

Submitted to the *Marine Stewardship Council* on June 1, 2009. The Manuscript Report will be available through DFO's library website at <http://inter01.dfo-mpo.gc.ca/waves2/index.html>

Canadian Manuscript Report of
Fisheries and Aquatic Sciences #####

2009

MANAGEMENT SUMMARY
FOR
BC PINK & CHUM SALMON FISHERIES

by

G. Pestal¹, B. Spilsted, and D. Dobson

Fisheries & Aquaculture Management Branch
Department of Fisheries and Oceans
200 - 401 Burrard St
Vancouver, BC
V6C 3S4

¹SOLV Consulting Ltd., Vancouver, BC V6H 4B9



Fisheries and Oceans
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Canada The wordmark for Canada, with a small red maple leaf icon above the letter 'a'.

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Cat. No. Fs 97-4/2855E-PDFISSN 1488-5387

Correct citation for this publication:

Pestal, G, B. Spilsted, and D. Dobson. 2009. Management Summary for BC Pink & Chum Fisheries. Can. Man. Rep. Fish. Aquat. Sci. ####: vii + 185p.

Table of Contents

Abstract.....	vi
Résumé	vi
Preface.....	vii
1 Management Context	1
1.1 Legal Context	1
1.1.1 Overview.....	1
1.1.2 Federal Legislation.....	1
1.1.3 Provincial Legislation	8
1.1.4 International Agreements	11
1.1.5 First Nations' Access to Fishing Opportunities.....	14
1.2 Policy Context	19
1.2.1 Overview.....	19
1.2.2 National Policy Initiatives.....	20
1.2.3 Policy for the Management of Fish Habitat	25
1.2.4 Aboriginal Fisheries Strategy.....	26
1.2.5 Pacific Salmon Revitalization Plan (a.k.a. Mifflin Plan).....	28
1.2.6 Pacific Fisheries Adjustment and Restructuring (PFAR).....	28
1.2.7 New Directions.....	29
1.2.8 Watershed Years: 2004/2005	32
1.2.9 The Changing Structure of Pacific Fisheries.....	34
1.3 Summary: Social and Economic Elements of the Management Context.....	38
1.3.1 Social and Economic Considerations in Current Policy Initiatives.....	38
1.3.2 Allocation.....	39
2 Management of BC Pink & Chum Fisheries.....	43
2.1 Overview	43
2.2 Background	43
2.2.1 Management Adapted to Species Characteristics.....	43
2.2.2 Biological Units	44
2.2.3 Fisheries Targeting BC Pink and Chum Salmon.....	46
2.3 Goals and Targets	51
2.3.1 Inventory of Goals and Targets	51
2.3.2 Long-term Objectives.....	51
2.3.3 Reference Points.....	53
2.3.4 Performance Measures	54
2.4 Monitoring and Assessment	55
2.4.1 Stock Assessment Program	55
2.4.2 Monitoring and Assessment of BC Pink and Chum Salmon.....	56
2.4.3 Data Management	61

2.5	Planning and Implementation.....	62
2.5.1	Regional Approach to Salmon Harvest	62
2.5.2	Decision Guidelines	63
2.5.3	Access Controls.....	64
2.5.4	Conservation and Recovery Measures in BC Pink & Chum fisheries	69
2.6	Compliance Mechanisms	74
2.6.1	Incentives and the National Compliance Framework.....	74
2.6.2	Comprehensive Compliance Management.....	75
2.7	Summary: DFO Toolkit for Assessment, Monitoring, and Enforcement	79
3	Conservation of Wild Pacific Salmon and Their Ecosystem	80
3.1	Overview	80
3.2	Elements of DFO’s Conservation Strategy	81
3.2.1	Recovery Planning	81
3.2.2	Wild Salmon Policy	85
3.2.3	Research	90
3.2.4	Selective Fishing and Impact Reduction	96
3.2.5	Salmon Enhancement and Restoration.....	102
3.3	Integrated Management of Marine and Coastal Ecosystems	107
3.3.1	Regional Approach to Integrated Management.....	107
3.3.2	Initiatives and Projects	115
3.3.3	Implications for BC pink and chum fisheries.....	119
3.4	Inventory of Major Conservation & Recovery Efforts	120
3.4.1	Summary of Conservation Concerns.....	120
3.4.2	Conservation Efforts for Pacific Salmonids	123
3.4.3	Other Conservation Efforts	132
4	Collaboration, Advisory Processes, and Consultation	139
4.1	Overview	139
4.2	Departmental Strategy for Enabling Public Participation	139
4.2.1	Incorporating Public Participation into the Planning Process	139
4.2.2	Supporting Public Participation.....	141
4.3	Types of Participatory Processes.....	145
4.3.1	Network of Participatory Processes	145
4.3.2	Processes with Broad Public Participation.....	146
4.3.3	Multi-interest Processes	147
4.3.4	Focused Stakeholder Processes	149
4.3.5	Review Processes	151
	Appendices.....	155
	Appendix 1: Inventory of Salmon Conservation and Recovery Measures – North Coast and Central Coast.....	156
	Appendix 2: Salmon fishery closures in Johnstone Strait.....	159

Appendix 3: MSC Indicators for Pink & Chum Certification..... 162
Evaluation Hierarchy: Principles, Criteria, Sub-Criteria, Indicators, and Scoring Guideposts 162
Principle 1: Target Stocks and their status 164
Principle 2: Ecosystem..... 167
Principle 3: Management System 170

ABSTRACT

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This report summarizes the management context for BC pink and chum salmon fisheries. It describes the most relevant laws and policies, the structure of the management system, coast-wide conservation and recovery initiatives, as well as processes for collaboration and public consultation.

RÉSUMÉ

To be included

PREFACE

MSC Ecocertification

Ecocertification is intended to link market incentives to the sustainability of fisheries, and a rapidly growing body of academic work is exploring the theoretical aspects of certification. However, substantial challenges remain in the practical implementation of certification programs, particularly in terms of transparency and consistency across different fisheries, species, and regions.

The Marine Stewardship Council (MSC) has developed a comprehensive and thoroughly documented certification process, with sufficient flexibility in the details to allow for adaptation to different settings. A standardized set of assessment criteria was recently released (www.msc.org).

This Document

The sustainability indicators considered in the MSC evaluation process are closely connected. This is particularly pronounced for indicators relating to regional policies, the structure of the management system, and large-scale dynamics. The intent of this document is to compile a comprehensive summary of generally applicable material and to include extensive examples that illustrate the big-picture linkages among different elements of the management system. For example, specific management measures in a local fishery need to be evaluated in the context of all fisheries harvesting the target stocks, coast-wide conservation and recovery measures, and emerging policy initiatives such as the changing structure of Pacific fisheries.

More detailed information about particular stocks or fisheries is included in a set of companion documents called *Certification Unit Profiles (CUP)*. These profiles are available for the following Certification Units under the MSC evaluation process: North Coast and Central Coast chum salmon, West Coast Vancouver Island chum salmon, Inner South Coast chum salmon (excluding Fraser chum), Fraser chum salmon, North Coast and Central Coast pink salmon, Inner South Coast pink salmon (excluding Fraser pink), and Fraser pink salmon. Each CUP includes information about stock status, management reference points, management approach for fisheries in the area, assessment programs, and specific conservation measures.

[Appendix 3](#) lists the MSC indicators and outlines relevant sections in this series of reports

This management summary captures the official DFO position expressed in published materials, through staff interviews, and in written staff contributions. Almost all of the information contained in this document has been previously distributed in some form to the public by DFO.

Some of the text in this management summary is directly carried over from the earlier BC sockeye submissions, the departmental response to the draft assessment of BC sockeye, the 2007 and 2008 Integrated Fisheries Management Plan, the Wild Salmon Policy, DFO websites, and DFO draft reports. Any material copied verbatim from sources other than these is put into “quotes”. Where possible, cited material is followed by a web link to the source or a catalogue number for DFO’s online library WAVES, which can be accessed at <http://inter01.dfo-mpo.gc.ca/waves2/index.html>.

Acknowledgments

Preparation of this report was mainly funded by the *Canadian Pacific Sustainable Fisheries Society* in support of the MSC Certification of BC Pink & Chum Fisheries. *Fisheries and Oceans Canada* contributed most of the information as well as a substantial amount of staff time, and supplementary funding. Overall, almost a hundred DFO staff contributed data, text, clarifications, and revisions to the full series of documents.

1 MANAGEMENT CONTEXT

1.1 Legal Context

1.1.1 Overview

This section describes four major elements of the legal context for the management of BC pink and chum salmon:

- *Federal Legislation* introduces the three keystones of the legal context (*Fisheries Act*, *Oceans Act*, and *Species at Risk Act*), briefly describes other pertinent acts, and outlines the federal regulations that implement the provisions of these acts.
- *Provincial Legislation* introduces BC-specific legal requirements for environmental management and the harvest of fish (e.g. processing).
- *International Agreements* outlines the implications of three UN conventions (Law of the Sea, Biological Diversity, Conservation of Anadromous Stocks in the North Pacific Ocean) and summarizes requirements under the Pacific Salmon Treaty.
- *First Nations' Access to Fishing Opportunities* outlines the legal and practical developments related to aboriginal peoples' fisheries in the Pacific Region. The section briefly covers aboriginal and treaty rights, their evolving interpretation, major court decisions, types of aboriginal fisheries, the treaty process, the new *Integrated Aboriginal Policy Framework*. Specific examples from BC pink and chum fisheries.

1.1.2 Federal Legislation

1.1.2.1 Acts, Orders, and Regulations

The management setting for Pacific salmon fisheries includes many legal instruments. A listing of the most pertinent federal acts, orders, and regulations, including links to their full text, is available at http://www.dfo-mpo.gc.ca/communic/policy/dnload_e.htm.

Two keystones of federal legislation for fisheries management are summarized in *A New Direction for Canada's Pacific Salmon Fisheries* (1998):

- The *Fisheries Act* provides the legislative authority for the management and regulation of the fishery. It assigns powers to regulate access, control conditions of harvesting, and enforce regulations. It is also one of the strongest environmental laws in Canada. The *Fisheries Act* prohibits the harmful alteration, destruction or disruption of fish or fish habitat unless specifically authorized.
- The *Canada Oceans Act* is founded on the principles of sustainable development and integrated resource management. By establishing the *Canada Oceans Act*, the federal government has reaffirmed its commitment to oceans and marine resource management. The act provides a comprehensive legal framework to foster stewardship of ocean resources. Further, it sets the stage for the development and implementation of an Oceans Management Strategy.

The third keystone element, the *Species at Risk Act*, became law in 2003 and details the legal protection for species at risk, as well as the process for designating species as 'at risk'.

1.1.2.2 Fisheries Act

The *Fisheries Act* is the primary legislative basis for fisheries management in Canada. It authorizes the Minister of Fisheries and Oceans to make decisions about the conservation and management of fisheries resources and habitat, to establish and enforce standards for conservation, and to determine access to and allocation of the resource.

The full text of the *Fisheries Act* is available at <http://laws.justice.gc.ca/en/F-14/index.html>.

The *Fisheries Act* establishes the legal authority for developing, implementing and enforcing fisheries regulations. Compliance and enforcement in BC pink and chum fisheries are described in Chapter [2: Management of BC Pink & Chum](#).

The *Fisheries Act* also establishes the legal authority for regulating activities that could affect fish or their environment, with explicit provisions to protect fish habitats, provide upstream and downstream migration, guard against the destruction of fish other than by fishing, and prohibit the deposit of a deleterious substance in water frequented by fish:

- An overview is available in *Canada's Fisheries Act : the habitat protection and pollution prevention provisions of the Fisheries Act* (Waves CATNO 272733).
- A guide explaining the practical implications for a wide range of activities is *Complying with the Fisheries Act: Fish habitat protection & pollution prevention law*, available on-line at <http://www.dfo-mpo.gc.ca/Library/272909.pdf>.

Implementation and enforcement of those provisions of the *Fisheries Act* which relate to oceans and habitat are described in Section [2.6: Compliance Mechanisms](#), which also establishes the link to the enforcement of the *Oceans Act*. DFO seeks partnerships with other levels of government, as well as stakeholders, to implement the requirements of the *Fisheries Act*. Specific examples are the *BC-DFO Partnering Agreement for the implementation of the Oceans Strategy* (Section [3.3.1.2](#)) and the *Canada - British Columbia Fish Habitat Management Agreement* (Section [3.3.1.3](#)).

The *Fisheries Act* has far reaching implications and a substantial amount of case law has accumulated, clarifying its interpretation and implementation:

- *A practical guide to the Fisheries Act and to the Coastal Fisheries Protection Act* summarizes the provisions of the acts, provides detailed definitions, and includes a review of case law up to 1995. This guide is available on-line at <http://www.dfo-mpo.gc.ca/Library/282791.pdf>.
- *The Fisheries Act and Local Governments: Court Judgments (1984 - 1994) in the Pacific Region* outlines the enforcement policy in the context of other federal and provincial acts, and summarizes court judgments in cases where local jurisdictions were charged. The report is available at <http://www.dfo-mpo.gc.ca/Library/222013.pdf>
- These summaries illustrate the enforcement of *Fisheries Act* provisions and establish that violations are being prosecuted. However, the pertinent case law has evolved substantially since 1995, and more recent summaries will be referenced here once they become available.

The *Fisheries Act* also provides for the protection of marine mammals and licensing of marine mammal harvests through the *Marine Mammal Regulations*, as described in Section [1.1.2.8: Federal Regulations](#).

1.1.2.3 Oceans Act

In 1997, the *Oceans Act* extended the Department's role in managing the use of marine resources and habitats. It called for the development of a national oceans management strategy guided by the principles of sustainable development, integrated management and an ecosystem perspective. Canada's *Oceans Strategy* was released in 2002 and defines an oceans-centred planning framework that combines these principles

The full text of the *Oceans Act* is available at <http://laws.justice.gc.ca/en/O-2.4/>.

Subsequent developments are documented in the following:

- In 2001, the Canadian Senate Standing Committee on Fisheries and Oceans (SCOFO) provided a detailed review of the *Oceans Act* and its implementation. The report with 16 recommendations is available on-line at <http://cmte.parl.gc.ca/cmte/CommitteePublication.aspx?COM=216&Lang=1&SourceId=213610>.
- The government's response to SCOFO, including a progress update from 2001 is available on-line at <http://www.dfo-mpo.gc.ca/reports-rapports/oceans/gr-oceans-eng.htm>.
- The Commissioner of the Environment and Sustainable Development (CESD) conducted a detailed review of Canada's Oceans Management Strategy in 2005. The full report is available at http://www.oag-bvg.gc.ca/internet/English/parl_cesd_200509_01_e_14948.html.
- The Government's response to the CESD report is available at http://www.oag-bvg.gc.ca/internet/English/att_oag-bvg_e_14097_e_14097.html.

The Oceans, Habitat and Enhancement Branch (OHEB) co-ordinates and facilitates the DFO Pacific Region's fulfilment of the provisions put forth in *Canada's Oceans Strategy*. OHEB assigns staff to coordinate the Region's implementation of *Canada's Oceans Strategy* which is the policy flowing from Canada's *Oceans Act*. National in scope, *Canada's Oceans Strategy* sets out the policy direction for the management of estuarine coastal and marine ecosystems in Canada. More information on *Canada's Oceans Strategy* is available at http://www.dfo-mpo.gc.ca/oceans-habitat/oceans/ri-rs/cos-soc/page02_e.asp. Implementation covers three interconnected portfolios: Integrated Coastal Management, Marine Protected Areas, and Marine Environmental Quality. Specific initiatives are summarized in Section [3.3: Integrated Management of Marine and Coastal Ecosystems](#).

The *Oceans Act* and *Fisheries Act* complement each other, but there are areas of overlap. For example, section 35 (1) of the *Fisheries Act* states: "No person shall carry on any work or undertaking that results in the harmful alteration, disruption or destruction of fish habitat." This overlaps conceptually with *Oceans Act* provisions for protecting marine habitats. However, in practice section 35 of the *Fisheries Act* is applied to localized works, usually streamside or at the shore line, that could impact fish habitat. The *Oceans Act* deals more with the integrated management of marine resources (Section [3.3](#)) and large-scale conservation measures such as Marine Protected Areas (Section [3.3.2.2](#)).

Canada's *Oceans Act* is enabling legislation that provides Canada the authority to engage in Integrated Management, establish Marine Protected Areas (MPA) and improve Canada's management of the marine environment. While the *Oceans Act* does contain enforcement provisions, notably for MPAs, it is relatively new legislation and there have been no recorded enforcement actions for an *Oceans Act* violation in the Pacific Region to date.

Implementation and enforcement of the *Oceans Act* in BC pink and chum management is described in Section [2.6: Compliance Mechanisms](#).

1.1.2.4 Species at Risk Act

The *Species at Risk Act* (SARA) is designed to meet one of Canada's key commitments under the UN Convention on Biological Diversity (Section [1.1.4.2](#)). SARA identifies 3 fundamental goals:

- Securing the recovery of species listed as extirpated, endangered, or threatened.
- Preventing species listed as extirpated, endangered, or threatened from becoming extinct.
- Managing species listed as special concern such that they don't become more seriously at risk.

SARA includes prohibitions against killing, harming, harassing, capturing, or taking species that are endangered or threatened, as well as against possessing, collecting, buying, selling or trading, and against destroying their residences or critical habitats. SARA also manages species of special concern, which may become threatened or endangered because of a combination of biological characteristics and identified threats. SARA identifies ways in which governments, organizations, and individuals can work together to preserve species at risk and establishes penalties for failure to obey the law.

As one of three federal departments charged with SARA's implementation, DFO is responsible for protecting aquatic species at risk and their habitat. This responsibility includes the legal requirements to enforce automatic prohibitions, develop recovery strategies, management plans, and action plans within specified timelines, identify and protect the critical habitat for endangered or threatened species, and conduct consultations within specified timelines.

The full text of the *Species at Risk Act* is available at <http://laws.justice.gc.ca/en/s-15.3/>, and a guide explaining the provisions of the act is available at <http://www.ec.gc.ca/publications/index.cfm?screen=PubDetail&PubID=526&lang=e>.

The act designates the *Committee on the Status of Endangered Wildlife in Canada* (COSEWIC), an independent committee of wildlife experts and scientists, to identify at-risk species and assess their conservation status (Section [4.3.5.2](#)). COSEWIC then issues a report to the government, and the federal Cabinet decides whether those species get legal protection under the act. These decisions are based on COSEWIC's recommendations and consultations with affected stakeholders and other groups.

Once a species is listed as endangered or threatened under the *Species at Risk Act*, it becomes illegal to kill, harass or capture it. In addition, it becomes illegal to possess, collect, buy, sell or trade the species. Once identified, residences and critical habitats are also protected from destruction. The act also requires that recovery strategies and action plans be developed for all endangered and threatened species and management plans be developed for all species of special concern.

Under certain circumstances, the Minister can issue a permit under Section 73 to allow for "incidental harm" to a listed species, including bycatch of a listed species by another fishery, scientific research, or activities beneficial to the species. These S.73 SARA permits are not automatically granted. Rather, an applicant must have considered other reasonable alternatives, have taken all feasible measures to minimize the impact, and must substantiate that any harm caused by the activity will not jeopardize the species' survival or recovery. Whenever permits are issued, explanations are to be published in the SARA Public Registry. An archive of SARA permits back to 2004 is available at http://www.sararegistry.gc.ca/sar/permit/permits_e.cfm.

Section [3.2.1](#) describes the details of the recovery planning process under SARA, including assessments of recovery potential and allowable harm. Section [3.4](#) summarizes current recovery efforts for marine species in BC.

Public communication and involvement are an important part of implementing the *Species at Risk Act*, and the responsible departments have generated a massive amount of publicly available information.

Public consultation materials:

- *Current consultations* (www-comm.pac.dfo-mpo.gc.ca/pages/consultations/sara/default_e.htm)
- *2007 Legal Listing* consultations for aquatic species, including detailed workbooks for each species (http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/Consultation2007/sara_e.htm)
- *2006 Legal Listing* consultations for aquatic species, including detailed workbooks for each species (http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/Consultation2006/sara_e.htm).

Information about the act:

- *Protecting and Recovering Species at Risk in Canada* (www.sararegistry.gc.ca/involved/you/folder_e.cfm)
- *Species at Risk Act: A Guide* (<http://www.ec.gc.ca/publications/index.cfm?screen=PubDetail&PubID=526&lang=e>)

Information about implementation of the act:

- Information about Canadian species designated ‘at risk’, on-going consultations for listing species under the act, and updates on recovery initiatives are available through http://www.dfo-mpo.gc.ca/species-especies/home_e.asp and http://www.sararegistry.gc.ca/default_e.cfm.
- Species assessment process and criteria (www.cosewic.gc.ca/eng/sct0/assessment_process_e.cfm#tbl2)
- Listing process (http://www.sararegistry.gc.ca/sar/listing/listing_e.cfm)
- Registry of listed species (http://www.sararegistry.gc.ca/species/default_e.cfm)
- Inventory of aquatic listed species (<http://www.dfo-mpo.gc.ca/species-especies/search-species-recherche-especies-eng.htm>)
- Archive of public consultations (www.sararegistry.gc.ca/involved/consultation/default_e.cfm)
- *The Species at Risk Act : a Fisheries and Oceans Canada regional perspective : a guide to aquatic species recovery planning in the Pacific Region* (Waves CATNO 285253)

Interpretation Guides:

- *Scientific Research Permits affecting SARA Listed Species: Guidelines for Applicants* (<http://www.dfo-mpo.gc.ca/species-especies/permits-permis/guidelines-directives-eng.pdf>)
- 2004 - *Revised Framework for Evaluation of Scope for Harm under Section 73 of the Species at Risk Act*. CSAS Stock Status Report 2004/048 (<http://www.dfo-mpo.gc.ca/Library/315954.pdf>)
- 2005 - *A Framework for Developing Science Advice on Recovery Targets for Aquatic Species in the Context of the Species At Risk Act*. CSAS Science Advisory Report 2005/054. (<http://www.dfo-mpo.gc.ca/Library/321042.pdf>)

Information leaflets:

- *The Species at Risk Act and critical habitat for aquatic species* (<http://dsp-psd.pwgsc.gc.ca/Collection/Fs23-437-2004E.pdf>)
- *Recreational boating and the Species at Risk Act* (dsp-psd.pwgsc.gc.ca/Collection/Fs23-439-2004E.pdf)
- *Recreational fishing and the Species at Risk Act* (dsp-psd.pwgsc.gc.ca/Collection/Fs23-438-2004E.pdf)
- *The fishing industry and the Species At Risk Act* (dsp-psd.pwgsc.gc.ca/Collection/Fs23-435-2004E.pdf)

Comprehensive materials for on-going SARA initiatives in the Pacific Region are available at <http://www.dfo-mpo.gc.ca/species-especes/regions/Pac/pacific-index-eng.htm>. This includes:

- Listed species
- Consultations
- Aboriginal Coordination

On-going recovery efforts, and their implications for BC pink and chum fisheries, are described in Section [3.4: Inventory of Major Conservation & Recovery Efforts](#). The inventory includes recovery efforts under SARA, as well as other conservation initiatives.

1.1.2.5 Canadian Environmental Assessment Act

The *Canadian Environmental Assessment Act* (CEAA) came into force in 1995 and was updated through amendments in November 2003. Federal agencies must conduct environmental assessments of development proposals requiring decisions under federal legislation (e.g. authorizations under section 35 of the *Fisheries Act* or prior to issuing permits under the *Navigable Waters Protection Act* or the *National Energy Board Act*). The CEAA process requires the advice of relevant federal agencies to assess the significance of environmental effects of proposed projects. Smaller and routine projects typically undergo a screening-level assessment, while larger and more environmentally sensitive projects undergo a comprehensive study. Potential impacts on salmon habitat are an important element of environmental assessments under the act.

1.1.2.6 Coastal Fisheries Protection Act

The *Coastal Fisheries Protection Act* (CFPA) is the legal instrument for ensuring that no foreign vessels are harvesting salmon within the Canadian Exclusive Economic Zone (EEZ). More broadly, the CFPA is the legislative means for controlling foreign fishing vessel access to, and activities in, Canadian fisheries waters and ports. As reflected in the CFPA, the general rule is that foreign fishing vessels are prohibited from entering Canadian fisheries waters for any purpose unless authorized to do so under the act, the regulations, or other law or treaty.

The full text of the CFPA is available at <http://laws.justice.gc.ca/en/C-33/index.html>. Regulations under the CFPA are available at <http://laws.justice.gc.ca/en/C-33/C.R.C.-c.413/index.html>. The CFPA, implementation policy, and related regulations were amended in 2003. The amendments, and the rationale for the changes, are described in the regulatory impact statement available at <http://gazette.gc.ca/archives/p2/2003/2003-12-17/html/sor-dors391-eng.html>.

1.1.2.7 Fisheries Development Act

The *Fisheries Development Act* establishes the legal authority for the Minister to undertake projects for:

- the more efficient exploitation of fishery resources and for the exploration for, and development of, new fishery resources and new fisheries;
- the introduction and demonstration to fishers of new types of fishing vessels and fishing equipment and new fishing techniques; and,
- the development of new fishery products for the improvement of the handling, processing and distribution of fishery products.

The full text of the act is available at <http://laws.justice.gc.ca/en/F-21/index.html>. Annual reports on implementation are available for the following years:

- 1999/2000 (<http://dsp-psd.pwgsc.gc.ca/Collection/Fs1-21-2000E.pdf>)
- 2000/2001 (<http://www.dfo-mpo.gc.ca/reports-rapports/fda/fda2000-eng.htm>)
- 2001/2002 (<http://www.dfo-mpo.gc.ca/reports-rapports/fda/fda2001-eng.htm>)

One important program implemented under the *Fisheries Development Act* was the *Pacific Fisheries Adjustment and Restructuring Program* (Section [1.2.6](#)), which drastically reduced the commercial fleet capacity in Pacific salmon fisheries through licence retirements, balanced with selective fishing initiatives and economic development projects.

1.1.2.8 Federal Regulations

Canadian fisheries are managed according to general regulations which operationalize the *Fisheries Act*, and other relevant acts. An overview of federal regulations is available at http://www.pac.dfo-mpo.gc.ca/ops/fm/toppages/actreg_e.htm. Their full text and a biennial summary of *DFO's Regulatory Plan* is available at http://www.dfo-mpo.gc.ca/communic/policy/dnload_e.htm,

Federal regulations particularly pertinent to BC salmon fisheries include:

- *Fishery (General) Regulations* apply to commercial, recreational and aboriginal communal fishing and related activities across the nation. These regulations cover close times, fishing quotas, size and weight limits of fish, as well as fishery logistics (documents, registrations, identification of fishing vessels and fishing gear, observers) and fishing for experimental, scientific, educational, or public display purposes.
- *Pacific Fishery Regulations, 1993* contain provisions specific to Pacific Region fisheries and cover commercial fisheries, fishing for Tuna from Canadian vessels on the high seas, and the harvesting of marine plants from Canadian fisheries waters outside of the geographical limit of the Province.
- *British Columbia Sport Fishing Regulations, 1996* regulate sport fishing in Canadian fisheries waters of the Pacific Ocean and the Province of British Columbia. The Regulations set close times, fishing quotas and size limits for all sport fisheries in B.C. For non-tidal waters (i.e. fresh water), fisheries are regulated by the Province of British Columbia under the *BC Wildlife Act*.
- *Yukon Territory Fishery Regulations* apply to all aspects of fishing in the Yukon Territory including commercial fisheries, sport fisheries, and the Inuvialuit Subsistence Fishery.

- *Aboriginal Communal Fishing Licences Regulations* set out the criteria for issuance of communal licences to aboriginal organizations (Section [1.1.5.4](#)).
- *Marine Mammal Regulations* provide for the protection of marine mammals and set out licencing requirements with respect to harvest of marine mammals (Section [3.4.3.3](#))
- *Management of Contaminated Fisheries Regulations* authorize the Regional Director-General (RDG) to close any area to fishing for a specific species of fish if the RDG has reason to believe that fish in that area are contaminated.
- *Pacific Fishery Management Area Regulations* describe the surflines and divide the Canadian fisheries waters of the Pacific Ocean into Areas and Subareas. The Areas and Subareas are often referenced when describing fishery openings and closures. The full text of the management area regulations is available at <http://laws.justice.gc.ca/en/showtdm/cr/SOR-82-215>. Maps of management area boundaries are available at http://www.pac.dfo-mpo.gc.ca/ops/fm/areas/areamap_e.htm.
- Specific regulations for each designated marine protected area, as discussed in Section [3.3.2.2](#).

The regulations under the *Fisheries Act* also establish additional legal instruments used to fine-tune the operational details of each fishery, the most important being licence conditions and variation orders:

- *Licence conditions*: Licences to fish granted under the regulations may also contain *Conditions of Licence* that set out requirements for proper conservation and management of the fishery. These conditions are the legal instrument for shaping the structure of commercial fishing fleets.
- *Variation Orders*: The regulations also provide the legal basis for issuing *Variation Orders*, which are used to vary provisions of the regulations such as set opening and close times for fisheries. When variation orders are issued, *Fishery Notices* publicly announce the detail of the order and advise affected fishers of, for example, openings and closings in a particular fishery.

The use of these legal instruments in BC pink and chum fisheries is described in Chapter [2](#): [Management of BC Pink & Chum](#).

1.1.3 Provincial Legislation

1.1.3.1 Jurisdictional Boundaries and Coordination

The management of Canada's Pacific fisheries resources is clearly divided between federal and provincial authorities. Marine fish typically fall under federal jurisdiction, and freshwater fish under provincial jurisdiction. However, the boundaries for the management of salmonid fisheries are a bit more complex:

- DFO regulates First Nations fisheries, even if they occur in freshwater.
- DFO regulates all commercial fisheries in tidal waters.
- DFO regulates all sport fisheries in tidal waters, and salmon sport fisheries in freshwater. DFO's regulations for salmon sport fisheries in freshwater are published as a supplement to provincial regulations for all freshwater fisheries.
 - 2007-2009 BC Tidal Waters Sport Fishing Guide and the 2007 to 2009 BC Freshwater Salmon Supplement are available at http://www.pac.dfo-mpo.gc.ca/recfish/SFG_e.htm

- 2007-2008 BC Freshwater Fishing Regulations are available at www.env.gov.bc.ca/fw/fish/regulations/.

Section [2.2.3](#) describes the different types of BC salmon fisheries.

Jurisdictional boundaries are even more complex for the issues that drive integrated management, such as water use, requiring multi-jurisdictional collaborations as described in Sections [3.3](#) and [3.4](#).

A detailed audit of federal-provincial roles was conducted in 2004. *Salmon forever: an assessment of the provincial role in sustaining wild salmon* by the BC Auditor General is available at www.llbc.leg.bc.ca/public/PubDocs/bcdocs/372078/Salmon_environment.pdf. The report also includes a formal response by the BC Government. Section [4.3.5.2](#) lists other provincial and federal audits relating to BC salmon.

Federal-provincial coordination takes place through several processes, including:

- The *Canadian Council of Fisheries and Aquaculture Ministers* (CCFAM) is composed of federal, provincial and territorial Ministers. CCFAM endorsed an *Agreement on Interjurisdictional Cooperation* in 1999, and has developed formal agreements on data sharing and oceans management, as listed below. The full text of the agreement is available at http://www.scics.gc.ca/pdf/830662a1_e.pdf, and background information is included in a news release available at http://www.scics.gc.ca/cinfo99/83066210_e.html.
- The *Pacific Council of Fisheries and Aquaculture Ministers* (PCFAM) is a forum for the Minister of Fisheries and Oceans, Yukon Minister of Environment, BC Minister of Agriculture and Lands, and BC Minister of Environment to meet and discuss policy issues on fisheries, aquaculture, oceans and habitat management. Under the 2003 *Agreement on the Pacific Council of Fisheries and Aquaculture Ministers*, the objectives of the Council are to maintain and enhance the conservation and long-term sustainability of the resource, provide for the long-term viability of industry, recognize the socio-economic importance of fisheries and aquaculture to communities, bring decision-making closer to clients and stakeholders, and create effective partnering arrangements to better manage the fishery and aquaculture.
- The *Federal-Provincial Introductions and Transfers Committee* was formed with a Memorandum of Understanding among DFO, the BC Ministry of Environment, Lands and Parks and the BC Ministry of Agriculture, Fisheries and Food. It is a technical committee whose primary role is to advise the above agencies on fish introduction and transfer issues. It meets at least four times per year, and consists of up to six members (two from each of DFO, and the appropriate provincial ministries). For example, the committee evaluates applications for pink salmon supplementation programs in Johnstone Strait and the Strait of Georgia (Section [3.2.5](#)) against federal and provincial legislation and coordinates cross-agency reviews.
- *Federal-provincial committees* at the staff level (staff, Director, Regional Director General) on a range of specific issues from aquaculture, fish habitat, fish management, and oceans.

The increased need for federal-provincial cooperation on integrated resource management is reflected in agreements that clarify roles and responsibilities for each party and map out processes for joint decision making. For example:

- 1996 - *Accord for the Protection of Species at Risk* (http://www.sararegistry.gc.ca/approach/strategy/accord_bac_e.cfm)

- 1997 - *Canada-British Columbia review of roles and responsibilities in the management of fisheries issues : background papers for consultation with stakeholders* (Waves CATNO 221949)
- 1997 - *Canada - British Columbia Agreement on the Management of Pacific Salmon Fishery Issues*
- 1999 - *Agreement on Interjurisdictional Cooperation with Respect to Fisheries and Aquaculture* (http://www.scics.gc.ca/pdf/830662a1_e.pdf)
- 2000 - *Canada-British Columbia Fish Habitat Management Agreement* (http://www.dfo-mpo.gc.ca/oceans-habitat/habitat/aboutus-apropos/partners-partenaires/bc_e.asp)
- 2002 - *Memorandum of Understanding between British Columbia Conservation Officer Service and Department of Fisheries and Oceans, Conservation and Protection, Fisheries Management Sector, Pacific Region, Respecting Mutual Assistance*
- 2004 - *Memorandum of Understanding Respecting the Implementation of Canada's Oceans Strategy on the Pacific Coast of Canada* (Section [3.3.1.2](#))
- 2005 - *Canada-BC Agreement on Species at Risk* (http://www.sararegistry.gc.ca/virtual_sara/files/agreements/aa%5FCanada%2DBritish%5FColumbia%5Fagreement%5Fon%5Fspecies%5Fat%5Frisk%5F0805%5Fe%2Epdf)

1.1.3.2 Overview of Relevant Provincial Acts

The following provincial acts cover Pacific salmon, their harvest, or their ecosystem. Descriptions are taken from the *Legislative Summary* for each act.

- The *BC Fisheries Act* provides for licensing and regulatory control of activities associated with commercial fisheries and aquaculture operations. The primary concerns are the licensing of: fish processing plants; fish buying establishments; fishers selling their own catch; wild oyster and marine plant harvesting; and aquaculture operations with the province of British Columbia. The full text of the act is available at http://www.qp.gov.bc.ca/statreg/stat/F/96149_01.htm, and regulations under the act are available at http://www.qp.gov.bc.ca/statreg/reg/F/Fisheries/140_76.htm.
- The *BC Wildlife Act* is the legal basis for the interaction of people and provincially managed wildlife. The full text of the act is available at www.qp.gov.bc.ca/statreg/stat/W/96488_01.htm. The act has recently been amended after a 3-year development and consultation process, as described at <http://www.env.gov.bc.ca/fw/wildlifeactreview/>.
- The *BC Environmental Management Act* provides the BC Ministry of Agriculture and Lands with the authority to manage, protect and enhance the environment. The full act is available at www.qp.gov.bc.ca/statreg/stat/E/03053_00.htm.
- The *BC Fish Protection Act* provides protection to fish and fish habitat by: prohibiting bank-to-bank dams on provincially significant rivers; establishing special rules in relation to water licences on "sensitive streams" where the sustainability of fish habitat is at risk; providing for the development of recovery plans for "sensitive streams"; allowing "water for fish" streamflow protection licences to be issued to community-based organizations; authorising temporary reduction in water use rights during periods of drought when the sustainability of fish is threatened; and allowing the Provincial government to establish directives for local governments in preserving streamside areas. The full act is available at <http://www.agf.gov.bc.ca/ministry/legsum/FPRO.stm>.

- The *BC Fish Inspection Act* ensures quality and wholesomeness in the fish industry by providing the authority to regulate activities concerning the handling, processing, storing, grading, packaging, marking, transporting, marketing and inspection of fish and fish products. The regulations ensure that fish processed and sold within British Columbia have met specified requirements. The full text of the act is available at http://www.env.gov.bc.ca/habitat/fish_protection_act/act/documents/act-theact.html, and regulations under the act are available at www.qp.gov.bc.ca/statreg/reg/F/FishInsp/12_78.htm.

1.1.4 International Agreements

1.1.4.1 UN Convention on the Law of the Sea (UNCLOS)

Canada is a signatory to the *UN Convention on the Law of the Sea*, the Agreement relating to Part XI of the Convention, and the *Agreement for the Implementation of the Convention* relating to the conservation and management of straddling fish stocks and highly migratory fish stocks. The full text of the UNCLOS is available at

http://www.un.org/Depts/los/convention_agreements/texts/unclos/unclos_e.pdf. The *UN Agreement for the Implementation of the Convention* relating to the conservation and management of straddling fish stocks and highly migratory fish stocks is available at:

http://www.un.org/Depts/los/convention_agreements/texts/fish_stocks_agreement/CONF164_37.htm

Canada operates in accordance with all aspects of the *Convention on the Law of the Sea*. The *Coastal Fisheries Protection Act* (Section [1.1.2.6](#)) and the *Pacific Salmon Treaty* (Section [1.1.4.4](#)) are specific legal instruments that operate to ensure consistency with UNCLOS. The *Coastal Fisheries Protection Act* established the legislative means for controlling foreign fishing vessel access to, and activities in, Canadian fisheries waters (Exclusive Economic Zone — EEZ) and ports. The *Pacific Salmon Treaty* establishes the legal framework for joint management of transboundary stocks.

1.1.4.2 Convention on Biological Diversity

Canada was the first industrialized nation to ratify the UN Convention on Biological Diversity signed by more than 150 countries at the 1992 Earth Summit in Rio de Janeiro. The Convention has three main goals: (1) the conservation of biodiversity; (2) sustainable use of the components of biodiversity; and (3) fair and equitable sharing of the benefits arising from the commercial and other use of genetic resources. In terms of defining at what level biodiversity should be conserved, it advocates the conservation of genes, species and ecosystems, without providing guidance on which one should receive priority.

The full text of the convention on Biological Diversity, as well as related information, is available at www.cbd.int.

Related legal instruments and initiatives are:

- *Species at Risk Act* (Section [1.1.2.4](#)) and its implementation (Section [3.4](#))
- Wild Salmon Policy development and implementation (Section [3.2.2](#))
- *Oceans Act* (Section [1.1.2.3](#)) and resulting integrated management initiatives (Section [3.3](#))

1.1.4.3 Convention for the Conservation of Anadromous Stocks in the North Pacific Ocean

The *North Pacific Anadromous Fish Commission* (NPAFC) was established by the *Convention for the Conservation of Anadromous Stocks in the North Pacific Ocean* which became effective in 1993. The

NPAFC includes Canada, Japan, the Republic of Korea, Russia, and the U.S., the primary states of origin for salmon stocks in the North Pacific. The Convention prohibits directed fishing for salmonids on the high seas of the North Pacific and includes provisions to minimize the number of salmonids taken in other fisheries. The NPAFC promotes the conservation of salmonids in the North Pacific and its adjacent seas and serves as a venue for cooperation in and coordination of enforcement activities and scientific research.

An overview and the full text of the convention are available at www.npafc.org/new/about_convention.html. Brief summaries of implementation activities are available at <http://www.dfo-mpo.gc.ca/media/back-fiche/2005/hq-ac58a-eng.htm> and <http://www.dfo-mpo.gc.ca/media/back-fiche/2005/hq-ac88a-eng.htm>.

Related legal instruments and initiatives are:

- *Species at Risk Act* (Section 1.1.2.4) and its implementation (Section 3.4)
- Wild Salmon Policy development and implementation (Section 3.2.2)
- *Oceans Act* (Section 1.1.2.3) and resulting integrated management initiatives (Section 3.3)
- High Seas enforcement (<http://www.dfo-mpo.gc.ca/media/npress-communique/2008/hq-ac10-eng.htm>)

1.1.4.4 Pacific Salmon Treaty

Before 1985, the *International Pacific Salmon Fisheries Commission* (IPSFC) was responsible for managing sockeye and pink salmon fisheries within the *Convention Area*, covering off-shore waters between the 48th and 49th parallels, areas off the southern tip of Vancouver Island (Juan the Fuca Strait, Puget Sound, southern Strait of Georgia), and the lower Fraser River. The catch taken within Convention waters was shared equally by Canada and the United States.

In 1985, Canada and the United States signed the *Pacific Salmon Treaty* (PST) requiring the conduct of fisheries so as to provide for optimum production and equitable harvest of salmon stocks. Under the Treaty, each party is to receive benefits equivalent to the production of salmon originating in its waters, and each is to avoid undue disruption to the other's fisheries. Bilateral agreements must be periodically developed to implement the Treaty's principles for long-term conservation and harvest sharing.

Annex IV of the treaty outlines management agreements and objectives between Canada and the U.S. for salmon.

The *Pacific Salmon Commission* (PSC) was established to advise both countries and several technical committees on the implementation of Treaty provisions. The PSC replaced the IPSFC and established four Panels to provide technical and regulatory advice to the Commission. Each Panel is made up of no more than six representatives and six alternates from each country. Membership reflects a range of governmental, First Nations, commercial, and recreational and in some cases, environmental interests:

- The *Fraser River Panel* manages fisheries within the former Convention Area, now referred to as the *Panel Area*.
- The *Southern Panel* has responsibility for salmon originating in rivers with mouths south of Cape Caution, with the exception of Fraser River sockeye and pink salmon.
- The *Northern Panel* has responsibility for salmon originating in rivers with mouths entering the Pacific Ocean between Cape Suckling in Alaska and Cape Caution in British Columbia.

- The *Transboundary Panel* has responsibility for salmon originating in the Alsek, Stikine, and Taku river systems.

Each Panel directs the development of annual fishery regimes in accordance with the objectives of the Treaty. The Panel, guided by principles and provisions of the Treaty, establishes general fishing plans based on conservation concerns and harvest sharing of co-migrating sockeye stocks. Each Panel's plans are based on a broad range of considerations including pre-season forecasts of abundance, management goals, and international and domestic allocation of the TAC.

In 1999, after years of dispute over the conservation and harvest provisions of the *Pacific Salmon Treaty*, Canada and the US renewed the Treaty with several refinements, including new implementation guidelines that clarified the role of each country in the management process. These refinements are captured in a formal agreement under the PST, which establishes abundance-based fishing regimes for the salmon fisheries under its jurisdiction. Two bilaterally managed regional funds were created to promote cooperation, improve fisheries management, and assist salmon and habitat enhancement efforts. The Agreement also included a commitment by the two countries to improve how scientific information is obtained, shared and applied to salmon management decisions. The renewed PST runs through to 2010 for the Fraser River sockeye and pink salmon.

Chum, chinook, and coho provisions expired in 2008, and were recently renegotiated.

Details of the 1985 Treaty, the 1999 Agreement, the 2009 renewal, and their implementation are publicly available:

- Section 3.8 of the 2008 *Integrated Fisheries Management Plan for Salmon – South Coast* includes a detailed update on the renewal process.
- 2009 renewal announcement (<http://www.dfo-mpo.gc.ca/media/npres-communication/2009/pr01-eng.htm>)
- A summary of changes is available at <http://www.dfo-mpo.gc.ca/media/back-fiche/2009/pr01-eng.htm>. are currently being renegotiated.
- Full text of the PST (www.psc.org/publications_psctreaty.htm)
- Overview of the 4 Panels (www.psc.org/about_org_panels.htm).
- History of the PST with details of the fisheries management provisions under the 1999 agreement (http://www.dfo-mpo.gc.ca/media/backgrou/1999/hq-ac29-113_e.htm)
- Bylaws governing the operation of the *Pacific Salmon Commission* and its Panels (<http://www.psc.org/pubs/Bylaws.pdf>)

Status assessment and fisheries monitoring are important elements of the PST:

- In order to properly account for the full 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 management of Chinook and coho salmon stocks under the PST. In 1985, the United States and Canada entered into a 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 recognized the importance of the CWT program to provide the data required to evaluate the effectiveness of bilateral conservation and fishing agreements. This approach has been confirmed with the recent release of an expert panel review that concluded the CWT system was the only technology that is currently capable of providing the data required for PST management regimes for chinook and coho salmon. The report and other materials from the CWT review are available at http://www.psc.org/info_codedwiretagreview.htm.

Canada's obligations under the PST comply with the principles of UNCLOS (Section [1.1.4.1](#)) under which the PST was negotiated. Examples of how compliance with the PST is achieved include:

- Annual performance reviews against the PST provisions occur at bilateral meetings of the Pacific Salmon Commission. The results are published at www.psc.org/publications_annual_pscreport.htm.
- The PST provides formal mechanisms for dispute resolution should the parties be unable to agree on the implementation of the PST. To date, there have been disagreements between the Parties from time to time, but these were dealt with through the Commission and its panels.
- Post-season reviews by Technical Committees list specific provisions of the treaty and management actions taken to achieve those provisions. Reports for chum salmon are available at http://www.psc.org/publications_tech_techcommitteereport.htm#TCCHUM. Reports for Fraser River pink salmon are available at http://www.psc.org/publications_annual_fraserreport.htm.

The 1999 agreement also established two bilateral funds for enhancement and restoration projects. Project proposals are publicly solicited, evaluated, and supervised by the PSC. Projects under the funds deal with enhancement, restoration, selective fishing, and improved information. Detailed project backgrounders and final reports are available at www.psc.org.

1.1.5 First Nations' Access to Fishing Opportunities

1.1.5.1 Aboriginal and Treaty Rights

The concept of aboriginal rights is recognized in Canadian law. Aboriginal rights may include a wide range of activities, including the right to fish. Generally, an aboriginal right is a practice, custom, or tradition that was integral to the distinctive culture of an aboriginal group at the time of contact between that group and Europeans. For example, many aboriginal groups assert an aboriginal right to fish for food, social, and ceremonial purposes (FSC) on the basis that use of fish for these purposes was an integral part of their culture prior to contact with Europeans.

Fishing rights for aboriginal people in Canada may also be derived from *historic* treaties entered into between the Crown and aboriginal peoples in various parts of Canada between the 1700s and the 1920s. More recently, aboriginal peoples have also sought to negotiate fishing rights under *modern* treaties with the Crown.

Aboriginal and treaty rights have existed in Canada for a very long time, but those rights were not protected by the Constitution of Canada until 1982. In that year, Section 35 was added to the *Constitution Act*. Section 35 states that existing Aboriginal and treaty rights are "recognized and affirmed". Section 25 of the constitution refers to the *Royal Proclamation of 1763*, which reserves all land west of the Great Lakes for First Nations hunting, which forms the legal basis for the need to negotiate treaties in BC. This constitutional recognition of aboriginal and treaty rights ensures that they form a fundamental component of the legal and policy frameworks that apply to the management of Pacific fish, their ecosystem, and their harvest.

1.1.5.2 Evolving Interpretation

The Constitution of Canada formally “recognized and affirmed” existing aboriginal and treaty rights in 1982, but many practical details remain to be determined relating to the specific nature and scope of aboriginal and treaty rights to fish for the approximately 200 aboriginal groups in B.C. Given the legal uncertainties surrounding the nature and scope of aboriginal rights, further examination of these rights has been sought through the court system. In addition, many aboriginal groups are attempting to gain further certainty through negotiation of modern treaties that would specifically define the nature and extent of their fishing rights.

A brief overview of these elements is available at www.pac.dfo-mpo.gc.ca/tapd/ab_fishg_e.htm. A comprehensive inventory of links to related materials is available at http://www.pac.dfo-mpo.gc.ca/tapd/links_e.htm.

1.1.5.3 Overview of Court Decisions Related to First Nations Access to Fishing Opportunities

Numerous court decisions have shaped the interpretation of aboriginal rights to fish. The full texts of some of the key court decisions are available at http://www.pac.dfo-mpo.gc.ca/tapd/links_e.htm#Court_Decisions.

DFO seeks to manage fisheries, including Aboriginal fisheries, in a manner consistent with these decisions.

One of the most important decisions relating to management of the fishery and the aboriginal right to fish for food, social, and ceremonial (FSC) purposes is the Supreme Court of Canada’s decision in *R. v. Sparrow*. In this case, the court set out a framework for the analysis of fisheries management decisions and whether they afforded the required protection of aboriginal and treaty rights to fish for FSC purposes. Essentially, with the exception of conservation or other valid legislative objectives, the Court held that aboriginal people’s access to fish for FSC purposes must be given priority over fishing for commercial or recreational purposes. The court held that the first step in the analysis is to determine whether an aboriginal or treaty right can be established. If a right is established, the next step is to determine whether it has been infringed. If the right has been infringed, the court will consider whether the infringement can be justified. The courts have made it clear that consideration of the issue of priority will always involve a detailed case-by-case analysis of the relevant facts.

Other court decisions which have had a significant impact on the management of fisheries are those relating to the Crown’s duty to consult with First Nations with respect to decisions which may affect their aboriginal rights. Significant guidance was provided by the Supreme Court of Canada in late 2004 in its decision in *Haida v. BC*. In that decision, the Court ruled that the Crown has a legal duty to consult with First Nations where the Crown has knowledge of the potential existence of an Aboriginal right or Aboriginal title and is making decisions that might adversely affect that right or title. The Court held that scope of the duty will vary depending on the circumstances, including the strength of a First Nation’s claim respecting the Aboriginal right or Aboriginal title and the potential impact of the government’s decision on the claimed right or title. It is significant that, in its decision in *Haida v. BC*, the Supreme Court of Canada held that the Crown’s legal duty to consult with an Aboriginal group can arise even before the group establishes any Aboriginal rights or Aboriginal title.

1.1.5.4 Food, Social, and Ceremonial (FSC) Fisheries

Many of B.C.’s aboriginal peoples assert an aboriginal right to fish for FSC purposes. In keeping with the decision in *R. v. Sparrow*, DFO’s overarching objective for First Nations’ fisheries is “to ensure

that, subject to conservation needs, first priority is accorded to First Nations for opportunities to harvest fish for food, social, ceremonial (FSC) purposes and any treaty obligations” (2008 Integrated Fisheries Management Plan for 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’s consultation process with First Nations is described in throughout Chapter 4.

Where treaties have not been finalized, opportunities to harvest FSC fish are managed through Communal Licences. An overview of different types of communal licences is available at http://www.pac.dfo-mpo.gc.ca/tapd/com_lic_e.htm.

First Nations access to salmon for FSC purposes is managed through communal licences. These licences are designed for the effective management and regulation of First Nations fisheries through a negotiated series of mutually acceptable conditions wherever possible. The dates, times, and locations where harvesting may occur, acceptable gear types, and other conditions are described in these licences. Communal licences can be amended in-season for resource conservation and other purposes. DFO seeks to provide for the effective management and regulation of First Nations fisheries through negotiation of mutually acceptable and time-limited *Fisheries Agreements*.

The *Integrated Fisheries Management Plans* (IFMP) list communal licence harvest targets by species for each year (Section 6.3 of the 2008 SC IFMP, Section 5.3 of the 2008 NC IFMP). Note that actual numbers of fish on some communal licences are still in negotiation, and therefore these numbers are subject to change. Also note that these are long-term catch ceilings, and actual catches in any given year will depend on, among other factors, in-season assessments of actual stock strength, management measures taken to ensure conservation of individual stocks, abundance of other species, and targeted fishing effort.

1.1.5.5 Economic Fisheries

In addition to opportunities to harvest fish for FSC purposes, DFO has also provided opportunities for aboriginal people to harvest fish for commercial purposes (i.e. sale). Fisheries for commercial purposes have been provided under DFO’s Aboriginal Fisheries Strategy (AFS). Through agreements made between DFO and Aboriginal groups, Aboriginal communities have been authorized to sell specified amounts of salmon subject to conservation needs and to agreed-upon monitoring, enforcement and management regimes. These fisheries have provided economic benefits for First Nation communities, fostered self-sufficiency by building aboriginal capacity, and contributed to improved management of the Aboriginal fishery. The summary below is from http://www.pac.dfo-mpo.gc.ca/tapd/economic_e.htm.

Economic opportunity fisheries have been permitted in three geographical areas of British Columbia:

- the lower Fraser River, involving Aboriginal groups representing the Indian Bands of the lower Fraser River and including the Sto:lo Nation as well as the Musqueam and Tsawwassen First Nations;
- the Alberni Inlet on Vancouver Island in the Somass River area, including the Tseshaht and Hupacasath First Nations of the Nuu-chah-nulth Tribal Council; and
- the Skeena River, including the Tsimshian Tribal Council, the Gitksan and Wet’suwet’en Watershed Authorities and the Lake Babine First Nation.

The harvest limits were negotiated with these Aboriginal groups on an annual basis. Historically the amounts were fixed numbers, but in recent years agreements have included a fixed share of the total allowable catch for some species. In all areas the total amount of harvest has depended upon the strength of the fish stocks. Monitoring of the aboriginal fisheries has generally been carried out by trained Aboriginal Guardians as well as DFO fishery officers.

The question of whether these economic fisheries are inconsistent with the equality provisions of the *Canadian Charter of Rights and Freedoms* was determined by the Supreme Court of Canada in June, 2008. In a unanimous decision the court upheld the Minister's ability to authorize economic fisheries for First Nations and determined that these fisheries did not violate the equality provisions of the *Canadian Charter of Rights and Freedoms*. The full text of the ruling in *R. v. Kapp* is available at <http://scc.lexum.umontreal.ca/en/2008/2008scc41/2008scc41.html>.

1.1.5.6 Treaties

The British Columbia Treaty Commission process provides an opportunity for aboriginal people to negotiate, amongst other things, fishing rights. The treaty process has far reaching implications for the structure and management of salmon fisheries. Treaties may provide for the harvest of certain species and quantities of fish. Through treaty negotiations, harvest agreements can also be negotiated under which commercial fishing opportunities can be provided to aboriginal peoples.

To date, only a few such modern treaties have been concluded. On May 29, 1993, Yukon First Nations, Canada, and Yukon signed the "Umbrella Final Agreement" under which treaties with individual Yukon First Nations would be negotiated. Since then, a number of such treaties (the "Yukon Final Agreements") have been entered into between individual Yukon First Nations, Canada and Yukon. Some of the provisions of those treaties apply to the management of wild Pacific salmon.

The Nisga'a Final Agreement, the first modern treaty in British Columbia, took effect on May 11, 2000 after ratification of the Final Agreement by the Nisga'a Nation and the enactment of federal and Provincial settlement legislation. With respect to salmon, the Nisga'a Final Agreement applies to the management of salmon originating in the Nass Area, as defined in the Final Agreement. A summary of the Nisga'a Treaty, with links to additional information and the full text of the treaty, is available at <http://www.ainc-inac.gc.ca/al/ldc/ccl/fagr/bc-eng.asp>.

The Nisga'a Final Agreement defines the catch allocations and fisheries management structures related to Nisga'a fisheries and salmon stocks originating from the Nass area. Nisga'a Lisims Government is responsible for the internal allocation of catch opportunities among Nisga'a harvesters and the day-to-day operation of the Nisga'a fishery. The Nisga'a have distributed their salmon catches between three type of fisheries: domestic fisheries for food, social and ceremonial purposes; communal sale fisheries where proceeds are used to support fisheries management programs; and individual sale fisheries that provide commercial catch opportunities and income for Nisga'a harvesters. The profiles for North Coast & Central Coast pink and chum salmon describe the treaty and its implementation in more detail.

Other modern treaties are being negotiated between First Nations, the government of Canada, and the government of British Columbia. British Columbia is unique among territories and provinces of Canada in having a large number of First Nations without historic treaties, as the treaty-making process was never completed in British Columbia after Confederation. To address the need to conclude modern treaties, a specific process was developed following the recommendations of the BC Claims Task Force in 1991. The British Columbia Treaty Commission (BCTC) facilitates the 6-stage treaty negotiation process.

Federal negotiating teams are led by the Federal Treaty Negotiation Office (FTNO) of Indian and Northern Affairs Canada. Fisheries and Oceans Canada (DFO) participation is coordinated through the Treaty Negotiations Division of the Treaty and Aboriginal Policy Directorate.

Explanations of treaty-related concepts, as well as links to more detailed information, are available at http://www.pac.dfo-mpo.gc.ca/tapd/tr_negot_e.htm and <http://www.bctreaty.net>.

The following treaty update is from <http://www.bctreaty.net/files/updates.php>: First Nations in the treaty process make-up about two-thirds of all aboriginal people in BC. The treaty process is voluntary and open to all First Nations in BC. As of March 2008 there are 58 First Nations participating in the BC treaty process. Because some First Nations negotiate at a common table, there are 48 sets of negotiations. There are 41 First Nations in Stage 4 agreement-in-principle negotiations and eight First Nations in Stage 5 negotiations to finalize a treaty. In-SHUCK-ch Nation, Maa-nulth First Nations, Lheidli T'enneh Band, Sechelt Indian Band, Sliammon Indian Band, Yekooche Nation and Yale First Nation have signed agreements in principle (AiPs)—the blueprint for a final treaty.

Tsawwassen has now signed a Treaty as well, which came into effect April 2009.

1.1.5.7 An Integrated Aboriginal Policy Framework

The Integrated Aboriginal Policy Framework serves as a guide for DFO employees for the renewal of DFO's Aboriginal policies and programs, to provide strategic policy direction for the development of operational guidelines and programs, and to guide DFO in discussions and collaboration with other federal agencies, provinces, territories, stakeholders, and Aboriginal groups.

This framework recognizes that DFO's core mandate has broadened considerably since earlier Supreme Court decisions such as Sparrow and Marshall (Section [1.1.5.3](#)) and now includes new ecosystem-based management responsibilities under the *Oceans Act*, expansion of its presence in inland habitat management, *Species at Risk Act* (SARA) implementation, an aquaculture framework, and an increasingly sophisticated approach to science (Sections [1.1.2](#) and [1.2](#)). In addition, DFO must continue to take into account new developments in case law (Section [1.1.5.3](#)).

The full text of the framework, including definitions, background information, and implementation strategies, is available at <http://www.dfo-mpo.gc.ca/fm-gp/aboriginal-autochtones/iapf-cipa-eng.htm>.

DFO conducted a series of meetings with aboriginal groups to shape the integrated policy framework. A summary of the meetings is available at <http://www.dfo-mpo.gc.ca/fm-gp/aboriginal-autochtones/afs/afsoct03-eng.htm>.

1.1.5.8 Aboriginal Aquatic Resource and Oceans Management (AAROM)

The *Aboriginal Aquatic Resource and Oceans Management* (AAROM) initiative 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 effectively participate in decision-making and advisory processes. The program was created in 2003 in response to recommendations received during a 2-year review of DFO's programs for First Nations (previous section). AAROM has a relatively stable operating mandate of approximately \$6 million annually in Pacific Region. More information about AAROM is available at http://www.pac.dfo-mpo.gc.ca/tapd/aarom_e.htm.

AAROM funds First Nations organizations and projects. For example *Uu-a-thluck* is an organization of 15 Nuu-chah-nulth First Nations coordinating aquatic resource management on the West Coast of

Vancouver Island. Uu-a-thluck combines a council of chiefs, a joint technical working group with DFO participation, and a secretariat of biologists and resource managers.

1.1.5.9 Implementing Aboriginal and Treaty Rights in BC Pink and Chum Fisheries

Pink and chum salmon are important to BC First Nations, and their aboriginal rights are reflected in all aspects of fisheries management from policy development to fisheries restructuring and in-season implementation.

Overall, management decisions affecting aboriginal opportunities to fish for FSC and commercial purposes are guided by the following legal elements:

- Court decisions that evaluate past management decisions and clarify the context for future management decisions (Section [1.1.5.3](#)).
- Established allocation priority of communal First Nation fisheries for Food, Social, and Ceremonial (FSC) purposes (Section [1.1.5.4](#))
- Economic opportunities established in some areas (Section [1.1.5.5](#))
- Treaties that formalize First Nations fisheries for FSC and economic purposes (Section [1.1.5.6](#)).

Aboriginal and treaty rights are a fundamental component of the following long-term initiatives:

- The Aboriginal Fisheries Strategy (AFS) with an initial focus on enabling First Nations' access to fisheries resources (Section [1.2.4](#)).
- The Aboriginal Aquatic Resource and Oceans Management (AAROM) program designed to build First Nations' capacity for fisheries management, monitoring, and assessment (Section [1.1.5.8](#)).
- Pacific Fisheries Reform (PFR), Pacific Integrated Commercial Fisheries Initiative (PICFI), and related projects that are shaping the future structure of salmon fisheries (Section [1.2.9](#)).

Section [1.2](#) retraces the development of these departmental policies and initiatives over the last 15 years.

Aboriginal and treaty rights create an obligation for the government to consult First Nations in any decision that affects those rights. Section [4](#) summarizes the interconnected processes in place to achieve these requirements within the practical constraints of salmon management.

The practical interpretation and consideration of aboriginal opportunities adds to the complexity of salmon management, requiring cooperative planning and close collaboration. Section [2.2.3](#) briefly summarizes fisheries targeting BC pink and chum salmon, including First Nations fisheries. For detailed information about First Nations fisheries in a particular area, refer to the appropriate *Certification Unit Profile*.

1.2 Policy Context

1.2.1 Overview

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 to promote biodiversity and a precautionary, ecosystem-based approach to the management of marine resources. Each of the policies was developed with considerable consultation of

all those with an interest in salmon management (Section [4.3.2.1](#)). While the policies themselves are not subject to annual changes, annual implementation details are continually refined where there is general support (Section [4](#)).

The policy context for the management of Pacific salmon has evolved substantially over the last 20 years. The first part of this section reviews national initiatives related to sustainability, precaution, and departmental governance. The second part chronologically retraces milestones in policy development for Pacific salmon, provides links to more detailed information. Both parts include examples from BC pink and chum fisheries for illustration.

The following policy milestones for Pacific salmon are covered in this section:

- *Policy for the Management of Fish Habitat* - 1986
- *Policy for the Management of Aboriginal Fishing* -1993
- *Aboriginal Fisheries Strategy* - 1992
- *Pacific Salmon Revitalization Plan (a.k.a. Mifflin Plan)* - 1996
- *A New Direction for Canada's Pacific Salmon Fisheries* - 1998
- *An Allocation Policy for Pacific Salmon* - 1999
- *A Policy for Selective Fishing in Canada's Pacific Fisheries* - 2001
- *Pacific Fisheries Reform* - 2005
- *Wild Salmon Policy* - 2005
- *Pacific Integrated Commercial Fisheries Initiative (PICFI)* - 2007

The policy context described in this section forms the basis for the general management approach described in Chapter [2](#) and the conservation measures described in Chapter [3](#).

1.2.2 National Policy Initiatives

1.2.2.1 Sustainable Development Strategy

In 1997, DFO started the department-wide process of preparing a *Sustainable Development Strategy* (SDS) as required by 1995 amendments to the *Auditor General Act*. Since then, DFO has produced an SDS with specific performance measures every three years, and the *Commissioner of the Environment and Sustainable Development* has been conducting annual progress evaluations.

Canada's oceans and aquatic resources are a shared asset, and DFO initiated the necessary collaborative approach in 1997 to ensure sustainable development of these resources. Public involvement started with a discussion paper called *Towards a Sustainable Development Strategy for the Department of Fisheries and Oceans* and has continued with subsequent implementation:

- The 2002-2003 SDS is available at www.dfo-mpo.gc.ca/sds-sdd/index_e.htm.
- A progress report from 2004 is available at www.dfo-mpo.gc.ca/sds-sdd2004/Index_e.htm.
- The 2005-2006 SDS is available at www.dfo-mpo.gc.ca/sds-sdd2005-06/Index_e.htm.

- The 2007-2009 SDS is available at www.dfo-mpo.gc.ca/sds-sdd/2007-2009/index_e.htm. It commits the department to working with interested partners and resource users to drive a cultural shift in decision-making when it comes to fisheries and oceans policy. It also outlines objectives and commitments for incorporating sustainable development into daily work.
- Since 1997, the *Commissioner of the Environment and Sustainable Development* has conducted annual progress reviews, all of which are available at http://www.oag-bvg.gc.ca/internet/English/parl_lpf_e_1205.html.
- A ten-year review of SDS's was completed as part of the 2007 annual progress report. The full review is available at www.oag-bvg.gc.ca/internet/English/parl_cesd_200710_01_e_23837.html.

The principles and priorities of the SDS are reflected in Pacific Region policy developments that shape the planning and implementation of BC pink and chum fisheries, such as the *Wild Salmon Policy* (Section [3.2.2](#)) and initiatives related to the changing structure of Pacific fisheries (Section [1.2.9](#))

1.2.2.2 A New Resource Management Sustainable Development Framework

DFO is in the process of developing an overarching framework for all departmental conservation policies and strategies, which will also serve as the national platform for ecosystem-based management approaches. The framework demonstrates that DFO is moving forward with the implementation of a precautionary approach (Section [1.2.2.3](#)) and related concepts.

A New Resource Management Sustainable Development Framework has two key elements:

- Formalize and codify current practice
- Monitor progress towards conservation goals.

The framework is intended to provide a national policy umbrella and establish fundamental sustainability principles. More specific conservation policies then need to be consistent with these overarching principles. For example, the *Wild Salmon Policy* (Section [3.2.2](#)) provides specific guidance for interpreting the principles of the Sustainability Framework.

Work on this framework currently focuses on 4 distinct components:

- A policy to manage the impacts of fishing on sensitive benthic areas
- A policy to help guide decisions regarding fisheries for forage species
- A formal framework for incorporating the precautionary approach into fishery management decisions, building on extensive developments already completed (Section [1.2.2.3](#))
- A fisheries sustainability checklist to help the department self-assess progress towards sustainability and to report externally on performance and progress towards sustainable management of fisheries

The sustainability checklist is conceptually aligned with the evaluation criteria developed by the *Marine Stewardship Council*, but the checklist is designed with an emphasis on rapid appraisal of fisheries resources to facilitate broad application. One initial priority under the framework is to complete a representative set of fisheries sustainability checklists reflecting the wide diversity of fisheries resources across Canada. In its first phase, this initiative aims to develop a report on precautionary measures and a gap analysis for 100 stocks spread across all of DFO's management regions.

WCVI chum are one of the Pacific region pilots for the fisheries sustainability checklist. Section [2.5.4.4](#) discusses these and other ecosystem considerations in pink and chum management.

1.2.2.3 Precaution and Risk Management

Fisheries and Oceans Canada has formally adopted the precautionary approach to fisheries management, and the federal government has established a more general framework for applying precaution in science-based decision making.

DFO Science continues to lead the development and refinement of a precautionary framework, and the management system continues to evolve towards a more efficient integration of scientific advice and multi-interest advisory processes within the logistical constraint of fisheries management.

This section briefly describes the policy context for applying precaution and risk management in fisheries management and includes illustrative examples from BC pink and chum fisheries. Note that this section only deals with precaution and risk in fisheries management. This is separate and distinct from DFO's *Integrated Risk Management (IRM)* initiative, which deals with the departments legal liabilities and financial risks (Section [1.2.2.4](#)).

The formal development of DFO's precautionary management framework started with Science workshops in Nanaimo at the Pacific Biological Station in 1998 and 1999 to develop recommendations for the strategic implementation of the precautionary approach in Canada. Full workshop proceedings are available at http://www.dfo-mpo.gc.ca/csas/Csas/Proceedings/1998/p98_18.pdf and http://www.dfo-mpo.gc.ca/csas/Csas/Publications/Pro-CR/1999/1999_041_e.htm.

The federal government then developed guiding principles for consistent application of the precautionary approach in four stages:

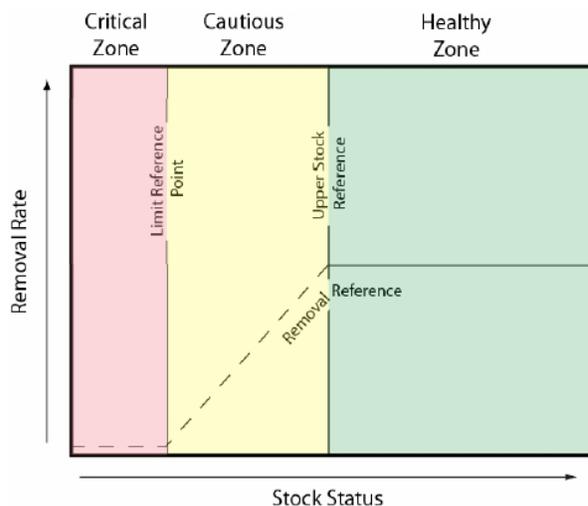
- In 2001, the Privy Council Office (PCO) released *A Canadian Perspective on the Precautionary Approach* to initiate the debate and provide initial guidance to federal departments such as DFO. A discussion paper is available at www.ec.gc.ca/econom/discussion_e.htm and a summary of guiding principles proposed at the time is available at www.ec.gc.ca/econom/booklet_e.htm.
- At the same time, DFO Science was developing the technical framework for implementing the precautionary approach in Canadian fisheries. Steps in the development process are documented in *Limits to overfishing: reference points in the context of the Canadian perspective on the precautionary approach* by Shelton and Rice (CSAS Research Document 2002/084, http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2002/RES2002_084e.pdf), and *Proceedings of the DFO Workshop on Implementing the Precautionary Approach in Assessments and Advice* (CSAS Proceedings Series 2002/009, http://www.dfo-mpo.gc.ca/csas/Csas/proceedings/2002/PRO2002_009b.pdf)
- Based on feedback received from federal departments, stakeholders in resource management settings, and the general public, the PCO then released *A Framework for the Application of Precaution in Science-based Decision Making About Risk* in 2003. The complete framework is available at <http://www.pco-bcp.gc.ca/docs/information/publications/precaution/precaution-eng.pdf>. The framework sets out guiding principles to achieve coherent and cohesive application of precaution to decision making about risks of serious or irreversible harm where there is lack of full scientific certainty, with regard to federal domestic policies, laws and agreements, as well as international agreements and guidelines in areas where science is implicated. Departmental and agency officials are expected to consider its guiding principles in decision making and to work

together in developing, in consultation with their stakeholders, guidance for the application of precaution in their particular area of responsibility.

- DFO established the *National Science Working Group on the Precautionary Approach* which organized workshops in 2004 and 2005. Full workshop proceedings are available at http://www.dfo-mpo.gc.ca/csas/Csas/proceedings/2004/PRO2004_003_B.pdf and http://www.dfo-mpo.gc.ca/csas/Csas/Proceedings/2005/PRO2005_027_B.pdf.
- Based on the discussions at these workshops, the *National Science Working Group* released a formal *Science Advisory Report* in 2006 describing the minimal requirements for harvest strategies to be compliant with the Precautionary Approach. The full science advisory 2006/023 is available at http://www.dfo-mpo.gc.ca/csas/Csas/status/2006/SAR-AS2006_023_E.pdf.

The main elements of Science Advisory 2006/023 are:

- The Precautionary Approach framework prescribes three stock status zones.
- The Limit reference point is the stock level below which productivity is sufficiently impaired to cause serious harm to the resource but above the level where the risk of extinction becomes a concern. The zone below the Limit reference point is called the Critical zone.
- The Upper stock reference point is the stock level threshold below which the removal rate is reduced. The stock status zone above the Limit reference point but below the Upper stock reference is called the Cautious zone. The stock status zone above the Upper stock reference is called the Healthy zone.
- The removal reference is the maximum acceptable removal rate.
- The removal rate is the ratio of all human induced removals and total exploitable stock size.
- In the Healthy zone, the removal rate should not exceed the Removal reference.
- In the Cautious zone, fisheries management actions should promote stock rebuilding towards the Healthy zone. The removal rate should not exceed the Removal reference.
- In the Critical zone, fishery management actions must promote stock growth. Removals by all human sources must be kept to the lowest possible level.



(Figure from Science Advisory Report 2006-023)

Science Advisory 2006/023 is consistent with the fundamental provisions of the Wild Salmon Policy (Section [3.2.2](#)), and together these two documents form the most directly applicable guidance for precautionary management of BC fisheries.

The management approach for BC pink and chum is generally consistent with the elements of Science Advisory 2006/023:

- Abundance forecasts and in-season estimates routinely reflect the level of uncertainty in the available data.
- Management controls are designed to address these uncertainties using the best available scientific information and a precautionary approach.
- Where there is an increased level of uncertainty in the information being provided, management measures include delaying fisheries, providing the first opportunities to fleets with lower impact or controlled effort (vessel and/or gear limitation).

Specific examples of measures or decisions that are consistent with the precautionary approach in general, and the provisions of Science Advisory 2006/023 in particular, include:

- Section [2.5.4](#) summarizes conservation and recovery measures implemented in BC pink and chum fisheries to control targeted harvests, incidental harvests, by-catch, and ecosystem impacts.
- Low impact fisheries (e.g. limited number of vessels) generally occur prior to those having a higher impact (e.g. 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.
- Exploitation rates on target stocks in mixed stock fisheries are constrained to protect less productive co-migrating stocks, and harvest opportunities are shifted towards selective or effort-controlled fisheries. For example, the mixed-stock chum fishery in Johnstone Strait is managed to a 20% exploitation rate (1-2% First Nation FSC opportunities, 17% commercial and about 1% test fishing), with additional harvests on productive stocks in terminal areas, based on in-season abundance estimates. Terminal chum fisheries have been restructured to allow low-effort harvests on small local surpluses with “pocket fisheries” in particular inlets with less than 10 vessels.
- Mixed-stock fisheries are generally implemented with shorter, low-impact openings early in the run, and then expanded as warranted by in-season information. For example, terminal chum fisheries in the Inner South Coast typically have short initial openings, and are either extended or closed depending on in-season escapement data and catch information from the initial opening.
- Harvest opportunities in many terminal fisheries are based on the lower quartile of the probability distribution for the abundance estimate (i.e. estimated 3 out of 4 chance that abundance is larger; 25th percentile, 75p level).
- Gear, area, and time of each fishery are adjusted to control incidental harvests and by-catch. For example, South Coast chum fisheries are delayed to protect Interior Fraser coho and Steelhead in Johnstone Strait, gear and area are adjusted to protect Interior Fraser Steelhead during chum directed fisheries at Nitnat; and commercial gill net fishery openings are delayed in order to protect 80% of the Fraser River return of Interior Fraser River Steelhead with 90% probability.

Additional examples are included in Chapters [2](#), [3](#), and [4](#). Chapter [2](#) describes the management system and outlines decision-making processes. Chapter [3](#) covers conservation and recovery initiatives.

Chapter 4 describes collaborative and advisory processes. Detailed descriptions of decision guidelines for each fishery are included in the *Certification Unit Profiles*.

1.2.2.4 Departmental Governance

Several on-going policy initiatives deal with the internal operations of the department. These include:

- *Integrated Risk Management (IRM)* is a DFO initiative focused on internal processes to manage legal liabilities and financial risk. Background information, risk management guidelines, and an implementation plan for IRM are available at www.dfo-mpo.gc.ca/communic/cread/irm/index_e.htm.
- *Management Accountability Framework (MAF)* is a Treasury Board Secretariat initiative focused on developing clear goals and monitoring performance throughout public service agencies in Canada. The main product from this initiative are
 - *Reports on Plans and Priorities (RPP)* which are released prior to the new fiscal year and describe how programs will support departmental plans and priorities and set out expected results.
 - *Departmental Performance Reports (DPR)* are released at the end of the fiscal year to provide a detailed analysis of how program activities have performed in relation to expected results identified in the RPP, as well as expenditures on different program components and links to internal audits.
- DFO is one of the participating agencies. The following information materials are available online:
 - Overview: http://www.tbs-sct.gc.ca/maf-crg/documents/booklet-livret/booklet-livret_e.asp
 - DFO: http://www.tbs-sct.gc.ca/maf-crg/assessments-evaluations/2005/FO-PO/FO-PO_e.asp
 - Process: www.tbs-sct.gc.ca/maf-crg/assessments-evaluations/assessments-evaluations_e.asp#r1
 - Guide to writing DPRs: http://www.tbs-sct.gc.ca/eval/pubs/RMAF-CGRR/guide/guide_e.asp
 - DPRs for all participating departments are available for 2005/2006 (www.tbs-sct.gc.ca/dpr-rmr/0506/index_e.asp) and 2006/2007 (www.tbs-sct.gc.ca/dpr-rmr/2006-2007/inst/institutions-eng.asp)
 - DFO RPPs and DPRs are available at <http://www.dfo-mpo.gc.ca/reports-rapports-eng.htm>.

Formal internal and external review processes are described in Section 4.3.5, which includes links to reports by DFO's *Audit and Evaluation Directorate*.

1.2.3 Policy for the Management of Fish Habitat

In 1986, DFO introduced the *Policy for the Management of Fish Habitat* to provide guidance to departmental staff, developers and the public on habitat conservation, restoration and development. The policy's overall objective is a net gain in the productive capacity of fish habitat, using the guiding

principle of “no net loss” to ensure that habitat is conserved. This policy administers the habitat protection provisions of the *Fisheries Act* (Section [1.1.2.2](#))

The full text of the policy is available at www.dfo-mpo.gc.ca/oceans-habitat/habitat/policies-politique/operating-operation/fhm-policy/index_e.asp. The summary below is from www.qc.dfo-mpo.gc.ca/habitat/en/reglementation.htm#Politique.

The object of the policy is to increase the natural productive capacity of habitats supporting the fish populations that sustain commercial, sport and subsistence fisheries. The overall goal is to achieve a “net gain” of fish habitat through the conservation, restoration, and development of such habitat.

The policy describes procedures for evaluating project proposals under the guiding principle of “no net loss” of productive capacity of fish habitat. In addition, the policy describes the review and analysis process that DFO must follow to identify the mitigation measures required to minimize or eliminate the adverse effects of projects on habitat or the compensation measures that apply in the event of a loss of fish habitat. The policy also specifies the proponent’s responsibilities with regard to minimizing or eliminating damage to fish habitat.

The policy recognizes that other sectors of the economy have a legitimate need to use water resources. Accordingly, it promotes the adoption of an integrated planning approach designed to ensure fish habitat protection and conservation while permitting the use of water resources for other purposes.

Habitat management takes place in a complex setting with many jurisdictions (Section [1.1](#)) and numerous advisory processes (Section [4](#)). On-going initiatives related to the integrated management of fish habitat are summarized in Section [3.3](#). Enforcement of habitat provisions is described in Section [2.6.2.3](#).

1.2.4 Aboriginal Fisheries Strategy

1.2.4.1 Implementing the Sparrow Decision

The Aboriginal Fisheries Strategy (AFS) was implemented in 1992 to address several objectives related to First Nations and their access to fisheries resources, including:

- Improving relations with First Nations.
- Providing a framework for the management of the First Nations fishery in a manner that is consistent with the 1990 Supreme Court of Canada Sparrow decision (Section [1.1.5.3](#))
- Greater involvement of First Nations in the management of fisheries (Section [4.2.1](#)).
- Increased economic returns from First Nations fisheries (Sections [1.2.4.3](#), [1.2.6](#), and [1.2.9](#)).

The AFS is applicable to areas where DFO manages the fishery and where land claims settlements have not already put a fisheries management regime in place. The AFS encourages and enables the establishment of relationships with Aboriginal people, provides a mechanism for DFO to address its legal obligations and promotes stable and orderly fisheries management for the benefit of all Canadians. It is also in keeping with the fact that courts have repeatedly encouraged governments and First Nations to resolve issues related to Aboriginal rights by negotiation rather than litigation.

Annual funding of the AFS is \$35 million, with about 125 AFS agreements signed each year since the implementation of the program. Approximately two-thirds of these agreements are reached with Aboriginal groups in DFO's Pacific Region.

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. An overview of the *Aboriginal Fisheries Strategy* is available at http://www.pac.dfo-mpo.gc.ca/tapd/afs_e.htm.

DFO has developed operational guidance for implementation in the *Policy for the Management of Aboriginal Fishing*. The full text of the policy is available at http://www.qc.dfo-mpo.gc.ca/peches/en/peche_au/politique.htm.

1.2.4.2 AFS Agreements

Fisheries and Oceans Canada (DFO) contributes annual funding of approximately \$16 million to more than 90 Aboriginal groups in British Columbia and the Yukon under the Aboriginal Fisheries Strategy (AFS). These funds are used in specifically-approved activities that may include negotiation of AFS agreements, management of Aboriginal fisheries, habitat restoration, fish enhancement, community-based research, economic development or stakeholder consultation. The AFS agreements may also contain provisions describing how Aboriginal groups manage their members' fishing opportunities for food, social and ceremonial purposes.

There are three main types of AFS Agreements: Watershed, Project Funding and Comprehensive Fisheries Agreements.

- *Watershed Agreements*: There is one major Watershed agreement in effect, for the Skeena River watershed. A majority of the First Nations in this watershed were signatories to this agreement. The purpose is to provide for a coordinated approach to the conservation, protection and enhancement of the fisheries resource in the area.
- *Project Funding Agreements*: These documents provide for the contribution of funds by DFO for carrying out specific projects or activities as agreed to by the parties and as detailed in *Schedule A* of each agreement.
- *Comprehensive Fisheries Agreements*: These are extensive and detailed documents describing the details of the collaborative relationship between DFO and the Aboriginal group with regard to fisheries-related activities.

AFS agreements are publicly available through the DFO library. The full text for most agreements is available online through WAVES, the DFO online library portal at <http://inter01.dfo-mpo.gc.ca/waves2/index2.html>.

1.2.4.3 Allocation Transfer Program (ATP)

Fisheries-based economic opportunities that promote orderly fisheries are realized primarily through the *Allocation Transfer Program* (ATP), which facilitates the voluntary retirement of commercial licences and the issuance of licences to eligible Aboriginal groups in a manner that does not add to the existing fishing effort. Since 1994-95, when the ATP was first launched, approximately 900 commercial licences have been issued to Aboriginal groups:

- An overview and contact information for further details are available at http://www.pac.dfo-mpo.gc.ca/tapd/atp_e.htm.

- The program continues to this day, and has been supplemented by funds from the *Pacific Integrated Fisheries Initiative* (Section [1.2.9.2](#)), as announced in a Fishery Notice to all commercial licence holders (<http://www.pac.dfo-mpo.gc.ca/ops/fm/PICFI/docs/RetirementFN.pdf>).
- A snapshot of First Nations' participation in commercial fisheries in 2003 was prepared by Michelle James of the BC Ministry of Agriculture, Food and Fisheries. The report is available at <http://www.agf.gov.bc.ca/fisheries/reports/NativeParticipationBCFishing03.pdf>.
- The *Licence Retirement Selection Committee* (Section [4.3.4.2](#)) coordinates licence transfers.

Section [1.3](#) clarifies how this initiative fits with other initiatives related to the changing structure of Pacific salmon fisheries.

1.2.5 Pacific Salmon Revitalization Plan (a.k.a. Mifflin Plan)

The *Pacific Salmon Revitalization Plan* was a multi-year programs initiated in 1996 with the three elements of gear selection (i.e. harvesters restricted to one of the three gear types), area selection (i.e. each licence restricted to a single area) , and fleet reduction through licence buy-backs.

Extensive materials about the plan and its implementation are publicly available, for example:

- 1996 report by Federal-Provincial Review Panel (<http://www.dfo-mpo.gc.ca/Library/199880.pdf>)
- Government response to Federal-Provincial Review Panel report (WAVES 223838)
- 1999 Review by the DFO's *Audit and Evaluation Directorate* (http://www.dfo-mpo.gc.ca/communic/cread/evaluations/99-00/salmon_e.htm)

1.2.6 Pacific Fisheries Adjustment and Restructuring (PFAR)

Pacific Fisheries Adjustment and Restructuring (PFAR) was a joint initiative of 4 federal agencies running from 1998 to 2002. The program emphasized a broad approach to addressing the challenges faced by Pacific fisheries at the time, such as drastic coastwide conservation measures for coho. PFAR had 3 key elements:

- Fishery restructuring through licence retirement (Sect. [2.5.3.4](#)) and selective fishing (Sect. [3.2.4](#))
- Economic development for fishing-dependent communities
- Rebuilding the resource through habitat restoration and strategic salmon enhancement

A discussion paper from 1998 is available at <http://www.dfo-mpo.gc.ca/Library/282246.pdf>. A progress report from 2000 is available at <http://dsp-psd.pwgsc.gc.ca/Collection/Fs23-370-2000-1E.pdf>. This reports summarizes the following:

- Commercial licences retired from 1996 to 2000, by gear type. Overall, the program achieved a 54% reduction in commercial licences over just 4 years.
- Selective fishing projects conducted in 1999 and 2000.
- Economic development projects in 1999 and 2000.
- Habitat restoration, salmon enhancement and habitat/watershed stewardship initiatives.

1.2.7 New Directions

1.2.7.1 A New Direction for Canada's Pacific Salmon Fisheries

A major milestone in the policy evolution was the 1998 discussion paper *A New Direction for Canada's Pacific Salmon Fisheries*, which established DFO's commitment to sustainable use of the salmon resource and mapped out guiding principles for comprehensive policy development. It established conservation as the primary objective for managing the wild salmon resource and set out 12 broad principles in the areas of conservation, sustainable use and improved decision-making.

New Directions called for more detailed policies to put its principles into operation. Policies and initiatives that directly grew out of *New Direction* are, in chronological order:

- An Allocation Framework for Pacific Salmon 1999-2005 (Blewett Report) (1999)
- An Allocation Policy for Pacific Salmon (1999)
- Improved Decision Making (Discussion Paper) (2000)
- A Policy for Selective Fishing in Canada's Pacific Fisheries (2001)
- The Wild Salmon Policy (2005)

The full text for all of these policies and discussion papers is available at http://www.pac.dfo-mpo.gc.ca/species/salmon/policies/default_e.htm. Each policy is described in more detail in the following sections.

1.2.7.2 An Allocation Policy for Pacific Salmon

An Allocation Policy for Pacific Salmon confirmed the precedence of conservation and described allocation principles for allocating among the commercial, recreational and aboriginal fisheries after conservation requirements have been met.

DFO conducted extensive planning and consultation under the *New Directions* initiative, and released *An Allocation Policy for Pacific Salmon* in October 1999, which presents a series of principles for sharing harvestable amounts of Pacific salmon among First Nations, recreational and commercial users. Interested parties had an opportunity to provide views to the Minister and DFO staff in writing or by taking part in facilitated meetings. The various views expressed were carefully considered in developing this final allocation policy.

The full text of the policy, which includes an overview of developments in the 1990s and a summary of advice received by DFO, is available at <http://www.dfo-mpo.gc.ca/Library/240366.htm>. A more detailed summary of the public feedback is included in the 1999 Blewett Report, available at <http://www.dfo-mpo.gc.ca/Library/240366.htm>.

Section [1.3.2](#) describes the allocation priorities and guidelines used to implement the policy.

1.2.7.3 Improved Decision Making (IDM)

In 2000, DFO initiated an independent review of participatory processes in the Pacific Region, conducted by the Institute for Dispute Resolution at the University of Victoria.

The resulting *Improved Decision Making (IDM)* initiative reviewed public participation in three distinct, but connected, processes:

- Annual salmon harvest management planning
- Policy development process for issues related to salmon fisheries management.
- Allocation and licencing

IDM unfolded in three phases:

- A discussion paper and background information were released in June 2000.
- Preliminary recommendations were publicly reviewed in March 2001.
- A final report was publicly released in May 2001.

All of the IDM materials, including records of written submissions, are available at http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/decision_e.htm.

Among 67 recommendations in the final report are the following:

- Establish a Policy Advisory Committee and a public Policy Forum process for discussion of key policy issues among all sectors (Recommendation 6). (Partly in place – Section [4.3.2](#))
- Establish a Commercial Harvest Planning Committee (In place – Section [4.3.4.2](#)).
- Create a Consultation Secretariat (In place – Section [4.2.2.2](#)).

A summary of current collaborative, advisory, and consultative processes is included in Section [4](#). Specific advisory processes described in Section [4.3](#) include:

- Bilateral consultation with individual First Nations, and regional groups (e.g. First Nations Fisheries Council, and AAROM (Section [1.1.5.8](#)) groups such as the Fraser River Aboriginal Fisheries Secretariat)
- Multi-sectoral advisory groups (e.g. Integrated Harvest Planning Committee)
- Harvester organizations (e.g. Commercial Salmon Advisory Board, Sport Fishing Advisory Board)
- Environmental groups (e.g. Marine Conservation Caucus)
- Community Dialogues

1.2.7.4 A Policy for Selective Fishing in Canada's Pacific Fisheries

In January 2001, the Department released *A Policy for Selective Fishing in Canada's Pacific Fisheries*. The policy lays out the department's objectives and principles for selective fishing as part of a long-term strategy for conservation and sustainable use. The policy outlines the responsibilities of harvesters for continuous development and implementation of new selective techniques and practices. The policy was based on the results of the intensive 4-year *Selective Fisheries Program* (Section [3.2.4.2](#)), in which DFO researchers and harvester groups experimented with a variety of methods to reduce the impact of fisheries on non-target species, with a number of measures reaching implementation in fisheries.

The policy defines selective fishing as the ability to “avoid non-target fish, invertebrates, seabirds, and marine mammals or, if encountered, to release them alive and unharmed”.

The *Selective Fishing Policy* clearly identifies the need for continuous improvement of gear and practices, and establishes strong incentives by linking that continuous improvement to future fishing opportunities. The policy lists an overarching objective and five principles:

- The objective is to ensure that selective fishing technology and practices are adopted where appropriate in all fisheries in the Pacific Region, and that there are continuing improvements in harvesting gear and related practices. Selective fishing is a requisite element of conservation-based fisheries. In meeting conservation objectives, fishing opportunities and resource allocations will be shaped by the ability of all harvesters – First Nations, commercial and recreational anglers – to fish selectively.
- *Principle 1:* Conservation of Pacific fisheries stocks is the primary objective and will take precedence in managing the resource.
- *Principle 2:* All Pacific recreational and commercial fisheries will adhere to selective fishing standards within set timelines.
- *Principle 3:* In fisheries where selective harvesting standards are not met within prescribed timelines, and by-catches prevent achievement of conservation objectives, fishing opportunities will be curtailed.
- *Principle 4:* Four fundamental strategies in fishing selectively to minimize mortalities and maximize chances for survival of non-target fish, invertebrates, seabirds and marine mammals will be adopted through increased knowledge of fishing gear and practices. In order of preference they are:
 1. avoidance of non-target species and stocks through time and area restrictions;
 2. avoidance through gear design;
 3. release alive and unharmed before being brought aboard or ashore, through gear design; and
 4. release alive and unharmed from the deck of the vessel or landing site (e.g. shore or fishing pier).
- *Principle 5:* First Nations and the recreational and commercial fishing sectors will be responsible for continuous learning and skills development and transfer of responsible and selective harvesting practices.

The full text of the *Selective Fishing Policy* is available at http://www-comm.pac.dfo-mpo.gc.ca/publications/selectivep_e.pdf

Implementation of the *Selective Fishing Policy* focuses on two priorities:

- Avoidance of non-target species is the best possible option in selective fishing. Test harvests on stock abundance, timing, and migration routes can supply valuable data to help develop fishing strategies that avoid non-target species or stocks of concern. Licensed harvesters can also play a role by informing the Department if stocks of concern are encountered. This may require improved communications and a shift in the practices of licensed harvesters who may be accustomed to keeping such information confidential.
- The next best option involves releasing non-target fish, invertebrates, seabirds, and marine mammals encountered (and captured) alive and unharmed, or in the best possible condition, to

maximize survival. Fish released that would not likely survive long enough to reproduce should be counted as mortalities, along with all retained fish. Fisheries and Oceans Canada is interested in developing ways of estimating spawning success of released fish.

Section 2.5.4 describes general conservation measures in BC pink and chum fisheries. Section 3.2.4 recounts the development and implementation of selective fishing measures in BC salmon fisheries.

1.2.8 Watershed Years: 2004/2005

1.2.8.1 New Challenges

The 2004 fishing season presented many particularly complex challenges, and triggered substantial debate among DFO and stakeholders. Two interwoven issues were at the forefront of the debate:

- Management of salmon fisheries in the face of conservation measures (e.g. Cultus Lake sockeye) and increased environmental uncertainty (e.g. high en-route mortality of Late run Fraser sockeye).
- Changing structure of salmon fisheries in the evolving context of First Nations rights and treaties.

1.2.8.2 Reviews and Recommendations

Two independent reports with recommendations for the changing structure of Pacific fisheries were developed prior to the 2005 fishing season:

- Report by the Federal-Provincial Joint Task Group on Post-Treaty Fisheries, called *Treaties and Transition: Towards a Sustainable Fishery on Canada's Pacific Coast*. A summary of the recommendations is available at <http://www.dfo-mpo.gc.ca/media/back-fiche/2005/pr07d-eng.htm>, and the full report is available at <http://www.pac.dfo-mpo.gc.ca/publications/pdfs/jtf-eng.pdf>.
- Report by the First Nation Panel on Fisheries, called *Our Place at the Table: First Nations in the BC Fishery*. A summary of recommendations is available at <http://www.dfo-mpo.gc.ca/media/back-fiche/2005/pr07c-eng.htm>, and the full report is available at <http://www.fns.bc.ca/pdf/FNFishPanelReport0604.pdf>.

Given the implementation challenges faced in the 2004 Fraser sockeye fishery, two separate reviews were conducted:

- A ministerial review chaired by Mr. Bryan Williams, a former Chief Justice of the BC Supreme Court, referred to below as the *Williams Review*. A committee appointed by the Minister of Fisheries conducted public hearings throughout BC and reviewed the performances of fisheries. The final report, including 47 specific recommendations, is available at <http://www.dfo-mpo.gc.ca/Library/314601.pdf>.
- Report by the Canadian Senate Standing Committee on Fisheries and Oceans, referred to below as the *SCOFO Report*. The committee conducted 3 days of hearings in Vancouver, and their final report with recommendations is available at <http://www2.parl.gc.ca/HousePublications/Publication.aspx?DocId=1698791&Language=E&Mode=1&Parl=38&Ses=1&File=9>

1.2.8.3 Plan of Action to Reform Pacific Fisheries

DFO formally responded to these reviews:

- A summary of the response to the *Williams Review* is available at <http://www.dfo-mpo.gc.ca/media/back-fiche/2005/hq-ac64a-eng.htm>. The full response is available at <http://www.dfo-mpo.gc.ca/Library/315508e.pdf>.
- Response to the *SCOFFO Report* is available at <http://www2.parl.gc.ca/HousePublications/Publication.aspx?DocId=1945044&Language=E&Mode=1&Parl=38&Ses=1>

The departmental response to reviews and recommendation emphasized four themes for long-term improvement:

- Sustaining strong salmon populations by setting clear objectives for each fishery based on the principles of the *Wild Salmon Policy*.
- Strengthening departmental programs that are critical to salmon conservation, such as habitat protection, enforcement, and the scientific assessment of stocks.
- Making progress over time on increasing First Nations' access to economic fisheries in collaboration with First Nations and Indian and Northern Affairs Canada.
- Improving the economic performance of fisheries so that they reach their full potential, provide certainty to participants and optimize harvest opportunities.

The departmental response also identified immediate measures for enforcement, catch monitoring, and stock assessment.

DFO conducted extensive consultations to develop a concrete implementation plan based on all of the recommendations received, which was announced in April 2005. The full announcement is available at <http://www.dfo-mpo.gc.ca/media/npres-communicue/2005/pr21-eng.htm>.

The implementation plan had two distinct elements:

- A detailed action plan for 2005 covering commercial demonstration fisheries, First Nations fisheries, and consultations on broader changes to the structure of Pacific Fisheries.
- Visions and principles for long-term reform in Pacific fisheries

1.2.8.4 Initiated Pacific Fisheries Reform

Building on the advice and recommendations received in 2004, DFO committed to a comprehensive development process to shape a unified long-term vision for sustainable and viable fisheries in the Pacific Region. The resulting initiatives, *Pacific Fisheries Reform* and *Pacific Integrated Fisheries Initiative*, are described in Section [1.2.9](#).

1.2.8.5 Finalized *Wild Salmon Policy*

Concurrent with the substantial policy developments described in previous sections, DFO also conducted extensive consultations on the *Wild Salmon Policy*, which was finalized in 2005. This policy established the principles and processes for sustainable management of wild Pacific salmon. The policy, its development, and on-going implementation efforts are described in Section [3.2.2](#).

1.2.9 The Changing Structure of Pacific Fisheries

1.2.9.1 Pacific Fisheries Reform (PFR)

Pacific Fisheries Reform, announced by DFO in April of 2005, describes a policy framework for improving the economic viability of commercial fisheries, and for addressing First Nations aspirations with respect to FSC fisheries, commercial access, and involvement in management. Work has also been initiated with the recreational sector to better understand their place in the future fishery. *Pacific Fisheries Reform* is entirely consistent with the existing fisheries management policies of the Department and is central to ensuring well integrated, sustainable fisheries for all species.

The full press release is available at <http://www.dfo-mpo.gc.ca/media/npres-communicue/2005/hq-ac64-eng.htm>.

The goals of *Pacific Fisheries Reform* are:

- Post-treaty fisheries that are resilient to variation in both nature and markets.
- Greater stakeholder involvement in planning and management processes.

A discussion paper on the implementation of *Pacific Fisheries Reform* was circulated in September 2005. Extensive public consultation took place in 2006. The discussion paper, consultation guide, and a summary presentation are available at http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/consultation2006/reform_e.htm

Pacific Fisheries Reform is currently in the implementation phase, and specific initiatives are described in Section [1.2.9.5](#)).

1.2.9.2 Pacific Integrated Commercial Fisheries Initiative (PICFI)

The *Pacific Integrated Commercial Fisheries Initiative* (PICFI) is a 5-year initiative announced in July 2007. PICFI builds on work done so far under *Pacific Fisheries Reform* and subsequent discussions in the different collaborative, advisory, and consultation processes (Section [4](#)). The full press release is available at <http://www.dfo-mpo.gc.ca/media/npres-communicue/2007/hq-ac38-eng.htm>. Up-to-date information on PICFI and its implementation can be found at http://www.pac.dfo-mpo.gc.ca/ops/fm/PICFI/default_e.htm.

PICFI encompasses work on four distinct elements:

- Enhanced Accountability Measures covering catch monitoring, traceability, and compliance.
- Acquiring Commercial Fisheries Access for First Nations. This is a significant supplement to the Allocation Transfer Program (Section [1.2.4.3](#))
- Capacity Building for managing fisheries, accessing fishing opportunities, and developing technical support.
- Co-management, among First Nations, and among all harvesters.

PICFI is designed around social and economic incentives for participation in the process, particularly increased reliability of allocations as a mechanism for increased accountability in monitoring and compliance. The process emphasizes clear business plans for future fisheries and encourages local cooperation (e.g. among First Nations, across harvest sectors).

First Nations fisheries are an important element of PICFI, but the process is open to all stakeholders and intends to address the full social context of Pacific fisheries (e.g. coastal communities such as Prince Rupert)

Public consultation shapes every step of the development process, from concepts to planning and implementation, and involves the full spectrum of advisory processes that evolved out of the *Improved Decision Making Framework* (Section [1.2.7.3](#))

PICFI consultations are thoroughly documented to enable broad public input:

- DFO hosted a series of *Community Dialogue* sessions in the Fall of 2007 to seek broad feedback on the basic design of integrated commercial fisheries. The schedule was posted on-line at http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/Consultation2007/2007meeting_schedule.htm.
- Discussion materials for 2007 are available at http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/Consultation2007/PICFI/Main_Tech_Des_Workshop_2007_e.htm
- Public records from 2007 PICFI consultations are available at http://www.pac.dfo-mpo.gc.ca/ops/fm/PICFI/WorkshopReports_e.htm
- DFO is also in the process of setting up a multi-sectoral PICFI advisory committee.

The remainder of this section introduces related projects and initiatives, organized into 3 general categories:

- Developing the policy and implementation framework
- Developing the tools for successful and efficient implementation
- Pilot projects to build support and test operational details

1.2.9.3 Developing the Policy and Implementation Framework

DFO is increasing First Nations participation in integrated commercial fisheries in a manner that does not add to the existing effort on the resource through the voluntary retirement of commercial licence eligibilities and quota and their subsequent issuance to eligible First Nations organizations:

- An overview of the 2008 Licence Acquisition process, including a link to the public announcement, is available at http://www.pac.dfo-mpo.gc.ca/ops/fm/PICFI/archives/2007-2008_Licence_Acquisition_e.htm
- An inventory of licence acquisitions is available at <http://www.pac.dfo-mpo.gc.ca/fm-gp/picfi-ipcip/docs/relinquishment-renonciation-2009Apr-Avr29.pdf>

Monitoring and reporting in Pacific fisheries have been addressed in a number of recent policy initiatives by Fisheries and Oceans Canada. For example, The *New Directions* policy series, and specifically the *Allocation Policy* emphasize that government, First Nations, and stakeholders have joint responsibility and accountability for sustainable fisheries, including management costs and decisions. This includes monitoring and reporting, and DFO committed to work with representatives of all harvesting sectors to develop basic catch monitoring and reporting standards. These standards will identify the best catch data collection system for each fishery (these may well differ between and within sectors), and improve the comprehensiveness, timeliness and credibility of catch data while seeking to minimise the associated costs. Over the longer term, the costs of catch monitoring and

reporting will be the responsibility of each harvesting group. Implementation of this will be discussed with each group and may reflect different arrangements according to the specific needs of the individual harvest group. A discussion paper, titled *Pacific Region Fishery Monitoring and Reporting Framework* was released in 2002. The paper is available at http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/fisheriesmgmt/reportingframework/monitoringpaper_e.pdf.

This work is continued under the Enhanced Accountability element of PICFI, which outlines DFO's long-term vision for compliance incentives, harvester participation in monitoring, and data management. Enhanced accountability builds on the 2002 discussion paper, and an updated monitoring framework is expected to be circulated for consultation in 2008. The principles and design considerations for accountability measures are part of the on-going PICFI consultations:

- Additional context is provided by http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/fisheriesmgmt/reportingframework/qa_e.htm.
- An overview is available at http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/Consultation2007/PICFI/Enhanced_accountability_measures_e.htm

1.2.9.4 Developing the Tools for Successful and Efficient Implementation

As part of the *Reporting and Monitoring* initiative, DFO is developing a series of implementation tools:

- 5-year strategic implementation plan
- Revised internal business processes and streamlined data management responsibilities
- Monitoring Plan for Lower Fraser
- Inventory of current monitoring programs
- Commercial Monitoring Standards (i.e. integrated monitoring plans for each major fishery with an emphasis in statistically rigorous design and rapid data availability)
- Final catch estimates
- Upgrading the Fisheries Operating System (FOS): 2-4 year process to integrate multiple data sources, improve integration of observer data on non-target stocks and species, improve public access, customize data, and develop interfaces for different information needs.
- Electronic logbooks are in the early stages of development, with an initial focus on commercial salmon fisheries. The main expected benefit for management is faster information with improved quality through real-time data transmission, as opposed to the daily phone-ins and end-of-season log book submissions, which then have to be manually entered into the database. Expected benefits for harvesters include saving the cost of paper log books, saving the time of daily phone-ins with unreliable signal (which is otherwise mandatory), and reliable encryption. These benefits are expected to improve compliance, even though compliance is already high (Section [2.6.2.3](#)). The first year of the project, 2006, focused on hardware and software development, as well as building end-user support through 12 pilot projects. In 2007, the emphasis shifted to demonstrations at trade shows and proader pilot testing across gear types, with about 10 vessels in each Licence Area. Early development and testing of hand-held e-logs for recreational fisheries is also underway in fishing guides and lodges.

1.2.9.5 Pilot Projects to Build Support and Test Operational Details

Numerous pilot projects have been implemented across all Pacific salmon fisheries. For example:

- *Area H Quota Pilots (2003, 2006)*: Two quota-based pilots have been implemented. One element of these pilots was to develop and test monitoring programs with independent catch confirmation. Two options were available to harvesters: dock-side verification by a fisheries observer or at-sea verification at a packer that only accepts fish from IQ/ITQ boats.
- *Area D Gillnet Effort Control*: Over the last 5 years commercial harvesters and DFO have developed and refined a collaborative effort-control program (a.k.a “small-bites fisheries”). These mostly target chum stocks in terminal fisheries, with short openings and a small number of vessels that can participate. For example, 5 boats out of 240 licence holders are selected by harvesters to fish Toba Inlet for a 1-day opening every two weeks. Based on agreements among licence holders, similar low-impact terminal fisheries have been designed for chum stocks along both coasts of Vancouver Island. All of these are managed based on local abundance, not aggregate abundance, and also provide improved abundance data for future management. Area C does not currently have the same kind of stakeholder-driven initiative, so Area C fisheries are open to all licence holders.
- *Improved stability of Inner South Coast chum fisheries*: Inside chum are harvested in the Johnstone Strait mixed-stock fishery, which includes all three gear types. In collaboration with licence holders (B, D, H) the management of this fishery has shifted away from the abundance-based decision rules (a.k.a. “chum clockwork”) to fixed exploitation rate and fixed dates. Two major practical challenges were encountered with the clockwork approach: it was highly sensitive to in-season estimate of abundance, which not only carried substantial uncertainty but also changed as additional in-season information became available. The clockwork was reviewed after series of years with uncertain abundance estimates spanning across the on/off trigger point for the fishery. Harvesters and DFO jointly developed a new approach, and the mixed-stock fishery is now set at a conservative fixed exploitation rate of 20%. This development has 4 distinct benefits: (1) Minimize potential impacts on small stocks that are not following the aggregate abundance pattern (low abundance of one stock when aggregate abundance is high), (2) minimize potential long-term consequences of over-estimation in low abundance years, (3) improve stability and predictability for harvesters, and (4) improve data availability as the foundation for improved terminal fisheries.
- *Area E Mandatory Landing Program*: A mandatory landing program was implemented for the 2007 season to complement established effort counts, and dockside observers picked about 30% of vessels for detailed count. The plan is to expand observer capacity to complete dockside monitoring .

The *Certification Unit Profiles* for each areas provide additional details about these and other changes to fishing patterns.

1.3 Summary: Social and Economic Elements of the Management Context

1.3.1 Social and Economic Considerations in Current Policy Initiatives

1.3.1.1 Balancing Biological, Social, and Economic Considerations

Biological objectives of conservation and recovery are the main policy drivers in Pacific Salmon management. The relevant laws and policies are outlined above, and the initiatives designed to achieve them are described in Section [3](#).

However, in the practical setting of salmon fisheries these biological objectives are balanced with social and economic objectives. The primary mechanism for sharing the social and economic benefits of Pacific salmon is through formalized allocations (Section [1.3.2](#)). In addition, all of the major policy initiatives have strong social and economic components, and an extensive network of advisory and consultative forums has been established to bring diverse views into the process of planning and implementing fisheries (Section [4](#)).

1.3.1.2 Incorporating Social and Economic Considerations

Fisheries managers receive advice on socio-economic values and issues formally through established advisory and consultative processes (Section [4](#)) and informally through direct interaction with harvesters and other interested groups. For example, the Canadian Section of the Fraser Panel (Section [1.1.4.4](#)) is comprised of members of the commercial, recreational and First Nations fishing community who identify socio-economic issues to be considered in the management of the fishery. In addition, representatives of the Province of B.C. raise socio-economic issues that have been identified by the industry and communities.

Fisheries and Oceans Canada also employs formal analyses of social and economic impacts in the implementation of conservation and recovery policies. Recent examples include:

- *Species at Risk Act*: Implementation of the act includes a formal evaluation of economic impacts associated with listing a species under SARA. Section [1.1.2.4](#) describes the act. Section [3.4](#) lists assessments and recovery efforts for species listed as threatened or endangered under Schedule 1 of SARA.
- *Wild Salmon Policy*: The policy outlines an integrated planning process for bringing cultural, social and economic values into the conservation and sustainable management of Pacific salmon. DFO is working with First Nations, partners and stakeholders on shaping the necessary collaborative processes. Section [3.3.2.5](#) describes an implementation pilot for Barkley Sound. A central element of the policy are benchmarks to be defined for each Conservation Unit (CU). The emphasis of the benchmarks shifts from conservation (lower benchmark) to long-term benefits (upper benchmark) as CU status improves. Section [3.2.2](#) describes the policy, its development, and its on-going implementation including the CU benchmarks.
- *Selective Fishing and Effort Reduction*: In 1998, when selective fishing was introduced into the salmon fishery to protect threatened stocks of coho, considerable effort was expended to assess the socio-economic impacts of the proposed changes. A contract was let solely for the purpose of assessing the socio-economic impacts of the proposed fishing plan. \$200 million was subsequently spent on licence retirements. Section [2.5.3.4](#) includes an overview of commercial licencing, and Section [1.2.6](#) summarizes the restructuring program.

- *Salmon Enhancement Program*: An important element of salmon enhancement projects are opportunities for community economic development through funding for restoration work and employment at hatcheries (Section [3.2.5](#))

1.3.1.3 Clarification: AFS vs. PFR vs. PICFI vs. FSC vs. Treaties vs. FOG vs. AAROM

- The Aboriginal Fisheries Strategy (AFS – Section [1.2.4](#)) was started in 1992 to address DFO’s objectives and legal obligations related to First Nations and their access to fisheries resources. The program funds collaborative management initiatives as well as specific projects and activities (e.g. Aboriginal Guardian Program)
- Pacific Fisheries Reform (PFR – Section [1.2.9.1](#)) and Pacific Integrated Commercial Fisheries Initiative (PICFI – Section [1.2.9.2](#)) are aimed at shaping sustainable and viable fisheries in the legal context of ratified and anticipated treaties. The public consultation processes for PFR and PICFI are influenced by and consistent with the treaty process.
- Food, Social, and Ceremonial (FSC – Section [1.1.5.4](#)) fisheries are legally established communal rights, and have the highest allocation priority after conservation. However, the exact nature of FSC rights is evolving, and the treaty process is a framework for formalizing FSC rights, among other things.
- FSC allocations are formalized within treaties (Section [1.1.5.6](#)), but commercial First Nations fisheries are covered in Harvest Agreements that are not part of the treaty. Fisheries Operational Guidelines (FOG) for managing First Nations commercial fisheries are subject to collaborative revision.
- An important element of PFR and PICFI is to create strong incentives for participating in enhanced accountability initiatives based on the expectation of more reliable fishing opportunities (e.g. fixed share of TAC).
- The Allocation Transfer Program (ATP - Section [1.2.4.3](#)) is designed to improve First Nations’ access to fisheries resources without increasing the overall fishing effort. As with PFR and PICFI, the licence transfers are tied to compliance measures.
- The Aboriginal Aquatic Resource and Oceans Management (AAROM - Section [1.1.5.8](#)) initiative is designed to increase First Nations capacity for participation in collaborative planning and implementation.

1.3.2 Allocation

1.3.2.1 Allocation Policy, Access Priorities, and Legal Setting

Social and economic elements of the fishery are primarily implemented through harvest allocations. *An Allocation Policy for Pacific Salmon* was finalized in 1999 (Section [1.2.7.2](#)). The policy formalizes management priorities and establishes sharing principles for salmon harvests:

- The *Allocation Policy* identifies the priority for allocation of salmon harvest, sets sharing arrangements between recreational and commercial, and specifies target shares for each of the three commercial fishing gear types. The target gear share is 40% seine, 38% gill net and 22% troll. Specific allocation plans for each year are included in the annual *Integrated Fisheries Management Plans* (e.g. Appendix 4 of the 2008 SC IFMP).

- The policy applies within the context of First Nations food, social and ceremonial requirements (FSC), treaty obligations to First Nations, and Canada’s international obligations under the Pacific Salmon Treaty.
- The policy is operationalized through an annual Allocation Plan, which is publicly reviewed prior to the fishing season. The 2008 pre-season Pacific Salmon Allocation Plan is included in Appendix 4 of the 2008 salmon IFMP (Section [4.2.1.2](#)).
- Based on the *Allocation Policy* and annual *Allocation Plan*, fishing opportunities are planned for different fishing sectors at different abundance levels. The general approach is described below, and the specifics for each harvest sector follow in subsequent sections.

Section [2.2.3](#) describes fisheries targeting BC pink and chum.

The table below describes the generalized framework by which fishing opportunities are allocated to different fishing sectors at different abundance levels.

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

(Source: Table 6 of the 2007 Salmon *IFMP*)

This table describes conceptually how First Nations FSC, recreational and commercial fisheries are generally 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 to non-target 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 (Section [2.3](#)).

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

1.3.2.2 Allocation in First Nations Fisheries

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

While this opportunity is given priority over all other allocations (except conservation), it does not necessarily mean that fishery targets for First Nations will be fully achieved before other fisheries can proceed. Many First Nations conduct their fisheries in terminal areas while other fisheries are undertaken in marine or approach areas. The fishing plan must adequately provide for the First Nations food, social and ceremonial harvests over a reasonable range of potential run sizes.

DFO field staff engage in consultations with First Nations. There has been a history of interaction between DFO and First Nations. The *Aboriginal Fisheries Strategy* (Section [1.2.4](#)) has been developed and implemented to foster positive working relationships with First Nations. Part of this is the negotiation regarding communal licences where the views and customs of the First Nation are considered.

DFO and First Nations are also collaborating on a series of initiatives regarding fishing for economic purposes to experiment with mechanisms to integrate management of fisheries following the negotiations of treaties (Section [1.1.5.5](#)) and on-going reforms to Pacific salmon fisheries (Section [1.2.9](#)). These fisheries are undertaken with two principles:

- These fisheries are of the same priority as the commercial fishery.
- The share of fish harvested by First Nation economic opportunity fisheries must be fully mitigated over time by the retirement of commercial salmon licences from the commercial fishery.

1.3.2.3 Allocation in Recreational Fisheries

Under the Department's Allocation Policy for Pacific Salmon, after FSC fisheries, the recreational sector has priority to 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.

If stock abundance information suggests that conservation objectives cannot be attained, closures or non-retention regulation will generally be applied. In some cases, recreational fisheries with a non-retention restriction in place will remain open while First Nations FSC fisheries are closed, provided the recreational fishery is not directed on the stock of concern, nor is the impact on the stock of concern significant.

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

1.3.2.4 Allocation in Commercial Fisheries

The Allocation Policy for Pacific Salmon provides for at least 95% of the combined commercial and recreational sockeye, pink and chum harvest to be allocated to the commercial sector. Commercial

harvest of chinook and coho salmon will occur when abundance permits and First Nations and recreational priorities are considered to have been addressed.

Specific sector target allocations are: 40% seine, 38% gill net, and 22% troll, expressed on a sockeye equivalent basis. The ability to achieve these targets is often compromised by conservation constraints and other factors. Commercial allocation targets by area and by species are included in the annual *Integrated Fisheries Management Plan*, which is publicly reviewed prior to each fishing season (Section [4.2.1.2](#)).

Low impact fisheries (e.g. limited number of vessels) generally occur prior to those having a higher impact (e.g. 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.

When one commercial gear type is unlikely to achieve its allocation, the usual approach is that the same gear type, but in a different area, is provided opportunities to harvest the uncaught balance.

Allocation targets are not catch targets for each sector. While the Department usually plans and implements fisheries to harvest fish in accordance with allocation targets, opportunities may be provided that are inconsistent with the allocation targets. For example, in the case of Late Run Fraser River sockeye, the Department may choose to close marine fisheries (seine, gill net and troll) and open river fisheries (gill net) to take advantage of a large run size of Summer Run sockeye, despite low abundance of Cultus or Late Run sockeye.

1.3.2.5 Allocation in Excess Salmon to Spawning Requirements (ESSR) 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 escapements 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.

DFO attempts, wherever practical, to eliminate or minimize ESSRs by harvesting in the FSC, recreational, and commercial fisheries. The intent is not to establish new ESSR fisheries that displace existing fisheries.

If ESSR opportunities are identified, the first priority is 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.

1.3.2.6 Coastal Communities

Coastal communities are not specifically addressed in the Allocation Policy. However, fishing fleets are centered in coastal communities:

- Fisheries and Oceans Canada has area and sub-division offices in many coastal communities. DFO employees are well aware of the dependence of many coastal communities on the fishery.
- Coastal communities actively participate in consultation processes hosted by Fisheries and Oceans Canada concerning social and economic issues related to fisheries and their impact on those communities (Section [4](#))

2 MANAGEMENT OF BC PINK & CHUM FISHERIES

2.1 Overview

This chapter describes the general management approach for BC pink and chum salmon and the fisheries harvesting them. The information is organized into 6 sections:

- *Background* information about the species, types of salmon fisheries, and the different biological groupings of salmon used for purposes such as stock assessment and in-season management.
- *Goals and Targets* outlines general considerations that shape the management of all Pacific salmon, introduces stock- and fishery-specific management objectives, and concludes with comparison between theoretical reference points and their operational equivalents currently in use.
- *Monitoring and Assessment* describes the types of assessment activities in place for BC salmon and briefly summarizes the specific programs in place for pink and chum.
- *Planning and Implementation* describes the management tools DFO uses to shape fisheries and control effort.
- *Compliance Mechanisms* describes how compliance is monitored and regulations enforced, summarizes current enforcement priorities, and links to summaries of enforcement success.
- A final section summarizes *DFO's Toolkit* for assessment, monitoring, and enforcement.

More detailed information about particular stocks or fisheries is included in a set of companion documents called *Certification Unit Profiles*. These profiles are available for the following Certification Units under the MSC evaluation process:

- North Coast and Central Coast chum salmon
- West Coast Vancouver Island chum salmon
- Inner South Coast chum salmon (excluding Fraser chum)
- Fraser chum salmon
- North Coast and Central Coast pink salmon
- Inner South Coast pink salmon (excluding Fraser pink)
- Fraser pink salmon

Each CUP includes information about stock status, management reference points, management approach for fisheries in the area, assessment programs, and specific conservation measures.

Note: Some of the examples included in this section are not directly from pink and chum fisheries, but illustrate general points about management system for Canada's Pacific salmon fisheries.

2.2 Background

2.2.1 Management Adapted to Species Characteristics

DFO's management of Pacific salmon is adapted to the characteristics of each species and the structure of fisheries targeting those species.

Sockeye assessment and management, as described in the 4 sockeye submissions to the MSC, reflect the distinctive population structure of sockeye salmon:

- Sockeye forecasts are developed for stock units based on spawning location and migration timing.
- Sockeye in-season management distinguishes between major stock aggregates.
- Sockeye conservation units under the *Wild Salmon Policy* are generally based on rearing lakes and migration timing.

Management and assessment of pink and chum salmon is similarly adapted to the particular population structure of these species:

- Pink salmon have a fixed 2-year life cycle, resulting in reproductively distinct stocks spawning in the same location in odd and even years.
- Chum salmon mature predominantly at ages 3 to 5, so that each year's run is recruited from three different brood years and any one year's harvest impacts on future production are mitigated by two other age classes.
- Pink and chum salmon have a much looser geographic structure than sockeye, and are managed in broader geographic aggregates. Pink stocks are managed in larger aggregates than chum salmon. Aggregations for these species use spawning streams, run-timing, geographic area, and genetic characteristics in determining stock groupings for management and conservation purposes.

An overview of Pacific salmon species and their general characteristics is available at <http://www.pac.dfo-mpo.gc.ca/fm-gp/species-especes/salmon-saumon/facts-infos/index-eng.htm>.

2.2.2 Biological Units

2.2.2.1 Hierarchy of Biological Units

Biological units for BC pink and chum are currently defined and used at five levels of resolution.

- *Natal streams*: These are the smallest biological units typically used. Data from annual escapement surveys is recorded and electronically archived at this level of resolution. All other biological units are based on some grouping of these stream units. Geographic locations of streams are documented using the BC Provincial stream mapping system.
- *Watershed aggregates*: Pink and chum assessment information for larger river systems is recorded using a tributary stream hierarchy system which follows the BC Provincial stream naming and numbering system. Large river systems may have several orders of tributary levels found within a watershed (e.g. Nass River chum).
- *Statistical Area and Management Sub-Area aggregates*: These are defined by federal regulations (Section [1.1.2.8](#)) under the *Fisheries Act* (Section [1.1.2.2](#)). Management Sub-Areas are geographic divisions found within a Statistical Area. Statistical Areas and Management Areas represent aggregates of watersheds found within each of these statistical areas. Catch and escapement data for pink and chum have historically been grouped by stat area. Commercial, recreational and Aboriginal harvests are documented at this level for both Canadian domestic management of pink and chum stocks and international data commitments. Current annual escapement estimates and conservation measures are summarised by Statistical Area. General maps of statistical areas are available at http://www.pac.dfo-mpo.gc.ca/ops/fm/Areas/areamap_e.htm. Detailed stream

information for each statistical area is available through DFO's Mapster tool at <http://www.canbcdw.pac.dfo-mpo.gc.ca/ows/imf.jsp?site=mapster>.

- *Run timing aggregates*: Some salmon stocks are differentiated based on the timing of adult return migration. However, this is typically only used for sockeye and chinook stocks where genetically distinct groups of spawners migrate through major fisheries or up the river with a relatively distinct peak timing (e.g. Early Summer Fraser sockeye, Spring-run Fraser chinook). Pink and chum salmon from the same watershed generally do not show distinct timing, and are genetically similar (See conservation units below)
- *Conservation Units (CU)*: The Wild Salmon Policy (Section [3.2.2](#)) requires that the biodiversity of wild salmon will be maintained by identifying and managing CUs that reflect the ecological, geographic and genetic diversity of a species. The framework for identifying CUs for all species of salmon is described in the policy, and the scientific details of implementation are being developed as part of an extensive on-going research effort:
 - A detailed methodology for delineating CUs has been developed and has undergone peer-review through the PSARC process (Section [4.3.5.1](#)). Both the method and resulting list of CUs have been revised through extensive public consultation since 2006. The most recent information materials are available at www-comm.pac.dfo-mpo.gc.ca/pages/consultations/wsp/wsp_forum_March_2008_e.htm. Final versions will be available on the website of the *Canadian Science Advisory Secretariat* at http://www.meds-sdmm.dfo-mpo.gc.ca/csas/applications/Publications/publicationIndex_e.asp. A complete and up-to-date list of sites for each Conservation Unit (CU) is available at www-comm.pac.dfo-mpo.gc.ca/pages/consultations/wsp/CUs_e.htm. For more information about conservation units and the Wild Salmon Policy, refer to Section [3.2.2](#).
 - A paper documenting population structure and stock structure for B.C. chum salmon is being published (*Population structure and stock identification of chum salmon from British Columbia determined with microsatellite DNA variation* by Beacham, Spilsted, and Wetklo)
 - The WSP research priority for 2009 is to finalize CUs and develop the CU-specific benchmarks required under the policy.

This hierarchy of biological units is best illustrated with a specific example: Escapement data is summarized for Kitimat River chum, which covers the mainstem, side channels, and all major and minor tributaries in the watershed. Kitimat River is one of 13 watersheds that are tracked in the North Coast escapement database as part of the Kitimat Arm Management Sub-Area, which in turn is one of 7 management sub-areas in Statistical Area 6. Douglas-Gardner is one of 39 preliminary conservation units for BC chum, and contains the Kitimat Arm Management area.

Section 2.1.1 of each *Certification Unit Profile* (CUP) contains a description of conservation units in the area, and Table 1 of each CUP lists the component populations of each CU.

Escapement data is readily available at each level of resolution within this hierarchy.

2.2.2.2 Use of Biological Units

A range of biological units are used to plan, implement, and assess pink and chum fisheries, but the basic planning unit for Pacific Salmon Treaty management and domestic fisheries management are watershed aggregates.

- *Stock Assessment:* Pink and chum stock groupings are well defined for assessment purposes. For example, these stock groupings are used in the *North and Central Coast Core Stock Assessment Program for Salmon* by English, Spilsted, and Peacock (2006), which identifies the “core” data need to provide information on stock status, trends, and productivity required to inform and guide the decision making process related to salmon stocks and fisheries, including pink and chum. Formal forecasts for North Coast chum are produced using the watershed aggregate stock unit. Spawner arrival timing estimates are identified for most streams as well as for run timing aggregates that co-migrate through commercial net fishing areas. In-season (during net fisheries) and post-season stream assessments are conducted on key streams to assess run size. Stream assessment data is well documented and is incorporated into weekly commercial fishery management plans. Similar levels of assessment are in place for most of the South Coast. The *Certification Unit Profiles* describe the assessment framework for each area in more detail.
- *Conservation:* Stock units are well defined for purposes of conservation and genetic stock groupings have been identified. There is biological information to distinguish stocks but no evidence of population sub-structure to warrant further division of pink and chum stocks below watershed units. Conservation units (CU) for pink and chum generally contain several watershed groupings. Refer to Section [3.2.2](#) for a description of CUs.
- *Fisheries Management:* Stock units are well defined for management purposes. Pink and chum salmon are typically harvested in a combination of mixed-stock fisheries with low exploitation rates and terminal fisheries harvesting local abundances at the mouth of the natal stream. Pre-season forecasting for these species may encompass a wide range of uncertainty. Stock aggregates are generally geographic and follow Statistical Area boundaries to facilitate fishery management. Knowledge of run timing and non-retention of species of concern are used as a management tool to limit by-catch of non-target stocks and species. Sufficient in-season escapement monitoring is conducted on core streams to identify and react to potential conservation concerns in a timely manner. Section [2.2.3](#) briefly summarizes fisheries harvesting BC pink and chum salmon.

In summary, BC pink and chum salmon are managed at the Statistical Area level, but fisheries targeting pink and chum salmon are actually managed in finer, more localized level of spatial resolution (i.e. by major system in terminal areas). In order to ensure the long-term survival of pink and chum salmon in both small (generally less productive) and large coastal streams, precautionary management strategies have been adopted. For examples, refer to the fisheries descriptions in Section [2.2.3](#), the explanation of DFOs conservation strategy in Section [2.5.4](#), and the overview of selective fishing measures in Section [3.2.4.3](#).

2.2.3 Fisheries Targeting BC Pink and Chum Salmon

2.2.3.1 Types of Salmon Fisheries

Pacific salmon fisheries fall into one of three basic categories,:

- *Food, Social, and Ceremonial (FSC) fisheries* are communal aboriginal fisheries. FSC fish cannot be sold legally.
- *Commercial fisheries* harvest salmon for sale during openings that are clearly delineated by time, location, gear, and sometimes even by the number of vessels. The number of commercial licences is fixed. No new licences are issued, and a substantial number of existing commercial licences have been bought by the federal government as part of several licence retirement programs designed to

reduce overall effort in the fleet (Section [1.2.5](#)), as well as the *Allocation Transfer Program* intended to build economic opportunities for First Nations (Section [1.2.4.3](#))

- *Recreational fisheries* target salmon for personal consumption or as a sport (i.e. catch-and-release). Fish harvested in recreational fisheries cannot be sold legally.

Three additional types of fisheries have evolved in recent years, each with a distinct legal setting:

- *Treaty fisheries* are covered under formalized agreements that specify FSC allocations and commercial allocations to a First Nation. Section [1.1.5.6](#) provides more information about the treaty process in BC.
- *Economic Opportunity Fisheries* are designed to improve First Nations' access to economic benefits. The long-term intent is to formalize communal FSC fisheries and economic fisheries as part of the treaty process (Sections [1.1.5.5](#) and [1.1.5.6](#)). These fisheries target a defined share of abundance under same rules as other commercial fisheries, but tend to use more selective technology and in a more terminal area (e.g. beach seines).
- *Excess Salmon to Spawning Requirements (ESSR) fisheries* may occur when salmon stocks return to a system after passing through the various fisheries and are at a level in excess of their spawning target. These fisheries have occurred on a regular basis in the Skeena River for sockeye and pink, on the Nass River for sockeye, and at a number of hatchery sites throughout the South Coast. Contingency plans are in place to initiate these fisheries in-season as conditions warrant. ESSR fisheries are not considered part of the regular planning and management process, but rather are the result of precautionary management of mixed-stock fisheries earlier along the migration route. ESSR fisheries prove that mixed-stock fisheries are not managed based on aggregate hatchery and wild abundance. ESSR fish are offered first to First Nations to supplement FSC fisheries, but may also be offered as an economic fishery for First Nations. ESSR fish at community hatcheries go first to FSC and then to the facility operators.

Priority of access for these different fisheries depends on the salmon species, as set out in the *Allocation Policy* (Section [1.2.7.2](#)).

For the purposes of the MSC certification process, this management summary focuses on commercial fisheries. However, DFO plans and implements all harvests in a comprehensive and coordinated process, and the management of other harvester groups is also briefly described in the detailed profiles for each certification unit. This additional information is necessary to address MSC criteria regarding the management of cumulative removals across all harvester groups.

A brief inventory of commercial fisheries that harvest pink or chum salmon in BC either directly or incidentally follows below, grouped according to the Certification Unit used for MSC evaluation. ESSR and Economic Opportunity fisheries are listed as well, because their harvest could enter the product chain of certified fish.

More detailed information about the management of these stocks, as well as the fisheries targeting them, is included in the *Conservation Unit Profiles*. Annual management priorities and resulting fishing plans are publicly reviewed in the *Integrated Fisheries Management Plans* for salmon (Section [4.2.1.2](#)).

2.2.3.2 North Coast and Central Coast

Commercial salmon fisheries in the North and Central Coast have generally shifted to terminal fisheries targeting local surpluses identified in-season. Any surpluses are determined in-season relative to established long-term escapement goals, based on data available at the time (e.g. test fisheries, assessment fisheries, escapement survey)

Terminal commercial net fisheries harvest pink and chum in the Queen Charlotte Islands in Areas 1 North, 2 East, and 2 West.

- Pink and chum stocks are harvested by commercial net gear only when a surplus to spawning stock is identified, with the fishery located terminally, close to the natal stream.
- Chum hatchery returns to Pallant Creek (2 East, Cumsheewa Inlet) are harvested terminally when surplus stocks are identified. ESSR fisheries for chum are possible in Pallant Creek.

North Coast fisheries target pink and sockeye in Areas 3 (Nass), 4 (Skeena), 5 and 6 (Hecate Strait), mainly with seine gear. Chum are intercepted as incidentally, with non-retention and mandatory release. Fish sorting and handling guidelines are in place to limit impacts on chum:

- *Areas 3/4/5:* The Dundas Island area, and inside to Portland Inlet, the Chatham Sound area and entrance to the Skeena River. Commercial net fisheries target returns to the Nass River, Skeena River and Alaska. ESSR fisheries may occur on the Skeena harvesting sockeye and pink, based on terminal abundance as described in the decision guidelines for Skeena River fisheries. No targeted terminal chum fisheries for at least a decade due to low abundance concerns.
- *Area 6:* Multiple pink stocks with differing migration timing through the fishing location are harvested in the Gil Island Area, in the outer portion of Area 6. The only targeted chum fishery on the North Coast occurs in Area 6 and targets enhanced Kitimat River chum. This fishery has moved from the Gil Island area to more terminal harvests of the enhanced stock in Kitimat Arm and inner Douglas Channel to more selectively harvest enhanced chum. The terminal fishery encounters very few non-enhanced chum, because stocks are separated by timing (i.e. Kitimat chums return earlier) and location.
- There are no other targeted chum fisheries in these areas, combined with mandatory non-retention and non-possession of chum salmon encountered in pink salmon commercial net fisheries located in Statistical Areas 3, 4, 5 and 6. This conservation strategy is accompanied with a provision requiring seines to brail and sort their catch and release chum in as healthy state as possible, a measure to reduce mortality of chum salmon. Gillnets are required to have a functional revival box and are encouraged to use it prior to releasing listed non-retention species, subject to circumstances (e.g. large catch, swells). The majority of gill net vessels actively use revival boxes most of the time.

Central Coast fisheries target pink and chum in Areas 7 (Bella Bella), 8 (Bella Coola), 9 (Rivers Inlet) and 10 (Smith Inlet):

- *Area 7/8:* Pink harvests are generally terminal, fishing channels or inlets close to the natal stream of the target stock. Chum harvests by nets focus on enhanced chum produced at Snootli Creek hatchery from Bella Coola River brood stock, and wild Bella Coola River chum (roughly 50% hatchery fish), and take place in middle-area mixed-stock fisheries as well as terminal areas or approaches to inlet of natal stock. Terminal chum fisheries also occur when surplus chums are identified for wild streams. Area 7 net fisheries targeting enhanced McLaughlin Bay chum occur in

terminal areas or the approach areas (i.e. Seaforth Channel) where the timing of these stocks is known.

- *Area 9/10*: No targeted fisheries since the mid-1990 to protect Smith and Rivers Inlet sockeye (Section [3.4.2.2](#)). An expanded mark-recapture experiment will be conducted for Nekite chum in 2008 to determine whether escapements may support a terminal fishery in future years.

2.2.3.3 Inner South Coast

Johnstone Strait mixed-stock fisheries target fall run chum, with seine, gill net and troll gear, managed based on a fixed 20% exploitation rate.

- *Areas 12/13 - Johnstone Strait*: The fishery targets chum that spawn in Johnstone Strait, Strait of Georgia, and Fraser River areas, though a small component are bound for Washington State systems. The main components of the harvest are the Mid Vancouver Island (MVI) and Fraser River stock groupings. The majority of chum stocks enter Johnstone Strait from September to November. This fishery also intercepts enhanced chum from Big Qualicum hatchery, Little Qualicum hatchery, Puntledge hatchery, Chehalis hatchery, Chilliwack hatchery, Inch Creek hatchery, and Weaver Creek spawning channel.

Johnstone Strait terminal fisheries targeting pink and chum are managed in-season based on terminal abundance, with seine or gill net gear.

- *Area 11/12 – Mainland Inlets*: Pink salmon harvested in this area are from two main systems, the Kakweiken River in Thompson Sound and the Glendale system in Knight Inlet. There have been no targeted commercial fisheries for pink salmon due to recent low returns and large uncertainty in recruitment. Commercial fisheries targeting other pink salmon stocks or other salmon species are modified to reduce interceptions of Mainland Inlet pink salmon when poor returns are expected. For example, fisheries are limited to below Lewis Point from late July to mid-August, extending a boundary closure already in place to protect Nimpkish sockeye until the end of July. This measure protects the early portion of the Mainland Inlet pink run, which includes the Ahnuhati River, Kakweiken River, and other systems which have recently experienced periods of low abundance. Another example is the ribbon boundary on the mainland side of Johnstone Strait in effect to protect Mainland Inlet pink salmon during directed fisheries for Fraser sockeye and Fraser pink from the end of July to the end of August. A recovery initiative is underway for Broughton Archipelago pinks (Section [3.4.2.5](#)).
- *Area 12 - Nimpkish River*: Chum openings are confined to a portion of Subareas 12-18 and 12-19 to minimize incidental harvest of other chum stocks. If commercial fishing opportunities have been exhausted and surplus stocks are still available, then an ESSR opportunity may be provided.
- *Area 13 - Bute Inlet*: Openings are confined to Subareas 13-21 and 13-22 to minimize incidental harvest of other chum stocks. If commercial fishing opportunities have been exhausted and surplus stocks are still available then, an ESSR opportunity may be provided.

Straight of Georgia terminal chum fisheries are managed in-season based on terminal abundance exceeding fixed escapement targets (e.g. Big Qualicum 130,000, Little Qualicum 100,000 and Puntledge 60,000). Chum harvests focus on terminal stocks listed below, but incidentally retain some other minor local stocks in the terminal areas as well. The major systems are:

- *Area 14 - Puntledge, Big Qualicum and Little Qualicum*: The fishery is directed at the enhanced stocks of three river systems; Puntledge, Little Qualicum and Big Qualicum Rivers. Chum

returning to this area have been enhanced since the late 1960s and terminal fisheries have occurred in October and November since the 1970s. ESSR fisheries are possible on enhanced stocks. (Section 4.9 of 2007 SC salmon IFMP)

- *Area 15 – Sliammon:* No targeted commercial fisheries for pink or chum
- *Area 16 - Jervis Inlet:* This terminal fishery targets wild chum stocks returning to river systems in the Jervis Inlet area. The main systems are Tzoonie, Deserted and Skwawka Rivers.
- *Area 17 – Nanaimo:* This fishery is directed primarily at Nanaimo River stocks. The Nanaimo River chum stocks are supplemented by the Nanaimo River Hatchery on poor return years.
- *Area 18 – Cowichan:* This fishery is directed primarily at Cowichan River stocks. Cowichan chum and to some extent Goldstream chum are also harvested. Chemainus River stocks are also impacted but likely to a lesser extent.
- *Area 19 – Goldstream (Saanich Inlet):* ESSR fishery is directed primarily at Goldstream River chum stocks, but some Cowichan River chum are also harvested incidentally.

2.2.3.4 West Coast Vancouver Island

WCVI terminal fisheries target hatchery chum, with seine, gill net and troll gear:

- *Areas 21/22 – Nitinat:* Commercial fisheries targeting Nitinat hatchery chum occur on a regular basis for seine and gill net. Trolling is also permitted, but there has been little interest in the past. ESSR fisheries are possible on enhanced chum. Boundaries at Cheewhat and Klanawa Rivers are in place to protect local chum and coho. ESSR fisheries are possible in Nitinat Lake (Section 4.14 of 2007 SC salmon IFMP)
- *Area 25 – Nootka:* Conuma Hatchery enhances four systems in Tlupana Inlet that have different run timings. There are approximately 30 un-enhanced chum systems in Nootka Sound. Outer Nootka boundaries are designed to target fish migrating through the approach area and to avoid fish holding off the stream mouths. An ESSR fishery in Tlupana Inlet occurs if a surplus is identified through marine and stream assessments. Terminal commercial fisheries occasionally harvest large abundances.
- *Areas 23, 24, 26, and 27:* Small-fleet fishing opportunities (i.e. less than 10 vessels) have been tested in terminal areas since 2004. These opportunities are based on local in-season abundance estimates, and are subject to close monitoring (e.g. observers, reporting requirements) and local by-catch reduction measures (e.g. timing). In 2007, these fisheries took place in Barkley Sound, Clayoquot Sound, Esperanza Inlet, Quatsino Sound (Neroutsos Inlet), and Bute Inlet.

2.2.3.5 Fraser River

Mixed-stock fisheries target Fraser River pink and chum with seine, gill net, and troll gear in the Strait of Georgia and Johnstone Strait (Section [2.2.3.3](#)).

Targeted Fraser pink and chum fisheries occur in

- *Area 20 – Juan de Fuca Strait:* Fisheries targeting Fraser pink salmon are limited due to conservation constraints for stocks of concern such as Late run and Cultus sockeye, Interior Fraser coho and Interior Fraser steelhead. Area 20 fisheries are subject to stringent conservation measures (Section [3.2.4.3](#))

- *Area 29 – Lower Fraser and approach areas*: Fisheries targeting Fraser pink salmon are limited due to conservation constraints for stocks of concern such as Late run and Cultus sockeye, Interior Fraser coho and Interior Fraser steelhead. Fraser chum are harvested based on a graduated harvest rate schedule that responds to in-season abundance estimates derived from the Albion test fishery (Section 4.8 in 2007 SC IFMP). Chum ESSR fisheries are possible on local surpluses from Chehalis hatchery, Chilliwack hatchery, Inch Creek hatchery, and Weaver Creek spawning channel. Fraser ESSR fisheries harvest pinks incidentally.

2.3 Goals and Targets

2.3.1 Inventory of Goals and Targets

The long-term objectives for salmon management are captured in the evolving laws and policies described in Chapter 1: [Management Context](#), and summarized in the next section. Stock-specific and fishery-specific goals and targets for BC pink and chum salmon are mapped out below:

- Current conservation priorities and initiatives to address them are described in Chapter 3 of this summary. Section 2.5.4 outlines conservation and recovery measures implemented in BC pink and chum fisheries. [Appendix 1](#) contains an inventory for North Coast and Central Coast. [Appendix 2](#) lists persistent fishing closures in Johnstone Strait as a further illustration.
- Detailed objectives for each stock and fishery are listed in the appropriate *Certification Unit Profile*, as described in Section 2.1.
- Annual management objectives are listed in Chapter 3 of the *Integrated Fisheries Management Plans* (IFMP) for Pacific salmon, as described in Section 4.2.1.2.
- Enforcement objectives are described in Section 2.6.2.2.
- Enhancement objectives are described in Section 3.2.5.

These objectives are developed through collaborative, advisory, and consultative processes (Section 4) in the context of the long-term objectives outlined below.

2.3.2 Long-term Objectives

The following laws, treaties, and policies are particularly relevant to the year-to-year management of BC pink and chum salmon:

- The *Fisheries Act* is designed to protect fish habitats, provide upstream and downstream migration, guard against the destruction of fish other than by fishing, and prohibit the deposit of a deleterious substance in water frequented by fish. It establishes the legal authority for developing, implementing and enforcing fisheries regulations (Section 1.1.2.2), including the authority to impose conservation measures for stocks of concern. For example, South Coast salmon fisheries have been adapted to support the recovery of Interior Fraser coho. Section 2.5.4 summarizes conservation and recovery measures in BC pink and chum fisheries. Section 3.4 summarizes major conservation and recovery initiatives in the Pacific Region.
- The *Oceans Act* mandates a comprehensive approach for the protection and development of oceans and coastal waters, based on the principles of sustainable development, integrated management, and the precautionary approach (Section 1.1.2.3).

- The *Species at Risk Act* establishes the process for identifying species as *threatened* or *endangered* and sets the legal requirements for conservation and recovery of species formally listed as *threatened or endangered* under the act (Section [1.1.2.4](#)). Once a species is listed as threatened or endangered, recovery and protection measures for that species trigger the collaborative development of stringent management objectives for any fisheries that have potential impacts, even if they target other species.
- The *Wild Salmon Policy* specifies general conservation targets for wild Pacific Salmon and establishes a strategic implementation process (Sections [1.2.8.5](#) and [3.2.2](#)).
- The *Pacific Salmon Treaty* specifies Canada-US allocations and establishes the legal mandate for joint management panels (Section [1.1.4.4](#)).
- The *Selective Fishing Policy* identifies general goals for avoiding non-target species and minimizing the release mortality of any non-target species that are intercepted (Section [1.2.7.4](#)). Specific selective fishing standards for each fishery are being developed based on the principles listed in the policy, and are being tested in demonstration fisheries (Section [3.2.4.3](#)).
- The *Allocation Policy* specifies the priority of access for different harvesters and defines gear-specific target shares of the commercial allowable catch for each of the five salmon species (Section [1.2.7.2](#))

The long-term objectives contained in the above laws and policies are summarized in the following excerpts from the 2007 *Integrated Fisheries Management Plan* for salmon:

- *Conservation Objectives:* Conservation of Pacific salmon is the primary objective and takes precedence in managing the resource. DFO manages fisheries with the objective of ensuring that salmon stocks return at sustainable levels. When returns decline below sustainable levels, management actions are taken which may include reducing targeted and incidental harvest of specific stocks, strategic enhancement, and habitat restoration. The objective of implementing conservation measures in particular fisheries is to reduce the impact of harvest and increase the level of escapement to the stock of concern. These conservation measures shape all Pacific Region fisheries, as illustrated by the overview of recovery initiatives in Section [3.4](#) and the inventory of conservation measures applied in BC salmon fisheries in [Appendix 1](#).
- *First Nations Objectives:* The objective is to manage fisheries to ensure that, subject to conservation needs, first priority is accorded to First Nations for opportunities to harvest fish for FSC purposes and any treaty obligations. 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.
- *Recreational and Commercial Fisheries Objectives:* The objective is to manage fisheries for sustainable benefits consistent with the *Wild Salmon Policy* (Section [3.2.2](#)). A primary objective in the recreational fishery is maintaining the expectation and opportunity to catch fish in a stable manner. In the commercial fishery, the objective is to improve the economic performance of fisheries so that they can reach their full potential, to provide certainty to participants, and to optimize harvest opportunities. However, stocks of concern constrain opportunities in many areas resulting in less than optimal opportunities. Both fisheries are increased where possible in accordance with allocation policies.

2.3.3 Reference Points

BC pink and chum fisheries are currently planned and implemented using 4 types of management reference points:

- *Escapement goals* are in place for target stocks. Pink and chum escapement goals have been generally based on experience and judgment (e.g. past escapements, habitat capacity). The *Certification Unit Profiles* list escapement goals for each of the actively managed pink and chum stocks. For example, management escapement goals have been set for all streams identified in the *North and Central Coast Core Stock Assessment Program for Salmon* by English, Spilsted, and Peacock (2006). Annual fishing plans, covering all harvests, are designed to achieve escapement targets with an acceptable risk tolerance.
- *Exploitation rate ceilings* are in place for many stocks of concern to support recovery efforts. This includes any incidental harvest or by-catch in fisheries targeting other stocks and species, and fisheries are shaped to balance economic constraints on fisheries targeting other stocks against cumulative fishing impacts on the stock of concern. For example, the Canadian fishery exploitation rate for Interior Fraser coho is limited to 3% (Section [3.4.2.1](#)).
- *Fixed harvest rates* are in place for several mixed-stock fisheries to minimize long-term impacts on component stocks. For example, Johnstone Strait mixed-stock chum fisheries are constrained to 20%, while terminal fisheries harvest local abundances where they exceed the escapement goals.
- *Allocation targets* describe either a target amount (FSC fisheries), a target opportunity (recreational fishery), or a target share (commercial gear types). Allocation targets are generally defined by species, not by stock, but in practical implementation allocations tend to be area-specific. Section [1.3.2](#) describes the allocation principles.

DFO incorporates escapement goals into annual planning and implementation as follows:

- Fisheries are designed to achieve escapement goals, and any excess abundance becomes available for terminal harvests for ESSR fisheries if there are no other constraints, such as by-catch concerns.
- Escapement goals are intended to ensure future production, not identify the minimum abundance that is likely to persist over time. Accordingly, occasional shortfalls should not pose serious risks of extirpation, especially if the escapement goals are set for components of a larger conservation unit.
- Any consistent shortfall from the escapement goals triggers corrective actions to build stocks back up to the target abundance (Section [3.4.2](#))

The Wild Salmon Policy (Section [3.2.2](#)) introduced two additional reference points, which are currently under development:

- *Lower benchmarks* intended to delineate an undesirable level of abundance, but with a substantial buffer above the level that would cause it to be considered at risk of extinction under the *Species at Risk Act*.
- *Upper benchmarks* intended to identify whether abundance is sufficient to provide maximum levels of catch, on average.

Lower and upper benchmarks under the WSP will be identified for conservation units (CU) rather than the stock groupings currently used for fisheries management (Section [2.2.2](#)).

As part of the MSC evaluation process it is necessary to match these operational reference points to theoretical *Limit Reference Points* (LRP) and *Target Reference Points* (TRP). Based on draft intent statements by the MSC evaluation team, DFO's current set of stock-specific escapement goals constitutes TRPs rather than LRPs. Management actions to maintain or rebuild stocks to TRPs are consistent with the requirement for avoiding LRPs (which in turn are intended to avoid irreversible long-term impacts).

The WSP benchmarks closely mimic the intent of LRPs and TRPs under MSC. Once the scientific and operational elements of WSP implementation have been finalized, the management system can progress from "operational equivalents" to the full implementation of reference points as envisioned by MSC.

2.3.4 Performance Measures

Performance measures for BC pink and chum salmon generally relate back to estimates of catch and escapement:

- Annual escapement is the main performance measure for statistical areas, and for the index streams within each area. Formal Limit Reference Points (LRP) or Target Reference Points (TRP) have not yet been developed for BC pink and chum stocks. However, operational *Management Escapement Goals* (MEG) have been identified for many individual streams with regular observations of spawning pink or chum, and aggregated for statistical areas or major watersheds. These operational equivalents were developed by interviewing DFO managers, biologists and contract field enumeration staff who had considerable years of local knowledge of particular streams and corresponding escapements of salmonids. The MEG represent the best estimate by these local experts and are used in a non-technical way as the operational equivalent for long-term benchmarks reflecting highly productive stocks (i.e. high sustainable yields). The *Certification Unit Profiles* list escapement targets for major systems in each area.
- Performance relative to genetic diversity objectives is measured in terms of the distribution across spawning sites in the CU, as well as the proportion of returns from wild and enhanced populations.
- For hatcheries, performance is measured in terms of broodstock targets, releases, and adult returns of hatchery origin.
- Post-season performance reviews are compiled annually. These reviews report catch and escapement statistics and describe whether or not the fishery met objectives. Post-season reviews are included in the annual *Integrated Fisheries Management Plans*. Detailed post-season review materials for 2007 are available at <http://www.pac.dfo-mpo.gc.ca/northcoast/post-seasonreview/default.htm>.

Several regional policy and conservation initiatives are establishing formal performance measures:

- Formal status benchmarks for each conservation unit are being developed under the *Wild Salmon Policy* (Section [3.2.2](#)).
- WSP benchmarks are consistent with the precautionary reference points defined as part of Canada's national implementation strategy for the precautionary approach to fisheries (Section [1.2.2.3](#)).
- Operational performance measures are being developed for the sustainability checklists under the *New Resource Management Sustainable Development Framework* (Section [1.2.2.2](#))

2.4 Monitoring and Assessment

2.4.1 Stock Assessment Program

2.4.1.1 Organization

Fisheries and Oceans Canada Science Directorate includes the *Stock Assessment Division* and the *Pacific Scientific Advice Review Committee* (PSARC). PSARC serves as an efficient peer-review process for stock assessment work (e.g. survey methodology, stock status reports). Section [4.3.5](#) describes PSARC and other review processes.

A summary of stock assessment activities, with links to data bulletins is available at <http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/salmon/stock.htm>

Note that assessment activities described in the sections below may also be organized and implemented through DFO's Fisheries Management Branch (e.g. test fisheries on the Lower Fraser).

2.4.1.2 Types of Data Collection Activities

DFO has established an extensive monitoring and assessment structure for Pacific salmon and the fisheries targeting them. Data collection activities can be grouped into 3 categories:

- *Stock assessment*: collects abundance data, escapement data, and biological data needed to manage stocks and monitor their status. (Section [2.4.2](#)).
- *Research*: collects data to address fundamental knowledge gaps and improve our understanding of BC fish stocks and their ecosystem (Section [3.2.2.5](#)).
- *Fishery monitoring and reporting*: collects information about harvesters, fishery openings, and catch (Section [2.4.2.5](#))

This information is collected through a combination of:

- Fishery-independent data collection (i.e. does not require a fishery opening). This includes departmental escapement surveys (e.g. mark-recapture programs, overflights), test fisheries, and tagging programs.
- Collaborative data collection in commercial fisheries. This includes reporting provisions identified in the licence conditions, assessment fisheries, charter patrols, observers, and dock-side monitoring.
- Collaborative data collection through co-management and capacity building arrangements. This includes joint escapement surveys, fishwheels, and aboriginal guardians.
- Information exchange between DFO, other agencies, and stakeholders through an extensive network of collaborative, advisory, and consultative processes (Section [4](#)).

Section [2.7](#) summarizes DFO's toolkit for assessment, monitoring, and enforcement.

2.4.1.3 Publications

DFO publicly distributes all stock assessment information as it becomes available, and regularly provides peer-reviewed analyses of the available data:

- Test fishing data is published on-line daily (Section [2.4.2.2](#)).

- In-season escapement estimates are circulated through established advisory processes (Section 4) and frequent updates are included in fishery notices (Section [2.5.3.4](#)).
- *Research Documents, Stock Status Reports, Science Advisory Reports, and Workshop Proceedings* for salmon are produced and published regularly (http://www.meds-sdmm.dfo-mpo.gc.ca/csas/applications/Publications/publicationIndex_e.asp). Section [3.2.3.5](#) lists available stock status reports.
- Annual salmon stock outlooks provide qualitative expectations for the upcoming season (<http://www.pac.dfo-mpo.gc.ca/fm-gp/species-especies/salmon-saumon/index-eng.htm>).
- South Coast Stock Assessment publishes regular bulletins that summarize assessment activities and in-season data. Bulletins since 2004 are available for more than a dozen systems (www-ops2.pac.dfo-mpo.gc.ca/xnet/content/salmon/sc%20stad/sc%20stad.htm).
- Salmon Updates are regularly released. These describe the outlook for the season, provide in-season updates, and a post-season wrap-up.

2.4.2 Monitoring and Assessment of BC Pink and Chum Salmon

2.4.2.1 Escapement Surveys

Information about the abundance and distribution of adult spawners (i.e. escapement) is the corner stone of BC salmon management. A comprehensive suite of annual escapement surveys is in place to collect this information using a combination of permanent, temporary, and mobile platforms:

- *North Coast and Central Coast:* A formal assessment framework has been developed and publicly released (English, Peacock and Spilsted. 2006. North and Central Coast Core Stock Assessment Program for Salmon). *Annual Working Plans* are developed to implement this framework, which in turn are translated into detailed *Field Work Plans* for each sampling site. Counting facilities include the Babine River counting fence, Docee River counting fence, Kitwanga River Salmon Enumeration Facility, Meziadin Fishway, and the Nass River Fishwheel. Descriptions of these facilities and links to up-to-date counts are available at <http://www.pac.dfo-mpo.gc.ca/northcoast/counts/default.htm>.
- *Inner South Coast:* The target level of coverage is to survey all major chum producing streams every year, using a combination of counting fences, sonar, visual counts from fixed-wing or helicopter overflight, and streamwalks. Some major streams, such as the Nanaimo and Englishman Rivers, are monitored for pink escapement, and some smaller streams are monitored by hatcheries and volunteer groups. Survey effort for pink escapements is low, because abundance and catches are also low.
- *West Coast Vancouver Island:* Twenty one systems throughout the WCVI are surveyed annually by DFO-contracted survey crews or hatchery staff. Crews count spawners in these systems several times throughout the run. Spawners are usually counted during swim surveys, but other methods may be used, such as aerial surveys or bank walks. The counts are compiled and analyzed (via area under the curve methods where survey number is adequate) to estimate total escapement. Chinook are the priority species for escapement surveys on the WCVI. Chum escape and spawn later, so the surveys may not capture the entire return and therefore the chum estimates are generally less reliable. A suite of other systems are surveyed less frequently and less rigorously by charter patrols and other groups (e.g. First Nations, BC Streamkeepers). Statistical estimates of abundance are not generated for these systems; however, they provide a gauge of spawner distribution among other

chum rivers. For chum in particular, partial in-season estimates of spawner abundance may be used to trigger fishery openings on identified hatchery surpluses. Therefore, these surveys can be an integral part of fisheries management.

- *Fraser River*: DFO implements chum escapement surveys in a number of Fraser systems, some of them in collaboration with First Nations, ranging from intensive surveys that produce relatively accurate and precise escapement estimates to less precise methods that are used more for assessing population trends. The most precise and accurate escapement estimate is produced on the Harrison / Chehalis / Weaver system using mark-recapture methods by Chehalis First Nation and DFO jointly since 1991. This complex represent the largest populations of chum in the Fraser watershed. Early observations of pink escapement were conducted for much of the last century by enforcement officers (Farwell et al. 1987). Adult tributary escapement estimates, using mark-recapture surveys, were compiled for the odd-year run from 1957 to 1991. A streamlined approach was implemented from 1993 to 2001, using a mark-recapture sampling in the lower river to develop a pink salmon escapement estimate for the entire Fraser system. A fry enumeration program at Mission has been conducted from 1962 to present. These changes in survey coverage are consistent with increasing abundance and changing harvest patterns over the same period. Assessment programs in Squamish and Burrard Inlet are led by local First Nations,

Section [2.4.3.1](#) describes how escapement data is compiled and managed. A detailed description of escapement monitoring in each area is included in the appropriate *Certification Unit Profile*.

2.4.2.2 Test Fisheries

Commercial fishing vessels are contracted for standardized test fisheries under *Collaborative Agreements*. These are primarily intended to provide in-season abundance indices for target stocks, but also observe fish behaviour, species composition including by-catch species, and collect biological samples (e.g. scales, tissue, fins). Test fisheries are considered part of the necessary data collection process, and are implemented with scientific licences under Section 52 of the *Fisheries Act* (Section [1.1.2.2](#)). As a result, these catches are not counted towards the commercial Total Allowable Catch. However, test fishing catches are included in the calculation of total catch and exploitation rates. For example, the mixed-stock chum fishery in Johnstone Strait is managed to a fixed exploitation rate of 20%, of which 5% is specifically set aside for First Nations FSC fisheries, recreational fisheries, and test fisheries.

Test fishing contracts undergo a public bidding process, described at <http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/salmon/testfish/selection.htm>.

An overview of past test fishing coverage is available at <http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/salmon/testfish/default.htm>. Some of the summaries on the site are from 2006, but up-to-date information for pink and chum test fisheries can be accessed through the links below. Daily test fishing results can be queried from the *Fisheries Operating System* (FOS) through the *Daily Test Fishing Summary Report* link at the top of each page.

A map of test fishing locations in southern BC is available at www.psc.org/image_test_fishing_locations.htm. A detailed map of Fraser River test fishing sites is available at www.psc.org/image_lower_fraser_river.htm.

North Coast and Central Coast Test Fisheries:

- Skeena Tye – All Salmon and Steelhead – Gill net (<http://www.pac.dfo-mpo.gc.ca/northcoast/skeena/tyeetest.htm>)
- Nass test-fishing sites near Gitwinksihlkw on the Nass River (using fish-wheels)

Inner South Coast Test Fisheries:

- Area 12 (Johnstone Strait) – Chum - Seine (http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/salmon/testfish/Chum/Area12_Seine.htm) Operated in 2005 but not in 2006 or 2007.
- Area 13 (Bute Inlet) – Chum – Gill Net (http://www-ops2.pac.dfo-mpo.gc.ca/fos2_Internet/Testfish/rptdtfdparm.cfm?fsub_id=571). Operated in 2005 and 2007.

West Coast Vancouver Island Test Fisheries:

- Area 21 (Nitinat) - Chum – Seine (http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/salmon/testfish/Chum/Area21_Nitinat_Seine.htm)
- Area 22 (Nitinat Lake) – Chum – Gill Net (http://www-ops2.pac.dfo-mpo.gc.ca/fos2_Internet/Testfish/rptdtfdparm.cfm?fsub_id=251). Operated in 2005, 2006, and 2007
- Area 23 (Barkley) – Chum - Seine (http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/salmon/testfish/Chum/Area23_Seine.htm).
- Area 24 (Clayoquot)– Chum – Seine (http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/salmon/testfish/Chum/Area24_Seine.htm)
- Area 25 (Nootka/ Esperanza) – Chum – Seine (http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/salmon/testfish/Chum/Area25_Nootka-Esperanza_Seine.htm)
- Area 26 (Kyuquot) - Chum – Seine (http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/salmon/testfish/Chum/Area26_Kyuquot_Seine.htm)

Fraser River Test Fisheries:

- Albion – Chum - Gill Net (http://www.pac.dfo-mpo.gc.ca/fraserriver/commercial/commercialalbionchum_e.htm)
- Fraser River pink salmon are caught in test fisheries in Areas 12 and 13 (Johnstone Strait), 20 (Juan de Fuca), and 29 (Whonnock and Cottonwood). (http://www.psc.org/info_testfishing_summaries.htm)

A detailed description of test fisheries in each area is included in the appropriate *Certification Unit Profile*.

2.4.2.3 Assessment Fisheries

DFO uses commercial openings with controlled effort to collect abundance and migration data. These openings provide some limited fishing opportunity to commercial harvesters, while improving abundance estimates and reducing in-season uncertainty. Except for the limitations on vessel numbers

or short openings, assessment fisheries are regular commercial fisheries and harvests count towards the commercial Total Allowable Catch (TAC).

For example:

- Area 7 (Mussel, Kainet, Neekas, Quartcha and Roscoe): Opportunities for one-day gill net and seine assessment fisheries on the last week of July or first week of August are determined pre-season based on recent trends in brood year escapement.
- Area 8 (Kimsquit and Bella Coola): Two-day gill net assessment fisheries early in the run to gauge abundance and determine subsequent openings.

A detailed description of assessment fisheries in each area is included in the appropriate *Certification Unit Profile*.

2.4.2.4 Monitoring Enhanced Pink and Chum

BC salmon enhancement programs are implemented for different purposes (Section [3.2.5](#)), and the monitoring approach for enhanced pink and chum differs depending on the purpose of a particular enhancement program:

- Monitoring of long term contribution of enhancement to rebuilding. For example, rebuilding efforts for Stave River chum were augmented with hatchery production. Active enhancement concluded in 2005, but escapement monitoring continues.
- Hatchery contribution to mixed-stock fisheries is estimated based on current and historic hatchery marking programs (e.g. thermally-induced otolith marking). Pink salmon marking concluded in the mid-1990s, but all hatchery releases are counted and adult contribution to run size is calculated from average survival rates. The number of chum populations marked has been reduced in recent years, but marking is maintained on indicator stocks.
- Hatchery contribution to indicator stocks is monitored through fishery and escapement sampling

Methods for assessing hatchery production and contribution to wild systems have been published and reviewed. The methods are still being used, but mark rates have since been reduced (Section [3.2.5](#)):

- 1989 - *Methodology for estimating production chum and pink salmon from SEP facilities* by Bailey and Plotnikoff. PSARC Report S89-24.
- 1990 - *Framework for estimating escapement of naturally spawning mark returns produced by SEP facilities*. PSARC Report S90-11.

2.4.2.5 Fishery Monitoring and Catch Reporting

A complete, accurate and verifiable fishery monitoring and catch reporting program is required to successfully balance conservation with the objectives of optimal harvest levels. Across all fisheries, strategies are being developed to improve catch monitoring programs by identifying standards that must be achieved as well as clarifying roles and responsibilities of the Department and harvesters. The standards focus on data collected to estimate catches, releases, and essential biological data, such as CWT sampling, for stock assessments and fishery evaluations. As well, new technologies are being used to facilitate the timely submission of data directly into centralized DFO databases (Section [1.2.9.4](#)).

Current fishery monitoring programs including non-target species are listed in the annual *Integrated Fisheries Management Plans* (IFMP) , described in Section [4.2.1.2](#). A detailed description of catch monitoring programs in each area is included in the appropriate *Certification Unit Profile*.

Larger FSC fisheries (e.g. at Nitinat) are monitored and sampled by either First Nation fishery or DFO staff. Smaller fisheries are generally not monitored, although as a condition of their communal licences First Nation bands are required to report catch.

Recreational fisheries are monitored through creel surveys. Creel surveyors gather catch-per-unit-effort data and take biological samples from boat landing sites. These data are augmented by logbook and manifest records of catch and effort submitted by lodges operating guided trips. Effort is determined through periodic surveys of fishing areas. These data are compiled and analyzed to produce catch and effort statistics by area and species.

Commercial fishery monitoring programs for target and non-target species are obligatory as a condition of license in all fisheries (Section [2.5.3](#)). Incremental development and implementation of commercial monitoring standards is built into the demonstration fisheries and pilot projects under the *Pacific Integrated Commercial Fisheries Initiative* (Section [1.2.9.2](#)). Specific monitoring and reporting requirements include:

- Conditions of licence require licence holders to report all fish caught whether landed or discarded and specify the catch reporting details applicable to each gear type. Log-books, frequent phone-ins, and sales slips are mandatory for all commercial salmon fisheries. Harvesters can be charged if they fail to comply with correct use of the logbook. All interceptions must be recorded, whether they are retained, released, or discarded. This includes details for encounters of non-target species. For example, salmon gill net harvesters are required to separately record any interception of all species of salmon including steelhead and Atlantics, dog fish, sturgeon, birds, mackerel, lingcod, halibut, rockfish, and marine mammals. Sample logbook pages are included in Appendix 9 of the 2008 salmon IFMPs. Conditions of Licence are outlined in Section [2.5.3.4](#).
- Observer reporting is currently not mandatory in commercial fisheries specifically targeting pink or chum salmon, but there is a provision in the licence conditions for each commercial vessel to accept observers on board if requested by DFO.
- Phone-in requirement for all license holders participating in commercial salmon fisheries is in place.
- There are provisions for self-reporting and observer reporting. For example, fishery notices include additional reminders for voluntary reporting of sea turtle sightings.
- In addition to log books, sales slips, and phone-in programs, real-time monitoring is in place where necessary.
- In order to properly account for the full 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.
- DFO charter patrols monitor commercial net fisheries. Daily information is passed along to the local fishery manager including catch estimates by species, fleet size, and distribution as well as any problems identified with respect to compliance of fishery restrictions. For North Coast and

Central Coast fisheries, this information is compiled in each manager's *Record of Management Strategies* (RMS) report.

- Independent observers from environmental organizations have recently begun monitoring by-catch in some salmon fisheries as part of collaborative initiatives. A sample report from the Fraser River chum fishery is available at <http://www.watershed-watch.org/news/item.html?nid=157>.

2.4.3 Data Management

2.4.3.1 Escapement Data

The most comprehensive source of information about pink and chum salmon populations is the *Salmon Escapement Database System* (nuSEDS) maintained by DFO, which contains an almost complete archive of escapement observations at a very detailed level (i.e. individual sampling sites, survey method):

- Background information about nuSEDS data is available at http://www-heb.pac.dfo-mpo.gc.ca/maps/temp/SEN_Overview_Disclaimer.htm.
- nuSEDS escapement data for specific locations can be accessed through Mapster v2.2, DFO's online geographic information system at http://www-heb.pac.dfo-mpo.gc.ca/maps/maps-data_e.htm. Instructions are available at http://www-heb.pac.dfo-mpo.gc.ca/maps/new_e.htm.
- This site-specific escapement data is then summarized by stock, watershed, and statistical area to inform stock assessment and fisheries management (Section [2.2.2](#))
- nuSEDS also includes information about survey methods used to estimate escapement at each site.

2.4.3.2 Catch Data

Commercial fishery monitoring and reporting data are managed as follows:

- Log book data is compiled by individual commercial fishers operating in the Pacific Region and is retained at the regional level.
- Commercial sale slip data documenting commercial fishers catch by Statistical Area is compiled at the regional level.
- FOS (phone-in) data documents individual fisher's weekly commercial catch. This information is compiled at the regional level.
- Hail Catch Data is obtained by DFO contracted charter patrols This in-season information documents the daily/weekly commercial fisheries and is held as a regional database.
- Data are entered into a regional database. A variety of reports derived from these data can be accessed at http://www-sci.pac.dfo-mpo.gc.ca/sa/Commercial/default_e.htm.
- Catch data are also available at <http://www.pac.dfo-mpo.gc.ca/northcoast/commercl/default.htm> and www.pac.dfo-mpo.gc.ca/species/salmon/salmon_fisheries/catchstats_e.htm.

The *Regional Data Unit* reports through the Corporate Services group. The main role of the Regional Data Unit is to compile, produce, maintain and provide official catch statistics for the Region, according to Regional standards and procedures.

The Unit also:

- provides information about the statistics such as the methods used to collect catch data and derive catch estimates.
- is responsible for producing monthly in-season and annual post-season reports of commercial, recreational, and aboriginal fisheries.
- is responsible for obtaining landed price information to estimate landed value for all commercial fisheries.
- is responsible for making all the catch data it manages available on-line for users inside DFO.
- proposes minimum data requirements for landing records (eg, fish slips, dockside monitoring validation records).

The Regional Data Unit home page at http://www.pac.dfo-mpo.gc.ca/sci/sa/default_e.htm links to up-to-date summaries of all recorded commercial and recreational catches.

2.5 Planning and Implementation

2.5.1 Regional Approach to Salmon Harvest

Pacific salmon fisheries are managed in a regular annual cycle of pre-season planning, in-season implementation, and post-season review. Each phase of this cycle incorporates extensive levels of public participation:

- Pre-season planning centers on the development and broad public review of *Integrated Fisheries Management Plans* (IFMP). These management plans include general decision guidelines for each fishery, expectations for the year, anticipated fishing plans, and a detailed review of the previous year.
- In-season management is subject to rapidly changing, uncertain information. The department works with stakeholder representatives to develop appropriate responses to these changing circumstances, adhering to the general decision guidelines and specific fishing plans documented in the IFMP.
- Post-season review meetings in the Fall provide a broad public forum for sharing information about the stocks and fisheries, reviewing management actions, and identifying opportunities for future improvements.

BC pink and chum fisheries are planned and implemented consistent with the general objectives identified in Section [2.3](#) and the specific goals and targets referenced therein.

The planning and implementation process has many distinct, but closely coordinated, components:

- *Continuous monitoring and assessment* (Section [2.4](#))
- *Regional research program* (Section [3.2.2.5](#)), and the particular priorities identified in the five-year research agenda (Section [3.2.3.1](#)). Research plans and results are publicly distributed.
- *Annual planning cycle* of pre-season planning, in-season management, and post-season review (Section [4.2.1.1](#)). This is the process by which new information can be quickly and transparently incorporated into future management activities.

- *Long-term policy development and strategic initiatives* (Section [4.3.2.1](#)). This is the process for identifying future problems and developing appropriate long-term responses.
- *Decision guidelines* for each fishery describe anticipated management actions under different plausible scenarios (Section [2.5.2](#)). These contingency plans are publicly reviewed prior to the season, and substantially enhance transparency for the hectic in-season period when extensive public review is not feasible.
- Strict *access controls* are in place for all fisheries (Section [2.5.3](#)). Licences and associated conditions are used to shape the structure of each harvester group through gear specifications. For commercial fisheries, licences are also used to limit the total size of each fleet.
- *Openings and closures* are used to specify when, where, and how fish can be harvested by those with a licence (Section [2.5.3](#)). Anticipated openings are carefully planned for each year based on the best available information and publicly reviewed as part of the *Integrated Fisheries Management Plans* (Section [4.2.1.2](#)).
- A comprehensive suite of *conservation and recovery measures* is planned, publicly reviewed, and implemented every year for specific fisheries, salmon stocks, and non-salmon species (Sections [2.5.4](#) and [3.4](#), [Appendix 1](#))

All of these components of the planning process are supported by a comprehensive network of review mechanisms, described in Section [4](#).

2.5.2 Decision Guidelines

Documenting decision rationales was an important priority in the initial development of the *Integrated Fisheries Management Plans* (Section [4.2.1.2](#)), and *Decision Guidelines* were introduced as a regular feature of BC salmon management in 2002. Decision Guidelines describe anticipated management actions under different plausible scenarios. These contingency plans are publicly reviewed prior to each season, and substantially enhance transparency for the hectic in-season period when thorough public review is not feasible. Development is guided by relevant departmental objectives (Section [2.3](#)), scientific advice, consultation with harvesters and other interests, and the experience of fishery managers. Decision guidelines are updated annually, and are publicly reviewed prior to the fishing season during the annual planning cycle (Section [4.2.1.1](#)) as part of the *Integrated Fisheries Management Plans* (IFMP) for salmon (Section [4.2.1.2](#)). Through these on-going revisions, the decision guidelines are becoming both more comprehensive and more detailed.

Decision Guidelines cover pre-season planning and in-season implementation, as described in this excerpt from the 2007 salmon IFMPs:

- Pre-season decisions include the development of escapement targets, exploitation ceilings, sector allocations, and enforcement objectives.
- In-season decision points vary from fishery to fishery depending on type, availability, and quality of in-season information, as well as the format of 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, and other details.
- In-season decisions are 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, and the availability and timeliness of in-season information (e.g. poor weather conditions). In-season management reacts to weekly catch and escapement abundance indicators. Fishery managers and biologists are aware of the dynamic nature of between-year and within-year variations in run timings and abundance and manage these stocks on a day-by-day or weekly time frame. Changes from the pre-season decision guidelines are the exception and occur very infrequently.

Decision guidelines for BC pink and chum fisheries have some basic elements in common:

- Low-impact fisheries are generally implemented before fisheries having a higher impact. This is particularly so at low run sizes or at the start of the run when the run sizes are uncertain or when stocks of concern have peaked but continue to migrate through an area.
- Mixed-stock fisheries are managed to a low target exploitation rate which is either fixed (e.g. Johnstone Strait chum fishery fixed at 20%) or changes with abundance (e.g. Fraser River chum fishery).
- Terminal fisheries are managed in-season based on estimated surplus to the escapement goal, with a precautionary buffer applied in both the abundance estimate and the timing of the fishery (e.g. seine fisheries on Nitinat chum after first week of October only if escapement milestones into Nitinat Lake have been met).
- Pre-season fishing plans use available data from previous years to anticipate stock levels returning in any given year. These pre-season plans are established for most fisheries through consultation with Departmental managers, biologists and scientists as well as industry and First Nations representatives. Most fisheries commence each year using the established pre-season plan. As in-season catch and escapement data become available through the season, fishing plans are adjusted on a daily or weekly basis to reflect this ‘real-time’ data. In terminal areas with less accurate pre-season information, fisheries are managed mainly based on in-season information (e.g. observed escapement into river, plus estimates of fish holding in the inlet)
- Stock recovery strategies are reflected in the decision guidelines. These take the form of reduced harvests at low abundance of target stocks and selective fishing measures to reduce impacts on non-target stocks or species (Section [2.5.4](#)).
- In-season information may not provide a clear-cut indication of run status. In this case, management actions use a precautionary approach on stocks of concern.
- If stocks of concern cannot be monitored or selectively protected, broader area and time closures are specified prior to the season.

The fishery-specific sections of each *Certification Unit Profile* are expanded from the decision guidelines in the *Integrated Fisheries Management Plans* (Section [4.2.1.2](#)).

2.5.3 Access Controls

2.5.3.1 Mandatory Licencing and Limited Openings

DFO manages the general structure and characteristics of all BC pink and chum fisheries through a strict licencing program. The *Fisheries Act* (Section [1.1.2.2](#)) prohibits any harvest unless authorized with a licence. An overview of licence types for First Nations, recreational, and commercial fisheries is available at http://www.pac.dfo-mpo.gc.ca/species/salmon/salmon_fisheries/licensing_e.htm. Each licence comes with detailed provisions that shape the fisheries of each harvester group and specify

conservation measures to be observed by each harvester. Licence conditions specify which species may be taken, fishing areas, permissible fishing gear, and fishing times. Licence conditions also stipulate requirements for selective fishing measures, catch reporting, and catch handling. Sample licence conditions for commercial fisheries are available at <http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/MPLANS/conditions.htm>.

DFO prohibits highly destructive fishing methods such as explosives or poisons. The type, size and quantity of fishing gear and equipment that is permitted to be used and the manner in which it may be used are specified in the *Conditions of Licence* (see below). Explosives or poisons are not included in the list of permitted gear and equipment, and are explicitly prohibited in Sections 28 and 36 of the *Fisheries Act*, ensuring that any violations can be legally prosecuted. An overview of the *Fisheries Act*, including a link to the full text of the act, is available in Section [1.1.2.2](#) of this report. DFO also regulates the use of explosives for other purposes if there is a potential impact on fish or their habitat. The 1998 technical report *Guidelines for the use of explosives in or near Canadian fisheries waters* by Wright and Hopky (Can. Tech. Rep. of Fish. and Aqu. Sci. 2107, <http://www.dfo-mpo.gc.ca/Library/232046.pdf>) describes the details.

DFO manages annual fisheries primarily by controlling fishing effort and secondarily by limiting the amount and type of gear permitted in a fishery. Effort controls differ by harvester group and gear characteristics.

2.5.3.2 Food, Social, and Ceremonial (FSC) Fisheries

DFO seeks to provide for the effective management and regulation of First Nations fisheries through the negotiation of mutually acceptable and time-limited Fisheries Agreements (Section [1.2.4.2](#)). Where agreement cannot be reached, DFO may still issue an Aboriginal Communal fishing licence to the group authorizing them to fish for FSC purposes.

Communal licences are issued under the *Aboriginal Communal Fishing Licences Regulations* (Section [1.1.2.8](#)) to Aboriginal groups to carry on fishing and related activities. Communal licences establish the provisions for FSC harvests by all members of an Aboriginal group. These licences are designed for the effective management and regulation of First Nations fisheries through a negotiated series of mutually acceptable conditions wherever possible. The dates, times and locations where harvesting may occur, type of gear, and other conditions are described in these licences. Communal licences can be amended in-season for resource conservation purposes. Section [1.1.5](#) summarizes the different elements of First Nations' access to fishing opportunities.

In recent years, specific types of communal licences have been crafted to fit particular circumstances. The types of communal licences issued in the Pacific Region are briefly described at http://www.pac.dfo-mpo.gc.ca/tapd/com_lic_e.htm.

Fisheries Agreements represent the final step of an extensive negotiation process and are publicly available through the DFO on-line library at <http://inter01.dfo-mpo.gc.ca/waves2/search.html>. Communal licences are considered interim documents, and are not publicly released.

Communal licences and fisheries agreements may include:

- gear limitations
- area restrictions
- size restrictions

- time restrictions
- total allowable harvest

2.5.3.3 Recreational Fisheries

Recreational fishing licences are available to any person wishing to harvest fish for personal consumption or to participate in catch-and-release fisheries. Tidal recreational fishing licences are administered by DFO, while freshwater recreational fisheries are licenced through the Province of BC. Section [1.1.3.1](#) describes the jurisdictional boundaries between federal and provincial agencies as they apply to fisheries management.

DFO regulates sport fisheries in tidal waters, and salmon fisheries in freshwater. DFO's regulations for salmon sport fisheries in freshwater are published as a supplement to provincial regulations for all freshwater fisheries. Recreational limits and regulations are announced pre-season, with in-season updates where necessary:

- 2009-2011 BC Tidal Waters Sport Fishing Guide and the 2009-2011 BC Freshwater Salmon Supplement are available at http://www.pac.dfo-mpo.gc.ca/recfish/SFG_e.htm
- 2009-2011 BC Freshwater Fishing Regulations are available at www.env.gov.bc.ca/fw/fish/regulations/.
- Local in-season changes to recreational limits and regulations are announced and archived at www-ops2.pac.dfo-mpo.gc.ca/xnet/content/fns/index.cfm?pg=fishery_search&lang=en&ID=recreational.
- An example of a recreational fishery notice is available at http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/fns/index.cfm?pg=view_notice&lang=en&DOC_ID=114043&ID=all.
- Detailed recreational fishing regulations for each statistical area and major lake are available at http://www.pac.dfo-mpo.gc.ca/recfish/default_e.htm.

Several variations of recreational licences are available, and there are differences in the fee schedule depending on age and residency. Detailed information and an on-line licencing system are available at http://www.pac.dfo-mpo.gc.ca/recfish/licensing/default_e.htm.

There is no limit on the number of recreational licences issued in a year, but each licence carries strict harvest limits and it is illegal to hold more than 1 licence for tidal and non-tidal waters. A summary of recreational licences issued since 1999 is available at http://www.pac.dfo-mpo.gc.ca/recfish/licensing/statistics_e.htm.

Recreational fisheries are open, unless closed by a Variation Order.

Recreational licence conditions include:

- gear limitations (e.g. barbless hooks only)
- area restrictions
- size restrictions (e.g. all coho, sockeye, pink and chum must measure 30 cm or more)
- time restrictions
- daily limits (e.g. daily limit of 4 Pacific salmon),
- annual limits (e.g. up to 10 adult chinook from tidal waters of the Fraser River)

DFO has compiled a detailed national survey of recreational fishing every 5 years since 1975. The survey includes information about angler profiles, fishing effort, expenditures, as well as total fish caught and retained. The four most recent surveys are available on-line at http://www.dfo-mpo.gc.ca/communic/statistics/recreational/canada/index_e.htm.

2.5.3.4 Commercial Fisheries

A limited number of commercial fishing licences are currently held in the Pacific Region. The current commercial licencing structure was established in 1996. The main features were permanent gear choice, area selection, and licence stacking:

- Permanent gear choice meant that each salmon licence eligibility would be restricted to either seine, gillnet or troll fishing for the future.
- Area selection meant that vessel owners/licence eligibility holders selected one area to fish for a period of four years.
- Area licensing divided the coast into two areas for seine gear, three areas for gillnet and three areas for troll:
 - Area A: North coast and central coast seine
 - Area B: South coast seine
 - Area C: North coast and central coast gill net
 - Area D: Johnstone Strait, northern Strait of Georgia and West Coast Vancouver Island gill net
 - Area E: Southern Vancouver Island and Fraser River gill net
 - Area F: Northern troll
 - Area G: Southern outside troll
 - Area H: Southern inside troll
- Maps of Commercial Salmon Licence Areas are available at http://www.pac.dfo-mpo.gc.ca/ops/fm/Commercial/salmonmaps/default_e.htm.
- Up-to-date information on licences, including licence listings by fishery, a commercial vessel directory, and *Commercial Licence Status Reports* (CLSR) is available at http://www.pac.dfo-mpo.gc.ca/ops/fm/Licensing/Default_e.htm.
- Over the same time period, the *Canadian Fisheries Adjustment and Restructuring Program* (CFAR) was implemented under the *Fisheries Development Act* (Section [1.1.2.7](#)) to put harvesting capacity in balance with resource availability and ensure the long-term sustainability of the fishing sector on both the Atlantic and Pacific coasts:
 - Pacific Fisheries Adjustment and Restructuring (PFAR) reduced the number of salmon vessels in the fleet by one-half from 1996 to 2000 (Section [1.2.6](#))
 - The Allocation Transfer Program (Section [1.2.4.3](#)) shifted commercial licences towards First Nations capacity building with no net increase in the total fleet.

- In 2000, the department reaffirmed its commitment to area licensing as a long term feature of commercial salmon management. A six year voluntary area selection occurred prior to the 2000 fishery and these selections remained in place until the 2007 Area reselection process.
- In 2007, the commercial sector went through a Licence Area re-selection process in the context of on-going consultations regarding the future structure of Pacific salmon fisheries (Section [1.2.9](#)), with the understanding that area selections will be in place indefinitely pending the outcome of these other initiatives. Summaries of the 2007 reselection process and outcomes are available at http://www.pac.dfo-mpo.gc.ca/ops/fm/Licensing/salmon07_e.htm.

Under the *Fisheries Act* (Section [1.1.2.2](#)) all commercial fisheries are closed unless specifically opened through one of the legal instruments described below. DFO opens commercial fisheries for clearly delineated times and areas, subject to many regulations that operationalize coastwide and local conservation objectives. Specific conservation measures are described in Section [2.5.4](#). The legal instrument for opening commercial fisheries is a *Variation Order* (Section [1.1.2.8](#)), with sign-off authority by the local resource manager. Section [4.3.5](#) summarizes the internal review process. Anticipated openings are carefully planned for each year based on the best available information and publicly reviewed as part of the *Integrated Fisheries Management Plans* (Section [4.2.1.2](#)).

All fishery openings are publicly announced through *Fishery Notices* listing exact time and location of the fishery, and any specific regulations in addition to the general *Conditions of Licence*, such as gear restrictions implemented to reduce by-catch. Fisheries Notices often summarize the information available at the time, such as abundance estimates, the rationale for the opening, and any specific regulations.

An archive of Fishery Notices, updated daily, is available through the right-hand sidebar on the Fisheries Management website at http://www.pac.dfo-mpo.gc.ca/ops/fm/fishmgmt_e.htm. Typical examples from 2007 include:

- *Openings*: FN0867-COMMERCIAL - Salmon: Seine - Area B - Area 14 - Mid Vancouver Island Chum
- *Information update*: FN0929-Salmon: Gillnet, Seine and Troll - Areas B, D, E & H - Area 14 to 19 - Mid Vancouver Island Chum Update

Commercial licences specify which species may be taken, fishing areas, permissible fishing gear and fishing times. Licence conditions also stipulate catch sorting and species segregation requirements, information that the vessel master is required to report to DFO, harvest operations records, in-season and post-season catch reporting requirements, and requirements regarding observers and fish slips. Sample licence conditions are available at <http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/MPLANS/conditions.htm>. Licence conditions specify all aspects of a commercial fishery:

- Target species, allowable quantity of catch (not all licences), and allowable by-catch retention.
- Conservation measures (e.g. closed areas, closed times)
- Permitted gear, and selective fishing equipment (e.g. revival box)
- Harvest log
- Reporting requirements for starting and ending fishing, as well as daily catch reports
- Observer requirements

- Handling and transport requirements

2.5.4 Conservation and Recovery Measures in BC Pink & Chum fisheries

2.5.4.1 General Approach to Conservation and Recovery

Conservation and recovery are the primary objective for BC pink and chum fisheries. Managing for conservation also means incorporating a precautionary approach to decision-making under uncertainty. Regular monitoring of fisheries, stock assessment, and the use of selective fishing methods are designed to maintain healthy stock levels and identify any emerging conservation concerns.

The management system distinguishes between the following types of harvest-related impacts:

- *Directed harvest*: harvest of target stocks
- *Incidental harvest*: inadvertent harvest of stocks of the same species as the target stocks (e.g. wild chum in a fishery targeting enhanced chum)
- *By-catch*: inadvertent harvest of different species (e.g. coho or rockfish in a chum fishery)
- *Ecosystem impacts*: large-scale, long-term effect of fishing on the broader ecosystem (e.g. habitat alteration, changes to the food web)

The management system relies on a comprehensive suite of measures to control harvests and harvest-related impacts:

- *Access controls* (Section [2.5.3](#)) to limit to total level of fishing effort in an area.
- *Decision guidelines* that prescribe reduced harvests as abundance declines (Section [2.5.2](#)). When required, DFO closes directed fisheries as an immediate management measure for achieving conservation objectives. Commercial harvest restrictions are implemented on a sliding scale ranging from directed fisheries to non-retention of incidental catch, and finally full closures, as outlined in the general allocation principles in Section [1.3.2.1](#). Full closures are generally determined pre-season based on long-term trends and forecasts, and strong in-season information is required before any openings are considered.
- *Monitoring programs* are in place for target salmon stocks, non-target salmon stocks, and non-target species (Section [2.4.2](#)). On-going data collection and management ensure defensible information is collected and that encounters of non-target salmon and non-salmon species are accurately recorded. Accurate record keeping and timely data transfer is a condition of licence.
- *Conservation measures* to reduce the fishing mortality of stocks of concern. This includes non-retention of incidental harvest or by-catch, as well as fishery restrictions (gear, time, area). General conservation principles have been formalized in the *Species at Risk Act* (Section [1.1.2.4](#)), and specifically defined for salmon in the *Wild Salmon Policy* (Section [3.2.2](#)). The *Selective Fishing Policy* (Section [1.2.7.4](#)) describes the hierarchy of strategies intended to minimize mortality of non-target species due to incidental harvest and by-catch. The sections below include examples of recent and current conservation measures. Section [3.4](#) includes a comprehensive inventory of conservation initiatives in the Pacific Region, and [Appendix 1](#) lists specific conservation measures implemented in salmon fisheries by gear-type and statistical area. These precedents establish a strong incentive for collaborative improvement of strategies for selective fishing and effort control (Section [3.2.4](#)).
- *Enforcement* of fishing regulations and conservation measures (Section [2.6](#)).

DFO develops new monitoring programs as new conservation concerns are identified during the annual planning process (Section [4.2.1.1](#)). Long-term developments in monitoring requirements grow out of the implementation of new policies (e.g. WSP), and specific measures are implemented annually through the *Integrated Fisheries Management Plans*. The IFMP identifies the approach to be taken in prosecuting a fishery. Monitoring programs are part of that approach and are specified in Conditions of Licence. Recent examples of new monitoring programs implemented in response to emerging issues include:

- Use of at-sea observers to monitor fish handling and release of non-target salmon species by commercial gear as identified in the 2007 NC IFMP (Section 7.6 pg 70).
- As the structure of Pacific salmon fisheries shifts towards defined shares (Section [1.2.9](#)), new catch validation and monitoring mechanisms have been developed. For example, the component of the Area H troll fleet that chooses to fish under a defined-share approach, about half in recent years, is subject to dockside validators and packer-based validators. The Area H troll fleet also tested cameras and data loggers to monitor discards in the defined-share fishery and avoid high-grading of catch. These measures are operational and could be implemented if concerns arise.
- The Area 20 seine fishery is subject to set-by-set monitoring on a grid to rapidly shift fishing effort away from locations with increased by-catch. This system was implemented after conservation concerns for Interior Fraser coho and WCVI chinook triggered a full fishing closure in the area (Section [3.2.4.3](#)).
- A key element of the *Pacific Integrated Commercial Fisheries Initiative* is improved catch monitoring and reporting, including electronic log-books (Section [1.2.9.2](#)).
- Anticipated re-allocation of a portion of commercial salmon catch to in-river selective fisheries with better in-season abundance information will require a comprehensive data gathering system. Stock assessment frameworks are being developed for the Fraser and the Skeena systems.

2.5.4.2 Measures to Control Total Removals of Target Salmon Stocks (Directed Fisheries)

First Nations FSC fishing plans and recreational fishing plans are generally developed pre-season based on long-term abundance trends in target stocks.

Commercial pink and chum fisheries are planned pre-season, but are also managed on a daily or weekly basis during the fishing season. Abundance estimates based on weekly escapement and catch assessments serve as in-season indicators of run size and timing. When in-season indicators identify conditions which fall below management escapement goals, fishing opportunities are reduced or terminated until conservation guidelines permit more fishing effort.

Examples of low-impact fisheries, selective fishing, and rapid in-season response for pink and chum fisheries include:

- Projects related to *Pacific Fisheries Reform* and *Pacific Integrated Fisheries Initiative* (Section [1.2.9](#)).
- Pink and chum commercial fisheries in Areas 1 to 6 usually commenced on 12 or 24 hour openings with subsequent opportunities dictated by in-season escapement indicators. Chum fisheries have been closed for most of these areas, except for a few possible terminal opportunities, and pink fisheries operate with requirements for chum non-retention and live-release. In Area 4, net fisheries fish to weekly exploitation rates identified for certain species. When the weekly exploitation rate is

reached, fishing is closed until further stock has been identified as migrating past the Skeena test fishing site (Section [2.2.3.2](#)).

- Terminal chum fisheries in the Inner South Coast typically have short initial openings, and are either extended or closed depending on in-season escapement data and catch information from the initial opening.
- WCVI chum fisheries are managed through a combination of mixed-stock fisheries with target harvest rate and terminal fisheries based on local escapement targets (section [2.2.3.4](#))

2.5.4.3 Measures to Control Incidental Harvests and By-Catch

A reporting framework is in place to identify in-season any potential by-catch issues and management of fisheries is flexible enough as to allow in-season adjustments to fishing plans (Section [2.4.2.5](#)). Documentation of the by-catch of non-target species in commercial fisheries is a condition of license. These data are used to determine whether fishery management actions are required to protect non-target species. By-catch data is reviewed and discussed with stakeholders to identify management strategies to limit or avoid impacts on species of concern. There is on-going selective fishing research focusing on commercial harvest methods to exploit target salmon while minimizing impacts on other stocks and species (Section [3.2.4](#))

BC pink and chum fisheries are managed to address time and area-specific concerns over incidental harvests and by-catch of weak salmon stocks through restrictions on location, timing, gear, and retention for net and troll fisheries. Measures are in place to protect weak stocks of steelhead, chinook, coho, chum, pink and sockeye. These measures are publicly announced through the commercial licence conditions and fishery notices (Section [2.5.3.4](#)) and are legally enforceable (Section [2.6](#)).

Fishing plans call for directed harvests of target stocks to be constrained when there are conservation concerns for other species, stocks, or stock aggregates encountered during directed fisheries. Fishing plans are designed to keep exploitation rates on stocks of concern within the limits described in the conservation and recovery objectives (Section [2.3.1](#)). Conservation and recovery measures are implemented and enforced in all fisheries (Section [3.4](#), [Appendix 1](#))

The MSC certification process explicitly evaluates whether there are documented management strategies for the recovery of stocks or species at risk. There are currently no pink or chum stocks that are either designated as endangered or threatened by COSEWIC or listed under Schedule 1 of the *Species at Risk Act*. However, DFO has identified pink and chum stocks of concern and responded with the pre-emptive implementation of conservation and recovery measures:

- *Wild chum in statistical areas 3,4,5, and 6*: The recovery of these stocks is managed through escapement and catch monitoring, use of non-retention/ live-release provisions in net fisheries, and closures in areas with high potential interception of stocks of concern (Section [2.2.3.2](#)).
- *Pink salmon in statistical area 12*: Some populations in this area have experienced drastic declines in abundance (Broughton), and there are no directed pink fisheries. Some test fishing has occurred to establish abundance indices.

BC pink and chum fisheries are also shaped by measures to reduce by-catch of the following non-target salmonid stocks of concern: Late Fraser sockeye, especially Cultus sockeye, Sakinaw sockeye, Interior Fraser coho, steelhead, WCVI Chinook, Lower Georgia Strait chinook, North Coast chum, and coho. DFO has demonstrated a willingness to conserve these salmonid stocks of concern by curtailing

fisheries in which there might be significant incidental harvest or by-catch, moving open areas, changing open times, or setting exploitation rate limits:

- In general, terminal fishing areas are structured to be very stock-specific (e.g. focus on enhanced) and reduce impacts on other stocks, despite the economic costs associated with foregoing better quality fish.
- In 1998, in response to serious conservation concerns for Skeena and Thompson coho, DFO closed all marine coho fisheries and closed or reduced a number of other fisheries of significant by-catch concern for Skeena and Thompson coho stock complexes. In addition, DFO initiated the *Selective Fishing Program* (Section [3.2.4.2](#)), which developed and tested by-catch reduction measures. Non-retention of wild coho is still in place in the Strait of Georgia, but recreational anglers can retain hatchery-marked coho.
- Salmon fisheries have been modified substantially to address coho and chinook by-catch concerns. Area 20 seine fisheries nicely illustrate the combination of effort controls, gear modifications, and in-season response mechanisms (Section [3.2.4.3](#)).
- In response to overall concern for wild chum stocks located in Statistical Areas 3 (Nass), 4 (Skeena), 5 and 6 (Hecate Strait), chum non-retention and use of selective handling techniques are mandatory in net fisheries to release this species, and net fishing locations have been adjusted to avoid sites of high chum encounters (Section [2.2.3.2](#)).
- To conserve chum and coho in Skeena pink fisheries in particular, the department implemented closures and reductions in fishery times and areas, gear modifications attached as license conditions, modifications in fishing practices, and mandatory revival tanks (Section [2.2.3.2](#)).
- Queen Charlotte Islands (Haida Gwaii) pink salmon fisheries are implemented on identified surplus stocks, with the fishery occurring terminally near the natal stream. Harvests of enhanced chum in occur terminally, close to the natal stream. Live release of certain non-target species is required.
- Seine and troll fisheries targeting abundant Fraser pink runs have been modified to address concerns for Late run sockeye, particularly Cultus sockeye. Pink fisheries are delayed until test fisheries show low incidence of sockeye, and live-release provisions are in place. Sockeye by-catch in these pink fisheries is closely monitored, and estimated mortality rates, based on past studies, are included in the evaluation of total harvest impacts on Late run sockeye stocks (Section [2.2.3.5](#)).
- Fisheries targeting Fraser River chum have been modified to address by-catch concerns. Most of the Fraser chum harvest occurs after the steelhead window closures, at the very tail-end of the steelhead migration timing, and with strict selective fishing requirements. There are no Fraser chum fisheries at the peak of the chum run because of by-catch concerns for steelhead and Interior Fraser coho. These time closures illustrate the established weak-stock management approach, at the cost of substantial foregone catch in the short-term to support conservation objectives and long-term sustainability.

Section [3.4](#) contains an inventory of conservation and recovery efforts for endangered or threatened species listed under SARA or designated by COSEWIC, as well as other salmon stocks of concern. [Appendix 1](#) lists well-defined management strategies outlined in the *2008 Integrated Fisheries Management Plan* to limit impacts on salmon stocks of concern and enable stock-specific recovery. The *Certification Unit Profiles* include more detail about salmon conservation measures in each area.

DFO has also demonstrated a willingness to modify pink and chum fisheries to reduce impacts on non-salmon by-catch species:

- For net and troll salmon fisheries, the incidence of non-salmon encounters is considered very low, based on log book reports, reports from selective fishing experiments in 1998-2002, and observer reports since then. Recent observer reports are being evaluated to identify any potential measures required in future.
- Rockfish Conservation Areas (RCA) have been developed through an extensive public consultation process. These are closed to commercial troll gear (Section [3.4.3.1](#)).
- In terms of ghost fishing the majority of salmon gear is not thought to be a problem. Troll gear simply drops to the bottom and is no longer in a fishable state. Seine nets are attached to the vessel, are expensive, and are rarely lost. Gillnets might continue fishing if lost, but the nets are designed to float, and would be quickly reported to enforcement officers for recovery. Accordingly no special monitoring systems or impact assessments are carried out for ghost fishing due to salmon fishing gear.
- The conditions of license for commercial fishers require completion of a log book that summarizes all fishing activity. Encounters of all non-salmon species are required to be documented in this manner. Very few birds have been observed caught in commercial salmon nets, and due to the timing and location of pink and chum fisheries bird encounters are considered to be low. A 2007 study in Area 4 documented bird encounters in the net fisheries. The Interdepartmental Recovery Fund (IRF) is also funding research into seabird interceptions.

2.5.4.4 Measures to Control Marine Ecosystem Impacts

Where conflicts exist between the harvest of fish and ecosystem concerns based on their removal from the food web, the balance achieved has been the subject of an open review by stakeholders. The process used to achieve this is to include management options in draft IFMPs that are available for review by stakeholders and the public.

DFO conducts and participates in extensive research into BC's marine and freshwater ecosystems, and leads integrated management initiatives throughout the province. Examples include:

- Comprehensive regional approach to integrated management
- Marine Protected Areas and other spatially persistent fishery closures
- Pacific North Coast Integrated Management Area (PNCIMA), which has incorporated previous work on the Central Coast Integrated Management Area (CCIM)
- The Strait of Georgia Ecosystem Research Initiative
- Barkley Sound / Alberni Inlet WSP Pilot
- Consideration of salmon as a forage species for marine mammals

Sections [3.3](#) and [3.4](#) include more details about these ecosystem research initiatives and integrated management projects.

2.6 Compliance Mechanisms

2.6.1 Incentives and the National Compliance Framework

DFO uses a full spectrum of complementary compliance mechanisms to achieve conservation and sustainability objectives. These mechanisms can be broadly categorized into incentives, and the application of principles, tools and approaches forming a comprehensive national Compliance Framework.

2.6.1.1 Incentives

Incentives are used to increase compliance and collaboration in the long-term. For example, commercial openings in low abundance years are tied to proven selective fishing methods and a demonstrated ability to control effort within a fleet. Several on-going policy initiatives include provisions for improved monitoring and effort control, but these are balanced against increased efficiency, predictability, and stability of harvests.

A good illustration of compliance incentives in the management system are collaborative projects related to the *Selective Fishing Program* (Section [3.2.4](#)). Priority access is given to those who have demonstrated the ability to meet or exceed selective fishing standards. DFO encourages the incorporation of selective fishing experiments into regular fisheries, where appropriate, to realize cost savings.

Another good illustration of compliance incentives in the management system are the initiatives related to *Pacific Fisheries Reform* and the *Pacific Integrated Commercial Fisheries Initiative* (Section [1.2.9](#)). For example, there are three different types of incentives built into the development of improved monitoring standards:

- *Risk matrix*: Fisheries will be categorized based on the status of target stocks and gear/effort/harvest. Each category will then be linked to a required level of monitoring. Harvester groups have to balance access to marginal opportunities and the structure of their fishery against the associated increase in monitoring requirements.
- *Predictability and Stability*: Clearly defined shares reduce the “race to fish” and improve the implementation of selective fishing technologies.
- *Harvester involvement*: Harvesters are closely involved in developing and testing the operational details of the *Enhanced Accountability* measures and *Monitoring Standards*. Pilot projects help refine the logistics of the program, build a momentum of support within the fleets, and enhance compliance through peer-pressure.

Specific examples of compliance incentives are included in Sections [1.2.9](#), [2.5.4](#), [3.2.4](#), and [3.4](#).

2.6.1.2 National Compliance Framework

The National Compliance Framework has nine underlying principles:

- Proactive (promote voluntary compliance)
- Collaborative (build support through partnerships)
- Problem-solving (special attention to specific problems)
- Risk-based (effort and response proportional to risk)

- Innovative (optimize the use of technology and other tools)
- Intelligence-led (increased role of intelligence and analysis in supporting enforcement operations)
- Cost efficient and cost effective (better use of resources), and
- Balanced (appropriate mix of activities undertaken to achieve compliance).

These approaches and principles guide the application of compliance tools by DFO staff. The primary program associated with the management of compliance for DFO is the Conservation and Protection (C&P) Directorate.

C&P 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, fish habitat, and oceans. The program is delivered through a balanced regulatory management and enforcement approach including:

- Promotion of compliance through education and shared stewardship;
- Monitoring, control and surveillance activities; and
- Management of major cases and special investigations in relation to complex compliance issues.

All Compliance Management Plans should be consistent with the National Compliance Framework and the DFO Compliance Model.

General information about C&P is available at http://www.pac.dfo-mpo.gc.ca/ops/CP/default_e.htm

An overview of C&P activities is available at www.pac.dfo-mpo.gc.ca/ops/cp/programs_e.htm

2.6.2 Comprehensive Compliance Management

2.6.2.1 Roles

DFO uses C&P fishery officers, observers, and charter patrols to achieve compliance with the conservation measures identified in licence conditions and fishery notices:

- *Fishery Officers*: DFO's *Conservation & Protection Directorate* (C&P) monitors fishing activities and enforces regulations under the mandate of the *Fisheries Act* (Section [1.1.2.2](#)). C&P currently deploys 170 Fisheries Officers plus Marine Enforcement Officers and Aboriginal Fishery Guardians. General information about C&P is available at http://www.pac.dfo-mpo.gc.ca/ops/CP/default_e.htm. An overview of C&P activities is available at www.pac.dfo-mpo.gc.ca/ops/cp/programs_e.htm.
- In Pacific region, DFO's *Conservation & Protection Directorate* (C&P) is comprised of over 170 Fishery Officers distributed over 5 areas and more than 30 field offices, supported by a number of Aboriginal Fishery Guardians. Fishery Officers are designated under section 5 of the *Fisheries Act* and have full enforcement powers and responsibilities outlined in the Act, *The Criminal Code of Canada*, and the *Constitution Act*. C&P Fishery Officers are designated under section 5 of the *Fisheries Act* and have full enforcement powers and responsibilities outlined in the Act, *The Criminal Code of Canada*, and the *Constitution Act*.
- *Observers* conduct on-board or dockside monitoring and are typically funded by DFO. They focus on monitoring by-catch and compliance with fishing regulations, but also collect information for stock assessment (e.g. species mix, size, age, condition, scales, tags). Observers record and report

any violations, but do not have a mandate for legal enforcement. There are no formal guidelines in place to indicate the number of observers; rather the level of observer coverage depends on the severity of the conservation issue and varies from one year to the next. Observer deployment focuses on areas with high-priority by-catch reduction regulations, but most fisheries have some coverage in most years. Licence conditions include a provision that commercial fishing vessels must take an observer on board when requested to do so by DFO.

- If there is no conservation issue, the level of observers is low (0 to 2 in each of the fisheries).
- If there is potential to have an impact on stocks or species of concern, the number of observers can increase to 6 to 10 per fishery (with 30-100 vessels operating in the fishery).
- During experimental pilot projects observer coverage is usually high (up to 100% of the vessels would carry an observer).
- *Charter Patrols* employed under a vessel charter contract are designated as "fishery inspectors". Their primary duty is to monitor compliance with conditions and regulations (e.g. area, time). Charter Patrols, just as observers, record and report any violations, but do not have the legal mandate to enforce. Charter patrols also collect biological information (e.g. stream surveys, anecdotal abundance information) and facilitate communication between the department and the fleet (collect catch reports, disseminate closure notices). Most BC salmon fisheries have charter patrols.

2.6.2.2 Compliance Priorities

The management of Pacific salmon remains a high priority for DFO. There are, however, other priorities and sustaining agenda activities which must be delivered by C&P and other departmental staff, for other mandated program areas such as habitat management, the Canadian Shellfish Sanitation Program, maritime security, and the protection of species at risk.

In order to balance multiple program demands, C&P utilizes a comprehensive risk-based integrated work planning process to address the highest risks to sustainability and establish annual operational priorities. 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.

Compliance objectives and priorities are publicly reviewed each year through the *Integrated Fisheries Management Plans* for salmon, and performance of the enforcement program is evaluated annually through the public post-season review process (Sections [4.2.1.1](#) and [4.2.1.2](#))

The 2008 and 2009 IFMP identified the following compliance management priorities for salmon fisheries:

- Maintain enhanced coverage both on the Fraser River and in marine approach waters (Johnstone Straits) by undertaking vessel, vehicle, and air patrols. Work to curtail illegal sales through a program designed to improve traceability of catch (improved catch monitoring and plant / storage verification)
- Improvements to fishery monitoring and catch reporting requirements
- Illegal retention of prohibited species
- Close time patrols balanced with random open time patrols
- Work with stakeholders to improve regulatory compliance

- Recreational - daily limits, non-retention and closed area enforcement

Habitat protection is an important part of DFO operations, with C&P working in collaboration with Habitat Management staff. Detailed information is available in the following publications:

- 2001 - *Compliance and enforcement policy for the habitat protection and pollution prevention provisions of the Fisheries Act* (Waves CATNO 263787)
- 2001 - *Habitat prosecution procedures* explains the complex setting of multiple agencies responsible for different aspects of habitat protection. The full manual is available at (<http://www.dfo-mpo.gc.ca/Library/280896.pdf>)

2.6.2.3 Measuring the Success of Compliance Management Activities

The *Conservation & Protection Directorate* conducts an annual assessment as part of the department's post-season review and evaluation of the fishery, as described at http://www.pac.dfo-mpo.gc.ca/ops/Cp/evaluation_e.htm.

At the end of each season, statistics are compiled on the numbers of checks conducted from various platforms (at-sea, vehicle, and foot) and the number of charges resulting from these checks. Using this information, staff can evaluate whether enforcement priorities were met and whether various enforcement activities were effective. Overall compliance rates for each area and fishery are calculated to help identify priority areas for enforcement in subsequent seasons. In addition, valuable narrative data is collected to ensure problem areas are identified and addressed.

Post-season review meetings with C&P and resource management staff are held annually. From these sessions, staff identify key compliance issues and recommend the most effective compliance tool to address each of those issues. This is supported by the development of specific strategies to target and mitigate identified risks to the sustainability of aquatic resources.

Compliance rates are generally high:

- Recent charges and convictions are publicly announced at http://www.dfo-mpo.gc.ca/media/charges_e.htm, which includes an archive of charges and convictions back to 1994
- DFO has documented compliance with catch monitoring provisions. These documents show that compliance with log book requirements range from 67% to 89% of the fleet.
- Section 8.5 of the 2008 SC salmon IFMP summarizes enforcement activities in six categories (Commercial Troll, Commercial Net, Aboriginal, Aboriginal Economic, Recreational Tidal, and Recreational Non-tidal) and lists the number of patrol hours, checks, observed violations, and compliance rate.
- 1996 - *The Fisheries Act and Local Governments: Court Judgments (1984 - 1994) in the Pacific Region* outlines the enforcement policy in the context of other federal and provincial acts, and summarizes court judgments in cases where local jurisdictions were charged. The report is available at <http://www.dfo-mpo.gc.ca/Library/222013.pdf>
- 1999 - *Habitat protection provisions of the Fisheries Act : a review : inventory of prosecutions and court decisions and innovative funding approaches to furthering fisheries habitat management objectives* (WAVES CATNO 237501)

- DFO prepares an *Annual Report to Parliament on the Administration and Enforcement of the Fish Habitat Protection and Pollution Prevention Provisions of the Fisheries Act*, which are available at http://www.dfo-mpo.gc.ca/publication_e.htm. These annual reports include a review of development proposals evaluated, summaries of habitat enforcement activities and resulting warnings, charges, and convictions, and a list of all convictions with sentencing details.

A comprehensive network of planning and advisory processes has developed for BC fisheries, as described in Section [4.3.1](#). The main purpose of all these processes is to build collaboration and preempt any confrontations. However, some disagreements cannot be resolved through the established channels, resulting in unilateral decisions by the department.

Section [4.2.2.4](#) reviews the various dispute resolution mechanisms in place for BC pink and chum fisheries.

2.7 Summary: DFO Toolkit for Assessment, Monitoring, and Enforcement

Information about BC salmon, and the fisheries targeting BC salmon, is collected using a comprehensive suite of departmental and collaborative tools. Earlier sections introduce each of these based on their predominant function in the management system (e.g. enforcement). However, distinctions are not that clear-cut in operational practice. The table below compares the different tools. The details for each fishery are included in the *Certification Unit Profiles*.

Tool	Description	Functions	Examples
Observers	On-board or dockside catch monitoring typically funded by DFO, and deployed to areas with high-priority by-catch reduction measures.	<ul style="list-style-type: none"> • By-catch monitoring • Biological data (species mix , size, age, condition, scales, tags) • Observe, Record, and Report any violations, but do not enforce 	Vessel operators were required to pay for an observer in an experimental selective gill net pink fishery in parts of the Skeena River in 2007.
Charter Patrols	Fleet-independent vessels typically funded by DFO that serve as liaison between DFO and harvesters	<ul style="list-style-type: none"> • Monitor compliance with conditions and regulations (e.g. area, time) • Collect escapement information • Communication (collect catch reports, disseminate closures) • Anecdotal abundance information (echosounding, jumpers) • Observe, Record, and Report any violations, but do not enforce 	Charter patrols conduct on-grounds surveys of approach areas and terminal areas in Nanaimo River chum fishery (Area 17) to provide information for escapement estimates.
Fishery Officers		<ul style="list-style-type: none"> • Monitoring, control and surveillance activities • promote compliance with legislation, regulations, and management measures through education and shared stewardship. • Management of major cases and special investigations in relation to complex compliance issues 	In 2008, C&P officers conducted 1076 checks in commercial salmon fisheries in the North Coast area.
Test Fisheries	Standardized harvest using a commercial vessel under contract.	<ul style="list-style-type: none"> • In-season estimates of abundance and migration timing • Stock composition • Biological data (species mix , size, age, condition, scales, tags) 	The Albion test fishery provides in-season abundance estimates for Fraser River chum, which determine the Total Allowable Catch.
Assessment Fisheries	Commercial fishery with strictly limited number of vessels	<ul style="list-style-type: none"> • In-season estimates of abundance and migration timing 	Assessment fisheries for in-season abundance estimates of Mainland Inlet Pinks.
Effort Surveys	Visual (overflight), reporting (hails), creel,	<ul style="list-style-type: none"> • Collect information about the number of vessels participating in an opening 	WCVI creel survey
Escapement surveys	Visual (overflight, streamwalk), counting fences, carcass pitch, mark-recapture	<ul style="list-style-type: none"> • Collect information number of adult spawners in each system • Biological data (species mix , size, age, condition, scales, tags) 	All major systems

3 CONSERVATION OF WILD PACIFIC SALMON AND THEIR ECOSYSTEM

3.1 Overview

Most of DFO's activities are linked to the underlying objectives of conservation and sustainable use, some more directly than others. This chapter focuses on those activities that are most clearly linked to conservation, and highlights direct conservation efforts (e.g. formal status benchmarks under the Wild Salmon Policy, Section [3.2.2](#)). Other chapters have a different emphasis, and contain examples of more indirect considerations for long-term conservation and sustainability (e.g. enhanced catch monitoring built into the changing structure of Pacific fisheries, Section [1.2.9](#)).

This chapter covers three topic areas:

- *Elements of DFO's Conservation Strategy*: DFO's long-term strategy for conserving Pacific salmon and their ecosystem is anchored on five key elements: Recovery planning under the *Species at Risk Act*, development and implementation of the *Wild Salmon Policy*, a comprehensive research program, the on-going implementation of selective fishing measures, and enhancement and restoration programs. Section [3.2](#) describes each of these elements.
- *Integrated management of marine and coastal ecosystems*: Recent policy developments place fisheries management decisions firmly in the broader ecosystem context. Section [3.3](#) outlines DFO's work on the building blocks necessary for integrated management of marine and freshwater ecosystems, and summarizes current implementation initiatives.
- *Inventory of conservation and recovery efforts*: DFO has initiated and maintained many comprehensive, large scale conservation and recovery initiatives in the last 15 years. Section [3.4](#) outlines the processes now in place to trigger formal recovery initiatives and summarizes current efforts.

Some of the material in this section is not directly linked to BC pink and chum fisheries, but the MSC process also evaluates the knowledge about the ecosystem in which the fisheries take place, and whether the management system incorporates these broader considerations. The intent of this section is to illustrate that the management system that deals with BC pink and chum salmon has a track record of:

- Identifying potential problems
- Initiating research and policy initiatives to identify the appropriate response
- Implementing fisheries modifications and other measures based on the outcomes of this research, in combination with public consultation.

3.2 Elements of DFO's Conservation Strategy

3.2.1 Recovery Planning

3.2.1.1 Pre-emptive vs. Legally-mandated Recovery Planning

DFO has shown a consistent pattern of responding to conservation concerns as they emerge, within the time-constraints imposed by due process. DFO pre-emptively collects much of the status information that goes into the legal listing process under the *Species at Risk Act* (SARA), and consistently acts prior to a legal listing. The typical sequence is:

- Identify conservation concerns through research, stock assessment, and public consultation.
- Respond with fisheries modifications while initiating focused research and policy initiatives.
- Develop and implement a comprehensive suite of response measures.
- If the conservation concerns persist despite response measures, the compiled information serves as the basis for a COSEWIC assessment, which may eventually lead to legal listing under SARA .
- Once a stock or species is listed under SARA, a formal recovery planning process is initiated, which builds on the measures already in place (see below).

This sequence is illustrated by many of the conservation and recovery efforts described in Section [3.4](#).

The annual *Integrated Fisheries Management Plans* (IFMP) for Pacific salmon (Section [4.2.1.2](#)) list all pertinent stocks and species protected by SARA, designated by COSEWIC, or otherwise identified as a conservation concern. Corresponding management measures for upcoming salmon fisheries are identified throughout the IFMP. A post-season review of performance against conservation objectives is also included.

For example, the 2007 IFMP for South Coast Salmon includes the following information about conservation efforts for Interior Fraser coho:

- Background for the Interior Fraser coho conservation strategy (Section 2.3.2 of the IFMP)
- A clearly defined conservation objective for Interior Fraser coho and an overview of conservation measures planned for 2007 salmon fisheries, including pink and chum fisheries (Section 3.1.2 of the IFMP)
- Specific conservation measures for Interior Fraser coho in 2007 First Nation fisheries (Section 5.2.2 of the IFMP)
- Specific conservation measures for Interior Fraser coho in 2007 recreational fisheries (Section 6.3 of the IFMP)
- Specific conservation measures for Interior Fraser coho in 2007 commercial fisheries, included as part of the description of weekly or monthly anticipated fishing plans for each gear type (Sections 7.13, 7.14, and 7.15 of the IFMP).
- 2006 Post-season review of total fisheries impact on Interior Fraser coho (Section 8.1.2 of the IFMP)

Section [3.4.2.1](#) of this management summary describes conservation and recovery efforts for coho.

Section [1.1.2.4](#) of this management summary contains more information about SARA, including extensive links to communication materials and up-to-date information about Canadian species at risk. The sections below describe the recovery planning process under SARA.

3.2.1.2 Process for Identifying Species at Risk and Planning their Recovery

Once COSEWIC designates a species or population as extirpated, endangered, threatened, or of special concern, a response process with strict timelines is initiated. A *Guide to the Species at Risk Act* summarizing this process is available at <http://www.ec.gc.ca/publications/index.cfm?screen=PubDetail&PubID=526&lang=e>.

- COSEWIC assesses and classifies a wildlife species as one of the following: extinct; extirpated; endangered; threatened; special concern; data deficient; or not at risk.
- COSEWIC provides its report to the Minister of the Environment and the Canadian Endangered Species Conservation Council, and a copy is included in the SARA Public Registry.
- Minister of the Environment indicates how he or she intends to respond to a COSEWIC assessment within 90 days.
- Once the Minister of the Environment provides a response regarding the COSEWIC assessment and forwards that response to the Governor in Council, the Governor in Council has 9 months to make a decision about whether or not to add the species to the List of Wildlife Species at Risk. Throughout the listing process, consultations must be undertaken with affected parties. Before the end of the 9-month timeline, proposed listing decisions are posted on the SARA Public Registry for 30 days to allow for public comment. Final listing decisions are posted on the SARA Public Registry at the end of the 9-month period. If no government action is taken, the species is automatically added.
- When a species is on or added to the List of Wildlife Species at Risk as either extirpated, endangered or threatened, then the species has:
 - Immediate protection on federal lands (except for those species in the territories that go through the safety net process described below).
 - Immediate protection if they are a migratory bird.
 - Protection through a safety net process if they are any other species in a province or territory
 - Protection of its residence(s), once identified.
- A recovery strategy must be prepared within one year for endangered species and within two years for threatened or extirpated species
- A management plan must be prepared within three years for a special concern species.
- Recovery strategies and action plans, which must include the identification of critical habitat for the species, to the extent possible, and management plans are published on the SARA Public Registry. The public has 60 days to comment on these documents before they are finalized

- Five years after a recovery strategy, action plan or management plan comes into effect, the competent minister must report on the implementation and the progress toward meeting objectives.

Recovery planning for species at risk is a multi-jurisdictional process. The table below, from <http://www.env.gov.bc.ca/wld/recoveryplans/rcvry1.htm>, identifies the agencies responsible for recovery planning in British Columbia:

Species Type	Lead Agency
Marine species	Fisheries and Oceans Canada
Freshwater fish	Fisheries and Oceans Canada & BC Ministry of Environment (as described in Section 1.1.3.1)
Most terrestrial species	BC Ministry of Environment
Species predominantly on/in lands/waters administered by Parks Canada (National Parks, Historic Sites and Marine Conservation Areas)	Parks Canada Agency
Migratory birds	Environment Canada

Once species assessments are received from COSEWIC, the lead agency initiates the listing process. As part of this process, DFO will conduct a *Recovery Potential Assessment* (RPA) for Endangered or Threatened species, which includes a number of steps to assess current or recent species status, the scope for management to facilitate recovery, and scenarios for mitigation and alternatives to activities. In addition, socio-economic impacts are evaluated and consultations are also completed. Completed RPAs are publicly available on the *Canadian Science Advisory Services* (CSAS) website at http://www.dfo-mpo.gc.ca/csas/Csas/Home-Accueil_e.htm. Once a listing decision has been made, DFO will initiate the recovery planning and action planning processes as required, which may include the identification of critical habitat:

- RPAs have been completed for white sturgeon, sea otters, transient killer whales, fur seals, Northern abalone, Cultus pygmy sculpin, Misty Lake sticklebacks, speckled dace, Nooksack dace, and Salish sucker.
- Critical habitat assessments have been completed for resident killer whales and Nooksack dace.
- Socio-economic impact analyses have been completed for several BC species, including white sturgeon, Interior Fraser coho, bocaccio (the first time it was up for listing), and Okanagan chinook.

Implementation details for these assessments are being refined. Progress is documented in the following sequence of workshop proceedings and reports:

- Proceedings of the National Science Review Meeting on Species at Risk Issues March 18-22 2002. *CSAS Proceedings 2002/007* (http://www.dfo-mpo.gc.ca/csas/Csas/proceedings/2002/PRO2002_007e.pdf)
- Proceedings of the National Science Review Meeting on Species at Risk Issues, December 9-13, 2002, Halifax, Nova Scotia. *CSAS Proceedings 2002/035* (http://www.dfo-mpo.gc.ca/csas/Csas/proceedings/2002/PRO2002_035_E.pdf)

- *National DFO Workshop on Quantifying Critical Habitat for Aquatic Species at Risk*, 2-6 December 2002, Montreal, Quebec. CSAS Proceedings 2003/012 (http://www.dfo-mpo.gc.ca/csas/Csas/proceedings/2003/PRO2003_012_E.pdf)
- *National Science Advisory Meeting on Section 73 Permits under the Species at Risk Act*, March 8-10. CSAS Proceedings 2004/005 (http://www.dfo-mpo.gc.ca/csas/Csas/proceedings/2004/PRO2004_005_B.pdf)
- *Revised Framework for Evaluation of Scope for Harm under Section 73 of the Species at Risk Act*. CSAS Stock Status Report 2004/048 (http://www.dfo-mpo.gc.ca/csas/Csas/status/2004/SSR2004_048_REVISED_e.pdf)
- Environment Canada released a *Critical Habitat Discussion Paper* in 2004. The full paper is available at http://www.sararegistry.gc.ca/virtual_sara/files/policies/Critical%20Habitat%20Discussion%20Paper%5Fe%2Epdf.
- *A Framework for Developing Science Advice on Recovery Targets for Aquatic Species in the Context of the Species At Risk Act*. CSAS Science Advisory Report 2005/054 (http://www.dfo-mpo.gc.ca/csas/Csas/status/2005/SAR-AS2005_054_e.pdf)
- *Revised Protocol for Conducting Recovery Potential Assessments*. CSAS Science Advisory Report 2007/039 (http://www.dfo-mpo.gc.ca/csas/Csas/status/2007/SAR-AS2007_039_e.pdf)
- *Assessing recovery potential: Long-term projections and their implications for socio-economic analysis*. Shelton et al. (2007) CSAS Research Document 2007/045 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2007/RES2007_045_e.pdf)

Federal recovery strategies are posted on the SARA Registry (www.sararegistry.gc.ca).

Provincial recovery strategies are posted at <http://www.env.gov.bc.ca/wld/recoveryplans/rcvry1.htm>.

Recovery Potential Assessments and Critical Habitat Assessments must be peer reviewed through PSARC and posted at http://www.meds-sdmm.dfo-mpo.gc.ca/csas/applications/Publications/publicationIndex_e.asp. Some DFO recovery strategies and conservation strategies were also peer-reviewed in the past, but this is no longer a requirement. Section 3.4 describes examples of conservation and recovery efforts, and references specific recovery strategies.

The *Species at Risk Act* includes provisions for permitting activities that may affect a listed wildlife species (Section 73 of the act) and for exempting a listed species from SARA protection for the first year after listing (Section 76 of the act):

- In order to be eligible to receive a section 73 permit to conduct an activity that may affect a listed wildlife species, several criteria must be met:
 - First, the Minister must be of the opinion that (a) the activity is scientific research relating to the conservation of the species and conducted by qualified persons; (b) the activity benefits the species or is required to enhance its chance of survival in the wild; or (c) affecting the species is incidental to the carrying out of the activity.
 - Second, the proponent must demonstrate that (a) all reasonable alternatives to the activity that would reduce the impact on the species have been considered and the best solution has been adopted; (b) all feasible measures will be taken to minimize the impact of the

activity on the species or its critical habitat or the residences of its individuals; and (c) the activity will not jeopardize survival or recovery of the species.

- Under section 76 of SARA, the Governor in Council may, on the recommendation of a competent minister, exempt certain activities from the prohibitions for up to a year from the initial listing. The development of recovery strategies is not affected by section 76 and will be carried out as usual. To be eligible for this exemption, the activity must already be authorized under another federal Act of Parliament. There are no other specific pre-conditions for this exemption. Only one such exemption has been granted relating to BC salmon. When Nechako, Upper Fraser, Upper Columbia, and Kootenay sturgeon were listed on August 15, 2006 a broad range of activities were exempted from the prohibitions for a period of one year.

3.2.2 Wild Salmon Policy

3.2.2.1 Intent

The Wild Salmon Policy (WSP) establishes the principles and processes for sustainable management of wild Pacific salmon. This policy formally expresses many years of conceptual and practical development in the department's management of Pacific salmon. It serves as a crucial platform for launching and coordinating comprehensive planning processes for the long-term conservation and sustainability of wild Pacific salmon.

The WSP maps out 4 key elements:

- Identifying irreplaceable groupings of salmon stocks, called *Conservation Units* (CU)
- Identifying upper and lower benchmarks to monitor the status of each CU. The lower benchmark will be established at a level of abundance high enough to ensure there is a substantial buffer between it and any level of abundance that could lead to a CU being considered at risk of extinction by COSEWIC. The upper benchmark will be established to identify whether harvests are greater or less than the level expected to provide, on an average annual basis, the maximum annual catch for a CU, given existing environmental conditions.
- Assessing habitat and ecosystem status of conservation units.
- Implementing a public process for establishing strategic plans that cover all Conservation Units and identify resource management actions required to address declines in status of CUs, habitat and ecosystems.

The WSP is well aligned with the MSC ecocertification process, which evaluates whether the management system clearly identifies what should be conserved, the current status of harvested stocks, and the planning process for fisheries. The six implementation strategies under the WSP emphasize all of the key elements of the MSC assessment criteria (e.g. definition of stock units, integrated planning).

3.2.2.2 Development

Concurrent with the substantial development of other policy initiatives described earlier (Section [1.2](#)), DFO also conducted extensive consultations on the development of the Wild Salmon Policy from the late 1990s until its release in 2005, and has consulted on implementation of the Policy since 2005.

Conceptual development started as part of the *New Directions* policy initiative (Section 1.2.7) and continued throughout a public consultation phase which lasted from 1999 to 2005:

- 2000 - *Wild Salmon Policy Discussion Paper* (<http://www.dfo-mpo.gc.ca/Library/243042.pdf>).
- 2002 - *A discussion paper on possible new stock groupings (Conservation Units) for Fraser River chinook salmon* by Candy and others. CSAS Research Document 2002/085, http://www.dfo-mpo.gc.ca/csas/Csas/publications/ResDocs-DocRech/2002/2002_085_e.htm.
- The draft policy underwent extensive public consultation in 2004, prior to formal adoption by the department in June 2005. Detailed records for these consultations were compiled, and publicly distributed to support on-going discussions. Now that the policy has been finalized, these records are no longer available on-line, but are available upon request through the Consultation Secretariat at http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/consult_e.htm.

The final policy is available at http://www-comm.pac.dfo-mpo.gc.ca/publications/wsp/default_e.htm.

3.2.2.3 Policy Implementation

Extensive public consultations have continued since the policy was finalized in June of 2005, but have now shifted towards operationalizing the concepts:

- A summary of 2005 Fall consultations, including WSP implementation is available at <http://www.dfo-mpo.gc.ca/Library/320150.pdf>.
- A general progress report on implementation from 2007 is available at http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/Consultation2007/progressreport_e.htm.
- A detailed progress update from March 2008 is available at http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/wsp/wsp_forum_March_2008_e.htm.
- Relevant reports and articles are accessible through the WSP portal at http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/consultations/WSP/default_e.htm.
- An implementation update from May 2009 is available at <http://www.pac.dfo-mpo.gc.ca/fm-gp/species-especies/salmon-saumon/wsp-pss/docs/sheet-fiche/may-09-mai-eng.htm>.

The WSP maps out 6 implementation strategies. The sections below summarize on-going work for each section.

3.2.2.4 Strategy 1 - Standardized monitoring of wild salmon status

DFO's Wild Salmon Policy (WSP) requires identification of Conservation Units (CUs) for salmon. In the policy, a CU is defined as "a group of wild salmon sufficiently isolated from other groups that, if extirpated, is very unlikely to recolonize naturally within an acceptable timeframe" (DFO 2005). The CU is the scale at which the DFO aims to maintain biodiversity and at which benchmarks (LRPs and TRPs) will be defined. It is also the scale at which depleted species may be legislatively protected (e.g. through the Canada Species at Risk Act, SARA). It is similar in concept to an Evolutionary Significant Unit (ESU), although not the same.

The WSP identifies three elements for this strategy:

- Identify CUs.
- Develop criteria to assess CUs and identify benchmarks to represent biological status.
- Monitor and assess status of CUs.

A comprehensive approach for identifying conservation units of the five Pacific salmon species under federal responsibility has been developed, based on a combination of the ecological context, the life history of each population, and genetic population structure. *Conservation Units for Pacific Salmon under the Wild Salmon Policy* by Holtby and Ciruna (CSAS Research Document 2007/070) documents all the details. Briefly, CU definitions are based on following considerations in sequence:

- Map out *Joint Adaptive Zones* (JAZ) based on a combination of freshwater characteristics and marine characteristics.
- Within each each JAZ, species were further divided into conservation units based on differences in life history, spawning time, and other ecological characteristics.

The approach was reviewed by the *Pacific Science Advice Review Committee* (Section [4.3.5.1](#)) and the resulting CUs in BC for each species continue to be reviewed in public consultation. Appendix 8 of Holtby and Ciruna (2007) summarizes the CU consultations up to 2007. The CU portal at http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/wsp/CUs_e.htm outlines the on-going consultation process and includes a complete and up-to-date list of sites for all CUs.

Section 2.1.1 of each *Certification Unit Profile* (CUP) describes the management aggregates and conservation units in each area. Table 1 of each CUP matches management areas and spawning sites against the conservation units.

Holtby and Ciruna (2007) also document the defining characteristics for each conservation unit. Specifically:

- Chapter 5 summarizes the distribution, life history, ecotypes, and genetic population structure of pink salmon.
- Chapter 6 summarizes the distribution, life history, ecotypes, and genetic population structure of chum salmon.
- Figure 5 (p. 127) shows locations with records of odd-year pink salmon.
- Figure 17 (p. 155) shows locations with records of chum salmon.
- Table 2 (p. 128) summarizes pink salmon presence in each of the *Joint Adaptive Zones*.
- Table 10 (p. 156) summarizes presence, relative abundance, and genetic population structure of chum salmon in each of the *Joint Adaptive Zones*.
- Table 9 (p. 152) summarizes classification criteria for odd-year pink salmon CUs, shown in Figure 16 (p. 154).
- Table 18 (p. 188) summarizes classification criteria for chum salmon CUs, shown in Figure 27 (p. 187).
- Appendix 1 summarizes the zoological, geographic, and physical characteristics of each *Freshwater Adaptive Zone* (e.g. salmon species, other fish fauna, major drainages, geology, hydrology, temperatures).

DFO is developing a toolbox for assessing the status of conservation units which differ substantially in terms of geographic extent and data availability (e.g. Bowron Lake sockeye vs. Southwest Vancouver Island chum). This toolbox will be used by DFO Area staff and partners to determine lower and upper benchmarks that delimit three status zones of a CU: red, amber and green. The biological status of a CU relative to these benchmarks will inform management actions. Management focuses on

conservation measures for CUs in the red zone (i.e. below the lower benchmark), shifts to cautionary management in the amber zone (between the lower and upper benchmark), and emphasizes sustainable use in the green zone (i.e. above the upper benchmark). Proposed methods for setting upper and lower CU benchmarks underwent a scientific review in 2009. Once the benchmark methodology is complete, DFO Area staff will begin to work with local stakeholders to identify benchmarks for CUs in each area.

DFO Area staff will work with local partners to adapt existing assessment frameworks (Section 2.4) to the additional requirements of monitoring CU status in each area. These updated assessment frameworks will build on existing programs and local partnerships. Data obtained from monitoring will be reported on and shared with the public.

3.2.2.5 Strategy 2 - Assessment of habitat status

The WSP identifies four elements for this strategy:

- Document habitat characteristics within CUs
- Select indicators and develop benchmarks for habitat assessment
- Monitor and assess habitat status
- Establish linkages to develop an integrated data system for watershed management

DFO has developed a two-level approach to documenting habitat characteristics for CUs. At the first level, an overview report for each CU will be provided to inform priorities for protection, rehabilitation and restoration. At the second level, a more detailed habitat status report will be produced for priority CUs where integrated planning processes are initiated. Local and aboriginal traditional knowledge will be used to inform these habitat status reports.

DFO has identified a list of habitat indicators, benchmarks and metrics for streams, lakes, and estuaries using a two-tiered approach. The first tier looks at pressure indicators to assess factors that force environmental change (e.g. land conversion, water abstraction). The second tier considers status indicators to describe the condition of the environment, such as sediment load and stream discharge. The approach will undergo a scientific review in 2009:

- A draft list of habitat indicators is available at http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/wsp/Presentations/Habitat_Indicators_List_read.pdf.
- A sample template for habitat status summaries is available at http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/wsp/Presentations/Habitat_Status_Template.pdf.
- A review of potential habitat indicators is available at http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/wsp/Presentations/WSP_Habitat_Indicators_PracticalAssessment_Report_July20_07.pdf.
- A discussion paper on habitat metrics and benchmarks is available at http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/wsp/Presentations/WSP_Habitat_Indicators_Metricsand_Benchmarks_Report_Sept5_071.pdf.

Next steps under Strategy 2, which are still in the conceptual phase, are to develop a habitat monitoring framework and to integrate habitat monitoring under the WSP with broader ecosystem monitoring conducted by DFO and other agencies.

The assessment of habitat will be linked to the assessment of CUs (Strategy 1) and the inclusion of ecosystem values (Strategy 3) to inform integrated strategic planning (Strategy 4). DFO is developing a WSP web-mapping application to store data and provide common access to data with partners. The application will be linked to other data sources and will provide one-window access to WSP data requirements. The web-mapping application is expected to launch in 2009.

3.2.2.6 Strategy 3 - Inclusion of Ecosystem Values and Monitoring

The Wild Salmon Policy commits DFO to identifying ecosystem values, objectives, and indicators to monitor status and trends regarding the impacts of ecosystems on wild salmon and the impacts of wild salmon on ecosystems.

The WSP identifies two elements for this strategy:

- Review existing information and identify indicators to monitor status of ecosystems
- Integrate climate and ocean information into annual salmon management processes

As a first step in this process, DFO held workshops in March 2007 with ecosystem science experts to discuss ecosystem objectives and indicators under the WSP. DFO has also undertaken public consultations throughout 2008 to compile feedback regarding objectives and associated indicators for ecosystem-based management (EBM) under the WSP. A discussion paper with proposed ecosystem objectives, indicators, benchmarks, and management options is scheduled for a scientific review in 2009.

Freshwater ecosystem monitoring will be integrated with other programs that assess climate and ocean conditions to better understand the effects of changes in climate and oceans on salmon production. Information on salmon and their marine environment will also be incorporated into DFO's annual State of the Ocean reports and linked to assessments of marine survival of salmon. Ecosystem monitoring will be linked to CU assessments under Strategy 1 and habitat assessments under Strategy 2, to provide a comprehensive overview of the health of salmon, their habitat, and environment in order to inform the integrated strategic planning process under Strategy 4.

3.2.2.7 Strategy 4 - Integrated Strategic Planning

Integrated strategic plans will guide resource management and other activities in specific geographic areas affecting CUs. Integrated strategic plans will not only provide information on the status of CUs, their habitat and ecosystems, but also identify:

- Long-term biological targets for CUs and groups of CUs that ensure conservation and sustainable use
- Recommended resource management actions to protect or restore salmon, their habitats and ecosystems in order to achieve these targets
- Timeframes and priorities for action.

The WSP identifies two elements for this strategy:

- Implement an interim process for management of priority CUs
- Design and implement a fully integrated strategic planning process for salmon conservation

As a first step, a discussion paper was developed to provide interim guidance to the development of strategic plans under WSP. The paper outlines the following steps to develop a strategic plan: identify planning priorities, identify resource management strategies, establish an evaluation framework, assess the impacts of the management strategies, and selecting a preferred management strategy. The discussion paper is available at <http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/wsp/Presentations/Strategic%20Planning%20Guidance-draft%20read.pdf>.

Work is underway to initiate a planning pilot for the Barkley Sound area (Section [3.3.2.5](#)). This planning pilot will be used to test the operational implementation of recent developments under Strategies 1 to 3 (i.e. conservation units, benchmarks, habitat and ecosystem indicators).

Lessons from the Barkley Sound pilot and the Fraser River Sockeye Spawning Initiative (<http://www.dfo-mpo.gc.ca/Library/334450.pdf>) will be used to shape a coast-wide implementation plan for integrated planning processes under the WSP.

3.2.2.8 Strategies 5 and 6 - Annual Program Delivery and Performance Review

Implementation of the policy will continue to unfold over several years in a combination of research (e.g. ecosystem indicators), policy development (e.g. monitoring framework) and pilot projects.

The Wild Salmon Policy commits DFO to conducting post-season reviews of annual workplans in consultation with First Nations and others to assess implementation of stock assessment, fishing, habitat and enhancement actions. The WSP also commits DFO to independent performance reviews within five years of its implementation. The policy will be revised based on recommendations in these independent reviews to improve effectiveness.

3.2.3 Research

3.2.3.1 DFO Science Branch

Research on BC salmon and their ecosystem is conducted by Science Branch. Research focuses on achieving a better understanding of salmon habitat, the impact of natural and man-made events, and returning stock abundance for the upcoming year.

As the department progresses with the move from single-species management to integrated ecosystem management, DFO Stock Assessment is retooling the data collection process and DFO Science is restructuring research efforts.

DFO launched the national *Science Renewal* initiative in 2005 to coordinate these efforts, which includes a comprehensive review of its operations and priorities to address the increasing requirement for integrated information to incorporate broader ecosystem considerations into the conservation and management of fisheries resources. In early 2008 DFO released *Science at Fisheries and Oceans Canada: A Framework for the Future*, which lays out the delivery models for collaborative research in support of integrated ecosystem management. Key elements of the framework are:

- *Ecosystem Science Framework in Support of Integrated Management* (http://www.dfo-mpo.gc.ca/science/Publications/Ecosystem/ecosystem_index_e.htm)
- *Five Year Research Agenda* (Section [3.2.3.2](#))
- *DFO Science Collaboration Framework*

- *Centres of Expertise* (e.g. Aquatic Risk Assessment, Marine Mammals). A list of COEs with links to detailed program descriptions is available at http://www.dfo-mpo.gc.ca/science/coe/index_e.htm.

The full framework is available at www.dfo-mpo.gc.ca/science/Publications/Framework/index_e.htm.

The research activities of the Department's science branch are summarized in scientific papers that are peer reviewed through the *Pacific Scientific Advice Review Committee* (Section [4.3.5.1](#)). The advice is then publicly released and brought into the appropriate advisory and consultative processes. Published science advice is available at http://www.meds-sdmm.dfo-mpo.gc.ca/csas/applications/Publications/publicationIndex_e.asp.

3.2.3.2 Five Year Research Agenda (2007-2012)

DFO Science Branch is undertaking a comprehensive review of its operations and priorities to address the increasing requirement for integrated information to incorporate broader ecosystem considerations into the conservation, and management of fisheries resources.

Under the *Science Renewal* initiative DFO developed a 5-year research agenda highlighting 10 departmental research priorities:

- Fish population and community productivity
- Habitat and population linkages
- Climate Change / Variability
- Ecosystem Assessment and Management Strategies
- Aquatic Invasive Species
- Aquatic Animal Health
- Sustainability of Aquaculture
- Ecosystem Effects of Energy Production
- Operational Oceanography
- Emerging and Enabling Technologies for Regulatory and Policy Responsibilities

The complete research agenda, including specific areas for research under each of these priorities, is available at http://www.dfo-mpo.gc.ca/science/research/research_agenda_e.htm.

3.2.3.3 Pacific Region Research Priorities

Regional research plans are developed collaboratively by Science staff, stock assessment staff, and fishery management staff. Section [4.3.5.1](#) describes the internal review process.

General subject areas of Pacific salmon research in recent years include:

- Methods for identifying distinct conservation units of salmon and evaluating their status (Section [3.2.2](#))
- Methods for selective harvest in BC salmon fisheries (Section [3.2.4](#))
- Salmon stock identification methods and genetic baseline sampling (Section [3.2.3.4](#))

- Evaluating stock status (Section [3.2.3.5](#))
- Enumeration Methods (Section [3.2.3.6](#))
- Methods for incorporating environmental information into salmon management and adapting to climate change (Section [3.2.3.7](#))

3.2.3.4 Salmon Stock Identification Methods and Genetic Baseline Sampling

On-going research into the population structure of Pacific salmon species has become increasingly important, because conservation effort such as the *Wild Salmon Policy* explicitly recognize the crucial role of diversity in ensuring long-term sustainability. The associated shift towards finer levels of selectivity in fisheries (Section [3.2.4.1](#)) requires new tools for in-season stock-identification.

Completed projects include:

- Collection of pink and chum genetic baseline samples in north and central coast streams for inclusion into the Pacific Region genetic database.
- Identification of genetic separation within pink and chum stocks.
- Stock identification methods for Area 3 (Nass) chum in commercial salmon net fisheries.
- 2008 - *Recommendations for Application of Genetic Stock Identification (GSI) Methods to Management of Ocean Salmon Fisheries; Special Report of the GSI Steering Committee and the Pacific Salmon Commission's Committee on Scientific Cooperation*. PSC Tech. Rep. No. 23, January 2008. The full report is available at <http://www.psc.org/pubs/psctr23.pdf>.
- White, B. Genetic Stock Identification of Fraser River Pink Salmon: Methodology and Management Application. PSC Tech. Rep. No. 7, May, 1996. Available upon request from the Pacific Salmon Commission.
- Shaklee, J.B., D.C. Klaybor, S. Young and B.A. White. 1991. *Genetic stock structure of odd-year pink salmon, O. gorbuscha (Walbaum), from Washington and British Columbia and potential mixed-stock applications*. Journal of Fish Biology (1991) 39 (Supp. A): 21-34.
- White, B.A. and J. Gable. 1991. *In-season management of Fraser River pink salmon using GSI techniques*. In B.A. White and I.C. Guthrie (eds.) Proceedings of the 15th Northeast Pacific Pink and Chum Salmon Workshop. Pacific Salmon Commission, pp. 194-200. Available upon request from the Pacific Salmon Commission.
- Woodey, J.C. 1989. *Use of GSI Data in Management of Fraser River Pink Salmon*. In P.A. Knudsen (ed.) Proceedings of the 14th Northeast Pacific Pink and Chum Salmon Workshop. Washington State Department of Fisheries, pp. 42-44. Available upon request from the Pacific Salmon Commission.
- 1992 - *Accuracy and Precision of Genetic Stock Identification for Estimating the Stock Composition of Mixed-Stock Chum Salmon Fisheries in Northern Puget Sound and Southern Georgia Strait*. Joint Chum Technical Committee Report TCCHUM (92)-2. The abstract is available at <http://www.psc.org/pubs/chum922.htm>.
- White, B.A. 1989. *Simulation analysis of GSI applications to odd-year pink salmon fishing*. In P.A. Knudsen (ed.) Proceedings of the 14th Northeast Pacific Pink and Chum Salmon Workshop. Washington State Department of Fisheries, pp. 37-41. Available upon request from the Pacific Salmon Commission.

- Blackbourn, D.J. and M.B. Tasaka. 1989. Marine scale growth in Fraser River pink salmon: a comparison with sockeye salmon marine growth and other biological parameters. In P.A. Knudsen (ed.) Proceedings of the 14th Northeast Pacific Pink and Chum Salmon Workshop. Washington State Department of Fisheries, pp. 58-63.

3.2.3.5 Evaluating Stock Status

DFO conducts regular status assessments, prioritized based on any conservation concerns that are identified during the annual planning cycle. These status assessments typically precede any formal designation or legal listing of the stock, as described in Section [3.2.1.1](#). Stocks status reports for salmon are available online.

Pink and chum status reports have been completed as follows:

- 1999 - Stock Status Report for Central Coast pink salmon (<http://www.pac.dfo-mpo.gc.ca/sci/psarc/SSRs/Salmon/d6-03-99.pdf>)
- 1999 – Stock Status Report for Inner South Coast chum salmon (<http://www.pac.dfo-mpo.gc.ca/sci/psarc/SSRs/Salmon/d6-09.pdf>)
- 2004 - Stock status of wild chum salmon returning to British Columbia’s Central Coast and Johnstone and Georgia Straits (excluding the Fraser River) by Lyse Godbout and others. CSAS Research Document 2004/ 007 (http://www.dfo-mpo.gc.ca/csas/Csas/publications/ResDocs-DocRech/2004/2004_007_e.htm)
- 2004 - Trends in abundance for Northern BC chum salmon by Brian Spilsted. CSAS Research Document 2004/013 (http://www.dfo-mpo.gc.ca/csas/Csas/publications/ResDocs-DocRech/2004/2004_013_e.htm)

Brief status reports for other Pacific salmonids have been completed for the following stocks, and are available online at http://www.pac.dfo-mpo.gc.ca/sci/psarc/SSRs/diadromous_ssrs_e.htm:

- Rivers and Smith Inlet Sockeye 1997
- Fraser River Sockeye 1998
- Skeena River Coho Salmon 1999,
- West Coast Vancouver Island Sockeye 1999
- Skeena River Sockeye Salmon 1999
- Fraser River Chinook Salmon 1999
- Lower Strait of Georgia Chinook Salmon 1999
- West Coast Vancouver Island Coho Salmon 2002
- Coho Salmon in Georgia Basin 2002
- Interior Fraser River Coho Salmon 2002
- Sakinaw Lake Sockeye Salmon 2002

Formal stock status evaluations for other Pacific salmonids have been completed as follows:

- Stuart Lake sockeye

- 2000 - *Stock Status and Genetics of Coho Salmon from the Interior Fraser River* by Irvine and others. CSAS Research Document 2000/125 (www.dfo-mpo.gc.ca/csas/Csas/DocREC/2000/PDF/2000_125e.pdf)
- 2000 - *Status in 1999 of Coho Stocks Adjacent to the Strait of Georgia* by Simpson and others. CSAS Res. Document 2000/158 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2000/PDF/2000_158e.pdf)
- 2001 *Assessment of Stock Status for Coho Salmon From the Interior Fraser River* by Irvine and others. CSAS Research Document 2001/083 (www.dfo-mpo.gc.ca/csas/Csas/DocREC/2001/RES2001_083e.pdf)
- 2002 - *Status of Cultus Lake sockeye salmon (*Oncorhynchus nerka*)* by Schubert and others. CSAS Res. Doc. 2002/064 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2002/RES2002_064_E.pdf)
- 2002 - *Status of Sakinaw Lake sockeye salmon (*Oncorhynchus nerka*)* by Murray and Wood. CSAS Research Document 2002/088 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2002/RES2002_088e.pdf)
- 2004 - *Stock status and lake based production relationships for wild Skeena River sockeye salmon* by Cox-Rogers and others. CSAS Research Document 2004/010 (http://www.dfo-mpo.gc.ca/csas/Csas/publications/ResDocs-DocRech/2004/2004_010_e.htm)
- 2004 - *Forecasted Status of Cultus and Sakinaw Sockeye Salmon in 2004* by Wood and Parken. CSAS Res. Doc. 2004/127 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2004/RES2004_127_e.pdf)
- 2005 - *Recovery potential assessment for interior Fraser coho salmon (*Oncorhynchus kisutch*)*. CSAS Science Advisory Report 2005/061 (http://www.dfo-mpo.gc.ca/csas/Csas/status/2005/SAR-AS2005_061_E.pdf)
- 2006 *Marine survival forecast for Southern British Columbia Coho*. CSAS Science Advisory Report 2006/037 (http://www.dfo-mpo.gc.ca/csas/Csas/status/2006/SAR-AS2006_037_E.pdf)
- 2007 - *Status of Birkenhead River Chinook salmon (*Oncorhynchus tshawytscha*)* by Schubert and others. CSAS Res. Doc.2007/019 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2007/RES2007_019_e.pdf)

3.2.3.6 Enumeration Methods

DFO is consistently exploring new methods for enumerating salmon. Recent projects have focused on a combination of hydroacoustic tools, fishwheels, and new tagging technologies. More information is available in the following publications:

- 2005 - *Report of the Expert Panel on the Future of the Coded Wire Tag Program for Pacific Salmon*. PSC Tech. Rep. No. 18 (<http://www.psc.org/pubs/psctr18.pdf>).
- 2005 - *Feasibility of deploying a dual-frequency identification sonar (DIDSON) system to estimate salmon spawning ground escapement in major tributary systems of the Fraser River, British Columbia* by Holmes, Cronkite, and Enzenhofer. Canadian Technical Report of Fisheries and Aquatic Sciences 2592 (<http://www.dfo-mpo.gc.ca/Library/315703.pdf>)
- 2007 - *Workshop on Hydroacoustics for Salmon Management: March 22-23, 2006*. PSC Tech. Rep. No. 21 (<http://www.psc.org/pubs/psctr21.pdf>)

3.2.3.7 Pacific Salmon and their Ecosystem

DFO is investigating the effect of environmental conditions on Pacific salmon, and evaluating the management implications of those effects. Recent and on-going projects include:

- *State of the Pacific Ocean Reports* have been prepared annually since 2000, and are available at www.pac.dfo-mpo.gc.ca/sci/psarc/OSRs/Ocean_SSR_e.htm. This information is used to qualitatively adjust expectations for the upcoming fishing season. More detailed information about ocean conditions is available at http://www.pac.dfo-mpo.gc.ca/sci/oceans_e.htm, which includes links to real-time oceans data.
- The *Fisheries Climatology Group* focuses on the possible impacts of climate and climate change on the productivity, abundance, distribution, and dynamics of marine fish stocks on the west coast of Canada. A brief overview of their research is available at http://www.pac.dfo-mpo.gc.ca/sci/sa-mfpd/climate/climate_publications.htm. Their website at <http://www.pac.dfo-mpo.gc.ca/sci/sa-mfpd/climate/climate.htm> links to detailed information about commonly used environmental variables: Atmospheric Forcing Index (AFI), Pacific Circulation Index (Winter) (PCI), Length of Day (LOD), Aleutian Low Pressure Index (ALPI), and Fraser River Flows (FRF).
- On the North Coast and Central Coast, water temperatures are monitored in representative streams by electronic devices. When streams are assessed for escapement, survey crews also document environmental conditions which include water level, presence of silt, presence of new fish barriers and flooding conditions in the Stream Inspection Log.
- The *Fraser River Environmental Watch Program* releases weekly reports describing the environmental conditions in the north-eastern Pacific Ocean and the Fraser River during the summer salmon migration period. A complete archive of weekly reports back to 2001 is available at <http://www.pac.dfo-mpo.gc.ca/science/habitat/frw-rfo/index-eng.htm>. This information is used to adjust in-season management targets, as illustrated by:
 - Macdonald, Williams, and Woodey. 2000. *The effects of in-river conditions on migrating sockeye salmon (Oncorhynchus nerka)*. In J.S. Macdonald (ed.) *Mortality during the migration of Fraser River sockeye salmon (Oncorhynchus nerka): a study of the effect of ocean and river environmental conditions in 1997*. Can. Tech. Rep. Fish. Aquat. Sci. 2315. (<http://www.dfo-mpo.gc.ca/Library/248209.pdf>).
 - Hague and Patterson (2007) *Quantifying the sensitivity of Fraser River sockeye salmon (Oncorhynchus nerka) management adjustment models to uncertainties in run timing, run shape and run profile*. Can. Tech. Rep. Fish. Aquat. Sci. 2776 (<http://www.dfo-mpo.gc.ca/Library/331503.pdf>)
- Researchers at the *Institute of Ocean Sciences* are assessing the expected impact of climate change on Fraser River salmon. An overview and a list publications up to 2002 are available at http://www-sci.pac.dfo-mpo.gc.ca/osap/projects/fraser/default_e.htm.

DFO is also investigating the capacity of freshwater habitat for Pacific salmon production:

- Mapping of pink and chum spawner locations in streams is on-going.
- Pink and chum escapement goals are typically based on information such as historic escapement levels, spawner distribution maps, and area estimates of available spawning substrate to spawners. Very modest work has been conducted to assess freshwater habitat capacity for these species, but

surveys of spawning area available to pink and chum salmon have recently been initiated and documented for a small number of coastal streams in the north and central coasts.

- Modest freshwater research specifically identified for pink and chum salmon is due to the limited time fry remain in this habitat. Freshwater research does include arrival timing and distribution of spawners, stream conditions at time of stream inspection, and long term water temperature profiles on a small number of coastal streams.
- DFO has conducted studies on the impacts of salmon carcasses on stream productivity and nutrient budgets. These consider the impact of salmon-derived nutrients on the terrestrial eco-system, including icon species such as bears, and the role that icon species play in the transfer of nutrients to the terrestrial ecosystem. Further studies are in progress that track salmon nutrients into higher trophic levels. For example, the manuscript *Effects of the abundance of spawning sockeye salmon (Oncorhynchus nerka) on nutrients and epilithic algal biomass in forested streams in north-central British Columbia* by Johnston, MacIsaac, Tschaplinski, and Hall has been submitted for publication.
- The *Lake Productivity and Capacity Project* focuses on sockeye salmon, but the resulting ecosystem-level lake studies are more generally relevant. An overview is available at <http://www.pac.dfo-mpo.gc.ca/science/habitat/lakeprod-prodlac-eng.htm>.
- The *Fish-Forestry Interaction Project* is a comprehensive, long-term study of natural riparian and stream functions and the effects of forestry on small streams in the Prince George Forest District. It will provide essential scientific information on the impacts of forestry activities on small fish-bearing and headwater streams and the importance of riparian buffers for protecting small-stream fish habitat. An overview is available at http://www-sci.pac.dfo-mpo.gc.ca/mehsd/projects/fish_forestry_e.htm.

3.2.4 Selective Fishing and Impact Reduction

3.2.4.1 What's Selective?

Based on the provisions of the *Wild Salmon Policy* (Section [3.2.2](#)) and established management practices, DFO considers the following levels of selectivity in its management of Pacific salmon fisheries:

1. Selective for salmon to minimize non-salmon by-catch (e.g. rockfish, sturgeon, birds, marine mammals)
2. Selective for target salmon species to minimize incidental harvest of other salmonid species (e.g. coho, steelhead)
3. Selective for target stock to minimize impact on co-migrating stocks (Cultus sockeye in Fraser sockeye fisheries)
4. Selective for components of target stock (e.g. hatchery-marked only, predominantly enhanced)
5. Selective for populations characteristics (e.g. size, age, sex)

Levels 1 to 4 apply to all salmon fisheries, but level 5 is only a potential issue for some First Nations fisheries (e.g. preferred female retention) or recreational fisheries (e.g. preferred retention of larger fish). Under current harvest patterns, neither of these is considered to have a detrimental effect at the stock level or the conservation unit level.

Note that “selective fishing” in BC fisheries is used in the positive sense of “the ability to avoid non-target fish, invertebrates, seabirds, and marine mammals or, if encountered, to release them alive and unharmed”. In the Alaska salmon certification process, “selective” refers to two potential negative effects:

- fishing practices that may change stock structure through consistent size/sex/age selectivity
- enhancement practices that may change stock structure through brood stock collection or non-natural selective pressures in hatchery rearing.

Management actions are generally consistent with maintaining the biological characteristics of BC pink and chum stocks. Terminal harvest opportunities of identified surplus chum stocks are managed to avoid undue impacts on any particular timing component or non-target species. Pink salmon harvests adjust fishing effort to respond to differing stock timings and productivities to ensure long-term viability of stocks from a wide range of small and large streams over large geographic areas. Information on biological characteristics such as the age and genetic structure of the target stocks is considered prior to making management decisions and management actions are consistent with maintaining healthy age, size, sex and genetic structure of pink and chum stocks.

DFO works closely with all harvester groups (Section 4) to develop, implement, and continually improve selective fishing technology and practices, such as gear modifications, area closures, and time closures. Milestones in this process were the *Selective Fisheries Program* (next section) and the resulting *Selective Fishing Policy* (Section 1.2.7.4). Section 3.2.4.3 summarizes on-going development and implementation. Appendix 1 contains an inventory of selective fishing measures by gear type and statistical areas 1 to 10 as an illustration. Through these programs and their continuing implementation, DFO has established a track record of responding to by-catch concerns as new issues were identified.

3.2.4.2 Selective Fisheries Program (1998-2001)

The *Selective Fisheries Program*, one element of the *Pacific Fisheries Adjustment and Restructuring Initiative* (Section 1.2.6), was designed to facilitate the transition to new, more selective fishing gear and techniques. One of the driving forces behind the *Selective Fisheries Program* was the *Coho Recovery Plan*, also initiated in 1998 (Section 3.4.2.1) The *Selective Fisheries Program* included five components.

- Experimental Pilots
- First Nations’ Gear Purchase
- Research Projects
- Education, Training, and Communication
- Compliance

New selective fishing technologies were evaluated in experimental fisheries. Modified traditional fisheries were used to evaluate the effectiveness of full-scale commercial operations. Scientific design of experiments combined with intensive monitoring and evaluation were necessary to demonstrate that alternative approaches are more selective than historical practices. New knowledge was transferred to harvesters and anglers through training and communications.

In the four years that the *Selective Fisheries Program* operated (1998-2001), \$21.5 million was expended on the five program components, including 122 selective fishing experimental projects. The

pilot projects and other efforts under the program are summarized in a final report, which is available at http://www.pac.dfo-mpo.gc.ca/ops/fm/selective/reports/SFFinalReport_e.pdf.

More information about approved selective fishing projects under the program is available at the following sites:

- http://www-ops.pac.dfo-mpo.gc.ca/fm/selective/project_list2001_e.htm
- http://www-ops.pac.dfo-mpo.gc.ca/fm/selective/project_list2001-2_e.htm
- http://www-ops.pac.dfo-mpo.gc.ca/fm/selective/project_list2001-3_e.htm
- <http://dsp-psd.pwgsc.gc.ca/Collection/Fs23-370-2000-1E.pdf>

Research and consultation under the *Selective Fishing Program* was extensively documented and publicly released:

- 1999 - *Fishing salmon selectively in British Columbia : report of the third Selective Fisheries Multi-Stakeholder Workshop, November 22-24, 1999, Richmond, B.C.* prepared by Brookhouse Consultants Inc. (<http://www.dfo-mpo.gc.ca/Library/243234.pdf>)
- 2001 - *Perspectives on selective fishing in the Pacific region, 1998-2001* by Wood and Fearon (<http://www.dfo-mpo.gc.ca/Library/269662.pdf>).
- 2001 - *Mortality rates of coho salmon caught by commercial salmon gillnets and the effectiveness of revival tanks and reduced soak time for decreasing coho mortality rates* by Hargreaves and Tovey. CSAS Research Document 2001/154 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2001/RES2001_154e.pdf)
- 2001 - *A comparison of the standard recovery box and a re-designed laminar flow box in the recovery of coho salmon (*Oncorhynchus kisutch*) caught with commercial seine gear : mortality rates and swimming performance* by Berry et al. (WAVES 284497).
- 2002 - *A comparison of harvest rates for target and non-target species between Alaska Twist and Multistrand gillnets* by Ken Derksen.
- 2002 - *Results of a marine recreational chinook and coho catch and release mortality study conducted in the lower Strait of Georgia during 2001* by Diewert et al. (Canadian Manuscript Report of Fisheries and Aquatic Sciences 2625, <http://www.dfo-mpo.gc.ca/Library/269830.pdf>).

Research and experimental pilot projects under the *Selective Fisheries Program* yielded three distinct outcomes:

- The Selective Fishing Policy, released in 2001 (Section [1.2.7.4](#))
- A momentum of close collaboration between the department and harvesters on selective fishing issues, with clear incentives for on-going improvement. This momentum is reflected in on-going collaborative projects and the *Codes of Conduct* developed by the commercial and recreational sectors (see Sections [3.2.4.3](#) and [3.2.4.4](#))
- Selective fishing gear and methods are now widely used and required in all salmon fisheries ([Appendix 1](#)), and compliance rates are high (Section [2.6.2.3](#))

A formal review of the *Selective Fishing Program* was completed by DFO's *Audit and Evaluation Directorate*. The full review is available at http://www.dfo-mpo.gc.ca/communic/cread/evaluations/04-05/salmon_e.htm.

3.2.4.3 On-going Implementation of Selective Fishing Measures

Selective fishing methods developed during the program continue to be implemented and refined. For example:

- *Revival tanks have become mandatory for all vessels participating in commercial salmon fisheries.* Only in a few specific cases is this not true (e.g. very small commercial vessels or in First Nation economic fisheries). All prohibited species captured incidentally must be revived in the revival tank and released, or released directly to the water in a manner that causes the least harm. If a fishing area shows higher than expected incidence of non-retention species the area can be closed or additional restriction put in place to minimize impacts. Some enforcement action was taken mainly in the early implementation years against harvesters who did not comply, and C&P officers have charged individuals for not having or not operating their revival tanks according to the conditions of licence. Harvesters are well aware of their requirements with revival tanks and for the most part are in compliance. Areas with high potential coho interception are restricted to daylight only fisheries, to ensure better handling of coho by-catch. Revival tanks are now standard equipment on gillnet and seine vessels. The case for improved benefits from the use of revival tanks on troll vessels is weaker due to mortality being mostly associated with hook location. Trollers experimented with hook size and type and revival tank versus waterline release and the associated mortality. There was a test of the old style non-laminar flow against release at the waterline and the results were not significant. Troll are still required to have the old or new style tank until a further test of the new laminar tank can be compared to waterline release. For gillnet it was most significant that the combination of short soak times and use of revival tanks resulted in increased survival of released non-target salmon.
- *Mandatory short sets for gillnets with a maximum soak time of 60 min to reduce by-catch mortality of salmon, birds, marine mammals, and rockfish.* On the Fraser when fishing in the river and off the mouth in Area 29, short nets are also mandatory.
- *Mandatory weed lines for gillnets to avoid steelhead by lowering the net below the surface, where steelhead tend to concentrate.*
- *Switch nets from multi-strand to Alaska twist.* Gillnets can be made of Alaska twist or multi-strand mesh, but Alaska twist mesh is more efficient (i.e. shorter, smaller openings). Net manufacturers have moved away from multi-strand nets and DFO was getting requests from harvesters interested in switching to Alaska twist nets. The two net types were tested in different geographic areas in experimental pilot projects under the *Selective Fishing Program* to determine the by-catch implications of a change in net type and concurrent move to deeper nets. The experimental pilots showed no increase in by-catch, because a more efficient net harvests the allocation sooner and exposes the net to potential by-catch encounters for a shorter period.
- *Brailing.* Ramping, where seine bunt and fish come in over the stern, was shown to have higher mortality than brailing the net with a large power-assisted dip net and sorting the by-catch on deck for release. Brailing is now mandatory in most areas (see [Appendix 1](#)). One exception is the Nitinat fishery due to low by-catch and safety concerns associated with large swells.

- *Grids in the bunt of seine nets.* A draft PSARC report has been prepared with all the data from coast-wide studies of grids in the bunt of seine nets. Results have been compelling that significant numbers of non-target salmon can be released from the net in the water by swimming through the grids before and during the brailing process. Bunts are used in conjunction with a small mesh knotless bunt to reduce scaling and providing an effective avenue of escape for bycatch smaller than the target species. By-catch mortality has been shown to be lower in vessels equipped with this gear. When this paper is completed it will likely provide a further option for seines to effectively separate target from non-target catch. The knotless bunts appear to provide improved target catch quality due to reduced scale loss.

DFO continues to refine and implement measures to control incidental harvest, reduce by-catch, and minimize the release mortality of by-catch. Since the inception of the *Selective Fishing Policy* (Section [1.2.7.4](#)), up to 5% of the annual Total Allowable Catch is available to support selective fishing experiments.

This TAC share is made available to individuals who have identified a gear modification that will permit the escape of non-target species or their release with no or very low rates of mortality. DFO publicly announces that proposals are being solicited and has an evaluation process to rank projects. DFO involves area organizations in the selection and considers their views but does, on occasion, overrule their input.

Selective fishing measures for individual fisheries are developed throughout the annual planning cycle (Section [4.2.1.1](#)), and summarized for public review in the *Integrated Fisheries Management Plans* (Section [4.2.1.2](#)). Long-term measures are incorporated into the *Conditions of Licence* and specific annual measures are included in the *Variation Orders* that specify fishery openings (Section [2.5.3](#)).

Implementation of selective fishing measures is tied to strong incentives for participation through increased harvest opportunities. For example, South Coast net fisheries are constrained by conservation objectives for Interior Fraser coho (Section [3.4.2.1](#)), so that improved selectivity directly translates into increased opportunity. When coho abundance collapsed in 1998, Area 20 was closed to commercial salmon fishing by all gear types. Gillnets are still not permitted to fish this area due to the high mortality that would be associated with long nets and long soak times resulting in increased rates of by-catch mortality before they reach the vessel, rendering revival tanks mostly useless. Seines were permitted to fish in Area 20 on the following conditions:

- Provide on-grounds catch data on a set-by-set basis according to a geographic grid so that high incidence of coho in relation to target catch (sockeye) could result in the on-grounds manager moving the fleet away from these areas and onto areas high in target catch.
- A chart plotter was mandatory so the vessels could determine their grid location effectively.
- Brailing mandatory into a sorting box. The sorting box created a wet area which is more efficient to sort and release or revive bycatch.
- Power skiff required to hold the vessel into the swells to minimize the bunt movement and reduce scale loss.
- Spreader bar to hold the bunt away from the vessel while brailing to minimize scale loss
- Limited fleet size

- This fishery was also operated as a pooled fishery with a limitation on coho encounters and this slowed the pace of the fishery and focused the fishery on areas of highest abundance of the target species.
- Fishing by seine continues in this area due to the implementation of measures that appear to have significantly reduced the impact on coho. This fishery would have remained closed without the implementation of all these selective fishing measures. The testing of bunt grids in this area has shown that further significant decreases in coho mortality are likely with the use of this gear in the future.

On-going changes in the structure of Pacific fisheries (e.g. defined shares; Section [1.2.9](#)) provide additional incentives for the development and implementation of selective fishing methods. Fisheries can slow down and focus on higher quality fish. For example:

- One gillnetter has used a tooth tangle net near the mouth of the Skeena River (Area 4) to harvest target salmon (sockeye, chinook, pinks and maybe coho and chum) live and then keep them live in his hold until they can be processed at the dock and shipped to high-end restaurants in Vancouver. Bycatch is placed in a revival tank and released. This harvester has been provided additional fishing time to fish pinks with this gear over the rest of the fleet. The rest of the fleet can enter this fishery if they use the same methods but none have joined into date.
- A pilot project in Alberni Inlet showed that salmon could be exposed to an air environment for several minutes and still be revived. This project led to holding live sockeye in the hold of a seine from the warm waters of Alberni Inlet to Vancouver with only 1% mortality therefore demonstrating that live salmon can be transported to a potential market not unlike the Skeena tooth tangle net operation.

Section [2.5.4.3](#) describes specific measures to reduce incidental harvest and by-catch, including selective fishing measures. [Appendix 1](#) contains an comprehensive inventory of conservation measures by gear type and statistical area for North Coast and Central Coast.

The continued development of selective fishing techniques has taken on more importance as a result of heightened conservation concerns on identified stocks as well as a stronger focus on protection of small stocks.

3.2.4.4 Impact Reduction

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 these types of gear often reflect a traditional way of fishing for many First Nations. 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 sector in the Pacific Region, through the Sports Fishing Advisory Board (SFAB), developed a *Code of Conduct* for recreational anglers.

The principles and guidelines in the *Canadian Code of Conduct for Responsible Fishing Operations* include the following priorities:

- “Reduce waste and adverse impacts on the freshwater and marine ecosystems and habitats....”
- “Practice environmentally sound waste management in all aspects of harvesting operations.”

- “Cooperate with appropriate regulatory authorities to establish sound waste management policies and procedures.”
- “Employ fishing practices that minimize the risk of gear loss.”
- “Establish jointly with regulatory agencies protocols for the marking, retrieving and reporting of lost gear.”
- “Make every reasonable effort to retrieve lost fishing gear, reporting all lost gear.”

The *Responsible Fishing Board*, which oversees compliance with the Code of Conduct, is described in Section [4.3.4.2](#).

One important element of impact reduction is to minimize operational waste. As part of the commercial fishing licence conditions, vessels are inspected to ensure, among other things, that operational waste is not released into holding areas. Similar inspection programs are in place in fish plants to ensure that operational waste is minimized and disposed of properly.

3.2.5 Salmon Enhancement and Restoration

3.2.5.1 Regional Approach

DFO leads or supports enhancement activities to:

- Rebuild or re-establish salmon runs by enhancing abundance of spawners in an area (e.g. re-establishing pink and coho populations in lower Fraser tributaries where there is historic evidence of spawning populations)
- Provide fishing opportunities either in targeted fisheries (e.g. terminal Qualicum chum fishery, terminal Nitinat fishery) or through enhancement of populations contributing to mixed-stock fisheries (e.g. Big Qualicum, Little Qualicum, Puntledge harvested in Area 14 fishery)

In addition, some enhancement activities provide stock assessment information.

In recent years, the emphasis has been shifting from production to conservation and rebuilding, but budget allocations can't be separated between these purposes because many hatcheries do both. This is reflected in the enhancement objectives from the 2007 Salmon IFMP:

- *“Enhancement Operations facilities will continue efforts focussed toward production supporting conservation and sustainable fisheries and provide key support to other priority watershed and public involvement activities”.*
- *“DFO will continue working with hatcheries operated by communities under contract to DFO to meet shared objectives for conservation, public stewardship, community capacity development, habitat conservation and fish production”.*

In the context of the *Wild Salmon Policy* (Section [3.2.2](#)), DFO uses the following terminology:

- *Enhancement*: Active, direct intervention in the life cycle of salmon (hatchery, managed spawning channel)
- *Restoration*: Indirect intervention in the life cycle of salmon (unmanaged spawning channels and habitat improvements)
- *Enhanced salmon*: originate directly from hatcheries and managed spawning channels

- *Wild salmon*: have spent their entire life cycle in the wild and originate from parents that were also produced by natural spawning and continuously lived in the wild.

The *Salmonid Enhancement Program* (Section [3.2.5.2](#)) also implements and supports non-hatchery activities designed to increase the productivity of populations, such as lake enrichment, controlled flow regimes, fishways, and habitat restoration. However, since the reproduction of these fish has not been altered, they are deemed wild under the definition of the *Wild Salmon Policy*. Section [3.3.1.3](#) summarizes habitat protection and restoration measures. SEP also supports stewardship and education opportunities.

Each hatchery program is carefully adapted to local circumstances and objectives, but they are all consistent with the following general implementation approach:

- Hatchery programs are fully coordinated through DFO, in a combination of federally-operated and contracted facilities as well as volunteer-run community facilities. Provincial hatcheries raise different species, and in the few cases where federally-operated hatcheries raise species under provincial jurisdiction, these species are jointly managed in close collaboration with the Province.
- Hatchery programs are implemented based on *Genetic Guidelines and Protocols*. These guidelines were first documented in 1985, and have been updated regularly since then. An up-to-date version of the guidelines and protocols is available from DFO upon request.
- All hatchery releases are counted and made publicly available through the facility descriptions on the SEP website at <http://www.pac.dfo-mpo.gc.ca/sep-pmvs/index-eng.htm> under “Fish Hatcheries in BC”, and through integrated data resources such as *Mapster* (Section [3.3.1.4](#)).
- Some hatchery fish are marked to collect information about the survival and contribution of enhanced fish. This includes external marks, such as tags or fin clips, and thermally-induced otolith marking. Indicator stocks are marked to establish release-to-adult survival rates (i.e. biostandards). Marking and interception data is publicly available through the the *Regional Mark Information System* (Section [3.3.1.4](#)). Hatchery mark rates are adapted to the statistical requirements of the mark-recovery program:
 - Hatchery chum with targeted fisheries are marked to provide indicators of survival rate and contribution to catch (Nitinat chum: all thermally marked, Snootli and Big Qualicum chum: percentage marked with fin clips).
 - Large-scale marking programs for pink salmon were discontinued in the 1990s because the large number of pink salmon returning to the Fraser in odd-numbered years makes recovery rates of marked fish too low to be practical. The majority of hatchery pink are produced on the East Coast of Vancouver Island (Areas 13 and 14). For these stocks, historical data is used to estimate returns based on release numbers and past survival rates. Small scale marking may occur to address local assessment needs.
- Fisheries targeting predominantly enhanced fish are either managed to overall abundance and constrained to a low exploitation rate (e.g. Johnston Strait mixed-stock fishery) or harvest enhanced fish terminally near the natal stream to minimize impacts on wild salmon.
- Egg targets are determined pre-season for each stock and consider potential adult production based on the objective of the program, average fecundities, average incubation to release survival rates, average marine survival rates, and average exploitation rates.

- Expected adults are calculated based on long-term average survivals for the species, area, and stage at release and may not reflect current marine survivals because of year to year fluctuations in survival rates.
- DFO enhancement and management activities consider potential interactions with wild stocks, including high target exploitation rates on wild stocks due to abundant hatchery stocks, competition for available food sources, and loss of genetic identity. Mechanisms are in place to address all three of these potential interactions:
 - Exploitation rates are constrained to be sustainable for less productive stocks in mixed stock fisheries, and abundant stocks are fished terminally, as illustrated by the fishery overview in Section [2.2.3](#).
 - Juvenile interactions in freshwater are managed through release strategies that either minimize freshwater residency periods or take into account juvenile carrying capacity. Marine carrying capacity is unknown, but SEP is working with DFO Science on Ecosystem Research Initiatives to support our understanding of marine carrying capacity (Section [3.3.2](#)).
 - The *Federal-Provincial Introductions and Transfers Committee* (Section [1.1.3.1](#)) reviews all movements of enhanced salmon and considers genetic, disease and ecological issues.

Enhancement activities are thoroughly documented, information is publicly released, and public feedback on enhancement practices is compiled through established processes, including the *Salmon Enhancement and Habitat Advisory Board* (Section [4.3.3.2](#)):

- Salmon enhancement plans are publicly reviewed each year through the *Integrated Fisheries Management Plans* (Section [4.2.1.2](#)). For example, the 2007 IFMP for South Coast Salmon includes the following information about enhancement activities:
 - Enhancement plan for 2007, including targets for egg takes and brood production, and operational details for each hatchery and community economic development project (Section 3.7 of the IFMP).
 - Post-season review of 2006, comparing actual enhancement activities to 2006 pre-season plan (Section 8.6 of the IFMP)
- The SEP main page at <http://www.pac.dfo-mpo.gc.ca/sep-pmvs/index-eng.htm> links to detailed information about each enhancement facility, including automated queries to the *Release Database*, as well as an inventory of community projects.
- Hatchery releases and restoration projects are included in on-line databases, such as Mapster, the Fisheries Project Registry (FPR), and the Fisheries Information Summary System (FISS). Section [3.3.1.4](#) includes links and background informations for these data services.
- A well documented example of enhancement as part of a recovery plan is summarized in the 2005 report *An integrated approach to rebuilding Stave River chum using harvest reduction, hatchery augmentation, flow control, and habitat improvement* by Bailey, Fedorenko, and Cook (Can. Tech. Rep. of Fish. Aqu. Sc. 2593, available at <http://www.dfo-mpo.gc.ca/Library/320926.pdf>). Other examples are listed in Section [3.2.5.3](#).

3.2.5.2 History of the Salmon Enhancement Program (SEP)

The Salmonid Enhancement Program (SEP) in British Columbia, Canada currently maintains nearly 300 projects across B.C. and the Yukon including hatcheries, fishways, spawning and rearing channels, and community initiatives. Projects range in size from spawning channels producing nearly 100 million juvenile salmon annually to school classroom incubators releasing fewer than one hundred juveniles per aquarium.

The summary below, based on excerpts from <http://www.pac.dfo-mpo.gc.ca/sep-pmvs/index-eng.htm>, retraces the development of SEP.

SEP was initiated as a comprehensive response to declining salmon abundance in the 1970s. The program was built around intensive collaboration with the B.C. Ministry of Environment, which is responsible for the conservation and management of steelhead and cutthroat trout. As well, this government program set a new precedent as many B.C. citizens became vital, hands-on partners in the effort. While the Department of Fisheries and Oceans built major facilities - hatcheries and spawning channels - individuals and groups went to work cleaning up damaged streams and building small incubation boxes. In a further effort to align SEP with local needs, the Community Economic Development Program was initiated, placing contracts with community-based groups to operate local enhancement projects.

Today, the scope of SEP is varied. Major hatcheries and spawning channels incubate and release millions of juveniles each year and fertilization of lakes has greatly increased production of sockeye on some Vancouver Island lakes. In some areas, SEP has turned to smaller technologies. Semi-natural spawning and rearing channels that require little or no on-going staff or maintenance are producing fish in remote regions. Fish ladders and fishways provide access for spawners to areas once barren of salmonids. Volunteer projects have grown and matured. Besides leaving a legacy of improved habitat in many urban areas, these projects often produce salmonids from small, genetically-unique populations that might otherwise have vanished forever. *Pacific Salmon Hatcheries in British Columbia* by MacKinlay and others describes the hatchery component of the Salmonid Enhancement program. The full paper is available at <http://www.sehab.org/pdf/hatcheries.pdf>.

Section [3.3.1.3](#) describes habitat management and restoration initiatives consistent with the principles of SEP.

3.2.5.3 Current Pink and Chum Enhancement and Restoration Activities

Annual enhancement plans are listed in the *Integrated Fisheries Management Plan* for salmon, and records of past enhancement are available through the on-line databases listed in Section [3.2.5.1](#). This section includes a brief overview of current enhancement activities.

Production-focused enhancement for pink and chum occurs throughout BC to contribute to fisheries as described in Section [2.2.3](#). For example:

- Chum production uses a hatchery at Nitinat, and the spawning channel at Big Qualicum, to support fisheries.
- Pink production uses hatchery programs, but also occurs incidentally to sockeye enhancement in the Weaver Creek spawning channel on the Fraser.
- Chum salmon enhancement on the Inner South Coast has focused on restoring depressed runs and stabilizing terminal commercial fishing opportunities. Mixed-stock commercial fisheries do not specifically target enhanced chum salmon runs, but do catch them as part of the overall chum

harvest strategy for Johnstone Strait, the Strait of Georgia, and the Fraser River. At a few facilities, chum production has been supplemented by local First Nations for ESSR harvest

The *Certification Unit Profiles* describe enhancement activities in each area, and explain the management of fisheries harvesting enhancement stocks in each area.

The SEP main page at <http://www.pac.dfo-mpo.gc.ca/sep-pmvs/index-eng.htm> links to detailed information about each enhancement facility, including automated queries to the *Release Database*, as well as an inventory of community projects.

Enhancement and habitat restoration are an integral part of comprehensive recovery efforts throughout BC, as illustrated by the following examples:

- Stave River chum (as described in Section [3.2.5.1](#))
- Sakinaw sockeye, Cultus Lake sockeye, and Rivers Inlet Sockeye (as described in Section [3.4.2.2](#))
- Habitat restorations projects, such as gravel cleaning, are being implemented on the Gendale River and Kakweiken River as part of the *Pink Salmon Action Plan* (Section [3.4.2.5](#))
- A number of Lower Fraser tributaries support small, genetically distinct and indigenous populations of chinook. A small chinook population indigenous to the upper reaches of the Chilliwack River will continue to be the focus for the enhancement program to ensure their conservation.
- Following five years of chinook brood capture efforts on Gold and Muchalat Rivers (Conuma River Hatchery) in which samples were insufficient to determine the status of a remnant population, it is proposed to cease production pending a review of the strategy in order to minimize the risk of exacerbating any negative effects of Robertson Creek chinook strays to that system.
- Maria Slough (Inch Creek Hatchery) chinook salmon existed in one side channel of the lower Fraser River. Nearby Wahleach Slough and Hope Slough have habitats suitable for this stock and are now receiving both habitat restoration and fish culture support to further improve this indigenous chinook population. In 2006, due to a poor return and extremely low water conditions when adults returned to spawn in Maria Slough in 2006, a decision was made to release half of the smolts back to Maria Slough, and half to Hope Slough. The release to Wahleach Slough will be suspended until habitat issues are resolved with BC Hydro.
- Egg production at Quinsam hatchery contributes to local community hatcheries with the objective of re-establishing local pink runs, supplements the local egg take at Puntledge hatchery, and provided the source for transplants to Nanaimo River, which are now starting to return.
- Eggs were collected from Cheakamus River (Tenderfoot Creek Hatchery) chinook in the fall of 2005 in response to the caustic soda spill into the Cheakamus River in August 2005. Eggs were also collected from this stock in 2006 and will be coded-wire tagged. The Cheakamus River Ecosystem Recovery Committee may recommend additional efforts for the fall of 2007. Habitat restoration projects will continue to be developed in 2007 on the major Chinook salmon spawning tributaries within the Squamish River watershed including Shovelnose Creek, Cheakamus River, Mamquam River, Mashiter Creek and Ashlu Creek. Extensive restoration works will also occur within the Squamish River estuary and the Mamquam Blind Channel. Discussions will continue on means of improving the effectiveness of hatchery and habitat restoration programs as part of the Squamish River Watershed Salmon Recovery Plan process.

- Chilliwack watershed restoration efforts support local chum populations.
- Mitigation of the Stoltz slide on the Cowichan River to reduce mortality associated with increased siltation has been coordinated through the Cowichan Round Table (Section [4.3.3.1](#))

3.2.5.4 Salmon Enhancement and the Wild Salmon Policy

The *Wild Salmon Policy* (Section Wild Salmon Policy [3.2.2](#)) maps out the long-term vision for enhancement as part of salmon conservation and sustainable use. Specifically:

- *“The enhancement program will continue to evolve towards greater emphasis on community stewardship, habitat restoration and rebuilding of priority CU’s.”*
- *“As part of integrated strategic plans, enhancement will continue to be used as a means of addressing social and biological objectives through the rebuilding of populations with an unacceptable chance of extirpation (and) by providing harvest opportunities and fishery benefits.”*

In summary, the policy acknowledges enhancement as a tool to address local or broader objectives at the local, planning unit, area, or CU scale. The WSP envisions integrated planning processes to develop specific enhancement objectives, and objectives generated from planning processes can encompass a continuum from rebuilding populations at risk to supporting harvest opportunities. Section [3.2.2.3](#) summarizes WSP implementation initiatives and Section [4.3.3](#) describes existing integrated planning processes. The *Strategic Directions Committee* (Section [4.3.5.1](#)) confirmed that all current hatchery objectives are allowable under the WSP.

The WSP also has implications for the operational aspects of the enhancement program. For example, DFO’s approach to introductions and transfers will consider the following: Identification of functionally distinct *Conservation Units* (CU) means that generally there should be no transfers between CUs. Natal streams are the first choice of broodstock for rebuilding programs in order to retain local adaptations but other transfers will be considered on a case by case basis.

3.3 Integrated Management of Marine and Coastal Ecosystems

3.3.1 Regional Approach to Integrated Management

3.3.1.1 Implementation Strategy

Most recent DFO initiatives explicitly recognize the need for more integrated management of the salmon resource. This includes:

- Integrating different interests through collaborative, advisory, and consultative processes.
- Integrating different planning and implementation processes across areas, across harvester groups, across agencies, and across target species.
- Integrating different types of information.

For example, the *Wild Salmon Policy* explicitly mandates safeguarding the genetic diversity of wild Pacific salmon, maintaining the integrity of their habitat and ecosystem, and managing fisheries for sustainable benefits. The policy also describes a structured five-step planning procedure, which is currently being implemented in pilot projects. Section [3.2.2](#) summarizes the policy, its development, and a suite of implementation initiatives.

The *Oceans Strategy* states that the “*proposed Integrated Management planning framework will extend from the large to the small scale – from Large Ocean Management Areas (LOMA) to Coastal Management Areas (CMA). There will also be a range of connected and nested structures that provide options for connections to terrestrial watersheds and their nested CUs*”.

DFO is actively building the policy and science foundation for a consistent national implementation of integrated ecosystem management, as illustrated by the following:

- 2002 - *Policy and Operational Framework for Integrated Management of Estuarine, Coastal and Marine Environments in Canada* (http://www.dfo-mpo.gc.ca/oceans-habitat/oceans/ri-rs/cosframework-cadresoc/index_e.asp)
- 2007 - *A New Ecosystem Science Framework in Support of Integrated Management* (<http://www.dfo-mpo.gc.ca/science/Publications/ecosystem/index-eng.htm>)

This policy development has been supported by substantial research and scientific debate regarding the operational details of integrated management:

- 1999 - *An evaluation on criteria for creating MPAs in the Pacific Region: A proposed semi-quantitative scheme* by Levings and Jamieson. CSAS Research Document 99/210 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/1999/pdf/99_210e.pdf)
- 2001 - *Proceedings of the National Workshop on Objectives and Indicators For Ecosystem-based Management. Sidney, British Columbia, 27 February – 2 March 2001*. CSAS Proceedings Series 2001/09 (http://www.dfo-mpo.gc.ca/csas/Csas/proceedings/2001/PRO2001_09e.pdf)
- 2001 - *A proposed MPA boundary identification process for reproductive refugium establishment, using lingcod (*Ophiodon elongatus*) as an example focal species* by Jamieson and Dixon. CSAS Research Document 2001/106 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2001/RES2001_106e.pdf)
- 2001 - *Marine and Estuarine Riparian Habitats and their role in Coastal Ecosystems, Pacific Region* by Levings and Jamieson. CSAS Research Document 2001/109 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2001/RES2001_109e.pdf)
- 2002 - *Hexactinellid Sponge Reefs: Areas of Interest as Marine Protected Areas in the North and Central Coast Areas* by Jamieson and Chew. CSAS Research Document 2002/122 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2002/RES2002_122e.pdf)
- 2002 - *Role of Modelling in Ecological Risk Assessment and Management with Emphasis on the Offshore Oil and Gas Industry* by Cretney and others. CSAS Research Document 2002/125 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2002/RES2002_125_E.pdf)
- 2002 - *Biogeochemical Benchmarks for Source Identification of Contaminants from an Offshore Oil and Gas Industry* by Cretney, Yunker, and Yeats. CSAS Research Document 2002/129 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2002/RES2002_129e.pdf)
- 2003 - *Proceedings of Three Workshops to Investigate the Unpacking Process in Support of Ecosystem-based Management* by O'Boyle and Keizer. CSAS Proceedings 2003/004 (http://www.dfo-mpo.gc.ca/csas/Csas/proceedings/2003/PRO2003_004e.pdf)
- 2004 - *Habitat Status Report on Ecosystem Objectives*. CSAS Habitat Status Report 2004/001 (http://www.dfo-mpo.gc.ca/csas/Csas/status/2004/HSR2004_001_e.pdf)

- 2004 - *Identification of Ecologically and Biologically Significant Areas*. CSAS Ecosystem Status Report 2004/006 (http://www.dfo-mpo.gc.ca/csas/Csas/status/2004/ESR2004_006_e.pdf)
- 2004 – *State of knowledge of Marine Habitats of the Northern B.C. Coast in Oil and Gas Lease Areas* by Jamieson and H Davies. CSAS Research Document 2004/09 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2004/RES2004_009_E.pdf)
- 2004 - *Proceedings of the Canadian Marine Ecoregions Workshop, March 23-25, 2004*. CSAS Proceedings Series 2004/016 (http://www.dfo-mpo.gc.ca/csas/Csas/proceedings/2004/PRO2004_016_B.pdf)
- 2004 - *Evaluation of site selection methodologies for use in marine protected area network design* by Evans et al. CSAS Research Document 2004/082 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2004/RES2004_082_e.pdf)
- 2005 - *Guidelines on Evaluating Ecosystem Overviews and Assessments: Necessary Documentation*. CSAS Science Advisory Report 2005/026 (http://www.dfo-mpo.gc.ca/csas/Csas/status/2005/SAR-AS2005_026_E.pdf)
- 2006 - *Identification of Ecologically Significant Species and Community Properties*. Science Advisory Report 2006/041 (http://www.dfo-mpo.gc.ca/csas/Csas/status/2006/SAR-AS2006_041_E.pdf)
- 2006 - *Background Scientific Information for Candidate Criteria for Considering Species and Community Properties to be Ecologically Significant* by Jake Rice. CSAS Research Document 2006/089 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2006/RES2006_089_e.pdf)
- 2006 - *Observations on the Implementation of Ecosystem-based Management: Experiences on Canada's East and West Coasts* by O'Boyle and Jamieson. Fisheries Research Volume 79, Issues 1-2, June 2006, Pages 1-12.
- 2006 - *Reducing Bycatch of Corals and Sponges in British Columbia's Groundfish Trawl Fishery through Trawl Fishery Closures* by Ardron and Jamieson. CSAS Research Document 2006/061 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2006/RES2006_061_e.pdf)
- 2006 - *Taxonomy and Zoogeography of Cold Water Corals in Explored Areas of Coastal British Columbia* by Jamieson, Pellegrin, and Jessen. CSAS Research Document 2006/062 (http://www.dfo-mpo.gc.ca/csas/Csas/Publications/ResDocs-DocRech/2006/2006_062_e.htm)
- 2006 - *Proceedings of the PSARC meeting on Deep Sea Corals, April 26, 2006*. CSAS Proceedings Series 2006/015 (http://www.dfo-mpo.gc.ca/csas/Csas/Proceedings/2006/PRO2006_015_E.pdf)
- 2007 - *Salmon as Status Indicators for North Pacific Ecosystems* by Irvine and Riddell. North Pacific Anadromous Fish Commission Bulletin No. 4: 285–287, 2007 (<http://www.npafc.org/new/publications/Bulletin/Bulletin%20No.%204/285-287Irvine.pdf>)
- 2007 - *Guidance Document on Identifying Conservation Priorities and Phrasing Conservation Objectives for Large Ocean Management Areas*. CSAS Science Advisory Report 2007/010 (http://www.dfo-mpo.gc.ca/csas/Csas/status/2007/SAR-AS2007_010_E.pdf)
- 2007 - *National Science Workshop: Development of a Nationally Consistent Approach to Conservation Objectives, 10-11 January 2007*. CSAS Proceedings Series 2007/001 (http://www.dfo-mpo.gc.ca/csas/Csas/Proceedings/2007/PRO2007_001_B.pdf)

- 2007 – *National Federal-Provincial-Territorial Coastal Management Areas Workshop, May 16-17, 2007*. CSAS Proceedings Series 2007/025 (http://www.dfo-mpo.gc.ca/csas/Csas/Proceedings/2007/PRO2007_025_B.pdf)

3.3.1.2 Oceans Management

Over the last 10 years DFO has led an extensive, long-term process to develop the building blocks for integrated oceans management:

- The *Oceans Act* was passed in 1997 and provides the legal basis for federal management of the oceans (Section [1.1.2.3](#))
- The *Oceans Strategy* was released in 2002 and establishes the policy framework for implementing the provisions of the *Oceans Act*. It calls for the Minister of Fisheries and Oceans to lead the development and implementation of plans for the Integrated Management of all activities affecting estuaries, coastal and marine waters. Information material about the *Oceans Strategy* is available at http://www.dfo-mpo.gc.ca/oceans-habitat/oceans/ri-rs/cos-soc/index_e.asp.
- The *Oceans Action Plan*, which ran from 2005 to 2007, developed implementation processes for the elements of the Oceans Strategy and identified five priority Large Ocean Management Areas (LOMA) across the country in which DFO would coordinate Integrated Management efforts. Information materials about the *Oceans Action Plan*, including a Media Backgrounder, is available at http://www.dfo-mpo.gc.ca/oceans-habitat/oceans/oap-pao/index_e.asp.
- DFO's Oceans Habitat and Enhancement Branch (OHEB) is developing a *Canada-BC Memorandum of Understanding Respecting the Implementation of Canada's Oceans Strategy on the Pacific Coast of Canada* to provide for further collaboration to advance implementation of specific activities and objectives identified in Canada's Oceans Strategy. Although not yet finalized, Canada and BC are developing 6 subsidiary MOUs for: a marine protected areas framework, coastal planning and integrated oceans management planning, an integrated oceans information management system, indicators for oceans management and state of the environment reporting, streamlining and harmonizing regulatory decision-making for aquaculture, and information-sharing related to offshore oil and gas resources. The full text of the MoU is available at http://www.dfo-mpo.gc.ca/oceans-habitat/oceans/ri-rs/bc-cb/index_e.asp.

The DFO portal for information about oceans management policies and initiatives is http://www.dfo-mpo.gc.ca/oceans-habitat/index_e.asp.

DFO's *Oceans and Habitat Enhancement Branch* is also developing a comprehensive overview of its policy and operational framework, which explains how these elements are linked into an overarching implementation of the *Oceans Act*. The full report will be publicly distributed.

DFO has established several specific initiatives to implement the provisions of the *Oceans Act* under a variety of funding umbrellas. These initiatives include:

- The *Health of the Oceans Initiative* was originally part of the *Oceans Action Plan*. Recently, the federal government provided new funding for a five-year plan to advance the health of Canada's three oceans. This money will be in addition to the funding that was identified in Budget 2007 as part of the National Water Strategy and will be used to establish 6 new marine protected areas across the country by 2012.
- The *Federal Marine Protected Areas Strategy* was established to clarify the roles and responsibilities of federal departments and agencies with marine protected area mandates, namely

Fisheries and Oceans Canada, Environment Canada and the Parks Canada Agency, and to describe how federal marine protected area programs can collectively create a cohesive and complementary network of marine protected areas. The full text of the strategy is available at <http://www.dfo-mpo.gc.ca/Library/315822e.pdf>

- *Integrated Management* (IM), also called *Integrated Oceans Management* (IOM) or *Integrated Coastal Zone Management* (ICZM) in various DFO documents, is envisioned as an ongoing and collaborative planning process that brings together interested stakeholders and regulators to reach general agreement on the best mix of conservation, sustainable use, and economic development of marine areas for the benefit of Canadians. The Oceans Strategy calls for the Minister of Fisheries and Oceans to lead the development and implementation of IM plans for all activities affecting estuaries, coastal and marine waters. General information about IM initiatives in the Pacific Region is available at http://www.pac.dfo-mpo.gc.ca/oceans/im/default_e.htm. The Department has identified five priority Large Ocean Management Areas across the country for coordinating IM efforts. In the Pacific Region, the the Queen Charlotte Basin has been identified as the priority area, also referred to as the *Pacific North Coast Integrated Management Area* (Section [3.3.2.3](#)).

Each of these initiatives is described briefly in the implementation section below.

3.3.1.3 Fish Habitat Management

This section outlines the habitat provisions in relevant acts and policies, and summarizes DFO's implementation mechanisms.

The *Fisheries Act* (Section [1.1.2.2](#)) defines fish habitat as “any spawning grounds and nursery, rearing, and food supply and migration areas on which fish depend, directly or indirectly, in order to carry out their life processes.”

DFO's *Fish Habitat Management Program* (FHMP) is a major federal regulator affecting most development projects occurring in, around, or with fresh and marine fish-bearing waters across Canada. Details are available through the FHMP web portal at http://www.dfo-mpo.gc.ca/oceans-habitat/habitat/index_e.asp. Guided by the *Policy for the Management of Fish Habitat* (Section [1.2.3](#)), the program implements habitat provisions under the *Fisheries Act*, the *Species at Risk Act* (Section [1.1.2.4](#)) and the *Canadian Environmental Assessment Act* (Section [1.1.2.5](#)). Implementation of the FHMP is being revised through an intensive public review process, the *Environmental Process Modernization Plan* (EPMP), which was launched in 2004. There are six elements of the EPMP:

- A program-wide, science-based Risk Management Framework for identifying projects posing the greatest risk to the environment.
- Referral streamlining of low-risk projects so that resources can be reallocated to higher risk reviews and other priorities.
- Improved management of major projects, including new policy guidance and new organizational structures, to increase the predictability, timeliness and harmonization of decision making.
- Formalized partnerships with industry sectors, provinces, territories, municipalities, conservation groups and others to enhance understanding, adopt common agendas and integrate DFO's responsibilities with the interests of key stakeholders where possible.
- Internal measures, including mandatory training for all staff, the adoption of new governance structures and national operating procedures, to improve predictability and the coherence of decision making.

- Habitat Compliance Modernization - to clarify compliance rules and improve compliance effectiveness through the creation of a habitat monitoring program.

A summary of online feedback on the EPMP is available at http://www.dfo-mpo.gc.ca/oceans-habitat/habitat/measuring-mesures/online-direct/index_e.asp. A progress update on implementation is available at http://www.dfo-mpo.gc.ca/oceans-habitat/habitat/modernizing-moderniser/index_e.asp.

Information about the habitat provisions in the various acts, and their practical implications, is available in the following publications:

- 1991 - *Canada's Fish Habitat Law* summarizes the legal background (<http://www.dfo-mpo.gc.ca/Library/140198.pdf>)
- *Complying with the Fisheries Act habitat sections* (http://www-heb.pac.dfo-mpo.gc.ca/habitat_policy/hab_law_article/contents_e.htm)
- 1997 - *Road Maintenance Activities and The Fisheries Act A Guidance Document to Avoiding Conflict* by Stoneman, Portt and Metikosh. Canadian Manuscript Report of Fisheries and Aquatic Sciences No 2404 (<http://www.dfo-mpo.gc.ca/Library/210807.pdf>)
- 1998 – *Decision framework for the determination and authorization of harmful alteration, disruption or destruction of fish habitat* (<http://www.dfo-mpo.gc.ca/Library/231028.pdf>)
- 1998 - *Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters* by Wright and Hopky. Canadian Technical Report of Fisheries and Aquatic Sciences 2107 (<http://www.dfo-mpo.gc.ca/Library/232046.pdf>)
- 1999 - *Resource Rebuilding: Habitat Conservation and Stewardship Program* outlines the operational framework for the HCSP (<http://www-heb.pac.dfo-mpo.gc.ca/community/pdf/frmwork.pdf>)
- 2000 - *Guidelines to Protect Fish and Fish Habitat From Treated Wood Used in Aquatic Environments in the Pacific Region* by Hutton and Samis. Canadian Technical Report of Fisheries and Aquatic Sciences 2314 (<http://www.dfo-mpo.gc.ca/Library/245973.pdf>)
- 2007 - *Documenting Habitat Use of Species at Risk and Quantifying Habitat Quality*. Science Advisory Report 2007/038 (http://www.dfo-mpo.gc.ca/csas/Csas/status/2007/SAR-AS2007_038_E.pdf)
- 2007 - *Species at Risk: Habitat Quantification Literature Review* by MCarthy. CSAS Research Document 2007/060 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2007/RES2007_060_e.pdf)

DFO has developed a set of *Standard Operating Policies* for habitat management. The intent of these internal guidelines is to support FHMP staff in making transparent and consistent decisions during the regulatory review of works or undertakings that may affect fish and fish habitat across Canada. The following guides are available at http://www.dfo-mpo.gc.ca/oceans-habitat/habitat/policies-politique/operating-operation/index_e.asp:

- *Departmental Position Statement: Application of the Habitat Protection Provisions of the Fisheries Act to Existing Facilities and Structures*
- *Practitioners Guide to the Risk Management Framework*
- *Practitioners Guide to Writing Letters Used in and for Fisheries Act and Species at Risk Act Reviews*

- *Practitioners Guide to Habitat Compensation (Practitioners Guide to Writing a Sub-section 35(2) Fisheries Act Authorization)*
- *Practitioners Guide to Fish Passage for DFO Habitat Management Staff*

In addition, a series of *Operational Statements (OS)* has been developed under the EPMP to streamline the regulatory review of low risk activities. The OS outline measures and conditions for avoiding the harmful alteration, disruption and destruction (HADD) to fish habitat and thus be in compliance with subsection 35(1) of the *Fisheries Act*. Proponents are not required to submit their proposal for review by Fisheries and Oceans Canada (DFO) when they incorporate the measures and conditions outlined in the OS into their plans. 19 OS have been completed and are available at http://www-heb.pac.dfo-mpo.gc.ca/decisionsupport/os/operational_statements_e.htm.

Annual reports on the *Administration and Enforcement of the Fish Habitat Protection and Pollution Prevention Provisions of the Fisheries Act* are available at http://www.dfo-mpo.gc.ca/oceans-habitat/habitat/measuring-mesures/reports-rapports/index_e.asp.

DFO leads and contributes to on-going habitat research in support of multi-stakeholder planning processes:

- 1995 - *Protection of Aquatic and Riparian Habitat by Local Governments: Measures Adopted in the Lower Fraser Valley* by Quadra Planning Consultants (<http://www.dfo-mpo.gc.ca/Library/224986.pdf>)
- 1995 - *Protection of Aquatic and Riparian Habitat on Private Land: Evaluating the Effectiveness of Covenants in the City of Surrey* by Inglis, Thomas, and Child (<http://www.dfo-mpo.gc.ca/Library/224985.pdf>)
- 1999 - *A New Direction: Habitat Conservation and Stewardship Forum Summary Report (Empire Landmark Hotel, Vancouver, B.C. Jan 8-9, 1999)* (www.dfo-mpo.gc.ca/Library/235008.pdf)
- 2000 - *No Net Loss of Fish Habitat: an audit of forest road crossings of fish-bearing streams in British Columbia, 1996 – 1999* by Harper and Quigley. Can. Tech. Rep. of Fish. and Aqu. Sc. 2319 (<http://www.dfo-mpo.gc.ca/Library/247265.pdf>)
- 1997 - *Thompson River salmonid habitat classification in the vicinity of Kamloops, B.C.* by Stalberg, Redden, and Hickey (<http://www.dfo-mpo.gc.ca/libraries-bibliotheques/toc-tdm/320731-eng.htm>)
- 2002 - *Floodplains, flooding, and salmon rearing habitats in British Columbia: A review* by Brown. CSAS Research Document 2002/007 (www.dfo-mpo.gc.ca/csas/Csas/DocREC/2002/RES2002_007_E.pdf)
- 2003 - *Enhanced Delivery of Canada's Policy for the Management of Fish Habitat (1986): An Evaluation of the Interaction between Fisheries and Oceans Canada and the Fraser Basin Council.* 2003. (<http://www.dfo-mpo.gc.ca/Library/271867.pdf>)
- 2004 – *Critical Habitat Case Study - Sakinaw Lake Sockeye Salmon* (Section [3.4.2.2](#))
- 2007 - *Skeena fish populations and their habitat* by Gottesfeld and Rabnett. (<http://www.dfo-mpo.gc.ca/Library/327687.pdf>)
- 2008 *Skeena River fish and their habitat* by Gottesfeld and Rabnett, published through Ecostrust.
- Stream life research for pink and chum spawners.

The intensive *Habitat Restoration and Salmon Enhancement Program* (HRSEP) ran from 1998 to 2002. It was designed to establish partnerships, enhance habitat protection, and expand community capacity for habitat stewardship. HRSEP established a legacy of stewardship initiatives consistent with the long history of stewardship and community involvement that DFO supports through initiatives such as the Salmonid Enhancement Program.

Consultation materials, project summaries, and a final report are available on-line:

- 2001 - *Habitat Restoration and Salmon Enhancement Program, 2000/2001 Summary Report* (<http://www.dfo-mpo.gc.ca/Library/240753-00-01.pdf>)
- 2008 - *An Overview of Salmon Habitat and Restoration Related Activities in Canada and the United States 1999 – 2006*. PSC Technical Report No. 24 (www.psc.org/pubs/psctr24.pdf)

DFO collaborates closely with other agencies and organizations on habitat management. For example:

- Two restoration and enhancement endowments were established jointly by Canada and the US under the Pacific Salmon Treaty, and are administered through the Pacific Salmon Commission (Section 1.1.4.4). Project backgrounders and final reports are available at http://fund.psc.org/pubs_fund.htm.
- The *Canada - British Columbia Fish Habitat Management Agreement* commits federal and provincial agencies to coordinate their work on habitat initiatives. The agreement is available at http://www.dfo-mpo.gc.ca/oceans-habitat/habitat/aboutus-apropos/partners-partenaires/bc_e.asp.

3.3.1.4 Online resources for Integrated Management

Federal, provincial, and non-governmental agencies are collaborating on growing toolkit for integrated management, which includes the following web-based resources:

- The *Fisheries Project Registry* (FPR) is a map-enabled database which tracks minimum data about the existence, general nature, location and key contacts for specific categories of fisheries-related projects (<http://www.canbcdw.pac.dfo-mpo.gc.ca/FPR/>).
- The *BC Fisheries Information and Summary System* (FISS) is a geo-referenced database of overview data about fish, fish habitat, macro-reach, and lake classification data (<http://www.env.gov.bc.ca/fish/fiss/index.html>).
- *Mapster* is an internet-based GIS application that provides access to fish and fish habitat related information from over 200 datasets, including salmon escapements and hatchery releases (<http://www.canbcdw.pac.dfo-mpo.gc.ca/ows/imf.jsp?site=mapster>).
- *Habitat Wizard* links to provincial databases, providing information on fish observations, fish ranges, stream and lake physical information, aerial photography, the watershed atlas, fish stocking records and bathymetric mapping for over 2,500 lakes (<http://www.env.gov.bc.ca/habwiz/>).
- The *Oceans Habitat and Enhancement Branch* (OHEB) web portal at provides centralized access to online tools such as *Mapster* and *Habitat Wizard*, but also maintains an inventory of downloadable basemaps and geo-referenced dataset at http://www-heb.pac.dfo-mpo.gc.ca/maps/maps-data_e.htm.
- The *Salmon Enhancement Program* main page at http://www-heb.pac.dfo-mpo.gc.ca/facilities/salmonid_e.htm links to detailed information about each enhancement facility, including automated queries to the *Release Database*.

- The *Regional Data Unit* home page at http://www.pac.dfo-mpo.gc.ca/sci/sa/default_e.htm links to up-to-date summaries of all recorded commercial and recreational catches. Section [2.4.3.2](#) describes how catch data are collected and managed.
- *Hectares BC* is user-friendly online portal to geospatial data holdings by federal and provincial agencies. Salmon conservation units are now included (<http://hectaresbc.org/trac/wiki>).
- The *Regional Mark Processing Centre* is a coast-wide data warehouse for salmonid marking programs (e.g. coded-wire tags, fin clips). Background about the RMPC and web access to its databases is available at <http://www.rmpec.org>.
- *Oceans Program Activity Tracking*: This inventory of all activities under the *Oceans Act* is available at http://mmsd2.mms.nrcan.gc.ca/dfo/opat_public_e.asp, but requires users to install the Autodesk Mapguide Viewer.
- Detailed information about ocean conditions is available at http://www.pac.dfo-mpo.gc.ca/sci/oceans_e.htm, which includes links to real-time oceans data.
- The *Fraser River Estuary Management Program (FREMP) Atlas* provides direct access to habitat inventories and habitat productivity classifications (http://www.cmNBC.ca/atlas_gallery/fraser-river-estuary-management-plan-atlas).
- The *Georgia Basin Habitat Atlas* includes many datasets including fish presence and important bird habitat (http://www.cmNBC.ca/atlas_gallery/georgia-basin-habitat-atlas).
- The *WCVI Regional Information System* is maintained by the *West Coast Vancouver Island Aquatic Management Board* (Section [4.3.3.1](#)) and provides access to “*Over 100 layers of interactive cultural and environmental maps that describe terrestrial and marine environments, resource uses and coastal communities*” (<http://www.westcoastaquatic.ca/RIS.htm>).

3.3.2 Initiatives and Projects

3.3.2.1 Oil Spill Preparedness

Two major oil spills occurred in American waters in the late 1980s, the Nestucca spill in Washington and the Exxon Valdez spill in Alaska. Canada launched an extensive multi-agency program to develop response plans and consolidate information about marine resources. A summary of Canada’s response to the Nestucca spill is available at <http://www.ec.gc.ca/ee-ue/default.asp?lang=en&n=A8F729D3#324>.

Key documents for the oil spill preparedness initiative include:

- 1991 - *Interpreting the mortality of seabirds following the Nestucca oil spill of 1988-1989* by Burger. Canadian Wildlife Service Tech. Rep. Series 178 (Waves 263980)
- 1992 - *Manual : British Columbia marine oil spill shoreline protection and cleanup response* prepared for DFO and MELP by Woodward-Clyde Consultants (Waves 137107)
- 1993 - *Coastal resources and oil spill response atlas for the southern Strait of Georgia* by Howes and others (Waves 188003)
- 1993 - *Assessment of spill response requirements within DFO* prepared for DFO by S.L. Ross Environmental Research Ltd. (Waves 218395)

- 1993 - *Effects of the Nestucca oil spill on seabirds along the coast of Vancouver Island in 1989* by Burger. Canadian Wildlife Service Tech. Rep. Series 179 (Waves 263979)
- 1994 - *Consolidation of fisheries resource information, West Coast Vancouver Island : Barkley Sound and Alberni Inlet* by Booth and Rueggeberg. Can. Tech. Rep. of Fish. Aqu. Sciences 2002 (Waves 238346)
- 1995 - *Consolidation of fisheries resource information, West Coast Vancouver Island : offshore* by Booth and others. Can. Tech. Rep. of Fish. Aqu. Sciences 2120 (Waves 238348)
- 1996 - *Consolidation of fisheries resource information, West Coast Vancouver Island : Clayoquot Sound and Long Beach* by Lightly Can. Tech. Rep. of Fish. Aqu. Sciences 2121 (Waves 238351)
- 1996 - *Marine oil spill preparedness and response regime : report to Parliament* by DFO (Waves 199048)
- 1996 - *Consolidation of fisheries resource information, west coast Vancouver Island : southwest Vancouver Island (Race Rocks to Cape Beale)* by Lightly and Hillaby Can. Tech. Rep. of Fish. Aqu. Sciences 2122 (Waves 238349)
- 1999 - *Coastal resource & oil spill response atlas for the West Coast of Vancouver Island [electronic resource]* by Howes and others (Waves 273905)
- 2001 - *Marine oil spill preparedness and response regime : report to Parliament, 1998-2000* by DFO (Waves 253931)

3.3.2.2 Marine Protected Areas and Other Spatially Persistent Fishery Closures

DFO has been working closely with Parks Canada, Environment Canada, and the Province of British Columbia (see MoU in section [3.3.1.2](#)) to establish a process for developing a network of protected areas on Canada's Pacific coast using various legislative tools, and an extensive network of areas with different levels of protection is already in place. *Marine Protected Areas and Fisheries Closures in British Columbia* (1997) by Jamieson and Lessard is available at www.pac.dfo-mpo.gc.ca/oceans/closure/contents_e.htm. The book outlines the different legislative tools and provides details on a number of protected area that are already in place, including a detailed inventory of spatially persistent fishery closures, as of 1997, organized by reason for closure (<http://www.pac.dfo-mpo.gc.ca/oceans/closure/table7.pdf>) or by site number (<http://www.pac.dfo-mpo.gc.ca/oceans/closure/main.pdf#table8>). In addition, the OHEB GIS unit provides current information on the spatial location of MPAs and rockfish conservation areas on the publicly accessible Mapster web-based mapping tool available at: http://www-heb.pac.dfo-mpo.gc.ca/maps/maps-data_e.htm. Note that Rockfish Conservation Areas (Section [3.4.3.1](#)) are administrated by Fisheries and Aquaculture Management, not OHEB.

As an illustration, [Appendix 2](#) lists current fishing closures in Johnstone Strait.

The Endeavour Hydrothermal Vents were designated as Canada's first MPA in 2003, and Bowie Seamount off the Queen Charlotte Islands was designated in April 2008:

- Extensive information about the Endeavour Hydrothermal Vents, including a chronology of scientific research, is available through http://www.pac.dfo-mpo.gc.ca/Oceans/mpa/Endeavour_e.htm.

- Extensive information about Bowie Seamount, including a record of consultations back to 1999, is available at http://www.pac.dfo-mpo.gc.ca/oceans/mpa/bowie/default_e.htm.

In addition, Race Rocks off Victoria has been identified as an area of interest for a potential future MPA (<http://www.racerocks.com/>)

Recently, Environment Canada has been working towards establishment of the Scott Islands as a Marine Wildlife Area, while Parks Canada has been working towards development of National Marine Conservation Areas in Gwaii Haanas and the Southern Strait of Georgia.

Section [3.2.4.3](#) describes additional selective fishing measures and Section [3.4](#) includes an inventory of conservation measures.

3.3.2.3 Pacific North Coast Integrated Management Area (PNCIMA)

This is one of 5 national pilot projects for integrated management. Work that has been completed for PNCIMA includes the *Ecosystem Overview*, an assessment of *Ecologically or Biologically Significant Areas* (EBSA), the beginnings of a geo-referenced database of relevant information including local and traditional ecological knowledge, and identification of conservation objectives. The conservation objectives element is still not completed, but products that have been developed are already showing benefits for diverse operational activities. For example, when the MV Queen of the North sank in 2006, the local and traditional ecological knowledge database was shared with emergency responders within hours and helped focus the environmental disaster response. More information relating to PNCIMA is available in the following publications:

- 2004 - *State of Knowledge of Marine Habitats of the Northern B.C. Coast in Oil and Gas Lease Areas* by Jamieson and Davies. CSAS Research Document 2004/009 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2004/RES2004_009_E.pdf)
- 2006 - *Identification of Ecologically and Biologically Significant Areas in the Pacific North Coast Integrated Management Area: Phase I - Identification of Important Areas* by Clarke and Jamieson. Can. Tech. Rep. Fish. Aquat. Sci. 2678 (<http://www.dfo-mpo.gc.ca/Library/326795.pdf>)
- 2006 - *Identification of Ecologically and Biologically Significant Areas in the Pacific North Coast Integrated Management Area: Phase II – Final Report* by Clarke and Jamieson. Can. Tech. Rep. Fish. Aquat. Sci. 2686 (<http://www.dfo-mpo.gc.ca/Library/326796.pdf>)
- 2007 - *The Pacific Coast Integrated Management Area: Moving Towards Modern Ocean Management* by Hillier and Gueret (<http://www.cseg.ca/publications/recorder/2007/03mar/mar2007-modern-ocean-management.pdf>).
- 2007 - *Marine environmental quality in the Pacific North Coast Integrated Management Area (PNCIMA), British Columbia, Canada : a summary of contaminant sources, types, and risks* by Johannessen and others. Can. Tech. Rep. Fish. Aquat. Sci. 2716 (<http://www.dfo-mpo.gc.ca/Library/328420.pdf>)
- 2007 - *Ecosystem Overview: Pacific North Coast Integrated Management Area (PNCIMA)* by B.G. Lucas, S. Verrin, and R. Brown (Editors) Canadian Technical Report of Fisheries and Aquatic Sciences 2667 (<http://www.dfo-mpo.gc.ca/Library/328842.pdf>). Appendix 1 summarizes available information about the salmon-habitat complex of PNCIMA and ecosystem linkages for salmon in PNCIMA.

- 2000 - current: *Living Marine Legacy of Gwaii Haanas* is a series of biological baseline inventories for the Queen Charlotte Islands, released as Parks Canada Technical Reports. The reports are not available on-line, but an overview and maps of current fishery closure areas are available at www.marinematters.org.
- A *Marine Use Analysis* for PNCIMA is available at www.dfo-mpo.gc.ca/Library/332374.pdf.

The PNCIMA initiative also draws on work completed for the *Central Coast Integrated Management Initiative (CCIM)*. A brief summary is available at http://www.dfo-mpo.gc.ca/oceans-habitat/oceans/im-gi/cc_e.asp and more detailed information as available in the following publications:

- 2003 - *Marine environmental quality in the central coast of British Columbia, Canada : a review of contaminant sources, types and risks* by Haggarty and others. Can. Tech. Rep. Fish. Aquat. Sci. 2507 (<http://www.dfo-mpo.gc.ca/Library/278588.pdf>)
- 2003 - *Proceedings of the Central Coast Integrated Management Marine Environmental Quality Workshop, June 5-7, 2002, Parksville, BC* by Jamieson, Bauer, Vandermeulen. CSAS Proceedings Series 2003/13 (http://www.dfo-mpo.gc.ca/csas/Csas/proceedings/2003/PRO2003_013_E.pdf)
- 2004 - *Proceedings of the Central Coast Marine Environmental Quality Indicators Workshop, March 10-12, 2004, Parksville, BC* by Jamieson and McCorquodale. CSAS Proceedings Series 2004/025 (http://www.dfo-mpo.gc.ca/csas/Csas/Proceedings/2004/PRO2004_025_E.pdf)
- 2004 - *Boundary definition for the central coast integrated management area* by Johannessen and others. CSAS Research Document 2004/050 (<http://www.dfo-mpo.gc.ca/Library/283668.pdf>)

3.3.2.4 The Strait of Georgia Ecosystem Research Initiative

DFO has launched a major ecosystem initiative investigating the Strait of Georgia. Research focuses on three central questions:

- How does this system work? What is the present state of the Strait and how has it changed?
- What are the drivers of change acting on the Strait and how might these drivers change?
- What might the Strait be like in the future under the influence of these drivers? What are potential pathways to that future (to take or avoid) ?

This 5-year research effort is currently in its second year. An overview of specific research projects, with progress updates, is available at http://www-sci.pac.dfo-mpo.gc.ca/sogeri/researchprojects_e.htm.

3.3.2.5 Barkley Sound / Alberni Inlet WSP Pilot

The *Wild Salmon Policy* envisions fully integrated management processes to ensure the conservation and sustainable use of wild Pacific Salmon. Barkley Sound / Alberni Inlet has been chosen as a pilot area for testing the implementation of the strategic integrating planning framework outlined in the policy (Section [3.2.2](#)).

Work has begun on three components of the integrated planning framework:

- Development of a fully integrated stock management plan for stocks, watersheds, habitat, ecosystem, fishery for Area 23 Barkley Sound / Alberni Inlet.
- Development of a governance co-management framework that's a model for other areas on the coast

- Utilize and develop processes conducive to consensus-based decision making with appropriate linkages to other agencies and local stakeholders.

A discussion paper will be circulated in 2009.

3.3.3 Implications for BC pink and chum fisheries

Many national and regional developments directly or indirectly shape fisheries targeting pink and chum salmon in BC. For example:

- Implementation of the *Wild Salmon Policy* provides direction for management of wild stocks to ensure sustainability of both target and weak pink and chum stocks and to maintain genetic diversity. Implementation of the policy has triggered extensive research to delineate distinct functional groupings for BC salmon, to identify status benchmarks for salmon CUs that differ substantially in terms of geographic extent and data availability, and to identify habitat indicators (Section [3.2.2](#))
- Recovery planning under the *Species at Risk Act* requires consideration of critical habitat and cumulative impacts (e.g. by-catch). Salmon fisheries are being adapted over time to address any potential impacts on species protected listed under SARA, designated by COSEWIC, or otherwise identified as a conservation concern (Section [3.4](#)).
- Several integrated conservation initiatives are focused on delineating geographic areas of particular value: SARA recovery plans identify critical habitat (Section [3.2.1](#)), the *Oceans Act* mandates the development of a national network of marine protected areas (Section [3.3.2.1](#)), and on-going DFO conservation efforts result in long-term area closures (e.g. rockfish conservation areas, described in Section [3.4.3.1](#)). BC salmon fisheries have been shifted around to fit within that network of considerations (see examples in [Appendix 1](#), and details in the *Certification Unit Profiles*)
- Regional integration of information supports local decision-making. DFO is building a comprehensive information base for integrated management. For example, DFO's Mapster tool provides access to geographically referenced information about such diverse topics as escapement estimates by site and fish bearing streams. Mapster is available at <http://www.canbcdw.pac.dfo-mpo.gc.ca/ows/imf.jsp?site=mapster>.
- Direct effects of BC salmon fisheries on the ecosystem are minimized through selective fishing and impact reduction measures (Section [3.2.4](#)). However, the MSC ecocertification also evaluates potential indirect effects, such as reduced transport of marine nutrients to freshwater ecosystems or reduced prey availability for marine mammals. This whole area needs further study to define impacts that could and should be ameliorated by manipulating salmon abundance through fishing. As there are no operational guidelines for ecosystem management in place, for any major salmon fishery, it is next to impossible at this time to explicitly manage salmon abundance based on its long-term effect on the freshwater ecosystem or marine piscivores. DFO Stock Assessment Division is monitoring research throughout the Pacific Northwest on ecosystem impacts of salmon abundance levels, and is carrying out its own research on:
 - long-term patterns in salmon escapement, their nutrient contribution to freshwater ecosystems, and resulting food web interactions (Section [3.2.3.7](#)).
 - marine mammal diets. DFO is also developing a formal policy for emerging fisheries that target forage species (Section [3.4.3.3](#))

3.4 Inventory of Major Conservation & Recovery Efforts

3.4.1 Summary of Conservation Concerns

3.4.1.1 Categories of Conservation Concerns

The management system distinguishes between 4 types of conservation concerns, and responds to each of them:

- Legally protected under Schedule 1 of the *Species at Risk Act* (SARA)
- Listed by COSEWIC, but not legally protected under Schedule 1 of the *Species at Risk Act*
- Listed by COSEWIC, and under consideration for legal protection under Schedule 1 of the *Species at Risk Act*
- Identified as a conservation concern by DFO, but not listed by COSEWIC or listed under Schedule 1 of the *Species at Risk Act*

The next four sections list marine species in each of these categories. Section [3.2.1](#) describes recovery planning processes for listed and non-listed species. Section [3.4.1](#) summarizes coast-wide conservation concerns and Sections [3.4.2](#) and [3.4.3](#) provide brief updates on the resulting recovery initiatives. Some of these initiatives are not directly linked to pink and chum fisheries, but they do affect the overall implementation of salmon fisheries and illustrate the extent of coast-wide conservation efforts.

3.4.1.2 SARA-listed Marine Species in BC (Schedule 1)

SARA identifies the three fundamental goals of preventing extinction, securing recovery, and managing species of special concern so they don't become more seriously at risk. SARA includes prohibitions against killing, harming, harassing, capturing or taking any species listed as endangered or threatened, as well as against possessing, collecting, buying, selling or trading the species, and against destroying their critical habitats and residences. Section [1.1.2.4](#) describes the act, its development, and implementation. Section [3.2.1.2](#) describes recovery planning under SARA.

As of April 2008, the following marine species are listed under Schedule I of SARA:

- *Whales*: Blue whale – Endangered, Killer whale southern resident population – Endangered, Killer whale northern resident population – Threatened, Killer whale transient population – Threatened, Killer whale offshore population – Special Concern, North Pacific right whale – Endangered, Sei whale – Endangered, Fin whale – Threatened, Humpback whale – Threatened, Grey whale – Special Concern, Harbour porpoise – Special Concern
- *Other marine mammals*: Steller sea lion – Special Concern, Sea otter – Threatened (In 2007, COSEWIC re-assessed sea otter as a species of special concern. It is currently in the listing process, proposed to be re-listed as special concern, replacing the current Threatened listing.)
- *Finfish*: Green sturgeon – Special Concern, White Sturgeon - Assessed by COSEWIC as six populations (all Endangered), of which four were legally listed under SARA, and two (the lower and mid-Fraser populations) were not. White sturgeon reside primarily in freshwater, but are included here because they occur in areas where in-river salmon fisheries take place.
- *Other*: Leatherback turtle – Endangered, Northern Abalone – Threatened, Olympia oyster – Special Concern

The SARA Registry lists all Schedule 1 species at www.sararegistry.gc.ca/species/schedules_e.cfm?id=1 and links to a summary of status, biology, and threats. These SARA threat summaries do not identify BC salmon fisheries as a direct threat for most of the species, with the following exceptions:

- *Accidental entanglement in fishing gear* is a potential threat to all of the listed marine mammals, but the DFO Marine Mammal/SARA program has developed a marine mammal response initiative which includes the possible disentanglement of whales. DFO tracks all reports through the 1-800 Observe, Record, Report number. DFO also coordinate responses with the *Marine Mammal Incident Response Network*, a coastwide network of government and non-government organizations. Fishers should report any entanglement or bycatch, as required by the conditions of licence (Section [2.4.2.5](#)), and DFO is proposing to include mandatory reporting of all collisions and entanglements in the amended marine mammal regulations. Gillnet entanglements of harbour porpoise have been reduced, and are identified as an area for further work. Whale entanglements are rare, and when they do occur they generally involve troll gear, but there is one report of a grey whale entanglement in gill net gear.
- *Reduction of salmon prey* is a potential threat for killer whales, Steller sea lions, and white sturgeon. On-going research on salmon predation by these species is summarized in the sections below.
- *By-catch in salmon fisheries* has been identified as a threat for white and green sturgeon. However, the relative contribution of this factor to total human-induced mortality is difficult to isolate. The Recovery Potential Assessment for white sturgeon states that “*Specific sources of harm or mortality to individual white sturgeon include targeted or incidental capture in recreational fisheries, bycatch in salmon gillnet fisheries, passage through dams, and sampling for research and hatchery broodstock. Best estimates for total annual mortality directly induced by humans range from 0.01% in the Upper Fraser to 0.07% in the Columbia population for small sturgeon (ages 2 to 10); and from 0.02% in the Upper Fraser to 0.3% in the Nechako population for large sturgeon (ages >10).*” The full text CSAS Science Advisory Report 2007/014 is available at http://www.dfo-mpo.gc.ca/csas/Csas/status/2007/SAR-AS2007_014_E.pdf.

3.4.1.3 COSEWIC-Designated Marine Species in BC Currently Under Consideration for SARA Listing

COSEWIC-designated marine or anadromous species in Pacific region currently under consideration for listing under Schedule I of SARA are:

- *Sharks*: Basking shark – Endangered, Sixgill shark – Special Concern, Soupfin shark (tope) – Special Concern. BC salmon fisheries do not currently pose a direct threat to these designated sharks, but records indicate substantial numbers of basking shark entanglements from 1942 to 1969, when Barkley Sound and Rivers Inlet were heavily fished with gill nets. Salmon fisheries in Rivers Inlet have been closed since the mid-1990s to protect local salmon stocks of concern. There have been no commercial fisheries targeting pink salmon in Barkley Sound since their local abundance declined to low but stable levels in the 1970s, and chum fisheries have been limited to small-scale assessment fisheries with controlled effort (e.g. 8 vessels fishing a maximum of 2 days / week in 2007). No recent concerns over shark entanglements have been identified.
- *Salmonids*: Okanagan chinook – Threatened. There are no pink and chum fisheries known to intercept these chinook migrating through the Columbia River.

- *Rockfish*: Bocaccio – Threatened, Canary – Threatened, Longspine thornyhead – Special Concern, Rougheye rockfish types I & II – Special Concern. Comprehensive conservation measures are in place for BC rockfish (i.e. Rockfish Conservation Areas, Section [3.4.3.1](#), but note that these are not specifically designed to protect bocaccio).
- *Marine mammals*: Northern fur seal – Threatened. Northern fur seals diets focus on pollock, herring, and squid. Salmon are not a major prey item.

3.4.1.4 COSEWIC-designated Pacific Salmon Not Included Under Schedule 1 of SARA

Three populations of salmon have been designated as Endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC):

- Interior Fraser Coho – Endangered
- Sakinaw sockeye – Endangered
- Cultus sockeye - Endangered

Following extensive public and stakeholder consultation processes for each population, the Minister of Environment, in consultation with the Minister of Fisheries and Oceans, did not include these population on Schedule I of SARA. However, conservation and recovery measures are in place for each of these designated populations (Section [3.4.2](#)). Fisheries targeting BC pink and chum salmon are continuously adapted to be consistent with protection and recovery requirements for these populations (Section [2.5.4](#), [Appendix 1](#), and [Appendix 2](#) lists current fishing closures in Johnstone Strait.

3.4.1.5 Other Salmon Stocks of Concern

There are currently no pink or chum stocks that are either designated as endangered or threatened by COSEWIC, or listed under the *Species at Risk Act*. However, DFO has identified pink and chum stocks of concern and responded with the pre-emptive implementation of conservation and recovery measures (Section [2.5.4](#)). These include:

- *Chum in statistical areas 3,4,5, and 6*: The recovery of these stocks is managed through escapement and catch monitoring, use of non-retention/ live-release provisions in net fisheries, and closures in areas with high potential interception of stocks of concern (Section [2.2.3.2](#)).
- *Pink salmon in statistical area 12*: Some populations in this area have experienced drastic declines in abundance (Broughton), and there are no directed pink fisheries. Some test fishing has occurred to establish abundance indices.

BC pink and chum fisheries are also shaped by measures to reduce by-catch of the following non-target salmonid stocks of concern: Late Fraser sockeye, especially Cultus sockeye, Sakinaw sockeye, Interior Fraser coho, steelhead, WCVI chinook, Lower Georgia Strait Chinook, North Coast chum, and coho. Stocks status reports for several of these stocks have been published (Section [3.2.3.5](#))

DFO has demonstrated a willingness to conserve these salmonid stocks of concern by curtailing fisheries in which there might be significant incidental harvest or by-catch, moving open areas, changing open times, or setting exploitation rate limits (Section [2.5.4](#), [Appendix 1](#)). For example, Canadian commercial harvest rates on chum salmon from Area 9 (Smith Inlet) and 10 (Rivers Inlet) have dropped from 20-40% in the early 1990s to 0% since 1998 to protect local salmon stocks of concerns, mainly sockeye (see *North Coast and Central Coast chum profile*). Similarly, total

exploitation rate of Fraser pink salmon dropped from 40-60% in the early 1990s to less than 10% since 1998 to protect co-migrating coho and steelhead.

Section [2.5.4.3](#) illustrates measures to reduce incidental harvest of coho in pink and chum fisheries. [Appendix 1](#) lists well-defined management strategies outlined in the *2008 Integrated Fisheries Management Plan* to limit impacts on salmon stocks of concern and promote stock-specific recovery. The *Certification Unit Profiles* include more detail about salmon conservation measures in each area.

3.4.2 Conservation Efforts for Pacific Salmonids

3.4.2.1 Coho

Conservation concerns for coho stocks from the Upper Fraser and the Skeena were first identified in the late 1980s, resulting in increased research and status assessment. Throughout the 1990s DFO steadily ramped up conservation measures, culminating in severe fisheries restrictions and the full-blown *Coho Recovery Plan* in 1998. Strict coho conservation measures continue to be in place. A formal, comprehensive conservation strategy for Interior Fraser Coho, which were designated *endangered* by COSEWIC, was completed in 2006.

Since coho conservation concerns were first identified, DFO has produced regular peer-reviewed assessments, and made them publicly available to support integrated planning of annual conservation measures.

- 1997 - *A biological assessment of the coho salmon of the Skeena River, British Columbia, and recommendations for fisheries in 1998* by Holtby and Finnegan. CSAS Research Document 1997/138 (Abstract available at http://www.dfo-mpo.gc.ca/csas/Csas/publications/ResDocs-DocRech/1997/1997_138_e.htm)
- 1998 - *A risk assessment for Thompson River coho salmon* by Bradford. CSAS Research Document 1998/092 (Abstract available at http://www.dfo-mpo.gc.ca/csas/Csas/publications/ResDocs-DocRech/1998/1998_092_e.htm)
- 1999 - *Stock Assessment of Thompson River/Upper Fraser River Coho Salmon* by Irvine and others. CSAS Research Document 1999/028 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/1999/pdf/99_028e.pdf)
- 1999 - *Forecast for southern British Columbia coho salmon in 1999* by Holtby and others. CSAS Research Document 1999/125 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/1999/pdf/99_125e.pdf)
- 1999 - *A review of hooking mortality rates for marine recreational coho and chinook salmon fisheries in British Columbia* by Cox-Rogers, Gjernes, and Fast CSAS Research Document 1999/127 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/1999/pdf/99_127e.pdf)
- *1999 Assessment of Thompson River/ Upper Fraser River Coho Salmon* by Irvine and others. CSAS Research Document 1999/128 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/1999/pdf/99_128e.pdf)
- 2000 - *Stock Status and Genetics of Coho Salmon from the Interior Fraser River* by Irvine and others. CSAS Research Document 2000/125 (www.dfo-mpo.gc.ca/csas/Csas/DocREC/2000/PDF/2000_125e.pdf)

- 2000 - *Reference points for coho salmon (*Oncorhynchus kisutch*) harvest rates and escapement goals based on freshwater production* by Bradford, Myers, and Irvine. *Can. J. Fish. Aquat. Sci.* 57: 677–686.
- 2000 - *Forecast for southern British Columbia coho salmon in 2000* by Holtby and others. CSAS Research Document 2000/127 (www.dfo-mpo.gc.ca/csas/Csas/DocREC/2000/PDF/2000_127e.pdf).
- 2000 - *Forecast for northern British Columbia coho salmon in 2000* by Holtby, Finnegan, and Spilsted. CSAS Research Document 2000/128 (www.dfo-mpo.gc.ca/csas/Csas/DocREC/2000/PDF/2000_128e.pdf).
- 2001 - *Status in 2000 of Coho Stocks Adjacent to the Strait of Georgia* by Simpson and others. CSAS Research Document 2001/144 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2001/RES2001_144e.pdf).

The *Coho Recovery Plan* was developed by the newly formed *Coho Response Team* in the spring of 1998, formally announced in the summer, and resulting fishery restrictions were fully implemented the same year. Information about this initial phase of the recovery plan is available online:

Coho conservation and resulting fishery restrictions served as a launching point for intensive research and collaborative development under the *Selective Fisheries Program* (Section [3.2.4.2](#)). For example, DFO advised that improved measures involving selective fishing methods would be required in the Straits of Juan de Fuca to protect coho in the harvest of Fraser sockeye. Commercial fishers worked out an extraordinary arrangement to slow the pace of the fishery and live-release coho by moving from a competitive to a co-operative fishing model, and limiting fleet size and effort so that coho could be handled and released in order to minimize mortality. There is evidence this approach has contributed to conservation. There has been an increase in coho escapements throughout the southern Gulf and in the Fraser River.

Interior Fraser coho were identified as a *designatable unit* by COSEWIC in 2002 because they are genetically differentiated and reproductively isolated. The same year, COSEWIC assessed Interior Fraser coho as endangered. Following this formal designation, DFO intensified recovery efforts and formed the multi-stakeholder *Interior Fraser Coho Recovery Team (IFCRT)* to develop a formal conservation strategy. Building blocks and the final strategy are documented on-line:

- 2004 - *National recovery strategy for coho salmon (*Oncorhynchus kisutch*) in the Interior Fraser River watershed, British Columbia, Consultative Draft* by the Interior Fraser Coho Recovery Team. (<http://www.dfo-mpo.gc.ca/Library/317368.pdf>)
- 2004 - *A review of biological principles and methods involved in setting minimum population sizes and recovery objectives for the September 2004 drafts of the Cultus and Sakinaw Lake sockeye salmon and Interior Fraser coho salmon recovery plans* by Bradford and Wood. CSAS Research Document 2004/128. (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2004/RES2004_128_e.pdf)
- 2005 - *Scientific Advice for input to the Allowable Harm Assessment for Interior Fraser Coho Salmon* by Folkes, Ionson, and Irvine. CSAS Research Document 2005/093 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2005/RES2005_093_e.pdf)
- 2005 - *Socio-economic implications of SARA : Interior Fraser coho, bocaccio* by Gislason (<http://www.dfo-mpo.gc.ca/Library/314597.pdf>)

- 2005 - *Recovery potential assessment for interior Fraser coho salmon (*Oncorhynchus kisutch*)* by Folkes and Irvine. CSAS Science Advisory Report 2005/061 (<http://www.dfo-mpo.gc.ca/Library/321044.pdf>)
- 2006 - *Conservation Strategy for Coho Salmon, Interior Fraser River Populations* by the IFCRT (http://www.pac.dfo-mpo.gc.ca/species/salmon/InteriorFraserCohoCS/InteriorFraserCohoCS_e.pdf)

Conservation measures with the objective of reducing harvest related impacts to Interior Fraser coho were first implemented in 1998. Since then, a formal, measurable conservation objective was established for Interior Fraser River coho (including Thompson River coho): *limit the Canadian fishery exploitation rate to 3% (not including terminal harvest on systems experiencing strong escapements of enhanced fish).*

Management actions to achieve this objective range from non-retention to time and area closures during May through September, when Interior Fraser coho are encountered in southern B.C. waters, specifically in:

- West Coast Vancouver Island (WCVI) troll and recreational fisheries in offshore areas from late May until mid-September.
- Commercial net and recreational fisheries in the Straits of Juan de Fuca (Area 19 and 20) from June until early October.
- Commercial, recreational and First Nations fisheries in Johnstone and Queen Charlotte Straits from early June until late August.
- Commercial, recreational and First Nations fisheries in the Strait of Georgia from June until early October, and
- Commercial, recreational and First Nations fisheries in the Fraser River from early September until mid-October.

Section [2.5.4.3](#) illustrates measures to reduce incidental harvest of coho in pink and chum fisheries. [Appendix 1](#) lists well-defined management strategies outlined in the *2008 Integrated Fisheries Management Plan* to limit impacts on salmon stocks of concern and promote stock-specific recovery. The *Certification Unit Profiles* include more detail about salmon conservation measures in each area.

3.4.2.2 Sockeye

Conservation concerns have been identified for several sockeye stocks and stock groupings. The highest-priority recovery efforts are focusing on the following:

- Late run Fraser sockeye, particularly Cultus Lake sockeye, which have been designated *endangered* by COSEWIC
- Sakinaw Lake sockeye, which have been designated *endangered* by COSEWIC

The COSEWIC assessment and listing of Cultus and Sakinaw sockeye was supported by on-going research and public consultation, leading up to formal recovery strategies. The following materials are available :

- 2002 - *Status of Cultus Lake Sockeye Salmon (Oncorhynchus nerka)* by Schubert and others. CSAS Research Document 2002/064 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2002/RES2002_064_E.pdf)
- 2002 - *Sakinaw Lake sockeye salmon*. CSAS stock status report D6-13 (http://www.dfo-mpo.gc.ca/csas/Csas/status/2002/SSR2002_D6-13e.pdf)
- 2002 - *Status of Sakinaw Lake Sockeye Salmon (Oncorhynchus nerka)* by Murray and Wood. CSAS Research Document 2002/088 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2002/RES2002_088e.pdf)
- 2003 - *Cultus lake sockeye salmon* by Schubert and Fanos. CSAS Stock status report 2003/024 (<http://www.dfo-mpo.gc.ca/Library/282434.pdf>)
- 2004 - *Forecasted status of Cultus and Sakinaw sockeye salmon in 2004* by Wood and Parken. CSAS Research Document 2004/127 (www.dfo-mpo.gc.ca/csas/Csas/DocREC/2004/RES2004_127_e.pdf)
- 2003 - *COSEWIC assessment and status report on the sockeye salmon Oncorhynchus nerka Cultus population in Canada* (<http://www.dfo-mpo.gc.ca/Library/327319.pdf>)
- 2003 - *COSEWIC assessment and status report on the sockeye salmon Oncorhynchus nerka Sakinaw population in Canada* (<http://www.dfo-mpo.gc.ca/Library/327318.pdf>)
- 2004 - *A review of biological principles and methods involved in setting minimum population sizes and recovery objectives for the September 2004 drafts of the Cultus and Sakinaw Lake sockeye salmon and Interior Fraser coho salmon recovery plans* by Bradford and Wood. CSAS Research Document 2004/128 (<http://www.dfo-mpo.gc.ca/Library/316103.pdf>)
- 2004 – *Critical Habitat Case Study - Sakinaw Lake Sockeye Salmon* by Godbout and others. CSAS Research Document 2004/116 (www.dfo-mpo.gc.ca/csas/Csas/DocREC/2004/RES2004_116_e.pdf)
- 2004 - *Financial considerations associated with potential SARA listing of Sakinaw and Cultus Lake sockeye* by DFO (<http://www.dfo-mpo.gc.ca/Library/318441.pdf>)
- 2004 - *Socio-economic implications of the Species-at-Risk Act : Sakinaw & Cultus sockeye* by Gislason (<http://www.dfo-mpo.gc.ca/Library/315515.pdf>)
- 2004 – *Progress Update on development of recovery strategies* (http://www-comm.pac.dfo-mpo.gc.ca/pages/release/p-releas/2004/salmonUpdate04_e.htm)
- 2004 – (Draft) *National recovery strategy for the sockeye salmon Oncorhynchus nerka (Cultus population) in British Columbia* by the Cultus Sockeye Recovery Team (<http://www.dfo-mpo.gc.ca/Library/317366.pdf>)
- 2004 - (Final) *National recovery strategy for the Cultus Lake sockeye salmon (Oncorhynchus nerka)* by the Cultus Sockeye Recovery Team (<http://www.dfo-mpo.gc.ca/Library/324818.pdf>).
- 2004 - *National recovery strategy for the sockeye salmon (Oncorhynchus nerka) Sakinaw Lake population in British Columbia* (<http://www.dfo-mpo.gc.ca/Library/317367.pdf>)
- The final recovery strategy for Sakinaw sockeye is scheduled for release in the next few months.

Conservation measures in BC salmon fisheries are an integral part of the comprehensive recovery efforts for Cultus and Sakinaw sockeye, which also include enhancement, predator control, and habitat improvements:

- *Cultus*: fry and smolt releases, captive brood program, removal of approximately 18,000 northern pikeminnow in 2006, removal of Eurasian milfoil.
- *Sakinaw*: fry releases, captive brood program, debris removal from spawning areas, investigations into the impacts of predation (seals, otters, and lamprey)

The fisheries management objective for Cultus Lake sockeye is to limit the exploitation rate to 20 percent. Canadian fisheries with potential impacts on Cultus Lake sockeye have been adapted to limit exploitation on this stock. This includes:

- Restrictions to First Nations fisheries in Queen Charlotte and Johnstone Straits, Strait of Georgia, Strait of Juan de Fuca, west coast of Vancouver Island and the lower Fraser River downstream of the Vedder River. However, where surpluses are identified, first priority is accorded to First Nations for opportunities to harvest fish for FSC purposes.
- Restrictions to recreational salmon fisheries in southern B.C. This includes sockeye non-retention in specific locations when Cultus Lake sockeye are present and allowable harvest limits have been reached.
- Closures to commercial salmon fisheries in southern B.C. when Late Run sockeye are present, or expected to be present in the area as it will not likely be possible to identify Cultus Lake sockeye in-season in 2008 due to relative low abundances of Cultus Lake sockeye compared to other co-migrating sockeye stocks. These closures will come into effect when allowable harvest limits for this stock group have been reached.

Canadian fisheries with potential impacts on Sakinaw Lake sockeye have been adapted to limit exploitation on this stock. This includes:

- Most fisheries that have potential to intercept Sakinaw Lake sockeye continue to be delayed until approximately July 25 to ensure a significant portion of the return has passed through major fisheries in Johnstone Strait.
- Restrictions in First Nations FSC fisheries prior to late July.
- Recreational fisheries in Queen Charlotte Strait, Johnstone Strait, and upper Strait of Georgia closed to sockeye retention until late July.
- The waters near the mouth of Sakinaw Creek in Area 16 closed to fishing all season as well as sockeye non-retention restrictions in Area 16 until early to mid August when sockeye retention opportunities are possible in Sabine Channel.
- Commercial fisheries in Queen Charlotte Strait and Johnstone Strait closed until late July, and upper Strait of Georgia (including Sabine Channel) until mid-August.

Section [2.5.4.3](#) illustrates measures to reduce incidental harvest of sockeye stocks of concern in pink and chum fisheries. [Appendix 1](#) lists well-defined management strategies outlined in the *2008 Integrated Fisheries Management Plan* to limit impacts on salmon stocks of concern and promote stock-specific recovery. The *Certification Unit Profiles* include more detail about salmon conservation measures in each area.

3.4.2.3 Steelhead

Overall, BC steelhead have faced poor marine survival and declining escapements since the early 1990s. Particular conservation concerns have been identified for Interior Fraser Steelhead, Georgia Basin Steelhead, and Skeena steelhead. Conservation and recovery efforts are in place for all three. COSEWIC has identified BC steelhead as a high priority for a detailed assessment in its most recent candidate list, available at http://www.cosewic.gc.ca/eng/sct3/sct3_1_e.cfm.

On-going joint research by federal, provincial, and non-governmental agencies supports the recovery efforts for BC steelhead. For example:

- 2000 - *Biological Reference Points for the Conservation and Management of Steelhead, Oncorhynchus mykiss* by Johnston and others. CSAS Research Document 2000/126 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2000/PDF/2000_126e.pdf)

Conservation objectives for Interior Fraser steelhead have become more specific over time. The 2008 Integrated Fisheries Management Plan (IFMP) for South Coast salmon lists the following: *“The objective for Interior Fraser River Steelhead provided by the B.C. Ministry of the Environment is to protect 80% of the run with a 90% certainty in Fraser River commercial gill net fisheries. This objective does not apply to selective commercial fisheries (those using gear types other than gill nets) or fisheries conducted terminally on single stocks. In addition, other commercial South Coast fisheries are to release to the water with the least possible harm all steelhead caught incidentally in fisheries targeting other species.”*

Management actions to achieve this objective have been implemented, with a focus on Fraser River chum fisheries. An analysis of steelhead run timing indicated that during the last 2 weeks of October less than 20% of the steelhead run would pass through the Lower Fraser area. Commercial openings in 2007 were prosecuted between October 21st and November 3rd with mandatory non-retention of steelhead, as well as maximum net length of 100 fathoms, 30 minute maximum soak times, mandatory revival tanks and daylight-only fisheries. The impact on Interior Steelhead in marine areas would be lower than recent years, with no Fraser Sockeye targeted fisheries, a consistent fishing pattern of the Johnstone Strait mixed stock chum fisheries relative to recent years, and mandatory revival tanks for by-catch,.

A long-term management strategy to achieve this objective is still being developed, but will likely include the following elements:

- Shifting the timing of the fishery window to protect the Deadman River component of the run while avoiding the peak timing of steelhead escapement.
- Improving steelhead catch monitoring in fisheries that occur on the stocks prior to the Fraser River and the development of "stop light" criteria that would govern opening fisheries in future years based on abundance indicators.
- The application of the management objectives in this approach are tied to escapement targets of steelhead stocks. The size and the timing of the fishery window may be varied in future years in accordance with abundance of the constituent stocks. If current freshwater and ocean conditions persist and result in reduced escapements then opportunities for non-selective fisheries will be curtailed.

Declining trends for many steelhead stocks in the Greater Georgia Basin have triggered the development and implementation of a comprehensive recovery action plan, predominantly funded by

the Province of BC and coordinated through the *Pacific Salmon Foundation* (Section [4.3.3.2](#)). The major threats to these stocks are poor marine survival and reduced habitat capacity, but fishery restrictions in place for Interior Fraser coho also contribute to the comprehensive recovery efforts for these stocks. The recovery plan and detailed information about steelhead in each of the watersheds are available on-line:

- 2002 - *Greater Georgia basin steelhead recovery action plan* by Lill (<http://www.psf.ca/07media/Steelheadreport092702.pdf>).
- News release (<http://www.psf.ca/07media/07releasesteelheadfinal092802.pdf>)
- Watershed summaries for N.E. Vancouver Island and Adjacent Mainland Inlets (<http://www.psf.ca/07media/Region1tables092702.pdf>)
- Watershed summaries for Southern Mainland Coast (<http://www.psf.ca/07media/Region2tables092702.pdf>)

Conservation objectives and resulting management actions for Skeena steelhead recently underwent an independent science review, funded by DFO and the Province of BC and led by the *Pacific Salmon Foundation* (Section [4.3.3.2](#)). Information about the science review and the final report are available online:

- News release (<http://www.dfo-mpo.gc.ca/media/npres-communique/2008/pr08-eng.htm>)
- Stock backgrounder (<http://www.dfo-mpo.gc.ca/media/back-fiche/2008/pr08-eng.htm>)
- Management approach (www-comm.pac.dfo-mpo.gc.ca/pages/release/bckgrnd/2007/bg005_e.htm)
- Final report (<http://www.psf.ca/pdf/ISRP-final.pdf>).

DFO is currently reviewing the recommendations provided by the independent science panel.

Section [2.5.4.3](#) illustrates measures to reduce incidental harvest of steelhead in pink and chum fisheries. [Appendix 1](#) lists well-defined management strategies outlined in the *2008 Integrated Fisheries Management Plan* to limit impacts on salmon stocks of concern and promote stock-specific recovery. The *Certification Unit Profiles* include more detail about salmon conservation measures in each area.

Finally, by-catch of non-target steelhead salmon was a concern in the Nitinat commercial gillnet fishery. Unpublished studies by DFO, the Provincial Fisheries Branch, and consultants reviewed steelhead capture in statistical area 21/121 chum fisheries through the late 1990s. These studies indicated that by-catch was reduced by fishing for chum only after the end of September, restricting fisheries to areas within the surfline (allowing openings only in area 21, not 121) and incorporating a mandatory 'weedline' on nets. These changes were incorporated into the fishery.

3.4.2.4 Chinook

Conservation concerns have been identified for three chinook stock groupings:

- WCVI chinook
- Lower Georgia Strait chinook
- Earliest-timed Fraser River chinook

Conservation objectives have been defined for each, and management actions have been implemented in Canadian fisheries with potential impacts on these stock groupings.

- The objective for WCVI chinook is to manage Canadian ocean fisheries (not including enhanced terminal areas) to an exploitation rate of 10% of the return to Canada. The objective for North Coast chinook is to manage in accordance with the allocation policy, and to manage the northern troll fishery to a WCVI chinook exploitation rate of 3.2%. Fisheries that this limit applies to are the northern troll, QCI sport, WCVI troll and WCVI sport. The exploitation rate is measured by Coded Wire Tag (CWT) data gathered from these fisheries. The exploitation rate limit includes Chinook caught and kept, as well as an estimate of fishing related mortalities. Commercial troll fisheries in the North Coast are monitored in-season using DNA analysis to minimize impacts on these stocks, while time and area closures will again be used in WCVI fisheries. DNA analysis guides in season management actions, but post-season CWT cohort analysis is used to formally assess performance.
- The objective for Lower Georgia Strait chinook is to continue with reduced fishery exploitation management measures in known areas of significant impact that were implemented in 2007. LGS chinook are impacted by mixed stock chinook harvest in commercial and recreational fisheries off the Queen Charlotte Islands, WCVI, Strait of Georgia, and in terminal First Nations fisheries. Restrictions were first introduced in 2004 and are on-going (e.g. shaping of WCVI commercial troll fisheries, restrictions and closures in the terminal and approach areas for First Nations and recreational harvesters)
- The objective for earliest-timed Fraser chinook is to limit harvest levels in Fraser River fisheries to levels similar, or less than in previous years. Further assessments are being undertaken and increased management measures in the spring of 2008 are possible. These chinook can be harvested in areas on the WCVI, Juan de Fuca and in the Fraser River, with the majority of the harvest by First Nations in the lower Fraser River.

Section [2.5.4.3](#) illustrates measures to reduce incidental harvest of chinook in pink and chum fisheries. [Appendix 1](#) lists well-defined management strategies outlined in the *2008 Integrated Fisheries Management Plan* to limit impacts on salmon stocks of concern and promote stock-specific recovery. The *Certification Unit Profiles* include more detail about salmon conservation measures in each area.

3.4.2.5 Pink and Chum

The *Certification Unit Profiles* (CUP) for each area describe the population structure and status of BC pink and chum salmon in detail. CUPs also describe the management strategy for fisheries in each area and summarize conservation measures.

Conservation measures focus on the following:

- *Chum salmon in Areas 3 to 5* (Skeena, Nass): There have been no targeted chum fisheries in Areas 3 to 5 for at least a decade due to low abundance concerns. Commercial fisheries targeting other salmon species in Areas 3 to 5 generally operate under chum non-retention provisions. Chum hatchery returns to Kitimat River (Area 6) are harvested terminally, in Kitimat Arm adjacent to the natal stream, when surplus hatchery stocks are identified. Measures are in place to conserve chum in fisheries targeting other salmon species, including frequent non-retention requirements for commercial seines, and frequent non-retention for gillnets combined with requirements for short nets and short sets to facilitate the release of non-target species. Possession of revival boxes for release of non-retention species is mandatory for all commercial gear. Chum non-retention is

mandatory for trollers throughout the whole season. The CUP for North and Central Coast chum salmon describes the details.

- *Pink salmon in the Broughton Archipelago*: Targeted commercial fisheries have occurred terminally in the Mainland Inlets when run size exceeded the escapement targets. No targeted commercial fisheries have taken place here since 2001 due to low abundance. Commercial fisheries targeting other pink salmon stocks or other salmon species are modified to reduce interceptions of Mainland Inlet pink salmon when poor returns are expected. For example, fisheries are limited to below Lewis Point from late July to mid-August, extending a boundary closure already in place to protect Nimpkish sockeye until the end of July. This measure protects the early portion of the Mainland Inlet pink run, which includes the Ahnuhati River, Kakweiken River, and other systems which have recently experienced periods of low abundance. Another example is the ribbon boundary on the mainland side of Johnstone Strait in effect to protect Mainland Inlet pink salmon during directed fisheries for Fraser sockeye and Fraser pink from the end of July to the end of August. The *Pink Salmon Action Plan* was initiated by DFO in 2003, with a focus on increased monitoring and research into potential factors contributing to the recent decline, particularly parasitic sea lice. Data collected under the Pink Salmon Action Plan is publicly available:
 - Background information about the action plan is available at <http://www.pac.dfo-mpo.gc.ca/science/aquaculture/pinksalmon-saumonrose/index-eng.htm>.
 - An overview of research programs is available at <http://www.pac.dfo-mpo.gc.ca/science/aquaculture/sok-edc/index-eng.htm>.
 - Each year, survey results are published in bi-weekly bulletins. An archive of bulletins and annual summaries is available at <http://www.pac.dfo-mpo.gc.ca/science/aquaculture/pinksalmon-saumonrose/results-resultats/index-eng.htm>.
 - 2004 - *Pink Salmon Action Plan: Sea Lice on Juvenile Salmon and on Some Non-Salmonid Species in the Broughton Archipelago in 2003* by Jones, and Nemeč. CSAS Research Document 2004/105 (www.dfo-mpo.gc.ca/csas/Csas/DocREC/2004/RES2004_105_e.pdf)
 - An interim report on research findings is available at <http://www.pacificsalmonforum.ca/pdfs-all-docs/2007InterimFindingsFeb8-08.pdf>
 - A detailed summary of on-going research projects is available at <http://www.pacificsalmonforum.ca/pdfs-all-docs/BroughtonResearchStatusReportOct2007.pdf>
 - A detailed ecosystem overview has been completed. *Broughton Archipelago: A State of Knowledge* by Pearsall is available at <http://www.pacificsalmonforum.ca/pdfs-all-docs/BroughtonStateofKnowledgeMay08.pdf>

[Appendix 1](#) lists well-defined management strategies outlined in the *2008 Integrated Fisheries Management Plan* to limit impacts on salmon stocks of concern and promote stock-specific recovery. The *Certification Unit Profiles* include more detail about salmon conservation measures in each area.

3.4.3 Other Conservation Efforts

3.4.3.1 Rockfish

Several BC rockfish species have been designated as threatened or special concern by COSEWIC (Section 3.4.1.3). Current conservation and recovery efforts focus on Inshore Rockfish (*Sebastes ruberrimus*, *S. malliger*, *S. caurinus*, *S. melanops*, *S. nigrocinctus*, and *S. nebulosus*) and Bocaccio (*Sebastes paucispinis*)

As for the other stocks of concern, DFO has implemented regular status assessments and intensified research to support recovery planning for rockfish, leading up to the development, refinement, and implementation of a recovery plan and conservation measures in salmon fisheries:

- *Structure of Yelloweye Rockfish (Sebastes ruberrimus) Populations in British Columbia* by Yamanaka, Withler, and Miller. CSAS Research Document 2000/172 (http://www.dfo-mpo.gc.ca/csas/Csas/publications/ResDocs-DocRech/2000/2000_172_e.htm)
- *2001 - Inshore Rockfish (Sebastes ruberrimus, S. malliger, S. caurinus, S. melanops, S. nigrocinctus, and S. nebulosus) Stock Assessment for the West Coast of Canada and Recommendations for Management* by Yamanaka and Lacko. CSAS Research Document 2001/139 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2001/RES2001_139e.pdf)
- *2001 - Preliminary status report on bocaccio (Sebastes paucispinis)* by Stanley, Rutherford, and Olsen. CSAS Research Document 2001/148 (http://www.dfo-mpo.gc.ca/csas/Csas/publications/ResDocs-DocRech/2001/2001_148_e.htm)
- *2002 - At-sea observer coverage for catch monitoring of British Columbia hook and line fisheries* by Haigh and others. CSAS Research Document 2002/108 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2002/RES2002_108e.pdf)
- *2002 - Toward an Inshore Rockfish Conservation Plan: A Structure for Continued Consultation.* DFO Discussion Paper (http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/fisheriesmgmt/rockfish/consultation_discussiondoc_e.pdf)
- Rockfish news releases describing initial implementation of conservation measures (www-comm.pac.dfo-mpo.gc.ca/pages/consultations/fisheriesmgmt/rockfish/Rockfish/Old_Rockfish_Stuff/rockfishnr_e.htm)
- *2004 - Bocaccio update* by Stanley, Starr, and Olsen. CSAS Research Document 2004/027 (http://www.dfo-mpo.gc.ca/csas/Csas/publications/ResDocs-DocRech/2004/2004_027_e.htm)
- *2004 - Stock assessment framework for Inshore Rockfish* by Yamanaka and others. CSAS Research Document 2004/068 (http://www.dfo-mpo.gc.ca/csas/Csas/publications/ResDocs-DocRech/2004/2004_068_e.htm)
- *2004 - Scientific advice for input to the Allowable Harm Assessment for Bocaccio* by Stanley and Starr. CSAS Research Document 2004/098 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2004/RES2004_098_e.pdf)
- *2004 - Allowable Harm Assessment for Bocaccio.* CSAS Stock Status Report 2004/043 (http://www.dfo-mpo.gc.ca/csas/Csas/status/2004/SSR2004_043_E.pdf)

- 2005 - *Socio-economic implications of SARA : Interior Fraser coho, bocaccio* by Gislason (<http://www.dfo-mpo.gc.ca/Library/314597.pdf>)
- Rockfish conservation strategy and record of consultations (http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/fisheriesmgmt/rockfish/default_e.htm)

As part of the long-term recovery strategy, DFO developed a clear conservation objective for inshore rockfish: *Fishing mortality in all Pacific Region fisheries is limited to 2% or less.*

Management actions to achieve this objective have focused on Rockfish Conservation Areas (RCA), designed to protect Inshore rockfish, which result in automatic restrictions for any fishery or gear with impacts on rockfish. Specifically, salmon troll fisheries are not permitted in RCAs. RCAs have been implemented within the Strait of Georgia and in all outside waters including the Queen Charlotte Islands. Up-to-date maps of RCAs are available at http://www.pac.dfo-mpo.gc.ca/recfish/Restricted_Areas/RCAs/default_e.htm.

In addition, an individual quota (IQ) system has been established for the lingcod fishery to help meet the conservation and sustainability objectives under groundfish integration. Initial allocation of quota was based on catch history from 1996 to 2003 as this time period coincided with the Dockside Monitoring Program. For those who have fished lingcod in conjunction with salmon during the qualifying years, fish slips were used to determine catch.

Implementation of an integrated groundfish fishery for this year has management implications for those wishing to retain lingcod while salmon trolling. Similar to last year, all vessels wishing to retain any amount of lingcod must have their fish validated through the established dockside monitoring program. In addition to this, any vessel wishing to land lingcod must acquire sufficient quota to do so. Requirements include the following (less than 500 lbs of lingcod per trip):

- Vessel must have sufficient IVQ
- Transportation requirement – All lingcod must be transported by the licensed vessel either directly to land or to a fish pen
- Hail in and Hail out requirements through the designated service provider Archipelago Marine Research Ltd (AMR)
- Specific locations and times at which landing of fish is permitted
- Landing requirements – The landing of any fish of any species is not permitted unless a designated observer is present to authorize the commencement of weight verification.

Vessels wishing to retain and land more than 500 lbs per trip of lingcod must, in addition to all of the above, meet the new electronic monitoring requirements. For more information on these requirements please refer to the 2008/2009 Groundfish Integrated Fisheries Management Plan.

The salmon troll fishery is currently permitted to retain 20 rockfish per day (excluding Yelloweye, Quillback, China, Tiger and Copper, as by-catch to salmon fishing (i.e. during salmon troll open times and when salmon are retained on board the vessel). This allowance will continue in 2008. There are no additional monitoring requirements.

3.4.3.2 Sturgeon

Conservation concerns have been identified for both white and green sturgeon, and several populations have been legally listed under the *Species at Risk Act*. Section [3.4.1.2](#) lists the populations and their status.

DFO has not historically been the lead on management of sturgeon; the Province of BC has been delegated this authority. The Province and others (e.g. industry, First Nations) have taken the lead in research and recovery of these species, and DFO has participated in some of these initiatives. For example, DFO contributes to the efforts of the Fraser River Sturgeon Conservation Society. Extensive background materials about Fraser Sturgeon are available at www.frasersturgeon.com.

Salmon fisheries pose two potential threats to these populations:

- By-catch during salmon fisheries
- Reduction of salmon prey

Where they are present together, salmon of all species are, directly and indirectly, the most important food source for white sturgeon (*Acipenser transmontanus*). Whole live fish, decaying carcasses, and eggs are all eaten by white sturgeon and by other fish and invertebrates which are themselves also prey for sturgeon. Pink and chum make up a sizable portion of this where they are present with sturgeon.

Very limited numbers of chum and pink salmon spawn in the upper Fraser and Nechako where SARA listed white sturgeon live. As such, they are not considered to be important food items.

Pink and chum are, however, available for lower Fraser white sturgeon, designated under COSEWIC. Chum are particularly important due to the fact that they are present every year, while pink are only present in odd-numbered years. An annual migration of white sturgeon into the lower Harrison River, as well as other chum spawning locations during spawn times, illustrates the importance of chum to lower Fraser white sturgeon.

The importance of chum and pink salmon as food for lower Fraser river white sturgeon has actually increased in recent years, due to a decrease in the availability of other food sources, most notably eulachon. Previously, sturgeon would feed on pink and chum eggs and carcasses (and the fish and invertebrates which also feed on the eggs and carcasses) in the fall and winter before feeding on energy-rich eulachon in the early spring. However, with the decline in eulachon, sturgeon must now rely on nutrients from salmon to sustain them beyond the spring. Nevertheless, the harvest of pink and chum would only affect in-river sturgeon if the salmon run is decreased to a point where sturgeon can not find enough of that food source. Given recent abundance patterns of all salmon species, this has not been identified as a potential threat.

DFO has additional responsibilities under SARA, and since the listings has become more involved in species research, recovery, and protection. DFO has contributed to documents listed below as part of DFO's SARA responsibilities to support the recovery planning process:

- 1995 - *Review of Fraser river white sturgeon (Acipenser transmontanus)* by Echols (www.dfo-mpo.gc.ca/Library/192608.pdf).
- 2003 - COSEWIC Assessment and Update Status Report of white sturgeon (*Acipenser transmontanus*) in Canada (http://www.sararegistry.gc.ca/document/default_e.cfm?documentID=414)

- 2004 - *COSEWIC assessment and update status report on the green sturgeon *Acipenser medirostris* in Canada* (<http://www.dfo-mpo.gc.ca/Library/327340.pdf>)
- 2005 - *An Assessment of White Sturgeon Stock Status and Trends in the Lower Fraser River* by Walters, Korman, and McAdam. CSAS Research Document 2005/066 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2005/RES2005_066_e.pdf). This assessment was reviewed through PSARC, and proceedings are available on-line: *Proceedings of the PSARC review on Lower Fraser River White Sturgeon; 21 June, 2005*. CSAS Proceedings Series 2005/016 (www.dfo-mpo.gc.ca/csas/Csas/Proceedings/2005/PRO2005_016_E.pdf)
- 2005 – (Draft) *Socio-economic implications of SARA : white sturgeon* by Gislason (<http://www.dfo-mpo.gc.ca/Library/314599.pdf>)
- 2006 - *Direct and delayed mortality of white sturgeon caught in three gear-types in the lower Fraser River* by Robichaud and others. Available on-line at <http://www.frasersturgeon.com/reports.html>.
- The Recovery Potential Assessment (RPA) was released as a research document, reviewed through PSARC, and finally published as a Science Advisory. All three documents are available on-line:
 - 2007 - *Recovery potential assessment for white sturgeon populations listed under the Species at Risk Act* by Wood and others. CSAS Research Document 2007/003 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2007/RES2007_003_e.pdf)
 - 2007 - *Proceedings of the PSARC meeting on white sturgeon populations listed under the Species at Risk Act, February 21, 2007*. CSAS Proceedings Series 2007/13 (http://www.dfo-mpo.gc.ca/csas/Csas/Proceedings/2007/PRO2007_013_E.pdf)
 - 2007- *Recovery potential assessment for white sturgeon*. CSAS Science Advisory Report 2007/014 (http://www.dfo-mpo.gc.ca/csas/Csas/status/2007/SAR-AS2007_014_E.pdf)

3.4.3.3 Marine Mammals

Conservation concerns have been identified for several populations of marine mammals in BC. Salmon fisheries pose two potential threats to these populations:

- Accidental entanglement in fishing gear
- Reduction of salmon prey

The following policy materials describe the general approach to marine mammal management in BC:

- 2002 Backgrounder on regulatory amendments for marine mammals (http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/marinemammals/documents/bulletin_e.pdf)
- Summary of 2003 consultations for amending the marine mammal regulations (www-comm.pac.dfo-mpo.gc.ca/pages/consultations/marinemammals/documents/MMRConsultaton%20Summary%20Final.htm)
- 2005 Consultation materials for amending the marine mammal regulations (http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/marinemammals/default_e.htm)
- DFO developed the *Be Whale Wise* guidelines which are directed at preventing marine mammal disturbance. These have been included salmon management plans (Section [4.2.1.2](#)) and the sport

fishing guides (Section [1.1.3.1](#)), as well as notices to industry so that commercial salmon harvesters are aware that it is illegal to disturb marine mammals under Section 7 of the Marine Mammal Regulations. The guidelines are available at http://www.pac.dfo-mpo.gc.ca/species/marinemammals/view_e.htm.

DFO leads on-going research in support of recovery planning processes for marine mammals:

- Portal for the *Cetacean Research Program*, including a whaling database and photo-identification catalogues (http://www-sci.pac.dfo-mpo.gc.ca/sa/cetacean/default_e.htm)
- 2005 - *Prey selection and food sharing by fish-eating 'resident' killer whales (*Orcinus orca*) in British Columbia* by Ford and Ellis. CSAS Research Document 2005/041 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2005/RES2005_041_e.pdf)
- 2005 - *Linking prey and population dynamics: did food limitation cause recent declines of 'resident' killer whales (*Orcinus orca*) in British Columbia?* by Ford, Ellis, and Olesiuk. Research Document 2005/042 (http://www.dfo-mpo.gc.ca/csas/Csas/Publications/ResDocs-DocRech/2005/2005_042_e.htm)
- 2005 - *Life History and Population Dynamics of Northern Resident Killer Whales (*Orcinus orca*) in British Columbia* by Olesiuk, Ellis, and Ford. Research Document 2005/045 (http://www.dfo-mpo.gc.ca/csas/Csas/Publications/ResDocs-DocRech/2005/2005_045_e.htm)
- 2005 - *An assessment of abundance and growth of the sea otter population (*Enhydra lutris*) in British Columbia* by Nichol and others. CSAS Research Document 2005/094 (http://www.dfo-mpo.gc.ca/csas/Csas/DocREC/2005/RES2005_094_e.pdf)
- 2005 - *Peer Review videoconference of a document on population status of Sea Otter in British Columbia, November 23, 2005*. CSAS Proceedings Series 2005/028 (http://www.dfo-mpo.gc.ca/csas/Csas/Proceedings/2005/PRO2005_028_B.pdf)
- 2007 - *Recovery Potential Assessment for Sea Otters (*Enhydra lutris*)*. CSAS Science Advisory Report 2007/031 (http://www.dfo-mpo.gc.ca/csas/Csas/status/2007/SAR-AS2007_031_E.pdf)

The importance of salmon prey varies with species, area, and time, as documented in the references above:

- Resident killer whales in BC are known to eat salmonids almost exclusively. However, of the salmonid species available, killer whales exhibit “strong selectivity” towards chinook over all other species. Over 70% of all recorded salmonids eaten by killer whales have been chinook. Killer whales focus on chinook from May to August, even when other salmon species are more common, and it is assumed that the trend would continue in the winter months (November through April). A strong correlation has been observed with changes in chinook salmon abundance and resident killer whale survival. No similar relationship was found between chum abundance and killer whale survival over the period from 1974-2004. Chum are an important, but seasonal, part of resident killer whale diet. In September and October only, killer whales eat mostly chum salmon. This corresponds with the autumn migration of pre-spawn chum salmon through the area. While almost 23% of salmon eaten by resident killer whales are chum, over 70% of these chum are eaten in September and October when they are most plentiful. Pink salmon have been shown to not be a significant food item for resident killer whales. In the Ford and Ellis study, only 3% of salmonids eaten were pinks, and half of them were eaten by a single calf over 1.5 hours.

- Estimates from Alaska show that salmon comprise 27% of Steller sea lion summer diet, and only 1-3% of the winter diet. These numbers are expected to be similar to salmon consumption in BC. DFO scientists are currently using genetic techniques to identify salmon species by their bones found in Steller sea lion scats. Findings are currently that 36% of salmon bones represent pink salmon, and 32% represent chum. These numbers are expected to fluctuate seasonally. Researchers at DFO are currently participating in a Pacific Salmon Commission study to fill in gaps in geographic and seasonal coverage of scat collections and sea lion aerial surveys to develop more defensible estimates of salmon consumption by species. The study covers an area from Queen Charlotte Sound to the Columbia River and is due in spring 2010. Steller sea lions have key salmon foraging areas near their breeding rookeries on the Scott Islands and near Cape St. James. As well, the sea lions congregate to feed on pre-spawn chum at the Nanaimo and Cowichan estuaries, the mouth of the Nitnat River, and Trevor Channel in Barkley Sound.

Based on this on-going research, the following recovery strategies have been developed:

- 2003 – (Draft) *Recovery action plan for the sea otter (Enhydra lutris) in Canada, 2004-2009* (<http://www.dfo-mpo.gc.ca/Library/284339.pdf>)
- 2004 – (Draft) *National recovery strategy for the sea otter (Enhydra lutris) in Canada* (<http://www.dfo-mpo.gc.ca/Library/317361.pdf>). Earlier drafts from 2002 and 2003 are also available through DFO's online library at <http://inter01.dfo-mpo.gc.ca/waves2/index.html>)
- Archive of sea otter recovery plan workshops (http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/sea-otters/default_e.htm)
- 2006 – (Proposed) *Recovery strategy for blue, fin and sei whales (Balaenoptera musculus, B. physalus, and B. borealis) in Pacific Canadian waters* by Gregr et al. (www.dfo-mpo.gc.ca/Library/327240.pdf)
- 2006 – (Final) *Recovery strategy for blue, fin and sei whales (Balaenoptera musculus, B. physalus, and B. borealis) in Pacific Canadian waters, 2006-2011* by Gregr and others (<http://www.dfo-mpo.gc.ca/Library/326460.pdf>)
- 2007 - *Recovery strategy for the Transient Killer Whale (Orcinus orca) in Canada* by Fisheries and Oceans Canada (<http://www.dfo-mpo.gc.ca/Library/332193.pdf>)
- 2007 - *Recovery Strategy for the sea otter in Canada* by Fisheries and Oceans Canada. (http://www.sararegistry.gc.ca/document/default_e.cfm?documentID=1373)
- 2007 - *Proposed recovery strategy for the northern and southern resident killer whales (Orcinus orca) in Canada* by Fisheries and Oceans Canada (www.sararegistry.gc.ca/virtual_sara/files/plans/rs_Resident_Killer_Whale_0607_e.pdf)
- 2008 – (Final) *Recovery strategy for the northern and southern resident killer whales (Orcinus orca) in Canada* by Fisheries and Oceans Canada (http://www.sararegistry.gc.ca/virtual_sara/files/plans/rs_Resident_Killer_Whale_0308_e.pdf)
- 2007 - (Draft) *Species at risk act action plan for blue, fin and sei whales, (Balaenoptera musculus, B. physalus, and B. borealis, in Pacific Canadian waters* by Spaven and others (<http://www.dfo-mpo.gc.ca/Library/327242.pdf>).
- 2008 Management plans for Grey Whale, Harbour Porpoise, Killer Whale, and Steller Sea lion (http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/marinemammals/mmplans_08_e.htm)

3.4.3.4 Marine Birds

Marbled Murrelets (*Brachyramphus marmoratus*) are listed as “Threatened” under Schedule 1 of SARA. Harvest of their nesting habitat, old growth forest, is the main cause for the species’ decline, but entanglement in gill nets has been identified as a potential contributing factor. An overview of research and recovery initiatives is available at:

www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=39.

Recovery planning for marbled murrelets is led by Environment Canada through the Canadian Wildlife Service (CWS). It is the responsibility of Environment Canada to develop and implement policies and regulations to ensure the protection of migratory birds, their eggs and their nests. This has included the creation of 130 Wildlife Habitat Areas for Marbled Murrelets, and an estimated 29% of their suitable nesting habitat in BC is protected.

There is no evidence of Marbled Murrelets feeding significantly on pink or chum salmon. While the birds have been spotted feeding on “salmon smolts” in freshwater lakes in the summer, pink and chum salmon migrate directly to the ocean as fry.

The effects of gill net mortality on Marbled Murrelets are currently being investigated by the Canadian Wildlife Service and the Department of Fisheries and Oceans through support from the Interdepartmental Recovery Fund. Smith and Morgan (2005) estimate that between 26 and 552 Marbled Murrelets (mean 278) may become entangled every year in BC gill nets. This represents between 0.18% and 12.34% (mean 3.45%) of the annual production of Marbled Murrelets. Thus, the risk of mortality to Marbled Murrelets is reported to be low. However, Marbled Murrelets are considered to be vulnerable to gill net fisheries, should the number of gill nets increase substantially. At this time there is no evidence that by-catch of Marbled Murrelets is a serious problem (http://students.washington.edu/josmith/papers/SmithMorgan_2005.pdf).

4 COLLABORATION, ADVISORY PROCESSES, AND CONSULTATION

4.1 Overview

DFO is committed to transparent decision making and efficient information sharing. The department has implemented a comprehensive strategy for enabling public participation, and put in place the extensive support structures needed to streamline the complex logistics of bringing together DFO managers, scientists, First Nations, harvesters from all sectors, environmental groups, and the general public. DFO also supports independent and arms-length processes through funding, in-kind contributions, staff participation, and scientific collaborations. Individual processes are adapted to the particular combination of participants and scope (e.g. local fishing plans vs. regional conservation measures).

The information in this chapter is organized into two sections:

- Section [4.2](#) outlines the three components of the departmental strategy for enabling public participation: the annual planning cycle for salmon fisheries, the development of *Integrated Fisheries Management Plans*, and major initiatives.
- Section [4.3](#) describes the network of participatory processes that feed into the three elements outlined in Section [4.2](#). These include processes with broad public participation (e.g. Community Dialogues), multi-interest processes (e.g. watershed advisory groups), focused stakeholder processes (e.g. Integrated Harvest Planning Council), and review processes (e.g. federal sustainability audits).

4.2 Departmental Strategy for Enabling Public Participation

4.2.1 Incorporating Public Participation into the Planning Process

4.2.1.1 Annual Planning Cycle For BC Salmon Fisheries

Pacific salmon fisheries are managed in a regular annual cycle of pre-season planning, in-season implementation, and post-season review. Each phase of this cycle incorporates extensive levels of public participation:

- Pre-season planning centers on the development and broad public review of *Integrated Fisheries Management Plans* (Section [4.2.1.2](#)). These management plans include general decision guidelines for each fishery (Section [2.5.2](#)), expectations for the upcoming year, anticipated fishing plans, and a detailed review of the previous year.
- In-season management is subject to rapidly changing, uncertain information. The department works with stakeholder representatives to develop appropriate responses to these changing circumstances, adhering to the general decision guidelines and annual fishing plans documented in the IFMP except in very unusual circumstances.
- Post-season review meetings in the Fall provide a broad public forum to share information about the stocks and fisheries, to review management actions, and to identify opportunities for future improvements. The review process seamlessly moves into pre-season planning, and culminates in the draft IFMP for the next year. DFO distributes comprehensive information about each fishing season as part of the post-season review. Pre-season forecasts and plans are compared with in-season estimates of run-size, management actions, and final catches and escapements.

Implementation issues are also identified. Internal post-season reviews are undertaken and written up by the local manager with input from the local Chief of Resource Management and Regional Resource Manager – Salmon. These documents are released prior to the post season review meetings with First Nations and stakeholders. For example, the last year’s review materials for North Coast salmon fisheries are available at <http://www.pac.dfo-mpo.gc.ca/northcoast/post-seasonreview/default.htm>.

- On the North Coast, the *Record of Management Strategies* (RMS) summarize annual salmon management actions for commercial, recreational and First Nation’s fisheries for each statistical area. This annual reporting format was initiated in the 1980s and documents the in-season decision-making process for opening, closing and managing fisheries. The documents are archived by local Fishery Managers, but are distributed to local advisory groups, and are available to the public upon request.

The detailed profiles for each Certification Unit describe :

- pre-season management inputs and main sources of uncertainty (abundance forecasts, recent trends, expected effort).
- In-season information used to adapt management actions, and how it is collected.

4.2.1.2 Integrated Fisheries Management Plans (IFMP)

Integrated Fisheries Management Plans (IFMP) are a central element of the annual planning cycle for Pacific salmon. Each IFMP describes management objectives, general decision guidelines, specific fishing plans for each fishery, and a review of the previous season.

DFO produces two IFMPs for the PACificsockeye, coho, pink, chum, and chinook salmon:

- The *Southern B.C. Salmon IFMP* covers all salmon fisheries in tidal and non-tidal waters from Cape Caution south to the B.C./Washington border, including the Fraser River watershed.
- The *Northern B.C. Salmon IFMP* encompasses tidal and non-tidal waters from Cape Caution north to the B.C./Alaska boundary. The tidal waters within this area are denoted as Management Areas 1 to 10 inclusive, 101 to 110 inclusive, and 130 and 142. For the purposes of this IFMP, non-tidal waters are defined as the watersheds that contain anadromous salmon and flow into Areas 1 to 10.

Draft salmon IFMPs are released each year on the salmon consultation website at http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/consultations/salmon/sapdefault_e.htm and publicly reviewed through a comprehensive network of participatory processes (Section 4.3.1). After sign-off by the Minister (Section 4.2.2.1) the final IFMPs are posted at www-ops2.pac.dfo-mpo.gc.ca/xnet/content/MPLANS/MPlans.htm.

The current format of salmon IFMPs was developed over two years from 2000-2002, with an emphasis on capturing general decision guidelines that form the basis of management strategies for each fishery (Section 2.5.2). The IFMPs also include detailed annual fishing plans for each sector and area, which are developed based on the management strategies, long-term trends, and pre-season expectations (e.g. brood year escapements, patterns in survival, abundance forecasts). Current and archived management plans for the Pacific Region are available at <http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/MPLANS/mplans.htm>.

4.2.1.3 Major Initiatives

For major initiatives, such as the *Wild Salmon Policy*, DFO incorporates a strong element of public participation into each step of development and implementation, including public review of draft policies and public distribution all received feedback. The typical sequence is:

- Public release of discussion documents. Scientific experts from outside DFO are often engaged in the development of the discussion document. The discussion document is made available in hardcopy in departmental offices and in electronic version on the Web.
- A series of meetings with First Nations, harvester representatives, and environmental groups, as well as public meetings to compile feedback on the discussion document. These consultations are usually integrated into the on-going participatory processes described in the next sections. There is opportunity to provide feedback in person at public meetings or electronically.
- Public release of proposed policy and implementation plan
- Another round of consultation meetings
- Public release of final policy and implementation plan
- On-going public participation in developing operational details (e.g. identifying conservation units under the *Wild Salmon Policy*)

The timeframe for this process can range from one year to several years. The objective is to consult as widely as possible. Throughout the consultation process, DFO reviews comments and explains to stakeholders how key issues are addressed in subsequent revisions of policies and implementation plans.

Section [4.3.2.1](#) lists examples of major initiatives with extensive public participation.

4.2.2 Supporting Public Participation

4.2.2.1 Types of Public Consultation: Consultation vs. Advisory vs. Co-management Processes

The management system distinguishes between three fundamentally different types of public participation:

- *Consultation*: In the most narrow interpretation of the word, DFO has a legal obligation to consult First Nations prior to taking any management action that could affect aboriginal rights. The procedural requirements for meeting that obligation continue to evolve, as outlined in the summary of relevant court decisions in Section [1.1.5.3](#). More broadly, DFO is committed to consult all interested stakeholders, and in this general sense DFO defines consultation as providing harvesters, environmental groups, and the general public opportunities to provide constructive feedback to the department, and to take into consideration any feedback received.
- *Advisory process*: Most of DFO's public engagement takes the form of advisory processes that serve as a structured, coordinated forum for formally providing recommendations to the department. DFO then considers all recommendations in balance with departmental policies and practices before making decisions.
- *Co-management*: This is the most formal type of process, with a specific mandate, a formal procedure for choosing participants (e.g. 2 DFO representatives on a management board), and, most importantly, a clearly delineated authority to make decisions rather than just provide

feedback. DFO is working towards establishing co-management bodies, with a particular emphasis on joint decision making in negotiated treaties (Section [1.1.5.6](#)), as part of *Wild Salmon Policy* implementation (Section [3.2.2](#) and [3.3.2.5](#)), and as part of the *Pacific Integrated Commercial Fisheries Initiative* (Section [1.2.9.2](#)).

In practice, however, a network of processes has evolved that complement each other but don't necessarily fit into a clear category. For the purposes of this document, the term participatory process is used to capture all forms of public contribution to the management of BC pink and chum salmon. This emphasizes the connected and complementary nature of these different processes rather than dwelling on ever-evolving formalities.

The final decision authority for all fisheries-related issues under federal jurisdiction rests with the Minister of Fisheries and Oceans. The Minister provides the final level of department-internal review (Section [4.3.5.1](#)), but is accountable to Canadians through external review processes (Section [4.3.5.2](#)). For example, the Pacific Region staff develop draft *Integrated Fisheries Management Plans* for salmon (Section [4.2.1.2](#)), which are publicly reviewed through a network of participatory processes (Section [4.3](#)). Once appropriate revisions have been incorporated, the management plans undergo final review and sign-off by the Minister.

DFO has compiled extensive guidance for participatory processes, including:

- 2004 – *Consultation Framework for Fisheries and Oceans Canada* (<http://www.dfo-mpo.gc.ca/Library/282187.pdf>)
- 2004 - *Consultation toolbox : a guide to undertaking consultations* (<http://www.dfo-mpo.gc.ca/Library/282189.pdf>)
- 2004 - *A Policy to Govern Pacific Region Advisory Bodies* (Available upon request)
- 2006 - *Consultation with First Nations: Best Practices* (<http://www.dfo-mpo.gc.ca/Library/329385.pdf>)
- 2008 - *Aboriginal Consultation and Accommodation: Interim Guidelines for Federal Officials to Fulfill the Legal Duty to Consult* (<http://www.ainc-inac.gc.ca/ai/mr/is/acp/intgui-eng.asp>)

4.2.2.2 Consultation Secretariat

The *Consultation Secretariat* was formed in January 2001 to develop and implement a long-term strategy to ensure that consultations with First Nations, stakeholders, and the public are well-documented, avoid unnecessary duplication, and are conducted in a transparent manner, including providing feedback on why decisions are made:

- The secretariat has developed a *Code of Conduct for Participation in Fisheries and Oceans Canada, Pacific Region Consultations* and maintains an inventory of current consultation processes. Up-to-date versions of these documents are available upon request.
- Information about the secretariat and major on-going consultation initiatives is available at http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/consult_e.htm.
- Detailed information about on-going participatory processes, including membership lists, terms of reference, and meeting records, is available at http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/consultations/salmon/default_e.htm.

4.2.2.3 Building Motivation and Capacity to Participate

DFO is committed to setting up and maintaining processes that will move the emphasis of the management system away from dispute resolution and towards participatory planning that pre-empts disputes. However, consensus cannot be reached on all decisions. While the final authority remains with the Minister of Fisheries and Oceans (Section [4.2.2.4](#)), the department strives to maintain constructive participatory processes by documenting all feedback received from stakeholders and formally explaining the rationale for decisions made based on the balance between feedback received and departmental policies.

Participatory processes require motivated and capable participants to succeed, and DFO leads several on-going initiatives designed to building citizens capacity to contribute. For example, all major initiatives related to First Nations' fisheries access have a strong component of capacity building. This includes the *Aboriginal Fisheries Strategy* (Section [1.2.4](#)), the *Pacific Integrated Fisheries Initiative* (Section [1.2.9.2](#)), and *Aboriginal Aquatic Resource and Oceans Management* (Section [1.1.5.8](#)). Similar efforts for integrating harvesters and environmental groups in decision processes have been in place for decades, and were formalized in response to the recommendations produced by the *Improved Decision Making* (IDM) initiative under the *New Directions* policy umbrella in 2001 (Section [1.2.7](#)). More broadly, DFO implements community stewardship programs and funds independent processes such as the Pacific Salmon Foundation (Section [4.3.3.2](#)).

DFO provides comprehensive support for formalized participatory processes:

- *Funding*: DFO directly or indirectly provides funding for many advisory groups and the technical advisors that support them (e.g. First Nations' fisheries commissions).
- *Process and logistics*: The Consultation Secretariat supports the logistics of participatory processes (e.g. developing terms of reference, meeting records).
- *Information sharing*: DFO circulates draft documents and reference materials to advisory groups (e.g. draft fishing plans, data summaries).
- *Participation*: Staff from all branches of the department attend participatory processes based on topic and availability. For many DFO managers and biologists this participation in various processes with different stakeholder groups throughout the province comprises a substantial portion of their workload.
- *Consideration*: Recommendations by advisory groups are documented and publicly circulated. Participants expect that DFO acknowledges all formal recommendations, considers them in the balance with recommendations by others and within the established policy context, and provides formal responses to explain the rationale of the final departmental decisions. Section [4.3](#) links to meeting records for many participatory processes. Decision rationales are documented in the annual *Integrated Fisheries Management Plans* (Section [4.2.1.2](#)).

4.2.2.4 Dispute Resolution

The final decision authority on all fisheries matters under federal jurisdiction remains with the Minister of Fisheries and Oceans, but DFO's substantial efforts to enable public participation are driven by the recognition that productive collaboration leads to better decisions, and by the intent to pre-empt disputes that result in legal action, either by the department or stakeholders.

Several formal mechanisms have been set up to settle disputes that can't be resolved as part of the regular collaborative planning processes (e.g. the *Pacific Region Licence Appeal Board* described in Section [4.3.4.2](#)).

Where these mechanisms fail to resolve a dispute, stakeholders have access to the court system. Legal proceedings are adversarial by their very nature, but ideally they clarify the setting for future policy development and operational decisions (e.g. case law relating to First Nation's fishing access summarized in Section [1.1.5.3](#)).

Internationally, the process for resolving technical disputes is identified in Article 12 of the Pacific Salmon Treaty, available at <http://www.psc.org/pubs/treaty.pdf>.

4.2.2.5 Transparency and Information Sharing

A crucial element of the departmental strategy for enabling public participation is to increase transparency by documenting the reasoning behind chosen management actions and making all relevant information publicly available. DFO has been actively developing a comprehensive public information base for 10 years as part of the federal *Government On-line* initiative. Since then, extensive data sources, technical reports, background information, and meeting records have been made available through a suite of specialized portals:

- The *Fisheries Management Consultations* portal links to information for on-going consultations (e.g. *Wild Salmon Policy*, draft management plans), a calendar of upcoming meetings, and an archive of meeting records since 2001. (http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/consult_e.htm).
- DFO's *library network* is accessible through the WAVES online catalogue at <http://inter01.dfo-mpo.gc.ca/waves2/index.html>). Waves currently covers 250,000 documents, including 8,000 past issues of departmental reports and research documents that have been scanned to allow easier public access. Many of the documents referenced in this report are available in electronic format through WAVES.
- DFO maintains and contributes to several on-line data resources, including the *Fisheries Operating System* (FOS), the new salmon escapement database *nuSEDS*, and the web-based geographic information system *MAPSTER*. Section [3.3.1.4](#) lists on-line information sources that support integrated planning initiatives. Section [2.4.1.3](#) links to publicly available stock assessment data (e.g. test fishing results). Section [2.4.3](#) describes how catch and escapement data are managed and shared.
- DFO regularly publishes research documents, status reports, and outlooks for Pacific fish stocks. The *Pacific Science Advice Review Committee* (PSARC) coordinates a peer-review review of these documents prior to publication at http://www.pac.dfo-mpo.gc.ca/sci/psarc/Default_e.htm. Section [3.2.3](#) summarizes Pacific salmon research and list relevant publications for BC pink and chum. Section [2.4.1.3](#) links to publicly available stock assessment reports (e.g. forecasts, outlooks, salmon bulletins). Each of the *Certification Unit Profiles* references research documents of particular relevance.
- DFO facilitates broad public participation in two of the three stages of the annual planning cycle (Section [4.2.1.1](#)) for salmon: Each spring, DFO publicly distributes draft management plans (Section [4.2.1.2](#)) including a list of specific management objectives. These management plans are thoroughly reviewed in a comprehensive network of advisory processes (Section [4.3.1](#)), leading up to a final *Integrated Fisheries Management Plan*. During the fishing season, DFO

works closely with stakeholder representatives to respond as new information becomes available. After each fishing season, DFO distributes detailed post-season review materials (e.g. list of openings, fishery descriptions, catches, escapements), which are again thoroughly reviewed by advisory groups.

- DFO also provides stakeholders and the general public direct access to DFO managers. Each management plan includes contact information of staff responsible for different aspects of the fisheries and stocks.

4.3 Types of Participatory Processes

4.3.1 Network of Participatory Processes

A comprehensive network of planning and advisory processes has evolved to deal with BC salmon, their ecosystem, and the fisheries targeting them. Processes with public participation operate at different scales of geographic reach and participation:

- *Major policy consultations* are usually region-wide efforts involving fisheries managers, scientists, and stakeholders over several years (Section [4.3.2.1](#)).
- *Community Dialogues* are coordinated through the Consultation Secretariat and bring information about regional DFO initiatives to local communities. Discussions range from broad policy feedback to the specifics of local implementation (Section [4.3.2.2](#)).
- *Local Integrated Advisory and Planning Processes*, such as community roundtables, emphasize structured and on-going collaboration on local operational details (e.g. selective fishing measures, water use). DFO actively participates in most local processes dealing with fisheries issues and provides funding support for many of them (Section [4.3.3.1](#)).
- *Regional Integrated Advisory and Planning Processes* are generally set up to tackle specific issues on a larger geographic scale, such as enhancement strategies (Section [4.3.3.2](#)).
- *Consultation and Collaboration with First Nations* takes place locally, in technical forums, and through formal bilateral consultation (Section [4.3.4.1](#)).
- *Harvester Advisory Processes* include commercial representative groups for each gear type and licence area, as well as the Sport Fishing Advisory Board, its sub-committees, and its community-based advisory committees (Section [4.3.4.2](#)).
- *Collaborative Agreements* are used to implement formal co-management arrangements with a clearly specified group of representatives. A recent court decision regarding DFO's Use-of-Fish policies has triggered a transition in funding approaches for work under collaborative agreements. (Section [4.3.4.4](#)).
- Joint federal-provincial and international decision processes (e.g. Fraser River panel of the Pacific Salmon Commission) typically include representatives from regional stakeholder organizations (Sections [1.1.3.1](#) and [1.1.4.4](#)).

The *Consultation Secretariat* (Section [4.2.2.2](#)) maintains an up-to-date inventory of consultation mechanisms, which is available upon request.

4.3.2 Processes with Broad Public Participation

4.3.2.1 Major Consultation and Collaboration Efforts

The following conservation and recovery initiatives have included extensive long-term public consultation:

- *Wild Salmon Policy* (Section [3.2.2](#))
- *Species at Risk Act* (Section [1.1.2.4](#))
- Marine mammal regulations (Section [1.1.2.8](#))
- Marine Protected Areas (Section [3.3.2.1](#)).
- Rockfish Conservation Strategy (Section [3.4.3.1](#))
- Pink Salmon Action Plan (Section [3.4.2.5](#))

DFO has also led extensive public reviews of initiatives related to the changing structure of Pacific fisheries:

- *Allocation Policy* (Section [1.2.7.2](#))
- *Improved Decision Making* (Section [1.2.7.3](#))
- *Selective Fishing Program* (Section [3.2.4](#))
- *Pacific Fisheries Reform* and *Pacific Integrated Commercial Fisheries Initiative* (Section [1.2.9](#))

4.3.2.2 Community Dialogues

DFO started hosting annual community dialogues in 2004. The meetings are organized by the consultation secretariat (Section [4.2.2.1](#)) and are open to all community members. Separate session for First Nations may be hosted prior to the main meeting, depending on local circumstances. Community dialogues do not focus on specific fisheries management issues, but rather deal with broad-scale regional initiatives and complement other advisory processes by providing opportunities for multi-interest groups to discuss issues relevant to their communities, and to do so closer to where people live.

Annual topics for dialogues are selected by DFO's *Regional Management Committee* (Section [4.3.5.1](#)) based on regional priority initiatives. Summary reports are compiled for each year's meeting series. Specifically:

- The 2004 Community Dialogues covered proposed Rockfish Conservation Areas, proposed recovery strategies for Sakinaw sockeye, Cultus sockeye, and Interior Fraser coho, and proposed SARA listings. Meeting materials and records are available at http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/consultation2004/main_e.htm.
- The 2005 Community Dialogues covered a wide range of topics: Pacific Fisheries Reform, the Integrated Groundfish Proposal, proposed Rockfish Conservation Areas for the Strait of Georgia, Implementation of the Wild Salmon Policy, Fisheries Act Renewal, and Proposed SARA Listings. Meeting materials are available at www-comm.pac.dfo-mpo.gc.ca/pages/consultations/consultation2005/main_e.htm. A summary of discussions is available at <http://www.dfo-mpo.gc.ca/Library/320150.pdf>.

- The 2006 Community Dialogues focused on the Environmental Process Modernization Plan, Wild Salmon Policy, and Fisheries Reform. Meeting materials and records are available at http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/Consultation2006/main_e.htm.
- The 2007 Community Dialogues focused the Pacific Integrated Fisheries Initiative, species at risk, and the Coastal Management Framework. Meeting materials and a 4-year progress report are available www-comm.pac.dfo-mpo.gc.ca/pages/consultations/Consultation2007/main_e.htm.

4.3.3 Multi-interest Processes

4.3.3.1 Local Integrated Advisory and Planning Processes

Local planning and advisory processes serve as a structured forum for collaboration on the operational details of managing fish stocks and fisheries. DFO leads or supports many of these processes.

Examples include:

- The *West Coast Aquatic Management Board* has been fully operational since 2002. The board includes 8 governmental board members, two each from the federal, provincial, First Nations, and local governments, and eight non-governmental board members reflecting harvesting, processing, tourism, environmental, labour, and aquaculture interests. The board's activities are supported by a comprehensive regional information system (<http://www.westcoastaquatic.ca/RIS.htm>) and thoroughly documented (http://www.westcoastaquatic.ca/Aquatic_Mgmt_Board.htm).
- *Georgia Basin Action Plan (GBAP)*: A multi-partnered initiative working to improve sustainability in the Georgia Basin. Previously called the Georgia Basin Ecosystem Initiative, this integrated management initiative has been funding and coordinating projects in four key areas since 1998: Integrated Data Management, Clean Air, Habitat & Species, Clean Water, Sustainable Communities. Project details are available at http://www.pyr.ec.gc.ca/georgiabasin/index_e.htm by following the link called "key activities". The main partners are Environment Canada, Fisheries and Oceans Canada, Parks Canada, BC Ministry of Environment, and Coast Salish First Nations. More than 100 additional partners are involved at the project level, including local and regional governments, other federal and provincial departments, non-government organizations, and academic institutions.
- The *Fraser River Salmon Table Society (FRSTS)* grew out of a sub-committee of the *Integrated Harvest Planning Committee* (Section 4.3.4.2) tasked with developing recommendations for conserving Cultus lake sockeye. The process is now shaping up as an interface between First Nations and the commercial fishing industry, supported by the Fraser Basin Council.
- The *Rivers and Smith Salmon Ecosystems Planning Society (RSSEPS)* grew out of a number of initiatives by First Nations, DFO, forest companies, environmental and stewardship organizations, local governments, fishing interests, and concerned individuals, undertaken in response to serious declines in salmon. A detailed inventory of projects is available at <http://www.rsseps.ca/>.
- The *Cumshewa Inlet Community Board* meets periodically to discuss returns to Cumshewa Inlet (Area 2), and enhancement strategies for Pallant Creek hatchery. This community board is made up of members from the Haida Tribal Society, DFO, and recreational and commercial advisors. The Pallant Creek Hatchery facility has been under the management and operation of the Haida Fisheries Program (HFP) with program objectives established through the Haida Tribal Society.

- The *Skeena Fisheries Commission* is a aboriginal watershed organization working closely with DFO on shaping and implementing aboriginal fisheries. Their website at <http://www.skeenafisheries.ca/> describes the mandate of the SFC and summarizes the technical components as follows: “*Each First Nation retains respective fisheries program managers, with program staff usually composed of enforcement personnel, biologists, and technicians. The Skeena Fisheries Commission Technical Committee is largely composed of fisheries program staff. SFC Nations place a premium on local capacity development, with many of the local community college fisheries technician programs taught from SFC-developed curricula. SFC has a known administrative and delivery capacity. The SFC Technical Committee meets on a monthly basis with Department of Fisheries and Oceans biologists to plan and report on initiatives that include stock assessment, habitat assessment and status, water quality studies, limnological surveys, and selective harvest techniques and to discuss current fisheries research, issues in fisheries biology, and outcomes in fisheries management.*” A specific example of joint project funding and collaboration is the thorough inventory of Skeena River fish populations, initially published as a report by the Skeena Fisheries Commission in 2007 (<http://www.dfo-mpo.gc.ca/Library/327687.pdf>) and recently published as full book by Ecotrust.
- The *Fraser River Estuary Management Program* and the *Burrard Inlet Environmental Action Program* are joint efforts to implement the formalized *Estuary Management Plan* and coordinate activities across agencies. Partners include Environment Canada, Fisheries and Oceans Canada, Transport Canada, British Columbia Ministry of Environment (formerly Water, Land and Air Protection), Metro Vancouver (formerly Greater Vancouver Regional District), Fraser River Port Authority, and the North Fraser Port Authority. The management plans, project summaries, and annual habitat inventories are available at www.bieapfrempp.org/main_frempp.html and www.bieapfrempp.org/main_bieap.html.
- The *Cowichan Community Roundtable* and the *Somass Community Roundtable* deal with integrated planning and conservation efforts relating to habitat, fisheries, and water use.
- The *Clayoquot Biosphere Trust*, established through a federal endowment, provides funding and logistical support for research, education and training initiatives in the *Clayoquot Sound Biosphere Reserve* designated by UNESCO in 2000. DFO contributes to funding decisions and project coordination. Details about the trust and an archive of projects are available at http://www.pac.dfo-mpo.gc.ca/oceans/im/clayoquot_e.htm.

4.3.3.2 Regional Integrated Advisory and Planning Processes

Regional advisory and planning processes are generally set up to tackle specific issues on a larger geographic scale. Examples include:

- The *Salmon Enhancement and Habitat Advisory Board* (SEHAB) has served as a liaison between federal agencies, provincial agencies, regional stewardship organizations, and local volunteer networks since 1976. Detailed information about SEHAB, including terms of reference and meeting records, is available at <http://www.sehab.org/index.html>.
- The *Pacific Salmon Foundation* (PSF) works collaboratively with the DFO on many occasion to coordinate community-based restoration projects that are funded through the Habitat and Enhancement Program and other federal programs. For example, the PSF manages annual projects under the federal *Pacific Salmon Endowment Fund* (PSEF) established in 1999. Detailed information about the foundation and its projects is available at <http://www.psf.ca/>.

- The *Fraser Basin Council* (FBC) focuses on facilitating collaborative processes to improve sustainable management in the Fraser Basin. Detailed information about the council and its projects is available at <http://www.fraserbasin.bc.ca/>.
- DFO's *Community Involvement Program* supports and coordinates local restoration efforts throughout the province. An overview of program activities is available at http://www-heb.pac.dfo-mpo.gc.ca/community/cip_e.htm. Brief summaries of on-going projects by area are available at http://www-heb.pac.dfo-mpo.gc.ca/community/dir/projects_e.htm.
- The *BC Pacific Salmon Forum* (www.pacificsalmonforum.ca/) provides advice to both DFO and BC.

4.3.4 Focused Stakeholder Processes

4.3.4.1 Consultation and Collaboration with First Nations

The management system operates in accordance with the *Policy for the Management of Aboriginal Fishing*, which establishes priority for fisheries for food, social and ceremonial (FSC) purposes and identifies requirements for consultation (Sections [1.1.5](#) and [1.2.4](#)). DFO meets regularly with individual bands, tribal councils, and regional representatives to discuss policy initiatives, conservation measures, and fishing plans. The department also supports meetings at the watershed level attended by representatives of bands and tribal councils to review broad policy approaches and other initiatives.

Consultation with First Nations is integrated into the annual planning cycle for Pacific salmon (Section [4.2.1.1](#)), First Nations representatives also participate in most of the local and regional integrated planning processes (previous section), and in the harvester advisory processes (next section).

In addition to these annual planning consultations, DFO implements and supports comprehensive programs that are designed to increase First Nation's participation in resource management (Section [4.2.2.3](#)).

4.3.4.2 Harvester Advisory Processes

DFO hosts a series of annual advisory meetings with representative groups from each fishing sector, gear type, and area. These meetings are a key component of the annual planning cycle for salmon fisheries (Section [4.2.1.1](#)). Pre-season these meetings serve as DFO's main forum for compiling stakeholder recommendations, and post-season DFO uses the opportunity to explain how those recommendations were considered.

The *Improved Decision Making* initiative (Section [1.2.7.3](#)) included a thorough review of public participation processes in the Pacific Region. One of the key recommendations resulting from that review was to streamline consultation efforts and establish a more formal and coordinated hierarchy of processes for interacting with harvesters. Implementation of these recommendations has progressed steadily since the initiative concluded in 2001:

- DFO created the *Consultation Secretariat* (Section [4.2.2.2](#)) to coordinate and support public participation.
- About 70 species-specific advisory bodies have been established. The Consultation Secretariat is leading an on-going effort to develop formal terms of reference for each advisory body and ensure a consistent record of meeting summaries. The mandate of these advisory bodies includes reviewing proposed fishing plans, proposing and coordinating pilot projects (e.g. selective fishing,

defined-share fisheries), and contributing to recovery plans. A major task for each advisory body in the annual planning cycle is to review the draft *Integrated Fisheries Management Plan* (Section 4.2.1.2). Appendix 1 of the 2008 Salmon IFMP lists members of the commercial salmon advisory boards.

- The *Integrated Salmon Harvest Planning Committee* (IHPC) was established to augment the processes in place with each harvester group and provide a forum for cross-sector discussion, planning and implementation. The IHPC consists of the North Coast Subcommittee and the South Coast Subcommittee. Membership lists, terms of reference, and meeting records since 2004 are available at www-ops2.pac.dfo-mpo.gc.ca/xnet/content/consultations/salmon/IHPC/default_e.htm.

Collaboration and consultation with commercial harvesters includes the following processes:

- *Area Harvester Committees* (AHC) from each commercial licence area (Section 2.5.3.4) review local gear-specific issues and provide recommendations to regional representatives.
- The *Commercial Salmon Advisory Board* (CSAB) includes representatives from each AHC, as well as other industry representatives. A membership list, terms of reference, and meeting records since 2004 are available at www-ops2.pac.dfo-mpo.gc.ca/xnet/content/consultations/salmon/CSAB/default_e.htm.
- The *Pacific Region Licence Appeal Board* (PRLAB) was established in 1979 as an arms-length body to review appeals regarding licencing decisions by DFO. The PRLAB provides written recommendations to the Minister of Fisheries and Oceans who makes the final decision. Information about the appeal board, including terms of reference are available at http://www.pac.dfo-mpo.gc.ca/ops/fm/Licensing/prlab/prlabguide_e.htm.
- The *Licence Retirement Selection Committee* consists of representatives from Aboriginal groups and representatives from the commercial fishing industry. The committee reviews all licences under consideration for retirement and recommends to DFO which licence retirement proposals should be accepted. Licence retirements are a key component of the *Allocation Transfer Program* (Section 1.2.4.3) and the *Pacific Fisheries Adjustment and Restructuring* initiative (Section 2.5.3.4).
- The *Responsible Fishing Board* oversees compliance with Code of Conduct for Responsible Fisheries (Section 3.2.4.4).

Collaboration and consultation with recreational harvesters is coordinated through the *Sport Fishing Advisory Board*, its local committees, and its working groups:

- Background information about the SFAB is available at http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/consultations/sfab/mainsfab_e.htm.
- A detailed organizational chart listing local committees and working groups is available at http://www.pac.dfo-mpo.gc.ca/recfish/images/SFAB_e.jpg.
- Membership lists, terms of reference, and meeting records for local committees are available at http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/consultations/sfab/sfat_e.htm.

4.3.4.3 Environmental Advisory Processes

DFO regularly consults and collaborates with Environmental Non-Governmental Organizations (ENGO) including the David Suzuki Foundation and the Sierra Club of BC. In an effort to coordinate

their interaction with DFO, nine ENGOs formed the *Marine Conservation Caucus* (MCC). DFO has incorporated the MCC into the established advisory process as a formal representative body for environmental interest groups. For example, 2 representatives from the MCC sit on each subcommittee of the *Integrated Harvest Planning Committee* (Section [4.3.4.2](#)).

4.3.4.4 Collaborative Agreements and Use-of-Fish Policy

Co-management is implemented by means of a collaborative agreement. A collaborative agreement is a formal co-management arrangement with a legally constituted, representative industry organization and allows for full involvement of stakeholders in fisheries research incremental to that of the department, and in the co-operative development and implementation of fisheries management and stewardship.

Co-management arrangements have existed for the past decade in Pacific fisheries (sablefish, for example, has had a co-management arrangement since 1993). Co-management arrangements have been used to foster improved compliance with fisheries regulations, safer fishing practices, and to put in place joint scientific, monitoring and enforcement programs. The experience gained from co-managed fisheries such as black cod, halibut and geoduck has been very valuable and has provided direction for the development of co-management in other fisheries. A *Status Report on Co-Managed Fisheries* from 2002 is available at http://www.bcseafoodalliance.com/BCSA/BCSA_BLEWETT.html.

In the past, joint test fishing and monitoring programs under collaborative agreements were structured to allow fishers assisting with data collection activities to help offset their costs by retaining and selling fish caught in test fisheries. Recent federal court decisions (e.g. Larocque) have affected the department's ability to deliver test fishing programs in this way. DFO is continuing to evaluate the impact of these court decisions, however it is likely that some approaches used in the past will have to be changed. DFO will be working in close consultation with resource users to ensure that the fisheries data collections necessary to set TACs and to ensure conservation will continue to be undertaken.

DFO has released an interim policy for *Collaborative Arrangements that previously relied on the Use of Fish*. The interim policy is available at <http://www.dfo-mpo.gc.ca/Science/newpoli-polinouv/guidance-conseils-eng.htm>.

4.3.5 Review Processes

4.3.5.1 Internal Review Processes

DFO has established a comprehensive hierarchy of internal review processes. Review mechanisms are in place within each branch of the department (i.e. policy, management, stock assessment, science) and multi-disciplinary review mechanisms are adapted to the characteristics of different areas and species.

The review hierarchy for fisheries planning and implementation is structured as follows:

- *Local managers and biologists* serve as the main conduit of information about local circumstances and operational details. The authority to open commercial fisheries has been delegated to local fisheries managers.
- *Geographic Management Area Teams* (GMAT) are the forum where local managers and biologists from connected areas review broader management actions and co-ordinate implementation. For example, GMATs are in place for Johnstone Strait, Strait of Georgia, and the West Coast of Vancouver Island.

- *Area Management Teams* (AMT) coordinate large-scale integrated management actions and policy implementation. For example, the South Coast Area Management Team reviews selective fishing projects for licence areas B, D, E, G, and H (Section [2.5.3.4](#)).
- *Regional Working Groups* deal with coast-wide initiatives and annual implementation for specific fisheries. For example, the Salmon Working Group reviews the draft *Integrated Fisheries Management Plans* for salmon (Section [4.2.1.2](#)) before they are circulated for public feedback.
- Several higher-level committees provide strategic direction to area staff. These include the *Regional Management Committee* (e.g. guides major policy and operational decisions), and the *Strategic Directions Committee*.
- The highest levels of review and sign-off rest with the Regional Director General, and finally with the Minister.

DFO Science maintains internal processes to coordinate research activities and review scientific work:

- The *Stock Assessment Coordinating Committee*—a departmental committee comprised of Stock Assessment biologists and fishery managers—reviews and provides advice/recommendations to the Director of Stock Assessment and the Chair of the Salmon Working Group regarding stock assessment priorities (e.g. PSARC papers to be developed, stock status assessments and advice regarding prioritizing of stock assessment programs. In making a decision regarding research plans, the Stock Assessment Coordination Committee considers the knowledge base, level of threat of extinction, and known and likely harvest and ecosystem impacts.
- The *Canadian Science Advisory Secretariat* (CSAS) coordinates the peer review of scientific issues for DFO. The different regions conduct their resource assessment reviews independently, tailored to regional characteristics and stakeholder needs. CSAS facilitates these regional processes to ensure national quality standards. CSAS also works with the Regions to develop integrated overviews of issues in fish stock dynamics, ocean ecology and use of living aquatic resources, and to identify emergent issues quickly. An overview of CSAS processes is available at http://www.dfo-mpo.gc.ca/csas/csas/Process-Processus/Process-Processus_e.htm.
- The *Pacific Science Advice Review Committee* (PSARC) is the regional body responsible for review and evaluation of scientific information on the status of living aquatic resources, their ecosystems, and on biological aspects of stock management. A description of PSARC, steps in the PSARC Review Process, organizational structure, meeting schedules and PSARC documents are available at http://www.pac.dfo-mpo.gc.ca/sci/psarc/whatis_e.htm. Most of the research documents (e.g. stock status reports) listed in Sections [2.4.1.3](#) and [3.2.3](#) were reviewed by PSARC. PSARC advises the *Resource Management Executive Committee* (see above) and other bodies on stock and habitat status and potential biological consequences of fisheries management actions and natural events. Fisheries Management provides prioritized requests for research papers to PSARC.

At a departmental level, the *Audit and Evaluation Directorate* carries out the internal audit and evaluation function within DFO and reports its activities to the Departmental Audit and Evaluation Committee (DAEC) 8-10 times per year. This committee is co-chaired by the Deputy Minister and the Associate DM and has all Assistant Deputy Ministers and Regional Directors General as members. The Committee considers and approves an annual workplan; approves the terms of reference for individual audits and/or evaluations; approves the reports and, management action plans that are necessary to address recommendations made in the reports. Up-to-date information about internal audits and resulting implementation plans is available at http://www.dfo-mpo.gc.ca/communic/CREAD/index_e.htm.

Many of the audits and evaluations focus internal matters, such as language training and fiscal responsibility, but there are frequent reports dealing with fisheries-related matters. The following are particularly relevant to BC salmon fisheries:

- Pacific Salmon Selective Fishing Program Evaluation (http://www.dfo-mpo.gc.ca/communic/cread/evaluations/04-05/salmon_e.htm)
- Audit of Management Control Framework Supporting Statistical Information on Fisheries (http://www.dfo-mpo.gc.ca/communic/cread/audits/06-07/6b012_e.htm)
- Value for Money Audit of the Fisheries Access Program (http://www.dfo-mpo.gc.ca/communic/cread/audits/05-06/60250_e.htm)
- Audit and Evaluation of the Contribution to the Pacific Salmon Foundation (http://www.dfo-mpo.gc.ca/communic/cread/audits/05-06/65175_e.htm)
- Formative Evaluation of Federal Species at Risk Programs (<http://www.ec.gc.ca/ae-ve/default.asp?lang=en&n=53869FF3-1>)
- Evaluation of the DFO 2001-2003 Sustainable Development Strategy (http://www.dfo-mpo.gc.ca/communic/cread/evaluations/06-07/60254_e.htm)
- Evaluation of the Canadian Fisheries Adjustment and Restructuring Program Licence Retirement Programs (http://www.dfo-mpo.gc.ca/communic/cread/evaluations/02-03/fisheries_e.htm)
- Review of Dockside Monitoring Program (http://www.dfo-mpo.gc.ca/communic/cread/reviews/02-03/dockside_e.htm)

4.3.5.2 External Review Processes

In addition to the on-going review mechanisms integrated into the network of participatory processes (Section 4.3) and the annual planning cycle (Section 4.2.1.1), DFO is subject to several levels of formal external review:

- The *Pacific Fisheries and Resource Conservation Council* (PFRCC), created by DFO in 1998 as an independent body, regularly publishes reports that address broad challenges in Pacific salmon management (e.g. impact of climate change on freshwater habitat of salmon). Detailed information about the council is available at <http://www.fish.bc.ca>, which includes access to all of the council's publications.
- The *Committee on the Status of Endangered Wildlife in Canada* (COSEWIC) was established in 1977 to ensure nationally consistent and scientifically defensible classification of wildlife species at risk. The committee has refined its risk definitions, criteria, and assessment procedures over 30 years of operation, and was designated as the official advisory body under the *Species at Risk Act* in 2003 (Section 1.1.2.4). The federal government takes COSEWIC's risk designations into account when establishing the legal list of species at risk. DFO works closely with COSEWIC to ensure that conservation concerns are identified in a timely manner and implements extensive recovery measures even for stocks or species that are not listed under SARA (Section 3.4.1).
- The *Office of the Auditor General of Canada* (OAG) established a dedicated *Commissioner of the Environment and Sustainable Development* in 1995 to conduct regular performance audits and monitor the 3-year *Sustainable Development Strategies* of about 3 dozen federal departments, including DFO (Section 1.2.2.1). Annual reports of the commissioner and other federal audits of

DFO back to 1981 are available at http://www.oag-bvg.gc.ca/internet/English/parl_lpf_e_1205.html. For example, the Commissioner conducted a detailed review of Canada's Oceans Management Strategy in 2005.. The full report is available at http://www.oag-bvg.gc.ca/internet/English/parl_cesd_200509_01_e_14948.html. The Government's response to the report is available at http://www.oag-bvg.gc.ca/internet/English/att_oag-bvg_e_14097_e_14097.html.

- The *BC Office of the Auditor General* typically conducts performance audits including the management of natural resources and environmental impacts under provincial jurisdiction (e.g. forestry), but in 2004 they also completed a detailed audit of federal-provincial roles in salmon management. *Salmon forever: an assessment of the provincial role in sustaining wild salmon* is available at http://www.llbc.leg.bc.ca/public/PubDocs/bcdocs/372078/Salmon_environment.pdf. The report also includes a formal response by the BC Government.
- The *Treasury Board* has implemented the *Management Accountability Framework* (MAF) which requires that participating departments, including DFO, complete annual *Departmental Performance Reports* (DPR) that summarize progress on key deliverables. Section [1.2.2.4](#) describes the process and links to the most recent DPRs.
- The *Standing Committee on Fisheries and Oceans* (SCFO) of the Senate of Canada regularly reviews the planning and implementation of Canadian fisheries. Information about the committee's activities is available at www.parl.gc.ca/fopo. Two reports of particular relevance to BC salmon are the review of *Oceans Act* (Section [1.1.2.3](#)) and the review of the 2004 Fraser River salmon fishery (Section [1.2.8.2](#)). An inventory of SCFO reports and government responses is available at http://www.dfo-mpo.gc.ca/communic/reports/index_e.htm.
- Formal *Ministerial reviews* of a particular fishery or initiative may be triggered if substantial disagreement and acrimony cannot be resolved through the other channels described in Section [4.3](#). For example, the *Williams Review* looked at how the Fraser River sockeye salmon fishery was managed in 2004 (Section [1.2.8.2](#)).

4.3.5.3 Independent Review Processes

DFO fully supports independent reviews of BC pink and chum management practices. For example, DFO publicly distributes data and research results, and contributes staff time to independent review processes.

A recent example is the Independent Science Review of Skeena fisheries, as described in the *North Coast Certification Unit Profiles*.

APPENDICES

Appendix 1: Inventory of Salmon Conservation and Recovery Measures – North Coast and Central Coast

This appendix includes an illustrative inventory of conservation and recovery measures in commercial salmon fisheries. For more detailed information about the planning and implementation refer to the *Certification Unit Profile* for each area. A complete list of conservation requirements is listed in the annual *Conditions of Licence*. Sample licence conditions are available at <http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/MPLANS/conditions.htm>.

Stat. Area	Target Stock(s)	By-catch species of concern	Management action
1 to 10	All Species	General Constraints	Troll: <ul style="list-style-type: none"> - Areas with know high abundance of undersized Chinook will remain closed - Areas or times where weak Queen Charlotte Islands, Northern mainland and Central coast chinook, coho and chum stocks are known to be abundant will remain closed - Barbless hook and use of revival boxes are required - Non-retention of steelhead all year, chum in most areas (except terminal areas where surpluses are identified) and sockeye in some areas
1, 2E, 2W	Chum, Pink	General Constraints	<ul style="list-style-type: none"> - Terminal net fisheries only - Fisheries permitted only on identified surplus stocks.
1, 2E, 2W	Chum, Pink	Coho	<ul style="list-style-type: none"> - Daylight only for reduction of coho by-catch - Use of brailing by seines, and revival box by nets may be required
3	Sockeye, Pink	Chum, Chinook, Coho, Steelhead	<ul style="list-style-type: none"> - Non-retention of this species in net fisheries - Brailing and sorting required for seines - Gillnet mesh restriction to reduce chum by-catch - Time and area restrictions to reduce chum and coho encounters, revival boxes required for net gear - Gillnet fleet encouraged to use weedline to limit steelhead encounters

Stat. Area	Target Stock(s)	By-catch species of concern	Management action
4, 5	Sockeye, Pink	Chum, Chinook, Coho, Steelhead	<ul style="list-style-type: none"> - Non-retention of these species in net fisheries - Brailing and sorting required for seines - Gillnet mesh restriction to reduce chum by-catch - Time and area restrictions to reduce chum and coho encounters, revival boxes required for net gear - Gillnet fleet encouraged to use weedline to limit steelhead encounters
6	Pink	Chum, Chinook, Coho, Steelhead	<ul style="list-style-type: none"> - Non-retention of these species in net fisheries - Brailing and sorting required for seines - Gillnet mesh restriction to reduce by-catch of species of concern - Revival boxes required for net gear - Daylight only for reduction of coho by-catch - Complete closure of mixed stock areas to gillnets-terminal area only fisheries on identified surplus stocks.
6	Chum	Chinook, Coho, Steelhead, chum (weak stocks)	<ul style="list-style-type: none"> - Terminal harvest of Kitimat R. enhanced stock to reduce by-catch of chum stocks of concern and other species, revival boxes required for net gear - Daylight only for reduction of coho by-catch - Brailing and sorting required for seines - Complete closure of mixed stock areas to gillnets-terminal area only fisheries on identified surplus stocks.
7	Chum, Pink	Chinook, Coho, Steelhead	<ul style="list-style-type: none"> - Time and area restrictions to reduce encounters of non-target species - Brailing and sorting required for seines and to release sockeye, chinook and steelhead - Gillnet mesh restrictions to limit impacts on sockeye stocks. - Terminal harvest of surplus chum stocks
8	Chinook	Sockeye, Coho, Steelhead, Chum	<ul style="list-style-type: none"> - Gillnet mesh restrictions to limit impacts on non-target stocks - Time and area restrictions to reduce encounters of non-target species
8	Chum,	Sockeye, Coho,	<ul style="list-style-type: none"> - Gillnet mesh restrictions to limit impacts on non-target stocks - Time and area restrictions to reduce encounters of non-target species

Stat. Area	Target Stock(s)	By-catch species of concern	Management action
	Pink	Chinook, Steelhead	<ul style="list-style-type: none"> - Coho managed to 60% exploitation level - Daylight only for reduction of coho by-catch - Brailing and sorting required for seines and to release sockeye, chinook and steelhead
9	All species	General constraints	<ul style="list-style-type: none"> - Owikeno Lake sockeye stocks currently considered in recovery mode. - No net fishing opportunities expected
10	All species	General constraints	<ul style="list-style-type: none"> - Long Lake sockeye stocks currently considered in recovery mode. - If a chum fishery takes place, a maximum mesh restriction of 150mm will be in place to protect Docee River chinook stocks. - Boundaries will be restrictive to protect non-targeted stocks. - No coho retention unless abundance warrants. - No other net fishing opportunities expected

Appendix 2: Salmon fishery closures in Johnstone Strait

This table include current salmon closures in Johnstone Strait (Areas 12 and 13) that apply commercial or recreational fisheries.

Closure	Applies to	Description	Reason for Closure	Length of Closure
Ribbon Boundary	Seine	The 0.5 nautical mile seine ribbon boundary is in effect in Areas 12 and 13 from Cracraft Point east to Brougham Point.	Protection of mainland pinks	End of July - end of August
Tsitika River Mouth (Robson Bight)	Seine, Gillnet, Recreational	The boundary is from the inside a line drawn from two triangular yellow boundary signs located approximately 1 nautical mile on each side of the mouth of the Tsitika River.	Protection of all salmon species	All year
Box Boundary	Seine, Gillnet	Close Sub Area 12-2	Protection of Eve/Adam River pinks	End of July - end of August
Port McNeil Bay	Recreational	Those waters of Port McNeill Bay westerly of a line from a boundary sign at the north end of the Western Forest Products jetty, true north to a boundary sign on the opposite shore of Ledge Point Peninsula	Finfish closure to protect of Bear Creek coho.	From Aug 15 to Dec 31
Klinaklini River (Knight Inlet)	Recreational	The mouth of the Klinaklini River (Knight Inlet) shoreward of a line from a fishing boundary signs at the southern entrance to Wahshihlas Bay to a fishing boundary sign at Rubble Point	Finfish closure to protect chinook.	All year.
Kingcome River	Recreational	The mouth of the Kingcome River shoreward of a line from a fishing boundary signs on Petley Point to a fishing boundary sign on a point on the opposite shore of Kingcome Inlet	Finfish closure to protect chinook.	All year
Wakeman River	Recreational	The mouth of the Wakeman River north of a line connecting two fishing boundary signs on opposite shores approx. 6 km from the head of Wakeman Sound	Finfish closure to protect chinook.	All year
Parson Bay (Sub area 12-20)	Seine, Gillnet, Recreational	Parson Bay bounded inside a line from Red Point on Harbledown Island to a marker on the most northwest point of Parson Island, from there following the northern shore to the most easterly point and from there true east to Harbledown Island	Finfish closure to protect juvenile chinook.	June 15 to October 13
Nimpkish River (sn/gn/rec)	Seine, Gillnet, Recreational	The mouth of Nimpkish River inside a line from a fishing boundary sign at a point on the shore of Vancouver Island approximately 1.5 km east of Broad Point, then to a navigational aid in the middle of Haddington Passage, then to a fishing boundary sign at a point approximately 1 km east of Willow Creek, then to the tidal water boundary signs approximately 100 m upstream of the Highway 19 bridge	Finfish closure to protect all returning stocks.	June 1 to November 30.
Scott Cove Creek	Recreational	The mouth of Scott Cove Creek and Viner Sound shoreward of a line between fishing boundary signs located at King Point and on the point 1 km south from the mouth of Scott Cove Creek	Finfish closure to protect chum and coho.	August 15 to September 30

Closure	Applies to	Description	Reason for Closure	Length of Closure
Hardy Bay (Subarea 12-16)	Recreational	The waters of Hardy Bay shoreward of a line from a boundary sign on the Keltic Seafoods wharf to a boundary sign on the opposite shore non-retention of all salmon is in effect from August 15 to September 30, and only one single-pointed hook that measures no more than 15 mm between the point and shank may be used	Non-retention of all salmon. Reviewed annually	August 15 to September 30.
Keogh River	Recreational	The mouth of the Keogh River within a 400 m radius of the shore only one single-pointed hook that measures no more than 15 mm between the point and shank may be used	Salmon closure to protect off year pink salmon.	August 1 to October 15.
Broughton Strait (Sub-area 12-19)	Recreational	Sub-area 12-19: Broughton Strait southerly of a line from Ledge Pt. to the light on the southern end of Haddington Island, then to the light on Yellow Bluff on Cormorant Island, then following the southerly shoreline to a marker on Gordon Bluff, then to Lewis Pt. on Vancouver Island	Non-retention of chinook	August 1 to October 31
Cluxewe River	Recreational	Those waters inside of a line that starts at a boundary sign approximately 1.9 km northwest of the Cluxewe river mouth, thence 35° true for 400 m to a position of 50° 37.57'N and 127°12.21'W, thence 108° true for approximately 3.3 km to a position of 50°36.98'N and 127°09.53'W, thence 200° true for approximately 400 m to the boundary sign on the shore. Only one single-pointed hook may be used during this period.	Non-retention of pink salmon during odd year cycles (ie: 2003, 2005).	July 14 to September 15
Loughborough Inlet	Recreational	The waters in Loughborough Inlet from Cosby Point to head of inlet	Finfish closure to protect chinook and coho.	All year
Deepwater Bay	Seine, Gillnet, Recreational	Deepwater Bay inside a line from a fishing boundary sign at Separation Head to a fishing boundary sign at the northerly entrance of Deepwater Bay	Rockfish Conservation Area	All year
Phillips Arm (Sub-area 13-24)	Recreational	Phillips Arm northerly of a line from Picton Point true east to the opposite shore.	Finfish closure to protect chinook. Open on even years for pink salmon only.	All year
Bute Inlet	Seine, Gillnet, Recreational	The waters in Bute Inlet from Alpha Bluff to the head of the inlet	Finfish closure to protect chinook and coho.	All year
Village Bay	Recreational	The waters of Village Bay inside a line from a fishing boundary sign at the north entrance of Village Bay, Quadra Island, to a boundary sign at the south entrance of Village Bay	Finfish closure to protect sockeye and coho.	June 30 to October 31

Closure	Applies to	Description	Reason for Closure	Length of Closure
Discovery Passage	Recreational	In those waters of Discovery Passage and the Campbell River, inside a line true east of the fishing boundary sign at Orange Point to the middle of the channel, then southeasterly down the middle of the channel to the intersection of a line running from a boundary sign on the southern end of Hidden Harbour breakwater, then true east to Quadra Island, , except for the Campbell River Discovery Pier	Finfish closure to protect coho.	October 1 to October 31
Salmon Bay	Recreational	The waters of Salmon Bay, bounded on the north by a line from Graveyard Point to the ferry landing on the opposite shore, and on the south by the downstream side of the first bridge upstream on the Salmon River	Finfish closure to protect all salmon species.	June 1 to December 1
Cape Mudge	Recreational	Those waters inside a line from the float at Yaculta Indian Village on Quadra Island true west one nautical mile, thence southeast 160 ⁰ true to the intersection with a line drawn from the fishing boundary sign on Willow Point to the Wilby Shoal light buoy, thence to the Cape Mudge light on Quadra Island	Finfish closure to protect LGS chinook.	July 15 to August 31

Appendix 3: MSC Indicators for Pink & Chum Certification

Evaluation Hierarchy: Principles, Criteria, Sub-Criteria, Indicators, and Scoring Guideposts

The Marine Stewardship Council (MSC) has developed a comprehensive and thoroughly documented certification process, with sufficient flexibility in the details to allow for adaptation to different settings. A standardized set of assessment criteria was recently released, but all of the BC salmon evaluations are still being conducted under the previous approach in which each evaluation team develops a draft set of assessment criteria and revises the criteria after a public review period. The final assessment criteria for BC pink and chum salmon fisheries are available at <http://www.msc.org/track-a-fishery/in-assessment/pacific/british-columbia-pink-and-chum-salmon/assessment-downloads>.

Assessment criteria for BC pink and chum fisheries are organized as follows:

- BC pink and chum fisheries are assessed against the three basic principles of (1) protecting the status of target stocks, (2) protecting the ecosystem, and (3) effective and transparent management.
- Specifically, MSC Principle 1 states *“A fishery must be conducted in a manner that does not lead to overfishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.”*
- MSC Principle 2 states *“Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends.”*
- MSC Principle 3 states *“The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.”*
- For each principle, the assessment criteria specify a list of criteria, sub-criteria, and indicators. For example, Criterion 1.1 under Principle 1 states that *“The fishery shall be conducted at catch levels that continually maintain the high productivity of the target population(s) and associated ecological community relative to its potential productivity.”* Sub-Criterion 1.1.1 states that *“Scientifically defensible stock units have been defined and the geographic distribution of these stocks is known.”* Indicator 1.1.1.1 states that *“The stock units are well defined for the purposes of conservation, fisheries management and stock assessment”*.
- For each indicator, the assessment criteria list scoring guideposts for scores of 60 (pass with conditions), 80 (pass without conditions), and 100. For example, the 80 guidepost for indicator 1.1.1.1 requires that *“The stock units are well defined and include details on the major component stocks”* and that *“The rationale for each stock unit for the target species is clear with regard to conservation, fisheries management and stock, assessment requirements.”*
- To achieve certification, a fishery needs to score at least 60 on every indicator and achieve at weighted average of at least 80 for each of the 3 principles. The relative importance of each indicators (i.e. weights) are determined by the evaluation team.

- Conditions will be imposed on the fishery for each indicator that is scored between 60 and 80, and annual progress for each condition needd to be demonstrated to retain the certification.
- Every 5 years, the fishery undergoes a full recertification.

The remainder of this Appendix lists all the indicators with links to relevant section in this *Management Summary* (MS) and the *Certification Unit Profiles* (CUP)

Principle 1: Target Stocks and their status

A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.

Indicators	Relevant Sections (MS = Management Summary, CUP = Certification Unit Profile)
<p>1.1.1.1 - The stock units are well defined for the purposes of conservation, fisheries management and stock assessment.</p> <p>1.1.1.2 There is general scientific agreement that the stock units are appropriate.</p>	<p>MS 2.2.2 describes the different biological units of Pacific salmon and how they are used in the management system.</p> <p>CUP 2.1.1 provides details about the stock units in each area.</p>
<p>1.1.1.3 The geographic range for harvest of each stock unit in the fishery is known.</p>	<p>CUP 2.1.2 describes stock characteristics, including marine distribution.</p> <p>CUP 2.3 describes the fisheries intercepting each stock unit.</p>
<p>1.1.1.4 Where indicator stocks are used as the primary source of information for making management decisions on a larger group of stocks in a region, the status of the indicator stocks reflects the status of other stocks within the management unit.</p>	<p>Where applicable, CUP 2.1.1.4 describes the use of indicator stocks.</p> <p>CUP 4.2 describes escapement monitoring in each area.</p>
<p>1.1.1.5 Where stock units are composed of significant numbers of fish from enhancement activities, the management system provides for identification of the enhanced fish and their harvest without adversely impacting the diversity, ecological function or viability of wild stocks.</p>	<p>MS 2.4.2 describes monitoring and assessment of BC pink and chum, with a specific section for monitoring enhanced fish. MS 2.5.2 outlines the general decision guidelines for pink and chum fisheries, including the approach to fisheries that target enhanced fish. MS 3.2.5 provides a regional overview of salmon enhancement and restoration activities.</p> <p>CUP 2.2 summarizes enhancement efforts in each area. CUP 3.2 explains the harvest strategy in each area, and CUP 3.3 provides the details for each commercial fishery. CUP 4.6 describes how stock composition is analyzed in each area.</p>
<p>1.1.2.1 Estimates exist of the removals for</p>	<p>MS 2.4.2 describes monitoring and assessment of BC pink and chum, with specific sections on monitoring catch and escapement. MS 2.4.3 outlines how catch and escapement data are</p>

<p>each stock unit.</p> <p>1.1.2.2 Estimates exist of the spawning escapement for each stock unit.</p>	<p>compiled, maintained, and publicly released.</p> <p>CUP 4 describes the assessment framework in each area (catch, escapement, exploitation rates). CUP 5 reviews the current status of stock units, including trends in escapement, catch, and exploitation rate.</p>
<p>Indicators</p>	<p>Relevant Sections (MS = Management Summary, CUP = Certification Unit Profile)</p>
<p>1.1.2.3 The age and size of catch and escapement have been considered, especially for the target stocks.</p> <p>1.1.2.4 The information collected from catch monitoring and stock assessment programs is used to compute productivity estimates for the target stocks and management guidelines for both target and non-target stocks.</p>	<p>MS 2.5.2 outlines the general decision guidelines for pink and chum fisheries and illustrates how annual fisheries respond to available information. MS 3.2.3 outlines research priorities and summarizes some research efforts directly relevant to the management of salmon fisheries (e.g. enumeration methods, stock identification). MS 3.3 summarizes DFO’s approach to integrated management and lists on-going initiatives. MS 4.2.1.1 describes how the annual planning cycle for BC salmon fisheries uses collaborative planning and public review to identify emerging concerns and develop management responses.</p> <p>CUP 3.2 explains the harvest strategy in each area, and CUP 3.3 provides the details for each commercial fishery. CUP 5 reviews the current status of stock units, including trends in escapement, catch, exploitation rate, and size. CUP 6 describes the resulting conservation and recovery efforts.</p>
<p>1.1.3.1 Limit Reference Points or operational equivalents have been set and are appropriate to protect the stocks harvested in the fishery.</p> <p>1.1.3.2 Target Reference Points (TRPs) or operational equivalent have been set.</p>	<p>MS 2.3 provides a comprehensive inventory of goals and targets for BC pink and chum, including an explanation of management reference points currently in place, and formal benchmarks under development as part of the <i>Wild Salmon Policy</i> implementation.</p> <p>CUP 2.4 lists specific objectives and management reference points for each stock unit.</p>
<p>1.2.1 There is a well-defined and effective strategy, and a specific recovery plan in place, to promote recovery of the target stock within reasonable time frames.</p>	<p>Note the MSC guidance and intent statements by the evaluation team regarding these indicators.</p> <p>MS 3.2.1 summarizes the processes for identifying species at risk and developing recovery plans. This covers all Canadian wildlife species.</p>

	<p>MS 3.2.2 describes the development and implementation of the <i>Wild Salmon Policy</i>, which focused on conservation and recovery planning for functionally distinct group of wild Pacific Salmon, called <i>Conservation Units</i>.</p> <p>MS 3.4 includes an inventory of major conservation and recovery efforts, including links to completed recovery plans. Appendix 1 lists management actions designed to achieve conservation objectives (e.g. to reduce coho by-catch).</p> <p>Decision guidelines for each fishery in CUP 3.3 outline how fisheries adapt to variations in abundance.</p> <p>CUP 6 highlights specific conservation measures in each area.</p>
<p>Indicators</p>	<p>Relevant Sections (MS = Management Summary, CUP = Certification Unit Profile)</p>
<p>1.2.2 Target stocks are not depleted and recent stock sizes are assessed to be above appropriate limit reference points (or equivalents) for the target stocks.</p>	<p>Note the MSC guidance and intent statements by the evaluation team regarding these indicators.</p> <p>Chapter 5 of each unit profile describes the status of target stocks in each area.</p>
<p>1.3.1 Information on biological characteristics such as the age, size, sex and genetic structure of the target stocks is considered prior to making management decisions and management actions are consistent with maintaining healthy age, size, sex and genetic structure of the target stocks.</p>	<p>MS 3.2.2.4 summarizes the comprehensive approach developed for identifying conservation units of the five Pacific salmon species under federal responsibility, based on a combination of the ecological context, the life history of each population, and genetic population structure.</p> <p>Table 1 of each unit profile compares the conservation units to management areas, and lists the component populations.</p> <p>CUP 2.1 describes the stocks units and population characteristics for pink and chum salmon in each area.</p>

Principle 2: Ecosystem

Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends.

Indicators	Relevant Sections (MS = Management Summary, CUP = Certification Unit Profile)
<p>2.1.1 The management plan for the prosecution of the fisheries provides a high confidence that direct impacts on non-target species are identified.</p>	<p>BC pink and chum fisheries are subject to extensive monitoring, assessment, and reporting requirements for target and non-target species.</p> <p>MS 1.2.7.4 briefly describes the selective fishing policy. MS 3.2.4 recounts the development and implementation of selective fishing measures in BC salmon fisheries, and includes links to mortality studies from different fisheries. MS 1.2.9 describes collaborative initiatives related to the changing structure of Pacific salmon fisheries, which include strong elements of enhanced monitoring and reporting.</p> <p>MS 2.4 describes the current monitoring and assessment approach, and more specifically, MS 2.4.2.5 discusses catch monitoring programs in the different fisheries, including provisions for reporting any harvest of non-target species.</p> <p>MS 2.5.4.3 describes measures that have been implemented to control incidental harvest of non-target stocks and by-catch of non-target species.</p> <p>MS 2.6 explains the mechanisms in place to monitor and enforce compliance with requirements for selective fishing and by-catch reporting.</p> <p>MS 3.4 includes an inventory of major conservation and recovery efforts, including measures to reduce by-catch of particular stocks or species of concern. Appendix 1 lists management actions designed to achieve conservation objectives (e.g. to reduce coho by-catch).</p> <p>Decision guidelines for each fishery in CUP 3.3 outline measures to reduce by-catch of non-target species. CUP 6 highlights highlights specific conservation measures in each area.</p>

Indicators	Relevant Sections (MS = Management Summary, CUP = Certification Unit Profile)
<p>2.1.2 The management system includes measures to reduce marine ecosystem impacts.</p>	<p>BC pink and chum fisheries are continuously adapted to reduce marine ecosystem impacts.</p> <p>MS 3.3 describes integrated management projects, and MS 3.2.3.7 summarizes research into Pacific salmon and their ecosystem.</p> <p>MS 2.5.4.4 outlines measures and initiatives in place to control marine ecosystem impacts.</p> <p>CUP 5 includes details about stock status and key indicators related to ecosystem impacts (e.g. long-term trends in abundance, exploitation rate, and stock composition)</p> <p>Also refer to relevant sections for MSC Indicator 2.1.1</p>
<p>2.1.3 Research efforts are ongoing to identify new problems and define the magnitude of existing problems, and fisheries managers have a process to incorporate this understanding into their management decisions.</p> <p>2.1.4 The management system supports research efforts to understand the adequacy of existing escapement goals for meeting freshwater ecosystem needs.</p> <p>2.1.5 The management system supports research efforts to understand human caused impacts on the environment caused by non-fishing activities (e.g., aquaculture, climate change, water removal, water quality, timber harvests, agriculture, etc.) ;the effect of these impacts on salmon production and incorporates this information into harvest management plans and escapement goals.</p>	<p>Refer to MSC Indicator 3.1.5 for an overview management responses to new information.</p> <p>Refer to MSC Indicator 3.2.1 and 3.2.2 for information about research and assessment programs. In particular, MS 3.2.3 summarizes salmon research priorities, describes the 5-year research agenda, and includes links to relevant research organized by topic area (e.g. salmon and their ecosystem).</p> <p>Refer to MSC Indicator 3.4.2.1 for the process of identifying conservation concerns and developing recovery initiatives.</p> <p>Good illustrations of collaborative research and implementation are the Selective Fisheries Program (MS 3.2.4), the Wild Salmon Policy (MS 3.2.2), recovery strategies for endangered or threatened species listed under the <i>Species at Risk Act</i> (MS 3.4), and integrated management initiatives, which support research into large-scale, long-term impacts of human activities in marine and coastal ecosystems (MS 3.3).</p> <p>BC pink and chum fisheries are managed to address time- and area-specific concerns over incidental harvests and by-catch through restrictions on location, timing, gear, and retention for net and troll fisheries. MS 3.4 includes a comprehensive inventory of conservation objectives and resulting recovery initiatives. MS 2.5.4 summarizes specific conservation measures implemented in pink and chum fisheries. Appendix 1 lists management actions designed to achieve conservation objectives (e.g. to reduce coho by-catch).</p>

Indicators	Relevant Sections (MS = Management Summary, CUP = Certification Unit Profile)
<p>2.2.1 The management of the fishery includes provisions for integrating and synthesizing new scientific information on biological diversity at the genetic, species or population level of all species harvested in the fishery and impacts on endangered, threatened, protected or icon species.</p> <p>2.3.1 Management strategies include provision for restrictions to the fishery to enable recovery of non-target stocks to levels above established LRPs (Limit Reference Points)</p>	<p>BC pink and chum fisheries are managed based a comprehensive suite of objectives, including the conservation of biological diversity.</p> <p>Refer to MSC Indicator 3.1.1 for a detailed inventory of objectives.</p> <p>The legal basis for conserving biological diversity in Canada is the <i>Species at Risk Act</i> (MS 1.1.2.4)</p> <p>The policy framework for conserving the biological diversity of wild salmon is mapped out in the Wild Salmon Policy (MS 3.2.2)</p> <p>MS 1.2.7.4 briefly describes the selective fishing policy. MS 3.2.4 recounts the development and implementation of selective fishing measures in BC salmon fisheries, and includes links to mortality studies from different fisheries. MS 1.2.9 describes collaborative initiatives related to the changing structure of Pacific salmon fisheries, which include strong elements of enhanced monitoring and reporting.</p> <p>MS 2.4 describes the current monitoring and assessment approach, and more specifically, MS 2.4.2.5 discusses catch monitoring programs in the different fisheries, including provisions for reporting any harvest of non-target species.</p> <p>MS 2.5.4.3 describes measures that have been implemented to control incidental harvest of non-target stocks and by-catch of non-target species.</p> <p>MS 2.6 explains the mechanisms in place to monitor and enforce compliance with requirements for selective fishing and by-catch reporting.</p> <p>MS 3.4 includes an inventory of major conservation and recovery efforts, including measures to reduce by-catch of particular stocks or species of concern (i.e. marine species listed as threatened or endangered under the <i>Species at Risk Act</i>).</p> <p>Appendix 1 lists management actions designed to achieve conservation objectives (e.g. to reduce coho by-catch).</p> <p>Decision guidelines for each fishery in CUP 3.3 outline measures to reduce by-catch of non-target species. CUP 6 highlights specific conservation measures in each area.</p>

Principle 3: Management System

The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.

Indicators	Relevant Sections (MS = Management Summary, CUP = Certification Unit Profile)
<p>3.1.1 The management system has a clear and defensible set of objectives for the harvest and escapement for target species and accounts for the non-target species captured in association with, or as a consequence of, fishing for target species.</p>	<p>BC pink and chum are managed in a comprehensive legal and policy setting that identifies broad long-term objectives as well as specific annual objectives for each stock and fishery.</p> <p>MS 1.1 summarizes the legal context for Pacific salmon fisheries, including the <i>Fisheries Act</i>, the <i>Oceans Act</i>, and the <i>Species at Risk Act</i>. The provisions of these acts establish clear objectives for the conservation and sustainable harvest of BC pink and chum salmon.</p> <p>MS 1.2 reviews policy developments for Pacific salmon fisheries over the last 15 years, including the Wild Salmon Policy, the Allocation Policy, and the Selective Fishing Policy. Specific examples and links to additional information are included throughout.</p> <p>MS 1.3 includes an overview of social and economic objectives, how they are incorporated into fisheries management (e.g. allocation), and how they are considered in on-going policy initiatives (e.g. Wild Salmon Policy, Pacific Integrated Commercial Fisheries Initiative).</p> <p>MS 2.3 includes an inventory of general goals and targets, a summary of long-term objectives derived from the legal and policy context summarized in MS 1.1 and MS 1.2, as well as a discussion of different reference points in place and under development for Pacific Salmon.</p> <p>Decision Guidelines have been developed for pink and chum fisheries, and are publicly reviewed each year as part of the <i>Integrated Fisheries Management Plan</i> (MS 4.2.1.2). MS 2.5.2 summarizes general decision guidelines, and CUP 3.3 includes detailed decision guidelines for each fishery.</p> <p>BC pink and chum fisheries are managed to address time- and area-specific concerns over incidental harvests and by-catch through restrictions on location, timing, gear, and retention for net and troll fisheries. MS 3.4 includes a comprehensive inventory of conservation objectives and resulting recovery initiatives. MS 2.5.4 summarizes specific conservation measures implemented in pink and chum fisheries. Appendix 1 lists management actions designed to achieve conservation objectives (e.g. to reduce coho by-catch).</p>

Indicators	Relevant Sections (MS = Management Summary, CUP = Certification Unit Profile)
3.1.1 continued	<p>CUP 2.4 describes conservation and management objectives for each area, and briefly introduces the main performance measures used for planning, implementation, and review.</p> <p>CUP 3.3 contains a detailed description of each fishery, including management reference points (i.e. escapement targets, exploitation rate limits).</p>
<p>3.1.2 The management system provides for periodic assessment of the biological status of the target species and the impact of fishing.</p>	<p>BC pink and chum are assessed annually. Assessment information is publicly distributed and incorporated into the annual planning cycle.</p> <p>MS 2.4.1 outlines the stock assessment program for Pacific salmon and provides an overview of different publications (e.g. Science Advisory Reports, Stock Status Reports, info bulletins)</p> <p>MS 2.4.2 summarizes monitoring and assessment activities for BC pink and chum salmon (e.g. escapement surveys, test fisheries, catch monitoring). MS 2.7 summarizes DFO’s toolkit for monitoring and assessment.</p> <p>MS 3.2.3.5 lists available stock status reports for BC pink and chum salmon.</p> <p>An extensive network of processes is in place to assess the status of BC pink and chum stocks, including the annual post-season review (MSC 4.2.1.1) and formal external reviews (MS 4.3.5)</p> <p>CUP 4 details the assessment programs for each area.</p> <p>CUP 5 describes the status of target stocks in each area.</p>
<p>3.1.3 The management system includes a mechanism to identify and manage the impact of fishing on the ecosystem.</p>	<p>In addition to the research programs, integrated management initiatives, and impact-reduction measures listed for MSC Indicator 2.1.2, the management system includes an extensive network of collaborative and consultative processes, described under MSC Indicator 3.3.1, which is used to bring any ecosystem-related concerns into annual fisheries planning, policy implementation, and the development of research priorities, as described under MSC Indicator 3.2.1.</p>

Indicators	Relevant Sections (MS = Management Summary, CUP = Certification Unit Profile)
<p>3.1.4 When dealing with uncertainty, the management system provides for utilizing the best scientific information available to manage the fishery, while employing a precautionary approach.</p>	<p>The management system operates under a comprehensive legal and policy framework (MS 1.1 and 1.2) that explicitly mandates a precautionary approach to dealing with uncertainty (e.g. <i>Species at Risk Act</i>, Wild Salmon Policy)</p> <p>MS 1.2.2.2 briefly describes the on-going development of a formal policy framework for incorporating the precautionary approach into fisheries management.</p> <p>MS 1.2.2.3 retraces research and policy development related to DFO’s implementation of the precautionary approach, and lists examples of precautionary practices.</p> <p>CUP 3.3 contains a detailed description of each fishery, including decision guidelines that explain anticipated responses to different possible scenarios and the use of in-season information.</p>
<p>3.1.5 Management response to new information on the fishery and the fish populations is timely and adaptive.</p>	<p>Management of BC pink and chum fisheries responds to in-season information (e.g. test fishery results), annual post-season reviews (e.g. escapement relative to target), and long-term patterns (e.g. recovery initiatives):</p> <p>MS 4.2.1.1 describes the annual planning cycle.</p> <p>MS 2.5.2 outlines the general decision guidelines for pink and chum fisheries and illustrates how annual fisheries respond to available information. CUP 3.2 explains the harvest strategy in each area, and CUP 3.3 provides the details for each commercial fishery and identifies specific pre-season and in-season information used for decision making.</p> <p>Refer to MSC Indicator 3.4.1.2 for additional details</p>

Indicators	Relevant Sections (MS = Management Summary, CUP = Certification Unit Profile)
<p>3.1.6 The management system provides a process for considering the social and economic impacts of the fishery.</p>	<p>Extensive collaboration and public participation ensure that social and economic considerations are brought into annual and long-term planning processes.</p> <p>MS 1.3 includes an overview of social and economic objectives, how they are incorporated into fisheries management (e.g. allocation), and how they are considered in on-going policy initiatives (e.g. Wild Salmon Policy, Pacific Integrated Commercial Fisheries Initiative).</p> <p>MS 4.2 outlines the departmental support structures for enabling participation.</p> <p>MS 4.3 describes the different types of participatory processes, with an inventory of examples for each, explains the departmental approach to major policy initiatives, and summarizes procedures for internal and external review.</p>
<p>3.1.7 The management system provides decision makers with useful and relevant information and advice for managing the fishery.</p>	<p>Management of BC pink and chum fisheries draws on many sources of information and advice:</p> <p>An extensive information base has been developed through on-going stock assessment, research, and fishery monitoring. Refer to relevant sections for MSC Indicator 2.1.1 and 2.1.2 for details about the monitoring and assessment framework. Refer to MSC Indicator 3.2.1 and 3.2.2 for details about the research program and current priorities.</p> <p>Scientific advice is formally developed and publicly released through the Pacific Science Advice Review Committee, which serves as one of several internal review processes (MS 4.3.5.1).</p> <p>An extensive network of processes is in place to compile advice on BC pink and chum fisheries, including a public review of the annual Integrated Fisheries Management Plan (MS 4.2.1.2), annual post-season reviews (MSC 4.2.1.1), internal and external reviews (MS 4.3.5), and the other processes described in MS 4.</p> <p>MS 2.5.2 outlines the general decision guidelines for pink and chum fisheries and illustrates how annual fisheries respond to available information. CUP 3.2 explains the harvest strategy in each area, and CUP 3.3 provides the details for each commercial fishery and identifies specific pre-season and in-season information used for decision making.</p>

Indicators	Relevant Sections (MS = Management Summary, CUP = Certification Unit Profile)
<p>3.1.8 The management system provides for socioeconomic incentives for sustainable fishing.</p>	<p>The management system creates strong incentives for participation in sustainable fishing initiatives:</p> <p>MS 1.2.9 describes incentives for participating in enhanced accountability initiatives based on the expectation of more reliable fishing opportunities (e.g. fixed share of TAC). MS 1.2.9.5 summarizes pilot projects.</p> <p>MS 3.4 includes a comprehensive inventory of conservation initiatives in the Pacific Region, and Appendix 1 lists specific conservation measures implemented in salmon fisheries by gear-type and statistical area. These precedents establish a strong incentive for collaborative improvement of strategies for selective fishing and effort control (Section 3.2.4).</p> <p>One outcome of the Selective Fisheries Program (MS 3.2.4.2) is a momentum of close collaboration between the department and harvesters on selective fishing issues, with clear incentives for on-going improvement. This momentum is reflected in on-going collaborative projects and the <i>Codes of Conduct</i> developed by the commercial and recreational sectors (see Sections 3.2.4.3 and 3.2.4.4)</p> <p>MS 2.6.1 explains that incentives are an important element of DFO’s compliance strategy, supplemented by extensive monitoring and enforcement programs. Specific examples of compliance incentives are included in Sections 2.5.4, 3.2.4, and 3.4.</p>
<p>3.1.9 The hatcheries are subjected to regulations that ensure harvest management practices and protocols that sustain the genetic structure and productivity of the natural spawning population are followed and there is coordination between hatchery programs from different agencies/operators.</p>	<p>Hatchery programs for BC pink and chum salmon are fully coordinated through DFO, in a combination of federally-operated facilities and volunteer-run community facilities. Provincial hatcheries raise different species, and in the few cases where federally operated hatcheries raise species under provincial jurisdiction are jointly managed under close collaboration:</p> <p>MS 2.2.3 summarizes fisheries targeting BC pink and chum, and identifies those fisheries that target hatchery fish.</p>

Indicators	Relevant Sections (MS = Management Summary, CUP = Certification Unit Profile)
3.1.9 continued	<p>MS 3.2.5 describes the regional approach to salmon enhancement and restoration, provides a brief history of the Salmon Enhancement Program (SEP), and includes an inventory of current enhancement and restoration activities for BC pink and chum. Links to up-to-date release information are included for each facility.</p> <p>MS 4.3.3.2 introduces the Salmon Enhancement and Habitat Advisory Board (SEHAB) and links to additional information.</p> <p>CUP 2.2 describes pink and chum enhancement activities in each area. CUP 3 describes the specific harvest strategies in place for those fisheries that target hatchery fish.</p>
<p>3.2.1 The research plan covers the scope of the fishery, includes all target species, accounts for the non-target species captured in association with, or as a consequence of fishing for target species, and considers the impact of fishing on the ecosystem and socioeconomic factors affected by the management program.</p> <p>3.2.2 Research results are available in a timely fashion to interested parties, and there is a mechanism for periodic review of the content, scope and results of the research plan</p>	<p>DFO has established an extensive monitoring and assessment structure for Pacific salmon and the fisheries targeting them. The management system publicly shares data and research as they become available, typically working closely with external reviewers and stakeholders.</p> <p>MS 2.4.1 outlines the stock assessment program for Pacific salmon with links to different publications (e.g. Science Advisory Reports, Stock Status Reports, information bulletins). MS 2.4.1.2 describes the different types of data collection activities (stock assessment, research, fishery monitoring).</p> <p>MS 2.4.2 summarizes monitoring and assessment activities for BC pink and chum salmon (e.g. escapement surveys, test fisheries, catch monitoring), with links to on-line data sources which are frequently updated during each fishing season.</p> <p>MS 2.4.3 describes how escapement and catch data are collected, managed, and publicly released.</p> <p>MS 3.2.3 summarizes salmon research priorities, describes the 5-year research agenda, and includes links to relevant research papers organized by topic area (e.g. enumeration methods, stock identification).</p> <p>MS 3.3.1.4 links to on-line information resources.</p>

Indicators	Relevant Sections (MS = Management Summary, CUP = Certification Unit Profile)
<p>3.2.1 and 3.2.2 continued</p>	<p>On-going research is shared with participants in collaborative and consultative processes that contribute to the annual planning cycle (MS 4.2.1.1) and documented in the Integrated Fisheries Management Plan (MS 4.2.1.2).</p> <p>Also refer to relevant sections for MSC Indicator 2.1.1 and 2.1.2 for details about the monitoring and assessment framework.</p> <p>CUP 4 describes the assessment framework in each area (catch, escapement, exploitation rates). CUP 5 reviews the current status of stock units, including trends in escapement, catch, and exploitation rate.</p>
<p>3.3.1 Provides for a consultative process that is open to all interested and affected stakeholders, which allows for their input on a regular basis into the management process.</p>	<p>A comprehensive network of processes for collaboration, consultation, and public participation has been established for BC salmon fisheries.</p> <p>MS 4.2 outlines the departmental support structures for enabling participation.</p> <p>MS 4.3 describes the different types of participatory processes, with an inventory of examples for each, explains the departmental approach to major policy initiatives, and summarizes procedures for internal and external review.</p>
<p>3.4.1.1 Utilizes methods to limit or close fisheries in order to achieve harvest and/or escapement goals, including the establishment of closed areas, no-take zones, and closed dates and times when appropriate.</p>	<p>BC pink and chum fisheries are managed to address time- and area-specific concerns over incidental harvests and by-catch through restrictions on location, timing, gear, and retention for net and troll fisheries</p> <p>MS 1.2.9 describes on-going initiatives related to the changing structure of Pacific salmon fisheries, including licence retirement and enhanced monitoring.</p> <p>MS 2.4 describes the current monitoring and assessment approach, and more specifically, MS 2.4.2.5 discusses catch monitoring programs in the different fisheries, including provisions for reporting any harvest of non-target species.</p> <p>MS 2.5.3 summarizes the access controls in place for each harvest sector, including the strict licencing requirements for commercial salmon fisheries.</p>

Indicators	Relevant Sections (MS = Management Summary, CUP = Certification Unit Profile)
<p>3.4.1.1</p>	<p>MS 2.5.4 outlines the general approach to conservation and recovery in BC salmon fisheries, and describes measures in place to control total removals of target stocks, incidental harvests of non-target stocks, by-catch of non-target species, and ecosystem impacts.</p> <p>MS 2.6 explains the mechanisms in place to monitor and enforce compliance with requirements for harvest targets, selective fishing, and by-catch reporting.</p> <p>MS 3.3.2.1 describes marine protected areas and other spatially persistent fishery closures.</p> <p>MS 3.4 includes an inventory of conservation objectives and resulting recovery initiatives.</p> <p>Appendix 1 lists specific management actions designed to achieve conservation objectives (e.g. to reduce coho by-catch).</p> <p>CUP 2.4 describes conservation and management objectives for each area, and briefly introduces the main performance measures used for planning, implementation, and review.</p> <p>CUP 3.3. contains a detailed description of each fishery, including management reference points (i.e. escapement targets, exploitation rate limits).</p>
<p>3.4.1.2 Provides for restoring depleted target species to specified levels within specified time frames.</p>	<p>A formal public process is used to identify species at risk and develop recovery strategies within a specified time frame. Decision guidelines are in place to respond to changing abundance levels by adjusting fisheries.</p> <p>MS 1.1.2.4 describes the <i>Species at Risk Act</i>.</p> <p>MS 3.2.1 outlines the recovery planning process.</p> <p>MS 2.5.2 outlines the general decision guidelines for pink and chum fisheries and illustrates how annual fisheries respond to available information, such as variable in-season estimates of abundance.</p> <p>MS 2.5.4 outlines the general approach to conservation and recovery in BC salmon fisheries, and describes measures in place to control total removals of target stocks, incidental harvests of non-target stocks, by-catch of non-target species, and ecosystem impacts.</p>

Indicators	Relevant Sections (MS = Management Summary, CUP = Certification Unit Profile)
	<p>MS 2.6 explains the mechanisms in place to monitor and enforce compliance with requirements for harvest targets, selective fishing, and by-catch reporting.</p> <p>MS 3.4 includes an inventory of conservation objectives and resulting recovery initiatives, including the development of recovery strategies for threatened or endangered species listed under the <i>Species at Risk Act</i>.</p> <p>MS 4.2.1.1 describes how the annual planning cycle for BC salmon fisheries uses collaborative planning and public review to identify emerging concerns and develop management responses.</p> <p>Appendix 1 lists specific management actions designed to achieve conservation objectives (e.g. to reduce coho by-catch).</p> <p>CUP 3.2 explains the harvest strategy in each area, and CUP 3.3 provides the details for each commercial fishery. CUP 5 reviews the current status of stock units, including trends in escapement, catch, exploitation rate, and size. CUP 6 describes the resulting conservation and recovery efforts.</p>
<p>3.4.2.1 The management system includes compliance provisions.</p>	<p>MS 2.6 explains the mechanisms in place to monitor and enforce compliance with requirements for harvest targets, selective fishing, and by-catch reporting.</p> <p>Also refer to the relevant sections for MSC Indicator 3.1.8.</p>
<p>3.4.2.2 The management system includes monitoring provisions.</p>	<p>MS 2.4.1 outlines the stock assessment program for Pacific salmon and provides an overview of different publications (e.g. Science Advisory Reports, Stock Status Reports, information bulletins)</p> <p>MS 2.4.2 summarizes monitoring and assessment activities for BC pink and chum salmon (e.g. escapement surveys, test fisheries, catch monitoring). MS 2.7 summarizes DFO’s toolkit for monitoring and assessment.</p> <p>MS 3.2.3.5 lists available stock status reports for BC pink and chum salmon.</p>

Indicators	Relevant Sections (MS = Management Summary, CUP = Certification Unit Profile)
3.4.2.2 continued	<p>An extensive network of processes is in place to assess the status of BC pink and chum stocks, including the annual post-season review (MS 4.2.1.1) and formal external reviews (MS 4.3.5)</p> <p>CUP 4 details the assessment programs for each area.</p> <p>CUP 5 describes the status of target stocks in each area.</p>
<p>3.5.1 There is an effective and timely system for internal review of the management system.</p> <p>3.5.2 There is an effective and timely system for external review of the management system.</p> <p>3.5.3 There is a mechanism for incorporating into the management system recommendations resulting from the review process.</p> <p>3.5.4 There is an appropriate mechanism for resolving disputes.</p>	<p>A comprehensive network of processes for collaboration, consultation, and public participation has been established for BC salmon fisheries.</p> <p>MS 4.2 outlines the departmental support structures for enabling participation. This includes the annual planning cycle (MS 4.2.1.1), the use of draft Integrated Fisheries Management Plans (MS 4.2.1.2) to solicit public feedback on proposed conservation measures, harvest strategies, and fishing plans, and formal dispute resolution mechanisms (MS 4.2.2.4)</p> <p>MS 4.3 describes the different types of participatory processes, with an inventory of examples for each. This covers the departmental approach to major policy initiatives (MS 4.3.2.1), as well as procedures for internal and external review (MS 4.3.5), including the Regional Management Committee, the Stock Assessment Coordinating Committee, the Pacific Science Advice Review Committee, the Pacific Fisheries and Resource Conservation Council, the Committee on the Status of Endangered Wildlife in Canada, and the federal auditor general.</p>
3.6.1 The fishery is not operated in a unilateral manner in contravention to international agreements.	<p>MS 1.1.4 summarizes international agreements considered for this indicator, and describes how they are being implemented in Canadian salmon fisheries. For example:</p> <p>The <i>Coastal Fisheries Protection Act</i> (MS 1.1.2.6) and the Pacific Salmon Treaty (MS 1.1.4.4) are legal instruments for ensuring consistency with the UN Convention on the Law of the Sea (MS 1.1.4.1).</p>

Indicators	Relevant Sections (MS = Management Summary, CUP = Certification Unit Profile)
3.6.1 continued	<p>The <i>Species at Risk Act</i> (MS 1.1.2.4), the <i>Oceans Act</i> (MS 1.1.2.3) , and the Wild Salmon Policy (MS 3.2.2) are domestic instruments that reflect the provisions of the UN Convention On Biological Diversity. Implementation examples are included in MS 3.2.2.3, MS 3.3, and MS 3.4. Specific fisheries measures taken to address incidental harvest and by-catch are listed by area in Appendix 1.</p> <p>MS 1.1.4.4 outlines the annual implementation of the Pacific Salmon Treaty, and links to annual reports that review each fishing season.</p>
3.6.2 The fishery is carried out in a manner consistent with all relevant domestic laws and regulations relevant to the fishery	<p>BC pink and chum fisheries are conducted under comprehensive federal and provincial laws, with extensive compliance monitoring and enforcement:</p> <p>MS 1.1.2 summarizes relevant federal legislation and and regulations.</p> <p>MS 1.1.3 summarizes relevant provincial legislation.</p> <p>MS 2.6 describes the range of compliance mechanisms in place for BC salmon fisheries, lists current enforcement priorities, and links to annual compliance summaries.</p>
3.6.3 The management system exists within an appropriate and effective legal and/or customary framework which ensures that it observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood.	<p>The exact scope and practical implementation of aboriginal rights is not fully defined for Canadian fisheries, and DFO is negotiating with First Nations through the treaty process to define those rights. Different aspects of Aboriginal rights have been addressed in court decisions, but uncertainty still remains about the exact interpretation of these rights within the complex operational setting of salmon fisheries. There are five distinct elements of First Nations rights in BC salmon fisheries:</p> <p><i>Court decisions that evaluate past management decisions and clarify the context for future management decisions.</i> MS 1.1.5 establishes the legal setting for FN access to fishing opportunities, explains the evolving nature of these rights and their interpretation in specific cases, reviews pertinent case law, explains the different types of FN fisheries (FSC, Economic Opportunity, treaty), and summarizes policy development for aboriginal fisheries.</p>

Indicators	Relevant Sections (MS = Management Summary, CUP = Certification Unit Profile)
3.6.3 continued	<p><i>Established allocation priority of communal First Nation fisheries for Food, Social, and Ceremonial (FSC) purposes.</i> MS 1.3 explains how social and economic considerations (including FN allocations) are incorporated in major on-going initiatives, and details the allocation approach.</p> <p><i>Policies and departmental initiatives to implement the provisions of the first three elements.</i> These include multi-year initiatives focused on First Nations, such as the Aboriginal Fisheries Strategy (AFS), as well as broader processes, such as Pacific Fisheries Reform (PFR). MS 1.2.4 retraces the development and implementation of AFS. MS 1.2.6 to 1.2.9 describe the policy and implementation initiatives that are reshaping Pacific Fisheries and FN participation in those fisheries.</p> <p><i>Consultative and advisory processes to incorporate the first four elements into fisheries management.</i> MS 4 describes DFO's approach to consultation and public participation, with specific sections on explaining the different definitions of consultation, describing bilateral consultation with First Nations, and summarizing the various processes in which First Nations participate.</p> <p><i>Planning and implementation of fisheries.</i> MS 2.2.3 explains how the different fisheries fit together (FSC, ESSR, commercial, Recreational). MS 2.5 explains how annual fishing plans are developed, lists general guidelines for all pink and chum fisheries, and describes how access is controlled in the different fisheries (including FSC fisheries). Section 2.7 summarizes how DFO and First Nations collaborate on assessment, monitoring, and enforcement.</p> <p>These five elements complement each other to form a comprehensive, evolving whole, and have to be evaluated as such.</p>

Indicators	Relevant Sections (MS = Management Summary, CUP = Certification Unit Profile)
<p>3.7.1 Utilization of gear and fishing practices that minimize both the catch of non-target species, and the mortality of this catch.</p>	<p>BC pink and chum fisheries have been substantially modified to reduce by-catch of non-target species:</p> <p>MS 1.2.7.4 briefly describes the selective fishing policy. MS 3.2.4 recounts the development and implementation of selective fishing measures in BC salmon fisheries, and includes links to mortality studies from different fisheries. MS 1.2.9 describes collaborative initiatives related to the changing structure of Pacific salmon fisheries, which include reduction of by-catch mortality.</p> <p>MS 2.4 describes the current monitoring and assessment approach, and more specifically, MS 2.4.2.5 discusses catch monitoring programs in the different fisheries, including provisions for reporting any harvest of non-target species.</p> <p>MS 2.5.4.3 describes measures that have been implemented to control incidental harvest of non-target stocks and by-catch of non-target species.</p> <p>MS 2.6 explains the mechanisms in place to monitor and enforce compliance with requirements for selective fishing and by-catch reporting.</p> <p>MS 3.4 includes an inventory of major conservation and recovery efforts, including measures to reduce by-catch of particular stocks or species of concern. Appendix 1 lists management actions designed to achieve conservation objectives (e.g. to reduce coho by-catch).</p> <p>Decision guidelines for each fishery in CUP 3.3 outline measures to reduce by-catch of non-target species. CUP 6 highlights highlights specific conservation measures in each area.</p>

Indicators	Relevant Sections (MS = Management Summary, CUP = Certification Unit Profile)
<p>3.7.2 Prohibits the use destructive fishing practices, such as poisons and explosives.</p>	<p>The <i>Fisheries Act</i> (MS 1.1.2.2) prohibits any use of explosives (Section 28) or deleterious substances (Section 34) in water frequented by fish. MS 3.3.1.3 includes an overview of the permit process for developments that affect fish habitat.</p> <p>The type, size, and quantity of permitted fishing equipment that is specified in the Conditions of Licence (MS 2.5.3). Neither explosives nor poisons are included in the list of permitted gear and equipment.</p> <p>MS 2.5.3.1 links to guidelines for the use of explosives in or near Canadian fisheries waters.</p> <p>MS 2.6 explains the mechanisms in place to monitor and enforce compliance with requirements for non-destructive fishing methods.</p>

Indicators	Relevant Sections (MS = Management Summary, CUP = Certification Unit Profile)
<p>3.7.3 Minimizes operational waste such as lost fishing gear, oil spills, on-board spoilage of catch, etc.</p>	<p>MS 3.2.4.4 outlines impact reduction measures, including the Canadian Code of Conduct for Responsible Fishing Operations.</p> <p>Commercial fishing licence conditions include provisions for minimizing operational waste. Vessels are inspected to ensure, among other things, that operational waste is not released into holding areas. Similar inspection programs are in place in fish plants to ensure that operational waste is minimized and disposed of properly.</p>
<p>3.7.4 The management system solicits the cooperation of the fishing industry and other relevant stakeholders in the collection of data on the catch and discard of non-target species and undersized individuals of target species.</p>	<p>DFO has established an extensive monitoring and assessment structure for Pacific salmon and the fisheries targeting them.</p> <p>MS 1.2.9 describes on-going initiatives related to the changing structure of Pacific fisheries, which emphasise enhanced monitoring and improved collaboration. The section discusses incentives for collaboration and lists pilot projects.</p> <p>MS 2.4.1.2 explains how collaborative programs complement DFO-led, fishery-independent data collection efforts.</p> <p>MS 2.4.2.5 outlines fishery monitoring and catch reporting programs in place for pink and chum fisheries.</p> <p>MS 2.7 summarizes DFO’s toolkit for monitoring and assessment, including collaborative programs such assessment fisheries</p> <p>MS 4.3.4.4 describes formal collaborative arrangements, which includes arrangements for catch monitoring (e.g. charter patrols) and stock assessment (e.g. test fisheries).</p> <p>MS 3.2.4 summarizes the Selective Fishing Program and includes examples of on-going implementation. MS 2.5.4.3 describes measures in place to reduce incidental harvest and by-catch. Many of these were developed in close cooperation with stakeholders.</p> <p>CUP 4.2.4 describes details of the catch monitoring program in each area.</p>

Indicators	Relevant Sections (MS = Management Summary, CUP = Certification Unit Profile)
<p>3.7.5 Implements fishing methods that minimize adverse impacts on habitat, especially in critical zones.</p>	<p>Commercial salmon fisheries in BC use gill net, seine, or troll gear. Neither of these gear types has been associated with habitat impacts. More generally, a range of measures and initiatives are in place to reduce any impacts of fishing activity:</p> <p>MS 2.5.4.4 describes measures to reduce potential marine ecosystem impacts of salmon fisheries.</p> <p>MS 3.2.4.4 summarizes impact reduction measures developed under the Selective Fisheries Program, as well as the Canadian Code of Conduct for Responsible Fishing Operations.</p> <p>MS 3.3.2.1 lists marine protected areas and other spatially persistent fishing closures.</p> <p>Appendix 2 illustrates the fine spatial resolution of critical area protection with a list of salmon fishing closures in Johnstone Strait (Areas 12 and 13).</p>