

PACIFIC REGION

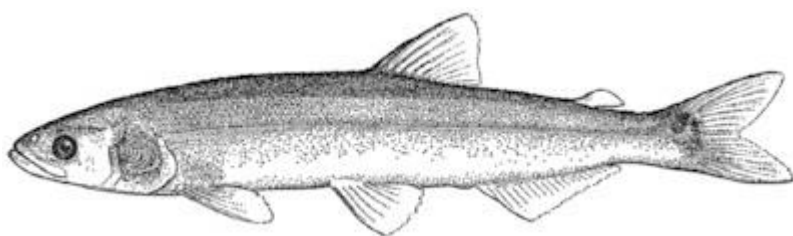
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# INTEGRATED FISHERIES MANAGEMENT PLAN

## JANUARY 1 - DECEMBER 31, 2021

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EULACHON  
FRASER RIVER



*Thaleichthys pacificus*



Fisheries and Oceans  
Canada

Pêches et Océans  
Canada

Canada

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

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# DEPARTMENT CONTACTS

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

<http://www.pac.dfo-mpo.gc.ca/fm-gp/contacts-eng.html>

## **Fisheries and Oceans Canada – Pacific Region**

Website: <http://www.pac.dfo-mpo.gc.ca>

Observe, Record, and Report 1-800-465-4336

National On-Line Licencing System (NOLS) 1-877-535-7307

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A/Regional Recreational Fisheries Coordinator	Greg Hornby	(250) 286-5886
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SARA Science Coordinator	Paul Grant	(250) 217-5376
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## **Fraser and Interior Area**

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Fraser Area Chief, Conservation and Protection	Sean Maloney	(604) 666-4162
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Resource Management Program Co-ordinator	Jamie Scroggie	(250) 851-4878
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Resource Manager (Below Port Mann Bridge)	Brian Matts	(604) 666-2096
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A/Resource Manager (Above Port Mann Bridge)	Elan Park	(604) 250-2260
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# INDEX OF WEB-BASED INFORMATION

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## FISHERIES AND OCEANS CANADA GENERAL INFORMATION

### MAIN PAGE

<http://www.dfo-mpo.gc.ca>

Our Vision, Latest News, Current Topics

Twitter:

DFO Pacific: [@DFO\\_Pacific](#)

En Français: [@MPO\\_Pacifique](#)

### ACTS, ORDERS, AND REGULATIONS

<https://www.dfo-mpo.gc.ca/acts-lois/index-eng.htm>

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

### REPORTS AND PUBLICATIONS

<http://www.dfo-mpo.gc.ca/reports-rapports-eng.htm>

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

### FEDERAL SCIENCE LIBRARY

<http://science-libraries.canada.ca/eng/fisheries-oceans/>

Fisheries and Oceans Canada online library catalogue

## **PACIFIC REGION**

### **GENERAL**

#### **MAIN PAGE**

<http://www.pac.dfo-mpo.gc.ca/index-eng.html>

General information, Area information, Latest news, Current topics

#### **POLICIES, REPORTS AND PROGRAMS**

<http://www.pac.dfo-mpo.gc.ca/fm-gp/species-especies/salmon-saumon/pol/index-eng.html>

Reports and Discussion Papers, New Directions Policy Series, Agreements

#### **OCEANS PROGRAM**

<http://www.pac.dfo-mpo.gc.ca/oceans/index-eng.html>

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

## **PACIFIC REGION FISHERIES MANAGEMENT**

#### **MAIN PAGE**

<http://www.dfo-mpo.gc.ca/fm-gp/index-eng.htm>

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

## **ABORIGINAL FISHERIES STRATEGY**

<http://www.pac.dfo-mpo.gc.ca/abor-autoc/index-eng.html>

or <http://www.dfo-mpo.gc.ca/fm-gp/aboriginal-autochtones/index-eng.htm>

Aboriginal Fisheries Strategy (AFS) principles and objectives, AFS agreements, Programs, Treaty Negotiations

## **AQUACULTURE MANAGEMENT**

<http://www.pac.dfo-mpo.gc.ca/aquaculture/index-eng.html>

The new federal regulatory program for aquaculture in British Columbia, Program overview and administration, public reporting, and aquaculture science

## **RECREATIONAL FISHERIES**

<http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/index-eng.htm>

Fishery Regulations and Notices, Fishing Information, Recreational Fishery, Policy and Management, Contacts, Current BC Tidal Waters Sport Fishing Guide and Freshwater Supplement, Rockfish Conservation Areas, Shellfish Contamination Closures, On-line Licencing

## **COMMERCIAL FISHERIES**

<https://www.dfo-mpo.gc.ca/fisheries-peches/commercial-commerciale/pac-yukon-eng.html>

Links to Groundfish, Herring, Salmon, Shellfish and New and Emerging Fisheries homepages; Selective Fishing, Test Fishing Information, Fishing Areas, Canadian Tide Tables, Fishery Management Plans, Commercial Fishery Notices (openings and closures)

## **FISHERIES NOTICES**

<http://www-ops2.pac.dfo-mpo.gc.ca/fns-sap/index-eng.cfm?>

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

## **INTEGRATED FISHERY MANAGEMENT PLANS**

<http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/ifmp-gmp/index-eng.htm>

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

## **LICENCING**

<http://www.pac.dfo-mpo.gc.ca/fm-gp/licence-permis/index-eng.html>

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

## **NATIONAL ON-LINE LICENSING SYSTEM (NOLS)**

<https://fishing-peche.dfo-mpo.gc.ca>

E-mail: [fishing-peche@dfo-mpo.gc.ca](mailto:fishing-peche@dfo-mpo.gc.ca)

(Please include your name and the DFO Region in which you are located.)

Telephone: 1-877-535-7307

Fax: 613-990-1866

TTY: 1-800-465-7735

## **PACIFIC REGION POLICY AND COMMUNICATIONS**

### **MAIN PAGE**

<https://www.dfo-mpo.gc.ca/about-notre-sujet/media-eng.htm>

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



## **CONSULTATION SECRETARIAT**

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

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

## **PUBLICATIONS CATALOGUE**

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

Information booklets and fact sheets available through Communications branch

## **SPECIES AT RISK ACT (SARA)**

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

SARA species, SARA permits, Public Registry, Enforcement, Stewardship Projects, Consultation, Past Consultation, Indigenous people, Related Sites, For Kids, News Releases

## **PACIFIC REGION SCIENCE**

### **MAIN PAGE**

<http://www.pac.dfo-mpo.gc.ca/science/index-eng.html>

Science Divisions, Research Facilities, PSARC, International Research Initiatives

### **EULACHON SCIENCE PAGES**

<http://www.pac.dfo-mpo.gc.ca/science/species-especes/pelagic-pelagique/eulachon-eulakane-eng.html>

Science projects, CSAS Documents and Stock Status Reports, Other Online Publications, Eulachon Links

# GLOSSARY AND LIST OF ACRONYMS

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Aboriginal Traditional Knowledge (ATK)	Knowledge that is held by, and unique to Aboriginal peoples. It is a living body of knowledge that is cumulative and dynamic and adapted over time to reflect changes in the social, economic, environmental, spiritual, and political spheres of the Aboriginal knowledge holders. It often includes knowledge about the land and its resources, spiritual beliefs, language, mythology, culture, laws, customs and medicines.
Abundance	A measure of quantity, such as for a fish stock or population, describing the number of individuals or a biomass level.
AFS	Aboriginal Fisheries Strategy
Area and Subarea	Defined in Section 2 of the Pacific Fishery Management Area Regulations. A map of Pacific Fishery Management Areas is available on the Department's Internet site at: <a href="http://www.pac.dfo-mpo.gc.ca/fm-gp/maps-cartes/areas-secteurs/index-eng.htm">http://www.pac.dfo-mpo.gc.ca/fm-gp/maps-cartes/areas-secteurs/index-eng.htm</a>
Biomass	Total weight of all individuals in a stock or a population.
Bycatch	The unintentional catch of one species when the target is another.
Committee on the Status of Endangered Wildlife in Canada (COSEWIC)	Committee of experts that assess and designate which wild species are in some danger of disappearing from Canada.
Communal Licence	A licence issued to Indigenous organizations under Section 4 of the Aboriginal Communal Fishing Licences Regulations, pursuant to the Fisheries Act, to carry on fishing and related activities.
CSAS	Canadian Science Advisory Secretariat chaired by DFO and including other federal and provincial government agency representatives and external participants (formerly PSARC).
Ecosystem-Based Management	Taking into account of species interactions and the interdependencies between species and their habitats when making resource management decisions.

Fishing Effort (Effort)	Quantity of effort using a given fishing gear over a given period of time.
Fishing Mortality	Death caused by fishing, often symbolized by the mathematical symbol $F$ .
Food, Social and Ceremonial (FSC)	A fishery conducted by Indigenous groups for food, social and ceremonial purposes.
Intertidal	The area of the ocean shoreline located between the highest high water and lowest low water tidal levels.
Landing	Quantity of a species caught and landed. Harvested animals transferred from a vessel to land.
lb	Imperial pound(s), which is equal to 0.45359237 kg.
Natural Mortality	Mortality due to natural causes, symbolized by the mathematical symbol $M$ .
Pelagic	Living in the surface or middle depths of the sea.
Population	Group of individuals of the same species, forming a breeding unit, and sharing a habitat.
Precautionary Approach	Set of agreed cost-effective measures and actions, including future courses of action, which ensures prudent foresight, reduces or avoids risk to the resource, the environment, and the people, to the extent possible, taking explicitly into account existing uncertainties and the potential consequences of being wrong.
Quota	Portion of the total allowable catch that a unit, such as vessel class, country, etc. is permitted to take from a stock in a given period of time.
Research Survey	Survey at sea, on a research vessel, allowing scientists to obtain information on the abundance and distribution of various species and/or collect oceanographic data. E.g.: bottom trawl survey, plankton survey, hydroacoustic survey, etc.
Spawner	Sexually mature individual.

Spawning Stock	Sexually mature individuals in a stock.
Species at Risk Act (SARA)	The Act is a federal government commitment to prevent wildlife species from becoming extinct and secure the necessary actions for their recovery. It provides the legal protection of wildlife species and the conservation of their biological diversity.
Stakeholders	Individuals or groups with an interest in a particular fishery or activity.
Stock	Describes a population of individuals of one species found in a particular area, and is used as a unit for fisheries management.
Stock Assessment	Scientific evaluation of the status of a species belonging to a same stock within a particular area in a given time period. A stock assessment is the process of collecting, analyzing, and reporting demographic information to determine changes in the abundance of a fishery stock. In some cases, it includes evaluating the effects of fishing on a stock or population to predict the reactions of a stock to alternative management choices.
Substrate	The surface (often the ocean bottom) and its composition, in or on which animals live.
Sub tidal	A portion of the bottom of the ocean that is not exposed at low tide stages. The ocean bottom at elevations below low water or chart datum.
Ton	Short ton, 2000 lb., traditionally used as a unit of measure by fish harvesters in British Columbia.
Tonne	Metric tonne, which is 1000kg or 2204.6 lb.
Total Allowable Catch (TAC)	The amount of catch that may be taken from a stock, often determined by analytical procedures, to achieve management objectives.
Traditional Ecological Knowledge (TEK)	A cumulative body of knowledge and beliefs, handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment.

# FOREWORD

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The purpose of this Integrated Fisheries Management Plan (IFMP) is to identify the main objectives and requirements for the Eulachon fishery in the Fraser River, as well as the management measures that will be used to achieve these objectives. This document also serves to communicate the basic information on the fishery and its management to Fisheries and Oceans Canada (DFO, the Department) staff, legislated co-management boards, Indigenous peoples, harvesters, and other interested parties. This IFMP provides a common understanding of the basic “rules” for the sustainable management of the fisheries resource.

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

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

# **I. OVERVIEW**

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## **I.1. INTRODUCTION**

This Integrated Fisheries Management Plan (IFMP) for Eulachon covers the period from January 1 to December 31, 2021 for the Fraser River area.

The IFMP provides a history and a broad context to the management of the Fraser River Eulachon stock, including issues related to conservation. Given the short life cycle of this species, and consecutive poor returns, there are conservation concerns with Fraser River Eulachon stocks, resulting in commercial and recreational fishery closures and minimal harvest for food, social and ceremonial (FSC) purposes. Long-term closures are required to allow for stock rebuilding.

## **I.2. HISTORY**

Eulachon have historically been and continue to be important to Indigenous groups who harvest them for FSC purposes. The significance of the Indigenous fishery transcends the collection of fish biomass for consumption. Rather, the collection, rendering and subsequent distribution of Eulachon grease are an integral part of coastal Indigenous cultures. Eulachon are eaten fresh, or often smoked, dried, salted or made into grease. Eulachon grease is an important food source for Indigenous groups. It is widely bartered among Indigenous communities and is given as gifts in potlatch ceremonies. The harvest of Eulachon and trade of the rendered oil led to the “grease trails” trade routes. It is used in many traditional foods, to preserve fruit, as medicine and even to lubricate tools (Hay and McCarter, 2000). Central and North Coast Indigenous groups in British Columbia, as well as some Indigenous groups in Alaska, produce grease. However Indigenous groups south of Knight Inlet, including groups on the Fraser River, do not produce grease and instead focus on smoked and fresh Eulachon (Moody, 2008).

There was a minor recreational fishery for Eulachon in the Fraser River in the past; however, it has been closed since 2005.

Commercial harvest of Eulachon on the Fraser River began in the 1870s. The only other large commercial fishery of Eulachon in BC was on the Nass River and it ended in the 1940s. From 1903 to 1912, the Fraser River Eulachon fishery was the fifth largest commercial fishery in BC (Stacey, 1995). More recently, annual catches of Eulachon in the Fraser River from the 1980s to the mid-1990s averaged approximately 20 tonnes per year and peaked in 1996 with an estimated catch of at least 63 tonnes. Due to increasing catch and effort and low levels of abundance, the commercial fishery was closed in 1997. Limited entry licensing was introduced in 1998 with the introduction of the ZU Eulachon licence category. Since closing in 1997, the commercial Eulachon fishery on the Fraser River was only opened twice: in 2002 and 2004, and it has been closed ever since.

## **1.3. TYPE OF FISHERY AND PARTICIPANTS**

### **Indigenous**

Indigenous harvest for FSC purposes is authorized in the lower Fraser River through communal licences. Indigenous groups apply for separate communal licences for Eulachon that are issued on a case-by-case basis. Fishing is primarily by drift net (e.g. gillnet). The use of other gear types may be authorized in traditional fishing areas upon request. Any Indigenous groups interested in developing new harvest methods or restarting historic harvest methods will work with DFO staff to licence and monitor appropriately.

### **Recreational**

The recreational fishery for Eulachon remains closed in all tidal waters and freshwater, including the Fraser River.

### **Commercial**

The commercial Eulachon fishery remains closed in all tidal waters and freshwater, including the Fraser River.

## **1.4. LOCATION OF FISHERY**

### **Indigenous**

Indigenous harvest may occur in portions of the lower Fraser River.

## **1.5. FISHERY CHARACTERISTICS**

Indigenous communal fishing times are collaboratively planned and conditions of licence may include: effort times, time restrictions (12 hours per day), number of days in a week, and/or harvest target balances. For each communal licence, participants must report catches through their respective monitoring programs and report to DFO. A strict monitoring regime is in place: DFO monitors, Fishery Officers, or Indigenous monitors may observe all sets directly or have harvesters pick their nets in the presence of the monitors.

## **1.6. GOVERNANCE**

Management of Fraser River Eulachon is directed by:

- The *Fisheries Act* and the regulations made thereunder.
  - Areas and Subareas, as described in the *Pacific Fishery Management Area Regulations* (2007), are referenced in describing Eulachon Management Areas.
  - *Fishery (General) Regulations* (i.e. Conditions of Licence) and the *Pacific Fishery Regulations*, 1993 (i.e. open times).
  - The *British Columbia Sport Fishing Regulations* (1996).
  - The *Aboriginal Communal Fishing Licences Regulations*.
- The *Oceans Act*.

These documents are available at: <http://laws-lois.justice.gc.ca/eng/>

## **Sustainable Fisheries Framework**

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

- Policy on Managing Bycatch (April 2013);
- Guidance on the Implementation of the Policy on Managing Bycatch;
- Fishery Decision-Making Framework Incorporating the Precautionary Approach (April 2009);
- Guidance for the Development of Rebuilding Plans under the Precautionary Approach Framework (April 2013);
- Policy for Managing Impacts of Fishing on Benthic Habitat, Communities, and Species (April 2009);
- Ecological Risk Assessment Framework (ERAF) for Coldwater Corals and Sponge Dominated Communities (April 2013); and,
- Policy on New Fisheries for Forage Species (April 2009).

For more information on the Sustainable Fisheries Framework and its policies visit: <http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/overview-cadre-eng.htm>

As required under the SFF, DFO annually tracks the performance of major fish stocks that it manages through the Sustainability Survey for Fisheries. The fish stocks are selected for their economic, ecological and/or cultural importance. The vast majority of the landings from fisheries managed by DFO come from these fish stocks. The survey reports on DFO's progress to implement its SFF policies, which guide the management of Canada's fisheries, and on other information about these fish stocks. The results of previous Sustainability Surveys for Fraser River Eulachon are available online:

<http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/survey-sondage/index-en.html>

## **National Fishery Monitoring Policy**

Robust fishery monitoring information is essential for stock assessment and to effectively implement management measures such as target and bycatch limits, quotas and closed areas. Fishery monitoring information is also needed to support the long-term sustainable use of fish resources for Food, Social, and Ceremonial and other Indigenous fisheries, commercial fisheries, recreational fisheries, and to support market access for Canadian fish products.

Following multi-sectoral consultations, DFO released the national Fishery Monitoring Policy in 2019, replacing the regional "Strategic Framework for Fisheries Monitoring and Catch Reporting in the Pacific Fisheries" (2012). The Fishery Monitoring Policy seeks to provide dependable, timely and accessible fishery information through application of a common set of procedural steps used to establish fishery monitoring requirements across fisheries. Policy principles include respecting Indigenous and Treaty rights, linkage of monitoring requirements to the degree of risk and complexity of fisheries, linkage of monitoring programs to fishery and policy objectives while accounting for cost-effectiveness and



practicality of implementation, and shared accountability and responsibility between DFO, Indigenous groups and stakeholders.

To ensure consistent national application of the Fishery Monitoring Policy, further guidance is provided through the “Introduction to the Procedural Steps of Implementing the Fishery Monitoring Policy”. Fisheries are first prioritized for assessment through collaboration with Indigenous groups and Stakeholders. Risk and data quality assessments are then conducted on priority stocks and associated fisheries and monitoring programs. Next, monitoring objectives are set in alignment with the Fishery Monitoring Policy, followed by specifying monitoring requirements and then monitoring programs are operationalized. Finally, a review and evaluation of the fishery monitoring programs against the monitoring objectives will be conducted and reported on.

The Fishery Monitoring Policy is part of DFO’s Sustainable Fisheries Framework and is available at: <https://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/fishery-monitoring-surveillance-des-peches-eng.htm>

The “Introduction to the Procedural Steps of Implementing the Fishery Monitoring Policy” is available at: <https://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/fmp-implementation-psp-mise-en-oeuvre-eng.htm>

In cases where assessment of monitoring programs identifies a gap between the current and target level of monitoring, discussions will be held between DFO Indigenous groups and stakeholders to identify options to address the monitoring gap, and the feasibility of these options (e.g. cost, technical considerations, etc.). To support Fishery Monitoring Policy principles, a collaborative approach is required.

Where monitoring options are determined to be feasible, the monitoring and reporting regime will be revised to incorporate these options, providing resource managers with sufficient information to meet Fishery Monitoring Policy objectives. Where monitoring options are not feasible, alternative management approaches are required to reduce the risk posed by the fishery. If there is no gap between the current and target level of monitoring, the management approach will not require any change.

To discuss the national *Fishery Monitoring Policy* with regional staff, please contact Amy Mar at [amy.mar@dfo-mpo.gc.ca](mailto:amy.mar@dfo-mpo.gc.ca) or 604-666-1090. We welcome your feedback and questions, as your contributions and participation are valuable to the implementation of this national policy.

## **1.7. CONSULTATION**

DFO has a broad mandate, with the authority to regulate and enforce activities, develop policy, provide services and manage programs. To help ensure that the Department's policies and programs are aligned with its vision and effectively address the interests and preferences of Canadians, DFO supports consultations that are transparent, accessible and accountable.

DFO Pacific Region undertakes consultations in order to improve departmental decision-making processes, promote understanding of fisheries, oceans and marine transport issues, and strengthen relationships.

The Fraser River population of Eulachon was assessed as Endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in May, 2011 (see section 3.5). Since 2011, the Department has sought the input of Indigenous peoples and stakeholders into the development of documents that support the *Species at Risk Act* (SARA) process to consider whether or not the Government should list this Designatable Unit (DU) as Endangered under SARA. Consultations on this SARA process occurred between August 30 and November 30, 2016. In fall 2020, the Department undertook a “check-in” period to ensure that viewpoints and information shared during 2016 consultations remain accurate and current. The Department will include any new information received during this period in its listing advice.

## **1.8. APPROVAL PROCESS**

This plan is approved by the Regional Director General for the Pacific Region.

## 2. STOCK ASSESSMENT, SCIENCE AND TRADITIONAL KNOWLEDGE

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### 2.1. BIOLOGICAL SYNOPSIS

Eulachon (also known as candlefish, or oolichan, and Swi:we (Halq'eméylem), or Swiw'ə (Hən'q'əmin'əm) belong to the family Osmeridae (smelts). The scientific name for Eulachon is *Thaleichthys pacificus*, a name derived from the Greek roots thaleia (rich), ichthys (fish), which refers to the high oil content found in these little fish, and pacificus (Pacific [Ocean]), which refers to where these fish live.

Within BC, there are 25 confirmed Eulachon spawning rivers and an additional 15 potential spawning rivers based on anecdotal information. All known spawning rivers experience increased spring runoffs known as freshets and most drain snow packs or glaciers. The major river systems where Eulachon return to spawn are the Fraser, Skeena, Nass, and Klinaklini.

Eulachon spawning is limited to the lower reaches of rivers. Spawning occurs from February to June in the Fraser River, with peaks typically occurring in March and April. During spawning, adhesive eggs, about 20,000 to 40,000 per female, attach to sand or pebbles and hatch in three to five weeks at ambient temperatures, usually between 3° and 10° Celsius.

Eulachon are anadromous. Once hatched, larvae are rapidly flushed to estuarine or marine waters. They live at sea for approximately three years before returning to natal rivers for spawning. Adults reach a length of 15 to 20 cm and weigh between 40 and 60 grams. Large post-spawning mortalities occur and most, if not all, Eulachon are expected to die after spawning.

In BC, Eulachon may be found on the offshore shelf around Dixon Entrance, Hecate Strait, Queen Charlotte Sound, and the West Coast of Vancouver Island (WCVI), and are caught in bottom trawl gear at depths of 80 to 200 m. They have also been caught in the summer at night in near surface waters (e.g. depths of 0 to 30m) off the west coast of Vancouver Island using mid water trawl gear with euphausiids in their stomachs (DFO unpublished data, 2006-2019).

Eulachon populations coast-wide have experienced a sharp downward trend with populations on some river systems becoming nearly extirpated or severely depleted. The Fraser River population has been at extremely low levels most years since 2004 although recent years have shown higher spawning numbers which may signal a positive trend.

### 2.2. ECOSYSTEM INTERACTIONS

Eulachon are prey for many species of fish, marine mammals and birds. In-river predators include white sturgeon, Steller sea lions, harbour seals, and eagles. Salmon and Dolly Varden trout have also been reported to feed on Eulachon eggs or larvae. Marine predators include dogfish, Pacific cod, Hake, salmon, pollock, Halibut, rockfish and many other species of fish, marine mammals and birds.

Stomach contents of juvenile and maturing Eulachon have included euphausiids, phytoplankton; copepod eggs; copepods; mysids; shrimp, ostracods and barnacle larvae as well as juvenile fish such as sandlance. Samples from nearshore and offshore caught eulachon suggest that the euphausiid *Thysanoessa spinifera* is their main prey along with other euphausiids, fish and invertebrates (e.g. Dealy and Hodes, 2019).

At this time there is no information available on the appropriate conservation limits for Eulachon based on ecosystem considerations. Research is ongoing to better understand ecosystem processes and the role Eulachon play in maintaining the integrity and functioning of the ecosystem.

## **2.3. ABORIGINAL TRADITIONAL KNOWLEDGE/TRADITIONAL ECOLOGICAL KNOWLEDGE**

### **Aboriginal Traditional Knowledge (ATK)**

Where available, ATK has been incorporated into the Recovery Potential Assessment (Schweigert et al., 2012) (see section 3.5) that will be used to aid in informing the SARA listing decision and is also considered in management decisions. ATK was also used in informing the draft COSEWIC assessment for Eulachon.

### **Traditional Ecological Knowledge (TEK)**

TEK in the form of observations and comments collected from commercial fishery participants, fishery officers, and resource managers over many years contributes to decisions on scientific survey locations and is considered in management decisions.

## **2.4. STOCK ASSESSMENT**

### **Data Sources**

There is limited biological information available pre-season to reliably forecast Fraser River Eulachon spawner run size and guide management decisions regarding in river harvest level. A 2003 Canadian Scientific Advice Secretariat (CSAS) research document (Hay et al., 2003) identified four potential indicators of population abundance and ‘response’ points that could be used together to guide management decisions for Fraser River Eulachon: the spawning stock biomass (SSB), offshore biomass index, same year Columbia River catches, and New Westminster test fishery. However, with the low population levels, discontinuation of the New Westminster test fishery, and the closure of the commercial and recreational fisheries, the Hay et al. (2003) approach is no longer used to inform management decisions. The main data source used to determine FSC harvest levels is the Fraser River Eulachon Egg and Larval Survey, but other data that are also considered are listed below. The methodology for setting the FSC harvest level is described in Appendix 3.

### **Fraser River Eulachon Egg and Larval Survey**

Annually since 1995, a 7-week sampling program that measures densities of Eulachon eggs and larvae has taken place in tidal waters of the lower Fraser River to generate a relative index of spawning stock biomass (SBB). This survey uses towed, plankton mesh nets to gather samples twice a week from mid-April to early June. The number of eggs and larvae gathered in each tow are counted to calculate density estimates. The density estimates are mathematically integrated to daily mean river discharge

water flows to estimate total egg and larvae amounts. The total estimates are then related to an Eulachon fecundity estimate (eggs produced per female) to back calculate estimates of SSB by week and to sum across a season. The SSB index is produced in the summer following spawning and provides a relative estimate of how many tonnes of Eulachon successfully spawned each year (Table 1 and Figure 1). The SSB index has been estimated since 1995. Please refer to Hay et al., (2002) and McCarter and Hay (2003) for additional background on the survey methods and calculation of results. The previous year's SSB index is not an adequate predictor of the following year's return because the typical lifespan of Fraser Eulachon is estimated to be approximately three years.

Since 2017, there has been exploratory sampling before the start of the standard 7-week survey period to monitor whether the timing of peak Fraser River spawning Eulachon activity may be shifting to earlier in the spring. In 2017, 2018 and 2019, there was 3 weeks of exploratory sampling (10 weeks of sampling in total). In 2020, instead of 3 weeks, there was 2 weeks of exploratory sampling. A week of sampling had to be canceled to accommodate delays related to COVID-19 operating restrictions; resulting in 9 weeks of sampling. DFO is interested in supporting an additional 3 weeks of exploratory sampling in 2021 and is currently seeking funding to continue this work.

In association with biweekly egg and larval water samples collected by the plankton nets, a large proportion of 2018-2020 water samples also contained relatively large amounts of small fibrous material that mixed and tangled with eggs and larvae, thus prolonging the laboratory work required to detect and count eggs and larvae in the samples. Upon preliminary analyses, the main contributing factor appears to be related to the freshet outflow of a benthic diatom (*Didymosphenia geminata*) occurring in particularly large amounts those years during freshet river levels and discharge rates. In 2018 and 2019 there were considerable delays in getting the laboratory samples processed and in 2020, approximately a third of all water samples were fractionated at 1/6 to 1/2 levels in order to finish the samples under time and cost constraints. Additional research is being planned to process additional water sample fractions in order to be able to compare and evaluate whole count estimates (calculated by extrapolating counts from subsamples) with actual whole counts (summing counts across all subsamples of a whole sample). The effect that subsampling water samples may have on the accuracy of whole Eulachon egg and larval counts and thus in calculating the relative abundance index requires additional investigation that will not be done prior to setting the 2021 Fraser Eulachon fishing limit. However, the goal is to have the work done and results available in time to be used to advise on future survey work as the phenomenon is expected to recur.

In 2020, the peak out-migration of progeny for both the South Arm and North Arm sampling sites occurred mid May (i.e. May 14-21), which overlaps with the long term average peak dates for the time series. See Table 1 and Figure 1 for 2020 estimates.

For more information on egg and larval survey results for 1995 to 2016, visit <http://www.pac.dfo-mpo.gc.ca/science/species-especes/pelagic-pelagique/herring-hareng/herspawn/pages/river1-eng.html>. For information on survey results after 2016, please contact Linnea Flostrand, Aquatic Science Biologist ([linnea.flostrand@dfo-mpo.gc.ca](mailto:linnea.flostrand@dfo-mpo.gc.ca)).

**Table 1: Fraser River Eulachon Spawning Stock Biomass (SSB) Index 1995 to 2020.**

Standard 7-week period in 2020 April 20 to June 4.

\*\*\*10-week periods in 2017-2019 and \*\*9-week period in 2020 (April 7-June 4), which include additional exploratory sampling. Subsampling done on approximately one third of 2020 samples (see text).

<b>Year</b>	<b>South Arm (tonnes)</b>	<b>North Arm (tonnes)</b>	<b>Total (tonnes)</b>
1995	257	45	302
1996	1,582	329	1911
1997	57	17	74
1998	107	29	136
1999	392	26	418
2000	76	54	130
2001	422	187	609
2002	354	141	494
2003	200	66	266
2004	24	9	33
2005	14	2	16
2006	24	5	29
2007	34	7	41
2008	8	2	10
2009	12	2	14
2010	4	<1	4
2011	19	12	31
2012	78	42	120
2013	59	41	100
2014	53	13	66
2015	185	132	317
2016	32	12	44
2017	29	6	35
***2017	32	7	39
2018	298	110	408
***2018	303	111	414
2019	70	38	108
***2019	75	39	114
<b>2020</b>	<b>404</b>	<b>220</b>	<b>624</b>
**2020	408	220	628

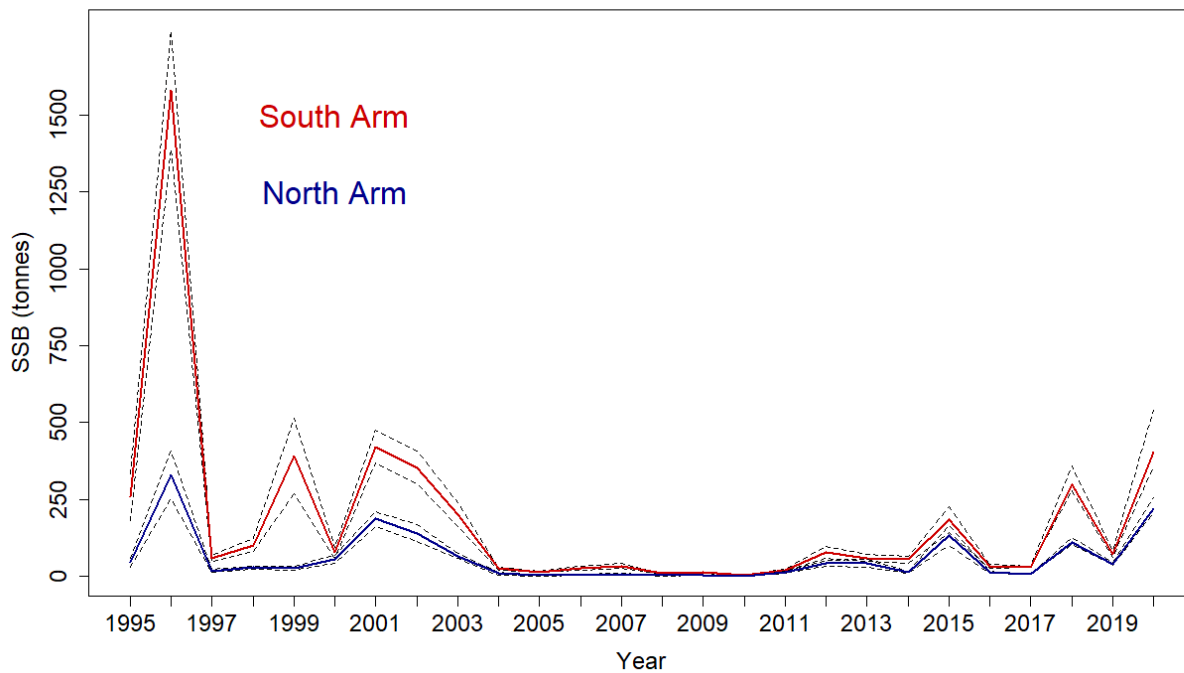


Figure I. Spawning stock biomass (SSB) in tonnes for the South and North Arms of the Fraser River calculated from Fraser River Eulachon egg and larval survey data (1995-2020). Dashed lines are 95% credible intervals.

### Fraser River (New Westminster) Test Fishery

The Fraser River test fishery was designed to provide an in-season index of Eulachon returns to the Fraser River. The test fishery was based on the cumulative catch of Eulachon fished daily at a fixed site (New Westminster), with specific gillnet gear, at a specific tide level and for a fixed time period. The test fishery was focussed on informing the commercial fishery and operated from 1995 to 2005 (with the exception of 1999), and was discontinued due to conservation concerns. The test fishery has not operated since 2006, and will not be conducted in 2021.

Table 3: Fraser River Test Fishery Final Catches for 1995 to 2005

Year	Final Catch (pieces)
1995	11,651
1996	42,071
1997	3,116
1998	2,052
1999	No Test Fishery
2000	12,991
2001	14,578
2002	14,754
2003	7,758
2004	12,433
2005	886
2006 - 2020	No Test Fishery

### **Fraser River (New Westminster) Gillnet Eulachon Assessment Survey, Lower Fraser Fishery Alliance (LFFA)**

The Lower Fraser Fishery Alliance (LFFA) conducted a pilot gillnet survey of returning Eulachon on the Fraser River between mid-February and mid-May 2017, with partial funding through the Aboriginal Fund for Species at Risk Program. The survey methodology and location were similar to that used in the 1995-2005 Fraser River (New Westminster) test fishery, with sampling every second day, and additional gear and methodology adjustments to minimize impacts to Fraser River Eulachon. Similar survey efforts led by LFFA were also conducted in 2018, 2019 and 2020. Each season, survey efforts have collected information on seasonal relative abundance and run timing, and biological data (fish length, weight, sex, spawn condition). A limited number of samples were also retained for DFO studies, such as for baseline genetics and aging and otolith isotope studies. LFFA intends to continue the survey in 2021 and is seeking funding to continue this work.

### **Offshore Small Mesh Multi-Species Bottom Trawl Survey**

The offshore small mesh multi-species bottom trawl survey was designed to provide an index of offshore shrimp abundance. The survey has been conducted by DFO annually in late April/early May since 1973. The survey has been conducted off the west coast of Vancouver Island most years until 2019 and in the Queen Charlotte Sound up until 2016. In 2020, the west coast of Vancouver Island survey was canceled due to COVID-19 operating restrictions. Recent and past survey information can be requested from Dan Clark, Shellfish Biologist (250-756-7327 / [dan.clark@dfo-mpo.gc.ca](mailto:dan.clark@dfo-mpo.gc.ca)).

Offshore biomass index: In the past, Eulachon caught in the offshore small mesh multi-species survey were used to calculate an annual index of relative Eulachon biomass for lower WCVI (Areas 121, 23, 123, 124 and 125); however this was discontinued in 2013. It is important to note that this was an index of biomass and not a biomass estimate. Historically it was used to inform the Eulachon Action Level (EAL; i.e. the level of estimated Eulachon bycatch in the shrimp trawl fishery above which management actions may be implemented; see section 3.3). Eulachon caught in this survey include stocks from the Fraser River, the Columbia River, and other areas. The Recovery Potential Assessment (Schweigert et al., 2012) (see section 3.5) suggests that the marine trends (including the offshore biomass index) may be misleading and notes that further investigation is warranted.

Table 2: Offshore Biomass Index for Eulachon 1995 to 2012

Year	Area 23, 121, 123	Area 124 (tonnes)	Area 125 (tonnes)
1995		166	115
1996		89	52
1997		168	110
1998		19	125
1999	335	124	28
2000	1,971	846	346
2001	4,896	1340	187
2002	5,862	3993	5343
2003	4,268	2028	1488
2004	3,405	428	343
2005	902	323	336
2006	461	90	42
2007	393	205	52



2008	368	698	185
2009	753	1810	520
2010	500	1469	576
2011	1073	510	129
2012	1369	2147	1375

Catch per unit effort (CPUE) data: Eulachon length information and catch per unit effort (CPUE) is collected from the WCVI offshore small mesh multi-species survey and analysed (see Figure 2).

Although not defined as one of the four indicators that could be used for managing Eulachon in Hay et al.'s 2003 work, CPUE trends may provide insight into the relative productivity of upcoming Eulachon year classes and future spawner abundance. However, they should be considered cautiously; the Recovery Potential Assessment (Schweigert et al., 2012) (see section 3.5) suggests that the marine trends may be misleading and further investigation is warranted.

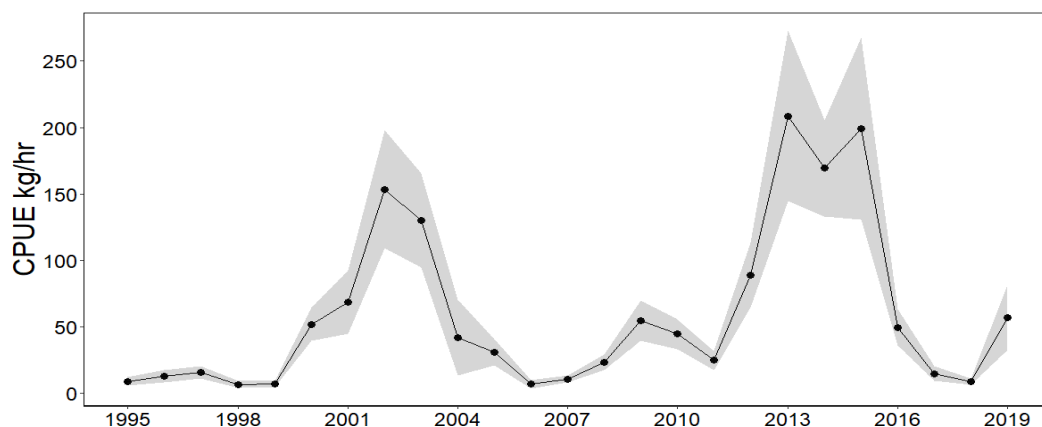
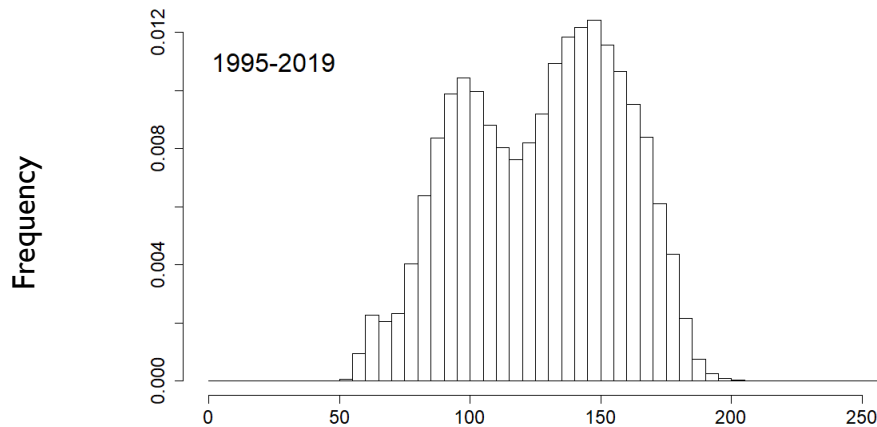


Figure 2. Eulachon catch per unit effort (CPUE) average (dots and lines) and 95% confidence interval (shaded envelopes) trends for 1995-2019, from West Coast Vancouver Island small mesh multi-species bottom trawl surveys, collectively and annually representing Pacific Fishery Management Areas (PFMAs) 23, 123, 124, and 125. There are no 2020 observations because the 2020 survey was cancelled due to COVID-19 operating restrictions.

Length data: Length-frequency histograms tend to reveal multi-modal distributions with different age classes distinguished by different length ranges, i.e. generally younger fish are shorter and older fish are longer. Fish that are typically less than 50 mm standard length are generally estimated to be less than one year old and are not well represented in the samples. These fish may not yet be in the survey area off of WCVI at the time of the offshore small mesh multi-species survey and may be too small for the trawl net to reliably collect. Fish that are 50 to 130 mm are generally estimated to be approximately one to two years old. However, there can be considerable overlap in length ranges between ages, especially in fish older than one year old. Characterizing age compositions with length-frequency histogram distributions may be difficult, especially when data from a number of years is pooled (see Figure 3A). Trends in length frequencies can vary considerably between years (see Figure 3B), which can be a function of changes in age compositions, as well as changes in growth rates between years and between stocks. In general, however, smaller fish are typically younger than larger fish. Length-frequency histograms for years prior to 2017 can be found at: <http://www.pac.dfo-mpo.gc.ca/science/species-especes/pelagic-pelagique/herring-hareng/herspawn/pages/ocean1-eng.html>

**A.**



**B.**

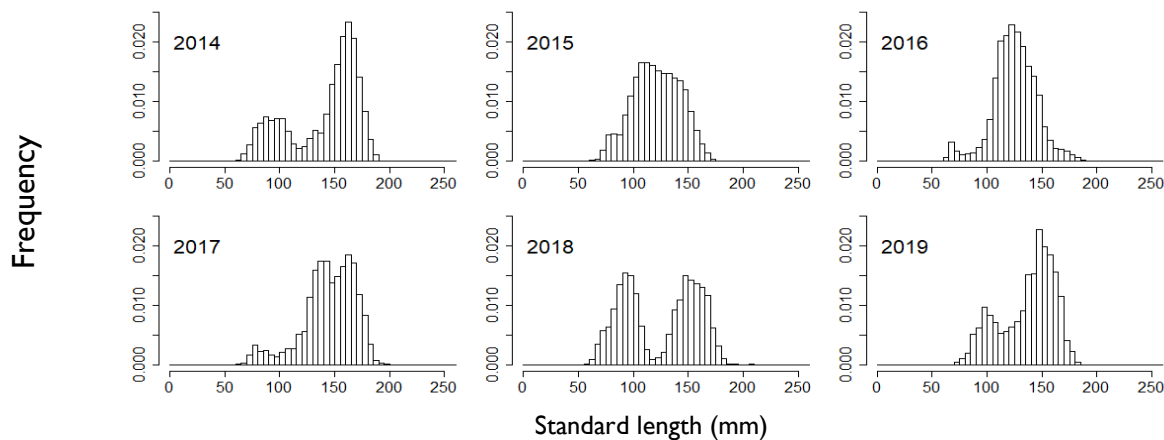


Figure 3. Eulachon length-frequency histograms (proportions by size bin) from annual May west coast of Vancouver Island offshore small mesh bottom trawl surveys: A. Pooled length measurements across years 1995 to 2019, and B. Pooled length measurements by year for 2014 to 2019. There are no 2020 observations because the 2020 survey was cancelled due to COVID-19 operating restrictions.

Ocean conditions: Eulachon growth appears to increase during “cool phases” and decrease during “warm phases”. Relatively warm ocean conditions were observed from 2014 to 2017, especially in late 2014, all of 2015, and all of 2016. However monthly average temperatures in 2018, 2019 and early 2020 were relatively cool, and were more similar to long term average conditions. Pacific Decadal Oscillation (PDO) is a multi-year El-Niño-like pattern of climate variation, and information on the PDO index from before 1900 to present can be found at: <https://www.ncdc.noaa.gov/teleconnections/pdo/>

Genetic Information:

Genetic information from river-caught Eulachon has been analysed to develop spawner baseline profiles to compare trends within and between sample collections by river of capture (e.g. Beachem et al. 2015; Sutherland et al. 2020). Tissue and genetic samples have been collected from adult Eulachon from rivers ranging from Northern California through Central Alaska. Eulachon baseline genetic studies show evidence of genetic isolation by distance between rivers within and between large scale

regions: from Northern California up to and including the Fraser River; north of the Fraser River to southeast Alaska; and within the Gulf of Alaska (Beachem et al. 2015; Sutherland et al. 2020). Additional work is being planned by DFO to increase baseline genetic sample collections, especially in rivers where no or few collections have been made representing different years.

Tissue and genetic samples have been collected from ocean-caught Eulachon, such as from trawl surveys or fisheries, and used in analyses to try to estimate the most likely river or area of origin based on genetic baseline markers. For example, Beachem et al. (2005) and Table 3 in Schweigert et al. (2012) show that for Eulachon collected from the west coast of Vancouver Island, genetic signals suggest that the majority of fish appear to be linked to Columbia River baseline. Reported results also suggest that second to the Columbia baseline, Eulachon collected from the west coast of Vancouver Island are also strongly linked to Fraser River baseline samples, and to a lesser degree to other baseline area and river samples. There can be considerable variability in mixed stock composition estimates from genetic samples from ocean-caught Eulachon between seasons and areas of capture. Similar and related to baseline genetic sample analysis, additional work is being planned by DFO to try to validate the characterization of marine-caught Eulachon to spawning locations.

### **Other DFO Eulachon Science Initiatives**

Scientific information compiled on the biology, distribution and fishery data of Fraser River Eulachon is documented in material related to: *Recovery Potential Assessment of Eulachon (Thaleichthys pacificus) in Canada* (Schweigert et al. 2012); the *Recovery Potential Assessment for Eulachon – Fraser River Designatable Unit* (DFO, 2015).

In 2017 the Department began several research projects to address knowledge gaps related to Eulachon biology, migration routes, geographic and temporal distribution, stock genetics, non-lethal sampling methodologies, and aging techniques. These projects include:

1. The deployment of periodic bottom trawl surveys to determine Eulachon biological condition, distribution, migration patterns and timing between offshore rearing areas and inshore waters adjacent to Eulachon spawning rivers.
  - a. South Coast (Fraser River pathway) Strait of Georgia, south of Nanaimo to the mouth of Juan de Fuca Strait, monthly from October 2017 to June 2018. Initial study findings are published and available online (Dealy and Hodes, 2019).
  - b. North Coast, Chatham Sound (Skeena and Nass River pathways) monthly from late July/August to November 2018, and January to March 2019. Initial study findings are expected to be published in late 2019 or 2020.
2. A pilot project in collaboration with the LFFA in the Fraser River to assess whether acoustic technologies are an effective, non-lethal way to assess Eulachon returns.
3. A comparison of surface reading of otoliths (inner ear bones) and scales for age determination, and validation of otolith surface reading through isotope analysis. Currently there is no validated aging technique for Eulachon.

## **United States Eulachon - Status and observations**

In the United States (U.S.), the Southern Distinct Population of Eulachon was federally listed as Threatened under the U.S. *Endangered Species Act* in March 18, 2010, and the *Recovery Plan for the Southern Distinct Population Segment of Eulachon (Thaleichthys pacificus)* was published in 2017 (NMFS, 2017).

### Columbia River Egg and Larval Survey

Efforts to track and estimate annual estimates of relative abundance of Eulachon in the Columbia River via egg and larval survey observations within and between spawning seasons have been conducted and supported by Washington and Oregon Departments of Fish and Wildlife and the U.S. National Marine Fisheries Service most years from 2000 to 2020. Trends of annual estimates from these surveys show moderate levels for 2000-2003, very low levels across 2005-2010, severe increases occurring from 2010 to 2015, sharp decreases from 2015 to 2018 and a moderate increase from 2018 to 2019 (Gustafson et al 2016; Langness et al, 2018, O. Langness and R. Gustafson pers comm 2019). For many of the years annual trends are similar to Fraser River Eulachon egg and larval survey trends but there are also divergent observations, such as for 2018 and 2019. In 2020, Columbia River Eulachon monitoring efforts were interrupted and/or cancelled from COVID-19 operating restrictions.

### Columbia River Fishery Observations

The total Columbia River Eulachon harvest used to be considered a potential pre-season indicator for the same year's Fraser River return when fishing efforts on the Columbia were regular occurrences and in years of low Columbia River returns. Findings of Hay et al. (2003) suggested that when there were low Columbia River catches (<500 t), historically, Fraser River catches were also low. Columbia River Eulachon peak returns typically occur between January and March whereas Fraser River Eulachon peak returns typically occur between February and May.

Columbia River catches declined from 2008 to 2010, followed by a three-year closure from 2011 to 2013 of all Eulachon fisheries. During the closure period an increase in spawning Columbia Eulachon was observed (Gustafson et al 2016). Limited indigenous, recreational, and commercial fisheries occurred in 2014-2020 with severe declines in total catches during those years compared to previous years (i.e. < 500 t annually; Hay et al. 2003; JCRMS, 2018). Official numbers for 2018-2020 were not available at the time of writing but are anticipated to also be relatively low. For more information on Columbia River Eulachon, please visit:

<https://www.fisheries.noaa.gov/species/eulachon#conservation-management>

## **2.5. PRECAUTIONARY APPROACH**

The Department follows the Sustainable Fisheries Framework (SFF), which is a toolbox of policies for DFO and other interests to sustainably manage Canadian fisheries in order to conserve fish stocks and support prosperous fisheries. The SFF includes a decision-making framework incorporating a precautionary approach to commercial, recreational, and food-social-ceremonial fishing:

<http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/precaution-eng.htm>.

In general, the precautionary approach in fisheries management is about being cautious when scientific knowledge is uncertain, and not using the absence of adequate scientific information as a reason to

postpone action or failure to take action to avoid serious harm to fish stocks or their ecosystem. This approach is widely accepted internationally as an essential part of sustainable fisheries management. Information on the precautionary approach and the decision-making framework is available from: <http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/precaution-back-fiche-eng.htm> and <http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/precaution-eng.htm> .

Reference points and harvest control rules as outlined in the decision-making framework for the precautionary approach have not been formally developed and evaluated for this fishery. DFO is seeking to fill biological information gaps and evaluate available data in order to move towards abundance-based methods for setting annual harvest levels. The decline of the species and limited or lack of recovery in river systems coast wide is an ongoing concern. Maintaining harvest at low levels should increase the probability of rebuilding Fraser River Eulachon stocks. DFO continues to take an approach to managing the fishery that emphasizes conservation and sustainable use.

## 2.6. RESEARCH

Scientific information compiled on the biology, distribution and fishery data of Fraser River Eulachon is documented in material related to: *Recovery Potential Assessment of Eulachon (Thaleichthys pacificus) in Canada* (Schweigert et al. 2012); the *Recovery Potential Assessment for Eulachon – Fraser River Designatable Unit* (DFO, 2015); and the *Recovery Plan for the Southern Distinct Population Segment of Eulachon (Thaleichthys pacificus)* (NMFS 2017). In addition, ecological information associated with timing and magnitude of catch trends and biological sampling efforts are reported in *Monthly distribution and catch trends of Eulachon (Thaleichthys pacificus) from Juan de Fuca Strait to the Fraser River, British Columbia, October 2017 to June 2018* (Dealy and Hodes, 2019).

The 2011 CSAS research document (CSAS 2011/101) provides background information on Eulachon in support of a Recovery Potential Assessment (RPA) (see section 3.5). To view the CSAS paper, please visit the following site:

[http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ResDocs-DocRech/2011/2011\\_101-eng.html](http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ResDocs-DocRech/2011/2011_101-eng.html)

To view the Recovery Potential Assessment (RPA) for the Fraser River Designatable Unit (DFO, 2015), please visit the following site:

[http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2015/2015\\_002-eng.html](http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2015/2015_002-eng.html)

To view the Recovery Potential Assessment (RPA) for Canada (Schweigert et al. 2012), please visit the following site:

[http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ResDocs-DocRech/2012/2012\\_098-eng.html](http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ResDocs-DocRech/2012/2012_098-eng.html)

To view the U.S. 2017 Recovery Plan for the Southern Distinct Population Segment of Eulachon (NMFS, 2017) please visit the following site:

<https://repository.library.noaa.gov/view/noaa/15989>

To view the report on Monthly Distribution and Catch Trends of Eulachon from Juan de Fuca Strait to the Fraser River, British Columbia, October 2017 to June 2018 (Dealy and Hodes, 2019), please visit the following site: <https://waves-vagues.dfo-mpo.gc.ca/Library/40811724.pdf>

### **3. MANAGEMENT ISSUES**

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The following sections highlight the on-going or longer-term management issues that are being addressed in this fishery.

#### **3.1. LIMITED BIOLOGICAL INFORMATION**

At present, there is limited biological information available for pre-season forecasting of spawner run size for Fraser River Eulachon. The biological indicators described in the Hay et al. 2003 paper and the reference points suggested for the management of Fraser River Eulachon were developed over ten years ago and were based on a short time series. DFO is seeking to fill biological information gaps and evaluate available data in order to move towards abundance-based methods for setting annual harvest levels.

In addition, the RPA (Schweigert et al. 2012) identifies several gaps in our knowledge of Eulachon biology and ecology, including limited information on ages, growth rates and mortality. The ability to identify genetic differences between populations, including the ability to identify the origins of fish in offshore mixed stock samples, would be useful for understanding the ecological roles of Eulachon and their responses to management actions, as well as the potential impacts from harvesting and habitat changes. Ongoing genetic analyses are being conducted to better characterize genetic variability of spawning fish within and between rivers. There is also uncertainty around the age of spawning, variability in annual growth rates, and degree to which Eulachon return to natal rivers. Based mostly on trends in fish length observations, it has been assumed that most fish live at sea for approximately three years before returning to rivers to spawn. Effects of climate change on Eulachon ecology are also uncertain but improved understanding of habitat requirements for all life history stages and adult and juvenile prey requirements would help to inform integrated management in keeping with the principles of the DFO Sustainable Fisheries Framework.

#### **3.2. FOOD, SOCIAL AND CEREMONIAL ACCESS**

Indigenous peoples in the Lower Fraser Area have expressed the concern that their needs are not being met by their current level of access to Eulachon for FSC purposes. A review of the current FSC harvest level and the development of an abundance-based approach to determine harvest levels for future years have been requested by Indigenous peoples.

#### **3.3. BYCATCH IN OTHER FISHERIES**

Fraser River Eulachon are incidentally caught throughout BC in both shrimp trawl and groundfish trawl fisheries. A review of allowable bycatch and encounter protocols is requested by Indigenous peoples. They are concerned about bycatch levels in shrimp trawl and groundfish trawl fisheries and the impacts this bycatch has to conservation targets and First Nations priority access to eulachon.

##### **Shrimp Trawl Fishery**

Eulachon are not permitted to be retained in the shrimp trawl fishery however there may be incidental mortality from bycatch. Preliminary genetic analysis has indicated that approximately 30-40% of Eulachon bycatch from the shrimp trawl fishery off the WCVI were from the Fraser River population. The Department has been working with the shrimp trawl industry to minimize Eulachon bycatch. The following management measures have been implemented in the WCVI shrimp trawl fishery to monitor and mitigate impacts of incidental catch of Eulachon:

1. In 2017/18 DFO implemented several new pilot initiatives that were suggested and agreed to by the Pacific Shrimp Harvesters Association to enhance Eulachon monitoring and support in-season management of the shrimp trawl fishery. For WCVI Pacific Fishery Management Areas (PFMAs) 124 and 125 the new initiatives included: (i) mandatory 100% at-sea observer coverage for all shrimp trawl fishing, (ii) a new non-transferable individual vessel Eulachon bycatch limit, (iii) a new individual vessel Eulachon bycatch overage adjustment, and (iv) mandatory dockside validation. At-sea observer requirements were also increased in WCVI PFMA 21, 23, 121, and 123 to a minimum of 25% coverage rate. These new pilot programs are expected to continue for the 2021/22 shrimp by trawl IFMP.
2. Increased at-sea observer days funded for other shrimp management areas along the coast. DFO is in discussions with the shrimp trawl licence holders regarding increasing observer coverage to better collect catch data in the fishery.
3. Mandatory bycatch reduction devices in shrimp trawl nets: A grid designed to reduce non-target fish species from entering the shrimp trawl net is mandatory for all shrimp trawlers. Specific details on grid spacing and deployment requirements are available in the Shrimp Trawl IFMP.
4. Commercial closure in Queen Charlotte Sound shrimp management area. No fishing has occurred within this area since 2000 because of concerns for Eulachon stocks in central coast rivers. Eulachon populations in BC are being considered for listing under the Species at Risk Act. Given the current SARA process and consultations, DFO is not considering any commercial harvest opportunities in QCSND during the 2021/22 season.
5. Eulachon Action Levels (EAL): An annual Eulachon bycatch action level is set for WCVI Shrimp Management Areas to encourage active shrimp trawl harvesters to adjust their gear to minimize Eulachon bycatch. In the event the estimate of Eulachon bycatch in a given WCVI area reaches the Eulachon Action Level, the commercial fishery will likely close. A precautionary approach has been taken to deal with Eulachon bycatch and the EAL has been reduced since 2011. The offshore Eulachon biomass index is no longer used to set the EAL. Since 2016/17, the EAL has been set at 4 t (reduced from 6 t in 2015/16). As in previous years, no in-season adjustment to the EAL is expected in 2020/21. The 4 t EAL is established for SMAs 121OFF, 23IN, 23OFF, 124OFF, and 125OFF combined. The EAL is further divided into two areas groups. If one of these two area groups does not open for commercial shrimp harvest, then that portion of the EAL may be allocated to the other area group. In addition, the Department has been working to reduce the time to receive observer data and implement closures when required.

Table 4: Eulachon Action Levels for West Coast Vancouver Island

Shrimp Management Area Group	2016/17, 2017/18, 2018/19, 2019/20 Annual Eulachon Action Levels (EAL) (t)
124OFF and 125OFF	2.0
123OFF+121OFF and 23IN	2.0

The total EAL for the WCVI is 4 t. In-season Eulachon bycatch estimates for WCVI Shrimp Management Area (SMA) groups are based on data collected by at-sea observers, following the Pooled In-season (PI) method, defined by Hay (1999). The Eulachon to shrimp ratio from at-sea observations are applied to total estimated shrimp catch (hails) to generate an estimate of in-season Eulachon bycatch for WCVI. If estimated Eulachon bycatch meets or exceeds the EAL for the defined area, the area will be closed. The fishery has been closed due to the EAL being reached in 2000, 2016 and 2019. In 2016 the shrimp trawl fishery in shrimp management areas (SMA) 124OFF and 125OFF reached the EAL, resulting in a closure of the major offshore areas. SMA 23IN and 23OFF&21OFF remained open. In 2019, only SMA 23IN and 23OFF&21OFF were opened on August 7 with a large shrimp biomass. Due to the eulachon bycatch estimate reaching the EAL, the areas were closed September 18, 2019 with  $\frac{3}{4}$  of the 4.5 million lb shrimp catch ceiling remaining.

For further information on the shrimp trawl fishery, or for a copy of the current Shrimp Trawl Integrated Fisheries Management Plan, please contact Guy Parker, Resource Management Biologist (250-756-7163 / [guy.parker@dfo-mpo.gc.ca](mailto:guy.parker@dfo-mpo.gc.ca)) or Karen Vaudry, Non-Salmon Resource Manager (778-834-8127 / [karen.vaudry@dfo-mpo.gc.ca](mailto:karen.vaudry@dfo-mpo.gc.ca)).

6. In April 2018 the Department conducted consultations with First Nations and stakeholders on a proposed amendment to the Pacific Fisheries Regulations section 8(1) that would allow commercial shrimp trawl 'S' licenced vessels to use artificial lights (LEDs) on their fishing gear. Recent scientific research in the United States has indicated that the proper placement of LED lights on the trawl gear drastically reduces the amount of bycatch of several species, including Eulachon. In a 2015 study by Hannah et al., bycatch of Eulachon was reduced by approximately 90% by using the LED lights. In May 2019 a regulation amendment was approved for the Pacific Fisheries Regulations to allow the use of LED lights in the shrimp trawl fishery. Licence rules for the use and placement of the LEDs has been developed in the U.S. fisheries, and LED lights are required in the Oregon, Washington, and California shrimp trawl fisheries (ODFW, 2018) as part of their Eulachon Recovery Plan (NMFS, 2017). The Department will work with licence holders to establish practices for best use in B.C.

## Groundfish Trawl Fishery

The Department continues to work with the groundfish trawl industry to ensure Eulachon avoidance by the groundfish trawl fleet. The groundfish bottom trawl fishery has been subject to 100% mandatory at sea observer coverage for all fishing activities since 1996. Due to the ongoing global pandemic, at-sea observer services were temporarily suspended to help protect the health of observers and fishers from the spread of COVID-19. The groundfish trawl fishery continues to be subject to 100% at-sea and dockside monitoring and an emergency electronic monitoring (EM) program is being deployed as an



alternative mitigating management measure for all Option A groundfish trawl vessels. Observer data indicate bycatch in the groundfish trawl fishery is typically low. Since 2007, Eulachon bycatch was estimated to be typically 0.7 tonnes or less, with the exception of four years: 2012 (1.8 tonnes), 2013 (1.8 tonnes), 2014 (4.2 tonnes), and 2019 (4.7 tonnes). Bycatch of Fraser River-bound Eulachon in the fishery was estimated to be 0.6 tonnes or less since 2007, with the exception of 2012 (1.2 tonnes), 2013 (0.8 tonnes), and 2014 (2.6 tonnes).

Current management measures in place for the groundfish trawl fishery include:

1. Groundfish trawl licences specifically prohibit the fishing for and retention of Eulachon.
2. The groundfish trawl fishery is subject to 100% at-sea monitoring of all fishing events and 100% dockside monitoring of catch.
3. DFO has implemented a minimum mesh size of 76 mm (approximately three inches) in any part of a bottom trawl or mid-water trawl net, including the cod-end, for all waters of the Pacific Ocean, except for specific areas where more restrictive rules are in place as outlined in the groundfish IFMP.
4. On April 2, 2012 DFO implemented a groundfish bottom trawl closure that “froze the bottom trawl footprint on the west coast of Canada” and implemented the industry agreed upon habitat conservation measures for protection of corals and sponges in the Pacific Region groundfish trawl fishery. A benefit for Eulachon of this closure was removal of current and future fishing activities in the shallow water habitat where Eulachon are known to be found.
5. DFO and the groundfish trawl industry will be developing encounter protocols for Eulachon that will require groundfish trawl harvesters to adjust their fishing activities when Eulachon are incidentally encountered. Encounter protocols are rapid-response procedures that could include bio sampling, enhanced monitoring and reporting requirements, immediate modification to vessel/fleet fishing activity and/or implementation of spatial/temporal closures.

For further information on the groundfish trawl fishery, or for a copy of the current Groundfish Integrated Fisheries Management Plan, please contact Deirdre Finn, Groundfish Trawl Coordinator (236-330-4139 / [deirdre.finn@dfo-mpo.gc.ca](mailto:deirdre.finn@dfo-mpo.gc.ca)).

### **3.4. OCEANS AND HABITAT CONSIDERATIONS**

#### **Oceans Act**

The *Oceans Act* came into force in 1997. This legislation provides a foundation for an integrated and balanced national oceans policy framework supported by regional management and implementation strategies. In 2002, Canada’s Oceans Strategy was released to provide the policy framework and strategic approach for modern oceans management in estuarine, coastal, and marine ecosystems. As set out in the *Oceans Act*, the strategy is based on the three principles of sustainable development, integrated management, and the precautionary approach.

For more information on the *Oceans Act* and other relevant publications, please visit: <http://www.dfo-mpo.gc.ca/oceans/index-eng.html>

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

### **Canada's Marine and Coastal Areas Conservation Mandate**

In August 2019, the Government of Canada surpassed its milestone of protecting 10% of Canada's marine and coastal areas by 2020, a target which is a reflection of Canada's United Nations Convention on Biological Diversity Aichi Targets commitments, collectively referred to as Canada's marine conservation targets. The Government of Canada further committed domestically to protecting 25% by 2025, and working towards 30% by 2030.

More information on the background and drivers for Canada's marine conservation targets is available at the following link:

<http://www.dfo-mpo.gc.ca/oceans/conservation/index-eng.html>.

To meet our marine conservation target, Canada is establishing Marine Protected Areas (MPAs) and "other effective area-based conservation measures" ("Other Measures"), in consultation with industry, non-governmental organizations, and other interested parties.

An overview of these tools, including a description of the role of fisheries management measures that qualify as Other Measures is available at the following link: <http://www.dfo-mpo.gc.ca/oceans/mpa-zpm-aoi-si-eng.html>.

### **Pacific North Coast Integrated Management Area (PNCIMA)**

Endorsed in February 2017, the Pacific North Coast Integrated Management Area (PNCIMA) plan was developed, in collaboration with the Province of British Columbia, First Nations and stakeholders to help coordinate various ocean management processes and to complement existing processes and tools including IFMPs. High level and strategic, the plan provides direction on integrated, ecosystem-based and adaptive management of marine activities and resources in the planning area as opposed to detailed operational direction for management. The plan outlines an ecosystem-based management (EBM) framework for PNCIMA that has been developed to be broadly applicable to decision-makers, regulators, community members and resource users alike, as federal, provincial and First Nations governments, along with stakeholders, move together towards a more holistic and integrated approach to ocean use in the planning area.

The endorsement of the PNCIMA plan supports the Government of Canada's commitment to collaborative oceans management for the Pacific North Coast and provides a joint federal-provincial-

First Nations planning framework for conservation and the management of human activities in the Pacific North Coast. One of the key priorities for the plan is the development of a marine protected area network. The planning for this network is well underway in the Northern Shelf Bioregion. It is anticipated that the network development will contribute to the Government of Canada's commitment to protecting 25% of Canada's oceans by 2025, and working toward 30% by 2030.

The PNCIMA Plan is available online at: <https://www.dfo-mpo.gc.ca/oceans/management-gestion/pncima-zgicnp-eng.html>

### **Northern Shelf Bioregion MPA Network**

The Province of BC, the Government of Canada and 16 First Nations are working together to develop a Network of marine protected areas for the Northern Shelf Bioregion which extends from the top of Vancouver Island (Quadra Island/Bute Inlet and Brooks Peninsula) and reaches north to the Canada - Alaska border. This bioregion has the same footprint as the Pacific North Coast Integrated Management Area. The planning process is being developed under the policy direction outlined in the National Framework for Canada's Network of MPAs as well as the Canada-British Columbia MPA Network Strategy.

A draft MPA network design, which consists of a map of areas proposed for conservation as well as potential management measures for proposed sites, was shared with First Nations, who are currently not part of the collaborative governance arrangement, and with members of the Network Advisory Committees in February 2019. The various sectors engaged in a review of the draft network design provided substantial input by January 30, 2020. A stakeholder forum was held in February 2020 to present and discuss feedback received. DFO completed its internal review of the draft design scenario and presented the report to the MPA Technical Team in March 2020. Governance partners are considering all input received to date and will be reporting out to stakeholders in late fall 2020. Revising the draft scenario will occur during the winter 2021 after which there will be further consultations, including public engagement in coastal communities, on scenario #2 and the accompanying socio-economic analysis.

More information on MPA Network Planning can be found at: <http://www.mpanetwork.ca>

### **Marine Spatial Planning South Coast**

As part of a national marine spatial planning (MSP) initiative, DFO in collaboration with the Province of BC, federal departments (Transport Canada, Natural Resources Canada, Environment and Climate Change Canada, Parks Canada) and Indigenous groups, have begun marine spatial planning efforts on the South Coast, including the Strait of Georgia and Southern Shelf bioregions. The intent of MSP is to improve coordination across jurisdictions and activities in the marine space, and work is underway to define scope and objectives of the project. In the early phases, engagement on governance is taking place internally with GC partners, and externally with the Province of BC and local First Nations (beginning with representative organizations like First Nations Fisheries Council). National MSP deliverables include: governance, a bioregional atlas, and a marine spatial plan. Harvesters can expect updates on this process via Advisory Boards in the future.

## **Marine Protected Areas (MPAs)**

DFO is also responsible for designating Marine Protected Areas (MPAs) under Canada's *Oceans Act*. Under this authority, DFO has designated three MPAs in the Pacific Region.

MPA regulations and management plans articulate any restrictions on activities taking place within the MPA, where applicable. More information on MPAs can be found at:

<http://www.dfo-mpo.gc.ca/oceans/conservation/areas-zones/index-eng.html>.

### **Endeavour Hydrothermal Vents (EHV) MPA**

The EHV MPA was designated in 2003 with the objective of conserving the unique hydrothermal vent ecosystems. The hydrothermal vents lie in waters 2,250 m deep 250 km southeast of Vancouver Island. The occasional licenced commercial pelagic fishing that occurs very near the ocean surface in the MPA is not considered to be in conflict with the conservation objectives of the MPA and will continue. All commercial groundfish fisheries are restricted within the Endeavour MPA. More information can be found online at: <http://www.dfo-mpo.gc.ca/oceans/mpa-zpm/endeavour/index-eng.html>.

### **SGaan Kinghlas-Bowie Seamount (SK-B) MPA**

The SK-B MPA (180 km west of Haida Gwaii) was designated in 2008 and was established to conserve and protect the unique biodiversity and biological productivity of the area's marine ecosystem, including the surrounding waters, seabed, and subsoil. The MPA is cooperatively managed by DFO and the Council of the Haida Nation (CHN) through the SK-B Management Board, which was established under a Memorandum of Understanding (MOU). The Management Board (in consultation with the SK-B Advisory Committee) has recently finalized the [SK-B MPA Management Plan](#) which guides the conservation and protection of the SK-B ecosystem. In 2018, the Government of Canada and the Haida Nation closed all bottom-contact fishing at SK-B MPA as a precautionary management approach to protect sensitive benthic habitats, resulting in the MPA being closed to all commercial fishing activities. More information can be found online at: <http://www.dfo-mpo.gc.ca/oceans/mpa-zpm/bowie-eng.html>

### **Hecate Strait and Queen Charlotte Sound Glass Sponge Reefs (HS/QCS) MPA**

The Hecate Strait and Queen Charlotte Sound Glass Sponge Reefs Marine Protected Area (Hecate MPA) was designated under the *Oceans Act* in February 2017 to conserve the biological diversity, structural habitat and ecosystem function of the glass sponge reefs. The Hecate MPA Regulations are available online at: <http://www.dfo-mpo.gc.ca/oceans/mpa-zpm/hecate-charlotte/index-eng.html>. The Hecate MPA is located in the Northern Shelf Bioregion of the Pacific Region southeast of Haida Gwaii, North and South of the entrance to the Douglas Channel, covering an area of approximately 2,410 square kilometers. The Hecate MPA zoning approach involves different management measures within each zone. Under the Hecate MPA Regulations, each glass sponge reefs' Core Protection Zone (CPZ) is closed to all commercial, recreational, and Aboriginal fishing. Anchoring, cable installation, maintenance and repair are also prohibited in the CPZ. The Vertical Adaptive Management Zone (VAMZ) and Adaptive Management Zone (AMZ) is currently closed to all commercial bottom contact fishing activities for prawn, shrimp, crab and groundfish (including halibut), as well as for midwater

trawl for hake. For more detail on the fishery closure within the Hecate MPA, review Fishery Notice FN0198 found here: [https://notices.dfo-mpo.gc.ca/fns-sap/index-eng.cfm?DOC\\_ID=194216&ID=all&pg=view\\_notice](https://notices.dfo-mpo.gc.ca/fns-sap/index-eng.cfm?DOC_ID=194216&ID=all&pg=view_notice). Scientific research, monitoring, and educational activities are allowed in the Hecate MPA if a proponent submits an activity plan to DFO and it receives Ministerial approval. Additional maps and shapefiles of the Hecate MPA are available at: <https://open.canada.ca/data/en/dataset/a1e18963-25dd-4219-a33f-1a38c4971250>.

## **Offshore Pacific Area of Interest**

In May 2017, DFO announced a new Area of Interest (AOI) with the intention of making it one of Canada's largest Marine Protected Areas by 2020. The proposed MPA extends from the toe of the continental slope to the westward boundary of Canada's Exclusive Economic Zone (EEZ) in the southern portion of the Offshore Pacific Bioregion. On average, the proposed MPA would be approximately 150 km away from the west coast of Vancouver Island, and would have an approximate area of 133,019 km<sup>2</sup>. The conservation objective for the proposed MPA is to conserve, protect and enhance understanding of unique seafloor features including seamounts and hydrothermal vents and the marine ecosystems they support. More information on the Offshore Pacific AOI can be found on the internet here: <http://www.dfo-mpo.gc.ca/oceans/aoi-si/offshore-hauturiere-eng.html>

### *Offshore Pacific Seamounts and Vents Closure*

Fishery closures to restrict commercial and recreational bottom-contact fishing activities within the Offshore Pacific AOI were announced in October 2017. At approximately 83,000 km<sup>2</sup> in size, the closure protects and conserves unique seafloor features including seamounts and hydrothermal vents identified through a Canadian Science Advisory Secretariat process, as well as a number of species of regional importance including corals, sponges and other endemic or rare species. The closure boundary was informed by available science and input received during consultations with First Nations, federal and provincial government agencies, industry and conservation organizations. Specific details of the closure can be found in the [Fishery Notice](#).

More information on the Offshore Pacific seamounts and vents closure can be found on the internet here: <http://www.dfo-mpo.gc.ca/oceans/oeabcm-amcepz/refuges/offshore-hauturiere-eng.html>

## **Race Rocks Area of Interest**

Race Rocks, an area off Rocky Point, south of Victoria (currently designated as a Provincial Ecological Reserve), has been identified as an area of interest.

## **National Marine Conservation Area Reserves (NMCARs)**

### **Gwaii Haanas**

Gwaii Haanas National Park Reserve, National Marine Conservation Area Reserve, and Haida Heritage Site is a 5000 km<sup>2</sup> land-and-sea protected area in the southern part of Haida Gwaii (formerly the Queen Charlotte Islands), approximately 100 kilometres off the north coast of British Columbia. The Haida Nation designated the area a Haida Heritage Site in 1985. The terrestrial part of Gwaii

Haanas was designated a National Park Reserve by the Government of Canada soon after, and Canada and the Haida Nation have been managing the area cooperatively since 1993. In 2010, the Gwaii Haanas marine area was designated a National Marine Conservation Area Reserve.

Gwaii Haanas is managed by the Archipelago Management Board (AMB), a cooperative body made up of three representatives of the Council of the Haida Nation and three representatives of the Government of Canada (Fisheries and Oceans Canada (1) and Parks Canada (2)). The AMB is guided by the *Gwaii Haanas Agreement* (1993) and the *Gwaii Haanas Marine Agreement* (2010), which describes how Canada and the Haida Nation will manage Gwaii Haanas cooperatively.

In November 2018, following an extensive consultation process, a new management plan for Gwaii Haanas was approved by Canada and the Haida Nation. The Gina 'Waadluxan KilGuhlGa Land-Sea-People plan includes a shared vision, guiding principles based on Haida cultural values, goals and objectives, and zoning for the land and the sea. The plan will be in place for the next decade.

To develop the zoning plan, key ecological and cultural features were identified using a range of ecological data and traditional knowledge. A set of design considerations, which included minimizing socio-economic impacts, was used to develop an initial zoning proposal. This proposal was reviewed with stakeholder groups including the commercial and recreational fishing sectors and major changes were made to the zoning plan based on advice the AMB received.

The final zoning plan includes several areas of strict protection, where commercial and recreational fishing are prohibited.

The zoning plan can be found at:

<https://www.pc.gc.ca/en/pn-np/bc/gwaiihaanas/%20info/%20consultations/gestion-management-2018>.

Refer to Fishery Notice 0536, released June 13, 2019 for a detailed description of the Strict Protection Zones and can be found at:

[https://notices.dfo-mpo.gc.ca/fns-sap/index-eng.cfm?pg=view\\_notice&DOC\\_ID=222098&ID=all](https://notices.dfo-mpo.gc.ca/fns-sap/index-eng.cfm?pg=view_notice&DOC_ID=222098&ID=all)

Council of the Haida Nation Fisheries Management Directions for the Gwaii Haanas Haida Heritage Site can be found at:

<http://www.haidanation.ca/wp-content/uploads/2019/04/CHN-Fisheries-Management-Directions-FINAL.pdf#:~:text=COUNCIL%20OF%20THE%20HAIDA%20NATION%20FISHERIES%20MANAGEMENT%20DIRECTIONS,jurisdiction%20of%20the%20Council%20of%20the%20Haida%20Nation>.

A monitoring plan will be developed to assess the effectiveness of zoning in achieving ecological and cultural objectives. Regular monitoring within and outside of strict protection zones will illustrate ecosystem responses and facilitate adaptive management of the Gwaii Haanas marine area.

Implementation of the Land-Sea-People plan will also involve cooperative management of fisheries using an ecosystem-based management framework, and monitoring activities will be supported through partnerships. For more information on Gwaii Haanas and the Archipelago Management



Board, visit [www.parkscanada.gc.ca/gwaiihaanas](http://www.parkscanada.gc.ca/gwaiihaanas). The Land-Sea-People plan can be downloaded at <https://www.pc.gc.ca/en/pn-np/bc/gwaiihaanas/info/consultations/gestion-management-2018>.

Users of the Gwaii Haanas marine area should be aware that, as specified in the *Gwaii Haanas Agreement*, there is "no extraction or harvesting by anyone of the resources of the lands and non-tidal waters of the Archipelago for or in support of commercial enterprise" (s3.3). There are specific requirements for visiting the Gwaii Haanas terrestrial area and advanced planning is necessary. Please contact the Gwaii Haanas administration office at 1-877-559-8818 for further information.

#### Southern Strait of Georgia National Marine Conservation Area Reserve (feasibility assessment)

Parks Canada, in partnership with the Government of British Columbia, launched a feasibility assessment for a National Marine Conservation Area Reserve (NMCAR) in the southern Strait of Georgia in 2004. Since then, consultations with First Nations, key stakeholders, communities and the public have occurred. Informed by those discussions, a proposed boundary for consultation was announced by the provincial and federal Ministers of Environment in 2011.

Since 2011, the two governments have been consulting with First Nations, local governments and industry. A preliminary concept is currently being developed to help advance consultations on the feasibility assessment. If the results of the feasibility assessment indicate that establishment of a NMCAR is practical and feasible, an establishment agreement between the Governments of Canada and British Columbia will be negotiated and an interim management plan developed. If the NMCAR is determined to be feasible, further consultations related to establishment agreements and Indigenous rights will also take place with First Nations. Commercial and recreational fishing sectors, communities, landowners, recreation and environmental organizations and other stakeholders will also have opportunities to provide input to the development of the interim management plan.

Parks Canada information on the proposed NMCAR in the southern Strait of Georgia is available on the internet at: <https://www.pc.gc.ca/en/amnc-nmca/cnamnc-cnmca/dgs-ssg>

#### Scott Islands Marine National Wildlife Area

The Scott Islands Marine National Wildlife Area (mNWA) is the first protected marine area established by Environment and Climate Change Canada (ECCC) under the Canada Wildlife Act. In support of the conservation objectives of the Scott Islands mNWA, DFO is consulting on new regulations under the Fisheries Act to restrict certain fisheries that pose a risk to seabirds. A Notice of Intent was published in Canada Gazette Part 1 in June 2018 indicating the proposed regulations would prohibit fishing for three key forage fish species that serve as a key food source for seabirds (Pacific sand lance, Pacific saury, and North Pacific krill) as well as groundfish bottom trawling (in portions of the mNWA consistent with existing commercial closures) and salmon gill net and seine for commercial, recreational, and Indigenous fishing for food, social and ceremonial purposes. The anticipated pre-publishing of the regulations in Canada Gazette 1 is expected to occur in early 2021.

For further information on this, please contact - [DFO.ScottIslands-IlesScott.MPO@dfo-mpo.gc.ca](mailto:DFO.ScottIslands-IlesScott.MPO@dfo-mpo.gc.ca)

More information on the Scott Islands marine NWA can be found at:

<https://www.canada.ca/en/environment-climate-change/services/national-wildlife-areas/locations/scott-islands-marine.html>

The Scott Islands Protected Marine Area Regulations can be found at:

<https://laws-lois.justice.gc.ca/eng/regulations/SOR-2018-119/index.html>

### **Strait of Georgia and Howe Sound Glass Sponge Reef Marine Refuges**

Effective April 1st, 2019 all commercial, recreational and Aboriginal Food, Social and Ceremonial (FSC) bottom-contact fishing activities for prawn, shrimp, crab and groundfish, as well as the use of downrigger gear for recreational salmon trolling (restricted via Condition of Licence) are prohibited within portions of Subareas 28-2 and 28-4 to protect nine Howe Sound glass sponge reefs, as marine refuges. This includes prohibition of the following fishing activities:

- prawn and crab by trap
- shrimp and groundfish by trawl
- groundfish by hook and line
- use of downrigger gear in recreational salmon trolling

These eight closures are in addition to the nine areas closed to all commercial, recreational and Aboriginal FSC bottom-contact fishing activities in the Strait of Georgia and Howe Sound in 2015. Nine remaining areas in Howe Sound have been

ground-truthed to assess their ecological significance and management measures are currently being considered.

For further information on this, please contact Lindsay Klopp at [Lindsay.Klopp@dfo-mpo.gc.ca](mailto:Lindsay.Klopp@dfo-mpo.gc.ca).

Current closure locations and more information are available at: <https://www.dfo-mpo.gc.ca/oceans/ceccsr-cerceef/closures-fermetures-eng.html>

### **Ghost Gear Initiative**

One of the biggest threats to oceans internationally is marine litter, and in particular, ghost fishing gear. Ghost gear refers to any fishing equipment or fishing-related litter that has been abandoned, lost or otherwise discarded and is some of the most harmful and deadly debris found in oceans.

In support of international efforts to reduce marine litter, in 2018, Canada signed the G7 Charlevoix Blueprint for Healthy Oceans, Seas and Resilient Coastal Communities. In doing so:

- Canada committed to accelerating the implementation of the 2015 Oceans Plastics Charter; and,
- Strengthened our domestic and international commitment to addressing marine litter by signing onto the Global Ghost Gear Initiative.

These commitments were further strengthened in DFO's 2019 Minister's Mandate Letter, emphasizing the importance of this work to Canadians.



### **Conditions of License to Report Lost and Retrieved Gear**

In the spring of 2020 it became a condition of license for commercial harvesters to report lost and retrieved fishing gear. Not reporting lost and or retrieved gear is now a chargeable offence that can have international trade implications.

Lost gear reporting forms can be found at: <https://www.dfo-mpo.gc.ca/fisheries-peches/commercial-commerciale/reporting-declaration-eng.html>

### **Sustainable Fisheries Solutions and Retrieval Support Contributions Program (A.K.A. The Ghost Gear Fund)**

In the summer of 2020, DFO funded seven organizations in Pacific Region to work on the retrieval, collection and responsible disposal of lost or otherwise discarded fishing gear. To learn more about the DFO Ghost Gear Fund, go to: <https://www.dfo-mpo.gc.ca/fisheries-peches/management-gestion/ghostgear-equipementfantome/program-programme/projects-projets-eng.html>

### **Cold-Water Coral and Sponge Conservation Strategy**

DFO's Pacific Region Cold-water Coral and Sponge Conservation Strategy encompasses short and long-term goals and aims to promote the conservation, health and integrity of Canada's Pacific Ocean cold-water coral and sponge species. The Strategy also takes into consideration the need to balance the protection of marine ecosystems with the maintenance of a prosperous economy. It was created with input from stakeholders throughout the Pacific Region and will help regional partners and stakeholders to understand how DFO's existing programs and activities tie into cold-water coral and sponge conservation.

### **Policy for Managing the Impacts of Fishing on Sensitive Benthic Areas**

Benthic ecosystems provide habitat, support food webs and are an important source of biodiversity. They also support many aquatic species that play an important social, cultural and economic role in the lives of many Canadians. It is imperative that these ecosystems are considered when managing oceans activities, including the harvest of fisheries resources. This includes the consideration of target species, non-target species, the ecosystems of which they are a part and the impact of fishing on these ecosystems when making management decisions. This is the basis of an ecosystem approach to fisheries management, which, along with a precautionary approach, is key to the Sustainable Fisheries Framework.

To avoid serious or irreversible harm to sensitive benthic habitat, species and communities and to otherwise address impacts to benthic habitat, communities and species, this policy follows a five (5) step process. Following these steps, ongoing fishing activities in historically fished areas will be managed to address impacts of fishing on sensitive benthic areas through existing processes, including the advisory processes in place for the given fishery, following these steps. The management of proposed new fishing activities in frontier areas will be addressed through a separate procedure, also using these steps. For more information on this Policy, please visit the following web site:

<http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/benthi-eng.htm>

## Rockfish Conservation Areas

There are 162 Rockfish Conservation Areas (RCAs) in British Columbia, covering roughly 4,350km<sup>2</sup> of the Canadian Pacific Coast. These areas are closed to a range of recreational and commercial fisheries to protect inshore rockfish and their habitat.

DFO is currently undertaking a multi-year review of the conservation effectiveness of RCAs, including meeting the national criteria and standards for marine refuges to better conserve sensitive areas and contribute towards Canada's Marine Conservation Targets (MCT). To meet these standards, the risks to inshore rockfish, their habitat, and benthic communities will need to be avoided or mitigated. Peer-reviewed science advice also recommends that boundary changes to some RCAs will improve their spatial design by better capturing rockfish habitat features. RCAs in the Northern Shelf Bioregion have been selected for the first phase of engagement to align with the MPA network planning process in that area. Workshops with First Nations and stakeholders and online consultations were held in 2019. A summary of what we heard is available online at: <https://www.pac.dfo-mpo.gc.ca/consultation/ground-fond/rca-acs/2020-heard-entendu-eng.html#6>. There will be more opportunities to provide feedback on Rockfish Conservation Areas in the Northern Shelf Bioregion in the near future. We're also planning to review Rockfish Conservation Areas in other regions of British Columbia at a later date.

Further information on RCAs and the boundary proposals are available online at: <http://dfo-mpo.gc.ca/rockfish-conservation> or for further information on this, please contact [DFO.RCA-ACS.MPO@dfo-mpo.gc.ca](mailto:DFO.RCA-ACS.MPO@dfo-mpo.gc.ca).

## 3.5. SPECIES AT RISK ACT (SARA)

The *Species at Risk Act* (SARA) came into force in 2003. The purposes of the *Act* are “to prevent wildlife species from being extirpated or becoming extinct, and to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity and to manage species of special concern to prevent them from becoming endangered or threatened.”

To view the list of endangered, threatened, and special concern species currently listed under Schedule 1 of SARA, please visit: <https://www.canada.ca/en/environment-climate-change/services/species-risk-act-accord-funding/listing-process/aquatic-species-protected-fisheries-act.html>.

In addition to the existing prohibitions under the *Fisheries Act*, it is illegal to kill, harm, harass, capture, take, possess, collect, buy, sell or trade any SARA-listed extirpated, endangered or threatened animal or any part or derivative of an individual. These prohibitions apply unless a person is authorized, by a permit, licence or other similar document issued in accordance with SARA, to engage in an activity affecting the listed species, any part of its critical habitat, or the residences of its individuals. Species listed as special concern are not included in these prohibitions.

The formal SARA legal listing process begins when the Minister of Environment issues a response statement, detailing how he or she intends to respond to the assessment of a species by the Committee on the Status of Endangered Wildlife Species in Canada (COSEWIC). Response statements can be found at:

[https://wildlife-species.canada.ca/species-risk-registry/sar/listing/response\\_e.cfm](https://wildlife-species.canada.ca/species-risk-registry/sar/listing/response_e.cfm)

COSEWIC was formed in 1977 to provide Canadians with a single, scientifically sound classification of wildlife species at risk of extinction. COSEWIC began its assessments in 1978 and has met each year since then to assess wildlife species.

In 2003, SARA was proclaimed. Within the Act, COSEWIC was established as an independent body of experts responsible for identifying and assessing wildlife species which are potentially at risk. This is the first step towards protecting wildlife species at risk. Subsequent steps include COSEWIC reporting its results to the Canadian government and the public, and the Minister of the Environment's official response to the assessment results. Wildlife species that have been designated by COSEWIC may then be listed under Schedule 1 of SARA and receive legal protection, and recovery or management plans.

For a full list of species identified and assessed by COSEWIC, please visit:

<http://cosewic.ca/index.php/en-ca/>

Additional species designated by the COSEWIC and which are currently under consideration for listing under SARA that may be encountered in the Eulachon Fraser River Fishery include:

- White Sturgeon
  - Lower Fraser River DU – Threatened
- Fraser Sockeye Salmon
  - Bowron-ES DU – Endangered
  - Cultus-L DU – Endangered
  - Francois-Fraser-S DU – Special Concern
  - Harrison D/S-L DU – Special Concern
  - Harrison U/S-L DU – Endangered
  - Kamloops-ES DU – Special Concern
  - Lillooet-Harrison-L DU – Special Concern
  - Nahatlatch-ES DU – Special Concern
  - North Barriere-ES DU – Threatened
  - Quesnel-S DU – Endangered
  - Seton-L DU – Endangered
  - Takla-Trembleur-ES DU – Endangered
  - Takla-Trembleur-Stuart-S DU - Endangered
  - Taseko-ES DU – Endangered
  - Widgeon River-Type DU – Threatened
- Coho Salmon – Interior Fraser DU – Threatened
- Southern BC Chinook Salmon
  - Lower Fraser, Ocean, Fall population – Threatened
  - Lower Fraser, Stream, Spring population – Special Concern
  - Lower Fraser, Stream, Summer (Upper Pitt) population – Endangered
  - Lower Fraser, Stream, Summer population – Threatened
  - Middle Fraser, Stream, Fall population – Endangered
  - Middle Fraser, Stream, Summer population - Threatened
  - Middle Fraser, Stream, Spring (MFR+GStr) population – Threatened

- Middle Fraser, Stream, Spring population – Endangered
- North Thompson, Stream, Spring population – Endangered
- North Thompson, Stream, Summer population – Endangered
- South Thompson, Stream, Summer 1.2 population – Endangered
- Upper Fraser, Stream, Spring population – Endangered

### **SARA Listing Process for Fraser River (and Central Pacific Coast) Eulachon**

**COSEWIC Assessment 2011:** COSEWIC assessed Eulachon in BC as three designatable units (DU's), as follows: the Fraser River DU assessed as Endangered, the Central Pacific Coast DU as Endangered, and the Nass/Skeena Rivers DU assessed as Threatened (and subsequently reassessed as Special Concern in 2013).

**SARA Listing Process:** The COSEWIC assessment triggered the Government of Canada to consider listing these populations under SARA. A process to determine whether or not to list these populations under SARA is underway, and a decision has not yet been made.

The regional listing process included the development of science advice, via a Recovery Potential Assessment for Eulachon (Schweigert et al. 2012), available at: [http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ResDocs-DocRech/2012/2012\\_098-eng.html](http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ResDocs-DocRech/2012/2012_098-eng.html); management scenarios that outline actions the Department can take in the event of, and of not, listing under SARA (completed in 2014); a socio-economic analysis weighing the costs and benefits of each scenario (completed in 2016); as well as consultation to seek input into whether or not to list these populations (completed 2011-2016). The following information in this section provides further detail on this process.

In developing the SARA listing recommendation, the Governor in Council will consider the following components for species assessed as Extirpated, Endangered or Threatened (such as the Fraser River and Central Pacific Coast populations of Eulachon):

- best scientific advice (e.g. Recovery Potential Assessments, COSEWIC Assessment);
- development of management scenarios;
- a Socio-Economic Analysis; and
- consultation with Indigenous peoples, affected stakeholders and the Canadian public.

Given the Nass/Skeena population was assessed as Special Concern, and the prohibitions would not apply, a simplified process occurred and was completed in 2016.

The listing process for all three populations of Eulachon is ongoing and no decision has yet been made regarding the addition of these population to SARA Schedule 1.

**Recovery Potential Assessment (RPA):** The RPA provides the Department's scientific advice in support of this SARA decision. Please see section 2.6 for further information.

**Management Scenarios:** Management scenarios were developed in consultation with Indigenous peoples and commercial sector representatives. These scenarios were finalized in October 2014 and outline actions the Department may take in the event that the Fraser River and/or Central Pacific Coast

populations of Eulachon is listed under SARA, as well as those actions that will be taken under existing legislation (e.g. the *Fisheries Act*) in the event that Eulachon are not listed under SARA. The decision on whether or not to list these populations has not yet been made. When a decision is made, management changes may be made in season in response to the listing decision.

**Socio-Economic Analysis:** Federal policy (Cabinet Directive on Regulatory Management, 2012) requires an analysis of benefits and costs for regulatory decisions, such as whether or not to list a species under SARA. The Socio-Economic Analysis (SEA) of the management scenarios provides an estimate of the benefits and costs to Canadians of a SARA listing, as well as the distribution of these benefits and costs among stakeholders. The Canadian Cost-Benefit Analysis (CBA) Guide (2007) provides the framework and methodology to be used for all regulatory changes, including SARA listings.

The SEA identifies, quantifies and monetizes, where possible, the incremental costs and benefits of the actions identified in the Management Scenarios. Where the impacts cannot be monetized or quantified, they are described in qualitative terms. The SEA also considers the potential social impacts of the scenarios, specifically examining measurable impacts such as employment and income impacts across affected parties and regions. A full draft of the SEA was completed in 2016.

**Listing Consultations:** The Department has sought input since 2011 into the development of the RPA, Management Scenarios, and Socio-Economic Analysis for the Fraser River and Central Pacific Coast populations. An Indigenous technical review of the Socio-Economic Analysis was conducted in 2015.

In recognition of the cultural significance of Eulachon, an Indigenous specific consultation plan was developed in fall 2011. Initial consultations were conducted in February to June 2012 with Indigenous peoples throughout the coast to clarify the SARA process and create an opportunity for discussion on the topic.

Consultation with Indigenous peoples, stakeholders, and interested members of the public on whether or not to list the Fraser River and/or Central Pacific Coast population as Endangered under SARA occurred August 30-November 30, 2016. The consultation process for the Nass/Skeena population concluded in 2016. Input was sought online via a web-based survey, by phone, letter, email, webinars, and meetings. The Department's Recovery Potential Assessment, Management Scenarios, and Socio-Economic Analysis for the Fraser River and Central Pacific Coast populations of Eulachon were made available during this consultation period. The Department is in the final stages of developing listing advice for Eulachon. In fall 2020, the Department undertook a "check-in" period to ensure that viewpoints and information shared during 2016 consultations remain accurate and current. The Department will include any new information received during this period in its listing advice.

## Marine Mammal Incident Reporting Hotline

The Department is responsible for assisting marine mammals and sea turtles in distress. In case of any accidental contact between a vessel or fishing gear and a marine mammal or turtle, or if you observe an entangled, sick, injured, distressed, or dead marine mammal or turtle in B.C. waters, please contact the Observe, Record, Report line (B.C. Marine Mammal Incident Reporting Hotline) immediately at:

**1-800-465-4336 OR VHF CHANNEL 16**

And provide the following:

- (a) the date, time and location of the incident;
- (b) the species involved in the incident;
- (c) the circumstances of the incident;
- (d) the size and type of vehicle and, if applicable, the type of fishing gear involved in the incident;
- (e) the weather and sea conditions at the time of the incident;
- (f) the observed state of the individual after the incident; and
- (g) the direction of travel of the individual after the incident, to the extent that it can be determined.
- (h) pictures/video taken



## Whale, Leatherback Sea Turtle and Basking Shark Sightings

The Department welcomes assistance in the reporting of any whale, Leatherback Sea Turtle or Basking Shark sighting. The collection of sighting data is useful to scientists in determining population size and species distribution and aids in recovery efforts under the *Species at Risk Act* (SARA).

Toll free: 1.866.I.SAW.ONE (1-866-472-9663)

Email: [sightings@vanaqua.org](mailto:sightings@vanaqua.org)

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

App: WhaleReport

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

Toll free: 1-877-50-SHARK (1-877-507-4275)

Email: [Sharks@dfo-mpo.gc.ca](mailto:Sharks@dfo-mpo.gc.ca)

Internet: <https://www.dfo-mpo.gc.ca/species-especes/sharks/info/sightings-eng.html>

## Shark Codes of Conduct

Out of the fourteen shark species in Canadian Pacific waters, three species are listed under SARA. The Basking Shark (*Cetorhinus maximus*) is listed as Endangered, and the Bluntnose Sixgill Shark (*Hexanchus griseus*) and Tope Shark (*Galeorhinus galeus*) are listed as species of Special Concern. The primary threats



to shark species have been identified as by-catch and entanglement. In order to address the conservation concerns with shark species, it is important that measures are taken to reduce the mortality of sharks resulting from these primary threats. As such, commercial fishing licences have been amended to include a Condition of Licence for Basking Sharks that specify mitigation measures in accordance with SARA permit requirements. Additionally, two 'Code of Conduct for Shark Encounters' documents have been developed to reduce the mortality of Basking Shark, as well as other Canadian Pacific shark species such as Bluntnose Sixgill and Tope Shark resulting from entanglement and by-catch in commercial, aquaculture and recreational fisheries. These guidelines include boat handling procedures during visual encounters with Basking Sharks as well as best practices for handling Canadian Pacific shark species during entanglement encounters.

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

Code of conduct for sharks:

<https://dfo-mpo.gc.ca/species-especes/publications/sharks/coc/coc-sharks/index-eng.html>

Code of conduct for Basking Sharks:

<https://www.dfo-mpo.gc.ca/species-especes/publications/sharks/coc/coc-basking/index-eng.html>

### **3.6. GEAR IMPACTS**

Under normal operating circumstances, there is minimal to no environmental impact from gear types used in the Eulachon fishery.

### **3.7. AQUACULTURE**

On December 19, 2010 DFO assumed the role of lead federal department for sustainable management of aquaculture. Under the *Fisheries Act*, the *Pacific Aquaculture Regulations* and the *Aquaculture Activity Regulations* govern finfish, shellfish and freshwater aquaculture operations in BC. Cultivation of fish within the province requires a federal aquaculture licence issued by Fisheries and Oceans Canada. Approvals from other agencies may be required, depending upon the location and type of aquaculture activity proposed.

Pacific Aquaculture Regulations:

<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2010-270/FullText.html>

Aquaculture Activity Regulations:

<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2015-177/page-1.html>

Integrated Management of Aquaculture Plans (IMAPs) consistent with IFMPs, which are used to govern wild harvest fisheries, have been developed to provide an overview of the management framework for aquaculture. For further information refer to:

<http://www.dfo-mpo.gc.ca/aquaculture/aquaculture-eng.htm>.

## 4. OBJECTIVES

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### 4.1. NATIONAL

Fisheries and Oceans Canada aims to:

- Meet conservation objectives and ensure healthy and productive fisheries and ecosystems;
- Base management decisions on the best available scientific information;
- Manage Indigenous fisheries for FSC purposes in a manner consistent with the Sparrow Decision (SCC 1990) and other relevant court decisions (*R v. Gladstone 1996 and Ahousaht*) and treaty obligations;
- Provide stability, transparency, and predictability in fisheries management and improved governance; and
- Foster shared stewardship.

### 4.2. PACIFIC REGION

The overall goal of Fisheries Management in the Pacific Region is the conservation of Canada's fisheries resources to ensure sustainable resource utilization and generate economic prosperity, accomplished through close collaboration with resource users and stakeholders based on shared stewardship consistent with treaty and Indigenous rights. Fisheries Management is responsible for management of the Indigenous, commercial and recreational fishing in the Pacific Ocean and creating the conditions for a vibrant and innovative aquaculture industry.

Fisheries Management will continue to develop and implement the Sustainable Fisheries Framework by integrating the precautionary and ecosystem approach frameworks into IFMPs with the goal of protecting vulnerable marine and freshwater ecosystems and vulnerable stocks from significant adverse impacts, and to help ensure long term sustainability and support economic prosperity.

In 1994, the Biological Objective Working Group of the Pacific Scientific Advice Review Committee (PSARC) identified three biological objectives for management of Pacific Region fish and invertebrate stocks (Rice et al, 1995):

- Ensure that subpopulations over as broad a geographical and ecological range as possible do not become biologically threatened (in the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) sense of "Threatened").
- Operationally, Objective 1 requires at least that management allow enough spawners to survive, after accounting for all sources of mortality (including all fisheries and natural mortality), to ensure production of enough progeny that they will, themselves, be able to replace themselves when mature.
- Fisheries may have collateral effects on other species, mediated by the ecological relationships of the target species. Fisheries should be managed in ways that do not violate the above objectives for ecologically related species, as well as target species.

The objectives remain relevant today, particularly in light of development of the national objectives around sustainable fisheries.



### **4.3. EULACHON RESOURCE MANAGEMENT**

The objective of the current Eulachon fishery is to respond to conservation concerns with Fraser River Eulachon stocks and introduce measures to allow for stock rebuilding. Specific objectives are detailed below, and respective performance measures are further described in the management measures for the Indigenous, recreational and commercial fishing plans (Appendices 3, 4 and 5):

#### **Recovery Target**

A coast-wide recovery target for Eulachon is, at a minimum, to “promote the populations’ recovery such that it can qualify as special concern within the COSEWIC assessment criteria”, with an interim goal of observing “positive growth in Eulachon spawning in river systems throughout” the designatable unit ranges, and a long term goal of seeing the populations reach historic levels (Schweigert et al. 2012).

For the Fraser River population, COSEWIC assessed this population as endangered based on an observed population decline of greater than 50% over three generations (approximately 10 years for Eulachon). Recovery for Fraser River Eulachon “should be reflected in an increase in this index to historical levels.” The first goal “would be a population increase that would exceed COSEWIC’s criteria for endangered status, and bring the assessment down to a species of special concern,” and “additional rebuilding would be required to bring the Fraser River [designatable unit] to a point where it was not at risk based on COSEWIC criteria” (Schweigert et al. 2012). In addition, “distribution targets for the population would include an expansion of sustained spawning ranging to the historical extent” (Schweigert et al. 2012).

#### **Environmental and Ecological Conservation**

To ensure conservation and protection of Eulachon stocks and their habitat, and manage for ecosystem impacts through the application of scientific management principles applied in a risk averse and precautionary manner based on the best scientific advice available.

#### **Consultation Process**

Conduct an open and transparent consultation process for discussions of harvest management issues related to Eulachon harvest. DFO currently does not have a consultative body related to harvest planning for this fishery, but is conducting extensive consultation with Indigenous peoples and stakeholders.

#### **Indigenous Peoples**

To ensure that, subject to conservation needs, first priority is accorded to Indigenous peoples for opportunities to harvest Eulachon for FSC purposes. Feedback from consultations sessions is relied on to measure the performance of providing priority to Indigenous peoples for opportunities to catch fish for FSC purposes.

Limited harvest opportunities will provide access to Indigenous peoples for FSC purposes while meeting conservation objectives. Maintaining harvest at low levels will increase the probability of

rebuilding Fraser River Eulachon stocks. The Department will manage the Fraser Eulachon fisheries conservatively in 2020.

#### **4.4. COMPLIANCE**

Conservation and Protection (C&P) staff promote, monitor and enforce compliance with legislation, regulation and management measures to ensure conservation and sustainable use of fisheries resources, including Eulachon.

For more information see the Compliance Plan, section 7.

## **5. ACCESS AND ALLOCATION**

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

### **5.1. INDIGENOUS**

Indigenous harvest of Eulachon for FSC purposes may occur where authorized by a communal licence. The Department will provide Indigenous peoples with priority access to the resource for FSC purposes. FSC quotas may be determined through bilateral discussions between Indigenous peoples and the Department.

### **5.2. RECREATIONAL**

Recreational harvest of Eulachon is closed coast wide in tidal waters and freshwater.

### **5.3. COMMERCIAL**

The commercial harvest of Eulachon is a limited entry fishery. There are currently 16 party-based ZU licence eligibilities; however the fishery has been closed since 2004.

## 6. SHARED STEWARDSHIP ARRANGEMENTS

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In the past, some co-operative work has been done coast-wide, including donations of time, money, vessels, gear, samples, and offshore surveys. These measures have contributed to our knowledge about Eulachon in the Pacific Region. Indigenous peoples and stakeholders have provided assistance in obtaining information on spawner distribution, in-season test fishery data, and survey data. Also, the commercial shrimp trawl industry provided survey assistance for the offshore index (WCVI and Queen Charlotte Sound).

The Department's AFS (Aboriginal Fisheries Strategy (<https://www.dfo-mpo.gc.ca/fisheries-peches/aboriginal-autochtones/afs-srapa-eng.html>)) has provided funds for Indigenous peoples to assist in the spawner distribution work and the egg and larval surveys including the egg and larval survey that provides the annual SSB estimate for the Fraser River area.

## 7. COMPLIANCE PLAN

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DFO's Conservation and Protection (C&P) program is responsible for enforcing the *Fisheries Act*, pursuant regulations and related legislation. Enforcement activities are carried out by Fishery Officers across Canada who conduct patrols on land, at sea and in the air.

The Department promotes compliance with the law through a range of activities from education and awareness activities that encourage Canadians to protect fishery resources and habitats, patrol activities to detect violations, and major case management. These activities are further outlined in the C&P National Compliance Framework.

There are approximately 173 fishery officers stationed in the Pacific Region, which encompasses British Columbia and Yukon Territory. They are designated as "Fishery Officers" under Section 5 of the *Fisheries Act*. The *Fisheries Act* and the *Criminal Code of Canada* are the primary pieces of legislation outlining the powers and responsibilities of Fishery Officers. Officers are designated under other Acts as well, such as the *Coastal Fisheries Protection Act* and *Species at Risk Act*.

Conservation and Protection Fishery Officers are supported by the National Fisheries Intelligence Service, whose staff provide intelligence analysis services and assist in identifying targets for enforcement action. A process to incorporate information of value to the intelligence cycle has been developed. This process allows Fishery Officers, Resource Managers and stock assessment staff to collect and submit this information on a timely basis.

Users of the resource have a responsibility to report violations. Any suspected or actual fisheries, wildlife or pollution violations can be quickly and discretely reported to the appropriate enforcement officer by using the toll free observe, record and report hotline. This toll free number is available 24 hours a day.

OBSERVE, RECORD AND REPORT 1-800-465-4DFO (1-800-465-4336)

Enforcement enquiries can also be directed to the local field offices during regular office hours.

### 7.1. MAIN PROGRAM ACTIVITIES

#### **Priorities for 2021**

Enforcement priorities and strategies for the 2021 Eulachon fisheries will be developed and coordinated with local C&P and Fisheries Management staff.

In-season and post-season reviews will be conducted to ensure the best approach and strategies are used in the management of this fishery.

**In-season**

Fishery Officers will conduct directed and opportunistic patrols of the fishing area. Patrols during open and closed times will be conducted taking into consideration competing priorities and resources.

Fishery Officers may also conduct general compliance inspections at various locations such as border crossings, air cargo locations, fish processing facilities or fishing supply and tackle stores where baitfish are sold.

Illegal fishing activity may be reported through the Observe, Report, and Record line at 1-800-465-4336. Fishery Officers attempt to follow through on the reports as often as priorities, time and resources allow.

Table 5: Enforcement Issues and Strategies

<b>Issue</b>	<b>Strategy</b>
Fishing during closed time/area	Enforcement patrols will be conducted when opportunities exist.
Purchase, sell or possess any fish without a licence	Investigations will occur when violations are encountered or reported.

## 8. PERFORMANCE REVIEW

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### 8.1. MANAGEMENT PLAN EVALUATION CRITERIA

#### **National**

Eulachon conservation objectives are met.

Reasonable effort has been made to provide harvest opportunities and still maintain conservation objectives.

Consultation and management processes are stable, transparent, and predictable.

#### **Pacific Region**

Both the commercial and recreational fisheries remain closed and Indigenous peoples may apply for harvest of small amounts of Fraser River Eulachon for FSC purposes that are considered on a case by case basis.

#### **Eulachon Resource Management**

##### **Environmental and Ecological Conservation**

- Conservation and protection of Eulachon stocks will be carried out by applying a conservative management regime in light of the limited biological information available for Fraser River Eulachon
- Collect relevant information by geographic location and time period when possible.

##### **Consultation**

- Where possible, facilitate consensus building among stakeholders on issues related to the management of the fishery.

##### **Indigenous Peoples**

- DFO will consult with Indigenous peoples in order to determine their FSC requirements. Indigenous peoples will be authorized to fish for FSC purposes on a priority basis for small amounts for Fraser River Eulachon through use of a communal licence.

##### **Commercial**

- Maintain a precautionary closure of the fishery for population rebuilding in tidal waters and freshwater.

##### **Recreational**

- Maintain a precautionary closure of the fishery for population rebuilding in tidal waters and freshwater.

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## APPENDIX I: 2020 POST-SEASON REVIEW

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**Indigenous Fisheries:** In 2020, Indigenous peoples' access to Eulachon for food, social and ceremonial (FSC) purposes was managed through communal Aboriginal fishing licences on the Fraser River. In 2020, harvest opportunities were provided on a case-by-case basis per Band up to the maximum harvest level target of 10,538 lb (4.78 t) total; the total Eulachon harvest in 2020 was 10,332 lb (4.69 t).

**Recreational Fisheries:** There were no recreational fisheries for Eulachon on the Fraser River in 2020.

**Commercial Fisheries:** There were no commercial fisheries for Eulachon on the Fraser River in 2020.

**New Westminster Test Fishery:** The New Westminster test fishery was not conducted in 2020.

**LFFA Gillnet Survey Project:** The New Westminster gillnet catch per unit effort survey was conducted in 2017 to 2020 and will be evaluated for future seasons.

**Egg and Eulachon Larval Survey:** The survey was conducted again in 2020, over the standard 7-week period and a 9-week period, which added an additional 2 weeks to the front end of the standard 7-week period. The standard 7-week period in 2020 consisted of sampling from April 7 to June 4, 2020.

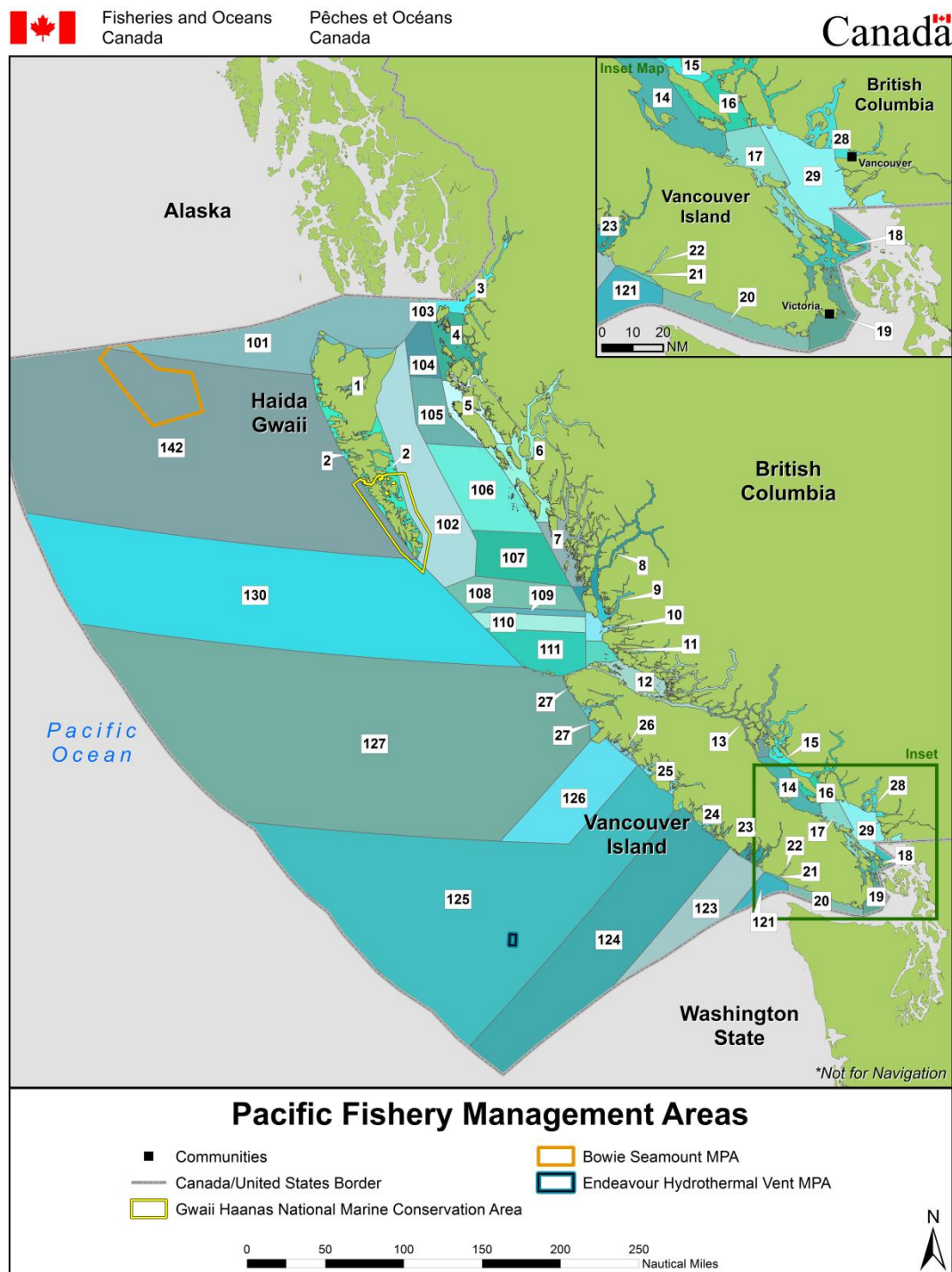
Number of Survey Weeks	Timing	North Arm SSB Index (tonnes)	South Arm SSB Index (tonnes)	Total SSB Index (tonnes)
7	April 20 – June 4	220	404	624
9	April 7 – June 4	220	408	628

In 2020, the peak out-migration of progeny for the South Arm and North Arm sampling sites occurred mid May (i.e. May 14-24), which overlaps with the long term average peak dates for the time series.

For more information on the survey results for 1995 to 2016, visit

<http://www.pac.dfo-mpo.gc.ca/science/species-especes/pelagic-pelagique/herring-hareng/herspawn/pages/river1-eng.html>. For information on survey results after 2017, please contact Linnea Flostrand, Aquatic Science Biologist / [linnea.flostrand@dfo-mpo.gc.ca](mailto:linnea.flostrand@dfo-mpo.gc.ca)).

## APPENDIX 2: MAP OF FISHING AREAS



## APPENDIX 3: 2021 INDIGENOUS FISHING PLAN

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The Department is committed to improving its relationship with Indigenous people. Indigenous fisheries play an important role in this relationship and, therefore, are an integral part of fisheries resource management in the Pacific Region. Through consultation, cooperative management and stewardship activities, DFO and Indigenous groups are working together to build strong, healthy relationships and a sustainable fishery.

Through the Aboriginal Fisheries Strategy, the Department seeks to negotiate with Indigenous groups regarding access for food, social and ceremonial (FSC) purposes. Subject to conservation, this access has priority over access for commercial and recreational harvest.

Due to conservation concerns and an ongoing recovery process, a maximum FSC harvest for Fraser River Eulachon of 15,486 pounds (lb) (7.02 tonnes (t)) will be permitted in 2021. In 2020, FSC licences for Eulachon were issued to individual Indigenous groups up to a maximum harvest level (total) of 10,538 lb (4.78 t). This was an increase from the 9,652 lb (4.38 t) limit in 2019, the 6,275 lb (2.85 t) limit in 2018, the 6,059 lb (2.75 t) limit in 2017, the 3,445 lb (1.56 t) in limit in 2016, and the 2,469 lb (1.12 t) limit in 2015 (see Table 1).

Since 2015 the method used to calculate the maximum harvest level has involved using a percentage of the average of Fraser Eulachon egg and larval survey Spawning Stock Biomass (SSB) index for a 2 to 3 Eulachon generation time span (i.e. assuming typically 3 years = 1 generation). In 2015, the maximum harvest level was set at 2% of the average of the previous 6 years (i.e. 2 generations) of SSB index values. In 2016, the method was revisited and instead the maximum harvest level was set at 2% of the average of the previous 9 years (i.e. 3 generations) of SSB index values. The longer time span was chosen in order to take into account year-to-year variation in SSB index values and Eulachon returns. Moreover, evaluating three generations or 10 years (whichever is greater) is the International Union for the Conservation of Nature (IUCN) criterion commonly used by the Committee of the Status of Endangered Wildlife in Canada (COSEWIC) for evaluating population trends. Two percent was chosen as a conservative harvest rate. Since 2017, 3.5% of the average of the previous 9 years has been used to calculate the maximum harvest level; this harvest level is still conservative and is intended to accommodate requests for an increased harvest to meet the FSC needs of Indigenous peoples.

Advice is being sought from DFO Science to inform coastwide abundance and the Department is committed to discussing the FSC harvest level methodology with Indigenous people going forward. In 2021, a harvest level of 3.5% of the average of the previous 9 years of the SSB index will be used.

Table 1. Recent Fraser River Eulachon Indigenous food, social and ceremonial fishery harvest level setting methodologies and maximum harvest levels.

Year	Harvest Rate	SSB index timespan used to calculate harvest level	Maximum harvest level (tonnes)	Maximum harvest level (pounds)
2014	NA	NA	0.36	800
2015	2%	Average of previous 6 years	1.12	2,469
2016	2%	Average of previous 9 years	1.56	3,445
2017	3.5%	Average of previous 9 years	2.75	6,059
2018	3.5%	Average of previous 9 years	2.85	6,275
2019	3.5%	Average of previous 9 years	4.38	9,652
2020	3.5%	Average of previous 9 years	4.78	10,538
2021	3.5%	Average of previous 9 years	7.02	15,486

This approach will provide access to Indigenous peoples for FSC purposes while supporting conservation and rebuilding objectives. Access to Fraser River Eulachon will be determined on a case-by-case basis through discussions with Indigenous groups and the DFO Fraser and Interior Area office staff. Specific fishing plans are developed through these consultations and fishing plan discussions.

DFO will continue to use management measures for communal licences, such as: gear restrictions, shorter opening times, and increased monitoring. These licence conditions are designed to ensure the total harvest target is not exceeded and to facilitate achievement of shared objectives between Indigenous people by allowing all Indigenous groups an opportunity to catch their harvest targets. Licence conditions will include the following management measures:

- Gillnet length: Maximum of 100 m;
- Fishing time: Maximum of 12 hours or as negotiated in-season;
- Soak time: Maximum of 20 minutes or as negotiated in-season;
- Consideration of various gear types in traditional fishing areas, and;
- Enhanced monitoring program. Going forward, this will be informed by an ecological risk assessment performed as directed in the Strategic Framework for Fishery Monitoring and Catch Reporting in Pacific Fisheries (more information is available in section 1.6).

Any Indigenous group interested in developing new harvest methods or restarting historic harvest methods will work with DFO staff to licence and monitor appropriately.

The Department will consider further management actions following the completion of the SARA listing process.

For additional information on DFO's Treaty and Aboriginal Fisheries programs, please visit: <http://www.pac.dfo-mpo.gc.ca/abor-autoc/index-eng.html>

## APPENDIX 4: 2021 RECREATIONAL FISHING PLAN

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DUE TO CONSERVATION CONCERNS, THE RECREATIONAL FISHERY IS CLOSED IN 2021.

### General Information on Tidal Water Sport Fishing - Licensing and Regulations

The recreational harvest of various fish and invertebrate species in BC is regulated via the *British Columbia Sport Fishing Regulations*, 1996 made under the *Fisheries Act*. A Fisheries and Oceans Canada Tidal Waters Sport Fishing licence is required for the recreational harvest of all species of fish. More information on licences is available online via the National Recreational Licensing System (NOLS) at: <http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/licence-permis/application-eng.html>

The regulations for recreational fishing of finfish are summarized in the British Columbia Tidal Waters Sport Fishing Guide which lists closed times, bag limits, size limits (where applicable) and closed areas: <http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/index-eng.html>. Fishery Notices are issued to advise of changes to the regulations which are kept up-to-date in the online Sport Fishing Guide; view or sign-up to receive Fishery Notice notifications by email at: <http://notices.dfo-mpo.gc.ca/fns-sap/index-eng.cfm>. The Sport Fishing Institute of BC has recently developed the 'FishingBC App', a free app you may optionally download to your mobile device if you wish to receive up-to-date sport fishing regulation details.

The Sport Fishing Advisory Board (SFAB) is the primary consultative body for the recreational fishing community, and includes representatives from all geographic regions in BC, and the BC Wildlife Federation, and the Sport Fishing Institute of BC. If you have any questions or need further information, please contact a recreational fisheries co-coordinator or a local Fisheries and Oceans Canada office (see Departmental Contacts).

## APPENDIX 5: 2021 COMMERCIAL FISHING PLAN

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**DUE TO CONSERVATION CONCERNS, THE COMMERCIAL FISHERY IS CLOSED IN 2021.**

The commercial Fraser River Eulachon fishery has limited entry licensing with sixteen licence eligibilities in ZU licence category, however for 2021 the fishery is closed. Since the fishery is closed, licence eligibility holders will not be required to designate a vessel. Licence holders are now asked to pay an annual renewal fee of \$0 to maintain 2021 licence eligibility.

### **General Information on Licensing Service Changes – Effective since 2013**

Fisheries and Oceans Canada (DFO) introduced the web-based National Online Licensing System (NOLS) in the spring of 2013. This web-based system replaces in-person counter service at Pacific Fishery Licensing Units. Fish harvesters/licence holders/vessel owners will now use the new online system to view, pay for and print their commercial fishing licences, licence conditions and/or receipts. Fish harvesters must log into the NOLS to register and activate their accounts using the DFO Passcode that has been mailed to them in order to pay the fees and request issuance of a licence.

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

Telephone: 1-877-535-7307 (ask for “Pacific Region”)  
Fax: 604-666-5855  
Email: [fishing-peche@dfo-mpo.gc.ca](mailto:fishing-peche@dfo-mpo.gc.ca) (specify “Pacific Region” in subject line)

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



## APPENDIX 6: FISHING VESSEL SAFETY

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## I. OVERVIEW – FISHING VESSEL SAFETY

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Vessel owners and masters have a duty to ensure the safety of their crew and vessel. Adherence to safety regulations and good practices by owners, masters and crew of fishing vessels will help save lives, prevent vessel damage and protect the environment. All fishing vessels must be in a seaworthy condition and maintained as required by Transport Canada (TC), WorkSafeBC, and other applicable agencies. Vessels subject to inspection should ensure that the certificate of inspection is valid for the area of intended operation.

In the federal government, responsibility for shipping, navigation, and vessel safety regulations and inspections lies with TC; emergency response with the Canadian Coast Guard (CCG) and DFO has responsibility for management of the fisheries resources. The Transportation Safety Board is an independent agency that advances transportation safety by investigating selected occurrences in the air, marine, pipeline and rail modes of transportation including fishing vessel occurrences. In BC, WorkSafeBC exercises jurisdiction over workplace health and safety and conducts inspections on commercial fishing vessels in order to ascertain compliance with the Workers Compensation Act (WCA) and the Occupational Health and Safety Regulation (OHSR).

Before departing on a voyage the owner, master, or operator must ensure that the fishing vessel is capable of and safe for the intended voyage and fishing operations. Critical factors for a safe voyage include the seaworthiness of the vessel, having the required personal protective and life-saving equipment in good working order, adequate number of properly trained crew, and knowledge of current and forecasted weather conditions. As safety requirements and guidelines may change, the vessel owner, crew, and other workers must be aware of the latest legislation, policies and guidelines prior to each trip.

There are many useful tools available for ensuring a safe voyage. These include:

- Education and training programs
- Marine emergency duties training
- Fish Safe – Stability Education Program & 1 Day Stability Workshop
- Fish Safe – SVOP (Subsidized rate for BC commercial fishers provided)
- Fish Safe – *Safest Catch* program – **FREE** for BC commercial fishers
- Fish Safe *Safe At Sea* DVD Series – Fish Safe
- Fish Safe Stability Handbook – *Safe at Sea* and *Safest Catch* – DVD Series
- Fish Safe *Safest Catch* Log Book
- Fish Safe *Safety Quik*
- First Aid training
- Radio Operators Course (Subsidized rate for BC commercial fishers provided)
- Fishing Masters Certificate training
- Small Vessel Operators Certificate training

Publications:

- *Gearing Up for Safety* - WorkSafeBC
- Transport Canada Publication TP 10038 Small Fishing Vessel Safety Manual (can be obtained at Transport Canada Offices from their website at: <http://www.tc.gc.ca/eng/marinesafety/tp-tp10038-menu-548.htm>)
- Amendments to the Small Fishing Vessel Inspection Regulations (can be obtained from: <http://www.gazette.gc.ca/rp-pr/p2/2016/2016-07-13/html/sor-dors163-eng.php>)
- Safety Issues Investigation into Fishing Safety in Canada report can be accessed: <https://www.tsb.gc.ca/eng/rapports-reports/marine/etudes-studies/M09Z0001/M09Z0001.html>

For further information see: <https://tc.canada.ca/en/marine-transportation>  
[www.fishsafebc.com](http://www.fishsafebc.com)  
[www.worksafebc.com](http://www.worksafebc.com)  
[www.tsb.gc.ca/eng/rapports-reports/marine/index.html](http://www.tsb.gc.ca/eng/rapports-reports/marine/index.html)

## **2. IMPORTANT PRIORITIES FOR VESSEL SAFETY**

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There are three areas of fishing vessel safety that should be considered a priority. These are: vessel stability, emergency preparedness, and cold water immersion.

### **2.1 Fishing Vessel Stability**

Vessel stability is paramount for safety. Care must be given to the stowage and securing of all cargo, skiffs, equipment, fuel containers and supplies, and to correct ballasting. Fish harvesters must be familiar with their vessel's centre of gravity, the effect of liquid free surfaces on stability (e.g. loose water or fish on deck), loading and unloading operations, watertight integrity and the vessel's freeboard. Know the limitations of your vessel; if you are unsure contact a naval architect, marine surveyor or the local Transport Canada Marine Safety Office.

Fishing vessel owners are required to develop detailed instructions addressing the limits of stability for each of their vessels. These instructions must include detailed safe operation documentation kept on board the vessel.

In 2017, Transport Canada Marine Safety (TC) issued Ship Safety Bulletin (SSB) [No. 03/2017](#) announcing the coming into force of the New Fishing Vessel Safety Regulations. The initial regulations were published in the Canada Gazette Part II on July 13, 2016 and came into force on July 13, 2017. The bulletin includes important information on changes to requirements for Written Safety Procedures, Safety Equipment and Vessel Stability.

As of July 13, 2017, new regulations pertaining to stability assessments to be performed by a competent person came into effect, as follows:

- A new fishing vessel that has a hull length of more than 9 m where the vessel construction was started or that a contract was signed for the construction after July 13, 2018;
- A fishing vessel more than 9 m and that has undergone a major modification or a change in activity that is likely to adversely affect its stability;
- A fishing vessel that is fitted with an anti-roll tank at any time;
- A fishing vessel more than 15 gross tonnage and used for catching herring or capelin during the period beginning on July 6, 1977 and ending on July 13, 2017
- For an existing fishing vessel that is not required to undergo a stability assessment, the owner shall be capable of demonstrating that their vessel has adequate stability to safely carry out the vessel's intended operations. Guidelines have been developed and are available online to help small fishing vessel owners and operators meet their regulatory requirements
- Two good resources can be found here: [TP 15393 - Adequate stability and safety guidelines for fishing vessels \(2018\)](#) and [TP 15392 – Guidelines for fishing vessel major modification or a change in activity \(2018\)](#)

Further, the new Regulation requires a “Stability Notice” to be developed after a stability assessment. This notice includes a simple diagrammatic of the vessel, its tanks and fish holds, or deck storage as the case may be. It is intended to assist fishing vessel crews in quickly determining the safe carriage limits of the vessel without having to reference a complicated Trim and Stability Book.

Additionally, Transport Canada published a Stability Questionnaire ([SSB No. 04/2006](#)) and Fishing Vessel Modifications Form ([SSB No. 01/2008](#)) which enable operators to identify the criteria which will trigger a stability assessment. Please contact the nearest Transport Canada office if you need to determine whether your vessel requires one, or to receive guidance on obtaining competent assessor.

In 2019, TC provided an updated [SSB 03/2019](#), which sets out a voluntary record of modifications for the benefit of owners/masters of any fishing vessels. For vessels of more than 15 gross tons, the record of modifications was to be reviewed by TC inspectors during regular inspections and entered on the vessel's inspection record. However, information gathered during the Transportation Safety Board's (TSB) Safety Issues Investigation into the fishing industry showed minimal recording of vessel modifications prior to this date.

The TSB has investigated several fishing vessel accidents since 2005 and found a variety of factors that effected the vessel's stability were identified as contributing factors in vessels capsizing, such as with: [M05W0110](#) - *Morning Sunrise*, [M07M0088](#) - *Big Sisters*, [M08W0189](#) - *Love and Anarchy*, [M09L0074](#) - *Le Marsouin I*, [M10M0014](#) - *Craig and Justin*, [M12W0054](#) - *Jessie G*, [M12W0062](#) - *Pacific Siren*, [M14P0121](#) - *Five Star*, [M15P0286](#) - *Caledonian*, [M16A0140](#) - *C19496NB*, [M17C0061](#) - *Emma Joan*, [M17P0052](#) - *Miss Cory*, [M18P0073](#) - *Western Commander* and [M18A0425](#) - *Charlene A*.

Vessel masters are advised to carefully consider stability when transporting gear. Care must be given to the stowage and securing of all traps, cargo, skiffs, equipment, fuel containers and supplies and also to correct ballasting. Know the limitations of your vessel; if you are unsure contact a reputable marine surveyor, naval architect or the local Transport Canada Marine Safety office.

WorkSafeBC's Occupational Health and Safety Regulations (OHSR) require owners of fishing vessels to provide documentation on board, readily accessible to crew members, which describes vessel characteristics, including stability.

Fish Safe has developed a code of best practices for the food and bait/roe herring fisheries and the prawn fishery: These Best Practices are available on Fish Safe's website for convenient download here: <https://www.fishsafebc.com/best-practices> Please contact Ryan Ford at Fish Safe for a copy of the program materials they developed to address safety and vessel stability in these fisheries. Ryan Ford – office: (604) 261261-9700 - Email: [ryan@fishsafebc.com](mailto:ryan@fishsafebc.com).

## **2.2 Emergency Drill Requirements**

The *Canada Shipping Act, 2001* requires that the Authorized Representative of a Canadian Vessel shall develop procedures for the safe operation of the vessel and for dealing with emergencies. The Act also requires that crew and passengers receive safety training. The Marine Personnel Regulations require that all personnel on board required to meet the minimum safe manning levels have received MED (Marine Emergency Duties) training to an A1 or A3 level, depending on the vessel's voyage limits, within 6 months of serving aboard. MED A3 training is 8 hours in duration and is applicable to seafarers on fishing vessels less than 150 GRT that are within 25 miles from shore (NC2). MED A1 training is 19.5 hours duration and is applicable to all other fishing vessels.

To assist fishers in meeting their crew training requirements, Fish Safe has created a downloadable '*New Crew Orientation Form and How To Guide*' available on Fish Safe's website here: <https://www.fishsafebc.com/downloadable-tools>

MED provides a basic understanding of the hazards associated with the marine environment; the prevention of shipboard incidents; raising and reacting to alarms; fire and abandonment situations; and the skills necessary for survival and rescue.

WorkSafeBC's Occupational Health and Safety Regulation (OHSR) requires written rescue and evacuation procedures for work on or over water. Additionally, fishing vessel masters must establish procedures and assign responsibilities to each crew member to cover all emergencies, including the following: crew member overboard, fire on board, flooding of the vessel, abandoning ship, and calling for help. Fishing vessel masters are also required to conduct

emergency drills at the start of each fishing season, when there is a change of crew, and at periodic intervals to ensure that crewmembers are familiar with emergency procedures.

Between 2011 and 2015 the TSB investigated 17 fishing vessel accidents which resulted in 17 fatalities. The reports findings highlighted the lack of safety drills and safety procedures and practices. The *Safest Catch* program, delivered by Fish Safe and free to BC commercial fishers, includes comprehensive practice of drills such as abandon ship, man overboard and firefighting drills.

## **2.3 Cold Water Immersion**

Drowning is the number one cause of death in BC's fishing industry. Cold water is defined as water below 25 degrees Celsius, but the greatest effects occur below 15 degrees C. BC waters are usually below 15 degrees C. Normal body temperature is around 37 degrees Celsius; cold water rapidly draws heat away from the body. The effects of cold water on the body occur in four stages: cold shock, swimming failure, hypothermia and post-rescue collapse. Know what to do to prevent you or your crew from falling into the water and what to do if that occurs. More information is available in the WorkSafeBC Bulletin Cold Water Immersion (available from the WorkSafeBC website at [www.worksafebc.com](http://www.worksafebc.com)).

Under the recently amended (June 2019) OHS Regulation, section 24.96.1, a crewmember must wear a PFD or lifejacket when on board a fishing vessel that has no deck or deck structure or when on the deck of a fishing vessel that has a deck or deck structure. The use of a PFD will prepare a crewmember to remain afloat, to survive the effects of cold shock, reduce the need to swim and give rescuers time to respond.

Section 8.26, which requires workers to wear a PFD or lifejacket when working “under conditions which involve a risk of drowning”, would continue to apply to fishing crewmembers and other workers (e.g. when they are working on shore, docks and other vessels). The specific requirements can be found on WorkSafeBC's PFD Primer provided on Fish Safe's website here: <https://www.fishsafebc.com/cold-water-survival>.

It has been demonstrated time and again that, when worn, PFD's save lives - and the chance of surviving a mishap increases significantly when these devices are worn while working on deck.

Resulting from the TSB investigations into the Diane Louise - [M14P0110](#) and the Caledonian – [M15P0286](#) fishing vessel accidents the Board recommended that both TC and WorkSafeBC require that persons wear a suitable personal flotation devices (PFDs) at all times when: on the deck of a commercial fishing vessel; or, when on board a commercial fishing vessel without a deck or deck structure, and ensure that programs are developed to confirm compliance.

## 2.4 Other Issues

### Weather

Vessel owners and masters are reminded of the importance of paying close attention to current weather trends and forecasts during the voyage. Marine weather information and forecasts can be obtained on VHF channels 21B, Wx1, Wx2, Wx3, or Wx4. Weather information is also available from Environment Canada website at:

[http://www.weatheroffice.gc.ca/marine/index\\_e.html](http://www.weatheroffice.gc.ca/marine/index_e.html)

### Emergency Radio Procedures

Vessel owners and masters should ensure that all crew are able to activate the Search and Rescue (SAR) system early rather than later by contacting the Canadian Coast Guard (CCG). It is strongly recommended that all fish harvesters carry a registered 406 MHz Emergency Position Indicating Radio Beacon (EPIRB). These beacons should be registered with the National Search and Rescue secretariat. When activated, an EPIRB transmits a distress call that is picked up or relayed by satellites and transmitted via land earth stations to the Joint Rescue Co-ordination Centre (JRCC), which will task and co-ordinate rescue resources. The TSB notes that there have been several recent occurrences on board vessels not equipped with an EPIRB, and that were either unable or did not use any other means of emergency signaling distress (e.g. M14P0121, M14A0289, M150189, M16A0327, M18A0076, M18A0303, M18A0078, M18P0184, M19A0082, M19P0242, M20A0258, M20A0160) which resulted in 24 fatalities.

Fish harvesters should monitor VHF channel 16 or MF 2182 KHz and make themselves and their crews familiar with other radio frequencies. All crew should know how to make a distress call and should obtain their restricted operator certificate from Industry Canada. However, whenever possible, masters should contact the nearest Canadian Coast Guard (CCG) Marine Communications and Traffic Services (MCTS) station (on VHF channel 16 or MF 2182 kHz) prior to a distress situation developing. Correct radio procedures are important for communications in an emergency. Incorrect or misunderstood communications may hinder a rescue response. Further information is available at [Radio Aids to Marine Navigation General](#)

Since August 1, 2003 all commercial vessels greater than 8 metres in length are required to carry a Class D VHF Digital Selective Calling (DSC) radio. A registered DSC VHF radio has the capability to alert other DSC equipped vessels in your immediate area and MCTS that your vessel is in distress. Masters should be aware that they should register their DSC radios with Industry Canada to obtain a Marine Mobile Services Identity (MMSI) number or the automatic distress calling feature of the radio may not work. For further information see the Coast Guard website at: <http://www.ccg-gcc.gc.ca/eng/CCG/Home> or go directly to the Industry Canada web page:

[www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01032.html](http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01032.html)

A DSC radio that is connected to a GPS unit will also automatically include your vessel's current position in the distress message. More detailed information on DSC can be found here: [TC DSC Safety Bulletin](#). Questions regarding Coast Guard DSC capabilities can be obtained by

contacting your local MCTS centre (Prince Rupert MCTS (250)627-3070 or Victoria MCTS (250)363-6333).

### **Collision Regulations**

Fish harvesters must be knowledgeable of the *Collision Regulations* and the responsibilities between vessels where risk of collision exists. Navigation lights must be kept in good working order and must be displayed from sunset to sunrise and during all times of restricted visibility. To help reduce the potential for collision or close quarters situations which may also result in the loss of fishing gear, fish harvesters are encouraged to monitor the appropriate local Vessel Traffic Services (VTS) VHF channel when travelling or fishing near shipping lanes or other areas frequented by large commercial vessels. Vessels required to participate in VTS include:

- a) every ship twenty metres or more in length,
- b) every ship engaged in towing or pushing any vessel or object, other than fishing gear,
- c) where the combined length of the ship and any vessel or object towed or pushed by the ship is forty five metres or more in length; or
- d) where the length of the vessel or object being towed or pushed by the ship is twenty metres or more in length.

### **Exceptions include:**

- a) a ship towing or pushing inside a log booming ground,
- b) a pleasure yacht *less than* 30 metres in length, and
- c) a fishing vessel that is *less than* 24 metres in length and not *more than* 150 tons gross.

More detailed information on VTS can be obtained by calling either Prince Rupert MCTS (250)627-3070 or Victoria MCTS (250)363-63336333 or from the Coast Guard website: [MCTS Radio Aids to Marine Navigation Traffic](#)

### **Buddy System**

Fish harvesters are encouraged to use the buddy system when transiting and fishing as this allows for the ability to provide mutual aid. An important trip consideration is the use of a sail/voyage plan which includes the particulars of the vessel, crew and voyage. The sail plan should be left with a responsible person on shore or filed with the local MCTS. After leaving port the fish harvester should contact the holder of the sail plan daily or as per another schedule. The sail plan should ensure notification to JRCC when communication is not maintained which might indicate your vessel is in distress. Be sure to cancel the sail plan upon completion of the voyage.



### 3. WORKSAFEBC

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WorkSafeBC exercises jurisdiction over workplace health and safety, including the activities of crews of fishing vessels. Commercial fishing, diving and other marine operations are subject to the provisions of the *Workers Compensation Act (WCA)* and requirements in Part 24 of the Occupational Health and Safety Regulation (OHSR). Examples of Part 24 regulatory requirements related to fishing include, but are not limited to, the requirement to establish emergency procedures, to conduct emergency drills, to provide immersion suits for the crew, to provide stability documentation for the vessel, safe work procedures, injury reporting, correction of unsafe working conditions, the requirement to wear personal flotation devices (PFDs), etc.

Other sections of the OHSR also apply to commercial fishing operations. For example, Part 3 addresses training of young and new workers, first aid, and employer incident/accident investigations. Part 4 addresses general conditions such as maintenance of equipment, workplace conduct and impairment. Part 8 addresses issues related to safety headgear, safety footwear, eye and face protection, limb and body protection and personal flotation devices (PFDs) when working on the dock. Part 12 addresses issues related to tools, machinery and equipment, including safeguarding. Part 15 addresses issues related to rigging.

Both owners and masters of fishing vessels are considered to be employers. Under the *Workers Compensation Act* and the OHS Regulation (OHSR) they have varying and overlapping duties and responsibilities. Masters, because they have the most control during fishing and related activities, are considered to be the employer with primary responsibility for the health and safety of the crew.

The OHSR and the WCA are available from the Provincial Crown Printers or by visiting the WorkSafeBC website: [www.worksafebc.com](http://www.worksafebc.com)

NOTE: Regarding the OHSR requirement to wear PFD's, WorkSafeBC has produced a video entitled "Turning the Tide – PFD's in the Fishing Industry". For more information on PFD use, including a link to the video, please access the following site:

<https://www.worksafebc.com/en/about-us/news-events/news-releases/2018/November/new-fishing-industry-safety-video?origin=s&returnurl=https%3A%2F%2Fwww.worksafebc.com%2Fen%2Fsearch%23q%3DTurning%2520the%2520Tide%26sort%3Drelevancy%26f%3Alanguage-facet%3D%5BEnglish%5D>

For further information, contact an Occupational Safety Officer:

Bruce Logan                      Vancouver/                      (604) 244-6477

	Richmond/Delta	
Mark Lunny	Courtenay	(250) 334-8732
Cody King	Courtenay	(250) 334-8733
Gregory Matthews	Courtenay	(250) 334-8734
Paul Matthews	Courtenay	(250) 334-8741
Jessie Kunce	Victoria	(250) 881-3461

or the Manager of Interest for Marine and Fishing, Pat Olsen (250) 334-8777

For information on projects and initiatives related to commercial fishing health and safety please contact Tom Pawlowski, Manager, OHS Consultation and Education Services, at (604) 233-4062 or by email: [tom.pawlowski@worksafebc.com](mailto:tom.pawlowski@worksafebc.com) or Tim Pryde, OHS Consultant at (604) 802-2954 or by email: [tim.pryde@worksafebc.com](mailto:tim.pryde@worksafebc.com).

#### **4. FISH SAFE BC**

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Fish Safe encourages Vessel masters and crew to take ownership of fishing vessel safety. Through this industry driven and funded program Fish Safe provides fishing relevant tools and programs to assist fishers in this goal. The Fish Safe Stability Education Program and 1 Day Stability Workshop are available to all fishers who want to improve their understanding of stability and find practical application to their vessel's operation. The SVOP (Small Vessel Operator Proficiency) Course is designed to equip crew with the skills they need to safely navigate during their wheel watch. The *Safest Catch* Program, along with fisher-trained Safety Advisors, is designed to give fishers the tools they need to create a vessel specific safety management system.

As referenced throughout the above documentation, Fish Safe provides a broad range of courses, programs and services that are either free for BC commercial fishers or highly subsidized.

Fish Safe is managed by Ryan Ford, Program Manager and support staff including John Krgovich, Program Coordinator, Stephanie Nguyen, Program Assistant, Rhoda Huey, Bookkeeper/Administrative Assistant, and an experienced team of fisher Safety Advisors. All activities and program development is directed by the Fish Safe Advisory Committee (membership is open to all interested in improving safety on board fishing vessels). The Advisory Committee meets two to three times annually to discuss safety issues and give direction to Fish Safe in the development of education and tools for fish harvesters.

Fish Safe also works closely with WorkSafeBC to improve the fishing injury claims process. For further information contact:

Ryan Ford	Cell: (604) 739-0540
Program Manager	Office: (604) 261-9700
Fish Safe	Email: <a href="mailto:ryan@fishsafebc.com">ryan@fishsafebc.com</a>
#100, 12051 Horseshoe Way	

## 5. TRANSPORTATION SAFETY BOARD

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The Transportation Safety Board (TSB) is not a regulatory board. The TSB is an independent agency that investigates marine, pipeline, railway and aviation transportation occurrences to determine the underlying risks and contributing factors. Its sole aim is the advancement of transportation safety by reporting publicly through Accident Investigation Reports or Marine Safety Information Letters or Advisors. It is not the function of the Board to assign fault or determine civil or criminal liability. Under the TSB Act, all information collected during an investigation is completely confidential.

In 2014 the TSB pacific region released three investigation reports:

- the collision between trawl fishing vessel [Viking Storm](#) and US long line fishing vessel *Maverick* and the subsequent fatality,
- the person over board off the prawn fishing vessel [Diane Louise](#) and the subsequent fatality, and
- the capsizing of the crab fishing vessel [Five Star](#) and subsequent fatality.

In 2016 the TSB pacific region released one investigation report:

- the capsizing of the trawl [Caledonian](#) and subsequent fatalities.

In 2018 the TSB pacific region released two investigation reports:

- the capsizing and sinking of the [Miss Cory](#) and subsequent fatality
- the sinking of the [Western Commander](#) and loss of life

In 2020 the TSB pacific region is currently investigating the fatal accident involving the [Arctic Fox II](#) on August 11.

The TSB issued five recommendations following the *Caledonian* report. Three recommendations issued are aimed at ensuring all crews have access to adequate stability information that meets their needs. That means:

- All commercial fishing vessels should have a stability assessment appropriate for their size and operation.
- The information from that assessment must then be kept current, and it must be used to determine safe operating limits.

Moreover, these operating limits must be easily measurable, and relevant to the vessel's operation. For example, that could mean marking the sides of a vessel's hull to indicate the maximum operating waterline, or maximum permitted loads can be specified in the most relevant unit of measure—total catch weight for instance, or the safe number of traps.

Regardless, for it to be of real, practical use, the information must be presented in a format that is clearly understood and easily accessible to crew.

The other two recommendations address the most basic step that harvesters can take: wearing a personal flotation device. Here in British Columbia, roughly 70 percent of all fishing-related fatalities in the past decade came while not wearing a PFD. Yet many harvesters still do not wear them. TC regulations currently require that PFDs be worn only if harvesters identify a risk, however; you never know when you could end up in the water. So the TSB is recommending to TC to require persons to wear suitable personal flotation devices at all times when on the deck of a commercial fishing vessel or when on board a commercial fishing vessel without a deck or deck structure and that programs are developed to confirm compliance. In June 2019, WorksafeBC amended its fishing regulation related to the use of PFDs. Under the amendments, crewmembers must wear a PFD or lifejacket when on board a fishing vessel that has no deck or deck structure, or when on the deck of a fishing vessel that has a deck or deck structure. Crewmembers are not required to wear lifejackets or PFDs below deck or when inside a deck structure where there is risk of entrapment. This amendment removes the need for a risk of drowning to be present before a PFD must be worn.

For more information about the TSB, visit the website at [www.tsb.gc.ca](http://www.tsb.gc.ca)  
For information about the TSB's investigation into fishing safety, or to view a brief video, visit: <http://www.tsb.gc.ca/eng/medias-media/videos/marine/m09z0001/index.asp>

To view information on the TSB's recent safety Watchlist, visit: <http://www.bst-tsb.gc.ca/eng/surveillance-watchlist/marine/2018/marine.html>

Reporting an Occurrence: [www.tsb.gc.ca/eng/incidents-occurrence/marine/](http://www.tsb.gc.ca/eng/incidents-occurrence/marine/)  
After a reportable occurrence happens; you can fill out the TSB 1808 form or call the TSB at the contact information below.

Recently the TSB produced a Safe at Sea: Activity book on fishing safety intended for the next generation of fish harvesters (ages 4-7). Download a copy.  
[www.tsb.gc.ca > eng > medias-media > prudence-safe > safe-at-sea](http://www.tsb.gc.ca/eng/medias-media/prudence-safe/safe-at-sea)

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