictions on gillnet mesh size may be implemented to reduce catches of non-target species.
2. Adjusting the fishing area: The commercial fishing area could be reduced during the Chinook assessment fishery in order to ensure adequate monitoring can be achieved and catches do not exceed weekly targets.

3. Non-retention: To address chum salmon conservation concerns, the retention of chum salmon will be prohibited throughout the season. In addition, fishers must release any steelhead caught.

6.3.2 Taku Commercial In-Season Catch Reporting Program

Details regarding catch reporting requirements are provided in the Conditions of Licence issued to each commercial fisher. While participating in the fishery, commercial fishers are required to land catches at a registered landing station within 1.5 hours of the end of the fishing period as identified by a single variation order, except for the final fishing period in any given week, when the deadline will be 2.5 hours after closure. Hail information collected throughout the openings will be used to justify extensions to fishing times. As in past years, catches shall be made available for sampling by Departmental staff or designates.

Fish slips must specify the number and weight of each species caught separated by: gear type, i.e. fishwheel or gill net; mesh size used; and, by fish landed in the round or dressed (head-on and head-off). If available, price per pound should be noted. Chinook salmon must also be separated by flesh colour (red and white) and size (large and small). A small Chinook salmon is considered to be a fish with a mid-eye to fork length of less than 660 mm. A logbook is required to document the number of fish caught but subsequently released and the information is submitted along with harvest and tag recovery information after each 24-hour fishing period.

6.3.3 Taku Commercial Non-Retention Species

All opening announcements will contain the species that will be allowed to be retained. All other species must be released to the water with the least possible harm. Licence conditions prohibit retention of chum salmon and steelhead.

6.3.4 Taku Commercial Monitoring Plan

The fishery will be monitored by DFO Fisheries Technicians stationed at the Ericksen Slough Field Office. They will collect catch and tag recovery data from landing stations and sample portions of the catch for biological samples and stock composition determinations. Catch and tag recovery data will be collected daily and will be recorded for each licence by species and hours fished. DFO Conservation and Protection personnel will monitor and enforce compliance in the fishery.

6.3.5 Taku Commercial Gill Net Construction

Specific restrictions such as the specifications for net construction are found in the Conditions of Licence, which are issued along with the commercial fishing licence. Fishers are urged to read these conditions carefully to ensure that their fishing gear and techniques are in accordance with licence conditions.

The maximum gill net length for the Taku River commercial fishery is 36.6 metres (120 feet) for both drift and set nets. All gill nets (drift and set) must meet the following web specifications:

- Have 30 or more filaments in each twine of the web, with all filaments in the web of equal diameter. (This is the web that is typically fished on the Taku River in Canada); or,
- Have 6 or more filaments in each twine of the web, with all filaments in the web a minimum of 0.20 mm in diameter. (This web is otherwise known as “Alaska twist”).
- The minimum allowable mesh size of gill nets used shall not be less than 100 millimetres (four inches).
- The maximum allowable mesh size of gill nets used shall not be greater than 204 millimetres (eight inches).

Set nets must be identified with an orange-coloured buoy with the fisher’s licence number clearly printed on it and attached to the end of the net that is furthest from shore.

Specific restrictions for net configuration are found in the Fishery Notice issued prior to every commercial fishery. Fishers are urged to read these carefully to ensure that their fishing gear is in accordance with the opening.

6.3.6 Taku Commercial Licensing

There are currently sixteen limited entry party based licences allocated for commercial fishing on the Taku River. All commercial licences are available through the National Online Licencing System (NOLS) which replaces the in-person payments of licensing fees at DFO offices (see: <https://fishing-peche.dfo-mpo.gc.ca/>). Harvesters will use NOLS to pay for and print their commercial fishing licence and licence conditions. The cost of a licence is \$200 (regular fee) and \$20 First Nation (reduced fee). In addition, two Aboriginal Communal Commercial Licences are issued to TRTFN pursuant to the *Aboriginal Communal Fishing Licences Regulations* for participation in the general commercial fishery.

Recommendations for transferring commercial licences were developed by the TRSMAC and adopted in 2004.

6.4 ESSR Fisheries

No ESSR fisheries are anticipated on the Taku River in 2015. If ESSR situations were to occur, consideration would be given to initiating ESSR fisheries subject to the provisions of the DFO ESSR policy (see Section 6.9).

7 TAKU RIVER SOCKEYE ENHANCEMENT PLAN FOR 2015

PST arrangements for Taku sockeye salmon call for joint Canada /U.S. sockeye enhancement projects to be conducted in the Taku River watershed. Currently, broodstock are captured at Tatsamenie Lake. Fertilized eggs are flown by small float-plane or helicopter to the Snettisham Central Incubation Facility south of Juneau, Alaska where they are incubated and thermally marked. Fry produced from the Tatsamenie egg-take are returned to Tatsamenie Lake in the subsequent spring. Most are directly released into the lake; however, a portion is dedicated to a Northern Fund project conducting extended rearing trials to assess fry release strategies to improve fry-to-adult survival. Two other projects in the Taku River watershed include: the investigation of the suitability of Trapper Lake for introduction of anadromous salmon through barrier removal. Information is being compiled to determine the possibility of long term access improvement to Trapper Lake with the intent of establishing a self-sustaining sockeye population. The feasibility of broodstock capture and smolt production in King Salmon Lake for overall production potential has also been investigated beginning in 2012. Broodstock collections were conducted in 2012 and 2014 and smolt enumeration and assessment is planned for 2015.

The PST identifies the following commitments:

- A Taku Enhancement Production Plan (TEPP) shall be prepared annually by the TTC by February 1. The TEPP will detail the planned enhancement activities to be undertaken by the Parties and the expected production from site specific egg takes, access improvements and all other enhancement activities outlined in the annual TEPP. The TCC will use this data to prepare an initial enhancement production forecast based on the best available information.
- The Transboundary Panel shall review the annual TEPP and make recommendations.

The agreed TEPP for 2015 is presented in Table 29 below.

Table 29. Taku Enhancement Production Plan (TEPP), 2015.

Enhancement Project	Activities	Expected Production	Technique to document production
Tatsamenie Lake	Egg take with target of 30% of available brood stock ~ goal of up to 2.0 million. Out-planting of fry from the 2014 eggtake. Approximately 225K fry will be allocated for subsequent on-shore/ in-lake extended rearing. Remainder for lake out-planting.	- 4,400 adults from out-planting: (3.7% green egg-smolt, and 6.8% smolt-adult); - 1,530 adults from extended rearing: (assumed survivals of 10% fry - smolt, 6.8% smolt - adult)	Thermal mark

Trapper Lake	Eggtake with target of 100,000 eggs or other agreed level based on incubation capacity and/or configuration ¹ . Location of subsequent outplant (above or below falls) is contingent on likelihood of barrier modification proceeding.	250 adults	Thermal mark
Expected Total Production		6,180 adults	

¹ The Enhancement Subcommittee is still reviewing the appropriate number of eggs to take in order to account for the minimum incubation unit capacity at the Snettisham Hatchery.

8 TAKU SALMON STOCK ASSESSMENT PLAN FOR 2015

8.1 Chinook Salmon

The Taku River Chinook in-river stock assessment program planned for 2015 includes:

- A mark-recapture program with marking occurring in the lower Taku River (Canyon Island) and recoveries in the Canadian fisheries as well as in select spawning streams to determine in-season projections and post-season estimates of total in-river run size and escapement, major stock timing and overall age and size composition. Estimates from the mark-recapture program are integral to the development of annual estimates of the total run size (Figure 14);
- An assessment fishery (drift-netting only) involving commercial fishers will be conducted to recapture tagged adult fish when run abundance does not permit the prosecution of a directed commercial fishery;
- Sampling in Canadian and US gill net fisheries to determine age and size composition of catches and contributions of enhanced stocks (in US fisheries only) and to recover CWTs.
- A CWT program to provide smolt production estimates associated with escapement estimates, ocean survival, harvest rates, and stock identification and contributions within the marine fisheries.
- Aerial surveys of select escapement index streams, potentially Nakina, Nahlin, Tatsamenie, Tatsatua, Kowatua and Dudidontu rivers.
- A new radio telemetry project with a target of 300 radio tags to be applied at Canyon Island to be tracked with up to 7 towers and aerial surveillance. Objectives include investigating the migratory behavior of Chinook salmon and augment the mark-recapture program.
- Sampling for age-size-gender, and tag recovery (spaghetti tags, CWT, radio) of select spawning populations such as Nakina, Nahlin, Tatsamenie (carcass weir) , Kowatua, Tseta and Dudidontu.
- Investigate the feasibility of deploying Didson sonar in the Nakina River.
- Creel survey of Nakina anglers.

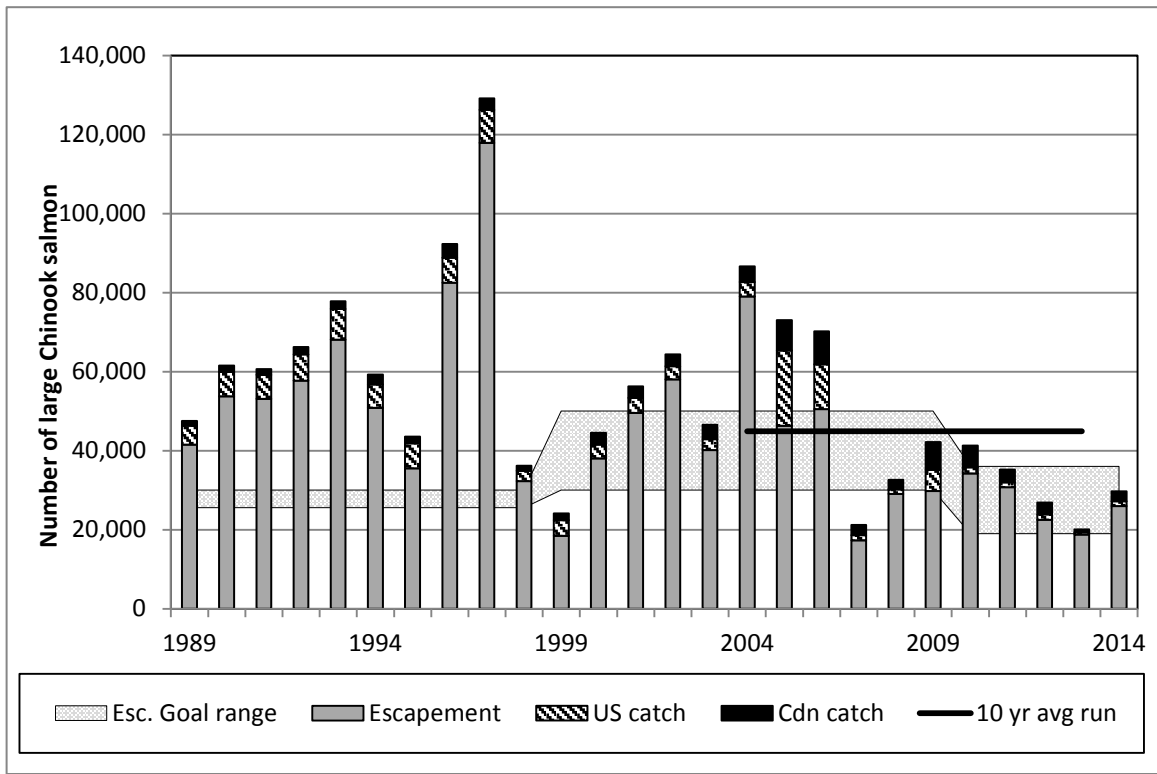


Figure 14. Terminal run of large Taku Chinook (≥ 660 mm mid-eye to fork length), 1989 to 2014. [Note: estimates of US catch prior to 1995 are derived from an assumed harvest rate of 10% (based on 1995-1999 average). Catches for 1995-2014 based on data from CWT (troll) and GSI (sport and net)]

8.2 Sockeye Salmon

The assessment program for Taku sockeye salmon in 2015 is expected to include the following:

- A mark-recapture program with marking in the lower Taku River (Canyon Island) and recovery in Canadian fisheries to provide in-season projections and post-season estimates of total in-river run size and escapement, major stock timing and overall age and size composition. Estimates from the sockeye mark-recapture program are used in annual run reconstructions summarized in Figure 15;
- Sampling in Canadian and US gill net fisheries to determine age and size composition of catches and contributions of enhanced stocks. Sampling is also conducted for stock identification;
- Stock-specific escapement enumeration and sampling (for age, size, gender, GSI, spaghetti tags), at select spawning sites including weirs located at Little Trapper (Figure 16), Tatsamenie (Figure 17), Kuthai (Figure 18) and King Salmon lakes.

- Radio tagging and matched sampling (GSI) of 50 early-timed sockeye salmon (in conjunction with the Chinook radio telemetry project) to examine the migratory behaviour/success of Kuthai sockeye salmon.

A number of assessment projects to evaluate the joint Canada/US sockeye enhancement program on Taku sockeye including: fry outplant and smolt emigration studies; otolith sampling and analyses in catches, escapements and juvenile samples to determine enhanced and wild contributions; and preliminary investigations of other potential enhancement opportunities.

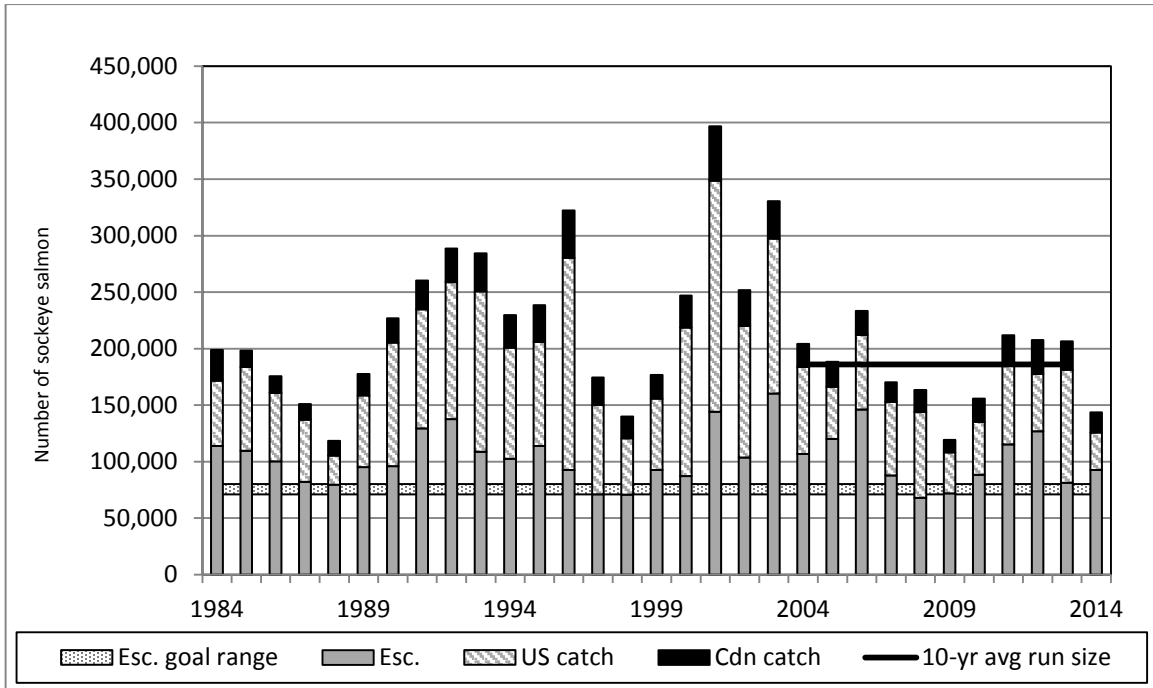


Figure 15. Terminal Run Size of Taku River sockeye salmon, 1984 to 2014. [Note: Escapement is determined from the mark-recapture program; US catch is based on scale pattern analyses and thermal marks; Canadian catch from inriver catch slips and monitoring]

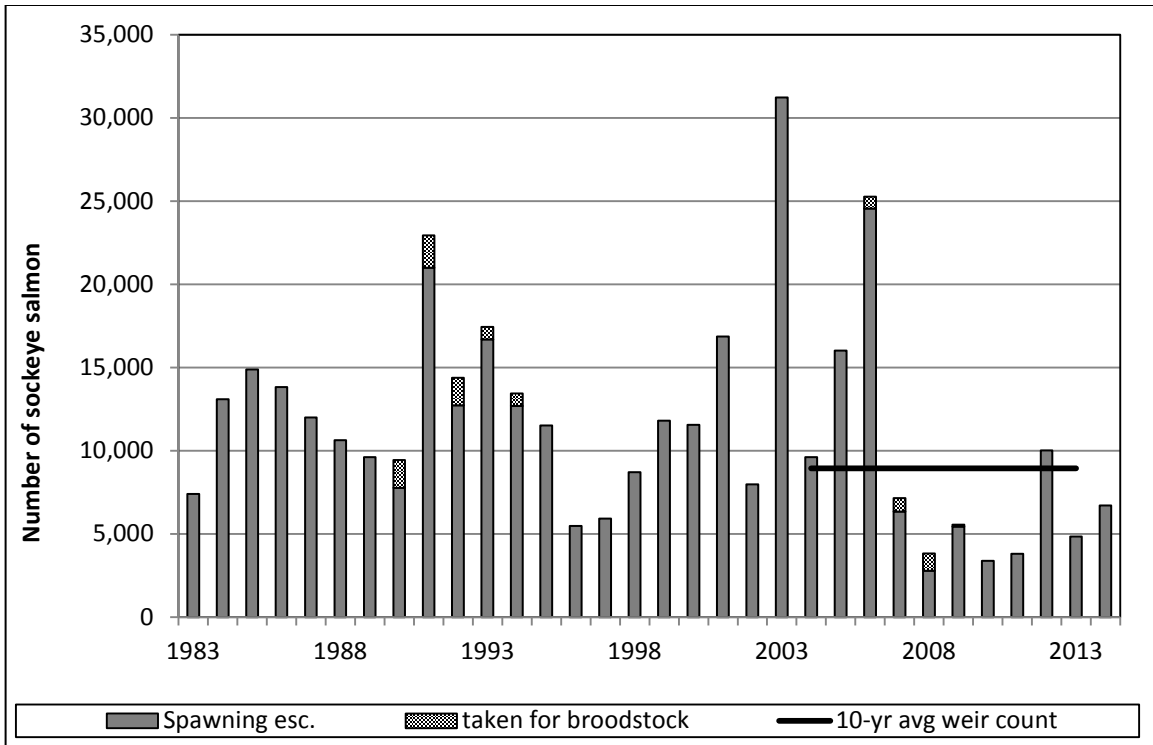


Figure 16. Weir counts of Little Trapper Lake sockeye 1983 to 2014. [Note: Annual weir count is sum of spawning escapement and fish taken for broodstock].

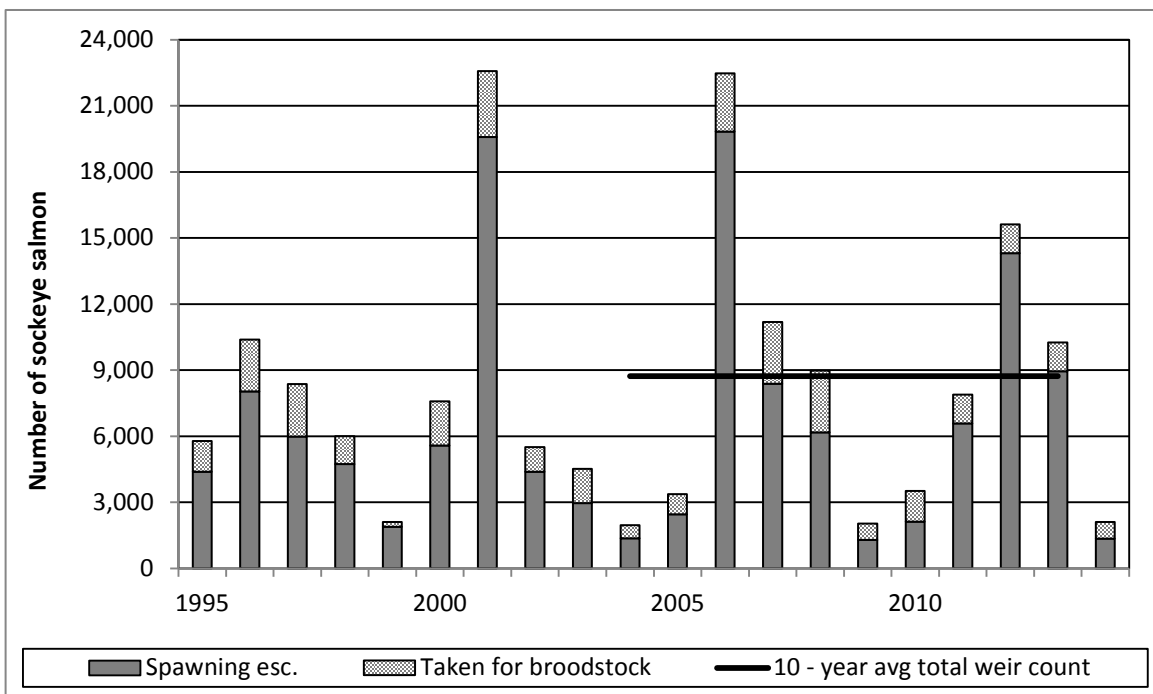


Figure 17. Weir counts of Tatsamenie Lake sockeye: 1985 to 2014. [Note. Annual weir count is sum of spawning escapement and fish taken for broodstock].

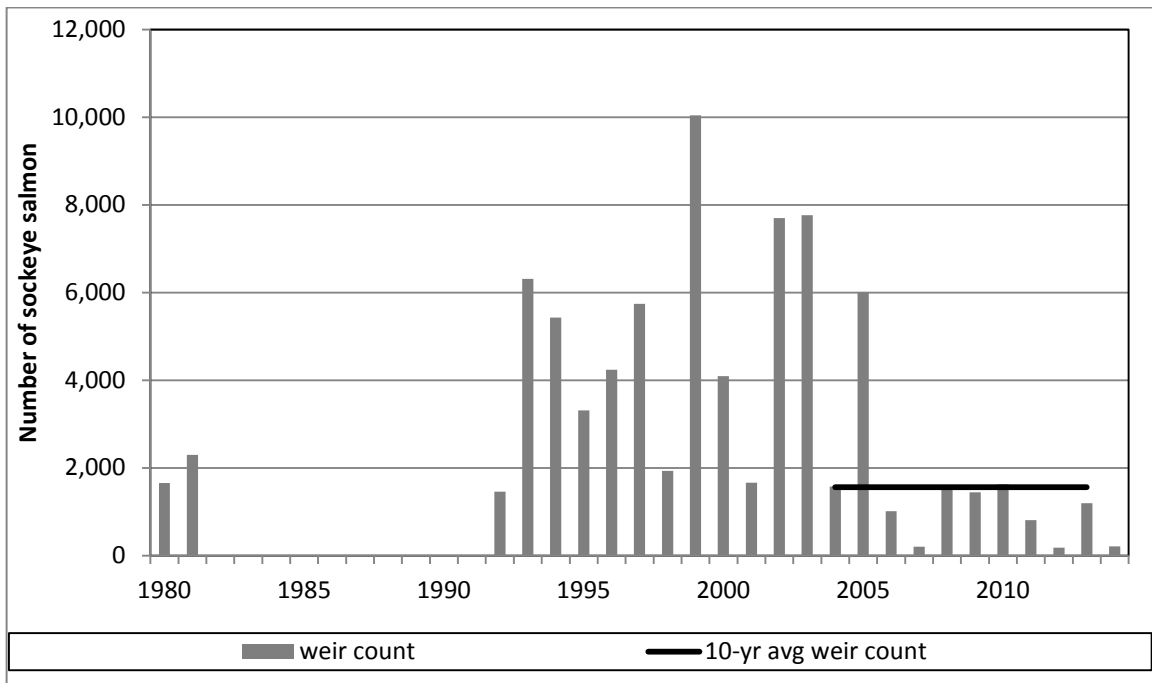


Figure 18. Weir counts of Kuthai Lake sockeye, 1985 to 2014.

8.3 Coho Salmon

The assessment program for Taku coho salmon in 2015 is expected to include the following:

- A mark-recapture program with marking in the lower Taku River (Canyon Island) and recovery in Canadian fisheries to provide in-season projections and post-season estimates of total in-river run size, escapement, major stock timing and overall age and size composition. In-river run estimates are combined with estimates of U.S. catches of Taku coho in troll, sport and net fisheries to produce estimates of the run size of the Taku coho salmon (Figure 19);
- Sampling in Canadian and US gill net fisheries to determine age and size composition of catches and contributions of enhanced stocks (US fisheries only) and to recover CWTs;
- A coho assessment/test fishery to continue run assessments once commercial fishing has ceased;
- A CWT program to provide smolt production estimates associated with brood year escapement estimates, ocean survival, harvest rates and stock identification and contributions within the marine fisheries.

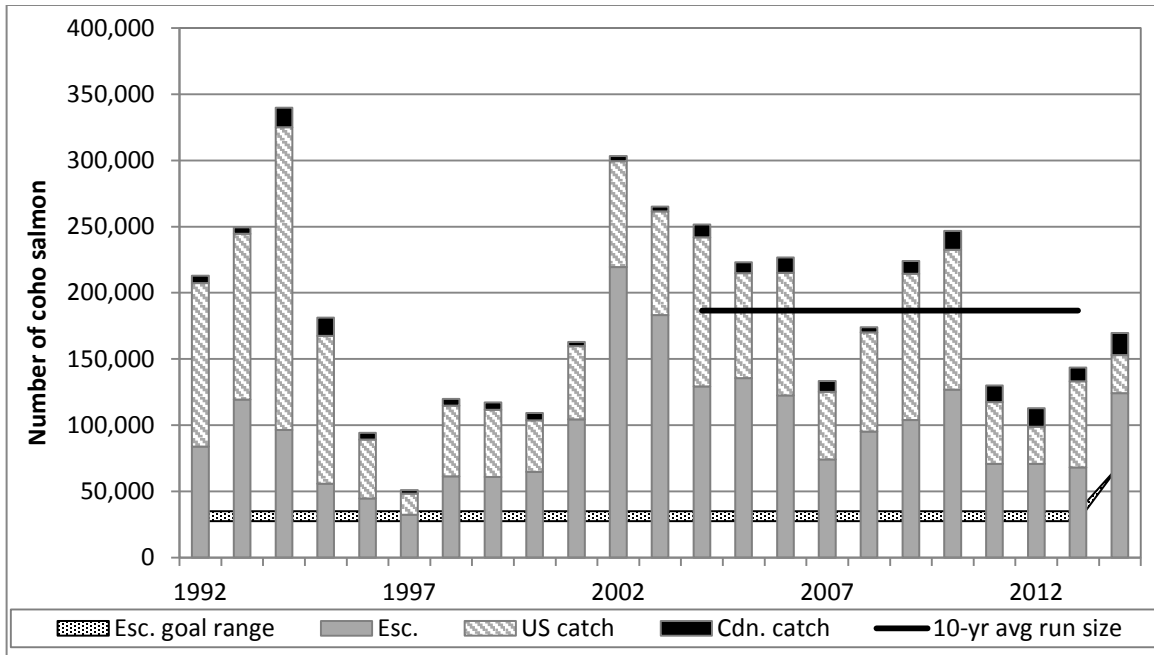


Figure 19. Estimated total run size of Taku River coho salmon, 1992 to 2014.

8.4 Pink and Chum Salmon

The assessment program for Taku River pink and chum salmon in 2015 primarily involves monitoring catches and effort in Canyon Island fishwheels and live-release gill nets, i.e. the gear used for the Chinook, sockeye and coho mark-recapture programs (Figure 20 and Figure 21). The CPUE from these sites has provided an indication of inter-annual variations in abundance although it is recognized that results can be variable, for example, due to water levels.

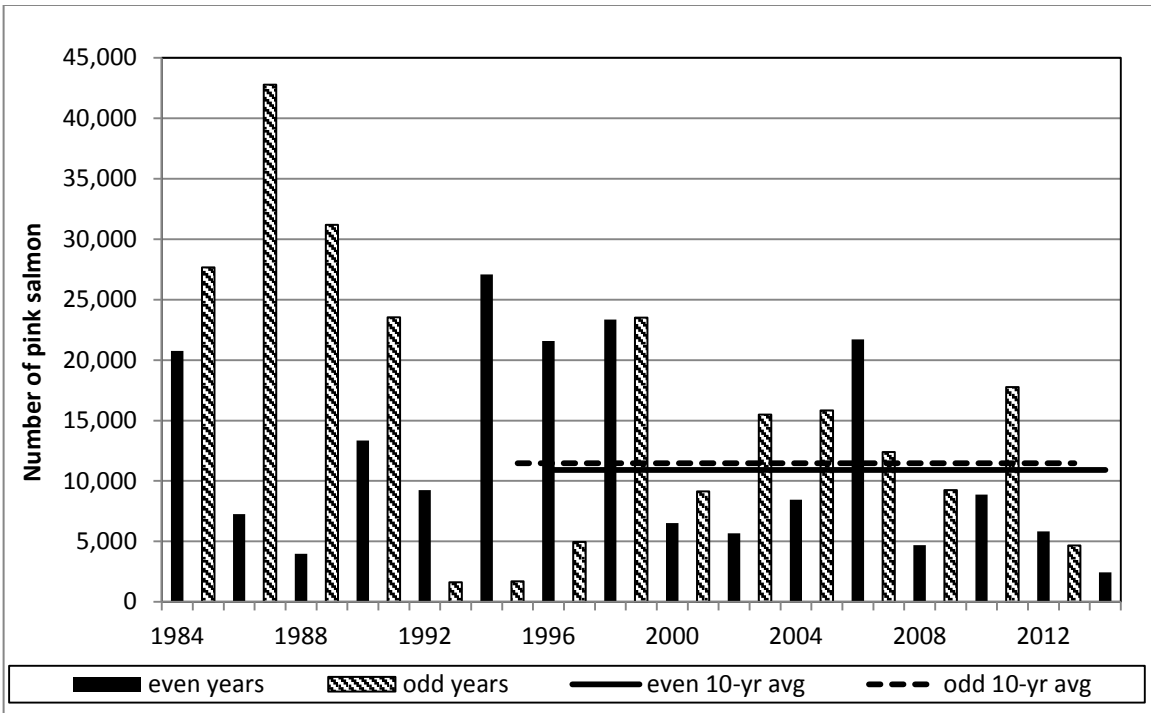


Figure 20. Pink salmon captures in the Canyon Island fishwheels, 1984 - 2014.

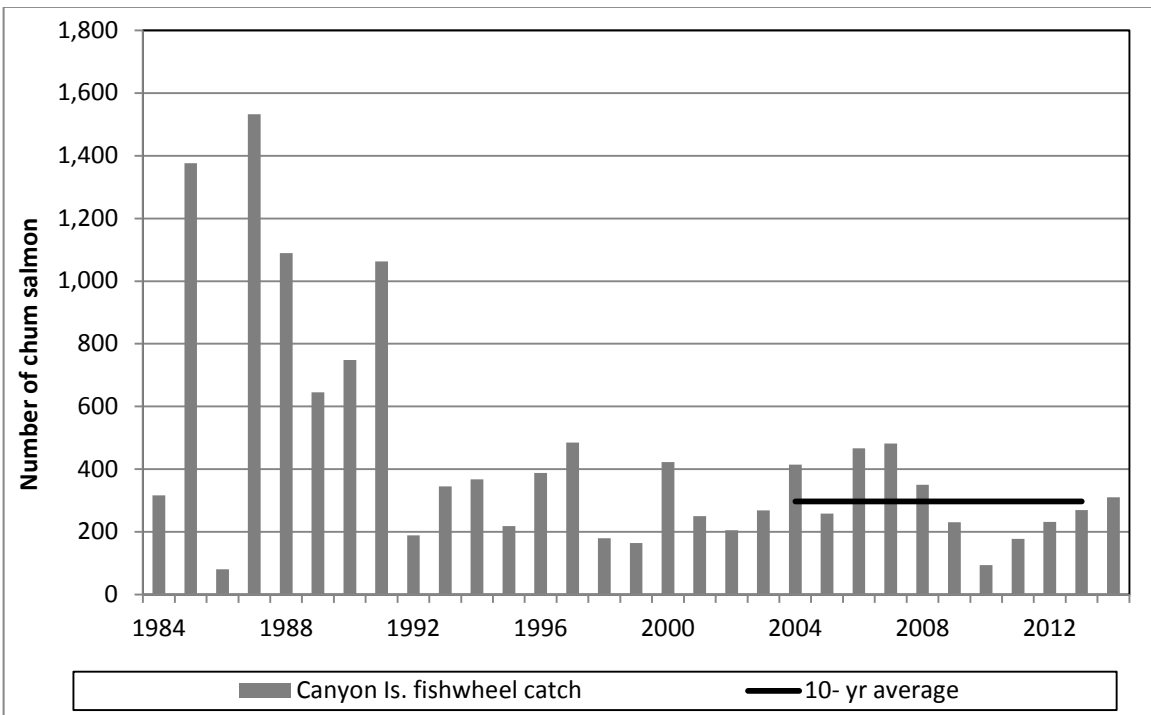


Figure 21. Yearly chum salmon captures in the Canyon Island fishwheels, 1984 - 2014.

9 TAKU RIVER POST SEASON REVIEW

A comprehensive post season review is conducted annually by the Transboundary Technical Committee (TTC) for the Transboundary Rivers Panel (TRP) and the Pacific Salmon Commission (PSC). An initial document with preliminary estimates is prepared for the TRP and PSC in the fall. Once analyses have been finalized, final reports are submitted to the PSC for general distribution. Results of the 2014 TTC review appear in:

Transboundary Technical Committee. In prep. *Preliminary estimates of Transboundary river salmon production, harvest and escapement and review of joint enhancement activities in 2014*. Pacific Salmon Commission.

The following sections summarizing the 2014 season are based substantially on the results of the TTC post season review and any recent updates.

9.1 Conservation

As summarised in Table 30, the sockeye escapement exceeded the escapement goal range (Figure 15), and the coho escapement was well above the minimum goal established for this species (Figure 19). For Chinook salmon, the escapement estimate was well within the target range (Figure 14) and fell just below the point target of 25,500 large Chinook. It is uncertain if the pink and chum spawning escapement goals were met due to limited information available.

Table 30. Escapement goals vs. estimated escapement for Taku River salmon in 2014.

Species	2014 Escapement Goal Ranges		2014 Escapement	Escapement Goals Met?
	from	to		
Sockeye	71,000	80,000	92,463	Exceeded
Coho	70,000		124,171	Exceeded
Chinook (large)	19,000	36,000	23,532	Met
Pink	150,000	250,000	Below Average ^a	Unknown
Chum	50,000	80,000	Below Average ^a	Unknown

^a Based on fishwheel catches.

9.2 First Nation Fishery

There were no restrictions to the TRT First Nation fishing activities in 2014 and the TRT First Nation had first priority to harvest fish for FSC purposes as seen in Table 31. However, BNA allocations were not achieved for Chinook, sockeye and coho salmon.

Table 31. Taku First Nation FSC Harvest vs. Basic Needs Allocation, 2014.

Species	BNA	Actual FSC Harvest	Priority Fishery
Chinook	500	96 large, 16 small	Yes
Sockeye	2,000	219	Yes
Coho	750	104	Yes
Pink	NA	0	NA
Chum	NA	0	NA

9.3 Recreational Fishery

It is assumed that 105 large Chinook salmon were harvested in recreational fisheries in 2014. Catches of the other salmon species were believed to be negligible.

9.4 Commercial Fishery

The 2014 assessment fishery for Chinook salmon opened on May 04, statistical week (SW) 19, with the duration of weekly fishing periods determined by the guideline harvest schedule developed pre-season to spread the reduced target assessment catch of 1,200 large Chinook over the run. By mid-May (end of SW 20), Canadian in-season run size projections had exceeded the 31,900 large Chinook threshold for allowing a directed harvest. Run size estimates continued to exceed this management threshold through SW 21 which prompted a very limited directed Chinook salmon opening for 6 hours commencing noon, May 25 (SW 22). The catch during this opening totaled 201 large Chinook salmon which was below the weekly guideline harvest of 228 fish (a guideline that had been reduced by 30% as a precautionary measure). Run size estimates produced in SW 22 using additional data from the fishery that week, dropped sharply falling below the management threshold. Hence, no further directed fishing for Chinook salmon was allowed and the assessment fishery was reinstated for SW 23. Updated run size projections during the remainder of the Chinook season continued to indicate no directed fishing opportunities.

The targeted sockeye commercial fishing season opened on Sunday, June 15 (SW 25) and continued through mid-August (SW33) when attention thereafter shifted to coho salmon. Commercial fishing activity ceased by September 20 (SW 38) due to poor market and transport conditions.

The commercial harvest of 17,645 sockeye salmon was below the previous decade average of 20,935 fish. The total commercial Chinook salmon harvest was also below average consisting of 1,041 large and 579 small fish compared to averages of 3,549 large and 560 small Chinook salmon. All but 201 of the large fish were taken as bycatch during the sockeye season. The catch of 14,464 coho salmon was well above the previous ten year average and was the second highest since 1979 when the Taku commercial fishery first started.

9.5 PST Harvest Sharing Performance

In 2014, fisheries on the Taku River were managed with the objective of achieving harvest sharing arrangements outlined in the Transboundary Rivers Chapter of the PST. General PST performance is summarized in Table 32 below.

Table 32. Harvest sharing report card for Taku River salmon, 2014. [Note: primary obligations are in in **bold** type].

Sp.	Component	2014 Treaty-based allocation		2014 Actual		Obligations Met?	
		Canada	US	Canada	US	Can.	US
CN	Directed catch	0	0	201	0	no ¹	yes
	BLC- trad'l fisheries	1,500	3,500	1,041	1,213	yes	yes
	BLC – test fishery	1,200 ²	na	1,230	na	yes	na
SO	%TAC (Taku wild)	20%	80%	24.1%-27.6%	47.2%-54.0%	no	yes
	Catch (wild)	12.6k-14.6k	50.2k-57.4k	17,318	33,912	no	yes
	Catch (enh'd)			468	989	na	na
CO	Catch	70,739	na	11,768	na	yes	na

¹Not met in terms of conducting a directed fishery; however, overall Canadian catch was within Treaty allocation.

²Treaty allocation of 1,400 reduced to 1,200 by the Panel for 2014.

Chinook Salmon

The pre-season forecast of 26,800 large Chinook salmon did not meet the threshold for allowing directed Chinook salmon fisheries early in the season. However, the Treaty stipulates that... *“the pre-season forecast will only be used for management purposes until inseason projections become available.”* In-season run size projections in mid-to-late May (33.5k to 34.5k) indicated the run was better than forecast and sufficient to support a directed Canadian harvest, i.e. the inseason predictions exceeded the inseason threshold of 31,900 fish. As a result, Canada allowed one, 6-hour opening to target Chinook salmon in late May, harvesting 201 large fish. However, run predictions unexpectedly plummeted at that time, dropping by approximately 10,000 large fish, and consequently, no further directed Chinook openings were allowed.

The post-season terminal run size estimate was approximately 27,200 large Chinook salmon. At this level of return there is no AC for directed fisheries but the run can support the Treaty-specified Base Level Catches (BLC) of 1,500 for Canada and 3,500 for the U.S. No adjustments in the BLC would have been required since the run size was sufficient to achieve the lower end of the escapement goal range (19,000 fish) and provide for the combined BLC's of the Parties. The Treaty infers that: a) adjustments in the Parties' BLC would have been required if the run size had been less than 25,200 large Chinook salmon (19,000 escapement, plus 5,000 combined BLC, plus the agreed assessment fishery allocation of 1,200 for 2014); and, b) that those adjustments would have been proportionate to each Parties share of the unadjusted combined BLC (excluding the assessment fishery), i.e. so that Canada would continue to receive 0.3 of the combined BLC.

The actual total Canadian catch (excluding the assessment fishery catch) was 1,242 large Chinook salmon, 1,041 of which constituted the BLC (840 large Chinook taken as bycatch during the commercial sockeye fishery, 96 harvested in the FSC fishery, and 105 estimated to have been caught in the recreational fishery). An estimated 1,213 large Taku River Chinook salmon was taken in U.S. fisheries as part of the U.S. base level catch allocation (Table 32). The spawning escapement benefitted from the BLC's which were not fully subscribed. As a result, the escapement of 23,532 large Chinook salmon was well into the target range of 19,000 to 36,000 and close to the S_{MSY} point goal of 25,500 fish.

Sockeye Salmon

The post-season estimate of the terminal run of Taku sockeye salmon was 145,159 fish comprised of 142,771 wild, and 2,388 enhanced sockeye salmon. Based on an escapement goal range of 71,000 to 80,000 wild sockeye, the TAC of wild fish was 62,771 to 71,771 fish. According to the PST harvest sharing arrangements, Canada's share of the TAC of wild sockeye was 20% given the enhanced production fell in the 1-5000 fish range (Table 26). Accordingly, based on the post-season analysis, Canada's allowable catch of wild sockeye for 2014 ranged from 12,554 to 14,354 fish. The actual catch of 17,318 wild sockeye exceeded this range and represented 24.1% to 27.6% of the TAC (Table 32). An additional 468 enhanced sockeye contributed to the overall Canadian catch. The primary reason for the Canadian harvest of wild sockeye being higher than Treaty provisions is attributed to the fact that in-season run projections, which ranged from 161,000 to 197,000 sockeye for the bulk of the sockeye season, were considerably higher than the post-season estimate of 145,159 fish. Management intent was to harvest 20% of the TAC and weekly cumulative catches were close to, or below, weekly guidelines.

The U.S. catch of 33,912 wild sockeye salmon accounted for approximately 47.2%-54.0% of the TAC which was well below their entitlement of 80%. In addition, U.S. fishers caught an estimated 989 enhanced Taku River sockeye salmon (Table 32).

Overall, the sockeye salmon spawning escapement of 92,463 fish was well above the upper end of the 71,000 to 80,000 goal range.

Coho Salmon

The 2014 estimate of coho salmon returning to the Canadian portion of the drainage was 140,739 fish. For 2014, the Panel had agreed that Canada could harvest all coho in excess of the spawning target of 70,000 fish. Theoretically this translated into an allowable harvest of up to 70,739 coho for Canadian fishers. The actual catch of 14,568 coho salmon, which excluded the test fishery catch of 2,000 coho, was well below the allowable harvest. Canada's catch included: 11,768 coho taken in the directed commercial coho fishery; 2,696 coho taken as bycatch during the targeted sockeye commercial fishery; and 104 taken in the First Nation fishery.

The escapement of 124,171 coho salmon was well above the minimum escapement goal of 70,000 established for 2014.

9.6 Taku Sockeye Enhancement Activities in 2014

In January 2015 the Transboundary Rivers Panel reviewed the performance of the 2014 Taku Enhancement Production Plan (TEPP). The 2014 Production Plan included actions that had been conducted in the summer and fall of 2014 (egg takes and extended rearing trials) and a review of the spring 2014 fry releases (from brood year 2013). Through this review, the 2013 TEPP was deemed complete and a discussion of 2014 TEPP activities completed to date was achieved.

The following summarizes TEPP activities undertaken and completed in 2014:

Tatsamenie Lake

Objective:

- 2014 spring release of incubated eggs (unfed fry) from 2013 brood year collections;
- Collection target of 2.0 million sockeye eggs in the fall of 2014 (including approximately 225K to be held as fry for extended rearing).

Results:

- 1.1 million fry were directly released to Tatsamenie Lake by June 6, 2014;
- 188,300 fry were delivered to Tatsamenie Lake and held for extended rearing, and subsequently released in July and August, 2014;
- 184,000 pre-emergent fry from BY2013 were confirmed positive for IHNV virus and destroyed according to protocols;
- 1.5 million sockeye eggs were collected and delivered to the Port Snettisham Hatchery by October 13, 2014;
- Fry will be thermally marked.

King Salmon Lake

Objective:

- To take up to 250,000 eggs and incubate them in Snettisham Hatchery. Fry to be thermal marked and outplanted back into King Salmon Lake.

Results:

- On September 14, 2014 an estimated 200,000 sockeye salmon eggs were collected from 71 females at King Salmon Lake. The estimated survival of these eggs was 89% to the 100 cell stage. This project is supported by the Northern Fund and led by the Taku River Tlingit Fisheries group.

APPENDIX 4. CONSERVATION AND PROTECTION 2015 COMPLIANCE PLAN

1 Compliance Objectives

The objective is to ensure compliance with acts and regulations associated with the management of Pacific salmon.

Compliance in the Salmon fishery is achieved through the application of the *Fisheries Act*, the *Fishery (General) Regulations*, the *Pacific Fishery Regulations* and the *Aboriginal Communal Fishing Licences Regulations* by Fishery Officers. The *Yukon Territory Fishery Regulations*, established pursuant to the *Fisheries Act*, are the main legislative guide in the Yukon. The Conservation and Protection (C&P) program of Fisheries and Oceans Canada is responsible for monitoring and enforcing compliance with the Act and the associated regulations in relation to anadromous fish in both lakes and river systems, and to ensure compliance with habitat provisions in all waters frequented by fish. C&P will continue to partner with other Federal, Provincial and Territorial agencies and departments (e.g. Canadian Food Inspection Agency, Yukon Territorial Government, Department of Environment) in addition to other departmental sectors to deliver services. The program is delivered through a balance of regulatory enforcement and a strategic management approach.

C&P conducts its activities based on:

- Pillar I Activities: Education, Shared Stewardship;
- Pillar II Activities: Monitoring, Control and Surveillance; and
- Pillar III Activities: Management of Major Case/Special Investigations in relation to complex compliance issues that cannot be addressed through Pillar I and Pillar II.

In carrying out activities related to the management of Pacific salmon as outlined in this management plan, C&P will utilise principle-based approaches and practices which are consistent with the National Compliance Framework and the DFO Compliance Model.

2 Regional Compliance Program Delivery

The following offers a general description of compliance activities carried out by C&P in the salmon fisheries:

- During river patrols, Fishery Officers conduct vessel inspections to check location, gear, catch, licences, logbooks and compliance with conditions of licences, e.g. live-release requirements;
- On land, Fishery Officers conduct similar activities;
- During patrols, officers may remove illegal gear, unidentified or unmarked gear;

- C&P staff carries out investigations into reports of fraud and collusion. This may involve interaction with other federal, provincial, territorial and municipal and international government agencies;
- Aerial patrols are conducted in the areas covered by this plan;
- Closed time patrols are balanced with random open time/area patrols;
- Stakeholders are communicated with to improve regulatory compliance;
- Closed area enforcement is conducted in the recreational fishery which includes ensuring compliance with other regulations, e.g. daily limits, non-retention.

3 Consultation

Shared stewardship, education and partnerships are achieved in the salmon fisheries through a renewed emphasis on the importance of C&P communication with the community at large including:

- C&P Management and Supervisors participate in advisory meetings with Resource Management, other DFO branches, First Nations and industry to determine expectations for monitoring, control and surveillance activities;
- Presentations to client/stakeholder groups, including school visits or community programs;
- Informal interaction with all parties involved in the fishery during patrols or in the community to promote conservation;
- Internal DFO consultation with Resource Management and other DFO branches to assess the effectiveness of enforcement activities and to develop recommendations for the upcoming season in relation to setting area priorities.

4 Compliance Strategy

In 2015, specific objectives for the salmon fishery will be to focus compliance management efforts on:

- Maintaining enhanced coverage both on in-river and land based approaches by undertaking vessel, vehicle, and air patrols;
- Curtailing illegal sales through a program designed to improve traceability of catch (improved catch monitoring and plant / storage verification);
- Balancing close time patrols with random open time patrols;
- Working with stakeholders to improve regulatory compliance;
- Enforcing daily limits, non-retention and compliance with closed area restrictions in the recreational fishery;
- Maintaining or increasing efforts to protect Yukon and Transboundary salmon stocks with priority to those stocks of concern such as Yukon Chinook salmon;

- Increasing Fishery Officer efforts to protect other salmon stocks of concern through implementation of area-specific project management enforcement plans;
- Monitoring and auditing catches, effort and offloads/landings of salmon during fisheries to ensure timely and accurate catch and effort reporting.

The management of Pacific salmon and salmon fishery compliance continues to be a high priority for 2015. There are, however, other competing priorities and activities, which must be delivered by C&P for other mandated program activities such as habitat management, and the protection of Species at Risk. Fishery Officers may also be deployed out of area to assist in Regional priorities.

In order to balance multiple program demands, C&P applies a risk-based integrated work planning process at the Regional and Area levels to establish annual operational priorities that address the highest risks to sustainability. This process ensures that resources are allocated in alignment with identified priorities to achieve broad departmental objectives in a way that best serves the interests of Canadians. Resource utilization is dependent on availability of program funding. C&P cannot be effective without the commitment of all salmon fishers and the fishing industry to the conservation of this valuable resource.

APPENDIX 5: FISHING VESSEL SAFETY

Vessel owners and masters have a duty to ensure the safety of their crew and safe operation of the vessel. Adherence to safety regulations and good practices by owners, masters and crew of fishing vessels will help save lives, prevent vessel damage and protect the environment. All fishing vessels must be in a seaworthy condition and maintained as required by Transport Canada (TC), WorkSafeBC, and other applicable agencies. Vessels subject to inspection should ensure that the certificate of inspection is valid for the area of intended operation.

In the federal government, Transport Canada (TC) is responsible for shipping, navigation, and vessel safety regulations and inspections. Emergency response is lead by the Canadian Coast Guard (CCG) and DFO has responsibility for management of the fisheries resources. In B.C., WorkSafeBC also regulates health and safety issues in commercial fishing. This includes requirements to ensure the health and safety of the crew and safe operation of the vessel. DFO (Fisheries and Aquaculture Management (FAM) and CCG) and TC through an MOU have formalized cooperation to establish, maintain and promote a safety culture within the fishing industry.

Before leaving on a voyage, the owner, master or operator must ensure that the fishing vessel is capable of safely making the passage. Critical factors for a safe voyage include the seaworthiness of the vessel, vessel stability, having the required safety equipment in good working order, crew training, and knowledge of current and forecasted weather conditions. As safety requirements and guidelines may change, the vessel owner, crew, and other workers must be aware of the latest legislation, policies and guidelines prior to each trip.

There are many useful tools available for ensuring a safe voyage. These include:

- Education and Training Programs;
- Marine Emergency Duties;
- Fish Safe - Stability Education Course;
- Fish Safe – Safe on the Wheel Course;
- Fish Safe – Safest Catch Program;
- First Aid;
- Radio Operators Course;
- Fishing Masters Certificates;
- Small Vessel Operators Certificate;
- Publications:
 - Transport Canada Publication TP 10038 *Small Fishing Vessel Safety Manual* (can be obtained at Transport Canada Offices from their website at: <http://www.tc.gc.ca/eng/marinesafety/tp-tp10038-menu-548.htm>;
 - Gearing Up for Safety – WorkSafeBC;
 - Safe at Sea DVD Series – Fish Safe;

- Stability Handbook – Safe at Sea and Safest Catch – DVD Series;
- Safest Catch Log Book;
- Safety Quik.

For further information see:

www.tc.gc.ca/eng/marinesafety/menu.htm;

www.fishsafebc.com

1 Important Priorities for Vessel Safety

There are three areas of fishing vessel safety that should be considered a priority. These are: vessel stability, emergency drills, and cold water immersion.

1.1 Fishing Vessel Stability

Vessel stability is paramount for safety. Care must be given to the stowage and securing of all cargo, skiffs, equipment, fuel containers and supplies, and also to correct ballasting. Fish harvesters must be familiar with their vessel's centre of gravity, the effect of liquid free surfaces on stability, loose water or fish on deck, loading and unloading operations and the vessel's freeboard. Know the limitations of your vessel; if you are unsure, contact a reputable naval architect, marine surveyor or the local Transport Canada Marine Safety Office.

Fishing vessel owners are required to develop detailed instructions addressing the limits of stability for each of their vessels. The instructions need to be based on a formal assessment of the vessel by a qualified naval architect and include detailed safe operation documentation kept on board the vessel. Examples of detailed documentation include engine room procedures, maintenance schedules to ensure watertight integrity, and instructions for regular practice of emergency drills.

The *Small Fishing Vessel Inspection Regulations* currently require, with certain exceptions, a full stability assessment for vessels between 15 and 150 gross tons that do not exceed 24.4 metres in length and are used in the herring or capelin fisheries. Once the proposed new *Fishing Vessel Safety Regulations* take effect, more vessels will be required to have a stability booklet.

In 2006, Transport Canada Marine Safety (TC) issued [Ship Safety Bulletin \(SSB\) 04/2006](#) ("Safety of Small Fishing Vessels: Information to Owners/Masters About Stability Booklets"), which provides a standard interpretation of the discretionary power available under Section 48 and the interim requirements prior to the implementation of the proposed *Fishing Vessel Safety Regulations*. The bulletin calls for vessels more than 15 gross tons to have a stability booklet where risk factors that negatively affect stability are present. The bulletin also suggests vessels less than 15 gross tons assess their risk factors. Every fishing vessel above 15 GRT built or converted to herring or capelin after 06 July 1977 and engaged in fishing herring or capelin must have an approved stability

book. Additionally Transport Canada has published a Stability Questionnaire (SSB 04/2006), and Fishing Vessel Modifications Form which enable operators to identify the criteria which will trigger a stability assessment. A stability assessment is achieved by means of an inclining experiment, which has to be conducted by a naval architect. Please contact the nearest Transport Canada office if you need to determine whether your vessel requires one.

In 2008, TC issued [SSB 01/2008](#), which sets out a voluntary record of modifications for the benefit of owners/masters of any fishing vessels. For vessels of more than 15 gross tons, the record of modifications was to be reviewed by TC inspectors during regular inspections and entered on the vessel's inspection record. However, information gathered during the Transportation Safety Board's (TSB) Safety Issues Investigation into the fishing industry showed minimal recording of vessel modifications prior to this date.

The TSB has investigated several fishing vessel accidents since 2002 and found that vessel modifications and loading of traps have been identified as contributing factors in vessel capsizings such as: [M02W0102](#) - *Fritzi-Ann*; [M05W0110](#) - *Morning Sunrise*; [M07M0088](#) - *Big Sisters*; [M08W0189](#) - *Love and Anarchy*; [M09L0074](#) - *Le Marsouin I*; [M10M0014](#) - *Craig and Justin*. In 2012, two prawn fishing vessels in BC, *Jessie G* and *Pacific Siren*, both capsized with prawn traps on deck and are currently under investigation.

Vessel masters are advised to carefully consider stability when transporting gear. Care must be given to the stowage and securing of all traps, cargo, skiffs, equipment, fuel containers, and supplies, and also to correct ballasting. Know the limitations of your vessel; if you are unsure contact a reputable marine surveyor or the local Transport Canada Marine Safety office.

1.2 Emergency Drill Requirements

The Canada Shipping Act 2001 requires that the Authorized Representative of a Canadian Vessel shall develop procedures for the safe operation of the vessel and for dealing with emergencies. The Act also requires that crew and passengers receive safety training. The Marine Personnel Regulations require that all personnel on board required to meet the minimum safe manning levels have received MED (Marine Emergency Duties) training to an A1 or A3 level, depending on the vessel's voyage limits, within 6 months of serving aboard. MED A3 training is 8 hours in duration and is applicable to seafarers on fishing vessels less than 150 GRT that are within 25 miles from shore (NC2). MED A1 training is 19.5 hours duration and is applicable to all other fishing vessels.

MED provides a basic understanding of the hazards associated with the marine environment; the prevention of shipboard incidents; raising and reacting to alarms; fire and abandonment situations; and the skills necessary for survival and rescue.

1.3 Cold Water Immersion

Drowning is the number one cause of death in B.C.'s fishing industry. Cold water is defined as water below 25 degrees Celsius, but the greatest effects occur below 15

degrees. BC waters are usually below 15 degrees. The effects of cold water on the body occur in four stages: cold shock, swimming failure, hypothermia and post-rescue collapse. Know what to do to prevent you or your crew from falling into the water and what to do if that occurs. More information is available in the WorkSafe Bulletin *Cold Water Immersion* (available from the WorkSafeBC website at www.worksafebc.com).

1.4 Other Issues

1.4.1 Weather

Vessel owners and masters are reminded of the importance of paying close attention to current weather trends and forecasts during the voyage. Marine weather information and forecasts can be obtained on VHF channels 21B, Wx1, Wx2, Wx3, or Wx4. Weather information is also available from Environment Canada website at:

http://www.weatheroffice.gc.ca/marine/index_e.html.

1.4.2 Emergency Radio Procedures

Vessel owners and masters should ensure that all crew are able to activate the Search and Rescue (SAR) system early, rather than later, by contacting the Canadian Coast Guard (CCG). It is strongly recommended that all fish harvesters carry a registered 406 MHz Emergency Position Indicating Radio Beacon (EPIRB). These beacons should be registered with the National Search and Rescue secretariat. When activated, an EPIRB transmits a distress call that is picked up or relayed by satellites and transmitted via land earth stations to the Joint Rescue Co-ordination Centre (JRCC), which will task and co-ordinate rescue resources.

Fish harvesters should monitor VHF channel 16 or MF 2182 Khz and make themselves and their crews familiar with other radio frequencies. All crew should know how to make a distress call and should obtain their restricted operator certificate from Industry Canada. However, whenever possible, masters should contact the nearest Canadian Coast Guard (CCG) Marine Communications and Traffic Services (MCTS) station (on VHF channel 16 or MF 2182 kHz) prior to a distress situation developing. Correct radio procedures are important for communications in an emergency. Incorrect or misunderstood communications may hinder a rescue response.

Since August 1, 2003 all commercial vessels greater than 20 metres in length are required to carry a Class D VHF Digital Selective Calling (DSC) radio. A registered DSC VHF radio has the capability to alert other DSC equipped vessels in your immediate area and MCTS that your vessel is in distress. Masters should be aware that they should register their DSC radios with Industry Canada to obtain a Marine Mobile Services Identity (MMSI) number or the automatic distress calling feature of the radio may not work. For further information see the Coast Guard website at: <http://www.ccg-gcc.gc.ca/e0003901>.

A DSC radio that is connected to a GPS unit will also automatically include your vessel's current position in the distress message. More detailed information on MCTS and DSC can be obtained by contacting a local Coast Guard MCTS centre (located in Vancouver, Victoria, Prince Rupert, Comox and Tofino) or from the Coast Guard website: www.pacific.ccg-gcc.gc.ca.

1.4.3 Collision Regulations

Fish harvesters must be knowledgeable of the *Collision Regulations* and the responsibilities between vessels where risk of collision exists. Navigation lights must be kept in good working order and must be displayed from sunset to sunrise and during all times of restricted visibility. To help reduce the potential for collision or close quarters situations which may also result in the loss of fishing gear, fish harvesters are encouraged to monitor the appropriate local Vessel Traffic Services (VTS) VHF channel, when travelling or fishing near shipping lanes or other areas frequented by large commercial vessels. Vessels required to participate in VTS include:

- a) every ship twenty metres or more in length,
- b) every ship engaged in towing or pushing any vessel or object, other than fishing gear,
- c) where the combined length of the ship and any vessel or object towed or pushed by the ship is forty five metres or more in length; or
- d) where the length of the vessel or object being towed or pushed by the ship is twenty metres or more in length.

Exceptions include:

- a) a ship towing or pushing inside a log booming ground,
- b) a pleasure yacht *less than* 30 metres in length, and
- c) a fishing vessel that is *less than* 24 metres in length and not *more than* 150 tons gross.

More detailed information on VTS can be obtained by calling (604) 775-8862 or from the Coast Guard website: <http://www.ccg-gcc.gc.ca/e0003910#VTS>.

1.4.4 Buddy System

Fish harvesters are encouraged to use the buddy system when transiting, and fishing as this allows for the ability to provide mutual aid. An important trip consideration is the use of a sail plan which includes the particulars of the vessel, crew and voyage. The sail plan should be left with a responsible person on shore or filed with the local MCTS. After leaving port the fish harvester should contact the holder of the sail plan daily or as per another schedule. The sail plan should ensure notification to JRCC when communication is not maintained which might indicate your vessel is in distress. Be sure to cancel the sail plan upon completion of the voyage.

2 Fish Safe BC

Fish Safe encourages Vessel masters and crew to take ownership of fishing vessel safety. Through this industry driven and funded program Fish Safe provides fishing relevant tools and programs to assist fishermen in this goal. The Fish Safe Stability Education Course is available to all fishermen who want to improve their understanding of stability and find practical application to their vessel's operation. The Safe on the Wheel Course is designed to equip crewmen with the skills they need to safely navigate during their wheel watch. The Safest Catch Program along with fishermen trained Safety Advisors is

designed to give fishermen the tools they need to create a vessel specific safety management system.

Fish Safe is managed by Gina McKay, Project Coordinator John Krgovich, Program Assistant, Connor Radil, and fishermen Safety Advisors. All activities and program development is directed by the Fish Safe Advisory Committee (membership is open to all interested in improving safety on board). The advisory committee meets quarterly to discuss safety issues and give direction to Fish Safe in the development of education and tools for fish harvesters.

Fish Safe also works closely with WorkSafe BC to improve the fishing injury claims process. For further information, contact:

Gina McKay	Phone: 604-261-9700
Program Manager	Cell: 604-339-3969
Fish Safe	Fax: 604-275-7140
#2, 11771 Horseshoe Way	Email: gina@fishsafebc.com
Richmond, BC V7A 4V4	www.fishsafebc.com

3 WorkSafeBC

Commercial fishing is legislated by the requirements for diving, fishing and other marine operations found in Part 24 of the Occupational Health and Safety Regulation (OHSR). Many general hazard sections of the OHSR also apply. For example, Part 8: Personal Protective Clothing and Equipment addresses issues related to safety headgear, safety foot wear and personal floatation devices. Part 15 addresses issues on rigging, Part 5 addresses issues of exposure to chemical and biological substances, and Part 3 addresses training of young and new workers, first aid, and accident investigation issues. Part 3 of the Workers Compensation Act (WCA) defines the roles and responsibilities of owners, employers, supervisors and workers. The OHSR and the WCA are available from the Provincial Crown Printers or by visiting the WorkSafeBC website: www.worksafebc.com

For further information, contact a regional Occupational Safety Officer.

Shane Neifer - Terrace	(250) 615-6640
Bruce Logan - Lower Mainland	(604) 244-6477
Wayne Tracey - Lower Mainland	(604) 232-1960
Pat Olsen - Courtenay	(250) 334-8777
Mark Lunny - Courtenay	(250) 334-8732

or the Manager of Interest for Fishing, Mike Ross (250) 881-3419.

For information on projects related to commercial fishing contact Ellen Hanson (604) 233-4008 or Toll Free 1-888-621-7233 ext. 4008 or by email: Ellen.Hanson@worksafebc.com.

4 Transportation Safety Board

The Transportation Safety Board (TSB) is not a regulatory board. The TSB is an independent agency that investigates marine, pipeline, railway and aviation transportation occurrences to determine the underlying risks and contributing factors. Its sole aim is the advancement of transportation safety by reporting publicly through Accident Investigation Reports or Marine Safety Information Letters or Advisors. It is not the function of the Board to assign fault or determine civil or criminal liability. Under the TSB Act all information collected during an investigation is completely confidential.

In 2012, the TSB released the results of a three-year investigation into fishing safety in Canada. This report identifies 10 key factors and makes several suggestions to address the problems that persist throughout the industry.

For more information about the TSB, visit our website at www.tsb.gc.ca. For information about the TSB's investigation into fishing safety, or to view a brief video, visit: <http://www.tsb.gc.ca/eng/medias-media/videos/marine/m09z0001/index.asp>.

To view a brief video about some of the issues on the TSB's recent safety Watchlist, visit: <http://www.tsb.gc.ca/eng/medias-media/photos/index.asp>.

Reporting an Occurrence - [TSB 1808 Form](#)

After a reportable occurrence happens you can fill out the TSB 1808 Form or call the TSB at the contact information below.

Glenn Budden, Investigator, Marine - Fishing Vessels
Transportation Safety Board of Canada
4 - 3071 No. 5 Road
Richmond, BC, V6X 2T4
Telephone: 604-666-2712
Cell: 604-619-6090
Email: glenn.budden@tsb.gc.ca

APPENDIX 5: GLOSSARY

Note: a more comprehensive glossary with relevant terminology and additional information is available on the Salmon Homepage at: <http://www.pac.dfo-mpo.gc.ca/fm-gp/species-especies/salmon-saumon/gloss-eng.htm>

Aboriginal Traditional Knowledge (ATK) or Traditional Ecological Knowledge (TEK): Knowledge that is held by, and unique to Aboriginal peoples. It is a living body of knowledge that is cumulative and dynamic and adapted over time to reflect changes in the social, economic, environmental, spiritual and political spheres of the Aboriginal knowledge holders. It often includes knowledge about the land and its resources, spiritual beliefs, language, mythology, culture, laws, customs and medicines.

Abundance: Number of individuals in a stock or a population.

Acidification: As it relates to oceans, it is a growing threat to marine ecosystems due to the increasing acidity of the oceans caused by the uptake of carbon dioxide (CO₂) from the atmosphere. Increasing atmospheric CO₂ is linked to human-derived activities such as the burning of fossil fuels and is a major factor contributing to climate change.

Age Composition: Proportion of individuals of different ages in a stock or in the catches.

Anadromous: An anadromous species, such as salmon, which spends most of its life at sea but returns to fresh water to spawn (often to the spawning area it originated from).

By-catch: The unintentional catch of one species when the target is another.

Catch per Unit Effort (CPUE): The amount caught for a given standardized fishing effort. For example: the number of sockeye caught per fisher per day; tons of shrimp per tow; kilograms of fish per hundred longline hooks.

Communal Commercial Licence: Licence issued to Aboriginal organizations pursuant to the *Aboriginal Communal Fishing Licences Regulations* for participation in the general commercial fishery.

Committee on the Status of Endangered Wildlife in Canada (COSEWIC): Committee of experts that assess and designate which wild species are in some danger of disappearing from Canada.

Discards: Portion of a catch thrown back into the water after they are caught in fishing gear.

Ecosystem-Based Management: Taking into account of species interactions and the interdependencies between species and their habitats when making resource management decisions.

Escapement: Reference to salmon - the number of fish escaping the fishery and reaching the spawning grounds, or other defined location, e.g. border escapement.

Fishing Effort: Quantity of effort using a given fishing gear over a given period of time.

Fishing Mortality: Death caused by fishing, often symbolized in mathematical formulae by the symbol “F”.

Fixed Gear: A type of fishing gear that is set in a stationary position. These include traps, weirs, set gillnets, longlines and handlines.

Food, Social and Ceremonial (FSC): A fishery conducted by Aboriginal groups for food, social and ceremonial purposes.

Gillnet: Fishing gear: netting with weights along the bottom and floats along the top used to catch fish. Gillnets can be set at different depths and may/may not be anchored (e.g. as in set gillnets/drift gillnet).

Incidental Catch: The inadvertent or non-targeted harvest of a specified component within a particular species, e.g. stocks of concern having special management restrictions.

Maximum Sustainable Yield (MSY): Largest average catch that can continuously be taken from a stock.

Mesh Size: Size of the mesh of a net. Different fisheries have different minimum mesh size regulation.

Natural Mortality: Mortality due to natural causes, often symbolized in mathematical formulae by the symbol “M”.

Otolith: Structure of the inner ear of fish, made of calcium carbonate. Also called "ear bone" or "ear stone". Otoliths are used to determine the age of fish: annual rings can be observed and counted. Daily increments are visible as well on larval otoliths.

Population: Group of individuals of the same species, forming a breeding unit, and sharing a habitat.

Precautionary Approach: Set of agreed cost-effective measures and actions, including future courses of action, which ensures prudent foresight, reduces or avoids risk to the resource, the environment, and the people, to the extent possible, taking explicitly into account existing uncertainties and the potential consequences of being wrong.

Quota: Portion of the total allowable catch that a unit such as vessel class, country, etc. is permitted to take from a stock in a given period of time.

RCA: Rockfish Conservation Area, which is an area that is closed for the protection of various inshore rockfish species to fishing activities that negatively impact rockfish.

Recruitment: Amount of individuals produced from a single brood year becoming part of the exploitable stock that can be caught in a fishery.

Research Survey: Surveys allowing scientists to obtain information on the abundance and distribution of various species and/or collect oceanographic data. E.g.: bottom trawl survey, plankton survey, hydroacoustic survey, etc.

Species at Risk Act (SARA): The Act is a federal government commitment to prevent wildlife species from becoming extinct and secure the necessary actions for their recovery. It provides the legal protection of wildlife species and the conservation of their biological diversity.

Scale patterns analysis (SPA): spawning streams will create varying, unique scale patterns in salmon that allow specific point of origin assessments to be made.

Spawner: Sexually mature individual.

Spawning Stock: Sexually mature individuals in a stock.

Stock: Describes a population of individuals of one species found in a particular area, and is used as a unit for fisheries management. Ex: NAFO area 4R herring.

Stock Assessment: Scientific evaluation of the status of a species belonging to a same stock within a particular area in a given time period.

Sulk rate: Refers to the time it takes a fish to resume its upstream migration after being tagged and/or otherwise handled. In Transboundary mark-recapture (M-R) programs it is determined by the time it takes tagged fish to reach the recapture location after the tagging event. The sulk rate is used to adjust the number of tags available for recapture and hence has a bearing on the weekly population estimates based on M-R data.

Total Allowable Catch (TAC): The amount of catch that may be taken from a stock without compromising achievement of spawning goals/objectives.

Traditional Ecological Knowledge (TEK): A cumulative body of knowledge and beliefs handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment.

Trawl: Fishing gear: cone-shaped net towed in the water by a boat called a "trawler". Bottom trawls are towed along the ocean floor to catch species such as groundfish. Mid-water trawls are towed within the water column.

Validation: The verification, by an observer, of the amount and/or composition of fish landed.

Year-class: Individuals of a same stock born in a particular year. Also called "cohort".

APPENDIX 6: ACRONYMS

AABM: Aggregate Abundance Based Management
AAROM: Aboriginal Aquatic Resources and Oceans Management
ABM: Abundance-Based Management
AC: Allowable Catch
ACCASP: Aquatic Climate Change Adaptation Services Program
ADFG: Alaska Department of Fish and Game.
AFS: Aboriginal Fisheries Strategy.
AI: Abundance Indices
AMAC: Aquaculture Management Advisory Committee
ATK: Aboriginal Traditional Knowledge
ATP: Allocation Transfer Program
BLC: Base-Level Catch
BNA: Basic Needs Allocations
BTR: Base Terminal Run
BWW: Be Whale Wise
CAFN: Champagne and Aishihik First Nation
C&P: Conservation and Protection Unit of DFO
CEDP: Community Economic Development Program
CGSB: Canadian General Standards Board
CN: Chinook salmon
CO: Coho salmon
COSEWIC: Committee On the Status of Endangered Wildlife In Canada
CPUE: Catch per unit effort.
CSAB CMWG: Commercial Salmon Advisory Board Catch Monitoring Working Group
CSAP: Centre for Science Advice Pacific
CSAS: Canadian Science Advisory Secretariat
CTC: Chinook Technical Committee
CU: Conservation Unit
CWT: Coded-Wire Tag
CYFN: Council of Yukon First Nations
DFO: Department of Fisheries and Oceans (Fisheries and Oceans Canada).
DPI: Dedicated Public Involvement
EBM: Ecosystem-Based Management
EC: Environment Canada
ESSR: Excess Salmon to Spawning Requirements.
FN: First Nation
FNFC: First Nation Fishery Council
FSC: Food, Social and Ceremonial
GSI: Genetic Stock Identification
IFMP: Integrated Fisheries Management Plan
IHNV: Infectious Hematopoietic Necrosis Virus
IHPC: Integrated Harvest Planning Committee
IMAP: Integrated Management of Aquaculture Plan
IPSO: International Programme on the State of the Ocean
ISBM: Individual Stock Based Management
MSY: Maximum Sustained Yield
MPA: Marine Protected Area
NBC: Northern British Columbia
NGO: Non-Government Organization
NMCA: National Marine Conservation Area
NOAA: National Oceanic and Atmospheric Administration
NOLS: National Online Licencing System
NPAFC: North Pacific Anadromous Fish Commission
NWA: National Wildlife Area
OHEB: Oceans, Habitat and Enhancement Branch.

ORR: Observe, Record, Report program of DFO's Conservation and Protection unit
PAR: Pacific Aquaculture Regulations
PFMA: Pacific Fishery Management Area
PICFI: Pacific Integrated Commercial Fisheries Initiative
PIP: Public Involvement Program
PNCIMA: Pacific North Coast Integrated Management Area
PP: British Columbia Provincial Park
PSARC: Pacific Scientific Advice Review Committee.
PSC: Pacific Salmon Commission
RPR: Regional Peer Review
RRC: Renewable Resource Council
PST: Pacific Salmon Treaty
SACC: Stock Assessment Coordinating Committee
SARA: Species At Risk Act
SCC: Salmon Coordinating Committee
SCMM: Stikine Chinook Management Model
SEAK: Southeast Alaska
SEP: Salmonid Enhancement Program
SEPP: Stikine Enhancement Production Plan
SFAB: Sport Fish Advisory Board
SFF: Sustainable Fisheries Framework
SFI: Sport Fishing Institute
SFMM: Stikine Forecast Management Model
SIRE: Salmon In Regional Ecosystems
SK-B MPA: SGaan Kinghlas-Bowie Seamount Marine Protected Area
SMM: Stikine Sockeye Management Model.
S_{MSY}: Number of spawners required to produce maximum sustained yield
SO: Sockeye salmon
SPA: Scale patterns analysis
SRSMAC: Stikine River Salmon Management Advisory Committee
SVOP: Small Vessel Operator Proficiency
SW: Statistical week
TAC: Total Allowable Catch
TEK: Traditional Ecological Knowledge
TEPP: Taku Enhancement Production Plan
TIFN: Tahltan and Iskut First Nation
TRP: Transboundary Rivers Panel of the Pacific Salmon Commission
TRSMAC: Taku River Salmon Management Advisory Committee
TRTFN: Taku River Tlingit First Nation.
TTC: Transboundary Technical Committee.
UFA: Umbrella Final Agreement
USFWS: United States Fish and Wildlife Service.
WCVI: West Coast of Vancouver Island
WSP: Wild Salmon Policy
YSSC: Yukon Salmon Sub-Committee
YTG: Yukon Territorial Government