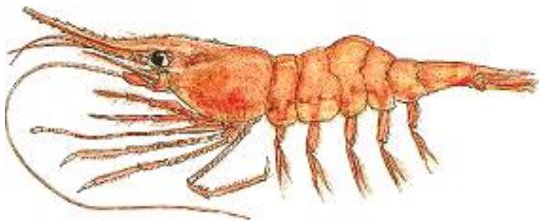


PACIFIC REGION

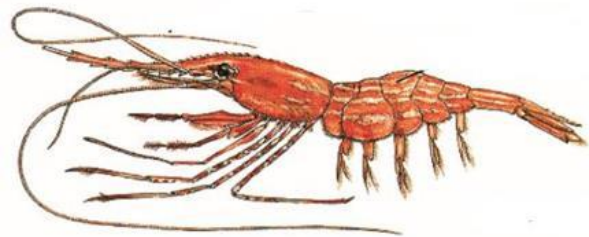
INTEGRATED FISHERIES MANAGEMENT PLAN

SHRIMP TRAWL

APRIL 1, 2022 TO
MARCH 31, 2023



Smooth Pink Shrimp: *Pandalus jordani*



Sidestripe Shrimp: *Pandalopsis dispar*



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.

© Her Majesty the Queen in Right of Canada, 2022.
Cat. No. Fs143-3/21-2079E-PDF ISBN 978-0-660-41317-4 ISSN 2564-002X

Correct citation for this publication:
Fisheries and Oceans Canada. 2022. Shrimp Trawl Fisheries Management Plan 2022/23. 21-2079:
215p.



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.

FOREWORD

The purpose of this Integrated Fisheries Management Plan (IFMP) is to identify the main objectives and requirements for the shrimp trawl fishery in the Pacific Region, 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) staff, legislated co-management boards and other stakeholders. 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.



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.

TABLE OF CONTENTS

1.	OVERVIEW	5
1.1.	Introduction.....	5
1.2.	History.....	5
1.3.	Type of Fishery and Participants	6
1.3.1.	First Nations	6
1.3.2.	Recreational.....	6
1.3.3.	Commercial	7
1.4.	Location of Fishery	7
1.5.	Fishery Characteristics.....	8
1.6.	Governance	11
1.7.	Consultation	12
1.8.	Approval Process	13
2.	STOCK ASSESSMENT AND SCIENCE.....	13
2.1.	Biological Synopsis	13
2.2.	Ecosystem Interactions	13
2.3.	Stock Assessment.....	13
2.4.	Precautionary Approach.....	14
2.5.	Stock Scenarios	15
2.6.	Research.....	15
3.	INDIGENOUS KNOWLEDGE	16
4.	SOCIAL CULTURAL AND ECONOMIC IMPORTANCE.....	16
4.1.	Socio-Economic Profile	16
4.2.	Commercial.....	17
4.3.	Processing	20
4.4.	Export Market	21
4.5.	Viability and Market Trends	23
4.6.	First Nations.....	24
5.	MANAGEMENT ISSUES	24
5.1.	Conservation and Sustainability	24
5.1.1.	Multi-species/Multi-stock Management.....	24
5.2.	Social, Cultural and Economic	24
5.2.1.	First Nations	24
5.2.2.	Recreational.....	25
5.2.3.	Commercial	25
5.3.	Compliance	25
5.4.	Ecosystem	25
5.4.1.	Strategic Framework for Fishery Monitoring and Catch Reporting	25
5.4.2.	Bycatch	26
5.4.3.	Gear Impact	27
5.4.4.	Forage Species.....	28
5.4.5.	Species at Risk.....	28
5.4.6.	Whale, Turtle and Basking Shark Incident and Sight Reports	30
5.4.7.	Southern Resident Killer Whale Management Measures.....	31

5.4.8.	Marine Mammal Protection Act	32
5.4.9.	Marine Mammal Regulations	33
5.4.10.	Relevant Species at Risk Materials	34
5.4.11.	Oceans and Habitat Considerations	34
6.	OBJECTIVES	43
6.1.	National	43
6.2.	Pacific Region	43
6.3.	Objectives for Pink and Sideshripe Shrimp Trawl	44
6.3.1.	Conservation and Sustainability	44
6.3.2.	Social, Cultural and Economic	44
6.3.3.	Compliance	44
6.3.4.	Ecosystem	44
7.	ACCESS AND ALLOCATION	45
8.	MANAGEMENT MEASURES FOR THE DURATION OF THE PLAN.....	46
9.	SHARED STEWARDSHIP ARRANGEMENTS.....	47
9.1.	Commercial	47
9.2.	Fisheries and Oceans Canada.....	47
10.	COMPLIANCE PLAN	47
10.1.	Priorities for 2022/23	47
10.2.	Enforcement Issues and Strategies.....	48
11.	2022/23 PERFORMANCE REVIEW	49
11.1.	Conservation and Sustainability	49
11.2.	Social, Cultural and Economic	49
11.3.	Compliance Plan Evaluation Criteria.....	50
11.4.	Ecosystem	50
12.	REFERENCES AND RESOURCES.....	50
13.	GLOSSARY	54
14.	INTERNET SITES	57

List of Appendices:

- Appendix 1: 2022/23 Shrimp Trawl Commercial Harvest Plan
- Appendix 2: Post Season Review (2020/21 Season)
- Appendix 3: Departmental and Industry Contacts
- Appendix 4: Fishing Vessel Safety
- Appendix 5: Identification of Commercial Shrimp Species
- Appendix 6: Example of Shrimp Trawl Log (Harvest Logbook) Record
- Appendix 7: Prawn Minimum Size Limit
- Appendix 8: Locations of Glass Sponge Reefs in Hecate Strait and Queen Charlotte Sound
- Appendix 9: Maps of Shrimp Management Areas
- Appendix 10: Fishing Hazard Advisory – VENUS Georgia Strait Node, Area 29
- Appendix 11: Fishing Hazard Advisory – NEPTUNE Node, West Coast Vancouver Island
- Appendix 12: Terms of Reference of the Shrimp Trawl Sectoral Committee
- Appendix 13: Example 2022/2023 Shrimp Trawl Conditions of Licence
- Appendix 14: 2022/2023 Shrimp Trawl Data and Reporting Standards
- Appendix 15: Risk Assessment Tool and Draft Results for Commercial Shrimp Trawl Fishery
- Appendix 16: Map of Gwaii Haanas

1. OVERVIEW

1.1. Introduction

The 2022/23 Pacific Region Shrimp Trawl Integrated Fisheries Management Plan (IFMP) encompasses the period April 1, 2022 to March 31, 2023.

Shrimp are harvested by two different methods in the Pacific Region, trawl nets and traps. This IFMP covers the harvest of Pacific shrimp species by trawl gear only. For more information on the trap fishery, including commercial, recreational and First Nations fisheries for prawns and shrimp, please refer to the Pacific Region Prawn and Shrimp by Trap IFMP.

The 2022/23 Shrimp Trawl Commercial Harvest Plan is attached as Appendix 1 of this IFMP. Several other appendices provide important information and commercial fish harvesters are advised to review them all.

The species of shrimp targeted by trawl gear are from the family Pandalidae. The most frequent targets are smaller shrimp species such as the Northern or Spiny Pink Shrimp (*Pandalus borealis*) and the Smooth Pink Shrimp (*Pandalus jordani*), collectively called pink shrimp. The next most common species is the Sidestripe Shrimp (*Pandalopsis dispar*). This species grows to a larger size and has a higher market value than pink shrimp. Two other species of Pandalid shrimp, the Coonstripe Shrimp (*Pandalus danae*) and the Humpback Shrimp (*Pandalus hypsinotus*) are also caught in localized areas. These two species may be incidentally retained by shrimp trawl harvesters but seldom make up the majority of their catch. Minor incidental bycatch retention of the Spot Prawn (*Pandalus platyceros*) is permitted.

1.2. History

The first records of trawl gear being used for commercial shrimp fishing date back to 1895. The shrimp trawl fishery did not develop in earnest until the 1960's when a downturn in the salmon and Halibut fisheries occurred. At this time, the British Columbia (B.C.) coast was explored for shrimp grounds and efficient trawl gear was developed. Licences were available for any commercial fishing vessel and most areas were open seasonally with no catch ceilings until stock assessments began in 1973. Shrimp trawl vessels fished the offshore shrimp grounds and landed the majority of the catch in United States of America (USA) ports. Expansion of fishing and processing capacity directed at offshore shrimp stocks, and Canada's declaration of a 200-nautical mile fisheries jurisdiction in 1977, led to licence limitation. Licence eligibility was restricted to vessels that had landed shrimp in 1975 and 1976. The result was that 237 vessels qualified for 'S' licence eligibilities and 71 qualified for Northern area permits. Once licence eligibility was finalized in 1978, a total of 249 'S' licence eligibilities were issued.

In 1995 and 1996, there was a dramatic increase in shrimp effort on the West Coast of Vancouver Island (WCVI) and all shrimp areas of the coast were fished. This increase was caused in part by the changes in groundfish and salmon management strategies, most notably a salmon licence buy-back that resulted in 100 vessels having only an S licence. In addition, shrimp abundance levels were also high in 1995 and 1996, along with a high price being offered for shrimp for those two years. There were catch ceilings in place for the WCVI but the rest of the B.C. Coast was open on a seasonal basis (April 1 to October 31) with no catch limits. In response to the increase in effort

and landings, significant changes in the management of the shrimp trawl fishery were implemented in 1997 as Fisheries and Oceans Canada moved to more precautionary management, risk adverse principles, and promoted selective fishing practices. Shrimp Management Areas (SMA) were defined, total allowable catches (TAC) were set to limit exploitation, a seasonal opening for the offshore pink shrimp fishery was implemented, and the development of industry-funded programs to monitor catches and contribute to stock assessment were initiated. The ‘shrimp year’ was defined for opening/accounting for catch ceilings. In 2003 the official licence year was changed to run from April 1 to March 31 the following year.

1.3. Type of Fishery and Participants

1.3.1. First Nations

First Nations fishing effort for shrimp for FSC or domestic purposes is currently not limited by catch quantity. However, few First Nations have access to the commercial trawl gear necessary to target pink and Sideshripe Shrimp. The amount of pink and Sideshripe Shrimp caught by First Nations is not accounted for in the setting of annual catch ceilings.

Five Nuu-chah-nulth First Nations located on the west coast of Vancouver Island - Ahousaht, Ehattesaht, Hesquiaht, Mowachaht/Muchalaht, and Tla-o-qui-aht (the Five Nations) – have aboriginal rights to fish for any species, with the exception of Geoduck, within their Fishing Territories and to sell that fish. The Department has developed a 2021/22 Five Nations Multi-species Fishery Management Plan (FMP). The FMP includes specific details about the fishery, such as allocation/access, licensing and designations, fishing area, harvesting opportunities, and fishery monitoring and catch reporting. Feedback provided by the Five Nations during consultations was considered and incorporated into the 2021/22 FMP by DFO where possible. The implementation of the Five Nations’ right-based sale fishery continues to be an ongoing process. The 2021/22 FMP was developed to implement the right-based multi-species fishery to accommodate the Five Nations’ Aboriginal rights consistent with the British Columbia Supreme Court’s 2018 decision. On April 19, 2021, the British Columbia Court of Appeal released its decision in relation to the appeal brought forward by the Five Nations. As a result, the department announced a number of in-season changes via fishery notice. For further information, see the revised 2021/22 FMP at: <https://waves-vagues.dfo-mpo.gc.ca/Library/41018588.pdf>.

1.3.2. Recreational

The recreational harvest of various fish and invertebrate species in BC is regulated via the *British Columbia Sport Fishing Regulations*, made under the *Fisheries Act*. A DFO Tidal Waters Sport Fishing licence is required for the recreational harvest of all species of fish and invertebrates.

Tidal Waters Sport Fishing licences may be purchased for a 1 day, 3 day, or 5 day period, or as an annual licence, covering the period April 1 to March 31 the following year. The annual licence fee is not pro-rated for annual licences purchased mid-season. Fees depend on licence duration, age (senior, adult, juvenile) and residency status. Licences for juveniles (ages 15 and under) are free. Concessionary fees are not otherwise available. There were 238,600 anglers participating in BC’s tidal waters recreational fishery in 2020/21.

Alternatively, licences may be purchased over the counter at Independent Access Providers (IAPs) in many areas (note that the IAP may charge an additional service fee).

Licences may be purchased online via the National Recreational Licensing System:
<http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/licence-permis/application-eng.html>.

A list of IAPs is available at:
<http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/licence-permis/iap-fai-eng.html>

Online Regulations

The regulations for recreational fishing are summarized online in the British Columbia Tidal Waters Sport Fishing Guide, which lists open and closed times, catch limits, size limits (where applicable) and open/closed areas.

When required, Fishery Notices are issued to advise of changes to the regulations which are kept up-to-date in the online Sport Fishing Guide. The British Columbia Tidal Waters Sport Fishing Guide is available at:
<http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/index-eng.html>, or call the local fishery office to obtain regulatory information for an area of interest.

To view or sign-up to receive Fishery Notice notifications by email is available at:
<http://notices.dfo-mpo.gc.ca/fns-sap/index-eng.cfm>

Local DFO fishery office contacts are available at:
<https://www.dfo-mpo.gc.ca/contact/regions/pacific-pacifique-eng.html>
or call 604-666-0384 or email info@dfo-mpo.gc.ca

1.3.3. Commercial

Pink and Sidesripe Shrimp are harvested commercially by trawl gear. There are currently 233 licences; 207 'S' licence eligibilities and 26 'FS' licence eligibilities which are allocated to First Nations. Shrimp trawl vessels range in length from 8 to 35 meters (m). Vessel owners who do not intend to fish shrimp by trawl are still required to renew their S licence. They are permitted to exercise their Schedule II privileges on their licence once they have satisfied any further conditions specific to each species.

1.4. Location of Fishery

Pink and Sidesripe Shrimp are mostly associated with sand and mud substrates. They move up into the water column during the night to feed on zooplankton and stay close to the bottom during the day. The fishery is conducted in protected inshore waters in the Strait of Georgia, inlets and fjords, offshore regions of the WCVI, and Prince Rupert District (PRD) (Figure 1).

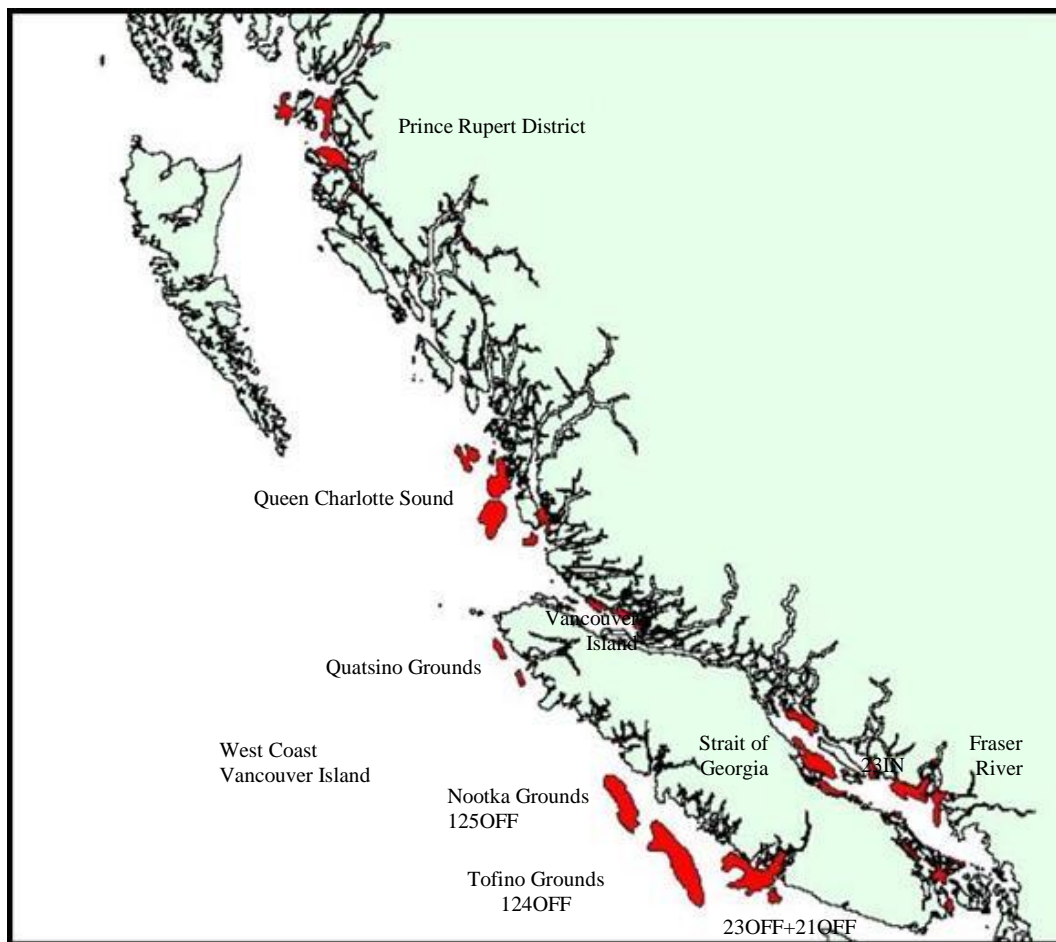


Figure 1. Major shrimp production areas in B.C., Pacific Coast (highlighted areas)

Shrimp Management Areas (SMAs) were developed for the entire B.C. coast in 1997 for the shrimp trawl commercial fishery so that specific catch ceilings could be defined to limit exploitation on discrete stocks of a number of different species. Fishery independent swept-area trawl surveys have been implemented in selected SMAs in order to index shrimp abundance. Descriptions of SMAs and maps can be found in Appendix 9.

1.5. Fishery Characteristics

Commitment to Reconciliation

DFO is committed to the recognition and implementation of Indigenous and treaty rights related to fisheries, oceans, aquatic habitat, and marine waterways in a manner consistent with section 35 of the Constitution Act, 1982, the United Nations Declaration on the Rights of Indigenous peoples, and the federal Principles Respecting the Government of Canada's Relationship with Indigenous peoples. DFO-CCG Reconciliation Strategy provides a guidance document to better understand why and how reconciliation informs the work of the Department.

For further details on the United Nations Declaration on the Rights of Indigenous peoples see <https://www.justice.gc.ca/eng/declaration/index.html>

For further details on the Principles Respecting the Government of Canada's Relationship with Indigenous peoples see <https://www.justice.gc.ca/eng/cs/sj/principles-principes.html>

DFO's Reconciliation Strategy can be found at <https://www.dfo-mpo.gc.ca/fisheries-peches/aboriginal-autochtones/reconciliation-eng.html>

For further details on reconciliation in British Columbia and Yukon, refer to <https://www.pac.dfo-mpo.gc.ca/abor-autoc/reconciliation-pacific-pacifique-eng.html>

Information on Indigenous fisheries and reconciliation is available at: <http://www.pac.dfo-mpo.gc.ca/abor-autoc/index-eng.html>

Information on the Government of Canada work to advance reconciliation can be found here: <https://www.rcaanc-cirnac.gc.ca/eng/1400782178444/1529183710887>

Food Social Ceremonial Fisheries (FSC)

Fish and marine resources are central to the culture, society, and well-being of First Nations and provide a critical connection to language, traditional knowledge, and health of communities.

Fisheries & Oceans Canada (DFO) remains committed to respecting First Nations' Aboriginal right to fish for food, social and ceremonial (FSC) purposes, or domestic purposes under Treaty which has priority – after conservation – over other uses of the resource.

Section 35(1) of the *Constitution Act* recognizes and affirms the existing Aboriginal and Treaty rights of the Aboriginal Peoples in Canada. However, it does not specify the nature or content of the rights that are protected. In 1990, the Supreme Court of Canada issued a landmark ruling in the Sparrow decision which found that the Musqueam First Nation has an Aboriginal right to fish for food, social and ceremonial (FSC) purposes. The Supreme Court found that where an Aboriginal group has a right to fish for FSC purposes, it takes priority, after conservation, over other uses of the resource. The Supreme Court has also indicated the duty to consult with Aboriginal Peoples when their fishing rights might be affected.

The Aboriginal Fisheries Strategy (AFS) was implemented in 1992 to address several objectives related to First Nations and their access to the resource. These included:

- Improving relations with First Nations
- Providing a framework for the management of the First Nations fishery in a manner that was consistent with the Supreme Court of Canada's 1990 Sparrow decision
- Greater involvement of First Nations in the management of fisheries
- Increased participation in commercial fisheries (Allocation Transfer Program (ATP))

AFS continues to be one of the principal mechanisms – in addition to Treaties and reconciliation agreements - to support the development of relationships with First Nations including the consultation, planning and implementation of fisheries, and the development of capacity to undertake fisheries management, stock assessment, enhancement and habitat protection programs.

Five Nations Right-Based Sale Fishery

Five Nuu-chah-nulth First Nations located on the west coast of Vancouver Island - Ahousaht, Ehatesaht, Hesquiaht, Mowachaht/Muchalaht, and Tla-o-qui-aht (the Five Nations) – have an Aboriginal right to fish for any species, with the exception of Geoduck, within their fishing territories and to sell that fish. It is important to note that access will align with SARA prohibitions.

Canada and First Nation Long-term agreements: Treaties and Reconciliation Agreements

Treaties and Self Government Agreements: There are six modern treaties and self-government agreements in British Columbia, which all have fisheries chapters: Nisga'a Final Agreement, Tsawwassen First Nation Final Agreement (TFA), Maa-nulth First Nations Final Agreement (MNA), Tla'amin (Sliammon) Nation Final Agreement, Sechelt Self-government Act, and Westbank First Nation Self-government Agreement. Through these treaties, Nations work with DFO to manage treaty fisheries on an annual basis. There are also historic treaties in British Columbia (Douglas Treaties and Treaty 8). For a detailed list of long-term fisheries arrangements in BC and Yukon, please see the internet at <https://www.pac.dfo-mpo.gc.ca/abor-autoc/treaty-traites-eng.html>.

Fisheries chapters in modern treaties may articulate a treaty fishing right for domestic purposes that are protected under Section 35 of the Constitution Act, 1982. Negotiated through a side agreement, some modern treaty First Nations have commercial access through a Harvest Agreement outside of the constitutionally protected treaty. Shrimp were unallocated under the Maa-nulth, Tsawwassen, Tla'amin and Nisga'a Treaties.

Reconciliation Agreements: In addition to negotiating treaties, the Government of Canada and Indigenous peoples can also negotiate Recognition of Indigenous Rights and Self-Determination (RIRSD) agreements, to explore new ways of working together to advance the recognition of Indigenous rights and self-determination. These agreements are led by Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC). With participation from relevant departments, DFO can also negotiate Fisheries Resources Reconciliation Agreements directly with First Nations to advance reconciliation with First Nations. These agreements seek to advance reconciliation and enhance First Nations and DFO collaborative governance and management on fisheries, marine and aquatic matters.

Reconciliation agreements work within the legislative framework of the Fisheries Act. The Act provides the Minister of Fisheries and Oceans Canada with the legislative authority for the proper management and control of the fisheries, the conservation and protection of fish, and regulation of the fishery.

Since 2019, the Government of Canada entered into several agreements with First Nations that lay the foundation for incremental development and implementation of new arrangements for collaborative governance on fisheries and marine matters. A 'framework agreement' sets out the subject matter for negotiation and describes how negotiations will proceed towards a final agreement. A 'final agreement' includes detailed commitments the Parties have agreed to implementing and governs the relationship between the Parties for its term.

See the BC Treaty Commission at <https://www.bctreaty.ca/index.php> and CIRNAC for more information on current treaty tables at:

<https://www.rcaanc-cirnac.gc.ca/eng/1100100028574/1529354437231> and for current RIRSD tables at: <https://www.rcaanc-cirnac.gc.ca/eng/1511969222951/1529103469169>.

Framework Agreements:

- GayGahlda “Changing Tide” Framework Agreement between Haida and Canada
- Haílcištut Incremental House Post Agreement between Heiltsuk and Canada
- Reconciliation Framework Agreement for Fisheries Resources between A-Tlegay Member Nations (We Wai Kai Nation, Wei Wai Kum First Nation, Kwiakah First Nation, Tlowitsis Nation, and K’ómoks First Nation) and Canada

Final Agreements:

- Coastal First Nations Fisheries Resource Reconciliation Agreement between Canada and Metlakatla, Gitxaala, Gitga’at, Kitasoo/Xai-Xais, Nuxalk, Heiltsuk, Wuikinuxv, and Haida Nations
- Gwet’sen Nilt’I Pathway Agreement between Tšilhqot’in, Canada and BC
- Burrard Inlet Environmental Science and Stewardship Agreement between Tsleil-Waututh Nation and Canada

As DFO and First Nations develop and implement new fisheries and collaborative governance arrangements, DFO works with these Nations to engage neighbouring First Nations and stakeholders (e.g. commercial and recreational sectors).

Commercial

The commercial shrimp trawl fishery primarily targets pink and Sidesripe Shrimp. Smaller beam trawl vessels (less than 15 m overall length) tend to fish in more sheltered areas and larger otter trawl vessels (15 to 35 m) use larger nets towed at higher speeds and sometimes fish in offshore areas. Of the 237 licences in 2014, participation declined to 36 beam trawl and 8 otter trawl vessels that actively participated in the fishery. In 2016, 33 beam trawl and 24 otter trawl vessels were active (twice the number of otter trawl vessels as the previous few years). Approximately 14 otter trawl vessels that had not been active for 15 years re-entered the fishery on the WCVI in 2015 and 2016, significantly increasing landings of pink shrimp in those areas. The WCVI shrimp biomass declined to average levels in SMA 124OFF and 125OFF and the larger vessels were not active for 2017 and 2018. Declines in shrimp biomass in the Strait of Georgia has limited the opportunities for beam trawl vessels to SMA PRD and a few more northerly areas so participation has declined to 21 beam trawl and 10 otter trawl vessels in 2018. An increase in shrimp biomass in 2019 in SMA 230FF+210FF has permitted larger volume landings so a few of the larger vessels were active in this area. Fishing effort has remained low during the 2020 and 2021 seasons.

1.6. Governance

The Minister of Fisheries, Oceans and the Canadian Coast Guard has ultimate and final responsibility for the management of fisheries in Canadian waters, and for the conduct of Canadian vessels operating in international waters. Ministerial functions are assisted and administered by the Department at the national level in Ottawa, and by the regional structure in the following

regions: Newfoundland-Labrador, Arctic, Ontario and Prairie, Gulf, Maritimes, Quebec, and Pacific.

The shrimp by trawl fisheries are governed by the *Fisheries Act* (R.S., 1985, c. F-14) and regulations made thereunder, including the *Fishery (General) Regulations* (e.g., conditions of licence), the *Pacific Fishery Regulations* (e.g., open times), the *British Columbia Sport Fishing Regulations*, the *Aboriginal Communal Fishing Licences Regulations* and the *Pacific Aquaculture Regulations*. Areas and Subareas are described in the *Pacific Fishery Management Area Regulations*.

Marine Protected Areas (MPAs) may be established under the *Oceans Act* (1996, c. 31). National marine conservation areas may be established under the *Canada National Marine Conservation Areas Act* (2002, c. 18).

These documents are available on the internet at: <https://www.dfo-mpo.gc.ca/acts-lois/index-eng.htm>.

Species listed as extirpated, endangered, threatened or special concern are governed by the *Species at Risk Act* (2002, c. 29) (SARA) which has implications for the management of fisheries that impact SARA-listed species. In addition to existing prohibitions under the *Fisheries Act*, it is illegal under the SARA to kill, harm, harass, capture, take, possess, collect, buy, sell or trade any listed extirpated, endangered or threatened animal or any part or derivative of an individual. More information on the SARA is available at: <http://www.sararegistry.gc.ca/>.

In addition, the national Sustainable Fisheries Framework (SFF) contains policies for adopting an ecosystem based approach to fisheries management, including: A Fishery Decision-Making Framework Incorporating the Precautionary Approach, Policy for Managing the Impacts of Fishing on Sensitive Benthic Areas, Policy on New Fisheries for Forage Species and Policy on Managing Bycatch. Along with other economic and shared stewardship policies, these will help DFO meet objectives for long-term sustainability, economic prosperity, and improved governance.

More recent information on Canada's Approach to Fisheries Modernization includes: Precautionary Approach Framework, Rebuilding Plan Guidelines, and the Benthic Ecological Risk Assessment Framework.

Scientific advice for this fishery is peer-reviewed primarily through a regional committee by the Centre for Science Advice Pacific (CSAP), formerly the Pacific Scientific Advice Review Committee (PSARC), conducted in conjunction with the Canadian Science Advisory Secretariat (CSAS).

1.7. Consultation

The Shrimp Trawl Sectoral Committee (STSC) is the primary management advisory process for this fishery. For a full description of the STSC see Appendix 12: Terms of Reference of the STRC.

A multi-sector meeting is held at least once each year. This sectoral meeting provides a forum for the exchange of information and views between the people with interests in the fishery and the

Department on issues of importance. It is open to the public and anyone interested in providing advice on the management of the shrimp trawl fishery.

1.8. Approval Process

The Regional Director General for the Pacific Region approves this plan.

2. STOCK ASSESSMENT AND SCIENCE

2.1. Biological Synopsis

There are over 90 species of shrimp found in waters of B.C. Seven of these species of shrimp, belonging to the family Pandalidae, are harvested by the shrimp trawl fishery off the Pacific coast of Canada. The species are the Northern Pink, (*Pandalus borealis eous*), Smooth Pink Shrimp (*P. jordani*), Flexed Pink Shrimp (*P. goniurus*), Coonstripe Shrimp (*P. danae*), Humpback Shrimp (*P. hypsinotus*), Prawn or Spot Shrimp (*P. platyceros*), and Sidestripe Shrimp (*Pandalopsis dispar*). The fishery varies in complexity from single species harvest to multi-species harvest, although pink and Sidestripe Shrimp are the main species targeted by the commercial trawl fleet.

Pandalid shrimp have a wide distribution in the northeast Pacific and are found from California to the Bering Sea and occupy a variety of habitats from rocky to mud bottoms. They are found in depths from intertidal to greater than 1,300 meters and inhabit both inshore and offshore areas. Many members of the Pandalidae family, including the species listed above, have a unique life history where each individual begins life as a male and then changes sex into a female. The biological term for this unique sex change is called protandrous hermaphroditism.

Pandalid shrimps start their post-larval life as a male and reach maturity in approximately 18-24 months. They then undergo a transformation phase of approximately 3-5 months where they change sex from male to female. By the third year, most shrimp have completed the sex change and are mature females. Breeding takes place in the fall with females carrying eggs on their abdomens for approximately 4-5 months until they hatch in the late winter. This is followed by a 3 - 4 month pelagic larval stage from March to summer. Larval settlement occurs in the summer (Butler 1980). Shrimp generally have a 4 year life cycle.

2.2. Ecosystem Interactions

Ecosystem interactions for Pandalid shrimp are complex due to the wide range of habitats and niches they occupy. However, Pandalid shrimp likely play an important role as forage fish species because, as larvae, they are a source of food for a number of marine organisms. As adults, shrimp are a food source for a number of pelagic fish species such as Hake, Turbot, Spiny Dogfish, Cod, rockfish, and skates (Butler 1980, and Hannah 1995).

Pandalid shrimp are opportunistic detritus feeders and are known to be predators of polychaete worms, sponges, diatoms, Euphausiids, and other crustaceans (Butler 1980).

2.3. Stock Assessment

The shrimp trawl fishery takes place within 34 of the 36 SMAs from large offshore areas to smaller inshore waters. Estimates of biomass are based on fishery independent surveys for pink shrimp,

Sidestripe Shrimp and sometimes for Coonstripe and Humpback Shrimp for a select number of SMAs. Area-swept trawl surveys are conducted on a fixed schedule basis to index shrimp biomass and to monitor trends in abundance over time. Survey results and abundance trends are reported in Shrimp Trawl Survey Bulletins in-season and are available upon request (see Appendix 3 for contacts).

The most recent science advisory report on stock trends and stock status advice for inshore shrimp stocks (DFO 2012) can be found at Fisheries and Oceans Canada, CSAS website: http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2011/2011_085-eng.html.

2.4. 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 and ceremonial fishing (FSC): <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.

Applying the precautionary approach to fisheries management decisions entails establishing a harvest strategy that:

- identifies three stock status zones – healthy, cautious, and critical – according to upper stock reference points and limit reference points;
- sets the removal rate at which fish may be harvested within each stock status zone; and
- adjusts the removal rate according to fish stock status variations (i.e., spawning stock biomass or another index/metric relevant to population productivity), based on pre-agreed decision rules.

The framework requires that a harvest strategy be incorporated into respective fisheries management plans to keep the removal rate moderate when the stock status is healthy, to promote rebuilding when stock status is low, and to ensure a low risk of serious or irreversible harm to the stock. A key component of the Precautionary Approach Framework requires that when a stock has declined to the Critical Zone, a rebuilding plan must be in place with the aim of having a high probability of the stock growing out of the Critical Zone within a reasonable timeframe. <http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/precautionary-precaution-eng.htm>.

Amendments to the *Fisheries Act* (Bill C-68) were passed into legislation in 2019 and include new authorities to amend the *Fishery (General) Regulations* and requirements to maintain major fish stocks at sustainable levels, and develop and implement rebuilding plans for stocks that have declined to their critical zone. The proposed regulatory amendments draw upon the 2013 Guidance

for the development of rebuilding plans under the Precautionary Approach Framework: Growing stocks out of the critical zone.

Information on the regulatory proposal regarding fish stocks and rebuilding plans is available at: <http://www.dfo-mpo.gc.ca/fisheries-peches/consultation/consult-maj-pri-eng.html>.

The regulatory proposal was consulted on from December 2018 to March 2019 with pre-publication of the proposed regulation in Canada Gazette Part I on January 2, 2021. The regulation will come into effect upon publication in Canada Gazette Part II. The publication is available at: <https://gazette.gc.ca/rp-pr/p1/2021/2021-01-02/html/reg1-eng.html>.

2.5. Stock Scenarios

Shrimp stock sizes in general tend to show high annual variation. Highly variable stock sizes over the long term should be expected and considered the norm for shrimp populations. This will result in high annual variability in area catch ceilings under the current fixed harvest rate management strategy.

In 2021 several DFO biomass surveys were conducted. The 2021 survey in Shrimp Management Areas (SMA) 124OFF and 125OFF indicated low biomass of Pink shrimp, with Pink shrimp in the critical zone. The survey conducted in SMAs FR indicated Pink shrimp in the critical zone, and Sidesripe shrimp in the cautious zone. The survey conducted in SMA 14 indicated Pink shrimp in the healthy zone, and Sidesripe shrimp in the critical zone. The survey in SMA 16 indicated Pink and Sidesripe stocks in the cautious zone. The survey for SMA GSTE indicated Pink Shrimp in the cautious zone and Sidesripe shrimp in the critical zone. The survey for SMA 18&19 indicated Pink shrimp and Sidesripe shrimp in the critical zone. Stocks defined in the critical zone remain closed to commercial harvest.

2.6. Research

Fishery independent surveys are the primary source of stock abundance and research data. From 1996-2011 a number of index sites were surveyed either annually or every second year according to a fixed survey schedule; these were: SMAs 23OFF&21OFF, 124OFF, 125OFF, 23IN, QCSND, 9IN, PRD, 14, and FR. In addition, SMA's GSTE, 16, 18, 19, and a portion of 12IN were included when survey time permitted. Descriptions of the commercial shrimp management areas can be found in Table 2 of the Commercial Harvest Plan (Appendix 2). In 2012 the Department began a two-year rotational survey schedule for some of the inshore index survey sites. SMA QCSND is no longer surveyed.

Additional scientific information on shrimp stocks and the fishery is available at Fisheries and Oceans Canada, CSAS website:

http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2011/2011_085-eng.html

DFO has developed a protocol to allow for potential industry funded biomass surveys to be conducted following a DFO survey design to help support stock assessment in the fishery. These industry funded surveys can help collect additional information in SMAs the Department is unable

to survey. These biomass estimates can be utilized in setting quotas and harvest opportunities for the commercial fishery in-season.

3. INDIGENOUS KNOWLEDGE

In 2019, the *Fisheries Act* was amended to include provisions for where the Minister may, or shall consider Indigenous knowledge (IK) in making decisions pertaining to fisheries, fish and fish habitat, as well as provisions for the additional protection of that knowledge when shared in confidence.

The term Indigenous knowledge may not be universally used, and other terms such as Indigenous Knowledge Systems, Traditional Knowledge, Traditional Ecological Knowledge, or Aboriginal Traditional Knowledge, which all convey similar concepts, may be used instead.

Indigenous knowledge can inform and fill knowledge gaps related to the health of fish stocks, and aid decision making related to fisheries management. The Government of Canada and the scientific community acknowledge the need to access and incorporate IK in meaningful and respectful ways. Work is underway at a National level to develop processes for how DFO receives Indigenous knowledge and applies it to inform decision making. This will include consideration of how to engage knowledge holders, and how to ensure that the knowledge can be shared and considered in a mutually acceptable manner by both knowledge holders and the broader community of First Nations, stakeholders, managers, and policy makers involved in the fisheries. This work will be an iterative process done in collaboration with First Nations, Indigenous groups and knowledge holders, to ensure protection of the knowledge provided.

4. SOCIAL CULTURAL AND ECONOMIC IMPORTANCE

4.1. Socio-Economic Profile

The intent of this section is to provide a socio-economic context for the shrimp trawl fishery in BC. Overviews of Commercial, Processing, Export and Aboriginal sectors of the fishery are included. Recreational fishing for shrimp species is not discussed here because use of trawl gear is prohibited in that fishery. For information on recreational fishing that may pertain to shrimp species, please refer to the Prawn and Shrimp by Trap IFMP.

Recent developments created two banner years (2015 and 2016) in the shrimp trawl fishery, but in the following years the West Coast of Vancouver Island (WCVI) shrimp biomass declined to levels that resulted in no fishing opportunity for the offshore areas. Increases in available biomass and market demand for shrimp resulted in significant growth in the BC fishery in 2015 and 2016, but with no fishing opportunity in these areas in the following years, the fishery was not able to maintain these markets. Despite this slowdown, the fishery once again experienced growth in 2018 and 2019, with increases in both harvest and landed value. This growth was short lived, however, as impacts of the Covid-19 pandemic have resulted in large declines in harvest and landed value for the 2020 season.

4.2. Commercial

Shrimp trawling in BC began over a hundred years ago but developed more quickly since the 1960s. From the 80s to 90s there was a period of increasing participation, until landings peaked in 1996; at that time most of the major shrimp grounds were being fished. From 1997 until 2014 landings have declined due to high costs and precautionary management changes, including selective fishing strategies and TACs set to limit exploitation.

The annual participation has been about 42 vessels on average for the last 6 years. In 2015 and 2016, there was an increase in participation, with 61 and 69 vessels participating in each of those years, respectively. The decline in shrimp biomass and resulting lack of fishing opportunity for 2018 and 2019 resulted in only 38 and 39 active vessels, respectively. In 2020, there were further declines in activity within the fishery, with only 26 vessels participating. This reduction in participation may be in part explained by impacts of the Covid-19 pandemic, which may have caused an inability for some anglers to participate in the fishery safely given restrictions in personal proximity in the pandemic environment, as well as by the delay of some openings due to the interruption of biomass surveys, a precursor to openings in many areas.. This marks a 38% decline from the 5-year annual average participation rate, and a 33% decline year-over-year. The shrimp fleet is quite diversified, with vessels participating in prawn, groundfish trawl, salmon gillnet, and salmon troll fisheries among other fisheries. Fishing for shrimp requires specialized gear that cannot be used in other fisheries, suggesting the decision to participate requires additional investment.

In 2015 and 2016, the BC fishing industry was generally composed of two groups: smaller vessels with modest volumes and large vessels with high volume. Prior to 2015, the majority of the British Columbia shrimp trawl fleet consisted of small vessels (<12m) that harvested modest volumes of shrimp during short trips. On the East Coast of Canada, Oregon and more recently Washington State in the U.S., large trawlers engage in an industrial scale fishery that directly competes with BC's fishery. In 2015 and 2016, several larger trawl vessels (>12m) actively participated in the BC fishery, focusing their effort in the offshore areas of the West Coast of Vancouver Island (WCVI). These larger vessels were much less active in 2017 due to the WCVI SMAs being closed. Some of the smaller beam trawl vessels headed north in 2017, but mostly the fleet in the Southern Gulf of Georgia was not active in 2017, again due to lack of areas to fish (Figure 2).

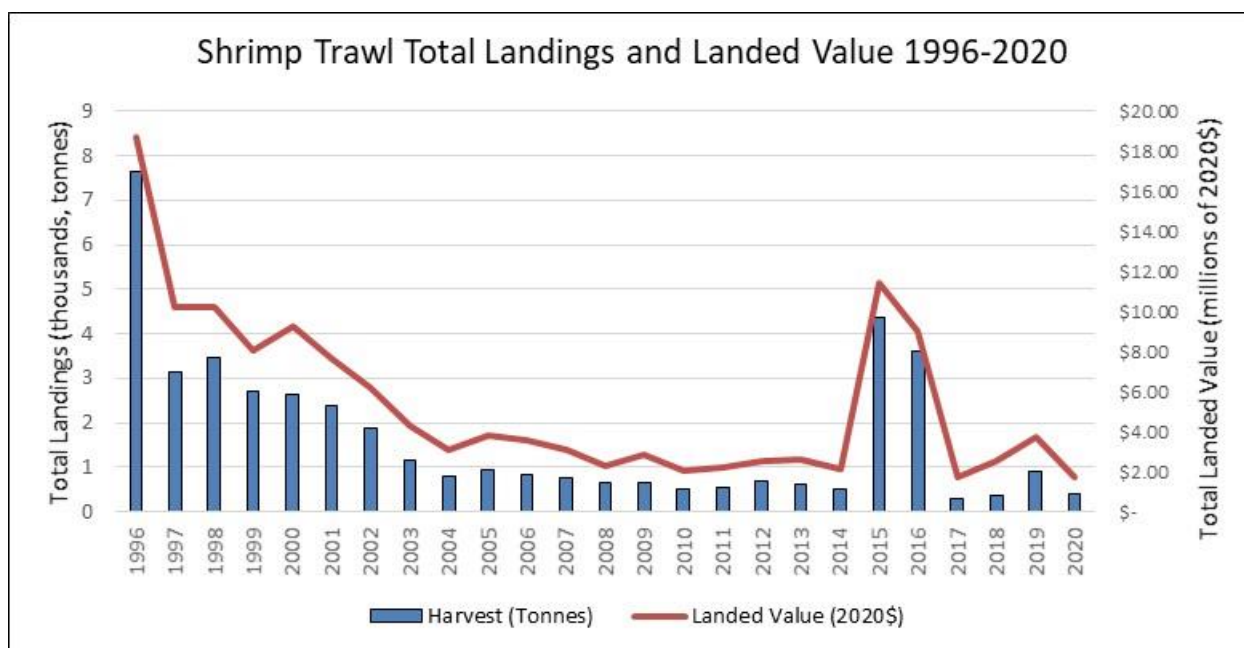


Figure 2. Total landings and Landed Value for all shrimp since 1996 by calendar year. (Sources: Logbooks with matched Sale Slip data, Economics Unit)

As mentioned, 2020 marked a contractionary year for the fishery, with landings (value and quantity) as well as participation declining. Harvest quantity (weight) declined by roughly 56% between 2019 and 2020 while landed value declined by 54%). Meanwhile, fishery-wide price per kilogram rose by nearly 45% (Table 1). Despite this increase in price and a decline in participation, it is estimated from logbook and sales slip data that remaining harvesters, on average, still generated incomes in 2020 that were roughly 30% lower than the estimated average in 2019 (2019: \$96,790; 2020: \$67,507).

Table 1: Shrimp Trawl Total Harvest, Landed Value and Price per Kilogram – 2019/2020 Comparison (Calendar Year)¹

Year	Harvest (Tonnes)	Landed Value (2020\$)	Price/KG (2020\$)
2019	893.47	\$3,774,843.10	\$4.22
2020	395.61	\$1,755,196.40	\$4.44
% Change YoY	-55.72%	-53.50%	+5.01%

¹ Source: DFO Logbook and sales slip data 2019/2020 – Last generated November 2021

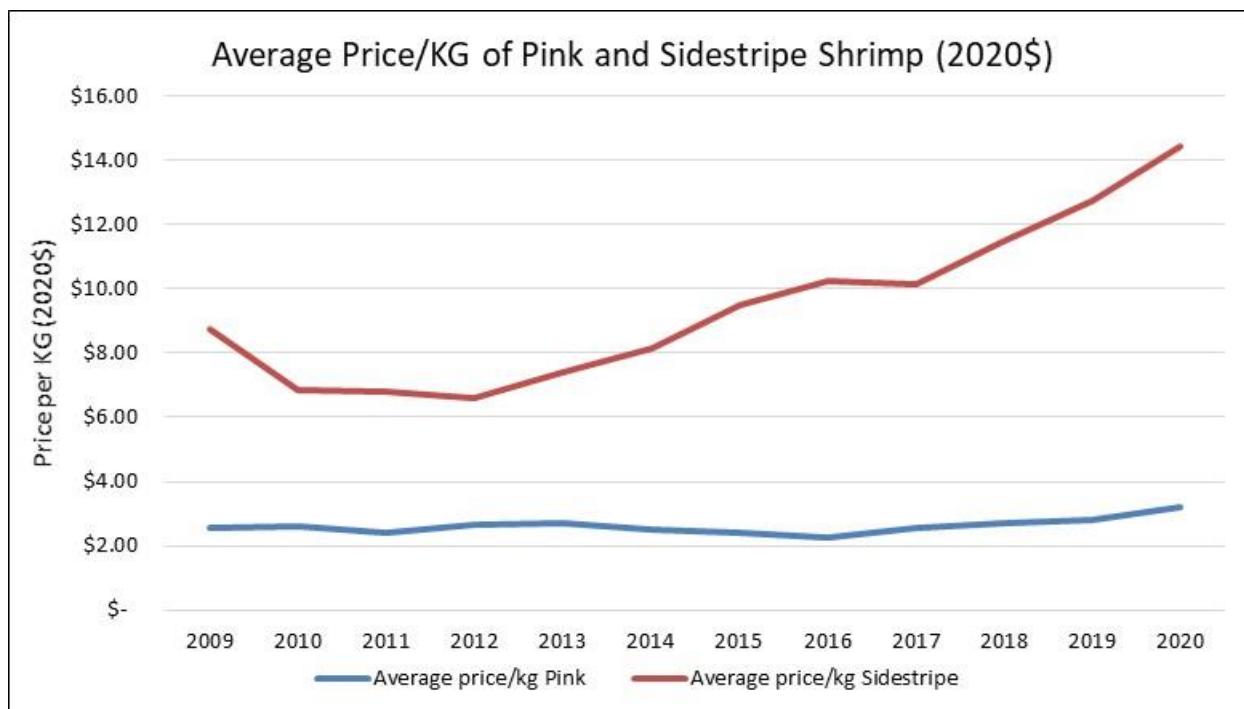


Figure 3. Average price per kg for pink shrimp (smooth and spiny) and sidesripe stripe shrimp from 2009-2020 (in 2020\$). (Sources: Logbooks with matched Sale Slip data, Economics Unit – Calendar Year)

The shrimp trawl fishery opens coast wide on June 1 and fishing opportunities generally continue until the harvest quotas are reached or the closing date is reached (March 31 the following year). Initial Catch Ceilings from forecast biomasses are reassessed after stock assessments are completed. The shrimp trawl fishery has not reached the coastal TAC in recent years. The cyclical pink shrimp population increase from 2014 to 2016 was confined to Areas 124 and 125. In 2016, Shrimp Management Areas 124OFF and 125OFF were closed due to the in-season estimate of eulachon bycatch (Eulachon Action Level or EAL) being reached, and subsequent stock assessment proving that the shrimp biomass had declined dramatically. The decline resulted in no fishing opportunity in 2017 in these areas. Smaller vessels that have historically been active in the fishery typically harvest in areas near population centres, resulting in catch ceilings for these areas being reached. The decline in fishing opportunities in the previous three years resulted in most of these smaller vessels not participating in the fishery. For the smaller vessels, a combination of fuel costs and limited shrimp in some open areas continued to reduce the incentive to fish in areas far from a vessel's home port, resulting in several shrimp trawl areas not being fished in coastal inlets.

Figure 2 shows the low harvest, and as a result the low revenue, experienced in the fishery since the early 2000s. In low harvest years, only the most active vessels had a positive return in the shrimp trawl fishery (Nelson, 2011). In 2014, the top third of the active shrimp fleet reported average gross revenues of over \$80,000 (2020\$), however, the bottom third of the fleet had gross revenues of roughly \$14,000 (2020\$). For the 49 active vessels in 2014, the average landings per vessel were almost 23,000 lbs (10,334 kg) and average gross revenues were just over \$44,000 (2020\$). During the time of low landings from 2004-2014, the real price of shrimp averaged \$4.05/kg (2020\$). The drastic increase in landings in 2015-2016 saw the price drop to an average

of \$2.13/kg over the two years. However, with landings falling back to pre-2015 levels, the industry saw a huge spike with price levels increasing to \$6.73/kg in 2018, before returning to \$3.62/kg in 2019. Prices within the fishery increased drastically in 2020, to \$5.53/kg. This marks the third highest price over the last decade, trailing only 2017 and 2018. This increase in price is likely driven by overall inflationary pressures, as well as general increases in operating costs for harvesters and processors arising from adapting work procedures to realities of the Covid-19 pandemic.

Shrimp trawl harvest changes with market demand and stock conditions. Starting in the fall of 2014 and continuing into 2016, there was an increase in Pink Shrimp biomass that coincided with a harvest reduction in major competing jurisdictions (northwest US, eastern Canada), creating more demand for BC shrimp. From 2014 to 2015, landings of shrimp nearly increased by nine-fold. In 2015, average landings per vessel increased substantially to over 157,000 lbs with average revenues of almost \$187,295 (2020\$) for the 61 active vessels; an increase in total fishery revenue of 527% from 2014. Despite this, most vessels experienced only modest increases, and average revenues for vessels in the bottom third of the fleet dropped from 2014 levels to just under \$12,000 (2020\$). The majority of the increased harvest was captured by a handful of vessels that had not participated during the low harvest years. In 2015, the 18 vessels that had not participated in 2014 caught 76% of the landed value (2020\$). Most of the landed value was from Pink Shrimp harvested off the West Coast of Vancouver Island, which saw nearly a ten-fold increase in value (2020\$). Some of the new vessels are quite large compared to the typical vessel in shrimp trawl, allowing them to harvest large quantities further away from their landing port. In 2014, Pink Shrimp accounted for about 70% of the landed quantity, while in 2015 and 2016, the share increased to 97%. The following two years (2017-2018) saw a substantial decrease in both total shrimp landings and the percentage of pink shrimp, which fell to a decade low 59% of landings. Pink Shrimp harvest increased in 2019 and 2020 accounting for nearly 86% and 88% of all landed quantity for the fishery, the highest makeup in the last decade apart from the two banner years (2015 and 2016).

4.3. Processing

There are seven Pandalid shrimp species harvested by trawl in BC, and fisheries vary in complexity from single to multi-species fisheries for a variety of markets including hand-peeled, frozen-at-sea, fresh and live shrimp. The majority of landings are a mix of Pink Shrimp and Sidesripe shrimp, with Sidesripe shrimp having a higher value due to their larger size. The largest Sidesripe shrimp are finger-packed (heads on) and frozen at sea for the Japanese market or sold fresh directly to the public at local dock sales and farmer's markets. They may also be marketed as a frozen product with the heads removed and the tails packaged and frozen at sea. This produces a higher value product for restaurant and domestic markets, but the market is limited. A large proportion of Sidesripe shrimp, an average of 29% of landings from 2012 to 2016 caught by smaller vessels, are sold dockside by harvesters. It seems that the capital investment in on-board freezing capacity does not warrant updating a shrimp vessel unless the freezer is used for other fisheries such as tuna, salmon by troll or prawn by trap.

The market for Pink Shrimp is limited by the Pink Shrimp's small size compared to other shrimp species. BC Pink Shrimp are marketed mainly as a frozen, peeled cocktail shrimp product and

therefore compete directly with a number of other shrimp fisheries worldwide, primarily Eastern Canada, Washington and Oregon.

There are two main methods of preparing cocktail shrimp: hand-peeling and machine-peeling. The hand-peeled market requires the largest shrimp and results in a higher quality (less broken) shrimp product. BC processors continue in the hand-peeled market segment, promoting BC shrimp and supplying this market year-round. Eastern Canada, Washington, and Oregon shrimp fisheries are Marine Stewardship Council certified, machine-peeled and generally supply the demand for cheaper quick frozen processed cocktail shrimp.

The majority of the shrimp harvest is landed on either Vancouver Island (45%) or the Lower Mainland (45%), while the remainder is landed on the North Coast (10%). Shrimp processing does not contribute significantly to the processing industry. However, with the drastic increase in landings for 2015 and 2016, shrimp processing provided over 55,000 hours of annual employment or \$ 1,066,075.94 (2020\$) in annual wages to British Columbia on average over the two years. The increased harvests of 2015 and 2016 resulted in the processing requirements substantially increasing in one year.²³

4.4. Export Market

In this section prawn and shrimp exports are reported together, as the harmonized system codes (which record and categorize exports), do not disaggregate exports of prawn and shrimp. The average annual value of prawn and shrimp exports from BC between 2011 and 2020 was approximately \$48.2 million (2020\$). In 2020, total value of exports fell to roughly \$35.9 million (2020\$). This decline in overall value was both in part to a fall in exported quantity, as well as a decline in price per kilogram in most major overseas markets. Average value per kilogram from prawn and shrimp exports peaked at about \$23.7/kg (2020\$) in 2017, while 2019 was the year with the second highest price per kilogram, at \$22.74/kg (2020\$). Average value per kilogram declined in 2020, falling to roughly \$18.70/kg (2020\$) -- the lowest price seen since 2016. In 2015, there was a major shift in the export profile for the combined product group, which appears to be as a result of changes in the shrimp trawl fishery (Figure 3). Between 2014 and 2016, export volume of shrimp and prawns to the U.S. increased about 10-fold, while the average export price for the U.S. declined from about \$36/kg to around \$6.2/kg. However, since 2016, export volumes to the U.S. have decreased by nearly 77%, returning to pre-2015 levels, and consequently, average export price has once again risen to \$17.75/kg (2020\$). This two year increase to the U.S. is likely in correlation with the drastic increase in shrimp harvest. By contrast, the volume of exports to Japan from 2014-2016 dropped by about 50% while the price increased by 43%. Export volumes remained low in 2017-2018, but saw an increase by 36% in 2019 while prices remained high. Exports to Japan in 2020 were much lower than the previous year, with exported quantity declining

² GSGislason & Associates Ltd. (Aug 2017) Linkages Between Seafood Harvesting and Processing (2016 Data)

³ It is unlikely that the entirety of this processing demand was fulfilled by local processors as BC does not have the processing capacity needed for the large quantities of shrimp harvested in 2015 and 2016, due in part to the specialized equipment and typically low harvest of shrimp. This problem was avoided by shipping the shrimp to Washington and Oregon for cooking and peeling. The increased harvest does not seem to have resulted in investment in additional peeling capacity, although industry participants have made investments in transportation capacity. Source: Interviews with Industry.

by roughly 42% and total value falling by 49%. This decline was only outpaced by the United States, where exported values declined by 47% and overall value fell by 54% year over year. These precipitous declines can be largely attributed to the impacts of the Covid-19 pandemic, which triggered large logistical issues for most international markets.

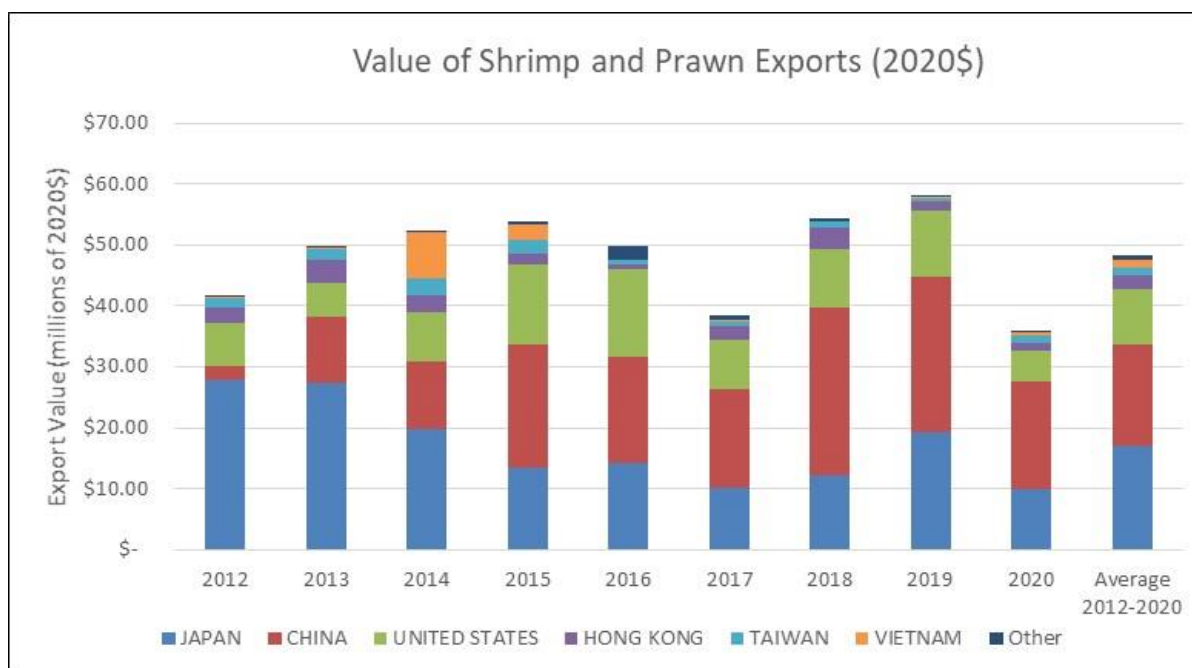


Figure 4. Total value of shrimp and prawn exports from BC (2019\$) 2011-2019. (Source: Statistics Canada (EXIM), Accessed on September 29, 2020 – Calendar Year)

Japan is one of the major markets for BC prawn and shrimp, annually accounting for about 39% of exports from 2011 to 2020, with an annual average value of about \$17.06 million; however, Japan's market share has declined from 69% in 2012 to 27% in 2020 (Figure 4). In 2015, Japan lost its position as the top market for BC prawn and shrimp, as China assumed the number one spot with exports valued over \$20 million. Over the past 5 years, China has been the destination for about 44% of BC's shrimp and prawn export volume, for an average value of \$20.83 million per year (2020\$). Prior to 2013, the U.S. was generally the second largest market for BC shrimp and prawn. Over the period 2011-2020, the U.S. accounted for 18% of shrimp and prawn export volume with an average value of \$8.8 million per year (2020\$). In 2016, the value of exports of BC shrimp and prawn to the U.S. increased by about 10% when compared to 2015. Other significant export markets include Vietnam, Hong Kong and Taiwan. The annual average value of prawn and shrimp imports by Vietnam, Hong Kong and Taiwan (combined) from 2011-2020 was at the level of about \$4.86 million (2020\$).

From 2016-2017, total export volumes drastically declined by 60% and total exported value also declined by 23%. Exports decreased to all countries, except Hong Kong and Taiwan; export volumes more than doubled to Hong Kong, and increased by 69% to Taiwan. As expected, each country that experienced a loss in import volumes saw shrimp and prawn prices increase. Hong Kong, however, also experienced an increase of 17% in shrimp and prawn price. BC saw a recovery in 2018 as export volumes increased by 36% and export value increased by 41%. Both export volume and value continued to increase the following year, with value received in 2019

being the highest in the past 9 years. In 2020, however, both export value and quantity (volume) of shrimp and prawn exports declined. Overall, the value of shrimp and prawn exports declined by roughly 38% year over year, this was accompanied by a smaller but still alarming decline of 23% in exported quantity (Table 3, 4).

Table 3⁴ - Value of Shrimp and Prawn Exports (2020\$)- 2019, 2020 Calendar Year Comparison

Destination	2019	2020
JAPAN	\$19,373,663.31	\$9,847,057.00
CHINA	\$25,433,448.39	\$17,698,668.00
UNITED STATES	\$10,824,577.27	\$5,027,886.00
HONG KONG	\$1,395,987.25	\$1,309,954.00
TAIWAN	\$704,925.93	\$1,371,507.00
VIETNAM	\$119,981.58	\$289,548.00
Other	\$328,748.34	\$390,893.00
Total, All Destinations	\$58,181,332.07	\$35,935,513.00
% Change, All Destinations 2019/2020	-38%	

Table 4 - Quantity of Shrimp and Prawn Exports (000's Kilograms) - 2019/2020 Comparison

Destination	2019	2020
JAPAN	737.67	429.25
CHINA	855.65	813.14
UNITED STATES	532.68	283.27
HONG KONG	53.43	66.09
TAIWAN	35.96	62.42
VIETNAM	5.94	41.78
Other	23.90	22.36
Total, All Destinations	2,245.22	1,718.30
% Change, All Destinations 2019/2020	-23%	

4.5. Viability and Market Trends

In addition to uncertainty around shrimp biomass in future years, there are developments that may impact harvest, the financial viability, or processing in the shrimp trawl fishery. These events include changes in market standards and international competition, protective measures for shrimp and other species, and the capacity of the fishery.

The Comprehensive Economic Trade Agreement (CETA) with European Union (EU) aims to reduce barriers for shrimp exports from Canada. This has the potential to increase market demand for BC shrimp in the EU and may increase harvest and exports to the EU in future years.

The move towards eco-labelling has prompted the East Coast of Canada and the Oregon shrimp by trawl fisheries to obtain certification by the Marine Stewardship Council (MSC). This process involves a third party review and requires on-going audits and assessment that is beyond the capacity of the BC shrimp trawl fleet in a low harvest environment. However, the trend of increasing consumer pressure for eco-certification is an issue that the BC fishery will need to address in order to compete with cocktail shrimp from other jurisdictions.

⁴ Table 3,4 Source: Statistics Canada (EXIM), Accessed December 2021

There are other management pressures on the shrimp trawl fishery which continue to impact the fishery. Eulachon was assessed as Endangered by the Committee on the Status of Endangered Wildlife in Canada and is caught as incidental by-catch in shrimp trawl. To reduce by-catch of eulachon, an Eulachon Action Level (EAL) has been implemented for specific shrimp trawl fishing areas. The estimated catch of eulachon is calculated from observer coverage and when an EAL is met, specific shrimp trawl areas are closed. In 2017, some licence holders agreed to define a mandatory 100% at-sea observer coverage program and dockside validation for all shrimp trawl fishing in PFMA 124 and 125.

4.6. First Nations

Two DFO programs, the Allocation Transfer Program (ATP) and Pacific Integrated Commercial Fishery Initiative (PICFI), use relinquished commercial licence eligibilities from fish harvesters on a voluntary basis to re-issue access to eligible First Nation organizations as communal commercial licences.

As a result of these programs, there are currently 34 communal commercial crab by trap licence eligibilities to provide economic opportunity to First Nations through participation in the commercial fishery.

For more information on the Aboriginal Fisheries Strategy (AFS) ATP, contact the resource manager listed in Appendix 8 or see the Internet at:

<https://www.dfo-mpo.gc.ca/fisheries-peches/aboriginal-autochtones/afs-srapa-eng.html>

More information on the PICFI is available on the Internet at:

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

5. MANAGEMENT ISSUES

The following emerging issues may impact the management measures in place for the shrimp trawl fishery.

5.1. Conservation and Sustainability

5.1.1. Multi-species/Multi-stock Management

The number of shrimp species and stocks involved in the shrimp trawl fishery has resulted in complex management and assessment programs. Surveys of the major shrimp grounds are conducted by the Department's Science Branch and the resulting shrimp biomass estimates are used to define catch ceilings.

5.2. Social, Cultural and Economic

5.2.1. First Nations

The incidental bycatch of an anadromous smelt, Eulachon (*Thaleichthys pacificus*), is of concern to First Nations since the returns of Eulachon to many of the Central Coast rivers and the Fraser River have declined. Various First Nations organizations in the North Coast, Central Coast, and Fraser River have requested that the shrimp trawl fishery be closed to avoid Eulachon bycatch. The Department is working with the shrimp trawl industry to minimize Eulachon bycatch. Area

closures, seasonal closures, and the EAL (see Appendix 1, Section 3.1) with an at-sea observer program were implemented to monitor Eulachon bycatch in WCVI. Bycatch reduction devices (including rigid grates, and footrope lighting devices) are mandatory coast wide.

5.2.2. Recreational

Recreational fish harvesters have brought forward concerns about the bycatch of prawns in the commercial shrimp trawl fishery. When prawn spawner abundance is below the “spawner index” (minimum number of female spawners), areas will close for recreational prawn fishing in winter (see the IFMP for Prawn and Shrimp by Trap for more details). Recreational harvesters have expressed concern that winter shrimp trawling may continue in these areas that have closed to recreational prawn harvesting. Retention of prawns is not permitted in the shrimp trawl fishery except where a small incidental bycatch of prawns is allowed during the commercial prawn by trap fishing season (May-June). When prawn bycatch is suspected to be high in specific areas, at-sea observers may be deployed on commercial fishing trips and a resource manager will make changes to the fishery if necessary.

5.2.3. Commercial

Licence eligibility holders who choose not to fish their shrimp trawl licences during the season are not required to contribute to the in-season program costs for the fishery. The commercial licence holders who are active in the fishery are required to fund the management programs (hails, catch ceiling monitoring, observer coverage, logbook data entry and data reporting). For 2022/23 participation in the opportunity to fish specific areas requires contribution to the management measures defined for those areas so the costs to individual fish harvesters may vary depending on their areas of interest.

5.3. Compliance

There are no emerging issues for enforcement other than those already highlighted in the Compliance Plan (Section 10). Each licence holder should download or print a copy of this IFMP. Additional attention to Rockfish Conservation Areas (RCA) and the Strait of Georgia and Howe Sound Glass Sponge Reef Conservation Areas is also required as these areas are closed to fishing by trawl nets. For further information on the RCAs and the sponge reefs see the following web sites:

<http://www.pac.dfo-mpo.gc.ca/fm-gp/maps-cartes/rca-acis/index-eng.html>

<http://www.dfo-mpo.gc.ca/oceans/ceccsr-cerceef/closures-fermetures-eng.html>

5.4. Ecosystem

The most pressing ecosystem issues concerning the harvest of shrimp and the shrimp trawl fishery are bycatch, benthic impacts, exploitation as a forage fish species, depleted species concerns, and oceans and habitat considerations.

5.4.1. Strategic Framework for Fishery Monitoring and Catch Reporting

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.

5.4.2. Bycatch

Bycatch has become one of the most significant issues affecting fisheries management both nationally and globally. The bycatch of non-target fish in the shrimp trawl fishery was defined by

at-sea observations starting in 1997, and a bycatch monitoring program has been supported by industry contributions since 1999. The Department collects estimates of bycatch, by tow, for trips that are observed. However, observer coverage has been limited in the past which precludes the ability to estimate total annual bycatch by the fishery. The observer program is focused on Eulachon bycatch in WCVI areas to monitor the EAL and to document the use of bycatch reduction gear. The use of bycatch reduction devices (bycatch grates, large mesh panels, etc.) significantly reduces the bycatch of non-target fish (Olsen et al, 2000). Bycatch reduction gear has been mandatory since 2000 (see Appendix 1, Section 2.2 and 7.1 for more detail). Catch composition results of the at-sea observer program for 2002 to 2011 are available in a Data Report (Rutherford et al 2013).

Shrimp trawl gear with bycatch reduction devices avoids larger fish, but is not selective for smaller organisms. Therefore bycatch of non-target species, particularly Eulachon, is a concern. Eulachon returns to the Fraser River and Central Coast rivers showed declines in the 1990s around the same time that effort and landings increased in the shrimp trawl and groundfish trawl fisheries. It was identified that Eulachon were a bycatch in the shrimp trawl fishery in 1997, leading to concern over the potential impact of trawling on Eulachons. When otter trawl effort shifted to Queen Charlotte Sound (SMA QCSND) in 1996, and observations in 1997 and 1998 showed significant Eulachon bycatch, QCSND was closed in 1999 and has remained closed to shrimp trawl.

Managing bycatch and discards has long been part of Canadian fisheries management as it is not always possible to fish for one species without incidentally capturing another species or undesired individuals of the target species. To ensure long-term productivity, biodiversity and sustainability, Fisheries and Oceans Canada has developed a policy for managing bycatch and discards that builds on the success of existing measures. This policy is a key component of a strengthened SFF and is consistent with the ecosystem approach to fisheries management. This policy can be found at:

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

In recent years, commercial shrimp trawl licence holders approached DFO requesting to be able to use LED lights on their trawl gear. This request was based on studies conducted in the Oregon shrimp trawl fishery which demonstrated significant reduction in bycatch amounts when using these LED lights. Reductions of Eulachon were specifically notable in the study. A new regulation amendment to the *Pacific Fisheries Regulation* was approved in May 2019 to allow for the use of LED lights in the shrimp trawl fishery. Effective April 1, 2021 LED lights are now required by condition of licence.

5.4.3. Gear Impact

Shrimp trawl gear contacts the ocean's floor. The potential impacts of mobile bottom trawl gear on benthic habitat, populations and communities have been well documented (DFO 2006). The shrimp trawl fishery off the coast of British Columbia tends to fish in soft bottom environments which are more robust to benthic alteration by trawl gear than complex, high structure substrate (Ibid.). A Departmental policy for Managing the Impact of fishing on Sensitive Benthic Areas has been finalized. For more information see the following website: <http://www.dfo-mpo.gc.ca/fm-gp/policies-politiques/index-eng.htm>

5.4.4. Forage Species

Shrimp are identified as a forage species. Forage species play a special role in aquatic ecosystems by providing a substantial portion of the annual food requirements of many fish, mammals and birds. The ecological relationships between predators and forage species are complex and the actual role of shrimp as forage fish in the ecosystem is not quantified. The Department has a Policy on New Fisheries for Forage Species which is available at: <http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/forage-eng.htm>.

Although there has been no specific evaluation of shrimp as a forage species, the Department uses a precautionary approach to ensure shrimp stocks are conserved.

5.4.5. Species at Risk

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

SARA contains several prohibitions to protect species listed on Schedule 1 of SARA. Under sections 32 and 33 of SARA, it is an offence to: 1) kill, harm, harass, capture or take an individual of a wildlife species listed as extirpated, endangered or threatened under SARA; 2) possess, collect, buy, sell or trade an individual (or any part or derivative of such an individual) of a wildlife species listed as extirpated, endangered or threatened under SARA; and 3) damage or destroy the residence of one or more individuals of a wildlife species that is listed as an endangered or threatened species, or that is listed as an extirpated species if a recovery strategy has recommended its reintroduction into the wild in Canada. These prohibitions apply unless a person is authorized, by a permit, licence or other similar document issued in accordance with SARA, to engage in an activity affecting the listed species or the residences of its individuals. Species listed as special concern are not included in these prohibitions. Section 58(1) contains provisions to prohibit the destruction of any part of the critical habitat of listed endangered or threatened species or of any listed extirpated species if a recovery strategy has recommended the reintroduction of the species in the wild in Canada. Critical habitat is the habitat necessary for the survival or recovery of a listed wildlife species and is identified in the recovery strategy or an action plan for the species.

To view the list of extirpated, 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-public-registry.html>

The process to list a wildlife species on Schedule 1 of SARA is initiated after an assessment by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) for that species is completed. The SARA legal listing process formally begins when the Minister of Environment and Climate Change issues a response statement, detailing how he intends to proceed with the COSEWIC species designations. Response statements can be found at: [Response statements - Canada.ca](https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html)

SARA Listing process for Pacific Coast Feeding Group and Western Pacific Grey Whale populations

The Grey Whale is a medium- to large-sized baleen cetacean. As of 2017, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) recognizes three Grey Whale populations in Canadian Pacific waters. The Eastern North Pacific population, currently Special Concern on Schedule 1 of SARA, was split into two populations. A broader North Pacific Migratory population, which migrates from winter breeding grounds in Mexico to summer feeding areas in the Bering Sea and Arctic waters, was assessed by COSEWIC as Not at Risk. A small population which over-winters in Mexico and resides and feeds in British Columbia waters in summer and fall, the Pacific Coast Feeding Group, was assessed as Endangered. A new Western Pacific population, which was recently found to contain individuals that migrate through British Columbia waters to breeding areas in Mexico, was also assessed as Endangered.

The two COSEWIC-assessed Endangered Grey Whale populations are under consideration for SARA listing. Consultations on these proposed amendments under SARA and the potential impacts of SARA listing will be held in 2022. For further information, please contact the Species at Risk Program at SARA.XPAC@dfo-mpo.gc.ca.

Committee on the Status of Endangered Wildlife Species (COSEWIC)

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 review information collected to assess wildlife species.

With the proclamation of SARA, COSEWIC has been established as an independent advisory panel responsible for identifying and assessing wildlife species considered to be in danger of disappearing in Canada. The assessments are carried out in accordance with section 15 of SARA, which, among other provisions, requires COSEWIC to determine the status of species it considers and to identify existing and potential threats. 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 and Climate Change's official response to the assessment results. Wildlife species that have been designated by COSEWIC may then qualify for legal protection and recovery under SARA.

For a full list of species identified and assessed by COSEWIC, please visit:
<https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-list-species-assessed.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. In Canadian waters, the primary threats to shark species have been identified as bycatch and entanglement. In order to address 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 bycatch in commercial and recreational fisheries, and aquaculture. These guidelines include boat handling procedures during visual encounters with Basking Sharks, and 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://www.dfo-mpo.gc.ca/species-especies/publications/sharks/coc/coc-sharks/index-eng.html>

Code of conduct for Basking Sharks: <https://www.dfo-mpo.gc.ca/species-especies/publications/sharks/coc/coc-basking/index-eng.html>

Potential listing of Eulachon under SARA

In 2011, COSEWIC assessed Eulachon within Canada as three designatable units (DUs): the Fraser River DU was assessed as Endangered, the Central Pacific Coast DU was assessed as Endangered, and the Nass/Skeena Rivers DU was assessed as Threatened (and subsequently reassessed as Special Concern in 2013). This 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; Management Scenarios that outline actions the Department will take in the event of a list or do not list decision, under SARA (completed in 2014); a socio-economic analysis weighing the costs and benefits of each scenario (completed in 2016); as well as consultations to seek input into whether or not to list these populations (completed 2011-2016). In Fall 2020, the Department undertook a “check-in” period to ensure that viewpoints and information shared during the 2016 consultations remain accurate and current. The Department will include any new information received during this period in its listing advice.

Eulachon are anadromous and spend most of their life at sea, with the stocks mixing throughout Canadian Pacific waters. The Fraser River DU Eulachon are known to occur in WCVI, QCSND and PRD SMAs. The Central Pacific Coast DU Eulachon are known to occur primarily in QCSND, PRD and to a lesser degree in WCVI (Beacham et al. 2005). The Nass/Skeena Rivers DU occurs primarily in PRD.

5.4.6. Whale, Turtle and Basking Shark Incident and Sight Reports

The Department is responsible for assisting marine mammals and sea turtles in distress. If your vessel strikes a whale, or if you observe an entangled, sick, injured, distressed, or dead marine mammal in B.C. waters, please contact the B.C. Marine Mammal Response Network Incident Reporting Hotline immediately:

1-800-465-4336 OR VHF CHANNEL 16

What to report:

- Your name and contact information
- Date and time of incident
- Location: Latitude/Longitude coordinates, landmarks
- Species
- Animal alive/dead (animal condition)
- Nature of injury and supporting details (if possible)
- Pictures/Video taken



SIGHTING REPORTING

The Department appreciates your assistance in tracking the sightings of live cetaceans (whales, dolphins and porpoises), sea turtles and Basking Sharks. While there are many whale species found in Pacific Canadian waters, sightings of Basking Shark and Leatherback Sea Turtles are infrequent. 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).

To report whale or turtle sightings contact the BC Cetacean Sighting Network:

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

Email: sightings@ocean.org

Website: <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: BaskingShark@dfo-mpo.gc.ca,

Website: www.pac.dfo-mpo.gc.ca/SharkSightings

5.4.7. Southern Resident Killer Whale Management Measures

The Government of Canada is taking important steps to protect and recover the Southern Resident Killer Whale population, in keeping with direction provided in *Species at Risk Act* (SARA) recovery documents. In May 2018, the Minister of Fisheries, Oceans and the Canadian Coast Guard and Minister of Environment and Climate Change determined the Southern Resident Killer Whale population faces imminent threats to its survival and recovery. Given the status of the population and ongoing threats to Southern Resident Killer Whale recovery, DFO implemented a number of measures in 2018 through 2021, including measures aimed at increasing prey availability and accessibility for Southern Resident Killer Whales - particularly Chinook salmon—and reducing threats related to physical and acoustic disturbance with a focus in key foraging areas within Southern Resident Killer Whale critical habitat.

Since 2018, Indigenous groups, the Indigenous and Multi-Stakeholder Advisory Group (IMAG), Technical Working Groups (TWGs) and stakeholders have provided recommendations and

feedback to Ministers and Departments on a range of measures (including measures related to increasing prey availability, sanctuaries, vessel disturbance [both noise and physical disturbance], and contaminants) to support Southern Resident Killer Whale recovery.

For the 2022 fishing season, the Government of Canada intends to ensure actions for the 2022 season to mitigate threats of prey availability and acoustic and physical disturbance can be implemented to coincide with the return of Southern Resident Killer Whales in typically greater numbers to Canadian Pacific waters. Any in-season changes will be announced via Fishery Notices.

To address vessel disturbance in the presence of whales, a mandatory 400-metre vessel approach distance for all killer whales is in effect until May 31, 2022 in southern BC coastal waters between Campbell River and just north of Ucluelet. The *Marine Mammal Regulations* remain in effect year-round, and require maintaining a minimum 200 metre approach distance from all killer whales in Canadian Pacific waters other than those described above, and, 100 metres for other whales, porpoises and dolphins or 200 metres when the animal is in resting position or with a calf.

The Government of Canada is asking vessel operators to respect the following voluntary measures:

- Stop fishing (do not haul gear) within 1,000 metres of killer whales and let them pass;
- Reduce speed to less than 7 knots when within 1000m of the nearest marine mammal
- When safe to do so, turn off echo sounders and fish finders
- Place engine in neutral idle and allow animals to pass if your vessel is not in compliance with the approach distance regulations
- For more information on the best ways to help whales while on the water, when on both sides of the border, please visit: bewhalewise.org

For information regarding the Southern Resident Killer Whale management measures to support recovery, please contact the Marine Mammal Team (DFO.SRKW-ERS.MPO@dfo-mpo.gc.ca) or visit <https://www.canada.ca/southern-resident-killer-whales>.

5.4.8. Marine Mammal Protection Act

U.S. Marine Mammal Protection Act Provisions

In 2016, the U.S. published new regulations (80 FR 54390) pursuant to the *Marine Mammal Protection Act* which focus on the reduction of marine mammal bycatch in foreign commercial fishing operations. Under these regulations, harvesting nations intending to continue to export fish and fish products to the USA after January 1, 2023, must apply to the U.S. National Oceanic and Atmospheric Administration (NOAA) for a comparability finding for each of its commercial fisheries listed in the US List of Foreign Fisheries. The harvesting nation must demonstrate: 1) the prohibition of intentional mortality or serious injury of marine mammals in the course of commercial fishing operations; and 2) the implementation of a regulatory program comparable in effectiveness to the US, including mandatory reporting of marine mammal bycatch, monitoring programs and management/mitigation measures where appropriate.

Depending on information provided, foreign commercial fisheries that export fish and fish products to the United States can be classified as either “export” or “exempt” based on the frequency and likelihood of incidental mortality and serious injury of marine mammals.

DFO will continue to share information about the U.S. *Marine Mammal Protection Act* Import Provisions and the process for ensuring continued access to US markets. Further information can be found on the [NOAA website](#), or by contacting the Regional Fisheries Coordinator or the DFO Marine Mammal Unit (MMU) (Contact: Lee Harber, Marine Mammal Advisor; Lee.Harber@dfo-mpo.gc.ca).

5.4.9. Marine Mammal Regulations

The *Marine Mammal Regulations* provide direction on conservation and protection of marine mammals, provide guidance for recovery of Endangered Species under the *Species at Risk Act*, and set out provisions related to reducing human disturbance of marine mammals (e.g. viewing of marine mammals) and mandatory reporting requirements in the case there is accidental contact with a marine mammal and a vessel or fishing gear. These regulations were amended in 2018 and now specify mandatory requirements to prevent disturbance of marine mammals.

As per section 7(2) of the *Marine Mammal Regulations*, disturbance is defined as a number of human actions including:

- Feeding, swimming or interacting with a marine mammal.
- Moving a marine mammal (or enticing/causing it to move).
- Separating a marine mammal from its group or going between it and a calf.
- Trapping a marine mammal or a group either between a vessel and the shore, or between a vessel and other vessels.
- Tagging or marking a marine mammal.
- Checking nautical charts for the locations of various protected areas and no go zones.
- Ensure to check nautical charts for the locations of various protected areas and no go zones.

These amendments include requirements for bBoats are required to maintain a minimum approach distance of 100 m for whales, dolphins or porpoises, 200m when whales, dolphins or porpoises are in a resting position or with a calf, and 200m from all Killer Whales in Pacific Canadian waters except when in southern BC coastal waters which requires a 400m minimum approach distance to all killer whales (please see section 5.4.7).

For more information on safe boating behavior around whales please visit: [Watching Marine Mammals and Be Whale Wise](#).

Any operator of a vessel or fishing gear involved in accidental contact with a marine mammal must notify DFO of the incident, as per section 39 of the *Marine Mammal Regulations*. Incident reporting includes:

- Reporting an injured, stranded, entangled or dead marine mammal to the [BC Marine Mammal Response Network \(Observe, Record, Report\)](#)
- Reporting as bycatch in a log book
- Report on a Marine Mammal Interaction Form <https://www.dfo-mpo.gc.ca/species-especies/documents/mammals-mammiferes/report-rapport/Fish-Harvester-Form-Eng.pdf>
- Depredation reporting to DFO by email at MarineMammals@pac.dfo-mpo.gc.ca or by calling (604) 666 9965.

Please note, incidents involving abuse or harassment of a marine mammal should be reported as a [fisheries violation](#), while injured, stranded, entangled or dead marine mammals should be reported to the [BC Marine Mammal Response Network](#) to enable a response if appropriate.

Further information regarding the *Marine Mammal Regulations* can be obtained by contacting the DFO Marine Mammal Unit (MMU) (MarineMammals@pac.dfo-mpo.gc.ca).

5.4.10. Relevant Species at Risk Materials

The following are resources that feature species listed under the *Species at Risk Act* and are specific to the Pacific Region. These resources cover topics from species identification, regulations, protocols for identifying and reporting incidents with marine mammals, and helping harvesters to properly identify marine species.

Marine Mammals:

- Whale entanglement brochure (best practices to reduce entanglement and reporting an incident): <http://dev-public.rhq.pac.dfo-mpo.gc.ca/whales-baleines/docs/entanglements-empetirements-pub-eng.html>
- Approach distances from the amended *Marine Mammal Regulations*: <https://canadagazette.gc.ca/rp-pr/p2/2018/2018-07-11/html/sor-dors126-eng.html>

Species identification guides:

- Sharks (<https://waves-vagues.dfo-mpo.gc.ca/Library/40757067.pdf>)
- Rockfish ID <https://www.pac.dfo-mpo.gc.ca/fm-gp/rec/docs/rockfish-sebaste-idguide-eng.pdf>
- Distinguishing between White and Green Sturgeon (<https://www.pac.dfo-mpo.gc.ca/fm-gp/rec/docs/sturgeon-esturgeon-idguide-pub-eng.html>)
- Distinguishing between Sea and River Otters (https://wildwhales.org/wp-content/uploads/2020/05/BCCSN_IDGuide_Otters_vertical_4.pdf)
- Distinguishing between pinnipeds, emphasizing differences between Steller and California Sea Lions (https://wildwhales.org/wp-content/uploads/2020/08/BCCSN_IDGuide_Pinniped_email.pdf)

Protecting rockfish (sharing responsibility for sustainable recreational fisheries in the Pacific Region): <https://www.pac.dfo-mpo.gc.ca/fm-gp/rec/docs/rockfish-sebaste-dd-eng.html>

5.4.11. Oceans and Habitat Considerations

Oceans Act

The *Oceans Act* provides a foundation for an integrated and balanced national oceans policy framework supported by regional management and implementation strategies. The *Oceans Act* was amended in May 2019 to include interim protection measures, time limits for establishment, the precautionary principle, and to strengthen enforcement powers.

The *Oceans Act*, the *Canada Wildlife Act*, and the *National Marine Conservation Areas Act* have given rise to several initiatives on the BC coast, which are listed below. As goals, objectives, and management plans are finalized for these initiatives, the Department's management of fisheries will be adapted as appropriate, in consultation with interested parties through Integrated Fisheries Management processes. Other important mandate commitments that inform the implementation of spatial marine conservation efforts include the considerations under the *Fisheries Act*, Sustainable Fisheries Policy suite, and mandate commitments to the Blue Economy Strategy and Reconciliation with First Nations.

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

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:

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

To meet its 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:

<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 Marine Protected Area Network

The Government of Canada, the Province of BC and 18 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 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, the Canada-British Columbia MPA Network Strategy, and is informed by previously developed First Nation marine plans.

Draft MPA network design scenario 1, which consists of areas proposed for conservation as well as their proposed management measures was shared with non-partnering First Nations, who are not part of the collaborative governance arrangement, and with members of the Network Integrated and Ocean Advisory Committees in February 2019.

Governance partners considered all the input received about the first network scenario and developed scenario 2, which was discussed and further revised by partners and stakeholders during workshops held during the winter and spring of 2021. Throughout the summer and fall 2021, significant technical work was undertaken to develop a draft Network Action Plan which describes the draft network design scenario, as well as additional information such as proposed designation tools, implementation timelines, and monitoring recommended governance frameworks. Considerations are underway with respect to next steps for the process, including timelines for consultation and engagement. The Department will share more information as it becomes available.. More information on MPA Network Planning is available at: <http://www.mpanetwork.ca>

The Pacific North Coast Integrated Management Area Plan is available at: <https://www.dfo-mpo.gc.ca/oceans/management-gestion/index-eng.html>

Southern BC Marine Spatial Planning South

As part of a national marine spatial planning initiative, DFO is in pre-planning phase, collaborating with Indigenous groups and organizations, the Province of BC, and other federal departments (Transport Canada, Natural Resources Canada, Environment and Climate Change Canada, Parks Canada and others), to gather information and data relevant to a marine spatial planning process in southern BC, which includes the Strait of Georgia and Southern Shelf bioregions. The concept of marine spatial planning is to improve coordination across jurisdictions and activities in the

marine space. Deliverables by 2023 include: recommendations for a trilateral governance model/approach, a Marine Atlas (working draft), and a Framework to inform future planning phases, including the development of a marine spatial plan.

Harvesters can expect updates on this process 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 MPA

The Endeavour Hydrothermal Vents Marine Protected Area (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. For more information on the EHV MPA—including maps, boundaries, and restrictions to other fisheries or human activities—please visit: <http://www.dfo-mpo.gc.ca/oceans/mpa-zpm/endeavour/index-eng.html>

SGaan K̓inghlas – Bowie Seamount MPA

The SGaan K̓inghlas – Bowie Seamount Marine Protected Area (SK-B MPA) was designated under the *Oceans Act* in 2008 and was established to conserve and protect the unique biodiversity and biological productivity of the area's marine ecosystem, including three seamounts (SGaan K̓inghlas – Bowie, Hodgkins, and Davidson) and the surrounding waters, seabed, and subsoil. The SK-B MPA is cooperatively managed by DFO and the Council of the Haida Nation (CHN) through the SK-B Management Board, and the SK-B MPA Management Plan guides the conservation and protection of the MPA. The SK-B MPA is closed to all bottom-contact fishing activities. For more information on the SK-B MPA—including maps, boundaries, and restrictions to other fisheries or human activities—please visit: <http://www.dfo-mpo.gc.ca/oceans/mpa-zpm/bowie-eng.html>

Hecate Strait and Queen Charlotte Sound Glass Sponge Reefs 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 four glass sponge reefs off the coast of British Columbia. The Hecate MPA protects rare glass sponges from human activities that may break their silica (glass) structure, or may result in smothering through increased suspended sediment. Under the Hecate MPA Regulations, human activities are regulated/managed using three different management zone types:

I. Core Protection Zones (CPZs) include the water columns surrounding the glass sponge reefs--extending from the seafloor to depths that vary depending on the Reef (100 m in Northern Reef, 120 m in the Central Reefs, 146 m in the Southern Reef).

- II. Vertical Adaptive Management Zones (VAMZs) include water columns immediately above the CPZs, and each extends from that boundary to the sea surface.
- III. Adaptive Management Zones (AMZs) are buffers around the CPZ/VAMZ water columns at each reef.

The CPZs are closed to anchoring and all fishing activities. In addition, the VAMZ and AMZs are closed to some commercial and recreational fishing activities. For more information on the Hecate MPA—including maps, boundaries, and restrictions to fisheries or human activities—please visit: <http://www.dfo-mpo.gc.ca/oceans/mpa-zpm/hecate-charlotte/index-eng.html>

Offshore Pacific Area of Interest & Fishery Closure

In May 2017, DFO announced the new Pacific Offshore Area of Interest (AOI) with the intention of making it one of Canada's largest Marine Protected Areas (MPAs) by 2021. The proposed MPA will provide protection to ecologically and biologically significant seamount and hydrothermal vent features within the Offshore Pacific Bioregion. Although the AOI has not yet been designated as an MPA, much of it is protected from under the Offshore Pacific Seamounts and Vents Closure (Offshore Fishery Closure). For more information on the Offshore Fishery Closure—including maps, boundaries and restrictions to other fisheries—please visit: <https://www.dfo-mpo.gc.ca/oceans/oecm-amcepz/refuges/offshore-hauturiere-eng.html>

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 km² 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/info/consultations/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

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. 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

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. Parks Canada consultations on the feasibility assessment are ongoing. 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-cnnmca/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). The anticipated pre-publishing of the regulations in Canada Gazette 1 is expected to occur in 2022.

For further information on this, please contact - 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

17 marine refuges were established between 2016 and 2019 under the Strait of Georgia and Howe Sound Glass Sponge Reef Conservation Initiative, which aims to protect glass sponge reefs from all bottom-contact fishing activities in alignment with DFO's Policy for Managing the Impacts of Fishing on Sensitive Benthic Areas. All commercial, recreational and Indigenous food, social and ceremonial (FSC) bottom-contact fishing activities for prawn, shrimp, crab and groundfish, are prohibited within the 17 marine refuges as well as the use of downrigger gear for recreational salmon trolling (restricted via Condition of Licence) are prohibited within the 17 marine refuges within Subareas 28-2 and 28-4 to protect Howe Sound glass sponge reefs. Prohibited fishing activities include:

- prawn and crab by trap
- shrimp and groundfish by trawl

- groundfish by hook and line
- use of downrigger gear in recreational salmon trolling

In 2020, a DFO Canadian Science Advisory Secretariat publication confirmed the presence of five additional live sponge reefs and one dead reef in Howe Sound. As glass sponge reefs are slow growing and vulnerable to physical disturbances, the report suggested the reefs be closed to bottom-contact fishing. Between September 2020 and February 2021, DFO officials undertook consultation and engagement on proposed commercial and recreational and Indigenous FSC closures to invertebrate trap, groundfish trawl, groundfish hook and line, and the use of downriggers within the new sites with the aim of establishing marine refuges. Commercial and recreational bottom-contact fishery closures went into effect on January 17, 2022 within the five sites in portions of Subareas 28-1, 28-2 and 28-3 to protect these five additional Howe Sound glass sponge reefs. The use of downrigger gear in recreational salmon trolling will also be prohibited within the five sites and at one existing site (Queen Charlotte Channel) via a Condition of Licence, which will come into effect on April 1, 2022.

For further information on this, please contact Danielle Derrick at Danielle.Derrick@dfo-mpo.gc.ca.

A description of the closures is provided on the Strait of Georgia and Howe Sound Glass Sponge Reef Conservation Initiative website, here: <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. It 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 the Canada-Wide Action Plan on Zero Plastic Waste Phase 2 developed by the Canadian Council of Ministers of the Environment, available from: <https://ccme.ca/en/current-activities/waste>.

Conditions of Licence to Report Lost and Retrieved Gear

In the spring of 2020, it became a mandatory condition of licence for commercial harvesters to report lost and retrieved fishing gear. While the Department is taking a stewardship approach to ghost gear and working with harvesters to reduce the effects of ghost fishing, the inclusion of the reporting requirement as a condition of licence means that not reporting lost and/or retrieved gear is now a chargeable offence.

Lost gear can be reported through the online Fishing Gear Reporting System, available at: <https://www.dfo-mpo.gc.ca/fisheries-peches/commercial-commerciale/reporting-declaration-eng.html>

The Ghost Gear Fund (Sustainable Fisheries Solutions and Retrieval Support Contributions Program)

2020-2022, the DFO Ghost Gear Fund has provided over \$18 million in funding to projects falling under four pillars of activity:

- Abandoned, lost or otherwise discarded fishing gear (ALDFG) retrieval
- Responsible disposal
- Acquisition and piloting of currently available innovative technologies
- International leadership

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 4,350km² 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-ac/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. DFO is also planning to review Rockfish Conservation Areas in other regions of British Columbia at a later date.

For further information on this, please contact DFO.RCA-ACS.MPO@dfo-mpo.gc.ca

6. OBJECTIVES

6.1. National

DFO aims to:

- Meet conservation objectives and ensure healthy and productive fisheries and ecosystems;
- Manage fisheries to provide opportunities for economic prosperity;
- Provide stability, transparency, and predictability in fisheries management and improved governance.

6.2. Pacific Region

In 1994, the Biological Objective Working Group of the PSARC identified three biological objectives for management of Pacific Region fish and invertebrate stocks (Rice et al, 1995). The objectives remain relevant today, particularly in light of development of the national objectives around sustainable fisheries:

- Ensure that subpopulations over as broad a geographical and ecological range as possible do not become biologically threatened (COSEWIC sense of “threatened”);
- Operationally, the above objective 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.

6.3. Objectives for Pink and Sideshripe Shrimp Trawl

6.3.1. Conservation and Sustainability

DFO's species specific objectives for the conservation and sustainability of pink and Sideshripe Shrimp stocks fished by trawl are:

- To maintain shrimp biomass in the Healthy and Cautious zones;
- To set catch ceilings by each SMA based on the best stock assessment information available. Catch ceilings will be defined following the Precautionary Approach. Fishery independent biomass surveys will be conducted in-season and harvest rates set based on stock biomass; and
- To monitor the ratio of Eulachon to shrimp in WCVI SMAs and to adjust fishing practices when estimated Eulachon bycatch reaches action levels.

6.3.2. Social, Cultural and Economic

DFO's objective is to work collaboratively with the STSC to ensure sustainable fisheries and to collect input from all fishing sectors in the annual development of the IFMP. Specific objectives for the pink and Sideshripe Shrimp by trawl fishery are:

- To promote a best practices approach that meets the Department's objectives for sustainable, selective and risk averse harvest strategies by encouraging participation by commercial licence holders and processors in IFMP development and by having licence holder and processor representation on the STSC;
- To promote an understanding of the shrimp trawl management strategies by encouraging participation by First Nations in the STSC;
- To consider experimental fishing proposals and the development of selective fishing techniques and standards in consultation with the STSC; and
- To provide opportunities for shrimp harvests that maximize the potential economic return to shrimp trawl fish harvesters, while meeting the Departments goals for a PA to shrimp harvesting, and ecosystem, bycatch, species at risk, sensitive benthic areas and forage species policies.

6.3.3. Compliance

DFO's objective is to pursue opportunities to monitor and enforce the shrimp trawl fishery in conjunction with the monitoring and enforcement priorities in the Pacific Region.

6.3.4. Ecosystem

DFO's objective is to use the Ecological Risk Assessment Framework drafted under the national Policy for Managing the Impacts of Fishing on Sensitive Benthic Areas to determine the level of risk in these fisheries and whether mitigation measures are required in any areas. Ecosystem

objectives may also arise with initiatives under the *Oceans Act*. It is a shared objective with the commercial fishery to avoid sponge reefs and cloud sponges in areas identified in the Commercial Harvest Plan (Appendix 1), including the Hecate Strait / Queen Charlotte Sound Glass Sponge Reefs.

Specific ecosystem objectives for the pink and Sidesripe Shrimp by trawl fishery are:

- To define selective and responsible fishing practices for the shrimp trawl fishery;
- To minimize Eulachon bycatch to stay below the EAL; and
- To avoid bycatch and close areas when deemed necessary.

7. ACCESS AND ALLOCATION

The exploitation of pink and Sidesripe Shrimp is primarily conducted under commercial licence and as such there are no sharing or allocation arrangements in place for the fishery. Harvest opportunity is determined under the stock assessment and management framework as defined under the Commercial Harvest Plan (Appendix 1). Harvest of pink and Sidesripe Shrimp by First Nations for FSC or domestic harvest; recreational harvest; and by other gear types in the commercial fishery is considered small and is not taken into consideration in setting annual catch ceilings.

Nisga'a Domestic Fishing:

The Harvest agreement for domestic (FSC) purposes under the Nisga'a Final Agreement (Treaty) came into effect on May 11, 2000. The Nisga'a territory is located within the Nass River valley on the northwest coast of B.C. More information on the Treaty and the Nisga'a annual fishing plan can be found at: <https://www.rcaanc-cirnac.gc.ca/eng/1100100030588/1542730442128>

Tsawwassen Domestic Fishing:

The Tsawwassen fishery for domestic (FSC) purposes under the Tsawwassen Final Agreement (Treaty) came into effect on April 3, 2009. The Tsawwassen First Nation is located in the lower mainland near the city of Vancouver, and their territory spans portions the Strait of Georgia near the mouth of the Fraser River as well as portions of the lower Fraser River and Boundary Bay. More information on the Treaty can be found at: <https://www.rcaanc-cirnac.gc.ca/eng/1100100022706/1617737111330>

Maa-nulth Domestic Fishing:

The Maa-nulth First Nations fishery for domestic (FSC) purposes under the Maa-nulth First Nations Final Agreement (Treaty) came into effect on April 1, 2011. The Maa-nulth First Nations comprise five individual First Nations; Huu-ay-aht First Nations, Ka:'yu:'k't'h'/Che:k'tles7et'h' First Nations, Toquaht Nation, Uchucklesaht Tribe and the Yuułu?ił?ath First Nation on the WCVI. More information on the Treaty can be found at: <https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/consulting-with-first-nations/first-nations-negotiations/first-nations-a-z-listing/maa-nulth-first-nations>

Tla'amin Domestic Fishing:

The Tla'amin fishery for domestic (FSC) purposes under the Tla'amin Final Agreement (Treaty) came into effect on April 5, 2016. The Tla'amin Nation is located near the City of Powell River, 130 km northwest of Vancouver. More information on the Treaty can be found at: <https://www.rcaanc-cirnac.gc.ca/eng/1397152724601/1542999321074>

While these four treaties do provide for shellfish harvest, no specific allocations for shrimp by trawl are provided in them.

Five Nations Right-Based Sale Fishery:

Five Nuu-chah-nulth First Nations located on the west coast of Vancouver Island - Ahousaht, Ehattesaht, Hesquiaht, Mowachaht/Muchalaht, and Tla-o-qui-aht (the Five Nations) – have Aboriginal rights to fish for any species, with the exception of Geoduck, within their Fishing Territories and to sell that fish. The Department has developed a 2021/22 Five Nations Multi-species Fishery Management Plan (FMP). The FMP includes specific details about the fishery, such as allocation/access, licensing and designations, fishing area, harvesting opportunities, and fishery monitoring and catch reporting. Feedback provided by the Five Nations during consultations was considered and incorporated into the 2021/22 FMP by DFO where possible.

The implementation of the Five Nations' right-based sale fishery continues to be an ongoing process. The 2021/22 FMP was developed to implement the right-based multi-species fishery to accommodate the Five Nations' Aboriginal rights consistent with the British Columbia Supreme Court's 2018 decision. On April 19, 2021, the British Columbia Court of Appeal released its decision in relation to the appeal brought forward by the Five Nations. As a result, the department announced a number of in-season changes via fishery notice. For further information, see the revised 2021/22 FMP at: <https://waves-vagues.dfo-mpo.gc.ca/Library/41018588.pdf>.

8. MANAGEMENT MEASURES FOR THE DURATION OF THE PLAN

See Appendix 1 for detail on the following management measures:

- Fishing seasons and areas;
- Total allowable catch ceilings and decision rules by species and Shrimp Management Area;
- Licensing requirements;
- Licenced species;
- Mandatory bycatch reduction devices;
- At-sea observer coverage requirements;
- EALs (bycatch action levels);
- Closures for RCAs, specific sponge reefs, conservation areas, seasonal areas, navigational areas and ecological reserves; and
- Notification and reporting measures (hails when fishing, hails of catch, logbooks, electronic data reporting).

Specific changes to the Commercial Harvest Plan such as fishing gear, bycatch limits, and closures based on conservation as a result of new initiatives, that may require on-grounds audits or enforcement, will be communicated to licence holders during the Sectoral meeting, at time of licence issuance, or by Fishery Notice if required to be implemented in-season.

9. SHARED STEWARDSHIP ARRANGEMENTS

9.1. Commercial

The Pacific Shrimp Harvesters Association (PSHA), the B.C. Shrimper Trawler's Association (BCSTA), and DFO have defined the annual data standards and reporting requirements to support of the commercial fishery for the start of this season.

Shrimp trawl harvesters are required by Conditions of Licence to make arrangements with an approved service provider for the delivery of in-season vessel fishing location and landing haul reports. A catch monitoring program, including at-sea bycatch and dockside sampling of shrimp, are also all requirements under the current fishery. The approved industry service provider for this season is Archipelago Marine Research Ltd.

9.2. Fisheries and Oceans Canada

Fisheries and Oceans Canada provides fishery management, enforcement, licensing and administration, and partial stock assessment for the shrimp trawl fishery. Personnel are generally multi-tasked and, as a consequence, costs incurred by the Department to manage this fishery are difficult to assess. Contributions to the IFMP are provided by the Fisheries Management Directorate, the Science Branch, the Shellfish Data Unit, the Conservation and Protection (C&P) Directorate, the Pacific Fisheries Licence Unit, the Recreational Fisheries Division, the Oceans Directorate and numerous administrative personnel.

10. COMPLIANCE PLAN

Conservation and Protection (C&P) staff will pursue opportunities to monitor and enforce this fishery, in conjunction with the monitoring and enforcement priorities directed by senior management in the Pacific Region.

At-sea observers will continue to provide an “observe, record and report” capability. OBSERVE, RECORD, AND REPORT hotline: 1-800-465-4DFO (4336).

10.1. Priorities for 2022/23

C&P staff will pursue opportunities to monitor the issues and problems associated with this fishery, patrol of closed areas/times and enforce retention rules and gear configurations in conjunction with other regional priorities. Inspections will focus on fishing vessels at-sea and at landing ports to inspect catch on board, bycatch gear in nets, hauls, landing records and harvest logs. Closed time and area patrols may be conducted by Canadian Coast Guard (CCG) patrol vessels, program vessels, or by air, in conjunction with other patrols.

10.2. Enforcement Issues and Strategies

Issue	Section	Strategy
Licensing Verification Vessel licensed. No Fisher's Registration Card (FRC). Fail to produce FRC.	<i>Pacific Fisheries Regulations</i> (PFR) Section (S) 22 PFR S 25 <i>Fisheries General Regulations</i> F(G)R S 11	At-sea and dockside inspections will occur during regular patrols. These inspections may include checks of all licensing documents on board the vessel to ensure compliance with regulations.
Fishing during closed time/area.	PFR S 63	Patrols utilizing patrol vessels will be pursued. Possibilities exist to use the regional air surveillance plane in co-ordination with patrols scheduled for priority fisheries.
Fail to provide proper landing and hail information, lack of notification for change of area, cancellation of trip, or incorrect reporting of area fished.	F(G)R S 22(7)	At-sea and dockside inspections will occur during regular patrols. Investigations will occur on an opportunistic basis, after C&P has been notified by Fisheries Management that a violation has occurred.
Fail to maintain Harvest Log Book.	F(G)R S 22(7)	At-sea and dockside inspections will occur during regular patrols. Investigations may also occur on an opportunistic basis, after C&P has been notified by Fisheries Management that a violation has occurred.
Bycatch monitoring. Retain prawns during closed time for prawn. Exceed prawn bycatch limit (100). Retain prawns < 33 mm carapace length. Retain prawns with eggs. Fail to keep prawns separate from shrimp catch. Fish without a selectivity device in place. Use of mechanical device for the purposes of automatically separating bycatch from shrimp. More squid than 2% of total shrimp onboard.	F(G)R S 22(7)	At-sea and dockside monitoring may include inspections for bycatch limits as noted to ensure compliance with the regulatory requirement. Inspections may occur in conjunction with enforcement activities in other fisheries, particularly where non-compliance in this fishery may impact conservation or control in other fisheries.

Issue	Section	Strategy
Retention of non-retention species. Failure to record retained squid or octopus on Shrimp Harvest Log.		
Fail to off-load “shrimp by trap” prior to fishing shrimp by trawl net.	F(G)R S 22(7)	At-sea and dockside inspections will occur during regular patrols.
Fish with gear other than trawl net.	F(G)R S 22(7)	At-sea and dockside inspections will occur during regular patrols.
Fish with gear that does not contain an escape hole, or exceeds maximum spacing on rigid grate.	F(G)R S 22(7)	At-sea and dockside inspections will occur during regular patrols.
Dockside sales without Fish Vending Licence.	<i>B.C. Fish Act</i> S 13(4)	Dockside inspections and monitoring will be pursued during regular patrols.

11. 2022/23 PERFORMANCE REVIEW

11.1. Conservation and Sustainability

- The landings and effort will be limited to the catch ceilings for each SMA. Opportunities for managing and accounting for multiple shrimp species in the catch will be reported.
- Fishery landings will be monitored through the catch monitoring program and harvest logs. Misreporting or under-reporting of catch will be documented. Problems with the catch monitoring program will be documented as identified by industry members, the Department, and/or the service provider.
- In-season stock assessment information will be incorporated into the in-season management of the fishery.
- Results of the catch sampling program will be compiled and areas for improvement to selective fishing practices will be identified.

11.2. Social, Cultural and Economic

- The management approach will be maintained for the 2022/23 fishery and any results of co-management programs will be documented.
- Any progress with regard to the improved economics of the fishery, enhancing fishery values, or alternative management strategies will be documented.
- Issues brought forward by First Nations will be identified and addressed.
- Issues of safety in the operation and management of the fishery will be identified and addressed.

11.3. Compliance Plan Evaluation Criteria

- Hours spent on enforcement of this fishery will be tracked, along with the number of charges, warnings, seizures, and suspected violations or convictions will be defined. Changes from previous years will be identified.
- The number of occurrence reports identified by the service provider and the nature of these occurrences and possible alternative management actions identified.
- Other in-season enforcement issues will be identified and any unresolved issues brought forward.

11.4. Ecosystem

The estimated Eulachon bycatch for WCVI SMAs will be monitored through observer coverage and fishing effort and will be assessed against Eulachon Action Level thresholds. The development of selective gear to reduce bycatch will be encouraged by the issuance of experimental licences and the results collected and documented.

12. REFERENCES AND RESOURCES

There are a number of important scientific papers that have contributed to our knowledge of Shrimp and to the current management regime. Please see the below for a full list of references.

Front cover illustration by A. Denbigh, in *Shrimps of the Pacific Coast of Canada*, T. H. Butler, 1980. Can. Bull. Fish. Aquat. Sci. 202: 280 p. Beacham, T. D., Hay D. E., and Le K. D. 2005. Population structure and stock identification of eulachon (*Thaleichthys pacificus*), an anadromous smelt, in the Pacific Northwest. Marine Biotechnology 7: 363-372.

Beacham, T. 2005. Population structure and stock identification of Eulachon (*Thaleichthys pacificus*), an anadromous smelt, in the pacific northwest.

Boutillier, J. A. and H. Nguyen. 1999. *Pandalus hypsinotus*, humpback shrimp a review of the biology and a recommended assessment framework for a directed fishery. Canadian Stock Assessment Secretariat Research Document 99/067.

Boutillier, J. A. and M. Joyce. 1996. Assessing the inshore shrimp fisheries: data status, model requirements, problems. In Invertebrate working papers reviewed by the Pacific Stock Assessment Review committee (PSARC) in 1996. Edited by G. E. Gillespie and L. C. Walthers. Can. Tech. Rep. Fish. Aquat. Sci. No 221.

Boutillier, J. A., J.A. Bond, H. Nguyen. 1999. Halibut bycatch in the British Columbia shrimp trawl fishery. Canadian Stock Assessment Secretariat Research Document; 99/122.

Boutillier, J. A., J.A. Bond, H. Nguyen. 1999. Evaluation of a new assessment and management framework for shrimp stocks in British Columbia. Canadian Stock Assessment Secretariat Research Document; 99/124.

Boutillier, J.A. J. A. Bond, H. Nguyen, and K. West. 1999. Shrimp survey and resulting management actions, Fraser River shrimp management area, August 1998. Canadian Manuscript Report of Fisheries and Aquatic Sciences; 2494.

Butler, T. H. 1980. Shrimps of the Pacific Coast of Canada. Can. Bull. Fish. Aquat. Sci. 202: 280 p.

Conway, K.W. 1999. Hexactinellid sponge reefs on the British Columbia continental shelf: geological and biological structure with a perspective on their role in the shelf ecosystem. Canadian Stock Assessment Secretariat Research Document 99/192.

Dahlstrom, W.A. 1970. Synopsis of biological data on the ocean shrimp *Pandalus jordani* Rathburn, 1902. FAO Fish Rep. 57: 1377-1416.

DFO. 1999a. Review of the Pacific Salmon Vessel Tie-up Program. <http://cat.fsl-bsf.scitech.gc.ca/record=4027303&searchscope=01>

DFO. 1999b. Shrimp Trawl Fishery off the west coast of Canada. Stock Status Report. 1999/c6-08. <http://www.dfo-mpo.gc.ca/csas/Csas/status/1999/C6-08e.pdf>

DFO. 2003. Pacific Region Guidelines on changes to Shellfish Management Plans to address requests by First Nations regarding harvesting for food, social, and ceremonial purposes. January 2003. 5p.

DFO. 2006. Impacts of Trawl Gears and Scallop Dredges on Benthic Habitats, Populations and Communities. DFO Can. Sci. Advis. Sec. Sci. Rep. 2006/025.

DFO. 2008. Fraser River Eulachon (*Thaleichthys pacificus*): 2007 Population Assessment and Harvest Recommendations for 2008. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2007/048.

DFO. 2009. Proceedings of the Precautionary Approach Workshop on Shrimp and Prawn Stocks and Fisheries; November 26-27, 2008. DFO Can. Sci. Advis. Sec. Proceed Ser. 2008/031.

DFO. 2012. Assessment of Inshore Shrimp Stocks Along the Coast of British Columbia, 2011. Can. Sci. Advis. Sec. Advis. Rep. 2011/085.

Dunham, J. S. and J. A. Boutillier. 2001. *Pandalus danae*, Coonstripe shrimp: A Review of the Biology and Recommended Assessment Framework for Directed Fisheries. Canadian Science Advisory Secretariat Research Document 2001/151.

Dunham, J. S., J. A. Boutillier, D. Rutherford and K. Fong. 2002. Biological decision rules for the assessment and management of directed fisheries on *Pandalus hypsinotus*, Humpback Shrimp. Canadian Science Advisory Secretariat Research Document 2002/127.

Fisheries and Oceans Canada. 1999. Selective Fishing in Canada's Pacific Fisheries. A new direction: The third in a series of papers from Fisheries and Oceans Canada. May, 1999. 34pp.

Hannah, R. W. 1995. Variation in geographic stock area, catchability, and natural mortality of ocean shrimp (*Pandalus jordani*): some new evidence for a trophic interaction with Pacific hake (*Merluccius productus*). *Can. J. Fish. Aquat. Sci.* 52:1018 – 1029.

Hannah, R. W., M. J. M. Lomelli and S. A. Jones. 2015. Tests of artificial light for bycatch reduction in an ocean shrimp (*Pandalus jordani*) trawl: strong but opposite effects at the footrope and near the bycatch reduction device. *Fisheries Research* 170:60-67.

Harbo, R., L. Convey, J.A. Boutillier and D.E. Hay. 1999. Pacific coast shrimp trawl fisheries : new management and assessment co-management programs. NAFO SCR documents; 99/82.

Harbo, R. and E.S. Wylie (eds). 2006. Shrimp Trawl Fishery 2000/01 Fisheries Update in: Pacific Commercial Fishery Updates for Invertebrate Resources (2000). *Can. Manuscr. Rep. Fish. Aquat. Sci.* 2735: viii + 304 p.

Hay, D.E. and P.B. McCarter. 2000. Status of the eulachon *Thaleichthys pacificus* in Canada. Canadian Stock Assessment Secretariat Research Document - 2000/145 92p.

Hay, D.E., P.B. McCarter, R. Joy, M. Thompson, and K. West. 2002. Fraser River Eulachon Biomass Assessments and Spawning Distribution: 1995-2002. Canadian Science Advisory Secretariat Research Document 2002/177.

Hay, D.E, R. Harbo, J. Boutillier, E. Wylie, L. Convey, and P.B. McCarter. 1999. Assessment of bycatch in the 1997 and 1998 shrimp trawl fisheries in British Columbia, with emphasis on eulachons. Canadian Stock Assessment Secretariat Research Document - 1999/179.

Hay, D.E, R. Harbo, K. Southy, J.R. Clarke, G. Parker and P.B. McCarter. 1999. Catch composition of British Columbia shrimp trawls and preliminary estimates of bycatch - with emphasis on eulachons. Canadian Stock Assessment Secretariat Research Document - 1999/26 45pp.

Jensen, G. C. 1995. Pacific Coast Crabs and Shrimps. 81pp.

McCarter, P.B. and D.E. Hay. 2003. Eulachon embryonic egg and larval outdrift sampling manual for ocean and river surveys. *Can. Tech. Rept. Fish. Aquat. Sci.* 2451: 33p.

Martell, S., J. Boutillier, H. Nguyen, C. Walters. 2000. Reconstructing the offshore *Pandalus jordani* trawl fishery off the WCVI and simulating alternative management policies. Canadian Stock Assessment Secretariat Research Document 2000/149.

Nelson, S. 2011. Pacific Commercial Fishing Fleet: Financial Profiles. Report for Fisheries and Oceans Canada.

Olsen, N., J.A. Boutillier and L. Convey. 2000. Estimated bycatch in the British Columbia shrimp trawl fishery. Canadian Stock Assessment Secretariat Research Document 2000/168.

Rice, J., R.D. Humphreys, L. Richards, R. Kadowaki, D. Welch, M. Stocker, B. Turris, G.A. McFarlane, F. Dickson and D. Ware (eds). 1995. Pacific Stock Assessment Review Committee (PSARC) Annual Report for 1994. Canadian Manuscript Report of Fisheries and Aquatic Sciences 2318.

Rutherford, D.T., L.L. Barton, D.G. Clark and K. Fong. 2013. Catch composition data from the British Columbia commercial shrimp trawl bycatch monitoring program, 2002-2011. Can. Data Rep. Fish. Aquat. Sci. 1246: iii + 114p.

Rutherford, D.T., L.L. Barton, G.E. Gillespie, and J.A. Boutillier. 2004. Utility of Historical Catch to Set Reference Points for the British Columbia Shrimp by Trawl Fishery Canadian Stock Assessment Secretariat Research Document 2004/026.

Rutherford, D.T., H. Nguyen, J. Dunham. 2007. Progress report on the development of an in-season management and assessment framework for Prince Rupert Humpback shrimp (*Pandalus hypsinotus*). Canadian Stock Assessment Secretariat Research Document 2007/057.

Schweigert, J., Wood, C., Hay, D., M. McAllister, J. Boldt, B. McCarter, T.W. Therriault, and H. Brekke. 2012. Recovery Potential Assessment of Eulachon (*Thaleichthys pacificus*) in Canada. DFO Can. Sci. Advis. Sec. Res. Doc. 2012/098. vii + 121 p.

Therriault, T.W. and P.B. McCarter. 2005. Using an Eulachon Indicator Framework to Provide Advice on Fraser River Harvest Opportunities for 2006. Canadian Science Advisory Secretariat Research Document 2005/077. 15pp.

Toole, J. 2011. 2010 Shrimp Trawl Fishery Review. Archipelago Marine Research Ltd. (Annually since 1997 – phone to request a copy 250-338-4535).

Troffe, P. M., S. Ong, C. D. Levings and T. F. Sutherland. 2003. Anatomical Damage to Humpback Shrimp, *Pandalus Hypsinotus* (Brandt 1851) Caught by Trawling and Trapping. J. Shellfish Res. Vol. 22(2) 561-568.

Walters, Carl J., Villy Christensen, Steven J. Martell and James F. Kitchell. 2005. Possible ecosystem impacts of applying MSY policies from single-species assessment. ICES Journal of Marine Science: Journal du Conseil 2005 62(3):558-568.

13. GLOSSARY

Acronyms

BRD	Bycatch Reduction Device
CSAP	Centre for Scientific Advice – Pacific (formerly PSARC)
DFO	Department of Fisheries and Oceans
EAL	Eulachon Action Level
EEZ	Exclusive Economic Zone
FSC	Food, Social and Ceremonial
IFMP	Integrated Fishery Management Plan
JPA	Joint Project Agreement
LRP	Limit Reference Point (40% of $\ln(\text{avg})\text{biomass}$)
MSC	Marine Stewardship Council
PICFI	Pacific Integrated Commercial Fisheries Initiative
PSARC	Pacific Scientific Advise Review Committee
SMA	Shrimp Management Area
STSC	Shrimp Trawl Sectoral Committee
TAC	Total Allowable Catch
USR	Upper Stock Reference (80% of $\ln(\text{avg})\text{biomass}$)
WCVI	West Coast Vancouver Island

Aquaculture	The process of spawning animals and rearing the progeny to marketable size, usually involving some level of intervention (e.g. feeding, predator protection) by the aquaculturist.
Area	A division of Canadian fisheries waters as described in Schedule II of the <i>Pacific Management Area Regulations</i> , maps are available on the Pacific Region internet at: https://www.pac.dfo-mpo.gc.ca/fm-gp/maps-cartes/areas-secteurs/index-eng.html
beam trawl	A type of trawl net in which the mouth of the net is held open by a “beam” or “pole.” The beam is held horizontal across the mouth of the net while under tow.
BRD	Bycatch reduction device (rigid grate, fish eye, fish excluder, escape holes, or other device in a trawl net to permit non-target, incidental or unintentional catch to escape the net and not be brought on board the vessel.
Bycatch	Incidental or unintentional catch of non-target stocks or species.
catch ceiling	A total allowable catch defined from a pre-season biomass forecast, or survey biomass index and harvest rate of 0 percent to 35 percent, or defined by an arbitrary precautionary quota set as a 10 th or 25 th percentile of landings history (up to 1997).

communal licence	Issued to First Nations organizations pursuant to the <i>Aboriginal Communal Fishing Licences Regulations</i> to carry on fishing and related activities.
Communal Commercial Licence	Issued to First Nations organizations pursuant to the <i>Aboriginal Communal Fishing Licences Regulations</i> for participation in the general commercial fishery. Licences issued are equivalent to the capacity of licences that have been retired under the Aboriginal Fisheries Strategy (AFS) Allocation Transfer Program (ATP).
CSAS - CSAP	Canadian Science Advisory Secretariat (formerly called the Pacific Scientific Advice Review Committee (PSARC); the authority for the regional Centre for Science Advice Pacific (CSAP).
exclusion grate or excluder	A grate that when inserted properly into a trawl net reduces the amount of non-target species in the catch (one form of BRD).
excluder net	A second trawl net that when attached properly inside a trawl net reduces the amount of non-target species in the catch. No longer allowed as the only bycatch reduction device.
fishing hail	Notification prior to commencement of fishing.
fishing trip	That period when the vessel departs from a dock to engage in fishing until fishing ceases and shrimp are offloaded.
fixed exploitation rate	The exploitation rate is the proportion of the fishable population that is taken as catch. With a fixed rate, the harvestable quota varies with the population size.
harvested	Referring to fish, including shrimp, caught by any means.

Indigenous knowledge	<p>There is no universal definition of Indigenous knowledge, and the composition of Indigenous knowledge is for Indigenous peoples to determine. Indigenous knowledge is intricately tied to Indigenous worldviews and ways of life, rather than knowledge in a western sense.</p> <p>The term Indigenous knowledge may not be universally used, and other terms such as Indigenous Knowledge Systems, Traditional Knowledge, Traditional Ecological Knowledge, or Aboriginal Traditional Knowledge, which all convey similar concepts, may be used instead. When working with Inuit, the term Inuit Qaujimajatuqangit (IQ) is more likely to be used than Indigenous knowledge. Similarly, when working with Métis knowledge holders, the term Métis Traditional Knowledge is more likely to be used than Indigenous knowledge. The term Indigenous knowledge is used throughout this document in line with the terminology in the <i>Fisheries Act</i>.</p>
Invertebrate	An animal without a backbone.
landed or landing	The transfer of catch from a licensed vessel to land (including docks and wharves).
landing hail	Notification prior to landing or offloading catch at the end of a fishing trip.
offloaded	The landing or removal of catch from the licensed vessel.
observer	An individual who has been designated as an observer by the Regional Director General for Pacific Region pursuant to Section 39 of the <i>Fishery (General) Regulations</i> .
otter trawl	A type of trawl net in which the mouth of the net is held open and towed by means of boards of wood and/or metal (“otter” boards or “doors”).
PICFI	Pacific Integrated Commercial Fisheries Initiative - DFO’s PICFI is an initiative aimed at achieving environmentally sustainable and economically viable commercial fisheries, where conservation is the first priority and First Nations’ aspirations to be more involved are supported.
PSARC	Pacific Scientific Advice Review Committee (now CSAP)
Quota	For the purposes of the Shrimp Trawl fishery, an annual quota refers to the total allowable catch determined from a biomass survey or other stock assessment information, and harvest rates of zero percent to 35 percent of the survey biomass.

selective fishing	The ability to avoid known, non-target species and stocks or, if encountered, to release them alive and unharmed.
selectivity device	A general term that refers to a device that when added to a trawl net will reduce the amount of non-target species in the catch. Also called BRD.
Shrimp Management Area (SMA)	The area of a management unit in the Shrimp Trawl fishery, based on location of fishing grounds and shrimp stocks. Maps of SMAs are in Appendix 9.
Shrimp Trawl Fishing Log (logbook)	A record of fishing activity, catch, effort, and gear.
Southern Inside Waters	Shrimp Management Areas 12IN, 14, 16, 17, 18, 19, GSTE, FR, and 23IN, differentiated from other areas to allow a split in the quota for two openings, ensuring some fishing opportunity in November.
stock assessment	Analyses of fisheries and research data used to estimate stock abundance and health or evaluate the effects of fishing on a stock or population and predict the reactions of populations to alternative management choices.
Stock	A biologically discrete population.
Subarea	A division of Canadian fisheries waters as described in Schedule II of the <i>Pacific Management Area Regulations</i> , maps are available on the Pacific Region internet at: http://www.pac.dfo-mpo.gc.ca/fm-gp/maps-cartes/areas-secteurs/index-eng.html
tonne (t)	Metric tonne, which is 1,000 kg or 2,204.6 lbs.
trawl net	Any bag-type net that is dragged in the water by a vessel for the purpose of catching fish, (under the <i>Fisheries Act</i> and <i>Regulations</i> , “fish” includes shellfish).
verification	Verification of any or all of the following activities: estimating, weighing, sampling all species, inspection of fishing records, and/or interviewing the vessel master.
WCVI	West Coast of Vancouver Island (generally includes Areas 21, 121, 123 to 127 and Subareas 23-7 to 23-11, but may be less depending on the area surveyed and used to estimate biomass).

14. INTERNET SITES

Pacific Region Shrimp web page (and links to Shrimp Trawl fishing information):

<http://www.pac.dfo-mpo.gc.ca/fm-gp/commercial/shellfish-mollusques/shrimp-pcrevette/index-eng.html>

Acts, Regulations, and Pacific Fishery Management Area Definitions:

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

Infectious Diseases of Shrimp:

<http://www.dfo-mpo.gc.ca/science/aah-saa/diseases-maladies/index-eng.html>

CSAP (e.g., shrimp stock status reports):

<http://www.isdm-gdsi.gc.ca/csas-sccs/applications/Publications/index-eng.asp>

http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2011/2011_085-eng.html

Openings and Closures (from Commercial Fisheries Notices):

https://www-ops2.pac.dfo-mpo.gc.ca/fns-sap/index-eng.cfm?pg=fishery_search&ID=all

APPENDIX 1: 2022/23 SHRIMP TRAWL COMMERCIAL HARVEST PLAN

1. MANAGEMENT CHANGES AND HIGHLIGHTS FOR 2022/2023	4
1.1. Changes to Sponge Reef Fishery Closures	4
1.2. Mandatory Use of LED Lights	4
1.3. SMAs Requiring New Biomass Survey Prior to Openings	4
1.4. Eulachon Action Level for West Coast Vancouver Island (WCVI).....	4
1.5. Individual Vessel Eulachon Bycatch Limit	4
1.6. Individual Vessel Eulachon Bycatch Limit Overage Adjustment	4
1.7. At-Sea Observer Coverage	5
1.8. Pre-notification Period Prior to Openings for SMA 23IN and 23OFF&21OFF	5
1.9. Limiting Fishing Hails for SMA 23IN and 23OFF&21OFF if Observer Coverage Not Achieved.....	5
1.10. Skeena River Estuary Area Seasonal Closure	5
1.11. Dockside Validation Program for SMA 124OFF and 125OFF	5
1.12. Marine Mammal Reporting Continues	5
1.13. Industry Funded Biomass Surveys.....	6
1.14. Bycatch Reduction Grate Spacing within PFMA 23-7	6
1.15. Licence Holder Association Stewardship Proposal	6
2. MANAGEMENT MEASURES.....	6
2.1. Species	6
2.2. Gear.....	7
2.2.1. Net Requirements:	7
2.2.2. Mandatory Use of LED Lights:	7
2.3. Fishing Season	7
2.3.1. Regular Fishing Season Coast-wide	8
2.3.2. Early Openings	8
2.3.3. Southern Inside Waters - Two Openings.....	8
2.3.4. Special Management Areas	9
2.4. Setting Catch Ceilings.....	10
2.4.1. Provisional Reference Points.....	11
2.4.2. Harvest Control Rules	12
2.4.3. Initial Catch Ceilings	12
2.4.4. Adjustment of Catch Ceilings after Survey	14
2.4.5. Catch Ceiling Reached	14
3. BYCATCH AND DISCARDS	15
3.1. Eulachon Bycatch Action Levels.....	15
3.1.1. Eulachon Action Levels Reached.....	16

3.2.	Prawn	16
3.3.	Squid	17
3.4.	Octopus	17
3.5.	Marine Mammal Interactions Reporting Requirements	17
3.6.	Pre-Notification Period Prior to Openings for SMA 23IN and 23OFF&21OFF...	18
3.7.	Limiting Fishing Hails for 23IN and 23OFF&21OFF if Observer Coverage Not Achieved.....	18
3.8.	Humpback and Coonstripe Shrimp	18
4.	CLOSURES.....	18
4.1.	Shrimp Management Area Closure Status.....	18
4.1.1.	Shrimp Information Line	19
4.1.2.	Fishery Notices	19
4.1.3.	Canadian Coast Guard Announcements	19
4.2.	Rockfish Conservation Areas and Glass Sponge Reef Closures	19
4.3.	Closures by Pacific Fisheries Management Area/Subarea	20
4.3.1.	Area 1	20
4.3.2.	Areas 101 and 142	20
4.3.3.	Areas 105 to 107, 110.....	20
4.3.4.	Area 2	20
4.3.5.	Area 3	21
4.3.6.	Area 4	21
4.3.7.	Area 9	22
4.3.8.	Area 13	22
4.3.9.	Area 14	22
4.3.10.	Area 16	22
4.3.11.	Area 17	22
4.3.12.	Area 18	23
4.3.13.	Area 19	24
4.3.14.	Area 20 & 121	24
4.3.15.	Area 23	24
4.3.16.	Area 24	25
4.3.17.	Area 25	25
4.3.18.	Areas 27 and 127	25
4.3.19.	Area 28	25
4.3.20.	Area 29	26

5. LICENSING	26
5.1. Licence Category	26
5.2. Licence Renewal Fees	27
5.3. Licence Issuance	27
5.4. Fishery Monitoring Services to Fish Shrimp	28
5.5. Vessel Replacement	28
5.6. Schedule II Species	28
5.7. Conditions of Licence to Transport Fish	29
5.8. Fisher Identification Number (FIN)	29
6. CONTROL AND MONITORING OF COMMERCIAL FISHING ACTIVITIES	29
6.1. Notification Procedures	29
6.1.1. Notification Prior to Commencement of a Fishing Trip	29
6.1.2. Notification of a Change in Fishing Area	30
6.1.3. For Fishing Trips Longer Than Seven Days	31
6.1.4. Notification Prior to Landing Catch	31
6.1.5. Cancellation of a Fishing Hail Number	31
6.1.6. Marine Mammal Reporting	32
6.1.7. New Licence Condition for Reporting Lost Fishing Gear	32
6.2. Dockside Validation for All Shrimp Harvested in SMAs 124OFF and 125OFF	32
6.3. Dockside Observations for Catch Verification	32
6.4. Assistance to Observers	33
6.5. Catch Sampling Program	33
6.5.1. Selection of Vessels for Catch Sampling Program	34
6.5.2. Shrimp Samples for Biological Sampling	34
6.6. Individual Vessel Eulachon Bycatch Limit	34
6.7. Shrimp Trawl Harvest Logbook Data	35
6.7.1. Gear Questionnaire	36
6.7.2. Submission and Release of Logbook Data	36
6.7.3. Nil Report for Logbook - Licence Issued but not Fished	36
6.7.4. Confidentiality of Data	36
6.8. Fish Slips	37
6.9. Customs Requirements When Fishing Offshore	37
6.10. Processing Requirements Prior to Export	37
7. SELECTIVE FISHING PRACTICES	38
7.1. LED Lights	38
7.2. Selectivity Devices	38
7.3. Experimenting with Selectivity Devices	39
7.4. Future Standards for Selectivity Devices	40
7.5. Selective Fishing Practices	40
8. GENERAL INFORMATION	41

1. MANAGEMENT CHANGES AND HIGHLIGHTS FOR 2022/2023

1.1. Changes to Sponge Reef Fishery Closures

The listing of individual Strait of Georgia and Howe Sound Sponge Reef commercial closure descriptions have been removed from the closure section of the commercial harvest plan and replaced with a web link containing official closure description boundaries as well as updated reference maps. The following link contains the closure information regarding all of the Sponge Reef Closures within the Strait of Georgia and Howe Sound:

<https://www.dfo-mpo.gc.ca/oceans/ceccsr-cerceef/closures-fermetures-eng.html>

1.2. Mandatory Use of LED Lights

Vessels fishing for shrimp by trawl must use footrope lighting devices (LEDs) on their trawl nets in all shrimp trawl management areas of the coast. LED spacing has been updated for 2022/23. See Section 2.2.

1.3. SMAs Requiring New Biomass Survey Prior to Openings

New shrimp trawl biomass surveys will be required within SMAs 14, PRD, Fraser River (FR), GSTE, 16, 18, 19, 124OFF, and 125OFF indicating that a commercial catch ceiling can be supported prior to the Department opening these SMAs.

1.4. Eulachon Action Level for West Coast Vancouver Island (WCVI)

The Eulachon Action Level (EAL) for the WCVI remains set at 4 tonnes (t). The WCVI EAL is further divided into two (2) portions, with an EAL of 2 t set for SMAs 124OFF and 125OFF combined, and 2 t set for SMAs 230FF&210FF and 23IN combined. See Section 3.1.

1.5. Individual Vessel Eulachon Bycatch Limit

An individual vessel Eulachon bycatch limit pilot program for SMAs 124OFF and 125OFF will be in place for the 2022/23 season. A maximum of 250 lb. of Eulachon bycatch will be authorized under this pilot program for each 'S' and 'FS' vessel fishing within SMAs 124OFF and 125OFF during the licence year. Each vessel's eulachon bycatch will be monitored by an independent at-sea observer for 100% of fishing effort.

1.6. Individual Vessel Eulachon Bycatch Limit Overage Adjustment

An individual vessel Eulachon bycatch overage adjustment provision for SMAs 124OFF and 125OFF will be in place for the 2022/23 licence year. Individual vessels fishing within SMAs 124OFF and 125OFF that exceed their individual vessel Eulachon bycatch limit for the 2022/23 season will have the overage amount deducted from their 2023/24 individual vessel bycatch limit. SMAs 124OFF and 125OFF will close effective 23:59 hours on February 28, 2023 even if these SMAs have remaining shrimp catch ceiling available. This closure is to allow the Department time prior to licence renewal to calculate any individual vessel Eulachon overages, and prepare unique individual vessel licence conditions for the following season.

1.7. At-Sea Observer Coverage

At-Sea Observer coverage will be required on all fishing trips for SMA 124OFF and 125OFF during the 2022/23 season (100% observer coverage). Within SMAs 23OFF&21OFF and 23IN coverage will be required at a rate of 25% of each vessels fishing days in these areas during the season.

An additional 20 at-sea observer days will be required to be funded and arranged by licence holders for deployment of observers in other SMAs on the coast during the fishing year.

Data and bycatch summaries and trip reports from all observations made by the at-sea observers on each fishing trip must be delivered to the Department within five (5) days following the completion of the fishing trip for the vessel.

1.8. Pre-notification Period Prior to Openings for SMA 23IN and 23OFF&21OFF

In order to allow time for the Service Provider to better organize and facilitate arrangements for At-Sea Observers within SMAs 23IN and 23OFF&21OFF a pre-notification period prior to these SMAs openings may be implemented once DFO decides whether harvest opportunities will be available, and a catch ceiling is set. DFO may announce a potential opening date with a couple weeks advance notice in order to help ensure At-Sea Observers will be available for the opening. See Section 3.6.

1.9. Limiting Fishing Hails for SMA 23IN and 23OFF&21OFF if Observer Coverage Not Achieved

In the event that the at-sea observer coverage rate objective is not being achieved within SMA 23IN and 23OFF&21OFF and sufficient observers are not available for the fishery, the Department may instruct the Service Provider to withhold all new hails to the fishery in order to ensure that observer coverage rates can be achieved. In the event that observers cannot be provided within the foreseeable future, DFO may implement an in-season closure for SMA 23IN and 23OFF&21OFF until such time as observers become available to the fishery. See Section 3.7.

1.10. Skeena River Estuary Area Seasonal Closure

A seasonal closure in Pacific Fisheries Management Area 4-12 and 4-15. Those waters that include Area 4-15 and that portion of Area 4-12 in that lies south of a boundary formed by two submarine cables that cross Inverness Passage about 0.8 miles South East of Hicks Point, and then beginning 2 miles north of Hazel Point on Smith island and following the line of the two submarine cables that cross Marcus Passage and Malacca Passage, to the North end of Lawyer Island and the Ashore to Porcher Island one mile south of Hunter Point, will be closed February 15th, 2023 to March 31st, 2023 to help avoid the risk of interactions with Eulachon returning to spawn.

1.11. Dockside Validation Program for SMA 124OFF and 125OFF

A mandatory Dockside Validation Monitoring pilot program for all shrimp harvested within SMAs 124OFF and 125OFF will be in effect for the 2022/23 season.

1.12. Marine Mammal Reporting Continues

Reporting of all interactions with marine mammals, including collision and entanglement with fishing gear, is mandatory during all commercial fishing trips Marine Mammal Incident Reporting

Hotline at 1-800-465-4336 or VHF Channel 16. For more information, please visit: <https://www.dfo-mpo.gc.ca/species-especes/mammals-mammiferes/report-rapport/page01-eng.html>.

1.13. Industry Funded Biomass Surveys

The Department is interested in continuing collaborative opportunities with the industry associations to conduct industry funded biomass surveys in an effort to expand possible fishing opportunities for the fleet. Future planning for this work is expected to continue through the survey subcommittee, and DFO would encourage licence holders to engage with their sectoral committee representative to provide advice and recommendations on this issue.

1.14. Bycatch Reduction Grate Spacing within PFMA 23-7

The maximum bycatch reduction grate spacing for PFMA 23-7 has been adjusted to 31.75 mm. See Section 2.2.1.

1.15. Licence Holder Association Stewardship Proposal

The BC Shrimp Trawlers Association is in the process of drafting proposals for possible future stock assessment and management changes to the shrimp trawl commercial fishery. Some of the preliminary ideas being discussed include: Area Licencing options; vessel monitoring programs; increased stock assessment programs with industry vessel involvement; and requests to the current management framework. These proposals are still in early stages. DFO has agreed to continue discussions with licence holder representatives on these topics for possible consideration in future IFMPs. In the case of proposed changes to the Stock Assessment protocol, a DFO CSAS (peer-reviewed) process will take place before the suggested changes become formal Science Advice.

2. MANAGEMENT MEASURES

2.1. Species

The following shrimp species may be retained:

- a.) Northern (spiny) Pink Shrimp (*Pandalus borealis*)
- b.) Pink (smooth or ocean) Shrimp (*Pandalus jordani*)
- c.) Flexed Shrimp (*Pandalus goniurus*)
- d.) Sidestripe Shrimp (*Pandalopsis dispar*)
- e.) Coonstripe (dock) Shrimp (*Pandalus danae*)
- f.) Humpback Shrimp (*Pandalus hypsinotus*)

Prawn (*Pandalus platyceros*), squid, and octopus caught incidentally while fishing for the above species may be retained subject to the quantity and other restrictions as defined in conditions of licence.

For proper identification and reporting of catch by species, illustrations of the common commercial shrimp species are attached to this plan (see Appendix 5: Identification of Commercial Shrimp Species) and included as a colour plate in the Shrimp Trawl Harvest Logbook.

Unless the retention of an incidental catch is expressly authorized by the licence, under Section 33 of the *Fishery (General) Regulations*, every person who catches a fish incidentally (including shellfish) shall forthwith return it to the place from which it was taken; and in a manner that causes it the least harm.

The non-retention of any incidentally caught finfish when shrimp trawling includes Schedule II species (those species listed in Part 2 of the shrimp trawl licence and in Schedule II - Part II of the *Pacific Fishery Regulations*) as trawl gear is not permissible for the harvest of these species.

Fish harvesters are reminded that where a vessel holds a shrimp trawl licence eligibility and a Prawn and shrimp by trap licence eligibility, all shrimp including Prawns caught under the authority of the Prawn and shrimp by trap licence must be offloaded prior to the vessel fishing under the authority of the shrimp trawl licence.

2.2. Gear

2.2.1. Net Requirements:

Trawl nets for fishing shrimp are either beam trawls (net held open by a neutrally buoyant beam) or otter trawl (net held open with doors). The trawl net must be modified to reduce bycatch of species other than shrimp with the insertion of a rigid grid or grate along with an escape hole. The bycatch reduction grid (e.g. aluminium, PVC) must be inserted into the forward end of the cod end of the trawl net at an angle so that it entirely blocks access to the cod end, except for the spaces between the bars. For 2022/23 the spacing between the bars of the grate must be no greater than 19 mm when fishing within Pacific Fisheries Management Areas 21, 121, 23-8 to 23-11, 123, 124, 125, and 127. Within all other SMAs the bars of the grate must be no greater than 31.75 mm apart (new for 2022/23 – also applies to Subarea 23-7). The netting directly above the grid must have an opening (escape hole) and the sides of the opening must be reinforced so that the opening remains unobstructed and maintains its shape while the net is being towed through the water.

In addition to the gear modification described above, the top (hood or upper belly) of an otter trawl net shall be comprised of a minimum 4.4 square metre (48 square foot) panel of plastic lattice with minimum 4 cm square openings, such as is found in snow-fencing (note that the STSC recommends that more than 48 square feet be installed).

2.2.2. Mandatory Use of LED Lights:

The vessel master shall ensure that vessels fishing for shrimp by trawl use footrope lighting devices (LEDs) on their trawl nets in all shrimp trawl management areas of the coast. At all times when the trawl net is in the water;

- (a) the lighting devices must be operational;
- (b) lighting devices are emitting a light;
- (c) lighting devices are securely attached within 6 inches (15.24 cm) of the forward leading edge of the bottom panel of trawl netting; and
- (d) each trawl net has a minimum of five (5) lighting devices spaced along the central portion of the net (updated for the 2022/23 IFMP).

2.3. Fishing Season

This section identifies the general rules for determining the fishing season in any given year. Table 2 identifies the status of each SMA for the 2022/23 season.

2.3.1. Regular Fishing Season Coast-wide

The shrimp by trawl commercial fishery is scheduled to open in some SMAs at 00:01 hours, June 1 and West Coast Vancouver Island SMAs (23OFF&21OFF and 23IN) on May 15 with the exceptions noted in Section 2.3.2. or SMAs without catch ceilings assigned in Table 2. Seasonal and permanent closures are in effect; see Section 4.3. SMAs will generally remain open until March 31, but may close earlier if the catch ceiling for a given species in an SMA is reached. SMAs 124OFF and 125OFF will close 23:59 hours on February 28, 2023 regardless of remaining shrimp catch ceiling available. This early closure in SMA 124OFF and 125OFF is required to allow for the administration of the new individual vessel Eulachon bycatch overage provisions.

All openings referred to in this plan are tentative until confirmed by issuance of a Variation Order accompanied by a Fishery Notice. When an area is open, any vessel with a valid S or FS licence and conditions to fish shrimp is allowed to fish the area provided they are adhering to all licence conditions and reporting requirements.

Other portions of the coast may be opened in-season following industry funded biomass surveys following the required DFO science survey protocol during the 2022/23 season, with new harvest areas opening in-season, or catch ceiling adjustments to existing SMAs resulting from these surveys.

2.3.2. Early Openings

Early openings in select areas have been permitted when shrimp biomass in the previous year was large, when 30% of the catch ceiling remained on March 15, and when there was a minimum of 3,000 lb of catch ceiling. Fish harvesters are requested to submit logbook information earlier than is outlined in the conditions of the shrimp trawl licence to assist in the evaluation of fishing opportunities.

For the 2022/23 fishing season no early openings are currently expected.

2.3.3. Southern Inside Waters - Two Openings

The most frequently fished areas in the south coast often have sufficient effort to reach the annual catch ceilings. Shrimp harvesters have asked for two openings so that some of the annual catch ceiling is reserved for the period starting November 15th when market demand is peaking and the highest value is obtained at dockside sales. Based on the recommendation from the STSC, the Southern Inside Waters (12IN, GSTE, 14, 16, 17, 18, 19, FR, and 23IN) generally will have two openings:

1. June 1 for 75% of the initial catch ceiling.
2. November 15 for the remainder of the annual catch ceiling.

The initial annual catch ceilings for these areas are provided in Table 2. An SMA will close upon attaining 75% of the annual catch ceiling for any one species. Landings from the first opening that exceed, or are short of, the early catch ceiling will be applied to the final opening.

In-season adjustments to catch ceilings may result from in-season biomass estimates and will be applied at the time the biomass estimates become available.

2.3.4. Special Management Areas

There are areas that are not regularly open to fishing shrimp by trawl as a result of management considerations (bycatch levels have been high in the past or observer coverage is required). These areas may be open to specific vessels by variation order or amended conditions of licence once all aspects of fishing activity and required management measures are satisfied.

2.3.4.1. Shrimp Management Area QCSND (Queen Charlotte Sound)

SMA QCSND is currently closed and includes Pacific Fisheries Management Areas 107, 108, 109, 110, 111, 130, and Subareas 7-1, 7-25, 7-26, 7-31, 8-1, 10-1, 10-2, 11-1 and 11-2. SMA QCSND was designated a special management area in 2000 because of concerns for Eulachon stocks in central coast rivers. The Department is currently reviewing Eulachon for consideration of listing under the *Species at Risk Act* (SARA). Given the current SARA process and consultations the Department will not be considering any commercial harvest opportunities in QCSND during the 2022/23 season. For further information, contact the North Coast Fisheries Manager (see Appendix 3: Departmental and Industry Contacts).

2.3.4.2. Shrimp Management Area 2IN

For SMA 2IN, vessel operators wishing to fish in this area are required to obtain amended Conditions of Licence prior to commencement of fishing. Sampling coverage in this remote area has been proven to be cost prohibitive to the catch sampling program. Commencing in 2001, and continuing for the current season, costs for observer coverage in this area will be the responsibility of the individual vessel master. Amended Conditions of Licence are issued subject to fulfilling application requirements, including the vessel master securing arrangements for certified shrimp fishery observer coverage and having up-to-date and complete Shrimp Trawl Harvest Logbooks. Proposals will be considered from groups of fish harvesters that arrange collectively for adequate observer coverage. Arrangements for amended Conditions of Licence can be made with the North Coast Fisheries Manager.

2.3.4.3. Skeena River Area – PFMA 4-12 and 4-15

Skeena River Estuary Area Seasonal Closure (Seasonal Closure) This seasonal closure is implemented in Pacific Fisheries Management Subareas 4-12 and 4-15. Those waters that include Subarea 4-15 and that portion of Subarea 4-12 that lies south of a boundary formed by two submarine cables that cross Inverness Passage about 0.8 miles South East of Hicks Point, and then beginning 2 miles north of Hazel Point on Smith island and following the line of the two submarine cables that cross Marcus Passage and Malacca Passage, to the North end of Lawyer Island and the shore to Porcher Island 1.6 km (one mile) south of Hunter Point, will be closed February 15th to March 31st to help avoid the risk of interactions with Eulachon returning to spawn.

2.3.4.4. Shrimp Management Area 27OFF

SMA 27OFF may open upon request from a vessel master subject to the vessel master securing arrangements for a certified shrimp fishery observer for the first fishing trip to these areas. Contact the South Coast Fisheries Manager to request an opening.

2.3.4.5. Shrimp Management Area 9IN

SMA 9IN (Pacific Fishery Management Areas 9-1 to 9-12), will open with the coast-wide opening for shrimp trawl, and will remain open until December 31 or until the annual catch ceiling is attained. If annual catch ceiling remains available after January 1 in the new year then subareas 9-1 and 9-12 will remain open. Pacific Fishery Management Subareas 9-2 to 9-11 may reopen during the period of January to March upon request subject to the vessel master securing arrangements for a certified shrimp fishery at-observer for the first fishing trip to this area. A limited number of observer days will be available from the industry-funded catch monitoring program. It will be the responsibility of the vessel master to secure arrangements for observer coverage before the area is opened. PFMA 9-1 and 9-12 will not automatically require at-sea observer coverage on the first trip. Contact the North Coast Fisheries Manager to request an opening.

2.4. Setting Catch Ceilings

In keeping with Fisheries and Oceans Canada mandate on conservation and risk-averse management, catch ceilings have been implemented for SMAs (see Appendix 9: Maps of Shrimp Management Areas). Catch ceilings are in effect for the period April 1, 2022 to March 31, 2023, with areas closing on achieving the catch ceiling for any species.

Catch ceilings are defined for most of B.C.'s main shrimp stocks using provisional reference points linked to indices of stock biomass estimated from fishery independent area-swept trawl surveys. Catch ceilings are defined using harvest rates following the Provisional Harvest Control Rules (HCR) compliant with the Precautionary Approach. The HCR adjust the harvest rate to a proportion of the biomass depending on the stock status (Healthy, Cautious or Critical Zone) for each major target species.

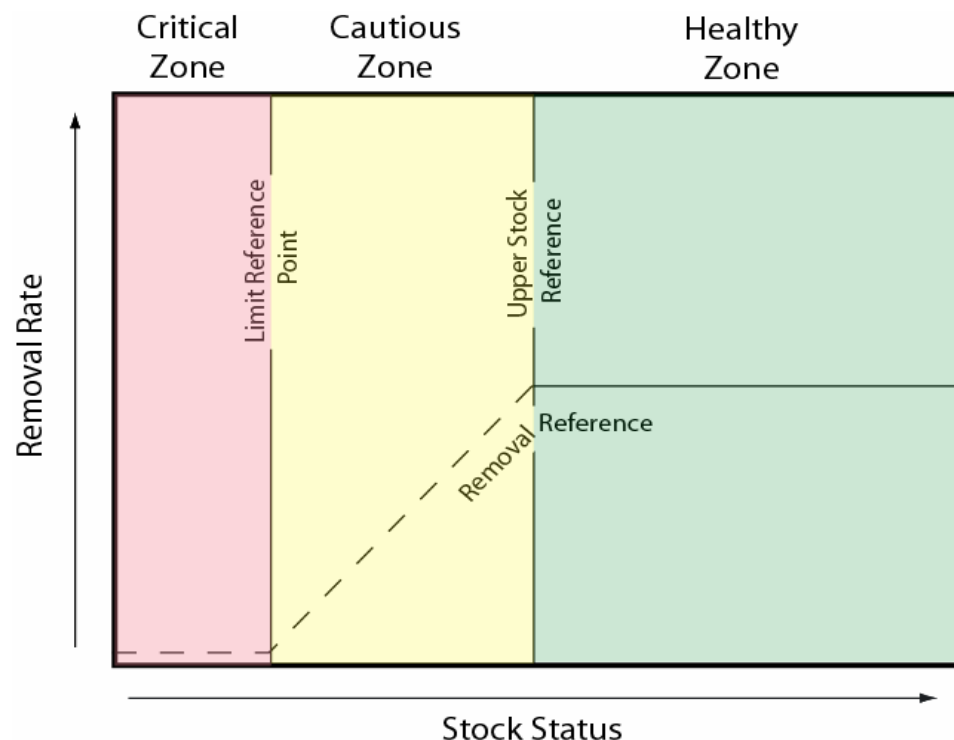


Figure 1: Adjustments to Removal Rate (harvest rate) when Stock Status is in Critical Zone (zero), Cautious Zone (0 to 35%) or Healthy Zone (35%). Healthy and Cautious Zone is delineated by Upper stock reference point. Cautious and Critical Zone delineated by Limit Reference Point.

2.4.1. Provisional Reference Points

Provisional Precautionary Approach reference points have been established for many west coast shrimp stocks (Table 1, DFO 2009) in relation to the biomass of maximum sustainable yield (Bmsy). For west coast shrimp stocks strong stock recruit relationships are not evident; therefore, a proxy for Bmsy, the natural log of the average biomass, is used (Bprox).

The default formulas used for the limit reference point (LRP) and upper stock reference (USR) are:

Proxy for the Biomass of maximum sustainable yield (B_{prox}) = \ln (average Biomass)

LRP = 40% B_{prox}

USR = 80% B_{prox}

Table 1: Summary of B_{prox} (tonnes), limit reference point (LRP) and upper stock reference (USR) points for Sidesripe Shrimp (*Pandalopsis dispar*), Spiny Pink Shrimp (*Pandalus borealis*) and Smooth Pink Shrimp (*P. jordani*) by SMA.

SMA	Species	B_{prox} (tonnes)	LRP (40%)	USR (80%)
PRD	Sidesripe	587.4	235.0	469.9
	Pinks ¹	977.6	391.0	782.1
9IN	Sidesripe	66.5	26.6	53.2
	Smooth pink	115.0	46.0	92.0
QCSND	Sidesripe	191.5	76.6	153.2
	Smooth pink	3006.7	1202.7	2405.4
12IN	Sidesripe	68.9	27.6	55.1
	Spiny pink	191.4	76.6	153.1
14	Sidesripe	69.8	27.9	55.9
	Smooth pink	313.3	125.3	250.6
GSTe	Sidesripe	78.6	31.4	62.9
	Smooth pink	367.9	147.2	294.3
16	Sidesripe	27.3	10.9	21.8
	Pinks ¹	114.8	45.9	91.9
FR	Sidesripe	171.0	68.4	136.8
	Pinks ¹	222.6	89.0	178.1
18	Sidesripe	23.7	9.5	19.0
	Spiny pink	94.7	37.9	75.7
19	Sidesripe	10.5	4.2	8.4
	Spiny pink	75.6	30.2	60.5
23IN	Sidesripe	35.1	14.0	28.1
	Smooth pink	330.2	132.1	264.1
121OFF+123OFF	Smooth pink	1796.8	718.7	1437.4
124OFF+125OFF	Smooth pink	2928.7	1171.5	2342.9

¹ Mixed pink shrimp species (*P. borealis* + *P. jordani*)

SMA 23IN and 23OFF&21OFF are no longer surveyed separately and a combined biomass is defined following the survey. Reference points have not been defined for the combined area. The combined biomass is divided in proportion to the previously defined Bprox estimates, and used to define the biomass for setting catch ceilings for SMA 23IN and 23OFF&21OFF.

2.4.2. Harvest Control Rules

For SMAs with annual surveys the harvest rates are determined from survey biomass estimates using the following decision rules, compliant with the Precautionary Approach:

- If estimated shrimp biomass (either forecasts or derived from survey information) are in the Critical Zone (i.e., below the LRP), the harvest rate is zero (i.e., the SMA will not open for fishing, or it will close for the remainder of the season). The area will not re-open until a stock assessment is completed.
- If estimated shrimp biomass is in the Cautious Zone (i.e., above the LRP but below the USR), harvest rate (HR) will vary between 0% and 35% based on the formula:

$$HR = 35\% * ((\text{Biomass} - 40\% B_{msy}) / (80\% B_{msy} - 40\% B_{msy}))$$

- If estimated shrimp biomass is in the Healthy Zone (i.e., above the USR), the harvest rate is 35%.
- When an area is surveyed and sufficient information is obtained to estimate a biomass for a species, but there is not sufficient history to define LRP or USR, a catch ceiling is defined from the survey biomass and a harvest rate of 33%. This harvest rate is derived from a Gulland model at a level of 0.3M.

2.4.3. Initial Catch Ceilings

Using the HCRs identified in section 2.4.2, at the beginning of the season a catch ceiling is allocated for each SMA on the coast. These Initial Catch Ceilings are identified in Table 2.

For the management areas with continued surveys a five year running average (5YRA) model is used to forecast biomass by species and SMA. Harvest rates are set according to the Precautionary Approach and an initial catch ceiling is defined. This initial catch ceiling is adjusted when shrimp biomass estimates are available following the shrimp surveys in-season. SMAs with no survey history have arbitrary catch ceilings defined from 10th or 25th percentile of the pre-1997 catch history – generally 10 t (22,050 lb) and offshore areas 25 t (55,120 lb). These areas accounted for approximately 25% of the 2018 coast-wide TAC. Forecast biomass estimates cannot be calculated using the five year running model for SMAs with some survey history but were not surveyed in the previous year. These SMAs may have initial catch ceilings set using the lowest biomass estimated as a result of surveys in the last five years, but will be recalculated in-season if a new biomass survey is conducted during the year.

Initial catch ceilings in 2022/23 may be adjusted in-season based on any new survey data and stock assessment information collected during the season. Surveys may include either DFO conducted assessments, or industry funded biomass survey assessments following the established DFO survey protocol. New harvest areas or portions of the coast may be opened for commercial harvest in-season following industry funded biomass surveys.

Table 2: Initial Catch Ceilings for 2022/2023. All species combined unless noted.

SMA	Areas and Subareas	Initial Catch Ceiling		Notes
		(lb)	(t)	
PRD	3-1 to 3-4, 103, 4-1 to 4-15, 104, 5-1, 5-2 and 5-23	Closed	Closed	Opening dependent upon in-season survey results.
DXE	1 and 101	22,050	10	
QCI	102 and 142	55,120	25	
2IN	2	22,050	10	Amended Conditions of Licence and observer required.
3IN	3-5 to 3-18	28,660 pink 31,526 sidestripe	13 pink 14 sidestripe	
5IN	5-3 to 5-10, 5-12 to 5-19, 5-21 and 5-24	22,050	10	
5OFF	5-11, 5-20, 5-22, 105	22,050	10	
6IN	6-1 to 6-8, 6-10 to 6-12, 6-14 to 6-16, 6-18 to 6-28	22,050	10	
6OFF	6-9, 6-13, 6-17 and 106	55,120	25	
7IN	7-2 to 7-24, 7-27 to 7-30 and 7-32	22,050	10	
8IN	8-2 to 8-16	22,050	10	
9IN	9-1 to 9-12	56,879 pink 36,376 sidestripe	25.8 pink 16.5 sidestripe	In-season survey may adjust catch ceiling, Contact the North Coast Fisheries Manager to request an opening of 9-2 to 9-11 after Dec 31 st .
10IN	10-3 to 10-12	22,050	10	
11IN	11-3 to 11-10	22,050	10	
12OUT	12-1 to 12-21, 12-24, and 12-25	8,818 pink 17,637 sidestripe	4 pink 8 sidestripe	
12IN	12-22, 12-23, 12-26 to 12-48	27,558 humpback 488,098 pink 45,856 sidestripe	12.5 humpback 221.4 pink 20.8 sidestripe	
GSTE	13 and 15	Closed	Closed	Opening dependent upon in-season survey results.
14	14	Closed	Closed	Opening dependent upon in-season survey results.
16	16	Closed	Closed	Opening dependent upon in-season survey results.
17	17	17,637	8	
18+19	18 and 19	Closed	Closed	Opening dependent upon in-season survey results.
20	20	22,050	10	
23IN	23-1 to 23-6	120,371 pinks 1,323 sidestripes	54.6 pinks 0.6 sidestripes	25% observer requirement.
23OFF&21OFF	21, 121, 123, 23-7 to 23-11	667,112 pink 2,646 sidestripe	302.6 pink 1.2 sidestripe	opens May 15, 25% observer requirement.
124OFF	124	Closed	Closed	Opening dependent upon in-season survey results 100% Observer.
125OFF	125	Closed	Closed	Opening dependent upon in-season survey results 100% Observer.

SMA	Areas and Subareas	Initial Catch Ceiling		Notes
		(lb)	(t)	
24IN	24	22,050	10	
25IN	25	22,050	10	
26IN	26	22,050	10	
27IN	27-3, 27-7 to 27-11	22,050	10	
27OFF	127, 27-1, 27-2, 27-4 to 27-6	55,115	25	Observer Requirement.
FR	28 and 29	Closed	Closed	Opening dependent upon in-season survey results.

New harvest areas not listed above may be considered for commercial openings in-season during the 2022/23 fishery based on new biomass survey assessment data or information.

2.4.4. Adjustment of Catch Ceilings after Survey

The catch ceilings for the shrimp management areas with continued surveys are based on estimates of shrimp biomass resulting from fishery independent trawl surveys conducted in May through September, and are defined following the Provisional HCRs, depending on the state of the stock (Healthy, Cautious or Critical Zone). After the survey, a bulletin is produced and the results of the survey will be announced by Fishery Notice.

2.4.4.1. In-Season Changes to Catch Ceilings for Southern Inside Waters

The catch ceilings for some inside waters have been allocated based on forecast biomass estimates from the previous year's surveys. For index areas with no survey in the previous year an initial catch ceiling is authorized to allow harvesting prior to the biomass survey being completed later in the year. In-season changes to catch ceilings for Southern Inside Waters will be determined if new survey results become available, and will be re-proportioned to the two harvest periods at that time. If survey results indicate additional catch ceiling and become available while an area is open and actively being fished, the catch ceiling will be re-proportioned at that time and the fishery will continue. If survey results indicate sufficient additional catch ceiling to manage a re-opening and become available while the area is closed, effort will be made to provide 48 hours advance notice prior to re-opening.

2.4.5. Catch Ceiling Reached

Catch estimates by each fish harvester are obtained at the end of each trip, prior to landing and selling the catch. A landing hail number is required and is entered in fishing logbooks and must be recorded prior to landing and selling the catch. The service provider maintains a cumulative catch from all fish harvesters and provides a Landing Quota Status (LQS) Report to the industry and the Department once a week. The LQS Report includes the catch ceiling, total landed, pounds remaining, percent remaining, area status and number of active vessels hailed to fish in each SMA for each species catch ceiling. Weekly Shrimp Trawl LQS Reports can be obtained by email or by fax from the service provider, Archipelago Marine Research Ltd, (250) 383-4535.

When the weekly LQS Report shows that a catch ceiling for one species is close to being reached the area will be closed, using the following criteria, with the objective of not exceeding the catch ceiling.

Closure decisions will be based on:

- Catch ceiling remaining in the area

- The number and gear type of boats fishing in the area
- Outstanding catch reporting
- Landings in previous weeks

This may result in some amount of catch ceiling remaining in the area when it is closed.

3. BYCATCH AND DISCARDS

Shrimp and incidental Prawns, squid, and octopus are permitted to be caught and retained (with seasons, catch limits, and area closures). All other bycatch must be discarded as soon as feasible in the best condition as possible. Specific management measures have been defined for some species. Management measures to minimize capture of fish that will reduce mortality of discards, improve reporting and accounting of the entire catch, including bycatch and discards will be developed following implementation of the Policy Framework on Managing Bycatch and Discards. Specific management measures for Eulachon bycatch have been developed for WCVI SMAs. An at-sea observer program is funded by active industry vessel owners. The primary goal of the observer program is to monitor Eulachon bycatch in WCVI SMAs. Observers are deployed by the service provider when the vessel master obtains a hail number to go fishing. The observer travels with the vessel when fishing and records information on all species in the catch, the configuration of the gear and specific tow location and duration. This information is used to monitor the Eulachon-to-shrimp ratio and the Eulachon catch rates. Current bycatch and discard measures are defined in the following sections.

Licence holders are responsible for arranging at-sea observer coverage through the Service Provider defined for the fishery. SMAs 124OFF and 125OFF will require 100% at-sea observer coverage on-board the vessel to monitor all fishing activity. Within SMA 23OFF&21OFF and 23IN licence holders must arrange for at-sea observer coverage on 25% of all fishing days during the season. Observer deployment is scheduled by the Service Provider on a random basis and will not necessarily be delayed to later trips – it could be at the first trip or any subsequent trips by an individual vessel.

In addition, licence holders shall arrange for an additional 20 days of at-sea observer coverage to be available for deployment in other SMAs along the coast. Deployment of observers will be based on Departmental priorities such as shrimp species identification, catch distribution or bycatch issues.

Data bycatch summaries and trip reports from all at-sea observer trips must be provided to DFO within five (5) days following the completion of the fishing trip. The Department may implement in-season closures to the fishery if data delivery timelines are not met by the licence holders or the Service Provider.

3.1. Eulachon Bycatch Action Levels

The Department is working with the shrimp trawl industry to minimize Eulachon bycatch. An EAL is set annually for WCVI (Table 3) to encourage active shrimp trawl harvesters to adjust their gear to minimize Eulachon bycatch. The 2022/23 EAL for the WCVI will be 4 t. There will be no in-season adjustment to the EAL based on the WCVI surveys as in previous years. Eulachon bycatch cannot be retained. If no commercial fishing opportunities exist within one of these SMA

groupings in a given year, then the EAL assigned to that grouping may be re-allocated to the other SMA grouping.

Table 3: Eulachon Action Levels for WCVI

SMA Group	2022/23 Eulachon Action Level (t)
124OFF and 125OFF	2.0
23OFF&21OFF and 23IN	2.0

In-season Eulachon bycatch estimates for SMA 124OFF and 125OFF, combined, will be determined from 100% at-sea observer estimates on a vessel trip basis, summarized weekly.

In season Eulachon bycatch estimates for 23OFF&21OFF and 23IN combined areas are based on data collected by at-sea observers following the Pooled In-season (PI) method defined by Hay et al.(1999). No confidence intervals are calculated. The Eulachon to shrimp ratio from at-sea observations is applied to total estimated shrimp catch (hails) to generate an estimate of in-season Eulachon bycatch when the catch is summarized each week.

Eulachon catch is estimated using $E_c = (\sum E_o) / (\sum S_o) * (S_c)$

Where E_c = eulachon catch estimate
 E_o = Eulachon observed
 S_o = Shrimp observed
 S_c = Shrimp catch estimate from fish harvester hauls (weekly Landings Quota Status Report)

If at-sea observations are not available, previously observed Eulachon to shrimp ratios (by beam or otter trawl) are used to impute Eulachon bycatch.

3.1.1. Eulachon Action Levels Reached

In the event the estimate of Eulachon bycatch in a given WCVI area reaches the EAL the commercial fishery will close in that area.

3.2. Prawn

Vessels operating under the authority of a shrimp trawl licence are restricted to an incidental, legal size, possession limit of 100 individual Prawn (*Pandalus platyceros*) whole, in the shell, provided that the area is open for fishing for Prawn by means of trawl gear. This generally occurs in areas and at times when the Prawn and shrimp by trap fishery is open. It is the vessel master's responsibility to ensure an area is open to Prawn retention by shrimp trawl gear. Vessel masters are advised to regularly contact a local Fisheries and Oceans Canada office for advice on Prawn closures in their area. The quantity of catch is recorded and reported as weight in pounds in the logbook.

The minimum legal size limit for Prawns is 33 mm carapace length (measured from the posterior most part of the eye orbit to the posterior mid-dorsal margin of the carapace). See Appendix 7 Prawn Minimum Size for instructions on measurement.

Concern has been expressed regarding the incidental catch of undersize Prawns. Fish harvesters are asked to avoid areas where there is a high incidence of undersize Prawn. If this is a persistent problem, shrimp trawl closures may be implemented.

South Coast Area 17 and Subarea 29-5 and North Coast Subareas 4-10 and 4-11 in PRD are closed year round to the retention of Prawn by shrimp trawl gear.

All Prawns must be sorted out of the catch immediately upon being brought on deck. Undersize Prawns, berried Prawns and Prawns in excess of the incidental catch allowance must be returned immediately to the water in a manner that best affords their survival. Predation of released Prawns by sea birds has been identified as a concern. Fish harvesters should consider methods that get the Prawns below the surface as quickly as possible. Concerns have been raised regarding the incidental catch mortality of trawl-caught Prawn during conservation closures for Prawn. If this is a persistent problem, shrimp trawl closures may be implemented.

All retained Prawns must be kept segregated from all other catch.

Any Prawns with an egg mass (berried females) shall be released immediately and unharmed to the waters from which they are caught.

No Prawns or shrimp that are not permitted to be retained under the authority of the commercial licence shall be on board the licensed vessel.

3.3. Squid

Vessels operating under the authority of an 'S' or 'FS' licence are restricted in the retention of incidentally caught Opal Squid (*Loligo opalescens*) to an amount that does not exceed two percent of the total weight of shrimp on board. This catch weight (in lb or kg) must be recorded on the Shrimp Trawl Harvest Logbook in the Remarks section.

3.4. Octopus

Vessels operating under the authority of an S licence are allowed to retain all incidentally caught Octopus (*Enteroctopus dofleini*). This catch weight (in lb or kg) must be recorded on the Shrimp Trawl Harvest Logbook in the Remarks section.

3.5. Marine Mammal Interactions Reporting Requirements

New U.S. *Marine Mammal Protection Act* (MMPA) requirements states that fisheries exporting into the U.S. market need to meet U.S. standards for levels of bycatch and impacts on marine mammals. If the fishery operations are comparable with U.S. levels then Canadian fisheries can continue to export their product to the U.S.

DFO has implemented new reporting requirements for shrimp trawl vessels. Vessel masters shall provide information regarding all interactions with marine mammals during fishing trips. For the purpose of reporting, interactions refer to cases of incidental mortality and serious injury to marine mammals. This includes accidental drowning, bycatch, entanglements, collisions, and fatalities. The vessel master shall complete the DFO reporting form "MARINE MAMMAL INTERACTION FORM", which shall be submitted as per the instructions provided on the form.

Note: The Marine Mammal Interaction Form is available at:

<https://dfo-mpo.gc.ca/species-especes/mammals-mammiferes/report-rapport/page01-eng.html>

Vessel Masters shall also report interaction via the 1-800-465-4336 ORR line.

3.6. Pre-Notification Period Prior to Openings for SMA 23IN and 23OFF&21OFF

In order to allow time for the Service Provider to better organize and facilitate arrangements for At-Sea Observers within SMAs 23IN and 23OFF&21OFF a pre-notification period prior to these SMAs openings may be implemented once DFO decides whether harvest opportunities will be available, and a catch ceiling is set. DFO may announce a potential opening date with a couple weeks advance notice in order to help ensure At-Sea Observers will be available for the opening.

3.7. Limiting Fishing Hails for 23IN and 23OFF&21OFF if Observer Coverage Not Achieved

In the event that the at-sea observer coverage rate objective is not being achieved within SMA 23IN and 23OFF&21OFF and sufficient observers are not available for the fishery, the Department may instruct the Service Provider to withhold all new hails to the SMA in order to ensure that observer coverage rates can be achieved. In the event that observers cannot be provided within the foreseeable future, DFO may implement an in-season closure for SMA 23IN and 23OFF&21OFF until such time as observers become available to the fishery.

3.8. Humpback and Coonstripe Shrimp

As set forth by the Minister of Fisheries and Oceans Canada in a letter to the Shrimp Trawl Sectoral Committee (STSC) (January 31, 1997), “any directed fishery for Humpback Shrimp in non-traditional areas or with new or modified trawl or trap gear, will be subject to the Pacific Region Guidelines on New and Developing Invertebrate Fisheries” (New Emerging Fisheries Policy).

In general, the harvest of Humpback and Coonstripe Shrimp is restricted to an incidental harvest. Closures to all shrimp fishing may be implemented in non-traditional Areas or Subareas where directed fishing for Humpback or Coonstripe Shrimp occurs. Under the New Emerging Fisheries Policy it has been recommended that directed Coonstripe fisheries should be based on species-specific catch ceilings developed through fishery independent surveys (Dunham and Boutillier, 2001). A bycatch monitoring program and catch validation/monitoring for both the trap and trawl fisheries would be used to quantify the discard mortality of small sorted shrimp and define the most selective fishing method or gear to be used.

4. CLOSURES

4.1. Shrimp Management Area Closure Status

It is the fish harvester’s responsibility to ensure that an area is open prior to setting gear. SMAs will close in-season as required on the basis of any one or more of the following:

- Catch ceilings or annual quotas for any species of shrimp have been reached. (See section 2.4.5.)
- For the areas included as Southern Inside Waters, the proportion of the catch ceiling allocated to that time period has been reached.
- If the Department is of the opinion that the fishery may be characterized as unmanageable; indications of misreporting of harvest on hails or harvest logs; at-sea observer coverage goals are not being met; Eulachon or other bycatch levels, including that of Prawns, are deemed by the Department as too high (if shrimp trawl fishing occurs

in areas identified as having low Prawn spawner index and are closed to recreational Prawn by trap fishing, the Department may close areas to trawl fishing to avoid handling mortality of egg bearing females and the overall Prawn population).

- SMAs 124OFF and 125OFF will close effective 23:59 hours on February 28, 2023 to allow year-end calculation of individual vessel Eulachon bycatch amounts and administer any necessary overage adjustments in the follow year's licence conditions for those individual vessels.
- Access to shrimp by First Nations for FSC purposes is jeopardized.
- For other reasons of conservation or for any other valid legislative reason.

4.1.1. Shrimp Information Line

Vessel masters are advised to call the Shrimp Information Line 1-888-978-7888 for information on area closures, the results of surveys, adjustments to catch ceilings and other in-season fishery information. Information will be available 24 hours a day by recording at this toll free number.

Fish harvesters are advised that the service provider is not responsible for notifying fish harvesters of existing or pending closures.

4.1.2. Fishery Notices

Information on area openings, through Fishery Notices for shrimp trawl, can be obtained by contacting local Fisheries Offices, the Fishery Managers listed in Appendix 3, or the Commercial Fishery Notices link from the Pacific Region Internet site:

<http://www-ops2.pac.dfo-mpo.gc.ca/fns-sap/index-eng.cfm?CFID=5970768&CFTOKEN=60169251>

4.1.3. Canadian Coast Guard Announcements

Once a week the Canadian Coast Guard (CCG) may announce shellfish openings and closures. These announcements will be made, time permitting, following regular scheduled WX broadcasts and may be interrupted or delayed for Search and Rescue (SAR) priorities. Broadcast times are as follows:

Prince Rupert MCTS	WCVI	Tuesdays	12:15 DST	1915 UTC
Prince Rupert MCTS	North Coast	Tuesdays	12:15 DST	1915 UTC
Victoria MCTS	S Coast Nanaimo to Juan de Fuca	Tuesdays	07:10 DST	1510 UTC
Victoria MCTS	S Coast North of Nanaimo	Tuesdays	12:15 DST	1915 UTC

4.2. Rockfish Conservation Areas and Glass Sponge Reef Closures

Fishing shrimp by trawl is not permitted in Rockfish Conservation Areas (RCAs). RCAs are in effect in inside waters as of February 2007. Hook and line fishing for Schedule II species is prohibited in RCAs. Maps, closure boundaries and information on RCAs is available at: <http://www.pac.dfo-mpo.gc.ca/fm-gp/maps-cartes/rca-acrs/index-eng.html>

There are Sponge Reef commercial closures in the Strait of Georgia and Howe Sound. The following link contains the closure information regarding all of the Sponge Reef Closure areas: <https://www.dfo-mpo.gc.ca/oceans/ceccsr-cerceef/closures-fermetures-eng.html>

4.3. Closures by Pacific Fisheries Management Area/Subarea

4.3.1. Area 1

4.3.1.1. Dixon Entrance/Hecate Strait Closure - Areas 1, 2, 101, 102, 103, 104, 105, 106, 130 and 142. Those waters of Areas 1, 2, 101 to 106, 130 and 142 will be closed 00:01 hours March 1 to 08:00 hours August 1 each year. (Crab Softshell Closure, Seasonal closure). If a soft-shell monitoring program is in place, the area, or portions of the area, could close earlier or later than March 1 and open earlier or later than August 1 if sampling indicates a change to the opening date is appropriate. Contact the North Coast Fisheries Manager.

4.3.1.2. McIntyre Bay: Subarea 1-5 closed to conserve halibut. (Conservation Halibut)

4.3.2. Areas 101 and 142

4.3.2.1. Bowie Seamount Marine Protected Area (MPA): 180 km west of the Queen Charlotte Islands Areas. For a schedule of boundaries and a map see the internet website at: <https://laws-lois.justice.gc.ca/eng/regulations/SOR-2008-124/index.html> (Marine Protected Area)

4.3.2.2. SGaan Kinglas: Bowie Seamount Protected Area – those waters of Areas 101 and 142 - has been established to conserve and protect the unique biodiversity and biological productivity of the area's marine ecosystem. The MPA Regulations establish the outer boundary of the MPA as the area of the Pacific Ocean, which includes the Bowie, Hodgkins and Davidson Seamounts — consisting of the seabed, the subsoil and the water column above the seabed — that is bounded by a series of rhumb lines drawn from a point 53°03'07.6" N, 135°50'25.9" W, to a point 53°16'20.9" N, 134°59'55.4" W, then to a point 53°39'49.2" N, 135°17'04.9" W, then to a point 53°39'18.0" N, 135°53'46.5" W, then to a point 53°52'16.7" N, 136°30'23.1" W, then to a point 53°49'19.6" N, 136°47'33.1" W, then to a point 53°40'02.5" N, 136°57'03.5" W, then to a point 53°13'59.2" N, 136°10'00.0" W, then back to the point of commencement (National Marine Conservation Area.)

4.3.3. Areas 105 to 107, 110

4.3.3.1. Hecate Strait and Queen Charlotte Sound Glass Sponge Reefs MPA in portions of Areas 105, 106, 107, and 110. Three closures have been established surrounding glass sponge reefs in the North and Central Coast areas. Area closure boundaries for each reef are shown in Appendix 8 Locations of Glass Sponge Reefs in Hecate Strait and Queen Charlotte Sound. The Core Protection Zone is closed to all fishing activity. The Vertical Adaptive Management Zone and the Adaptive Management Zone are closed to all commercial bottom contact fishing activities, as well as for midwater trawl for hake. For more detail on the fishery closure within Hecate Strait and Queen Charlotte Sound Glass Sponge Reef MPA please review the Fishery Notice FN0198. (Sponge Reef)

4.3.4. Area 2

See 4.3.1.1 Dixon Entrance/Hecate Strait Closure.

4.3.4.1. SMA 2IN: Opens under request with confirmation of observer coverage at fish harvester's expense. Amended Conditions of Licence required. (See Section 2.3.4.2.) (Seasonal Observer)

4.3.4.2. Cumshewa Inlet: Subareas 2-3 and 2-4. (New Emerging Fisheries Policy)

4.3.4.3. Burnaby Narrows: Those waters of Subareas 2-13 and 2-16 inside a line commencing at 52°23.071' N and 131°20.427' W, east to a point at 52°23.079' N and 131°22.790' W, then following the southern shoreline of Kat Island east to a point at 52°23.104' N and 131°22.193' W, then east to a point at 52°23.303' N and 131°22.277' W, then following the western shoreline of Burnaby Island south to a point at 52°20.982' N and 131°20.427' W, then west to a point at 52°20.733' N and 131°21.063' W, then north following the eastern shoreline of Moresby Island back to the point of commencement. (National Marine Conservation Area)

4.3.4.4. Cape Saint James: Those waters of Subareas 2-19, 102-3, 130-3 and 142-1 inside a line commencing at 51°56.509 minutes N and 131°01.547 minutes W, southwest to 51°55.499 minutes N and 131°02.468 minutes W, then southeast to 51°52.493 minutes N and 130°57.907 minutes W, then south to 51°51.655 minutes N and 130°57.780 minutes W, the southeast to 51°50.395 minutes N and 130°56.561 minutes W, then northeast to 51°51.054 minutes N and 130°54.702 minutes W, then north to 51°53.826 minutes N and 130°55.640 minutes W, then northwest to 51°58.517 minutes N and 130°59.468 minutes W, and then west to 51°58.727 minutes N and 131°00.620 minutes W, and then following the southern shore of Kungit Island to the point of commencement. (National Marine Conservation Area)

4.3.4.5. SGang Gwaay: Those waters of Subareas 2-31 and 142-1 inside a 3 km radius from the centre point on Anthony Island located at 52°05.655' N and 131°13.178' W. (National Marine Conservation Area).

4.3.4.6. Louscoone Estuary: Those waters of Subareas 2-33 and 2-34 north of a line drawn from 52°11.828' N and 131°15.662' W east to 52°12.269' N and 131°14.579' W. (National Marine Conservation Area)

4.3.4.7. Flamingo Estuary: Those waters of Subarea 2-37 north of a line drawn from 52°14.523' N and 131°22.24' W southeast to 52°14.245' N and 131°21.481' W. (National Marine Conservation Area)

4.3.4.8. Gowgaia Estuary: Those waters of Subarea 2-41 east of a line drawn from 52°24.947' N and 131°32.13' W southeast to 52°24.233' N and 131°32.021' W. (National Marine Conservation Area)

4.3.5. Area 3

4.3.5.1. Nass River: Those waters of Subareas 3-12 and 3-18 will be closed February 1 to March 31 to avoid interaction with schooling adult Eulachon returning to spawn. (Seasonal Eulachon)

4.3.6. Area 4

4.3.6.1. Prince Rupert Harbour: Subareas 4-10 and 4-11. Closed to the retention of Prawns at all times. (Conservation Prawns)

4.3.6.2. Those waters that include Subareas 4-15 and that portion of Subarea 4-12 in that lies south of a boundary formed by two submarine cables that cross Inverness Passage about 0.8 miles South East of Hicks Point, and then beginning 2 miles north of Hazel Point on Smith island and following the line of the two submarine cables that cross Marcus

Passage and Malacca Passage, to the North end of Lawyer Island and the Ashore to Porcher Island one mile south of Hunter Point, will be closed February 15th to March 31st to help avoid the risk of interactions with Eulachon returning to spawn. (Seasonal Closure)

4.3.7. Area 9

4.3.7.1. SMA 9IN: Opens June 1 and remains open until December 31, or until the annual catch ceiling is attained. After January 1, if sufficient catch ceiling remains, Subareas 9-1 and 9-12 will remain open. Subareas 9-2 to 9-11 will open under request with confirmation of observer coverage. (Seasonal Observer)

4.3.8. Area 13

4.3.8.1. Discovery Passage: Subareas 13-3, 13-4, 13-5 and a portion of 13-6. Those waters of Discovery Passage bounded on the north by a straight line drawn true west from North Bluff on Quadra Island, across Seymour Narrows to a fishing boundary sign on Vancouver Island, and on the south by a line from the Cape Mudge light true west to Vancouver Island. (Marine Reserve)

4.3.8.2. Deepwater Bay: A portion of Subarea 13-7 inside a line from a fishing boundary sign at Separation Head to a fishing boundary sign at the north-westerly entrance to Deepwater Bay, salmon holding area. (Marine Reserve)

4.3.8.3. Kelsey Bay: Subarea 13-34. (Navigation)

4.3.9. Area 14

4.3.9.1. Several closures in Area 14 are defined to protect Glass Sponge Reefs. A description of the closures and charts with waypoints is provided on the Strait of Georgia and Howe Sound Glass Sponge Reef Conservation Initiative website, here: <https://www.dfo-mpo.gc.ca/oceans/ceccsr-cerceef/closures-fermetures-eng.html> (Sponge Reef Closure)

4.3.9.2. Baynes Sound Closure: Those waters of Subareas 14-8 and 14-15 will be closed due to bycatch issues in this area. (Conservation Bycatch)

4.3.9.3. Upper Baynes Sound (Subarea 14-11) and Comox Harbour (Subarea 14-14). (Navigation)

4.3.10. Area 16

4.3.10.1. Bargain Bay (Subarea 16-3), Pender Harbour (Subarea 16-4) and Head of Sechelt Inlet (Subarea 16-5). (Navigation)

4.3.10.2. Skookumchuck Narrows Provincial Park: Subarea 16-9. Those waters of Skookumchuck Narrows and Sechelt Rapids bounded on the West by a line from a point on the foreshore at the westerly limit of Secret Bay on Sechelt Peninsula thence 50° true to a point on the foreshore on the mainland; and the east by a line from Raland Point on Sechelt Peninsula, thence 50° true to a point on the foreshore on the mainland. (Park)

4.3.11. Area 17

4.3.11.1. Several closures in Area 17 are defined to protect Glass Sponge Reefs. A description of the closures and charts with waypoints is provided on the Strait of Georgia and Howe Sound Glass Sponge Reef Conservation Initiative website, here:

<https://www.dfo-mpo.gc.ca/oceans/ceccsr-cerceef/closures-fermetures-eng.html> (Sponge Reef Closure)

4.3.11.2. Area 17 is closed year round to the retention of Prawn by shrimp trawl gear. (Conservation Prawns)

4.3.11.3. Ladysmith Harbour (Subarea 17-7) and Nanaimo Harbour (Subarea 17-14). (Navigation)

4.3.11.4. Subarea 17-17 Pylades Channel. This Subarea is mainly a Humpback Shrimp area with very few pink shrimp or Sidestripe Shrimp and the populations have not been assessed. (New Emerging Fisheries Policy)

4.3.12. Area 18

4.3.12.1. Several closures in Area 18 are defined to protect Glass Sponge Reefs. A description of the closures and charts with waypoints is provided on the Strait of Georgia and Howe Sound Glass Sponge Reef Conservation Initiative website, here: <https://www.dfo-mpo.gc.ca/oceans/ceccsr-cerceef/closures-fermetures-eng.html> (Sponge Reef Closure)

4.3.12.2. Sansum Narrows, Burgoyne Bay and Maple Bay (Subarea 18-7), Cowichan Bay (Subarea 18-8) and Fulford Harbour (Subarea 18-10). (Navigation)

4.3.12.3. Satellite Channel: that portion of Subarea 18-6 found inside a line starting at 48°41.46'N latitude 123°29.48'W longitude, thence one nautical mile 60° true to 48°41.96'N latitude 123°28.178'W longitude, thence one nautical mile 330° true to 48°42.82'N latitude 123°28.92'W longitude, thence one nautical mile 240° true to 48°42.32'N latitude 123°30.23'W longitude, thence one nautical mile 150° true to the point of origin. (Ecological Reserve)

4.3.12.4. Saturna Island: Those portions of Subareas 18-5 and 18-11 off Saturna Island inside a line commencing on the shoreline of Saturna Island at 48°47.033'N and 123°03.550'W [North Boundary of East Point(shoreline)] northeasterly to a point in water at 48°47.300'N and 123°03.000'W [Tumbo Channel], thence northeasterly to a point in water at 48°47.666'N and 123°02.416'W [Northwest Corner(Boiling Reef)], thence southeasterly to a point in water at 48°47.550'N and 123°02.000'W [Northeast Corner (Boiling Reef)], thence southwesterly to a point in water at 48°46.933'N and 123°02.666'W [Boundary Pass], thence southwesterly to a point in water at 48°46.600'N and 123°03.166'W [Narvaez Bay Boundary Following the Traffic Separation Scheme(TSS)], thence southwesterly to a point in water at 48°46.450'N and 123°03.650'W [Narvaez Bay Boundary Following the TSS], thence southwesterly to a point in water at 48°46.300'N and 123°04.200'W [Southeast Corner (Narvaez Bay)], thence northwesterly to a point in water at 48°46.416'N and 123°04.533'W [Southwest Corner (Narvaez Bay)], thence northeasterly to a point along the shoreline of Saturna Island at 48°46.766'N and 123°03.916'W [South Boundary of East Point (shoreline)], and thence following the eastern shoreline back to the point of commencement. [Saturna Island Interim Sanctuary Zone]

4.3.12.5. Pender Island: That portion of Subarea 18-4 west of Pender Island inside a line commencing at a point in water at 48°44.166'N and 123°13.900'W [Southeast Boundary (Wallace Point)] due east to a point in water located at 48°44.166'N and 123°15.550'W [Southwest Boundary (Swanson Channel)], thence northwesterly to a point in water at

48°46.050'N and 123°19.516'W [Northwest Boundary (Swanson Channel)],thence due east to point in water at 48°46.050'N 123°18.383'W [Northeast Boundary (South of Thieves) Interim Sanctuary Zone]

4.3.13. Area 19

4.3.13.1. Victoria Harbour (Subarea 19-1) and Esquimalt Harbour (Subarea 19-2). (Navigation)

4.3.13.2. Sidney Spit Marine Park: Subarea 19-6. (Park)

4.3.13.3. Saanich Inlet: Subareas 19-7 to 19-12. (Conservation)

4.3.13.4. Ogden Point: Subarea 19-3. Those waters of inside a line from the navigation light at the western end of the Ogden Point Causeway thence to Brochie Ledge Light, thence to Holland Point on Vancouver Island. (Marine Reserve)

4.3.13.5. 10 Mile Point: Subareas 19-4 and 19-5. Those waters of within 0.4 nautical miles of Cadboro Pt. navigation light. (Marine Reserve)

4.3.13.6. Race Rocks: Subareas 19-3 and 20-5. Those waters of within 0.5 nautical miles of Great Race Rocks. (Marine Reserve)

4.3.14. Area 20 & 121

4.3.14.1. Race Rocks: Subareas 19-3 and 20-5. Those waters of within 0.5 nautical miles of Great Race Rocks. (Marine Reserve)

4.3.14.2. Port San Juan: Subareas 20-2) and Sooke Harbour and Basin (Subareas 20-6 and 20-7). (Navigation)

4.3.14.3. Swiftsure: Those portions of Subareas 121-1 and 121-2 inside a line commencing at a point in water located at 48°34.000'N and 125°06.000'W [Northwest Boundary] due east to a point in water located at 48°34.000'N and 124°54.200'W [Northeast Boundary], thence southeasterly to a point in water at 48°32.100'N and 124°49.518'W [Southeast Boundary], thence due west to point in water located at 48°32.100'N and 125°01.843'W [Southwest Boundary], and thence northwesterly back to the point of commencement. [Swiftsure Bank Interim Sanctuary Zone]

4.3.15. Area 23

4.3.15.1. Pacific Rim National Park, Broken Group Islands: Those waters of the Broken Group Islands in Barkley Sound within park boundaries as shown, since 1989, on Canadian Hydrographic Service Chart 3671. (Park)

4.3.15.2. Fishing Hazard Advisory – Areas 23 and 123. The NEPTUNE Canada Ocean Observatory is a scientific cabled ocean observatory that is installed on the seafloor off the West Coast of Vancouver Island by Oceans Network Canada. The Observatory consists of a ring of powered telecommunications cable laid on the seafloor down the centre of Alberni Inlet and Trevor Channel across the continental shelf and out to approximately 160 nautical miles offshore (2,500 meters water depth). For further information, see Appendix 11 Fishing Hazard Advisory – NEPTUNE Node, West Coast Vancouver Island or check the Neptune Internet site: www.neptunecanada.ca. (ONC Infrastructure 2017)

4.3.16. Area 24

4.3.16.1. Pacific Rim National Park, Grice Bay and McBey Islets: Those waters of Tofino Inlet within Pacific Rim National Park including McBey Islets and Dinner Island in Tsapee Narrows, Browning Passage in Subarea 24-9 and Grice Bay West and South of Indian Island in Subarea 24-11. (Park)

4.3.17. Area 25

4.3.17.1. Subarea 25-16. (Navigation)

4.3.18. Areas 27 and 127

4.3.18.1. 27OFF: Open under request with confirmation of observer coverage. The intent is to document species composition of bycatch. (Seasonal Observer)

4.3.19. Area 28

4.3.19.1. Several closures in Area 28 are defined to protect Glass Sponge Reefs. A description of the closures and charts with waypoints is provided on the Strait of Georgia and Howe Sound Glass Sponge Reef Conservation Initiative website, here: <https://www.dfo-mpo.gc.ca/oceans/ceccsr-cerceef/closures-fermetures-eng.html> (Sponge Reef Closure)

4.3.19.2. Horseshoe Bay: Subarea 28-2. Those waters bounded by a line commencing from Whytecliff Point, thence in a straight line to the most southerly point of Bowyer Island, thence in a straight line 120 true to the mainland. (Navigation)

4.3.19.3. Whytecliff Park: Subarea 28-2. Those waters bounded by a line commencing from the most southerly point of Whytecliff Park; thence in a straight line to a point located 100 m East of the most southeasterly point of Whyte It.; thence following the southern shoreline of Whyte It. at a distance of 100 m to a point lying 100 m from the most southwesterly point of Whyte It.; thence in a straight line to a point lying 100 m west of White Cliff Point; thence following the shoreline at a distance of 100 m in a northerly direction to a point 100 m North of Lookout Point; thence following the shoreline at a distance of 100 m in an easterly direction to a point 100 m perpendicular to the most northerly point of Whytecliff Park; thence to the most northerly point of Whytecliff Park on the mainland. (Marine Reserve)

4.3.19.4. Porteau Cove: Subarea 28-4. Those waters east of a line drawn from a white fishing boundary sign located on the south shore of Porteau Cove to a white fishing boundary sign located on the north shore of Porteau Cove. (Marine Reserve)

4.3.19.5. Point Atkinson Reef: Subarea 28-6. Those waters bounded by a line commencing at the southwest entrance to Starboat Cove thence seaward in a southwest direction for 85 meters, thence westerly following the shoreline for 100 meters, thence in a northeast direction to a point on land. (Conservation)

4.3.19.6. Subareas 28-8 and 28-10. (Navigation)

4.3.19.7. Subareas 28-11 to 28-14. (Conservation)

4.3.20. Area 29

4.3.20.1. Several closures in Area 29 are defined to protect Glass Sponge Reefs. A description of the closures and charts with waypoints is provided on the Strait of Georgia and Howe Sound Glass Sponge Reef Conservation Initiative website, here:

<https://www.dfo-mpo.gc.ca/oceans/ceccsr-cerceef/closures-fermetures-eng.html> (Sponge Reef Closure)

4.3.20.2. Subarea 29-5 is closed year round to the retention of prawn by shrimp trawl gear. (Conservation Prawns)

4.3.20.3. Subareas 29-7 to 29-10, 29-12 and those portions of Subareas 29-3, 29-4, and 29-6, shoreward of the 100 metre contour line as shown on charts 3463 and 3512, as published by the Canadian Hydrographic Service of Fisheries and Oceans Canada. (Conservation Crab)

4.3.20.4. Fishing Hazard Advisory - Subareas 29-6, 29-7. The Victoria Experimental Network under the Sea (VENUS) project includes a shallow water installation that may pose a hazard to trawl fishing (see Appendix 10 Fishing Hazard Advisory – VENUS Georgia Strait Node, Area 29). For further information, check the VENUS Internet site: www.venus.uvic.ca (ONC Infrastructure 2017)

5. LICENSING

National On-line Licensing System (NOLS) Client Support – Licensing Services

All fish harvesters/licence holders/vessel owners are now required to use the National Online Licensing System (NOLS) to view, pay for and print their commercial fishing licences, licence conditions and/or receipts.

Training materials, including step-by-step guides and a detailed user training manual, are available online (<http://www.dfo-mpo.gc.ca/FM-GP/SDC-CPS/licence-permis-eng.htm>) to guide users of the system in completing their licensing transactions. DFO also provides client support and assistance on how to use the system via e-mail at fishing-peche@dfo-mpo.gc.ca or by calling toll-free at 1-877-535-7307. Telephone support is available Monday to Friday (excluding holidays) from 07:00 to 19:00 Eastern.

For more information on how to register and use the system, visit the Department's website at the website address above, or contact our client support.

5.1. Licence Category

A shrimp trawl (category S) or communal commercial (category FS) licence is required to commercially harvest shrimp with trawl gear.

Category S licence eligibilities are limited entry and vessel based.

Category FS eligibilities are limited entry and party-based. A First Nation group is the licence eligibility holder, and the licence must be designated to a commercially registered fishing vessel that meets established length restrictions.

5.2. Licence Renewal Fees

In accordance with the Service Fees Act, annual licence renewal fees will be adjusted by the annual rate of inflation determined by the Consumer Price Index (CPI) published by Statistics Canada. The commercial Shrimp by Trawl (Category S) licence renewal fee may be found on the following link: <https://www.pac.dfo-mpo.gc.ca/fm-gp/licence-permis/index-eng.html>

There is no annual licence renewal fee for communal commercial category FS licences.

5.3. Licence Issuance

Renewal of a category S licence and payment of the fee must be done on an annual basis to retain the privilege to be issued the licence in the future, regardless of whether or not fishing is carried out. Those category S licences not renewed by March 31, 2023 will cease and licence issuance requests will be unable to be considered in future. Prior to annual licence issuance of a communal commercial (FS) licence, licence eligibility holders are required to annually designate the fishing vessel to hold the licence. This must be done by navigating to the 'Submit a Request' menu selection within the National Online Licensing System (NOLS). Full instructions are available at: <https://fishing-peche.dfo-mpo.gc.ca/>.

Prior to annual licence issuance, vessel owners/licence eligibility holders are required to:

- a) Meet any Ministerial conditions placed on the licence eligibility.
- b) Ensure any conditions of the previous year's licence, such as submission and approval of logbooks have been met.
- c) the designated vessel's overall length does not exceed the maximum vessel length of the category FS licence eligibility.

To avoid delays, please ensure the payment and vessel designation information is submitted all at the same time through the Pay Fees and Submit a Request menu selection within the NOLS, when renewing a communal commercial licence.

Licence Documents

Shrimp by trawl licence documents are valid from the date of issue until March 31, 2023.

Replacements for lost or destroyed licence documents may be obtained by reprinting the licence documents through the NOLS.

Designation of Harvesters to Fish a Communal Commercial Licence

Under the *Aboriginal Communal Fishing Licence Regulations*, every person working on a vessel that is fishing under authority of a communal commercial licence must be designated by the First Nation that holds the licence. The designation must be made in writing and include the person's name and reference the communal commercial licence. The designation must be carried on-board and be produced on request of any Fishery Officer.

First Nations licence holders interested in obtaining an example template to use to designate their fish harvesters may contact a DFO Resource Manager (see Contacts in Appendix 3 of the Integrated Fisheries Management Plan for Shrimp by Trawl).

5.4. Fishery Monitoring Services to Fish Shrimp

Prior to fishing for shrimp by trawl, vessel masters must arrange for hail services and at-sea observer coverage to meet the notifications, catch verification, and catch sampling requirements outlined in the licence conditions for this fishery.

5.5. Vessel Replacement

The owner(s) of a category S licensed Shrimp by Trawl vessel may make an application to replace the commercial fishing vessel. Both the replacement vessel and the vessel being replaced must have a survey on file with the Pacific Fishery Licence Unit (PFLU) or submitted with the vessel replacement application. Vessel must be surveyed according to the Department guidelines.

Only one Shrimp by Trawl licence is allowed on a vessel at a time.

The replacement vessels may not exceed the overall length of the vessel being replaced.

Shrimp by Trawl licence eligibilities become permanently married to other vessel based licence eligibilities when combined on a vessel and may not be separated from those married licence eligibilities upon further vessel replacement requests.

Communal commercial licences are not eligible for vessel replacement as the licence eligibility is party based.

Temporary vessel replacements are allowed if the vessel has been declared a loss or the vessel is out of service due to an accident or unforeseen damage. Vessels that are in disrepair at the time of purchase, have engine problems, or have encountered delays in annual maintenance or rebuilding do not qualify for a temporary replacement.

Written confirmation from an insurance company, shipyard, or marine engineer explaining why the vessel is inoperative must be submitted to a Pacific Fishery Licence Unit when declaring the vessel a total loss.

Temporary replacement vessel may not exceed the overall vessel length plus 10 per cent of the Shrimp by Trawl trap vessel.

Should the Shrimp by Trawl licence eligibility be temporarily split from other licence eligibilities, the remaining eligibilities may not be placed on a third vessel.

For further information on vessel replacement policies, please contact the Department by telephone at 1-877-535-7307 or email at fishing-peche@dfo-mpo.gc.ca.

5.6. Schedule II Species

The commercial S licence includes harvest opportunities under specific gear requirements for the species listed in Schedule II - Part II of the *Pacific Fishery Regulations*. Refer to Part 2 of the conditions of shrimp trawl licence and the Pacific Region Integrated Fisheries Management Plans for Lingcod, Dogfish, Tuna, Skate, Sole, Flounder and Pacific Cod by Hook and Line (available from Pacific Fishery Licensing Units), for the conditions and guidelines for harvest of these species.

5.7. Conditions of Licence to Transport Fish

If catch is transferred from a licensed vessel to another vessel, the receiving vessel must have a commercial fishing licence or a transporting, category “D”, licence according to *Pacific Fishery Regulations*, Part II, Section 24. Part 3 of the shrimp trawl licence authorizes the vessel to transport fish other than fish caught by the licensed vessel. When product is transferred from one vessel to another vessel or a vehicle, that vessel or vehicle requires a provincial fish receiver licence. This licence is required for all types of vessels and vehicles, including aircraft. The licence may also be required for personal vehicles in some instances, when a vehicle is carrying the catch from more than one vessel, even if the licence holder owns both vessels. Fish harvesters should contact AgriServiceBC at 1-888-221-7141. For more information see the website: <http://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/fisheries-and-aquaculture/seafood-industry-licensing>

5.8. Fisher Identification Number (FIN)

Under the *Pacific Fishery Regulations*, any person over the age of sixteen engaged in commercial fishing, or on board a vessel being used in commercial fishing, must possess a Fisher’s Registration Card (available from Pacific Fishery Licensing Units). DFO has introduced unique Fisher Identification Numbers (FIN) that will be assigned to all Pacific commercial fish harvesters. A FIN will be automatically generated for fisher harvesters when their new year’s FRC licence is issued. Once a FIN has been assigned to a fisher, that individual will reference the FIN when identifying him or herself in subsequent business dealings with both the department and service contractors, completing the FIN field on logbooks, noting the FIN when hailing and landing catch, etc.

Licence holders may be asked to provide their FIN when applying for a licence, or for dockside monitoring, or for enforcement purposes.

For further information, please contact a PFLU or a resource manager (see Appendix 3).

6. CONTROL AND MONITORING OF COMMERCIAL FISHING ACTIVITIES

To meet the conservation and sustainable fishing objectives in this fishery, a Shrimp Trawl Catch Monitoring Program has been developed to track commercial fishery landings and to monitor the status of SMA catch ceilings. The program has two main components: a “hailing” requirement including notification prior to fishing and prior to offloading, and a catch reporting requirement through harvest logbooks and fish slips with verification in the form of random dockside validation by a Department certified observer.

6.1. Notification Procedures

6.1.1. Notification Prior to Commencement of a Fishing Trip

The vessel master shall obtain a Fishing Hail Number 24 hours prior to leaving port and prior to commencing fishing by contacting 1-866-377-1400 between the hours of 08:30 to 16:30 h Monday to Friday only except official holidays, and provide the following information (hereinafter referred to as a “Fishing Hail”):

- a.) Vessel name and Vessel Registration Number (VRN #)
- b.) Vessel master’s name (first and last) and contact phone number

- c.) Vessel's cellular or satellite phone number
- d.) Gear type (beam or otter trawl)
- e.) SMA or Subarea to be fished (note - one area only)
- f.) Anticipated date and time that fishing will begin
- g.) Anticipated number of fishing days for the trip
- h.) Target shrimp species
- i.) Product type (fresh, live, frozen at sea, etc.)
- j.) Anticipated offload location and date

Alternatively, a Shrimp Fisher ID number may be issued in-season by the service provider to replace items (a) through (d) providing there is no change to the contact information provided at the start of the season. If there is a change in vessel masters, this information must be updated.

Upon completion of the notification, the vessel master (skipper) will receive a unique Fishing Hail Number. More than one Fishing Hail Number may be issued if a fishing trip is planned to end on a weekend and a new trip is planned to begin on a weekend when the service provider cannot be contacted (between the hours of 08:30 to 16:30 h Monday to Friday). This permits sales of shrimp from one trip by obtaining a Landing Hail Number from the after hours number, then starting a new trip on a weekend.

Vessel masters must have available for inspection by Fisheries and Oceans Canada officers or fishery guardians their current Fishing Hail Number at all times during fishing or while shrimp are on board their vessel.

In all instances, it is the vessel master's responsibility to obtain a Fishing Hail Number prior to leaving the dock to go fishing. A Fishing Hail Number may be refused if the hail location is vague or misleading.

It is a Condition of Licence that vessels arrange for 100 percent at-sea observer coverage. This requirement may be waived at the time of Fishing Hail if the Department does not require an observer on board the vessel for that particular fishing trip. Deployments will follow DFO schedule.

The service provider is not responsible for notifying fish harvesters of existing or impending closures (See Section 4.1).

Vessel masters who are having difficulty dialling the toll free number using marine radio telephones in remote locations are advised to dial the operator and ask for assistance.

6.1.2. Notification of a Change in Fishing Area

If the SMA or target species to be fished is different from the original Fishing Hail, the vessel master shall contact (866) 377-1400 (08:30 to 16:30 hours, Monday to Friday only) to update the fishing hail record prior to fishing in the new SMA. This shall be done by quoting the original Fishing Hail Number for that trip and advising of the new SMA to be fished and the weight of each species of shrimp on board from each SMA fished prior to changing locations.

Changes to the anticipated number of fishing days (trip length), product type (fresh, live, frozen at sea, etc.) and/or landing port do not need to be re-hailed unless the SMA to be fished changes.

6.1.3. For Fishing Trips Longer Than Seven Days

If the fishing trip is longer than seven days (i.e. the landing date is more than seven days after the Fishing Hail), the vessel master shall contact (866) 377-1400 (08:30 to 16:30 hours, Monday to Friday only) and provide the following information every seven days:

- a.) Fishing hail number which applies to the current fishing trip.
- b.) SMA or Subarea in which fishing occurred.
- c.) Total weight of each species of shrimp, on board the vessel from each SMA fished.

For example, if the fishing hail report is made on Monday, then an update of catch information is required every Monday for the duration of the fishing trip.

6.1.4. Notification Prior to Landing Catch

Prior to landing any catch at the end of a fishing trip, the vessel master shall obtain a Landing Hail Number by calling (866) 377-1200 (24 hours per day, seven days a week) or (866) 377-1400 (08:30 to 16:30 h, Monday to Friday only) and provide the following information (hereinafter referred to as a “Landing Hail”):

- a.) Fishing hail number which applies to the current fishing trip.
- b.) Vessel name and VRN #
- c.) Vessel master’s name
- d.) Date fishing began
- e.) Date and time of offloading
- f.) Port and location of offloading
- g.) Buyer
- h.) SMA(s) or Subarea(s) in which fishing occurred
- i.) Weight of each species* of shrimp on board from each SMA fished
- j.) Total hours towed for each SMA fished

*Northern Pink Shrimp (*Pandalus borealis*) and Smooth Pink Shrimp (*Pandalus jordani*) may be reported as “pink shrimp.”

Upon completion of the Landing Hail, the vessel master (skipper) will receive a unique Landing Hail Number.

The Landing Hail and Shrimp Trawl Harvest Logbook must be completed and account for all shrimp and incidental catch retained prior to any shrimp or incidental catch being offloaded from the vessel.

6.1.5. Cancellation of a Fishing Hail Number

Where a fishing hail number has been issued and no fishing occurs, the vessel master shall notify (866) 377-1200 (24 hours per day, seven days a week) or (866) 377-1400 (08:30 to 16:30 h, Monday to Friday only) to cancel the hail, i.e. specify that no fishing took place. No follow-up paperwork will be required by the vessel master.

Active hails that have not been cancelled are deemed to be late, and thereby not in compliance of the Conditions of Licence.

6.1.6. Marine Mammal Reporting

The *Marine Mammal Regulations* provide direction on conservation and protection of marine mammals, provide guidance for recovery of Endangered Species under the *Species at Risk Act*, and set out provisions related to reducing human disturbance of marine mammals (e.g. viewing of marine mammals) and mandatory reporting requirements in the case there is accidental contact with a marine mammal and a vessel or fishing gear. For more information see section 5.4.6 of the main IFMP.

6.1.7. New Licence Condition for Reporting Lost Fishing Gear

The licence holder shall report any lost fishing gear to Fisheries and Oceans Canada within 24 hours of landing by completing and submitting the Lost Fishing Gear form available online at <http://www.dfo-mpo.gc.ca/fisheries-peches/reports-rapports/mobile-pac/index-eng.html>

The licence holder/vessel master shall report the retrieval of any of their own previously reported lost gear to Fisheries and Oceans Canada within 24 hours of landing by completing and submitting the Retrieval of Previously Reported Fishing Gear form available online at <http://www.dfo-mpo.gc.ca/fisheries-peches/reports-rapports/retrieval-pac-recuperation/index-eng.html>

6.2. Dockside Validation for All Shrimp Harvested in SMAs 124OFF and 125OFF

A mandatory Dockside Validation Monitoring pilot program for all shrimp harvested within SMAs 124OFF and 125OFF will be in place for the 2022/23 season. At the time of completing the landing hail, vessels must arrange for mandatory dockside validation and monitoring of offloading by the DFO approved service provider for the fishery.

Under Section 47 of the *Fishery General Regulations*, the vessel master of the licensed vessel shall:

- a.) Permit the observer to go on-board the vessel to perform the designated duties. This would include providing access to the vessel's fish holds, freezers, and other fish storage areas at any time during the landing.
- b.) Allow the observer to inspect a hard copy of the Shrimp Trawl Harvest Logbook upon completion of each verification.
- c.) Provide the observer with such assistance as is reasonably necessary to enable the observer to perform those duties.

Harvesters fishing within SMAs 124OFF and 125OFF must land their catches at one of the following approved designated landing ports; Ucluelet, Tofino, Zeballos, Gold River, Winter Harbour, or Coal Harbour.

Detailed data and reporting standards for the dockside validation program are outlined in Appendix 14: 2022/23 Shrimp Trawl Data and Reporting Standards.

6.3. Dockside Observations for Catch Verification

The service provider will conduct dockside observations for catch validation during 2022/23 to verify shrimp landing weights, species composition, and quality against hailed or otherwise reported figures. Biological samples may also be requested for use in the stock assessment program. The program includes 20 random days defined as opportunities present themselves.

Under Section 47 of the *Fishery General Regulations*, the vessel master of the licensed vessel shall:

- a.) Permit the observer to go on-board the vessel to perform the designated duties. This would include providing access to the vessel's fish holds, freezers, and other fish storage areas at any time during the landing.
- b.) Allow the observer to inspect a hard copy of the Shrimp Trawl Harvest Logbook upon completion of each verification.
- c.) Provide the observer with such assistance as is reasonably necessary to enable the observer to perform those duties.

6.4. Assistance to Observers

Under Section 46 of the *Fishery (General) Regulations*, the vessel owner or master of a fishing vessel shall, at the request of the Regional Director General, permit an observer to go on-board that vessel to perform the designated duties for the period of time specified and arrange for the embarkation or disembarkation of the observer, at such time and place as is specified. The vessel master shall provide all reasonable assistance to the observer, including:

- a.) Providing a suitable work area, including a table and adequate lighting;
- b.) Providing, at the request of the observer, information relating to any matter mentioned in subsection 61(2) of the *Fisheries Act*;
- c.) Providing, at the request of the observer, the position of the vessel in latitude and longitude;
- d.) Facilitating the sending and receiving of messages by means of the communications equipment on board the vessel;
- e.) Giving access to all areas of the vessel involved in fishing, processing and storage operations;
- f.) Permitting the taking of samples free of charge;
- g.) Providing suitable storage facilities for samples;
- h.) Assisting, at the request of the observer, in the examination and measurement of fishing gear on board the vessel;
- i.) Permitting the taking of photographs of the fisheries operations, including fishing gear and equipment;
- j.) Permitting the removal from the vessel of samples, records, photographs or film taken or made on board the vessel; and
- k.) Where the observer is on board for more than four consecutive hours, providing food and accommodation equivalent to that provided to officers of the vessel.

Fishery closures will be implemented if the level of sampling and observer coverage required for the proper management and control of the fishery has not been achieved. Vessel owners or vessel masters that fail to comply with the request to take on board an observer are subject to prosecution under the *Fisheries Act*.

6.5. Catch Sampling Program

A Catch Sampling Program will be undertaken by dockside and at-sea observers or catch monitors to collect biological samples of shrimp for size and age analysis, and to assess the composition of the catch for both shrimp and non-target species. This information is necessary for the proper management of the fishery, and for the stock assessment program. Fishing closures will be

implemented if the level of catch sampling coverage required by the Department has not been achieved.

Licence holders are responsible for arranging at-sea observer coverage. Within SMA 124OFF and 125OFF 100% at-sea observer coverage will be required to monitor all fishing activity. Within SMAs 23IN and 23OFF&21OFF licence holders must arrange for at-sea observer coverage on 25% of all fishing days. In addition, licence holders shall arrange for an additional 20 days of at-sea observer coverage to be available for deployment in other SMAs along the coast.

During the fishing season, vessel owners will be responsible for arranging at-sea observer coverage with a Fisheries and Oceans Canada certified observer. Observers will be distributed coast-wide to monitor catch onboard vessels and in some instances to collect biological information or samples.

Data bycatch summaries and trip reports from all at-sea observer trips must be provided to DFO within five (5) days following the completion of the fishing trip. The Department may implement in-season closures to the fishery if data delivery timelines are not met by the licence holders or service provider.

6.5.1. Selection of Vessels for Catch Sampling Program

During the course of the season, certified shrimp fishery observer coverage is required as part of the catch sampling program. Vessels will be selected for catch sampling depending on sampling requirements by area and time period. In SMA 124OFF and 125OFF 100% at-sea observer coverage is required. In SMAs 23IN and 23OFF&21OFF a minimum of 25% of all fishing days shall be monitored by at-sea observers. Twenty (20) additional days of observer coverage will be required in other areas of the coast. The actual days targeted for coverage will be determined in-season according to area fished, gear, fishing effort, month, and the need for biological samples.

It is a Condition of Licence that vessel masters arrange for observer coverage prior to leaving the dock to start fishing activities for every day of fishing activity. For vessels that are not deemed to require an observer on that particular trip, the service provider will issue an exemption at the time of hail-in. The shrimp information line will provide updates on the outstanding requirements for observer coverage in priority areas. Fishery closures will be implemented if the level of observer coverage required for the proper management of the fishery has not been achieved.

6.5.2. Shrimp Samples for Biological Sampling

Observers, catch monitors, or patrol vessels from Fisheries and Oceans Canada may also approach vessels, while at a dock or at-sea while fishing, to request samples of shrimp or to collect other catch information. Detailed information may be requested concerning the location, depth and area of catch, gear type, bycatch reduction devices, preferred cod end mesh size, bycatch species and marketing of the shrimp sampled. Fisheries and Oceans Canada, industry associations and the STSC ask for the co-operation of fish harvesters and processors in providing biological samples and other catch information. These samples will provide the information such as shrimp species in the catch, strength of age classes, location of shrimp stocks, number of egg-bearing female shrimp, and preferred mesh size or gear.

6.6. Individual Vessel Eulachon Bycatch Limit

An individual vessel Eulachon bycatch limit pilot program for SMAs 124OFF and 125OFF will be implemented for the 2022/23 season. A maximum of 250 lb per year of Eulachon bycatch would

be authorized under this pilot for each ‘S’ and ‘FS’ vessel fishing within SMAs 124OFF and 125OFF. Each vessel will have an individual vessel Eulachon bycatch limit listed on their licence conditions. Eulachon may not be retained. All eulachon bycatch must be discarded.

Vessels fishing within SMAs 124OFF and 125OFF will also require 100% at-sea observers on-board during all fishing operations. At-sea Observers will record and track total Eulachon catch for the vessel. Once a vessel reaches their individual vessel’s limit, that vessel may no longer fish within SMAs 124OFF and 125OFF for the remainder of the licence year.

6.7. Shrimp Trawl Harvest Logbook Data

An important component of the stock assessment program is the information collected from the vessel master in the form of a Shrimp Trawl Harvest Logbook. In-season adjustments to catch ceilings rely on information collected from these logbooks. Vessel masters and processors are encouraged to submit logbook information early (e.g. following each trip), to ensure more timely analyses and assessments that may result in further fishing opportunities. Timely submission of logbooks is particularly important for assessing WCVI fishing opportunities.

The vessel master/licence holder is responsible for the provision and maintenance of an accurate record, a “log,” of daily harvest operations. This Shrimp Trawl Harvest Logbook must be completed and a copy submitted in both hard copy (paper) and electronic form in an approved format as defined by Fisheries and Oceans Canada Stock Assessment and Research Division’s Shellfish Data Unit.

To fulfil stock assessment objectives it is imperative that a very fine resolution of fishing location be reported in this fishery. The vessel master/licence holder is responsible for reporting latitude/longitude position on harvest logs in the “location” field for each “tow” undertaken.

Logbooks meeting the requirements of the Department are available from service providers who, for a fee, will provide the logbook coding and data entry service, thus complying with the requirements for a hard (paper) copy and an electronic copy of harvest data.

The original white page copy of the logbook and the electronic copy must be forwarded within 28 days following the end of each month in which fishing occurred. This information must be sent to:

Fisheries and Oceans Canada
Shellfish Data Unit
Pacific Biological Station
3190 Hammond Bay Road
Nanaimo, BC V9T 6N7
Tel: (250) 756-7022
Email: PACSDU@dfo-mpo.gc.ca

As an alternative to logbook provision through a service provider, the vessel master/licence holder may provide a hard copy logbook in the same form and providing the same particulars as shown in the logbook sample attached as Appendix 6: Example of Shrimp Trawl Log (Harvest Logbook) Record. The vessel master/licence holder must also provide an electronic copy of the harvest data, which is required to be a true and accurate transcription of the hard copy data, delivered to the Shellfish Data Unit on Shellfish Data Unit approved media. Submissions will remain the property

of Fisheries and Oceans Canada. The electronic copy must be a database table of specific design created by Microsoft Access 2016 (or earlier version).

Contact the Shellfish Data Unit at the above address to obtain the requirements and acceptable data formats for supplying logbook and electronic data in a format that meets the Conditions of Licence. The paper copy of the logbook and the electronic data must be forwarded within 28 days following the end of each month in which fishing occurred. This information must be sent to the above address.

Catch information must be recorded in the Shrimp Trawl Harvest Logbook by midnight of the day of fishing. The logbook must be kept aboard the licensed vessel. Logbooks must be produced for examination on demand of a fishery officer, guardian, or a fishery observer designated under the *Fisheries Act*.

Fisheries and Oceans Canada reminds harvesters that logbooks must be completed accurately during fishing operations and submitted to the Department in accordance with the timing set out in the Conditions of Licence. Delay of completion or submission of logs is a violation of a Condition of Licence.

6.7.1. Gear Questionnaire

Gear information is collected on the harvest logbook sheets. A gear questionnaire may be filled out by an observer during catch verification or sampling. A gear questionnaire should be filled out and submitted for any significant change to the gear being used. A gear questionnaire may be included in the Shrimp Trawl Harvest Logbook or can be obtained from the Shellfish Data Unit by calling (250) 756-7022 or emailing PACSDU@dfompo.gc.ca.

6.7.2. Submission and Release of Logbook Data

The vessel owner/licence holder of record reported with the PFLU is responsible to ensure that the vessel master has completed and submitted a copy of the harvest log data. The Department can only release logbook data to the reported vessel owner/licence holder and only upon written request.

6.7.3. Nil Report for Logbook - Licence Issued but not Fished

In the event that a licence is issued but not fished, the vessel owner/licence holder is responsible for submitting a Nil Report for the season. The Nil Report must be submitted prior to the issue of approval for licence renewal. One page from the logbook identifying the vessel, licence tab number, and the year with “Nil” entered in the body of the logbook and signed by the vessel owner/licence holder constitutes a Nil Report. The exception to the Nil Report requirement is when the licence issued is ‘Option N – Schedule II fishing only’. A Nil Report for the ‘Option N’ licence is not required.

6.7.4. Confidentiality of Data

Harvest data, including fishing location data supplied through latitude/longitude coordinates, collected under the harvest logbooks for shellfish fisheries programs, are used by the Department in the proper assessment, management, and control of the fisheries. Upon receipt by the Department of harvest data and/or fishing location information, supplied by the fish harvester in accordance with Conditions of Licence, Section 20(1)(b) of the *Access to Information Act* prevents the Department from disclosing to a third party, records containing financial, commercial, scientific or technical information that is confidential information. Further, Section 20(1)(c) of the

Act prevents the Department from giving out information, the disclosure of which could reasonably be expected to prejudice the competitive position of the licence holder.

6.8. Fish Slips

An accurate written report shall be furnished on a fish slip of all fish and shellfish caught under the authority of the licence. A report must be made even if the fish and shellfish landed are used for bait, personal consumption, or otherwise disposed. The written report shall be posted not later than seven days after the offloading and sent to:

Fisheries and Oceans Canada
Regional Data Unit
200 - 401 Burrard St.
Vancouver, BC V6C 3S4

Fish slip books may be purchased at the above address, or at most Fisheries and Oceans Canada offices. Phone (604) 666-2716.

6.9. Customs Requirements When Fishing Offshore

Fisheries and Oceans Canada cooperates with the Canadian Border Services Agency (CBSA) in the administration of programs under the *Coastal Fisheries Protection Act*. The Regulations covering the authority are under the *Oceans Act* and a result of Canada's being signatory to the 1982 UN Convention on the Law of the Sea.

Shrimp trawl vessels fishing more than 12 nm offshore should refer the specific memorandum outlining the requirements under D3-5-1 ISSN 2369-2391 August 4, 2015. Details and contact information for CBSA can be found at the website: <http://www.cbsa-asfc.gc.ca/publications/dm-md/d3/d3-5-1-eng.pdf>

6.10. Processing Requirements Prior to Export

A Safe Food for Canadians licence issued by the Canadian Food Inspection Agency may be required for activities conducted by fishers for export or interprovincial trade. As explained in Section 5.11 of "Food business activities that require a licence under the Safe Food for Canadians Regulations", a licence is required by fishers if you:

- Manufacture, process, treat, preserve or grade fish; and/or
- Package and label fish (unless it is not consumer pre-packaged, and will be subsequently manufactured, processed, treated, preserved, graded, packaged or labelled by a licence holder in another province).

See CFIA web pages:

<https://inspection.gc.ca/food/requirements-and-guidance/food-licences/food-business-activities/eng/1524074697160/1524074697425#a511>

Glossary items: [manufacture](#), [process](#), [treat](#), [preserve](#) or [grade](#) fish, [package](#) and [label](#).

A licence is not required to conduct activities that are necessary to protect the fish you catch or harvest from contamination, damage and spoilage. These are handling practices associated with catching, harvesting, unloading, holding and moving fish. With respect to shrimp, this includes:

- freezing whole shrimp on a vessel
- holding fish in containers

- icing whole shrimp
- refrigerating
- rinsing whole shrimp

Information on the requirements for licensing under the *Safe Food for Canadians Act* and Regulations can be found at: <https://inspection.gc.ca/eng/1297964599443/1297965645317>

Information on exporting food from Canada can be found at:
<https://inspection.gc.ca/food/exporting-food/eng/1323723342834/1323723662195>

If you require a Safe Foods for Canadians Licence, please contact the CFIA. More information on the *Safe Food for Canadians Regulations* and licensing can be found on the CFIA website:
<https://inspection.gc.ca/food/requirements-and-guidance/eng/1512149634601/1512149659119>

To apply for a licence, please go to:
<https://inspection.gc.ca/food/requirements-and-guidance/food-licences/eng/1523876882572/1523876882884>

CFIA – Burnaby
150-3001 Wayburne Dr.
Burnaby, B.C.
V5G 4W3
(604) 666 9904

CFIA – Victoria
103 – 4475 Viewmont Ave.
Victoria, B.C.
V8Z 6L8
(250) 363 3618

CFIA - Parksville
457 E. Stanford Ave.
Parksville, B.C.
V6P 1V7
(250) 248-4772

7. SELECTIVE FISHING PRACTICES

7.1. LED Lights

The vessel master shall ensure that vessels fishing for shrimp by trawl use footrope lighting devices (LEDs) on their trawl nets in all shrimp trawl management areas of the coast. At all times when the trawl net is in the water:

- (a) the lighting devices must be operational;
- (b) lighting devices are emitting a light;
- (c) lighting devices are securely attached within 6 inches (15.24cm) of the forward leading edge of the bottom panel of trawl netting; and
- (d) each trawl net has a minimum of five (5) lighting devices spaced along the central portion of the net.

7.2. Selectivity Devices

The shrimp trawl industry, through the STSC and with the support of industry associations and the Department, recommended that selectivity devices (also known as exclusion gates, excluders, soft mesh excluders or Bycatch Reduction Devices) be mandatory as a Condition of Licence. Fisheries and Oceans Canada commends the shrimp trawl industry's initiative in fishing selectively and taking active measures to reduce bycatch. Each trawl net used shall have an exclusion grate (or

Nordmore grate) inserted into the forward end of the cod end of the trawl net at an angle so that it entirely blocks access to the cod end, except for the spaces between the bars. A maximum spacing of 31.75 mm (1.25 inches) on the rigid grate has been implemented as a Condition of Licence for all fishing areas other than Pacific Fisheries Management Areas 21, 121, 23-8 to 23-11, 123, 124, 125, and 127. Within Pacific Fisheries Management Areas 21, 121, 23-8 to 23-11, 123, 124, 125, and 127 the maximum spacing is 19 mm. The netting directly above the grate shall have a triangular opening (escape hole) the full width of the grate.

The shrimp trawl industry has undertaken directed studies and efforts to minimize Eulachon bycatch. Preliminary results from a twin trawl comparison study are encouraging and have led to an industry recommendation that a panel of plastic lattice be installed in all otter trawl nets beginning in 2001 to reduce the incidence of Eulachon and other bycatch. It is anticipated that bycatch of Eulachon will be reduced significantly and that fishing opportunities should be extended with the use of this material. The plastic lattice is similar to the material used in snow fencing. The plastic is rigid enough to maintain a minimum 4 cm square opening while being towed to allow small fish to escape. The lattice is available in four foot wide rolls and is inexpensive. A four foot by 12 foot (48 square feet) panel was tested during the twin trawl studies. Vessel masters already using this material are convinced of its capabilities in reducing bycatch of many species and have installed more than 4.4 square metres in their nets. The STSC has recommended that more than 4.4 square metres (48 square feet) be installed. Please contact the industry representatives to the STSC (see Appendix 3) for further information on installation and sources for this material.

7.3. Experimenting with Selectivity Devices

Fish harvesters are encouraged to conduct formal experiments with various gear configurations and amended Conditions of Licence are defined to permit testing of different gear combinations. Experimentation with selectivity devices that differ from those described in the conditions of the shrimp trawl licence will be made possible through an application for amended Conditions of Licence of shrimp trawl licence or through a scientific licence.

Those fish harvesters wishing to experiment during open times may apply for amended Conditions of Licence to the shrimp trawl licence by submitting a proposal to the Shrimp Trawl Manager or Science Branch Advisor (see Appendix 3). The proposal shall include a description of the proposed experimental gear and will require that the vessel master agree to take an observer or catch monitor on board upon request from the Department while fishing under authority of the amended Conditions of Licence. Experimental testing should be structured and conducted such that the data or outcome of the experiment can be reviewed.

Prior to issuance, the vessel master must provide a letter from a catch monitoring service bureau to Fisheries Management personnel stating that arrangements for one day of certified shrimp observer coverage have been made. This letter shall accompany the application for a renewal. Cost of observer coverage is the responsibility of the vessel owner.

Those fish harvesters wishing to experiment with selective fishing devices during closed times or interested in pursuing a special project or initiative concerning selective fishing, developing increased value to the fleet, new management approaches, fishing in unconventional time, area, etc., will be required to apply for a scientific licence. There is special consideration given to experimentation during close times as areas are allocated TACs. Prior to the Department issuing a

scientific licence, the Selective Fishing subcommittee of the STSC will review the proposal and make a recommendation to the Department for the study to be undertaken under scientific licence. Exploratory or experimental projects or initiatives should be planned well in advance of proposed implementation so that effective planning and approval can take place. Full time observer or catch monitoring coverage will be required. The Department will approve the observer or catch monitor prior to issuance of a scientific licence. Costs of the observer coverage are the responsibility of the project proponents. It should be noted that all special projects will have to be evaluated for conflicts with recent court cases regarding the Minister's authority regarding use of fish. Catch that is a target species with catch ceilings defined will be accumulated against the current catch ceiling. Where no catch ceiling has been defined, the project will be assessed against the New Emerging Fisheries Policy, before approval of fishing activity.

7.4. Future Standards for Selectivity Devices

Future standards for selectivity devices will be determined in consultation with the Department and the Industry Caucus of the STSC. Those selectivity devices that are deemed acceptable and desirable will be defined as a Condition of Licence for fishing shrimp with trawl gear. Fish harvesters that have found experimental selectivity devices to be effective are advised to submit a report to the Department (See Resource Managers and Science contacts in Appendix 3) for consideration in developing standards. The report should provide details on testing of the device and demonstrate the value of the device as legitimate selectivity gear.

7.5. Selective Fishing Practices

Fish harvesters are asked to avoid areas where there is bycatch of those species not permitted to be retained by the conditions of the shrimp trawl licence.

The ongoing Catch Sampling Program will collect information for the evaluation of selective fishing practices. Anyone who would like to provide information or feedback on bycatch and selectivity devices should contact the Selective Fishing Subcommittee. Bycatch information collected through the Catch Sampling Program, and other directed studies, will be consolidated for review by the Selective Fishing Subcommittee and the STSC. The gear questionnaire included in the Shrimp Trawl Harvest Logbook is an important component of this study and fish harvesters are reminded to submit a completed questionnaire as part of the logbook Conditions of Licence. Results of the catch sampling program are available in the document: Estimated bycatch in the British Columbia shrimp trawl fishery (Olsen *et al.* 2000), for 1997, 1998 and 1999 is available from the Canadian Scientific Advice Secretariat at: <http://www.isdm-gdsi.gc.ca/csas-sccs/applications/Publications/index-eng.asp>

Based on a recommendation from the STSC, the use of mechanised devices (e.g. “smelt belts”) for the purposes of automatically separating bycatch from shrimp has been prohibited. Smelt belts can be described as on board bycatch-discarding machines that use a series of sandpaper belts to separate small fishes, such as smelts, from shrimp. The texture and slope angle of the belt allows the fish to travel up the belt and be discarded overboard while shrimp, having a hard exoskeleton, do not adhere to the belt and roll to the bottom of the machine. Smelt belts come in different sizes and configurations, generally made of aluminium and powered by several small hydraulic motors, which turn the belts. Smelt belts are not to be confused with conveyor belts that are used simply to move shrimp on deck, or grading machines (series of slotted trays) used to grade shrimp into different sizes to maximize value, although they may be used in conjunction with grading

machines. Smelt belts are not as commonly used in B.C., as they may be in other jurisdictions. In particular, the B.C. shrimp trawl industry does not support high bycatch of Eulachon and believes that allowing the use of these devices may overcome the usual incentives to avoid fishing in areas with high Eulachon bycatch.

The Shrimp Trawl Industry Caucus recommends that on-board shrimp sizing graders be allowed only with certain restrictions on mesh size and use of selectivity devices for shrimp size in the trawl. The shrimp industry supports and recommends that in-water shrimp sizing grates be installed in all nets to reduce the incidence of juveniles in the catch and improve market quality and value.

The shrimp industry supports responsible fishing practices, including the recommendation that larger, better quality and better-valued shrimp be targeted, and that juvenile shrimp be avoided. To reduce the incidence of fishing on undersize and unmarketable shrimp, minimum shrimp counts (i.e. a shrimp count per pound or per litre) are under consideration. The shrimp trawl industry representatives recommend the use of in-water shrimp sizing devices to reduce the incidence of small unmarketable shrimp and improve the value of the catch. The use and effectiveness of on-board graders and “pickers” will be evaluated and additional restrictions may be implemented in the future.

8. GENERAL INFORMATION

Commercial Vessels Engaged in First Nation’s Food Fisheries

Commercial vessels participating in First Nations’ food fisheries authorized under an Aboriginal communal licence are required to carry a letter of designation from the appropriate First Nation’s Organization office and to follow the conditions of the communal licence. Fisheries and Oceans Canada must be notified 24 hours prior to fishing when commercial vessels are harvesting under authority of a communal licence. Notification to the Conservation & Protection field supervisor is a requirement of the individual communal licence.

Human Waste Containment on Commercial Vessels

Disposal of human waste into waters where shellfish are harvested or adjacent to shellfish harvest areas creates unnecessary and potentially serious health risks for shellfish consumers. In accordance with the Canadian Shellfish Sanitation Program (CSSP) and Transport Canada Regulations, raw sewage (Human wastes, sewage or refuse) shall not be discharged from vessels while in or adjacent to shellfish areas. Vessels operating at a distance which does not allow for timely access to on-shore washroom facilities are expected to have a designated human waste receptacle on board. Receptacles could include a portable toilet, a fixed toilet, or other containment device as appropriate. Such devices must be made of impervious, cleanable materials and have a tight-fitting lid. (Refer to Transport Canada’s *Vessel Pollution and Dangerous Chemicals Regulations* under the *Canada Shipping Act*):

1. Portable toilets or other designated human waste receptacles shall be used only for the purpose intended, and shall be so secured and located as to prevent contamination of the shellfish area or any harvested shellfish on board by spillage or leakage.
2. The contents of toilets or other designated human waste receptacles shall be emptied only into an approved sewage disposal system.

3. Every person on-board a shellfish harvest vessel must wash and sanitize their hands after using or cleaning a waste receptacle, or after using an onshore washroom facility.

Information on Human Waste Containment Receptacle Requirements under the CSSP can be found at the following Canadian Food Inspection Agency internet site:

<https://www.inspection.gc.ca/preventive-controls/fish/cssp/questions-and-answers/eng/1563470479199/1563470589053>

1. CONSERVATION AND SUSTAINABILITY

Total Catch Reported By Shrimp Management Area

The hailed shrimp landings for the 2020/21 fishing season (April 1, 2020 to March 31, 2021) were 613.0 tonnes (t); 1,351,509 lb for all Shrimp Management Areas (SMA) (Table 1). Landings may change when outstanding logbook records are electronically recorded. Catch in-season is hailed in lb and recorded in logbooks in lb.

Table 1: 2020/21 Shrimp Trawl landings as reported by skipper hails in pounds by major shrimp area and SMA (* indicates less than 3 vessels reporting, data as of November 4, 2021).

SMA Group	ShrimpArea	Pink Shrimp	Sidestripe	Spot Prawn	Humpback	Coonstripe
North Coast	3IN	24,031	22,639			
	5IN	5,414	2,294		12,735	
	6IN	11,873	10,017	308	496	
	7IN				*	
	8IN	*	*			
	9IN	*	*			
	PRD	53,462	87,949			
West Coast	23IN	*	*			
Vancouver Island	23OFF	991,050	*			
Southern Inside Waters	12OUT	*	*		*	
	12IN	41,521	17,155		8,112	
	17	2,622	2,212		5,679	4,758
Total		1,170,302	148,999	308	27,142	4,758
Total All Areas		1,351,509				

The BC coast has been divided into 36 Shrimp Management Areas with catch ceilings defined for all SMAs with fishing opportunity and specific species catch ceilings defined when a species specific biomass can be defined from surveys.

Season Opening Catch Ceilings and In-season Surveys

At the start of the 2020/21 season, eight SMAs were closed with no fishing opportunity (SMAs 14, 16, 18, 19, 124OFF, 125OFF, GSTE, and FR) due to low biomass estimates or no survey in the previous year and no biomass forecast for 2020 and 'lowest catch ceiling in the last five surveys' included a closure. SMA QCSND remained closed due to concerns over Eulachon interactions. SMA 126OFF has not been surveyed and has not been open in recent years. In addition, SMAs 23IN and 23OFF&21OFF were also kept closed, pending the spring biomass survey. Although the pink shrimp biomass in these areas in 2019 had been the highest ever, it was anticipated that this shrimp might move northwards in the following year, a pattern that had occurred previously, so the areas were not opened early in the season. The forecast biomass at the 25% risk level (risk of the true biomass being lower than the forecast biomass) for pink shrimp in SMAs 23IN + 23OFF&21OFF was low, due to the 5 year averaging procedure and very low

biomass estimates in 2018 and 2017 for this area. It was decided to wait for the 2020 shrimp biomass estimate to open these areas.

The COVID 19 pandemic was confirmed to have reached Canada on January 27, 2020, with the first case of community transmission in British Columbia confirmed on March 5. In mid-March 2020, as cases of community transmission were confirmed, all of Canada's provinces and territories declared states of emergency. Along with measures to limit the spread of COVID 19 all DFO offices were closed and Science activities limited to essential services. This resulted in cancellation of the spring shrimp biomass surveys in 2020 since the crew could not socially distance while conducting on board science activities.

SMA 124OFF and 125OFF were closed following the 2016 survey (as of June 21, 2016) due to pink shrimp biomass being below the Limit Reference Point and have not opened since even though surveys were conducted in 2017, 2018 and 2019. With no survey in 2020, these areas were not opened in 2020/21.

With no Science vessel program and no stock assessments, SMAs 14, 16, 18, 19, FR and GSTE remained closed. In consideration of the low harvest opportunity, the catch ceiling for SMA 12IN, originally based on the normal 25% risk level, was amended upwards in consideration of upward trending surveys and the 2019 biomass being the highest ever observed. The biomass forecast using the 50% level of true biomass being lower than the forecast was considered a safe level to use in this situation. This amendment to catch ceilings for SMA 12IN was announced August 20, 2020.

When it was determined that no stock assessment would be conducted for WCVI, SMAs 23IN and 23OFF&21OFF were opened based on the 50% risk level forecast. The resulting catch ceilings were not huge, but enough to justify maintaining the 25% at-sea observer program. These areas opened September 8, 2020. The delay in opening permitted refinement of At-Sea Observer programs at AMR to ensure they met the COVID 19 restrictions. SMA 23OFF&21OFF closed Oct 8, 2020 when the catch ceiling for pink shrimp was reached.

Later in the season, a Science program was defined to enable a shrimp survey for SMA PRD for September 10 to 20, 2020. A stock assessment was conducted and the pink shrimp and Sidestripe shrimp biomasses were found to be in the Healthy Zone. The area was opened October 28, 2020.

The in-season catch estimates hailed by skippers (Shrimp Trawl Landings Quota Status Report) are provided by the service provider, AMR, to the industry each week. These catch estimates are used to monitor the effort and in-season management actions are based on these numbers. As of April 9, 2021, the catch on the final 2020/21 Landings Quota Status Report was 1,351,509 lb (Table 2). As of November 29, 2021 logbook data for Jan, Feb and Mar 2021 has not been electronically entered into the logbook database so the skippers' hailed landings estimates are used in this Post Season Review since the logbook data does not include the full season.

Table 2: Shrimp trawl initial catch ceilings, catch ceilings after survey as of Nov 15 and landings for 2020/21 by SMA and species in lb as reported by skipper hails (*indicates landings are confidential - less than 3 vessels reporting).

Shrimp Management Area	Species	Initial Catch Ceiling t	Catch Ceiling Nov 15 or After Survey t	Catch Ceiling After Survey lb	Hailed Landings lb
North Coast					
10IN	All Species Combined	10	10	22,050	
2IN	All Species Combined	10	10	22,050	
3IN	All Except Sidesripes	13	13	28,660	24,031
3IN	Sidesripes	14	14	31,526	22,639
5IN	All Species Combined	10	10	22,050	20,443
5OFF	All Species Combined	10	10	22,050	
6IN	All Species Combined	10	10	22,050	22,694
6OFF	All Species Combined	25	25	55,120	
7IN	All Species Combined	10	10	22,050	110
8IN	All Species Combined	10	10.0	22,050	155
9IN	Sidesripes	16.5	16.5	36,376	*
9IN	All Except Sidesripes	25.8	25.8	56,879	*
DXE	All Species Combined	10	10	22,050	
PRD	Sidesripes	90.3	278.1	613,099	53,462
PRD	All Except Sidesripes	195.5	451.9	996,259	87,949
QCI	All Species Combined	25	25	55,120	
QCSND	All Except Sidesripes			Closed	
QCSND	Sidesripes			Closed	
Total North Coast	All Species Combined	485.4	929.6	2,049,439	237,326
South Coast					
11IN	All Species Combined	10	10	22,050	
124OFF	All Species Combined	0	0	Closed	
125OFF	All Species Combined	0	0	Closed	
126OFF	All Species Combined			Closed	
12OUT	All Other Species	4	4	8,818	*
12OUT	Sidesripes	8	8	17,637	*
20	All Species Combined	10	10	22,050	
23OFF	&21OFF Sidesripes	0	7.4	16,241	*
23OFF	&21OFF All Except SS	0	406.3	895,622	991,050
24IN	All Species Combined	10	10	22,050	
25IN	All Species Combined	10	10	22,050	
26IN	All Species Combined	10	10	22,050	
27IN	All Species Combined	10	10	22,050	
27OFF	All Species Combined	25	25	55,120	
Total South Coast	All Species Combined	97.0	510.7	1,125,738	991,052
Sothorn Inside Waters					
12IN	All Except HB & SS	141.3	350.0	771,610	41,596
12IN	Humpbacks	12.5	20.0	44,092	8,122
12IN	Sidesripes	32.4	30.0	66,138	17,165
14	Sidesripes	0	0	0	
14	All Except Sidesripes	0	0	0	
16	All Except Sidesripes	0	0	0	
16	Sidesripes	0	0	0	
17	All Species Combined	8	8	17,637	15,271
18	& 19 Coonstripes Combined	0	0	0	
18	& 19 Pinks Combined	0	0	0	
18	& 19 Sidesripes Combined	0	0	0	
23IN	All Except Sidesripes	0	74.7	164,684	40,200
23IN	Sidesripes	0	3.6	7,937	*
FR	All Except Sidesripes	0	0	0	
FR	Sidesripes	0	0	0	
GSTE	Sidesripes	0	0	0	
GSTE	All Except Sidesripes	0	0	0	
Total S. Inside	All Species Combined	194.2	486.3	1,072,097	123,131
	Total Coastwide	776.6	1,926.6	4,247,274	1,351,509
See Notes: Landings Higher Than Catch Ceilings Following Surveys					

Random dockside observations are included in management measures as a means to monitor discrepancy between hailed catch and logbook landings, however, scheduling observer deployment and difficulties in estimating total catch at the dock have resulted in few dockside observations. The budget for the dockside program is often used for at-sea observations to maintain coverage for priority areas. No dockside observations were conducted in 2020/21. Logbook records are not entered for Jan, Feb, Mar 2021 as of the time of finalizing this document.

Changes to Catch Ceilings Following Surveys

Initial catch ceilings are defined following the Precautionary Approach (See IFMP Appendix 1 Section 2.4 Setting Catch Ceilings) and adjusted in-season if a survey provides a biomass estimate of shrimp by species. For offshore West Coast Vancouver Island (WCVI) areas 124OFF, 125OFF and SMA PRD if hailed catches in the previous year are low compared to catch ceilings – 30% of previous year’s catch ceiling remaining – the areas may be open April 1 - called “early openings” should industry make a request. These criteria were not met for 2020, since the previous surveys for WCVI SMAs (except SMA 23OFF&21OFF and 23IN) indicated significant declines and the pink shrimp biomasses were in the Critical Zone. There was no early opening in SMA PRD since the area was closed in 2019 and a stock assessment was planned for 2020.

Initial catch ceilings from biomass forecasts permit areas to open June 1 coastwide, then the catch ceilings are adjusted following surveys and stock assessments. The areas that had shrimp biomasses in the Critical Zone following surveys in 2019 did not open in 2020/21 until/unless a stock assessment was completed.

At the start of the 2020/21 season, ten SMAs were closed with no fishing opportunity (SMAs PRD, 14, 16, 18, 19, 124OFF, 125OFF, GSTE, and FR) and since there were no surveys most were not opened. There was a delay in opening SMAs 23IN and 23OFF&21OFF until fishing opportunity was made available on September 8, 2020 based on higher risk forecast procedures and at-sea observer protocol following COVID 19 Health Guidelines.

The only DFO survey conducted for 2020 was for SMA PRD (Table 3). Since the pink shrimp biomass in the 2019 survey was determined to be in the Critical Zone, the area was closed at the beginning of the season. SMA PRD was surveyed September 10 to 20. The bulletin can be requested from Resource Managers. The lack of fishing opportunity was an issue for industry, prompting participation in a survey in addition to the scheduled DFO surveys. Industry interest in defining a fishing opportunity in the Strait of Georgia resulted in an industry survey conducted January 12 to 16, 2021 in SMA GSTE. The biomasses for both pink and Sidesripe resulting from the survey were below the Limit Reference Points, and no fishing opportunity was provided. The survey in GSTE was conducted with an industry vessel and net and therefore no abundance trends are reported.

Table 3: Shrimp biomass surveys in 2020/21 by SMA and species, changes to catch ceilings following surveys and stock status (Healthy, Cautious or Critical Zone) according to the Provisional Harvest Control Rules compliant with the Precautionary Approach (PA), and last survey year.

Survey Date 2020	SMA Surveyed	Species	Change in Biomass Since Last Survey	PA Zone	Last Survey Year
Sep 20-21	PRD	All Except Sidesstripes	Increase	Healthy	2019
		Sidesstripes	Increase	Healthy	2019
Jan 12-16, 2021	GSTE (Industry Vessel)	All Except Sidesstripes	No Change	Critical	2019
		Sidesstripes	No Change	Critical	2019

Table 4. Initial catch ceiling, catch ceiling after shrimp biomass surveys in 2020, changes to catch ceilings following surveys, landings and final closure dates.

Survey Date 2020	SMA Surveyed	Species	Initial Catch Ceiling (t)	Change in Catch Ceiling (t)	Catch Ceiling After Survey (lb)	Landings (lb) (Hails)	Final Closure Date
Sep 10-21	PRD	All Except Sidesstripes	Closed	451.9	996,259	53,462	Mar-21
		Sidesstripes	Closed	278.1	613,099	87,949	Mar-21
Jan 12-16, 2021	GSTE (Industry Vessel)	All Except Sidesstripes	Closed		Closed		
		All Except Sidesstripes	Closed		Closed		

Catch ceilings adjusted after surveys accounted for 38% of the opportunity and resulted in 10% of the landings. Most of the catch ceilings were defined from forecasts or lowest catch ceilings from the last five surveys (50%) and landings in these areas accounted for 81% of landings. Arbitrary 10 t, 25 t and arbitrary catch ceilings from historical landings accounted for 13% of fishing opportunity and 8% of landings.

Landings Higher Than Catch Ceilings Following Surveys

Landings for the season were higher than the catch ceilings in the following SMAs. Notes are indicated in Table 1.

1. SMA 6IN All Species Combined. The area opened June 1 and up to six vessels were active. When hailed landings were almost at the catch ceiling the area was closed on July 6, 2020 and when final hauls were received the total landings were 7% higher than the catch ceiling (644 lb).
2. SMA 23OFF All except Sidesstripe Shrimp. The area opened September 8 and up to six vessels were active, and the area was closed October 6, 2020. When final hauls were received, landings were higher than expected in the two weeks prior to the closure (350,000 lb per week). The final hailed landings were 95,428 lb over the catch ceiling of 895,622 lb (11%).

Catch Ceilings With No In-season Survey

SMAs 23IN, 23OFF&21OFF, 124OFF, 125OFF, 14, 16, 18&19 and FR were on the list for surveys in 2020, however, due to the COVID 19 health orders, DFO staff were not permitted to be on a vessel until the fall. As a result, although SMA PRD had been surveyed in 2019 and usually

the survey is biennial, the area was chosen as the highest priority SMA. A survey in GSTE was conducted by an industry vessel in January 2021 with DFO biological technician support on board.

Catch ceilings for 22 SMAs were set based on a fixed 10 tonne, 25 tonne or long term average catch ceiling (these represented 13% of fishing opportunities after surveys for the coast). The catch ceilings in most of these areas were not reached (only SMA 6IN had enough effort to reach the catch ceiling) and the rest of these areas stayed open until March 31. The landings for these arbitrary areas was 8% of the coastwide total landings.

Fishing Effort

The number of vessels active in the shrimp trawl fishery peaked in 1996 at 238. The number of shrimp trawl vessels active declined to 45 in 2014/15, then due to high shrimp biomass in the West Coast Vancouver Island areas, 20 otter trawl vessels returned to the fishery with a total of 65 vessels active in 2016. The shrimp biomasses declined following the peak in 2016 and due to the many closed areas and lack of processing activity, the effort in 2020/21 was the lowest ever at 30 vessels out of a current 207 licensed vessels and 26 FS communal licences (Figure 1).

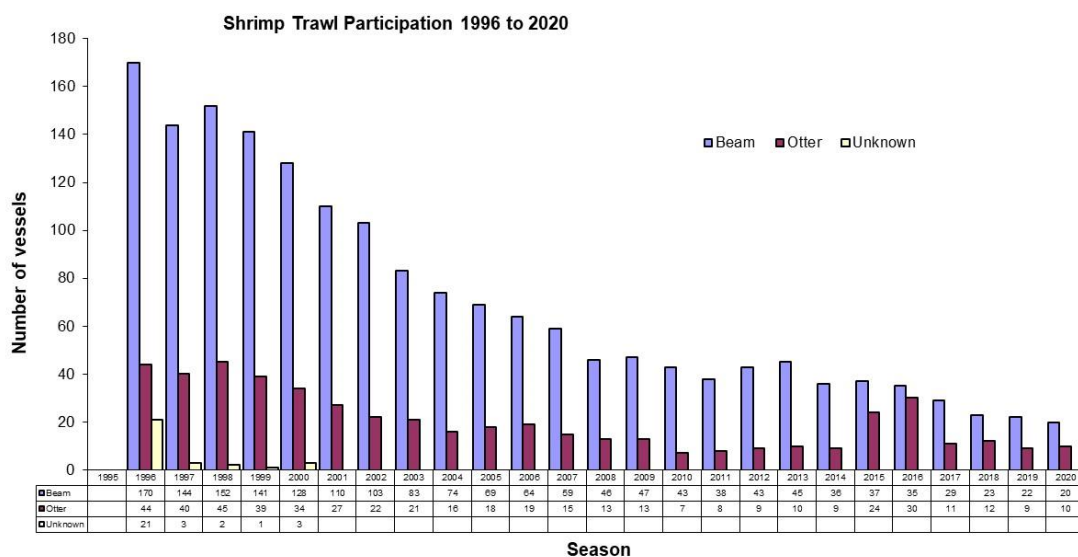


Figure 1. Number of Shrimp Trawl active vessels by gear type from logbook data by shrimp season 1996 to 2020.

Once an area opens, any licensed vessel is allowed to fish until a catch ceiling for any one species is reached. The coastwide Total Allowable Catch (TAC) for all species combined was 933.2 t, lower than record 2014/15 TAC of 21,725 t (Figure 2). Landings of 390.6 t did not reach the TAC and were below average as a result of many of the preferred areas being closed due to low shrimp biomass and with many shore markets closed and no hand peeling at seafood processing facilities.

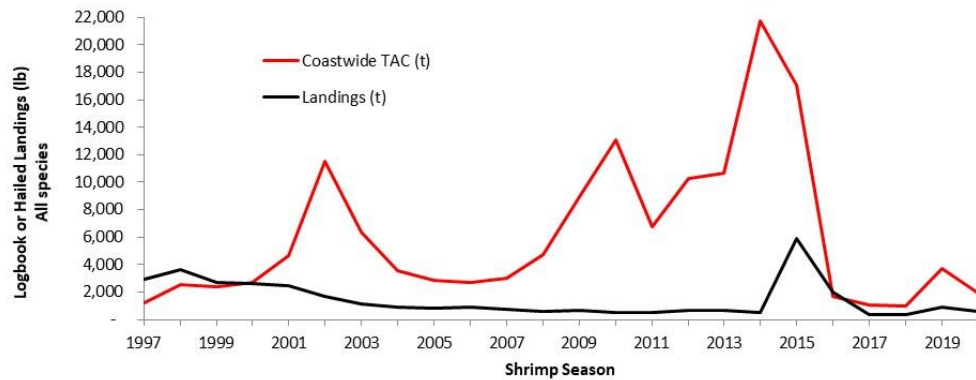


Figure 2. Shrimp Trawl Coastwide Total Allowable Catch (TAC) following surveys and landings from logbooks for all species combined for shrimp seasons 1996 to 2020. Landings for 1996 are Jan 1, 1996 to Mar 31, 1997; 1997 to 2020 are shrimp season (Apr 1 to Mar 31)

Weekly Effort

Weekly effort as measured in hailed landings varied from 1 to 13 vessels per week coastwide with the highest number of active vessels in the North Coast (Figure 5). A total of 30 vessels hailed to fish.

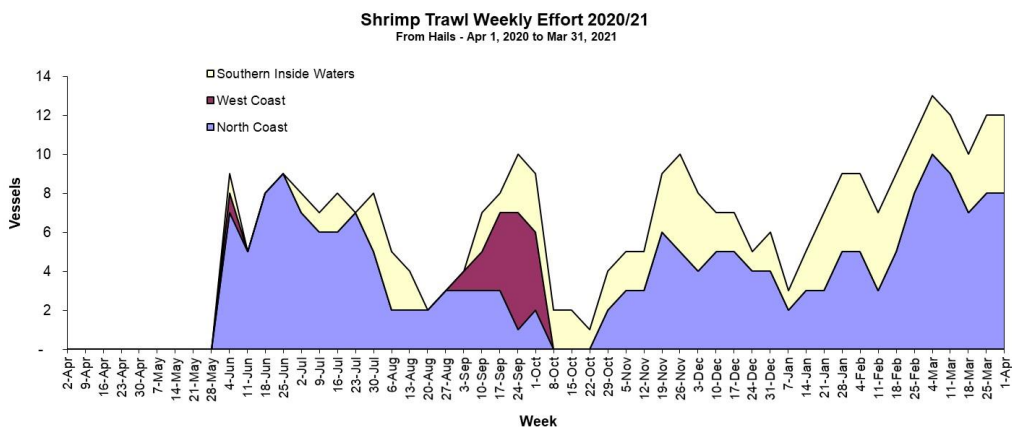


Figure 5. Number of S licensed vessels active in the B.C. shrimp trawl fishery in 2020/21 on a weekly basis for major groups of SMAs.

The West Coast Vancouver Island accounted for most of the landings (Figure 6). Although the areas were open, there was little to no activity in SMAS 2IN, 5IN, 5OFF, 6OFF, 7IN, 8IN, DXE, QCI, 10IN, 11IN, 20, 24IN, 25IN, 26IN, 27IN or 27OFF.

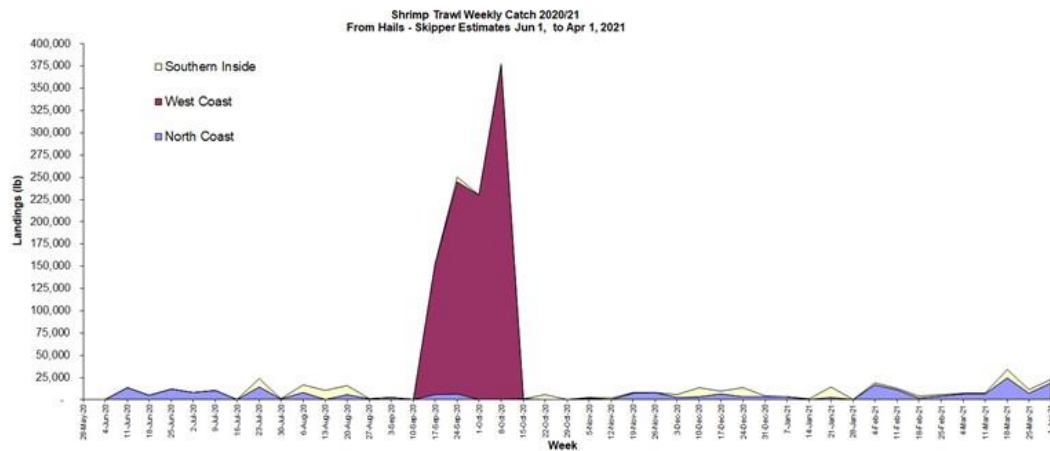


Figure 6. Shrimp trawl weekly catch from skippers hailed estimates for 2020/21 for all areas June 1, 2020 to March 31, 2021 grouped by North Coast, WCVI and Southern Inside Waters SMAs.

2. SOCIAL, CULTURAL AND ECONOMIC

The management of hails, landings, observer deployment, dockside observations, and logbook data entry was conducted by a service provider, Archipelago Marine Research Ltd. (AMR). AMR defined contracts for observer coverage for the area that the active shrimp harvesters intended to fish and defined a management fee to provide the services to meet the Department's fishery monitoring and reporting requirements. AMR defined contracts prior to a vessel obtaining a hail number to fish and identified to DFO which vessels had obtained a hail number on a weekly basis as part of the fishery reporting data delivery. DFO maintained responsibility for vessel licence renewal, stock assessment, catch monitoring and area management (opening and closing fishing areas by gear type based on landing hail reports) and enforced the conditions of licence.

The landed value of the 2020 shrimp trawl fishery was significantly lower than the previous years due to the reduced landings. The shrimp species targeted in 2020/21 in the North Coast were the higher value Sidesripe Shrimp (as indicated by the landings of Sidesripe being higher than pink shrimp in SMA 3IN and PRD in Table 1). The low fishing opportunity in Southern SMAs South of Port Hardy required that shrimp markets that were traditionally supplied with fresh shrimp would have to be supplied by frozen shrimp to be offered at places like Steveston. These markets were not opened when the Office of the Provincial Health Authority on May 14, 2020 required that workplaces required a Safety Plan that defined minimum requirements for social distancing in the workplace. The shrimp processing was also affected by the COVID 19 Health order requiring workplace Safety Plan requirements. As a result of these conditions, no shrimp cooked and hand peeling occurred in 2020.

In addition to impacts on the processing side, a Fisheries Management Order (April 2, 2020 and extended May 15, 2020) was announced that required specific conditions to ensure safe working procedures for at-sea observers. The result was that many vessels with limited deck and cabin space would not be a safe working environment for at-sea observers and therefore if observers were required, some vessels would not be given a hail to fish.

3. COMPLIANCE

Shrimp trawl vessels encountered during regular patrols were monitored for compliance with licensing and conditions of licence as time and opportunities presented. The Air Surveillance Program identified shrimp trawl vessels actively fishing and these vessels were checked for active fishing hail numbers.

4. ECOSYSTEM

At-sea Observer Sampling Goals

Low Eulachon returns to many of the rivers within British Columbia continues to be a concern. Priorities for the at-sea observer program for 2020/21 were defined as monitoring the interaction of vessels active in WCVI with Eulachon and monitoring fishing in inside waters.

The At-Sea Observer coverage required in the pilot areas of SMA 124OFF and 125OFF during the 2020/21 season was 100% of all fishing activity, however, these areas did not open due to low shrimp forecasts and very low biomass in the survey so this program was not required.

For SMAs 23OFF&21OFF and 23IN the coverage goal was 25% of all fishing days in these areas during the season and due to the COVID 19 plan defined by AMR, they were able to follow the monitoring program for these SMAs.

An additional 20 at-sea observer days was required to be funded and arranged by licence holders for deployment in other SMAs on the coast during the fishing year. DFO did not identify any significant management issues during the season and no deployments of ASO were requested. There were no at-sea observations in any other areas.

At-sea Sampling Results

SMA 23OFF&21OFF was opened September 8 with a catch ceiling of 895,622 lb of pink shrimp and 16,241 lb of Sidesripe Shrimp. Observers were deployed on approximately every fourth trip for most vessels. By end of September, there were 6 active otter vessels. At-sea observations were deployed on five of the six active vessels starting September 8 and continuing to October 6th. The hailed catch reached the pink shrimp catch ceiling and the area was closed October 6th. Final at-sea observer coverage obtained for SMA 23OFF was 20% of the total hails (113 sets – hails 991,052 lb). Observer coverage was obtained on the one of the four active vessels in SMA 23IN. No Eulachon were caught in the observed sets, and the observed vessel was responsible for 76% of the landings for SMA 23IN. The total landings observed in all at-sea observed trips (91.4 t or 202,402 lb) were 1.5% of the coastwide shrimp landings for 2020/21 (613 t or 1,351,509 lb). A total of 123 sets were observed (Table 6).

Table 6. At-sea observer coverage in the Shrimp Trawl fishery for WCVI SMAs for 2020/21.

SMA	Gear	Vessels Observed	Sets Observed	Tow Hours	Eulachon lb	Shrimp lb	Total Catch lb	Eulachon/Shrimp Ratio
23OFF	Otter	5 vessels	113	126.1	737.6	194,259	197,071	0.0038
23IN	Otter	1 vessel	10	5.1	0	*	*	0

Eulachon Bycatch Estimates WCVI

An Eulachon Action Level (EAL) for WCVI was defined to limit the Eulachon bycatch and encourage Eulachon avoidance. The EAL for 2020/21 was 4 tonnes. The EAL is further divided as 2 t for 124OFF+125OFF and 2 t for 23IN+23OFF&21OFF.

There was no fishing and no Eulachon bycatch occurred in SMAs 124OFF and 125OFF.

Pooled In-season Eulachon Bycatch estimate for WCVI was 1.7 tonnes (Table 8).

Table 7. Pooled In-season Eulachon Bycatch estimated WCVI 2020/21.

SMA	Trawl Type	Most Recent Eu/Shr Ratio	Hailed Landings lb	Pooled In-Season Eulachon bycatch lb		
23IN	Beam	0.0016	*	*		
	Otter	0.00	*	*		
23OFF	Beam		-	-		
	Otter	0.0038	991,052	3,763.3		
21OFF	Beam		-	-		
	Otter		-	-		
23IN+23OFF+21OFF TOTAL			1,032,029	3,771.4	lb	1.7 t
124OFF	Beam		-	-		
	Otter		-	-		
125OFF	Beam		-	-		
	Otter		-	-		
126OFF	Beam		-	-		
	Otter		-	-		
27OFF	Beam		-	-		
	Otter		-	-		
124OFF + 125OFF TOTAL			-	-	lb	-
WCVI TOTAL ALL AREAS			1,032,029	3,771.4	lb	1.7 t
* Confidential - less than 3 vessels reporting						
Eu/Shr Ratio	Sets	Source				
0.0016	n=20	2018/19 23OFF B at-sea observer coverage				
0.00	n=10	1 otter vessel 23IN 2020 out of 3				
0.0038	n=113	23OFF 2020 - five of six Otter vessels				

This estimate uses the non-verified at-sea observer trip reports (as recorded in lb at sea). Changes to the Eulachon to shrimp ratio may occur when the data has been proofed, verified and adjusted to kg in the ShrimpTrawlBio.mdb. Changes to the landings may be defined once logbook records are received and proofed.

Exploratory Fishing or Scientific Studies

No applications were received or licences issued for any scientific studies or experimental investigations for 2020/21.

APPENDIX 3: DEPARTMENTAL AND INDUSTRY CONTACTS

Observe, Record, and Report (Enforcement Line) (800) 465-4336
Fishery Notice Voice-information system (604) 666-2828 or (866) 431-3474
Shrimp Information Line (888) 978-7888
Fishery Notices online: <http://notices.dfo-mpo.gc.ca/fns-sap/index-eng.cfm>

Resource Management

Regional Resource Manager - Invertebrates	Lisa Mijacika	(604) 666-3869
Lead Shrimp Trawl Resource Manager	Guy Parker	(250) 756-7163
Regional Recreational Fisheries Coordinator	Greg Hornby	(250) 286-5886

North Coast Area (Areas 1 through 10)

417 2nd Avenue West

Prince Rupert, B.C. V8J 1G8

Resource Management Biologist, North/Central Coast	Coral Cargill	(250) 627-3021
Aboriginal Affairs Advisor	Melanie Anthony	dfo.ncap-pacn.mpo@dfo-mpo.gc.ca

South Coast Area (Areas 11 through 27)

3225 Stephenson Point Road

Nanaimo, B.C. V9T 1K3

Program Coordinator

Resource Management Biologist

Resource Manager - First Nations North East VI

Resource Manager - First Nations South East VI

Resource Manager - First Nations WCVI

A/Resource Management Biologist – Prawn and Shrimp by Trap

General Inquiries	(250) 756-7270
Fax	(250) 756-7162

Beth Pechter	(250) 756-7268
Dan Clark	(250) 756-7327
Kent Spencer	(250) 268-5886
Gerry Kelly	(250) 756-7122
Kevin Conley	(250) 756-7196
Mike Kattilakoski	(250) 756-7315

Lower Fraser/Interior Area, Areas 28 and 29

Unit 3, 100 Annacis Parkway

Delta, B.C. V3M 6A2

Resource Manager – Non-salmon Fisheries

General Inquiries	(604) 666-8266
Fax	(604) 666-7112

Hong Tjhie	(236) 330-3240
------------	----------------

Science Branch

Stock Assessment and Research (STaR) Division

Pacific Biological Station

3190 Hammond Bay Road

Nanaimo, BC V9T 6N7

Crustacean Program Head

Shrimp Biologist

Fax	(250) 756-7138
-----	----------------

Andres Araujo	(250) 713-0268
Virginia Noble	

Shellfish Data Unit email: PACSDU@dfo-mpo.gc.ca

Conservation and Protection

Compliance Plan	Fay Gin	(604) 664-9266
-----------------	---------	----------------

Commercial Fishing Licence Information

National On-line Licensing System (NOLS)		(877) 535-7307
Email: fishing-peche@dfo-mpo.gc.ca		

Fisheries Protection Program

		(866) 845-6776
--	--	----------------

Aboriginal Programs Directorate

Director	Duncan Stephen	(604) 666-6622
----------	----------------	----------------

Aquaculture Resource Management

Senior Shellfish Coordinator	Melinda Scott	(250) 356-5362
------------------------------	---------------	----------------

British Columbia Ministry of Agriculture, Food and Fisheries

Industry Specialist-Marine Fisheries	Darah Gibson	(250) 893-0260
--------------------------------------	--------------	----------------

Canadian Food Inspection Agency

Molluscan Shellfish Operations		(604) 666-3737
--------------------------------	--	----------------

BC Shrimp Trawlers' Association

President	Phil Burgess	(250) 954-9312
Email: frozen_at_sea@telus.net		

Pacific Shrimp Harvesters Association

Executive Director/Advisor	Dave Dawson	(604) 726-0449
PO Box 144		
Lantzville, BC V0R 2H0		
Email: ddawson@pacseafood.com		

Shrimp Trawl Service Provider

Archipelago Marine Research Ltd.	www.archipelago.ca	(250) 383-4535
Catch Monitoring	Jennifer Toole	
At-sea observer Coordinator	Ian Hamilton	
Catch Monitoring Hails	Matt Jessop	

SHRIMP TRAWL SECTORAL COMMITTEE

A consultative process exists for the shrimp by trawl fishery and is a major part of the planning for the fishery. The primary consultative body for shrimp by trawl is the Shrimp Trawl Sectoral Committee (STSC). This committee includes representatives from Fisheries and Oceans Canada, commercial licence holders, processors, First Nations, the Province of B.C., and others with an interest in the resource. The STSC meets annually to review and provide advice to the Department regarding management issues pertaining to the fishery and on the proposed management plan.

The STSC terms of reference and meeting calendar are available from the Resource Managers (see Contacts) or from the Department's consultation internet site at:
<http://www.pac.dfo-mpo.gc.ca/consultation/shell-crust/stsc-cspcc/index-eng.html>

The STSC was appointed in the Fall of 2021 for a three-year term (Fall 2021 – Fall 2024).

Elected S Licensed Vessel Owner Representatives

Phil Burgess	(Alternate)
Box 1022	To Be Determined
Parksville, BC V9P 2H1	
Tel: (250) 954-9312	
Email: frozen_at_sea@telus.net	

Troy Sawyer	(Alternate)
P.O. Box 916, 1070 Cold Water Road	To Be Determined
Parksville, BC V9P 2G9	
Tel: (250) 616-1399	
Email: offmyboat@gmail.com	

Tyson Wachsmuth
Email: Twachsmuth@dccnet.com

Steve Gillis
Email: steve_g@outlook.com

Processor Representatives - Shrimp Trawl Sectoral

Pacific Seafood	Dave Dawson	(604) -726-0449
Email: ddawson@pacseafood.com		

Hub City Fisheries	Roger Paquette	(250) 753-4135
262 Southside Drive		
Nanaimo, BC V9R 6Z5		
Email: rogerhubcityfisheries@shaw.ca		

APPENDIX 4: FISHING VESSEL SAFETY

TABLE OF CONTENTS

1.	OVERVIEW – FISHING VESSEL SAFETY	2
2.	IMPORTANT PRIORITIES FOR VESSEL SAFETY	3
2.1.	Fishing Vessel Stability	3
2.2.	Emergency Drill Requirements.....	5
2.3.	Cold Water Immersion.....	6
2.4.	Other Issues.....	7
3.	WORKSAFEBC.....	8
4.	FISH SAFE BC	10
5.	TRANSPORTATION SAFETY BOARD	11

1. OVERVIEW – FISHING VESSEL SAFETY

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 Quiz*
- 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
- <https://tc.canada.ca/en/marine-transportation/marine-safety/tp-15393e-adequate-stability-safety-guidelines-fishing-vessels> TP 15393E - Adequate stability and safety guidelines for fishing vessels
- TP 15392E - Guidelines for fishing vessel major modification or a change in activity. <https://tc.canada.ca/en/marine-transportation/marine-safety/tp-15392e-guidelines-fishing-vessel-major-modification-change-activity>
- 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
www.worksafebc.com
www.tsb.gc.ca/eng/rapports-reports/marine/index.html

2. IMPORTANT PRIORITIES FOR VESSEL SAFETY

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 a stability assessment, 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, [M18A0425](#) – Charlene A and [M18A0454](#) – Atlantic Sapphire.

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.

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 report's 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).

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

2.4.1. Weather

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

2.4.2. Emergency Radio Procedures, EPIRB's and AIS

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). All fishing vessels greater than 20m in length must carry a Class A AIS, as well as a float free 406 MHz Emergency Position Indicating Radio Beacon (EPIRB). These beacons must be registered with the Canadian Beacon Registry. 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](#), [M15A0189](#), [M16A0327](#), [M18A0076](#), [M18A0303](#), [M18A0078](#), M18P0184, M19A0082, M19P0242, [M20A0258](#), [M20A0160](#), [M21A0315](#)) which resulted in 26 fatalities. The carriage of both AIS and EPIRB is strongly encouraged for all fishing vessels who do not fall under the mandatory threshold.

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: <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).

2.4.3. Collision Regulations

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

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

Exceptions include:

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

More detailed information on VTS can be obtained by calling either Prince Rupert MCTS (250)627-3070 or Victoria MCTS (250)363-6333 or from the Coast Guard website: <https://www.ccg-gcc.gc.ca/publications/mcts-sctm/ramn-arnm/part3-eng.html>

2.4.4. Buddy System

Fish harvesters are encouraged to use the buddy system when transiting and fishing as this allows for the ability to provide mutual aid. An important trip consideration is the use of a sail/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. WORKSAFEBBC

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 floatation 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

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/ Richmond/Delta	(604) 244-6477
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 or Tim Pryde, OHS Consultant at (604) 802-2954 or by email: tim.pryde@worksafebc.com.

4. FISH SAFE BC

Fish Safe encourages Vessel masters and crew to take ownership of fishing vessel safety. Through this industry driven and funded program Fish Safe provides fishing relevant tools and programs to assist 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: ryan@fishsafebc.com
#100, 12051 Horseshoe Way	www.fishsafebc.com
Richmond, BC V7A 4V4	

5. TRANSPORTATION SAFETY BOARD

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

In 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
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>

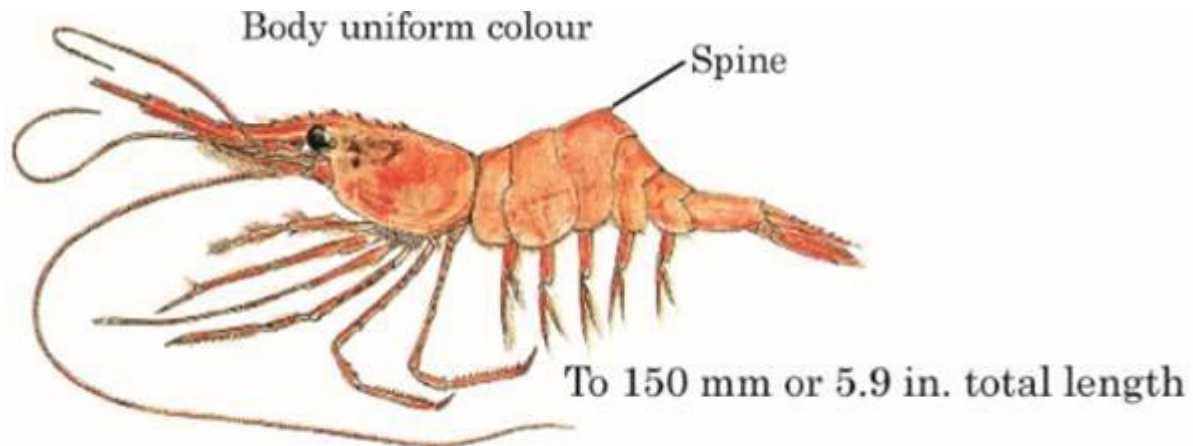
To view information on the TSB's recent safety Watchlist, visit:
<http://www.tsb.gc.ca/eng/surveillance-watchlist/marine/2020/marine-01.html>

Reporting an Occurrence: 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.

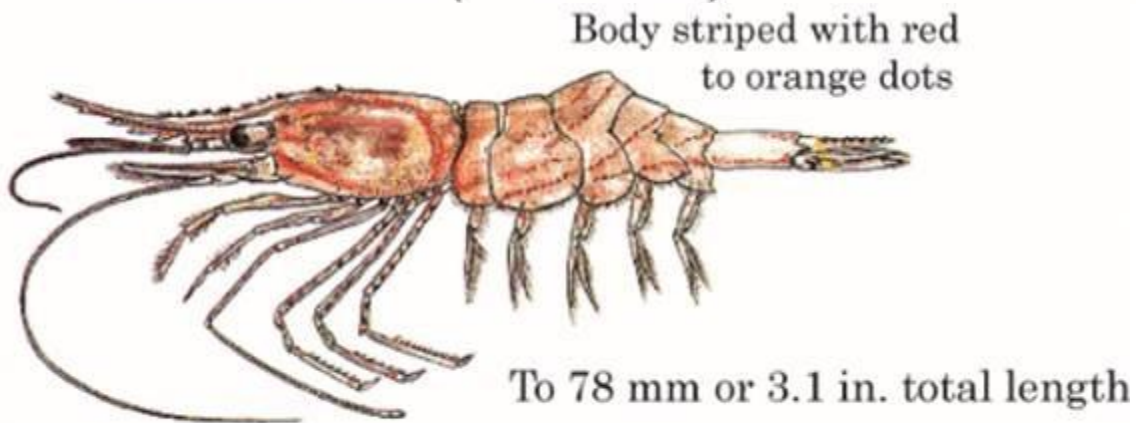
Recently the TSB produced a Safe at Sea: Activity book on fishing safety intended for the next generation of fish harvesters (ages 4-7). Download a copy.
[www.tsb.gc.ca > eng > medias-media > prudence-safe > safe-at-sea](http://www.tsb.gc.ca/eng/medias-media/prudence-safe/safe-at-sea)

Glenn Budden, Investigator, Marine - Fishing Vessels
Transportation Safety Board of Canada
4 - 3071 No. 5 Road
Richmond, BC, V6X 2T4
Telephone: (604) 619-6090
Email: glenn.budden@tsb-bst.gc.ca

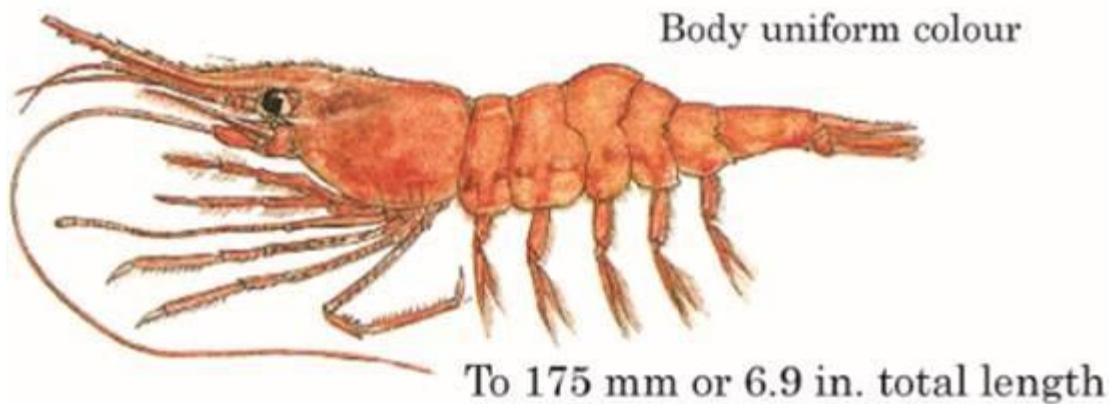
APPENDIX 5: IDENTIFICATION OF COMMERCIAL SHRIMP SPECIES



Pandalus eous (P. borealis)

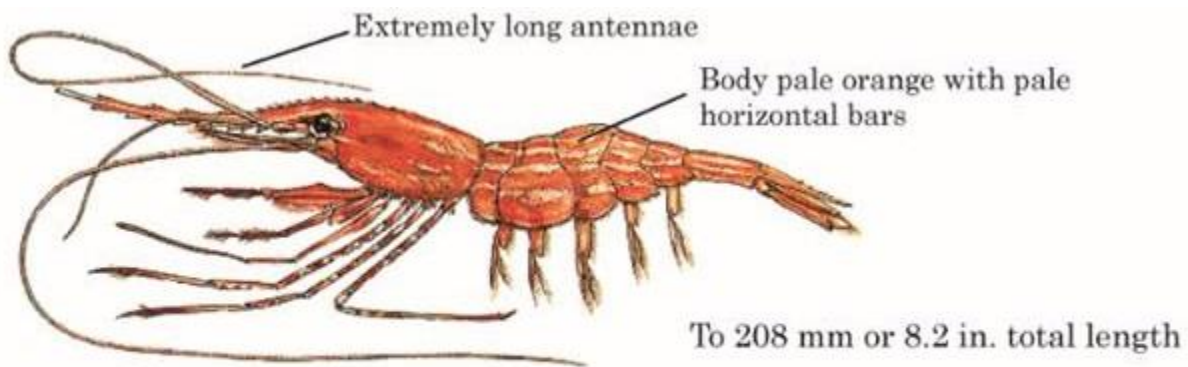


Pandalus goniurus

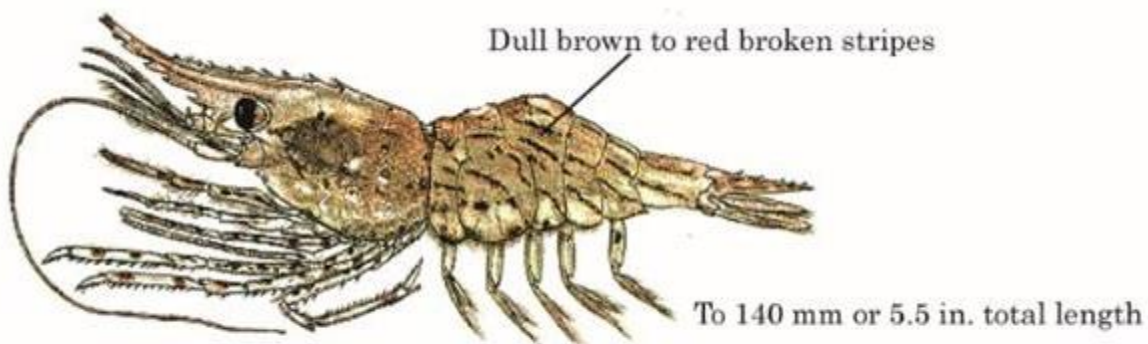


Pandalus jordani

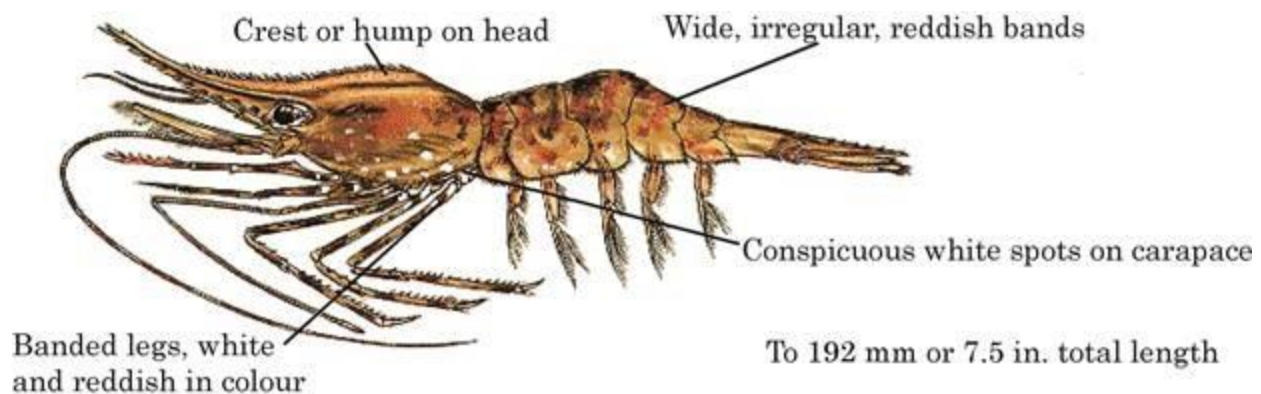
Pink Shrimp – Spiny, Flexed and Smooth



Pandalopsis dispar
Sidestripe Shrimp



Pandalus danae
Coonstripe Shrimp (Dock)



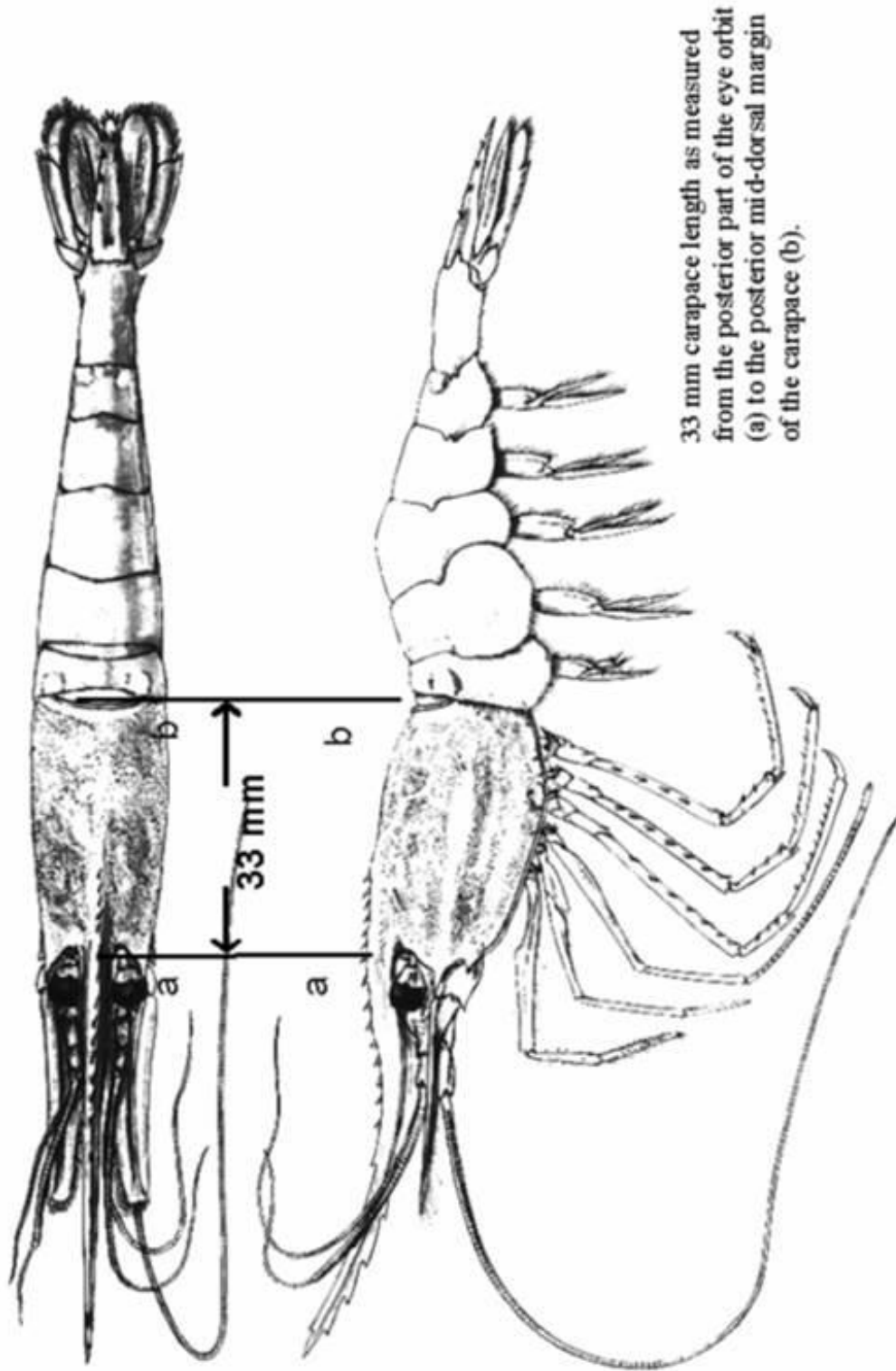
Pandalus hypsinotus
Humpback Shrimp (King)

Illustrations by A. Denbigh
Graphic Design by T. Boxwell and R. Harbo.

Appendix 6: Example of Shrimp Trawl Log (Harvest Logbook) Record

[illegible]

APPENDIX 7: PRAWN MINIMUM SIZE LIMIT



APPENDIX 8: LOCATIONS OF GLASS SPONGE REEFS IN HECATE STRAIT AND QUEEN CHARLOTTE SOUND

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 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 Regulations are available online at: <http://www.dfo-mpo.gc.ca/oceans/mpa-zpm/hecate-charlotte/index-eng.html>.

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.

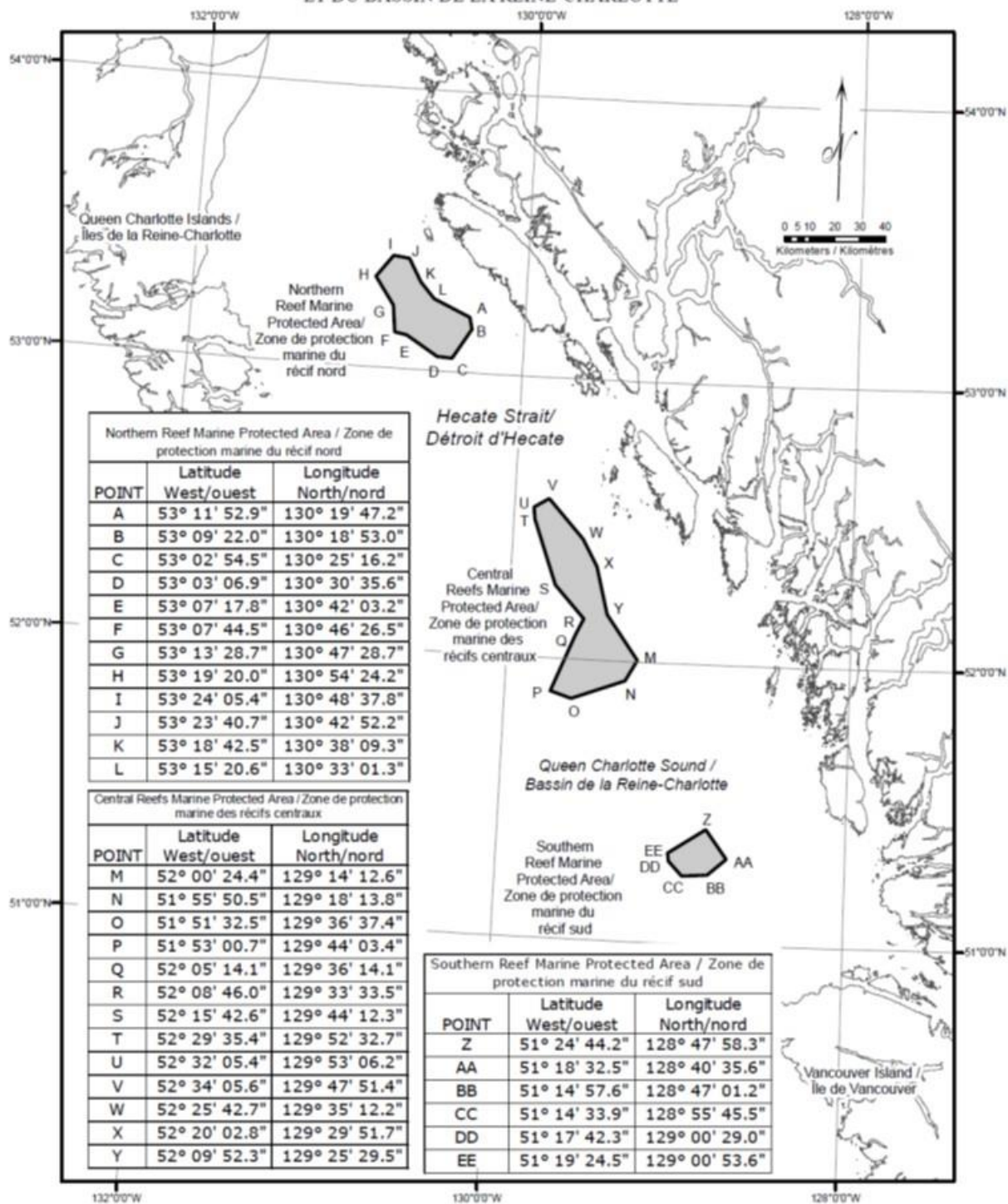
Scientific research, monitoring, and educational activities are allowed in the Hecate MPA if a proponent submits an activity plan to DFO and it receives Ministerial approval. Additional maps and shapefiles of the Hecate MPA are available at: <https://open.canada.ca/data/en/dataset/a1e18963-25dd-4219-a33f-1a38c4971250>.

As part of the MPAs adaptive management cycle, MPAs undergo a review of associated management and regulatory measures; and new information is reviewed. This approach promotes adherence with the conservation objective and responds to potential changes in the MPA and adjoining area. A review is currently underway for this MPA.

The following graphic illustrations of each closed area are for information purposes only.

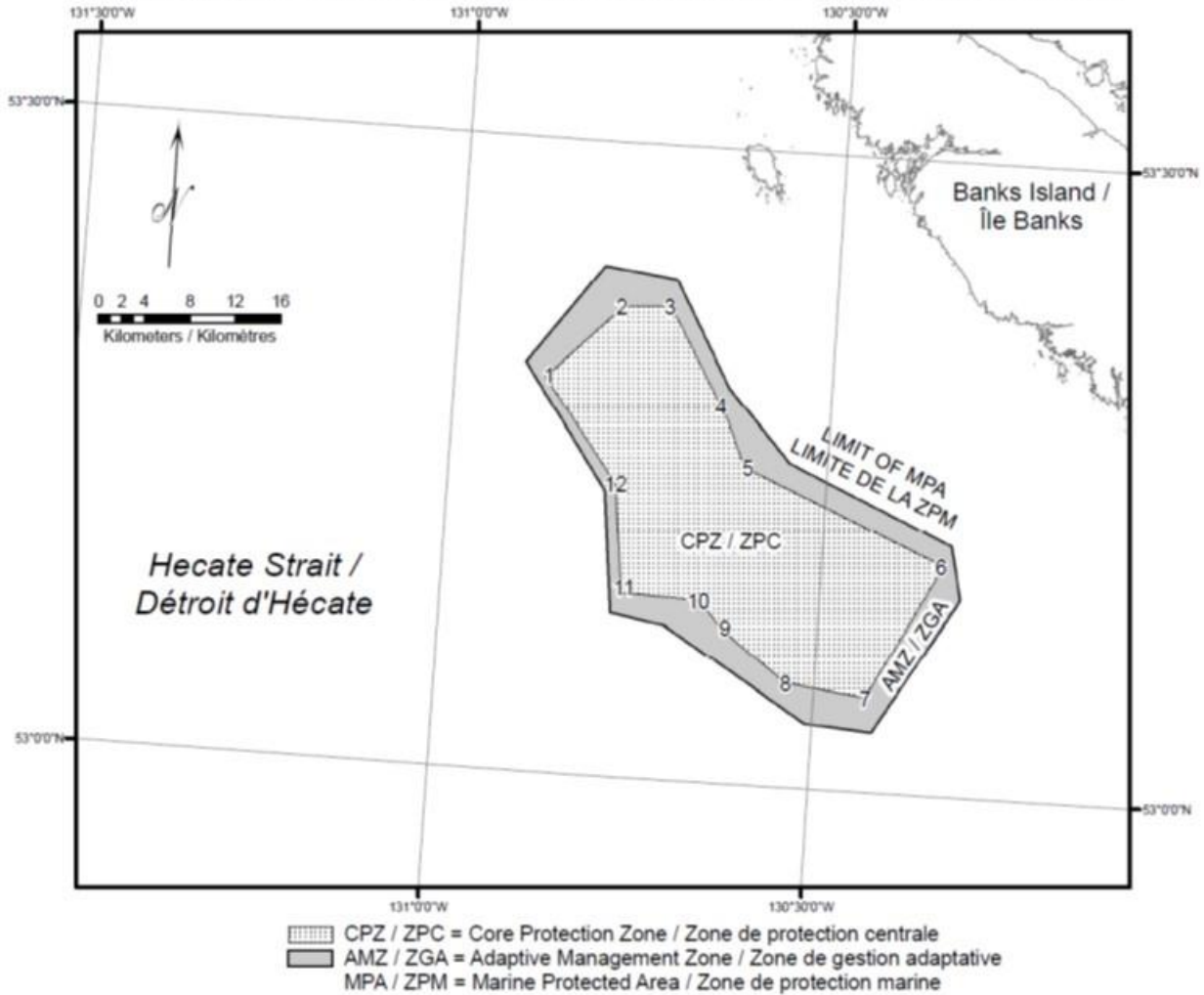
SCHEDULE 1 / ANNEXE 1

HECATE STRAIT / QUEEN CHARLOTTE SOUND GLASS SPONGE REEFS MARINE PROTECTED AREAS
ZONES DE PROTECTION MARINES DES RÊCIFS D'ÉPONGES SILICEUSES DU DÉTROIT D'HECATE
ET DU BASSIN DE LA REINE-CHARLOTTE



SCHEDULE 2 / ANNEXE 2

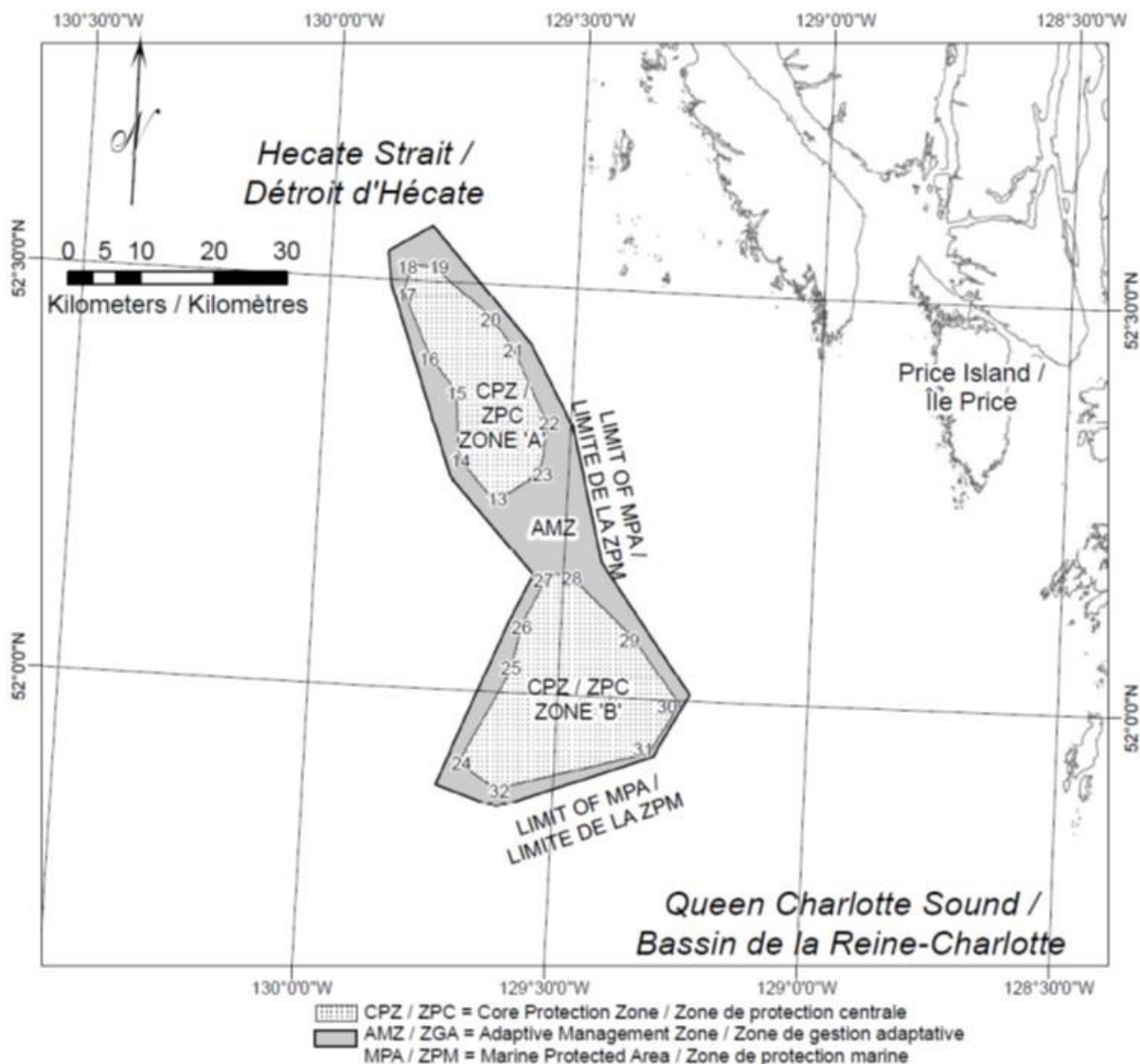
HECATE STRAIT / QUEEN CHARLOTTE SOUND GLASS SPONGE REEFS MARINE PROTECTED AREAS ZONES DE PROTECTION MARINES DES RÉCIFS D'ÉPONGES SILICEUSES DU DÉTROIT D'HÉCATE ET DU BASSIN DE LA REINE-CHARLOTTE NORTHERN REEF MARINE PROTECTED AREA / ZONE DE PROTECTION MARINE DU RÉCIF NORD



Northern CPZ / ZPC nord		
POINT	Latitude North/nord	Longitude West/ouest
1	53° 18' 40.4"	130° 52' 46.5"
2	53° 22' 12.1"	130° 47' 01.7"
3	53° 22' 20.2"	130° 43' 12.5"
4	53° 17' 22.8"	130° 38' 18.2"
5	53° 15' 01.7"	130° 36' 35.5"
6	53° 10' 55.2"	130° 20' 19.3"
7	53° 04' 30.2"	130° 25' 53.6"
8	53° 04' 58.0"	130° 32' 16.9"
9	53° 07' 22.2"	130° 37' 37.6"
10	53° 08' 36.6"	130° 39' 29.5"
11	53° 08' 41.8"	130° 45' 40.0"
12	53° 13' 51.2"	130° 46' 41.2"

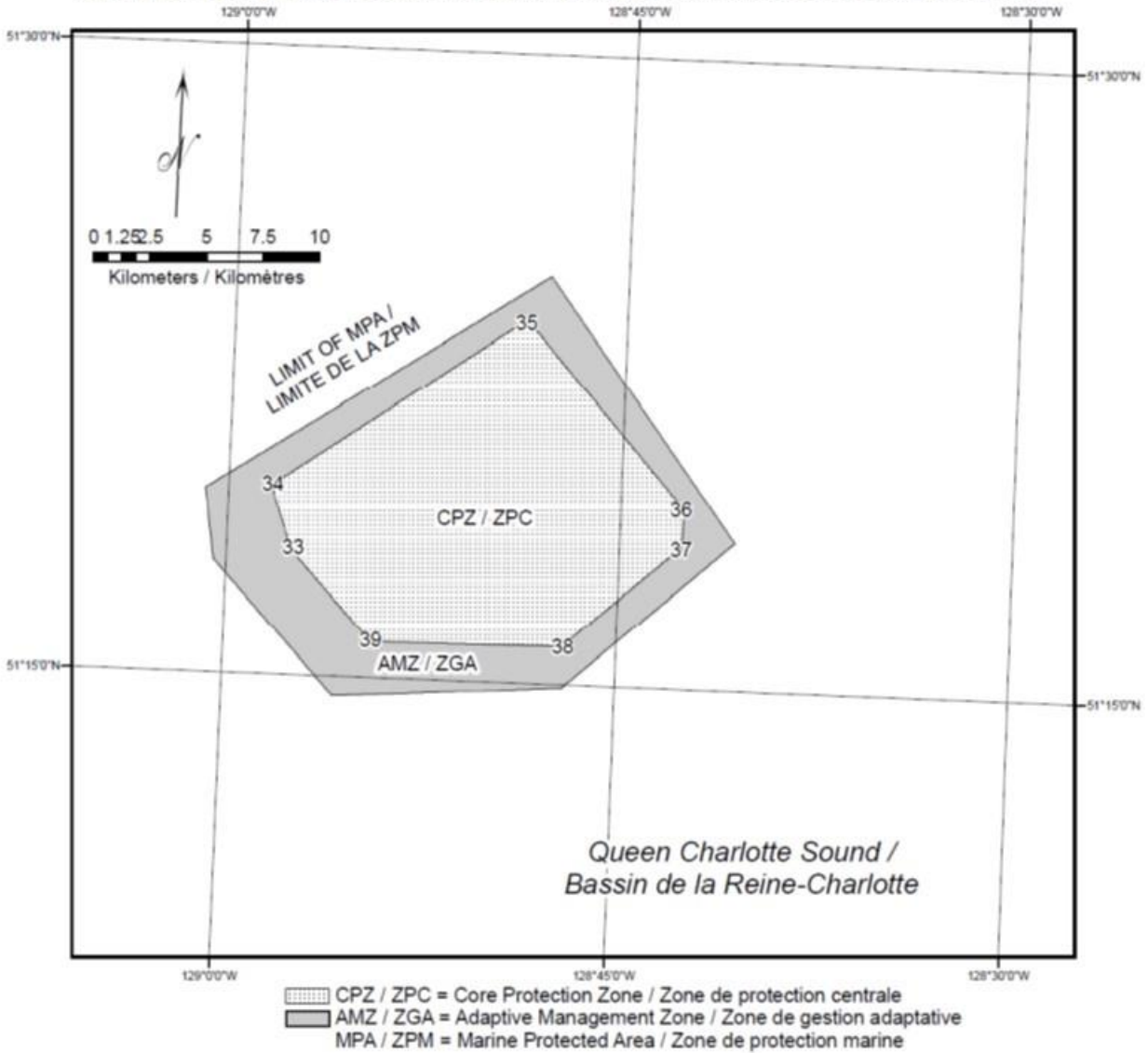
SCHEDULE 3 / ANNEXE 3

HECATE STRAIT / QUEEN CHARLOTTE SOUND GLASS SPONGE REEFS MARINE PROTECTED AREAS
ZONES DE PROTECTION MARINES DES RÊCIFS D'ÉPONGES SILICEUSES DU DÉTROIT D'HÉCATE
ET DU BASSIN DE LA REINE-CHARLOTTE
CENTRAL REEFS MARINE PROTECTED AREA / ZONE DE PROTECTION MARINE DES RÊCIFS CENTRAUX



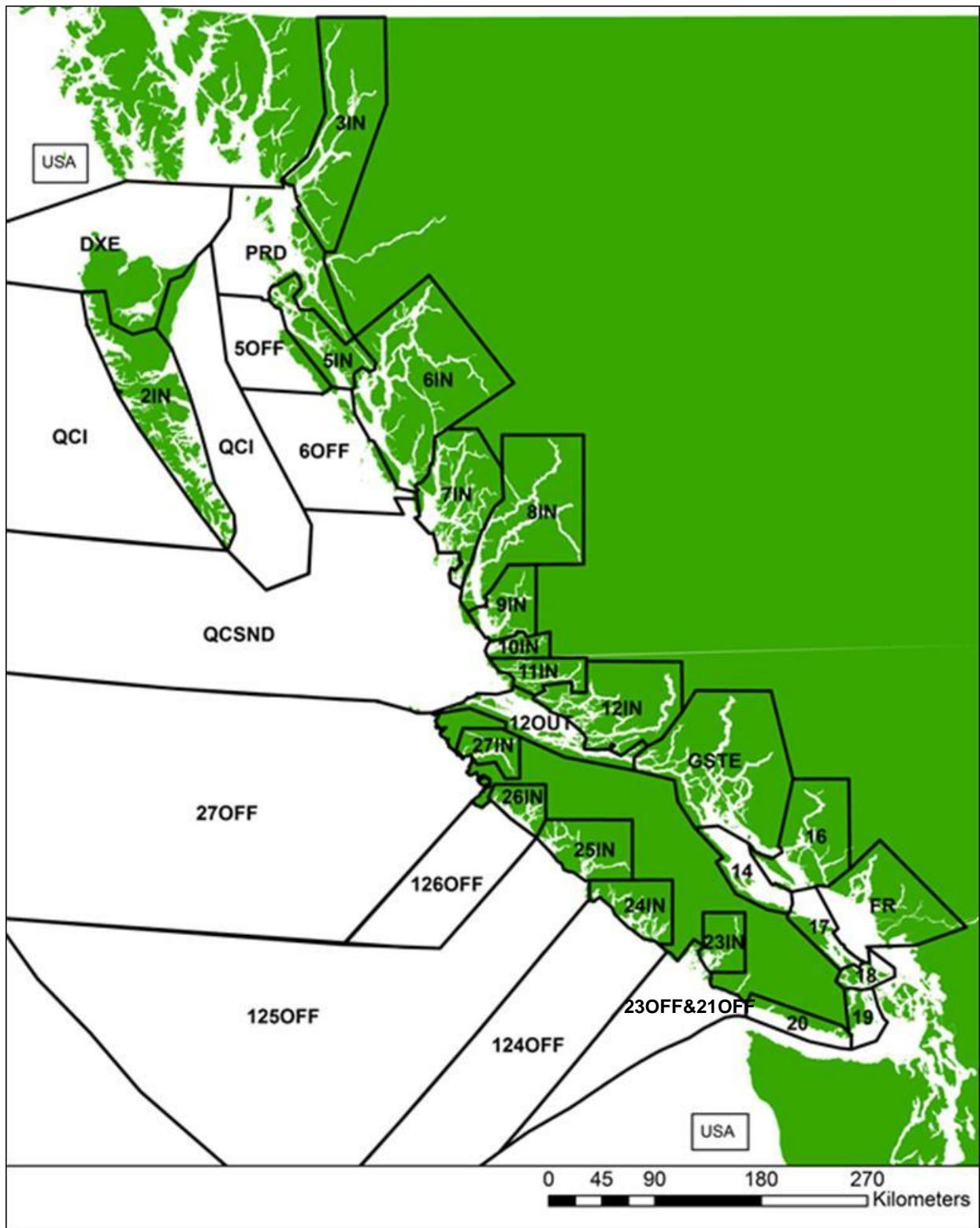
SCHEDULE 4 / ANNEXE 4

HECATE STRAIT / QUEEN CHARLOTTE SOUND GLASS SPONGE REEFS MARINE PROTECTED AREAS
ZONES DE PROTECTION MARINES DES RÉCIFS D'ÉPONGES SILICEUSES DU DÉTROIT D'HÉCATE
ET DU BASSIN DE LA REINE-CHARLOTTE
SOUTHERN REEF MARINE PROTECTED AREA / ZONE DE PROTECTION MARINE DU RÊCIF SUD



Southern CPZ / ZPC sud		
POINT	Latitude North/nord	Longitude West/ouest
33	51° 17' 59.2"	128° 57' 31.9"
34	51° 19' 30.8"	128° 58' 22.7"
35	51° 23' 41.9"	128° 48' 50.9"
36	51° 19' 17.5"	128° 42' 33.6"
37	51° 18' 24.5"	128° 42' 37.7"
38	51° 15' 56.0"	128° 47' 04.2"
39	51° 15' 52.2"	128° 54' 20.4"

APPENDIX 9: MAPS OF SHRIMP MANAGEMENT AREAS



Shrimp Management Areas (SMA) of the British Columbia Coast

Pacific Fishery Management Area and Subarea Boundaries and Shrimp Management Area Maps

Pacific Fishery Management Area (PFMA) maps are available at:

<http://www.pac.dfo-mpo.gc.ca/fm-gp/maps-cartes/areas-secteurs/index-eng.html>

Boundaries of PFMA's are defined in the Pacific Fishery Management Area Regulations, 2007. See:

<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2007-77/index.html>

Map Legend	Description of Closure
 Rockfish Conservation Area	Closed to shrimp trawl
 ONC Cables 2017	See Notice to Mariners - Ocean Networks Canada
 ONC Infrastructure 2017	See Notice to Mariners - Ocean Networks Canada
 Conservation	Closed to shrimp trawl
 Conservation Bycatch	Closed due to bycatch of herring, coonstripe shrimp
 Conservation Crab	Closed for conservation of juvenile crab and to avoid crab gear
 Conservation Halibut	Closed for conservation of juvenile halibut
 Conservation Prawns	Closed to retention of prawns year-round
 Marine Reserve	Closed to shrimp trawl
 National Marine Conservation Area	Closed to shrimp trawl
 Navigation	Closed to fishing
 New Emerging Policy	Closed due to New Emerging Fishery Policy - humpback shrimp
 Park	Closed to fishing
 Seasonal Crab Softshell	Closed March 1 to August 1 - unless softshell monitoring in place
 Seasonal Eulachon	Closed February 1 to March 31 to avoid interaction with eulachon
 Seasonal Observer	Closed subject to arrangements for at-sea observer
 Satellite Ecological Reserve	Closed to fishing
 Sponge Reef	Closed to shrimp trawl

Terms of Use, Disclaimer and Limitation of Liability:

The following maps are intended for general reference and to provide a guide of the Shrimp Management Area (SMA) and PFMA and Subarea boundaries and the closures to fishing by shrimp beam trawl and otter trawl as listed in the Shrimp Trawl Integrated Fisheries Management Plan (IFMP). Other areas may be closed to fishing by shrimp trawl and are not shown on these maps (navigational closures, parks, ecological reserves, etc.). It is the responsibility of the vessel master to determine if an area is open to fishing by trawl net, and be aware of all Fishery Notices and closures. Changes may occur in-season to specific closures and Fishery Notices may be issued to indicate changes. The maps are not intended to be used for navigation. The scale of each map changes with each SMA for visual purposes only. An area identified as open to fishing by beam or otter trawl is not necessarily suitable to fishing by trawl net.

Map geometric projection is North American Datum 1983 CSRS BC Environment Albers.

NAD_1983_CSRS_BC_Environment_Albers
Projection: Albers
False_Easting: 1000000.000000
False_Northing: 0.000000
Central_Meridian: -126.000000
Standard_Parallel_1: 50.000000
Standard_Parallel_2: 58.500000
Latitude_Of_Origin: 45.000000
Linear Unit: Meter
GCS_North_American_1983_CSRS
Datum: D_North_American_1983_CSRS

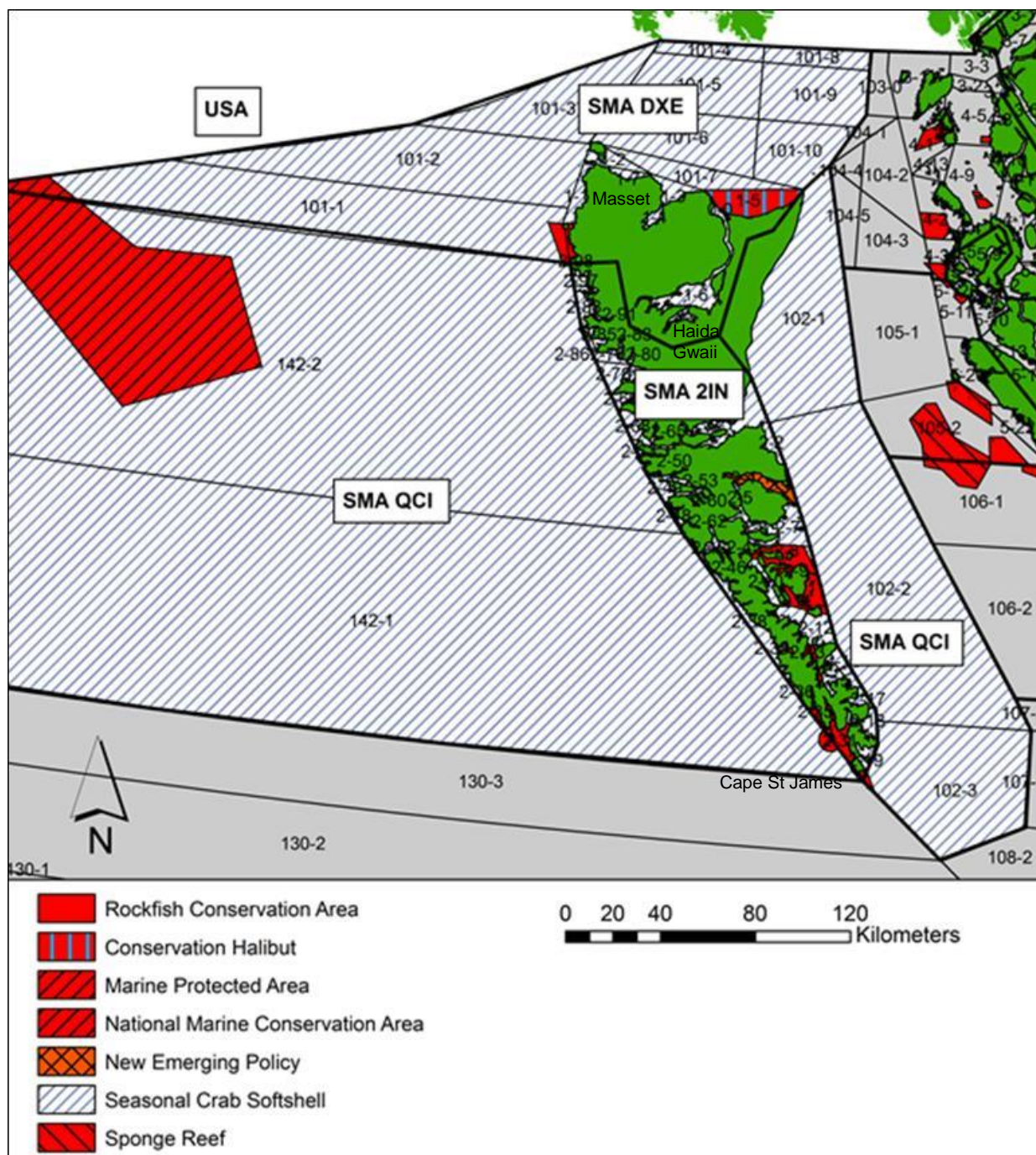


Figure 1. Shrimp Management Areas: DXE (Areas 1, 101), SMA QCI (Areas 102, 142) and SMA 2IN (Area 2 except Subareas 2-3, 2-4, 2-13, 2-16, 2-31 to 2-37 and 2-41).

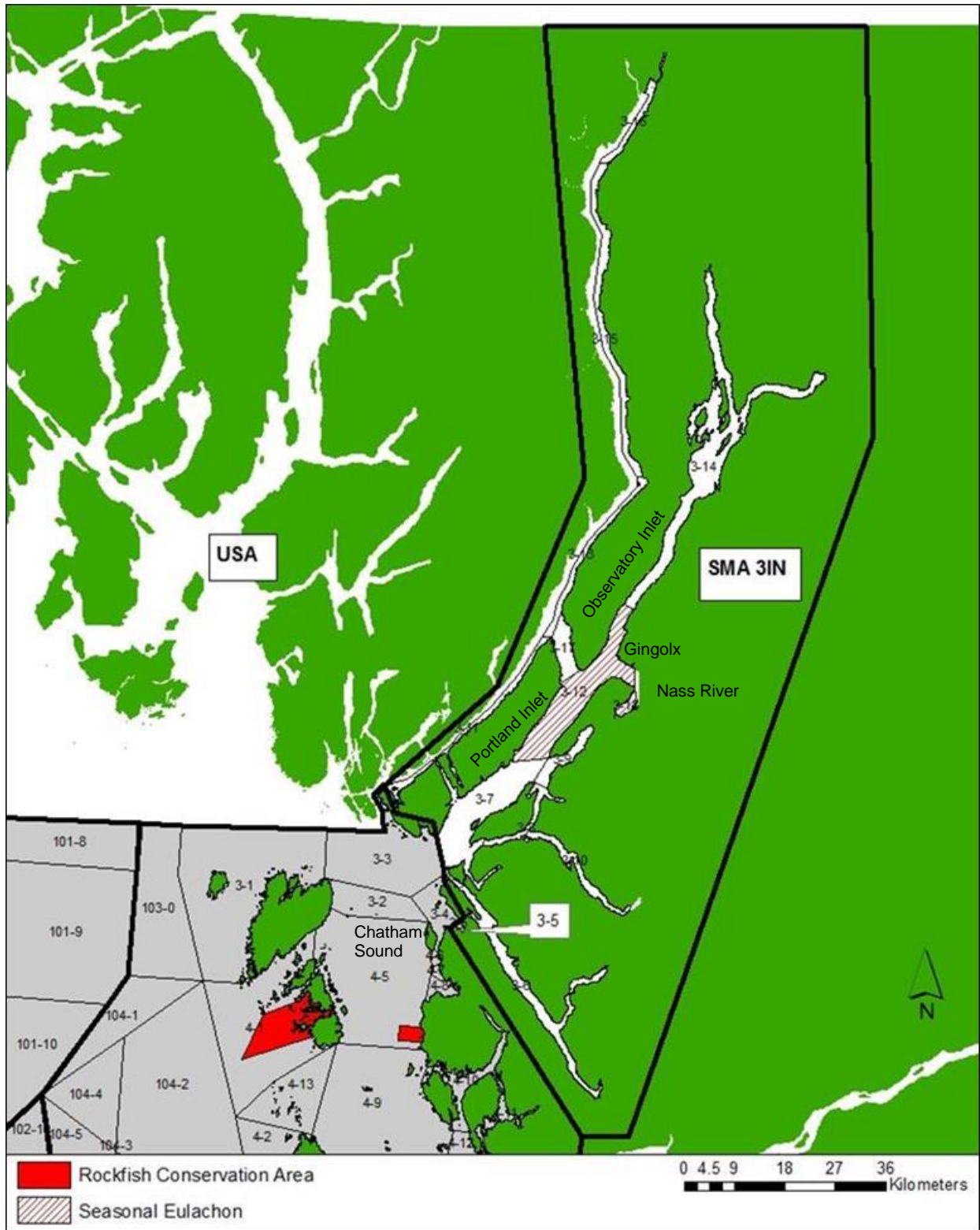


Figure 2. Shrimp Management Area: 3IN (Subareas 3-5 to 3-18). Subareas 3-12 and 3-18 closed February 1 to March 31.

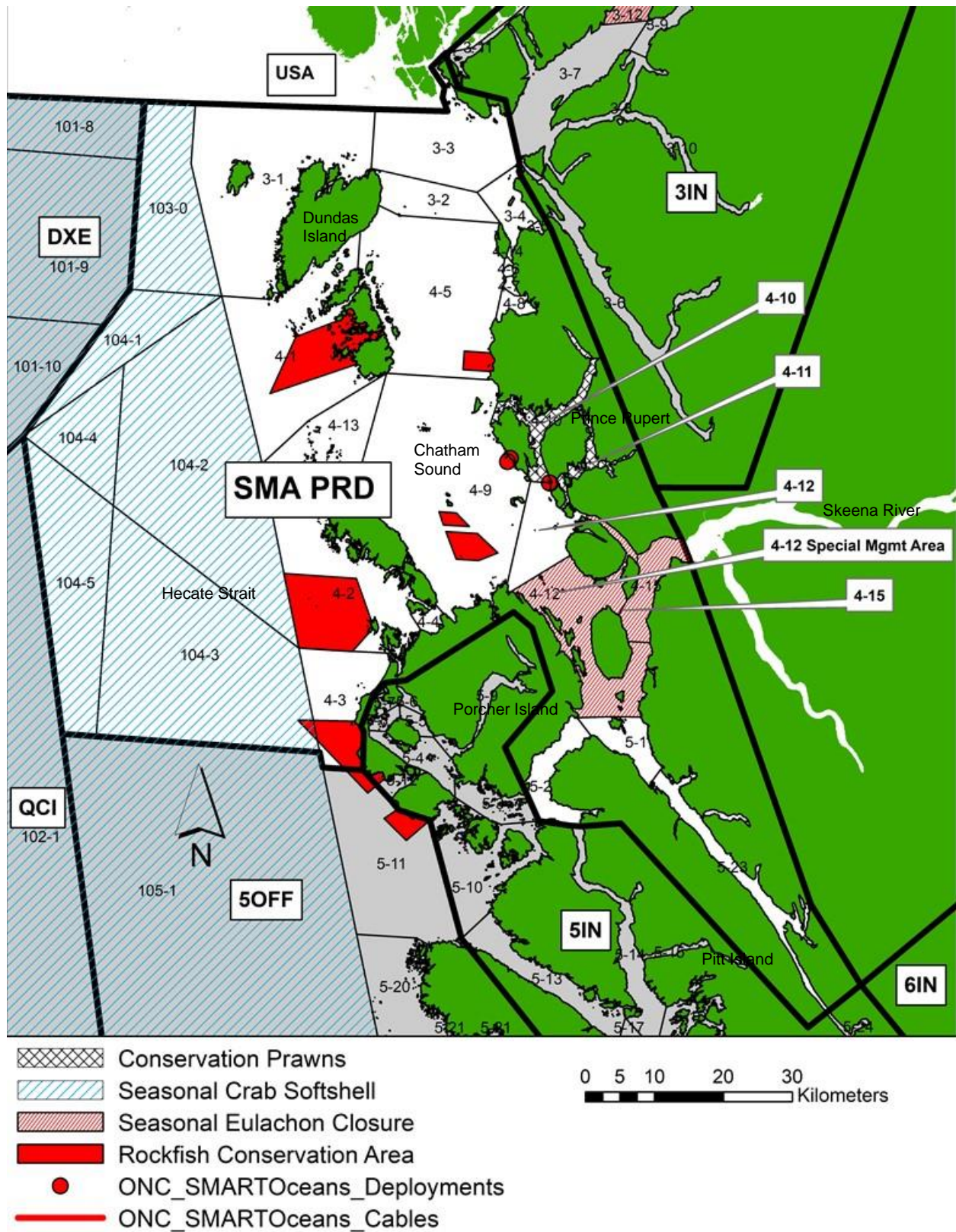


Figure 3. Shrimp Management Area: PRD (Subareas 3-1 to 3-4, 103, 4-1 to 4-15, 104, 5-1, 5-2 and 5-23). Subarea 4-15 and 4-12 Special Management Area closed Feb 15 to Mar 31.

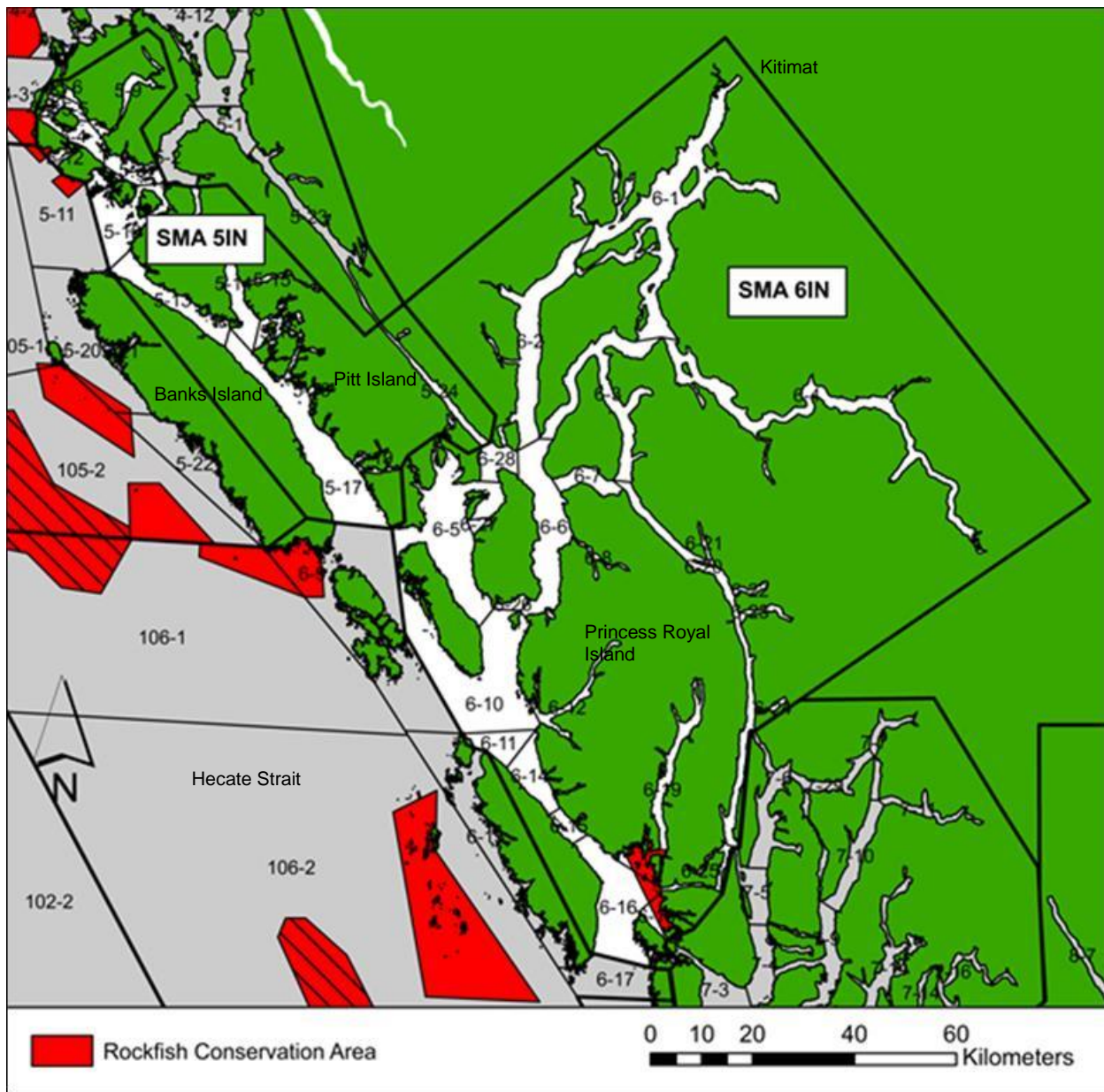


Figure 4. Shrimp Management Areas: 5IN (Subareas 5-3 to 5-10, 5-12 to 5-19, 5-21, 5-24) and SMA 6IN (Subareas 6-1 to 6-8, 6-10 to 6-12, 6-14 to 6-16, 6-18 to 6-28).

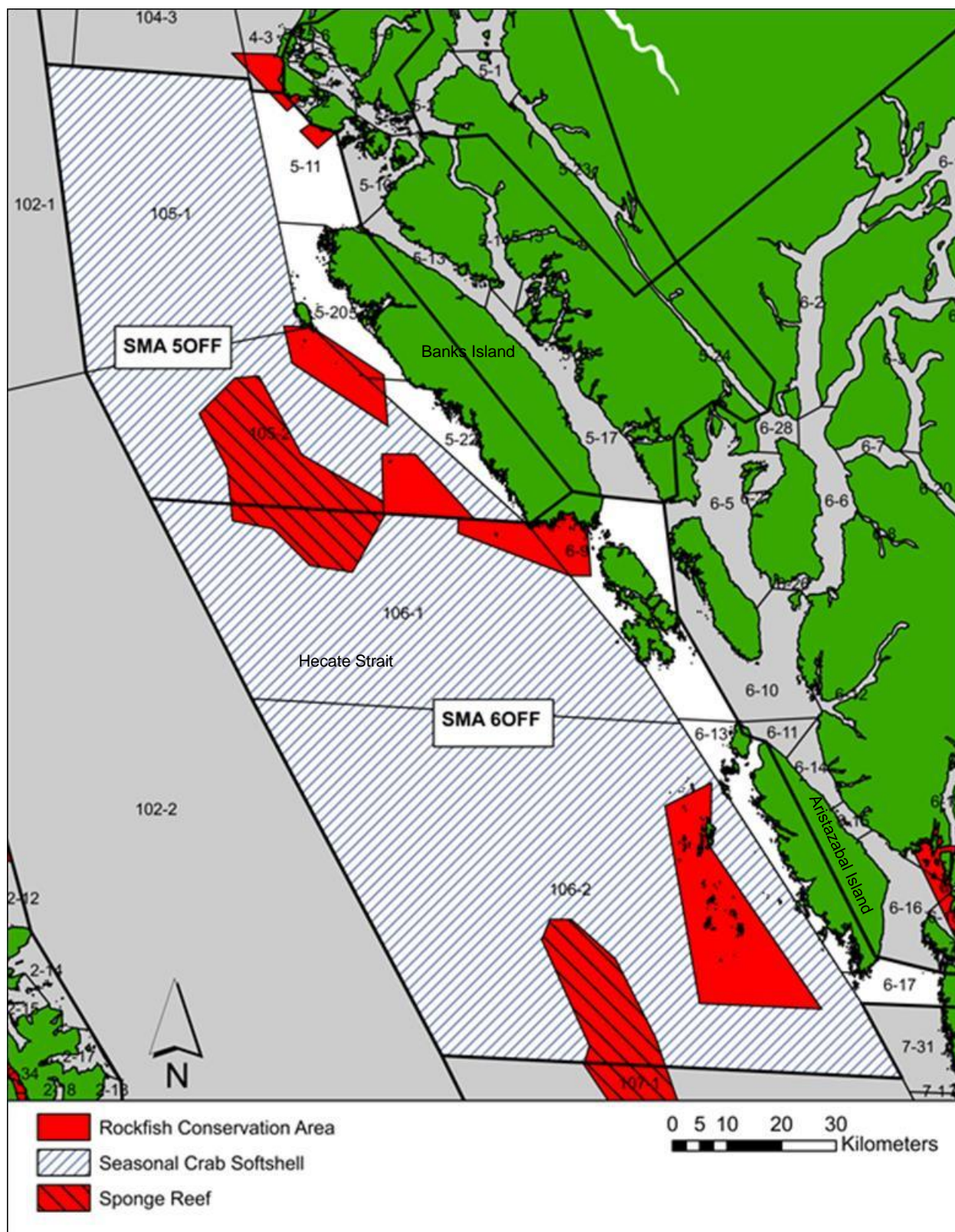


Figure 5. Shrimp Management Areas: 5OFF (Subareas 5-11, 5-20, 5-22, Area 105) and SMA 6OFF (Subareas 6-9, 6-13, 6-17, Area 106).

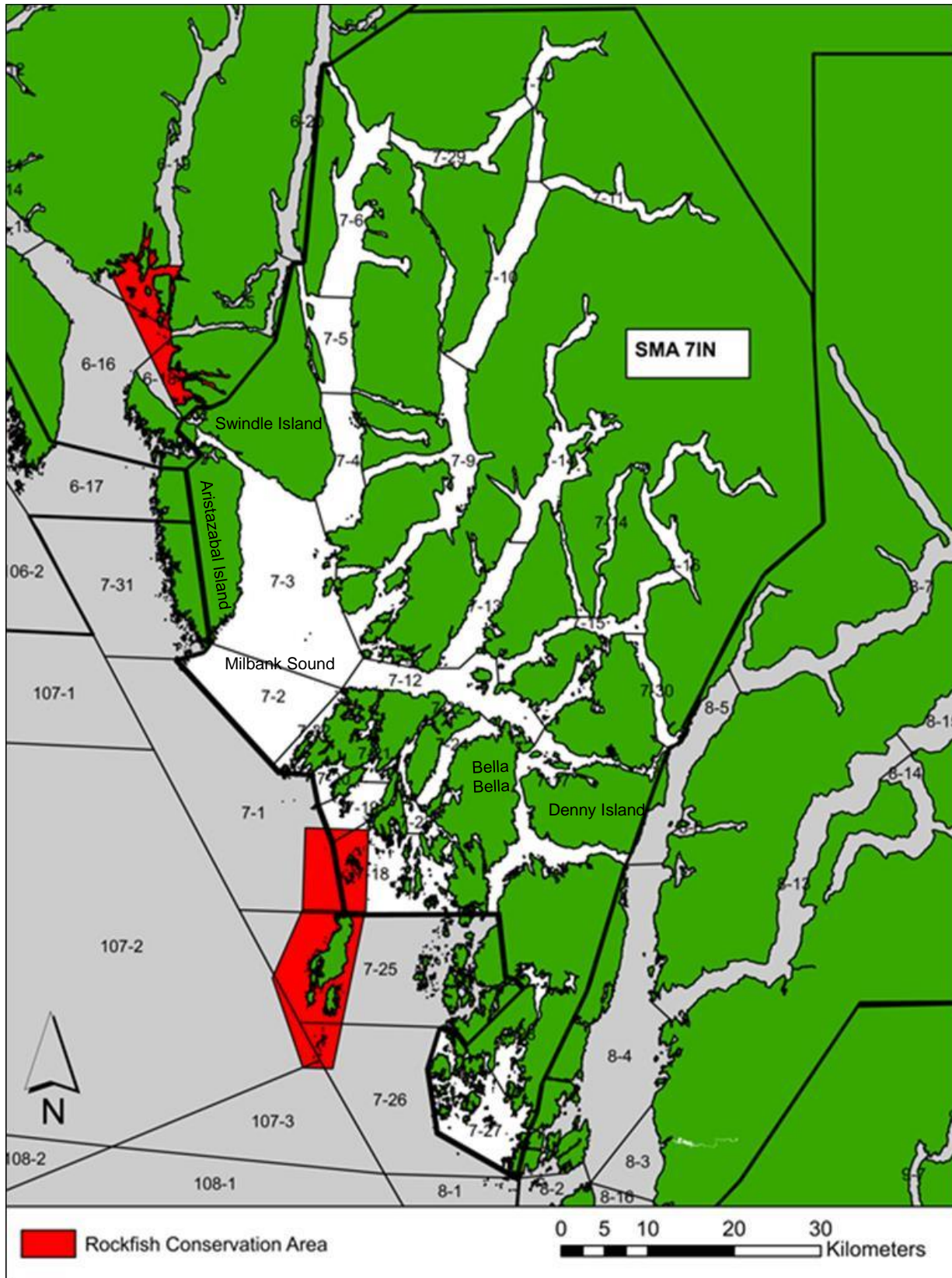


Figure 6. Shrimp Management Area: 7IN (Subareas 7-2 to 7-24, 7-27 to 7-30 and 7-32).

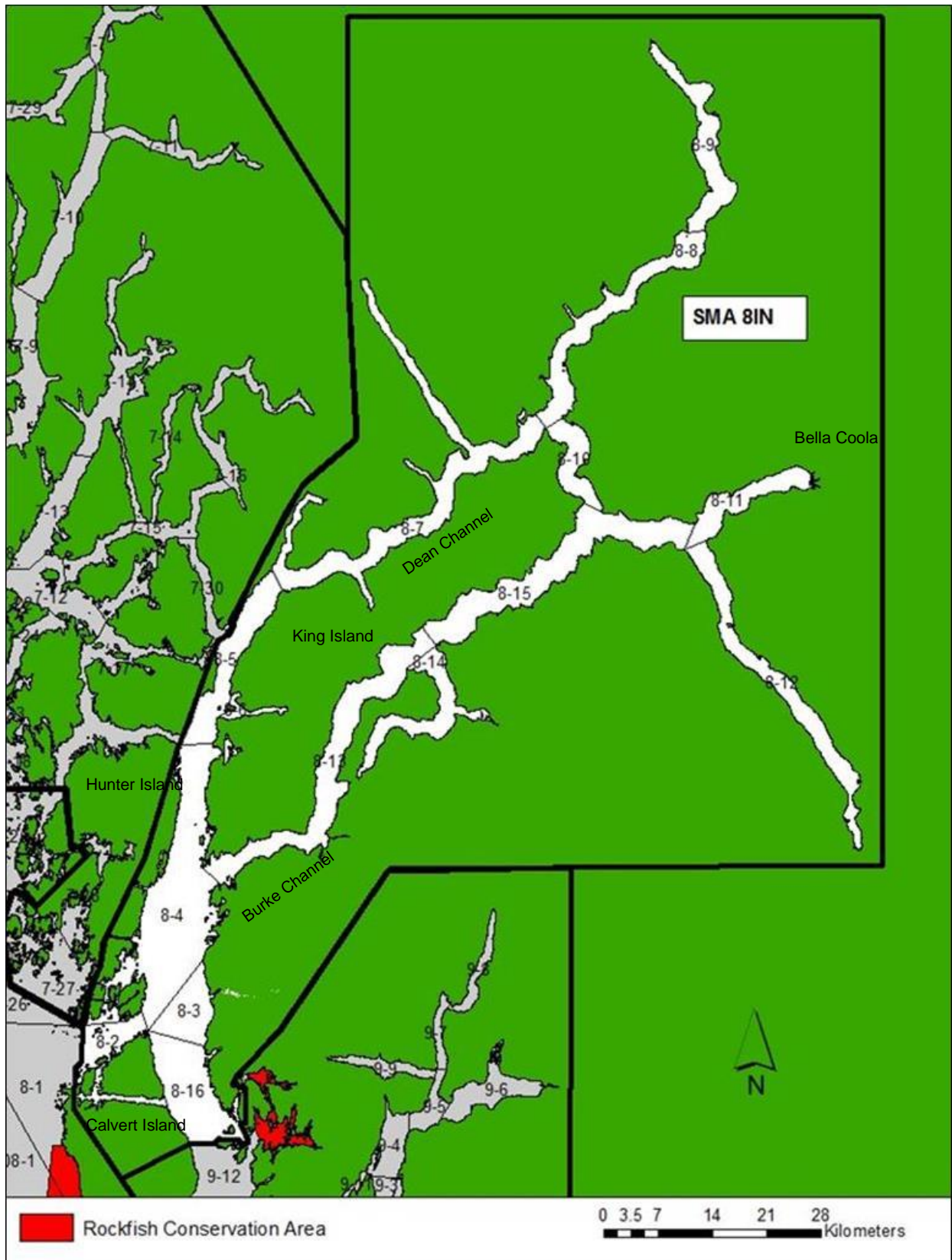


Figure 7. Shrimp Management Area: 8IN (Subareas 8-2 to 8-16).

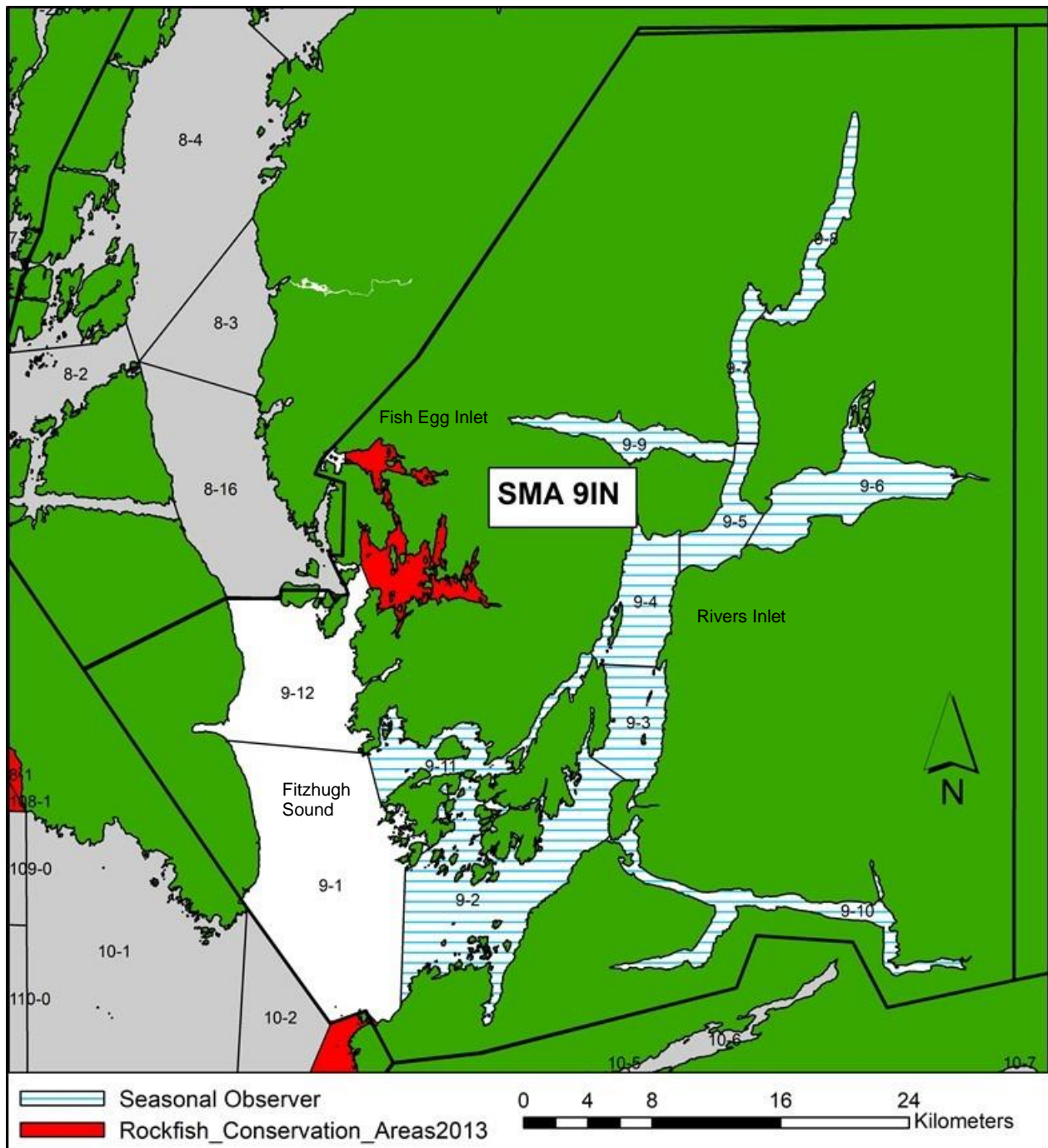


Figure 8. Shrimp Management Area: 9IN (Subareas 9-1 to 9-12).

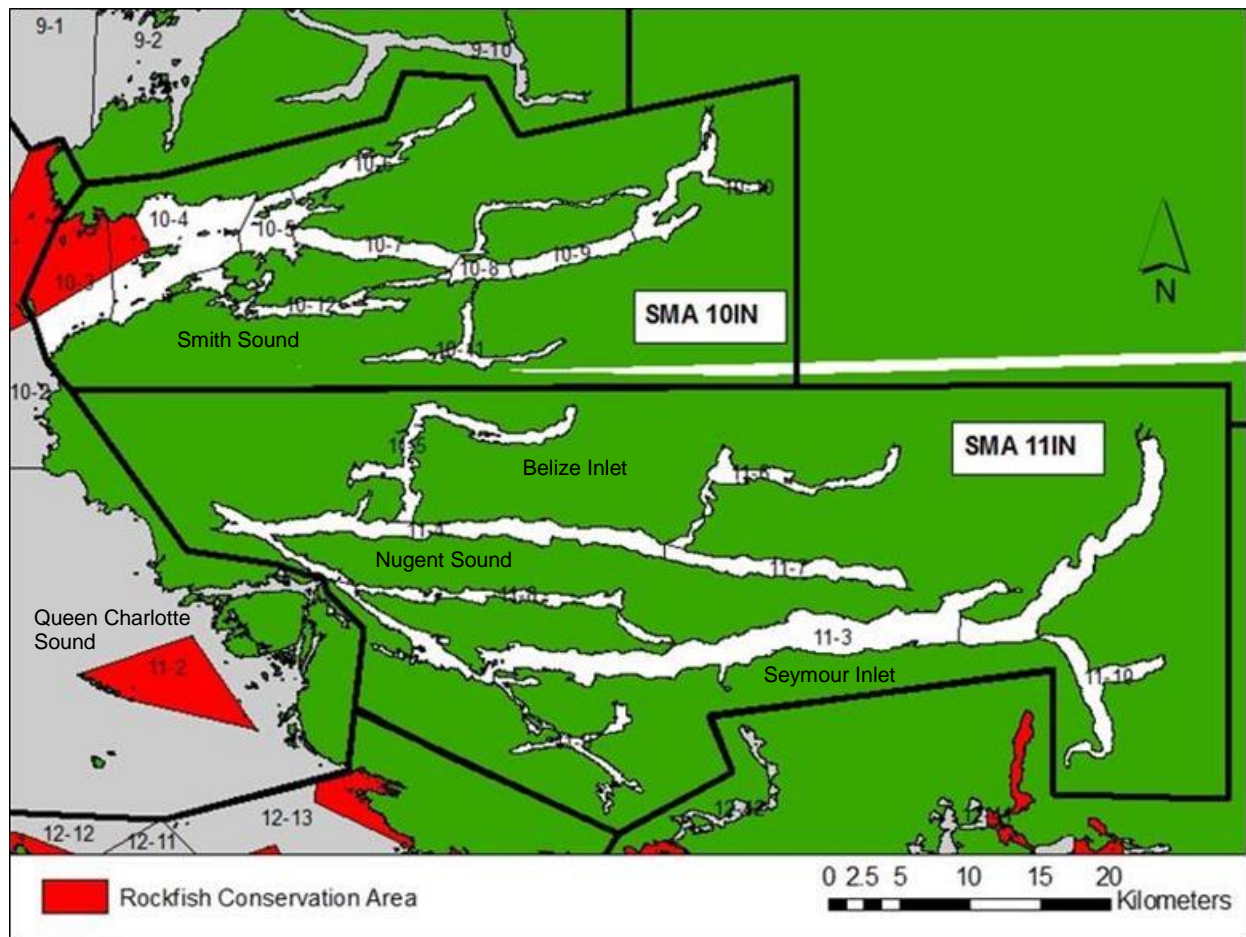


Figure 9. Shrimp Fishery Management Areas: 10IN (Subareas 10-3 to 10-12) and SMA 11IN (Subareas 11-3 to 11-10).

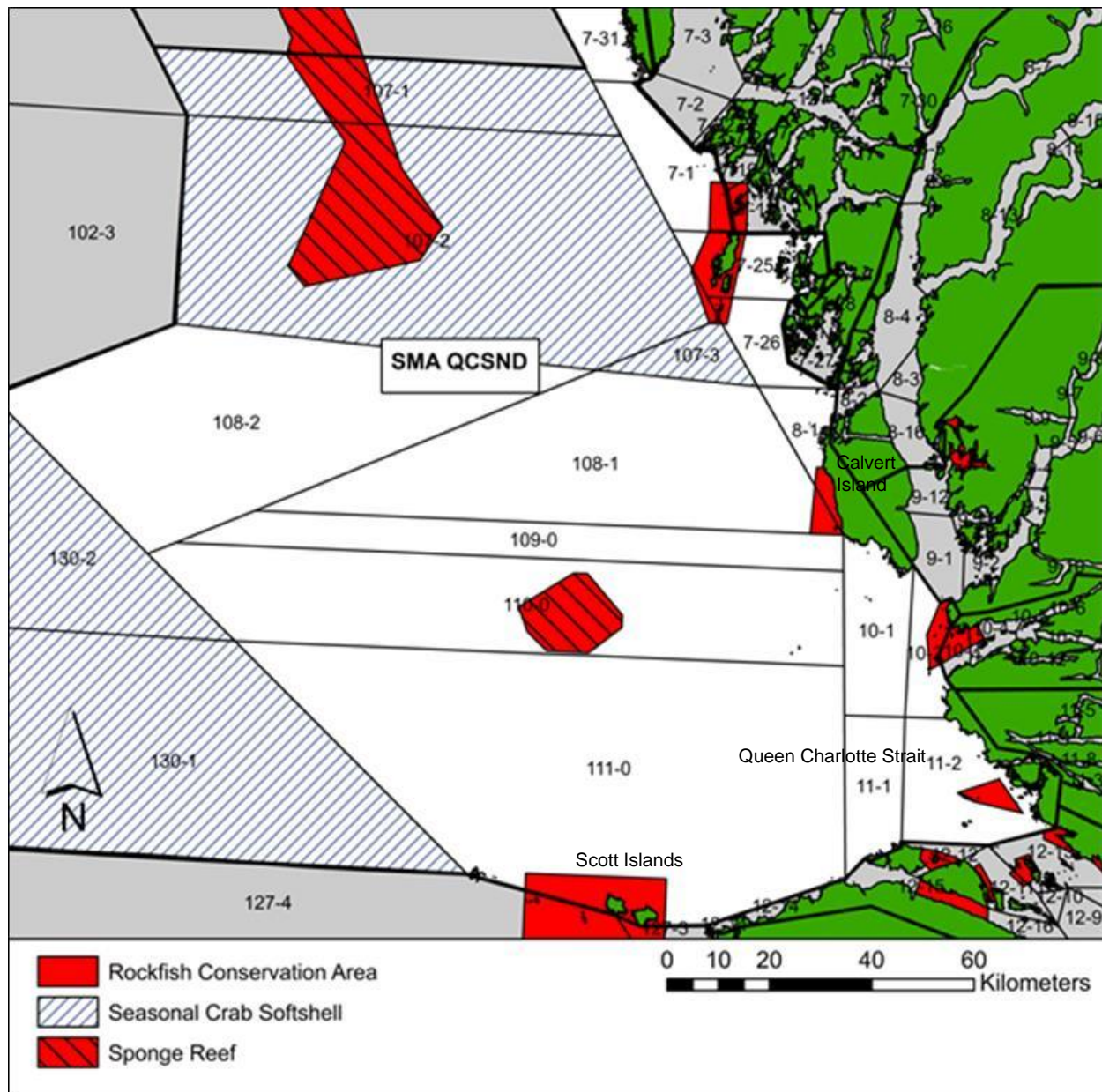


Figure 10. Shrimp Management Area: QCSND (Areas 107, 108, 109, 110, 111, 130, Subareas 7-1, 7-25, 7-26, 7-31, 8-1, 10-1, 10-2, 11-1, 11-2). Sponge Reef Closure coordinates are defined in Appendix 8.

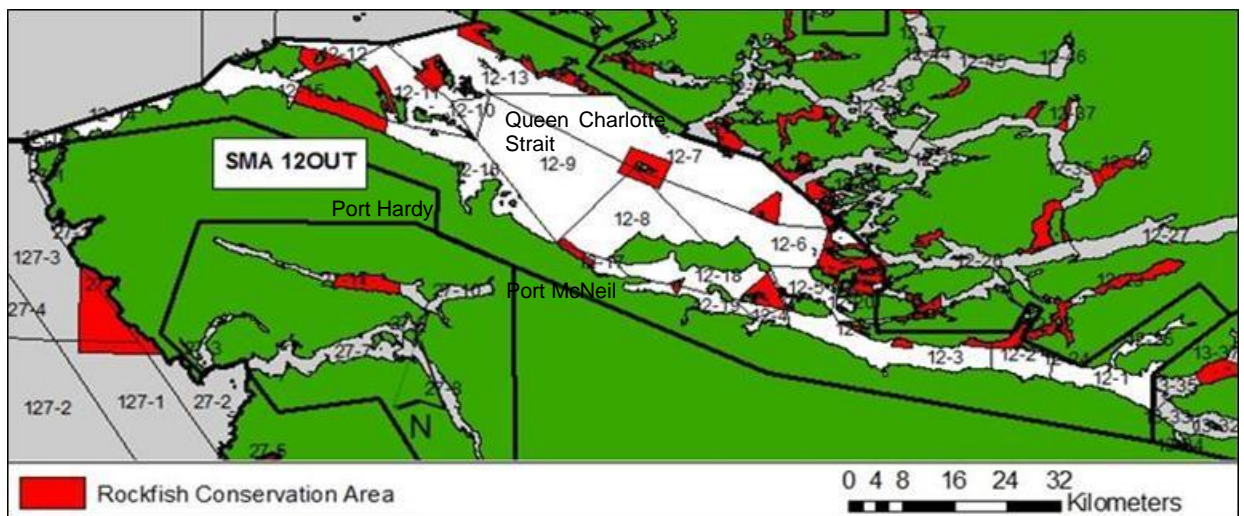
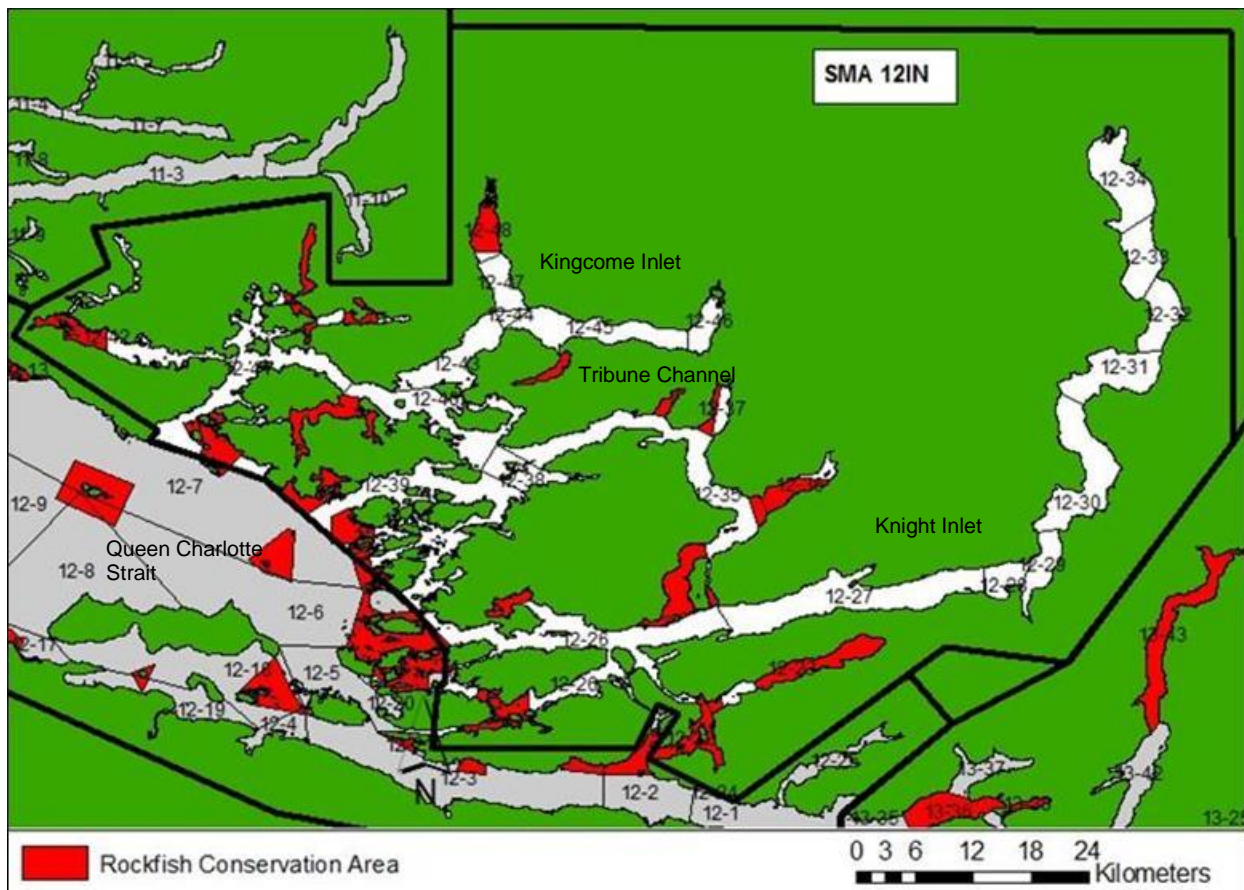


Figure 11. Shrimp Management Areas: 12IN (Areas 12-23, 12-26 to 12-35, 12-37 to 12-47) and SMA 12OUT (Areas 12-1 to 12-21, 12-24, 12-25). Closed in 12-22, 12-36 and 12-48.

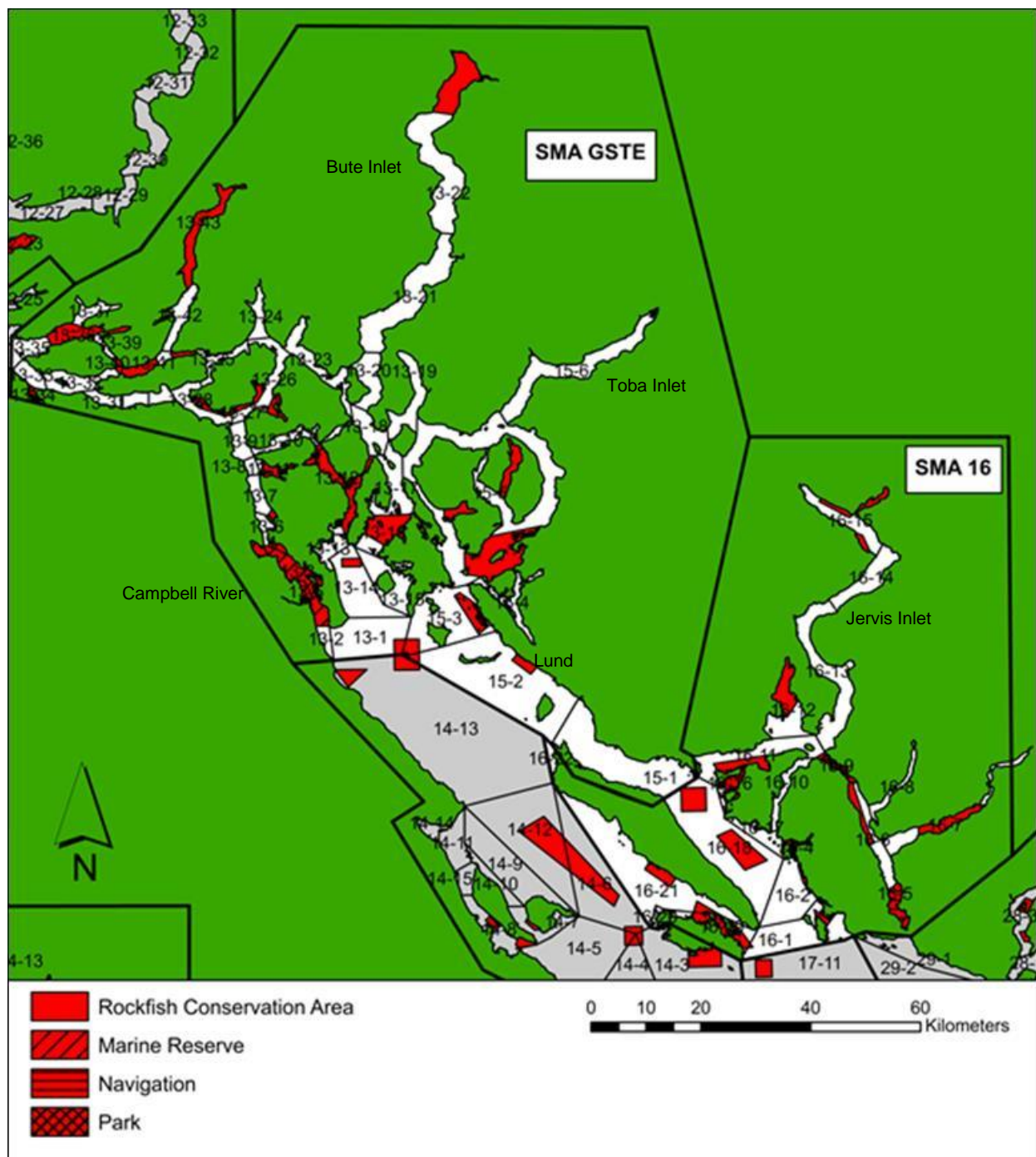


Figure 12. Shrimp Management Areas: GSTE (Areas 13 and 15) - Closed in subareas 13-3, 13-4, 13-5, 13-34, 13-36, 13-38 and 13-43 and SMA 16 (Subareas 16-1, 16-2 and 16-6 to 16-8, 16-10 to 16-22). Closed in 16-3 to 16-5 and 16-9.

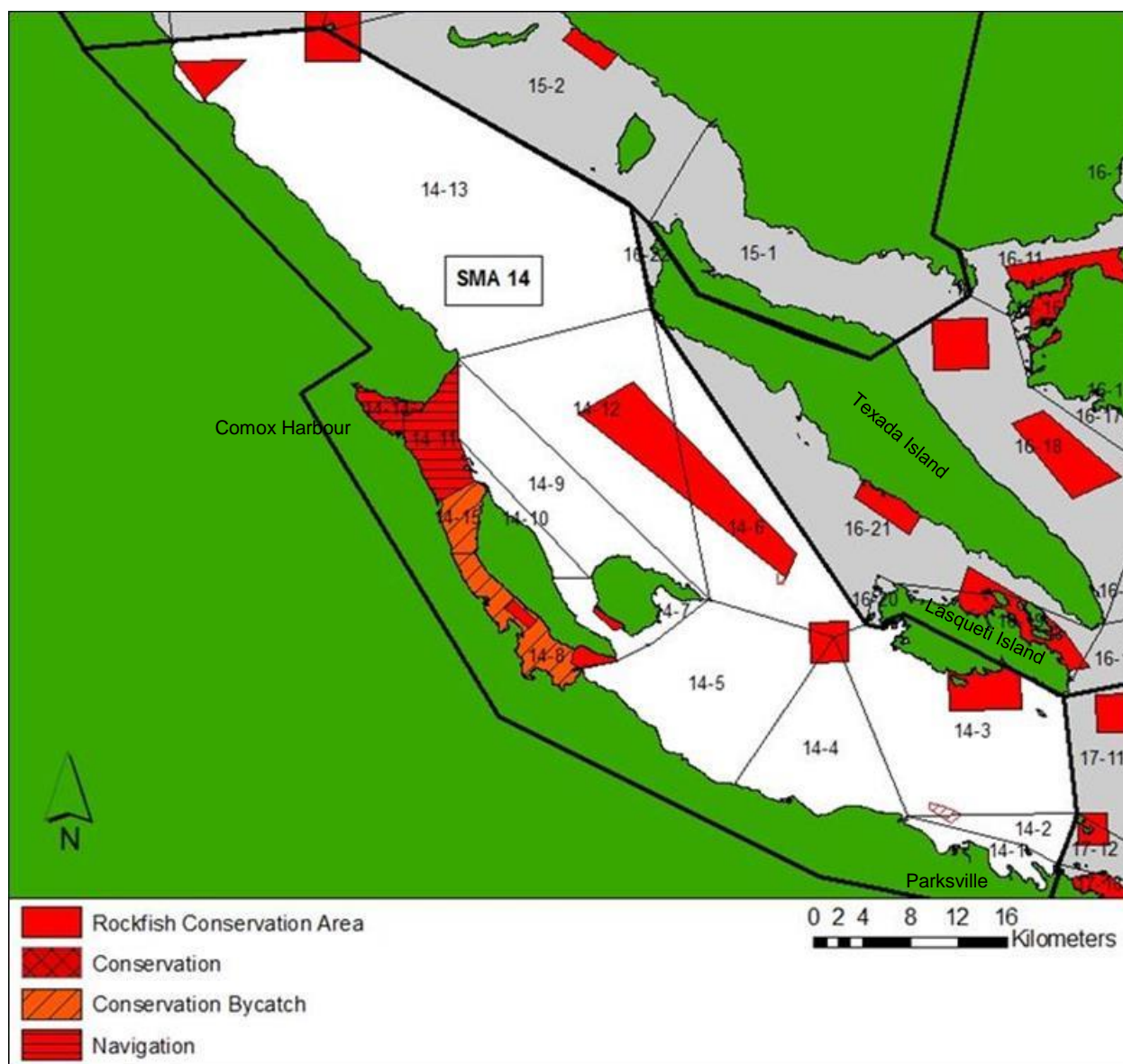


Figure 13. Shrimp Management Area: 14 (Subareas 14-1 to 14-7, 14-9, 14-10, 14-12 and 14-13). Conservation closures in 14-15 and 14-8. Closed in 14-11, 14-14.

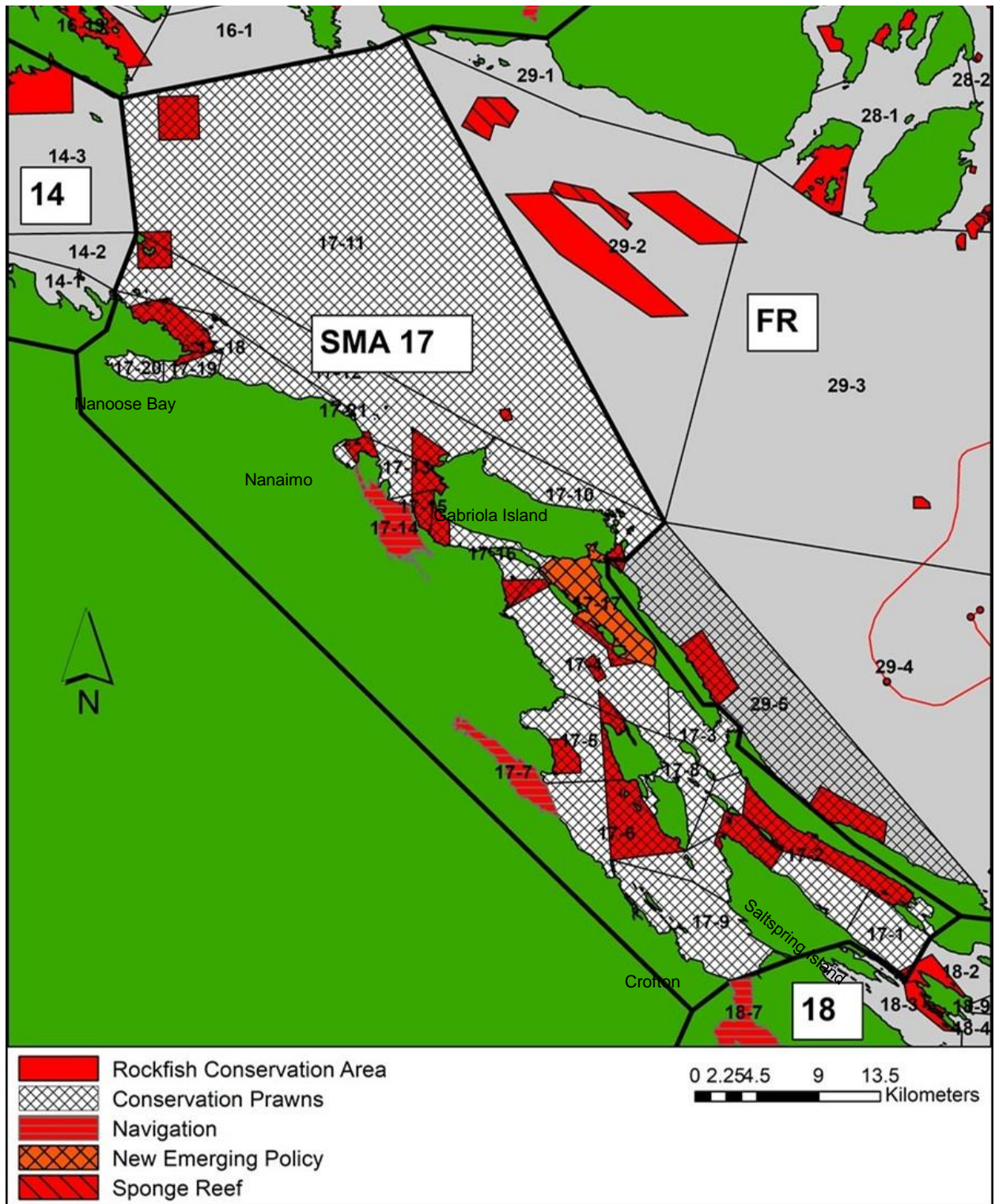


Figure 14. Shrimp Management Area: 17 (Subareas 17-1 to 17-6, 17-8 to 17-13 and 17-15, 17-16, 17-18 to 17-21). Closed in 17-7, 17-14 and 17-17. Closed to prawns year round.

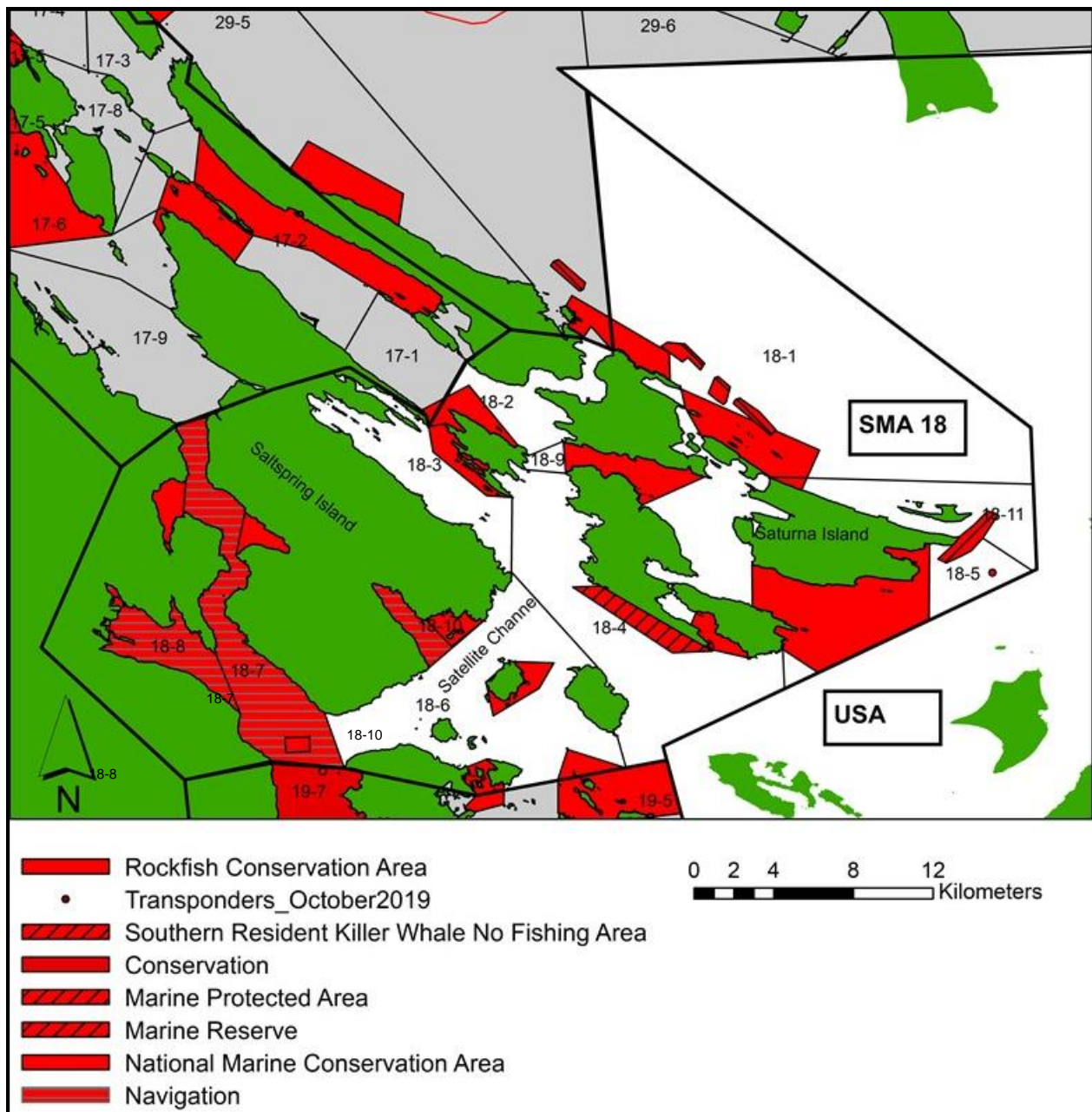


Figure 15. Shrimp Management Area: 18 (Subareas 18-1 to 18-6, 18-9 and 18-11). Closed in 18-7, 18-8 and 18-10.

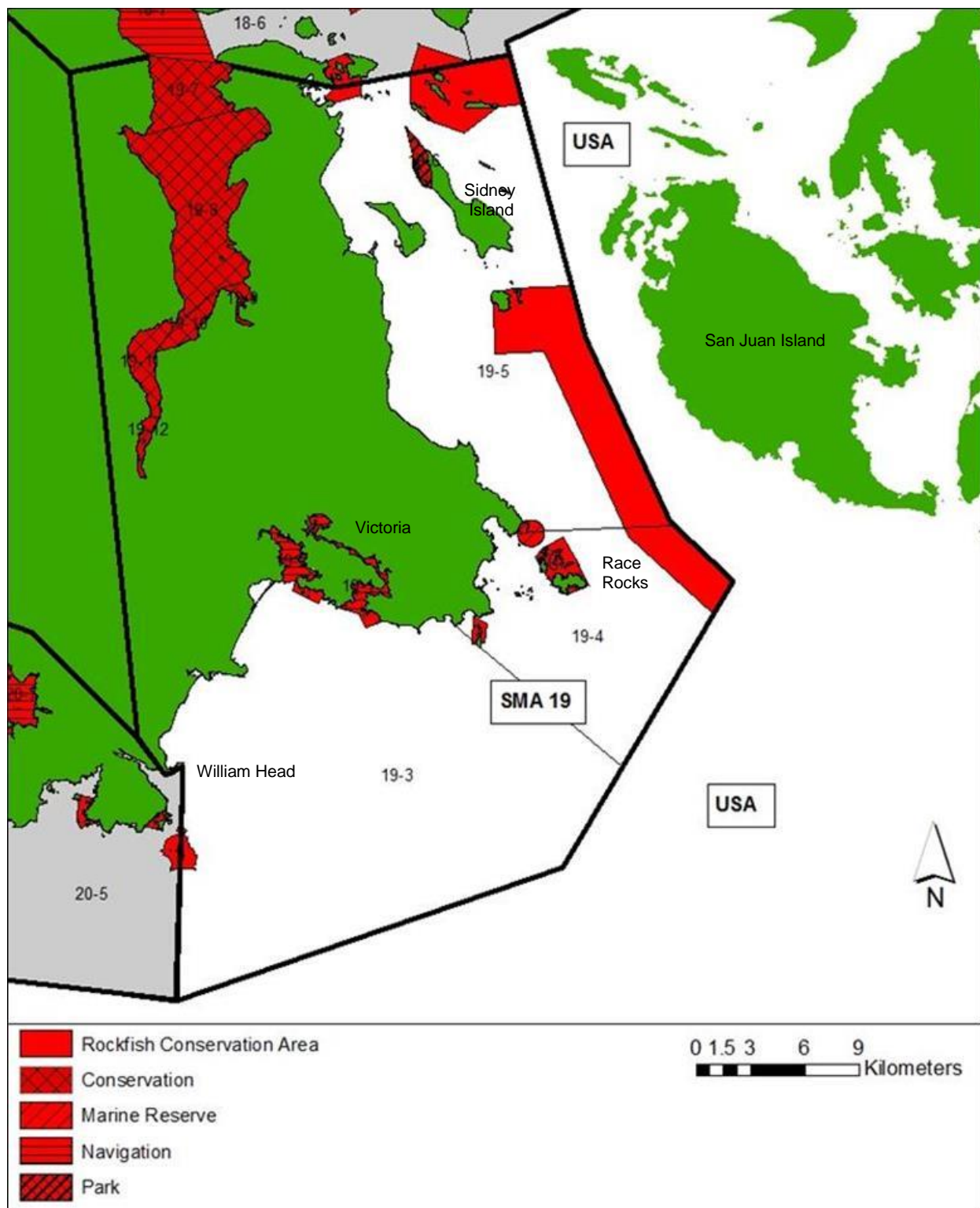


Figure 16. Shrimp Management Area: 19 (Subareas 19-3 to 19-5). Closed in 19-1, 19-2, 19-6, 19-7 to 19-12.

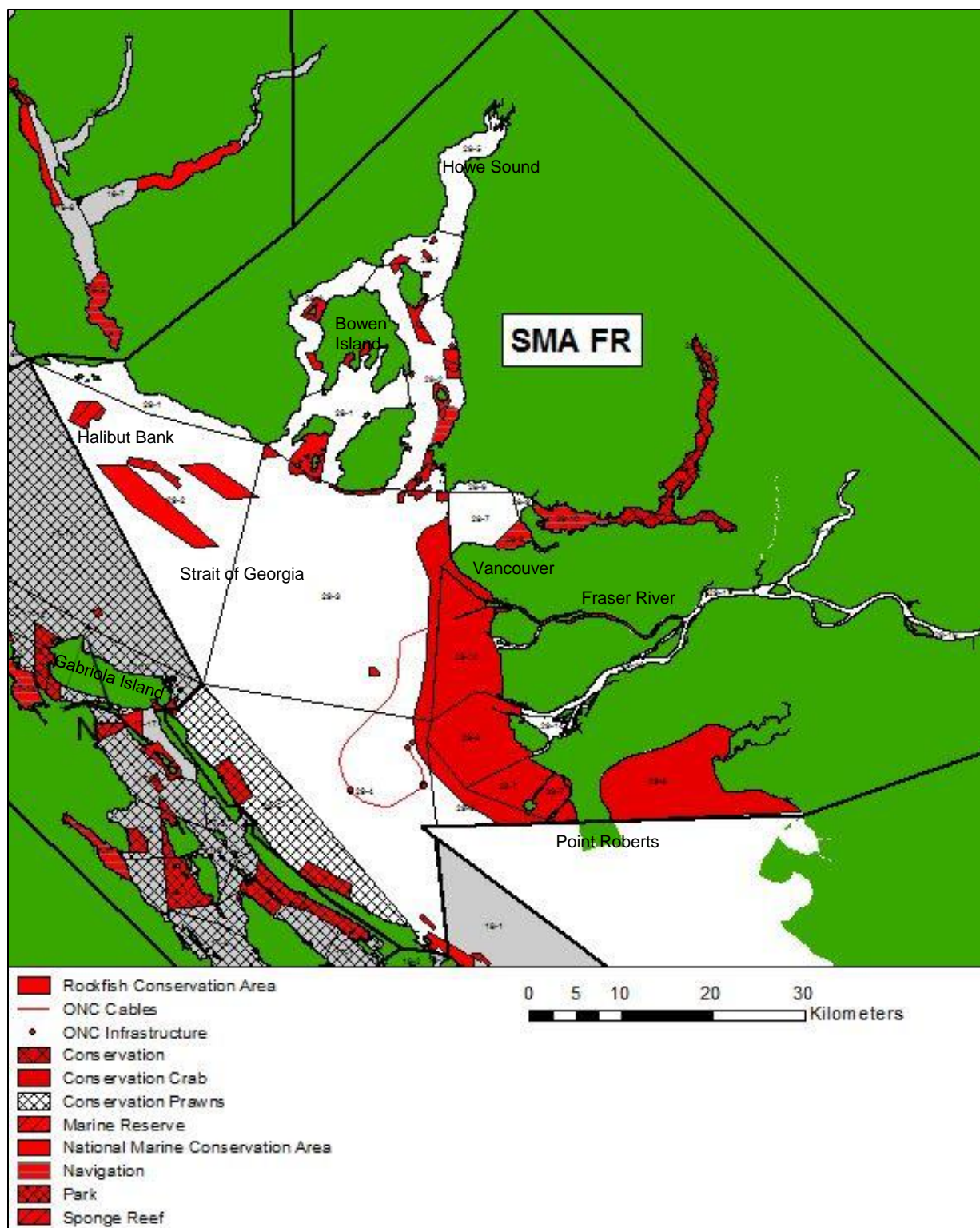


Figure 17. Shrimp Management Area: FR (Subareas 28-1 to 28-7, 28-9 and Subareas 29-1 to 29-6). Closed in 28-8, 28-10 and 28-11 to 28-14, 29-7 to 29-10, 29-12 and portions of 29-3, 29-4 and 29-6.

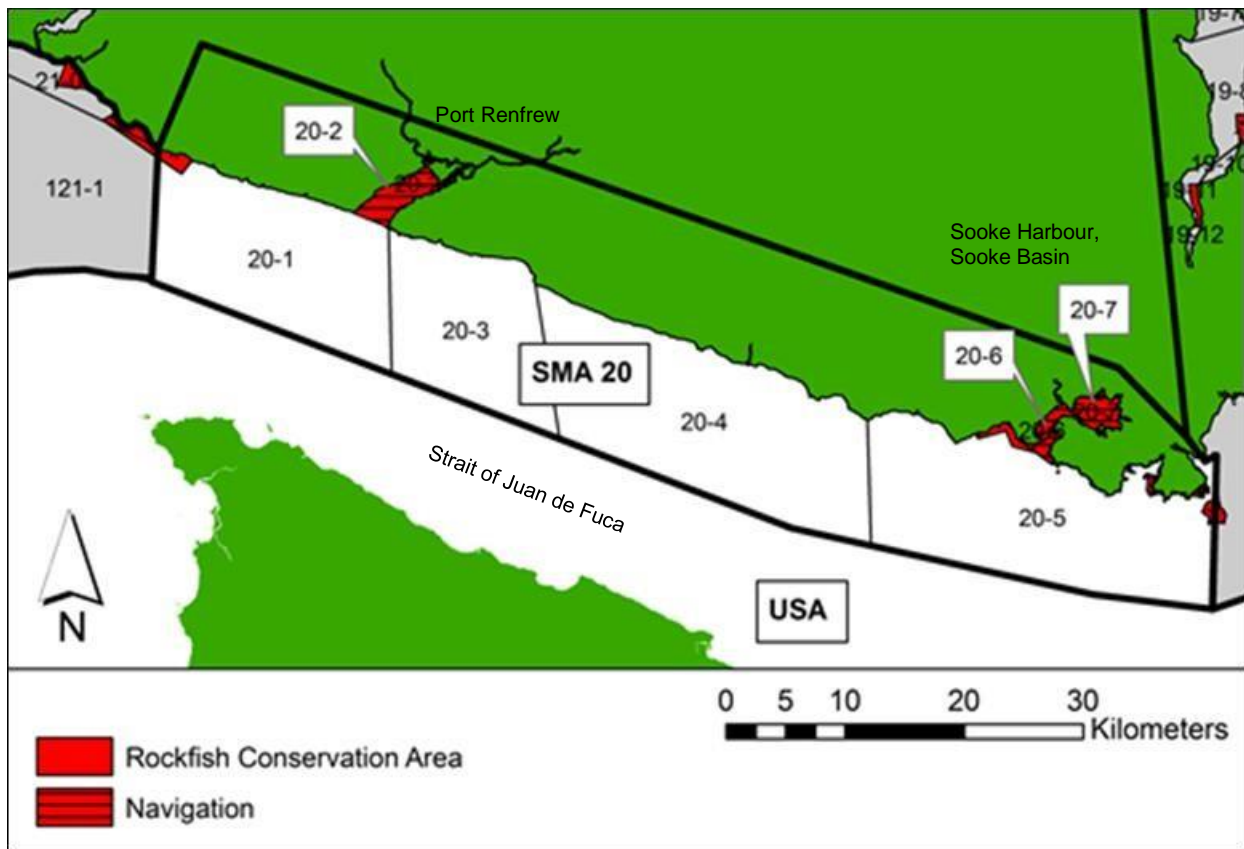


Figure 18. Shrimp Management Area: 20 (Subareas 1, 3, 4 and 5). Closed in 20-2, 20-6, 20-7.

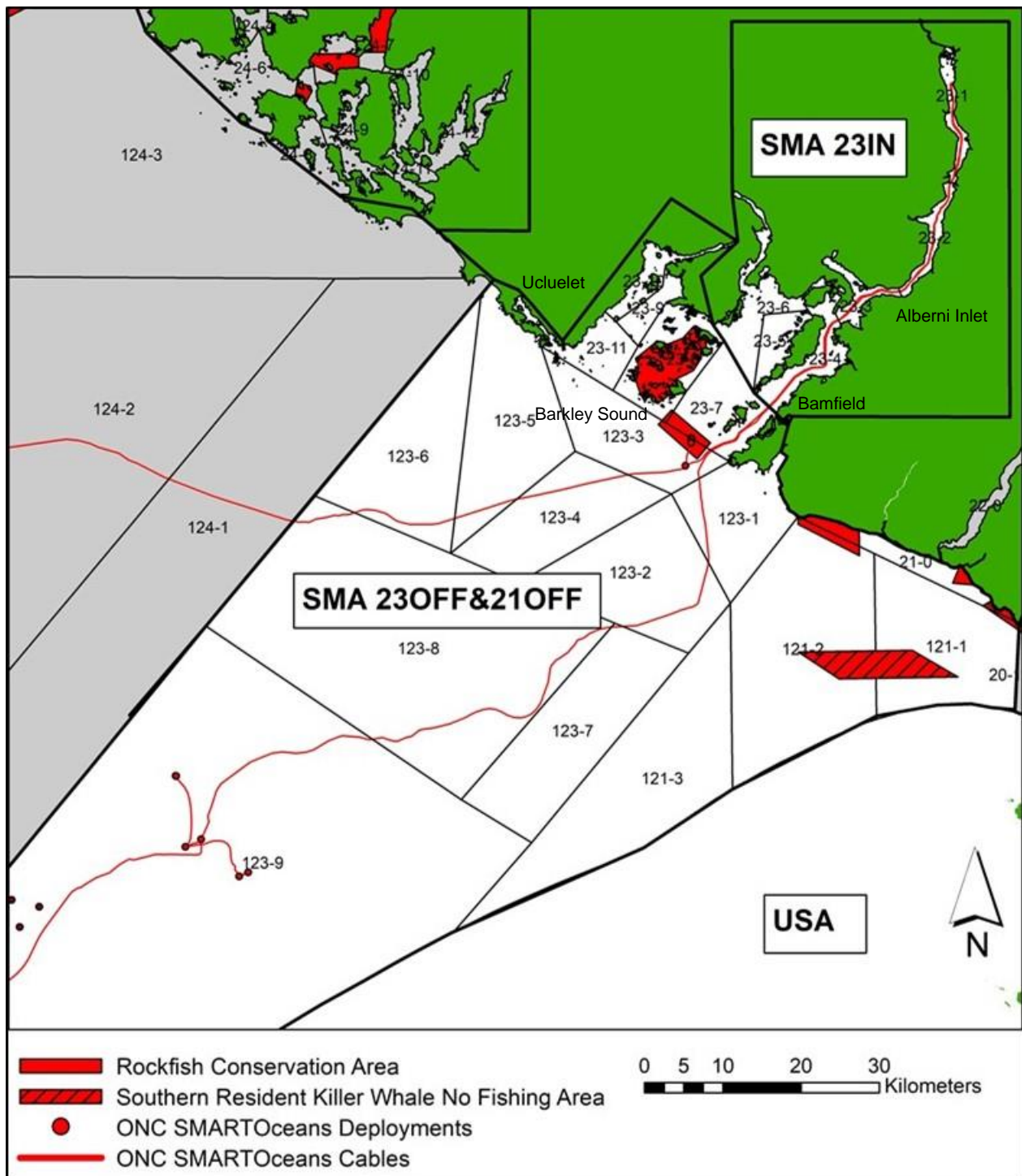


Figure 19. Shrimp Management Areas: 23IN (Subareas 23-1 to 23-6) and SMA 23OFF&21OFF (Subareas 23-7 to 23-11 and Areas 21, 121 and 123).

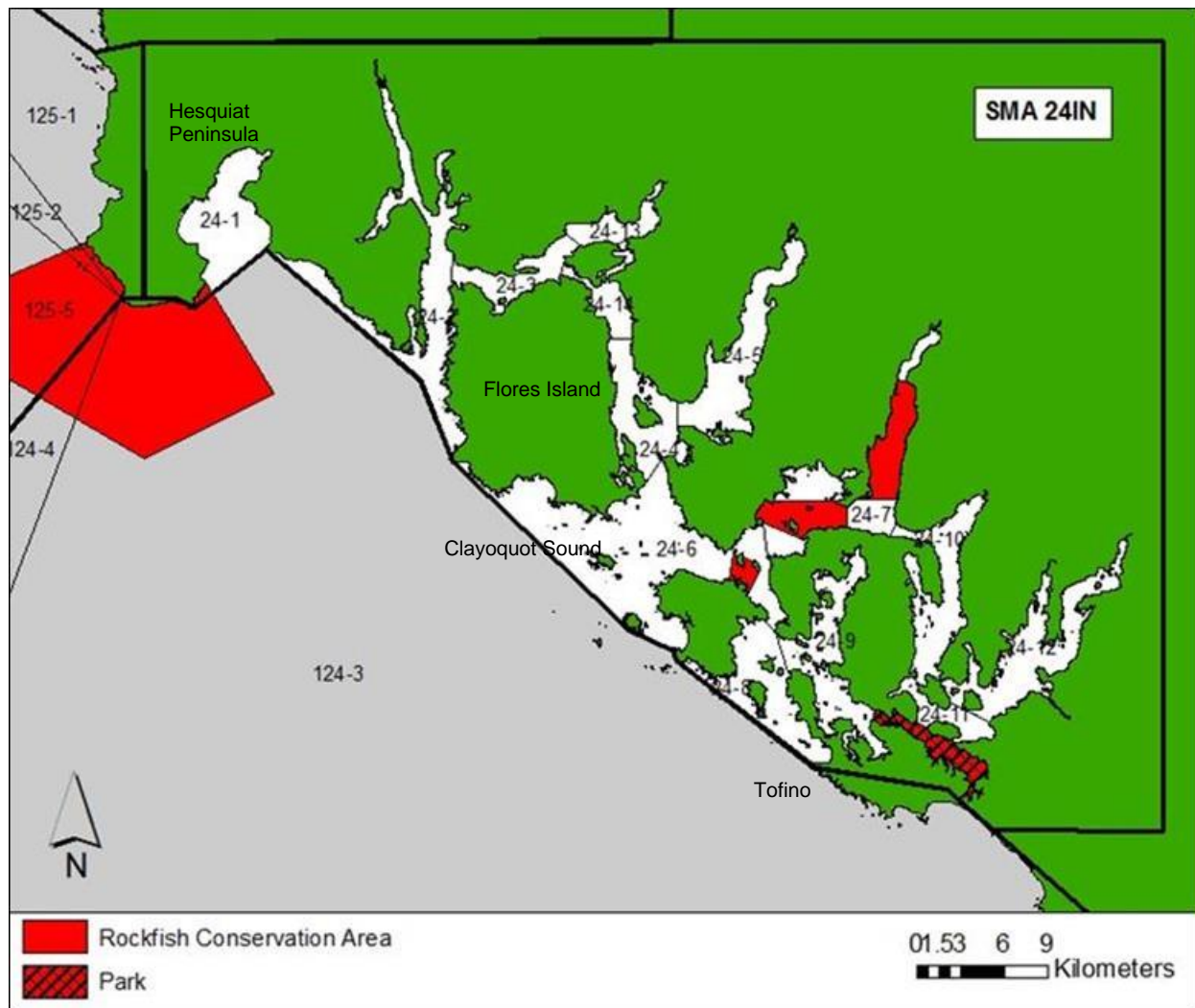


Figure 20. Shrimp Management Area: 24IN (Area 24).

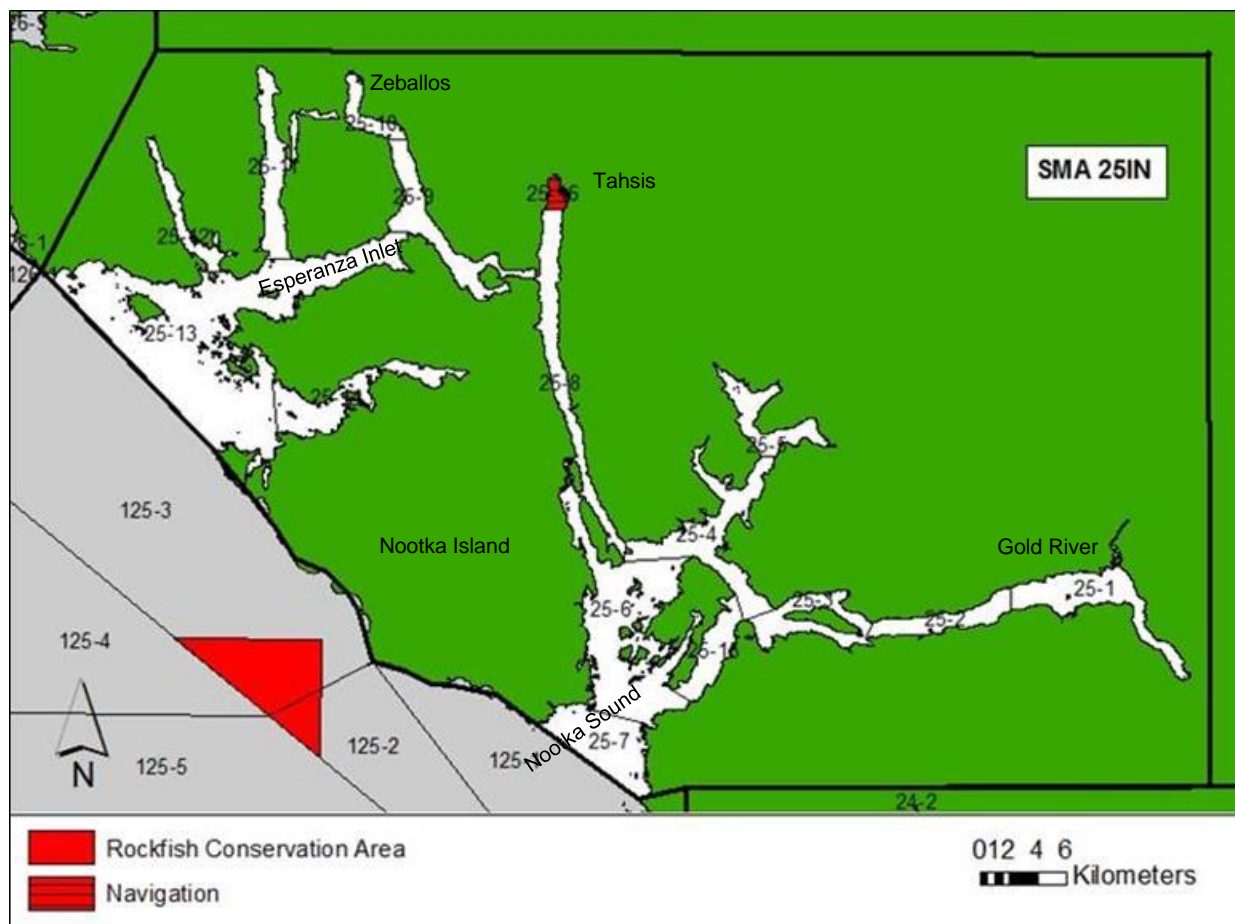


Figure 21. Shrimp Management Area: 25IN (Subareas 25-1 to 25-15). Closed in 25-16.

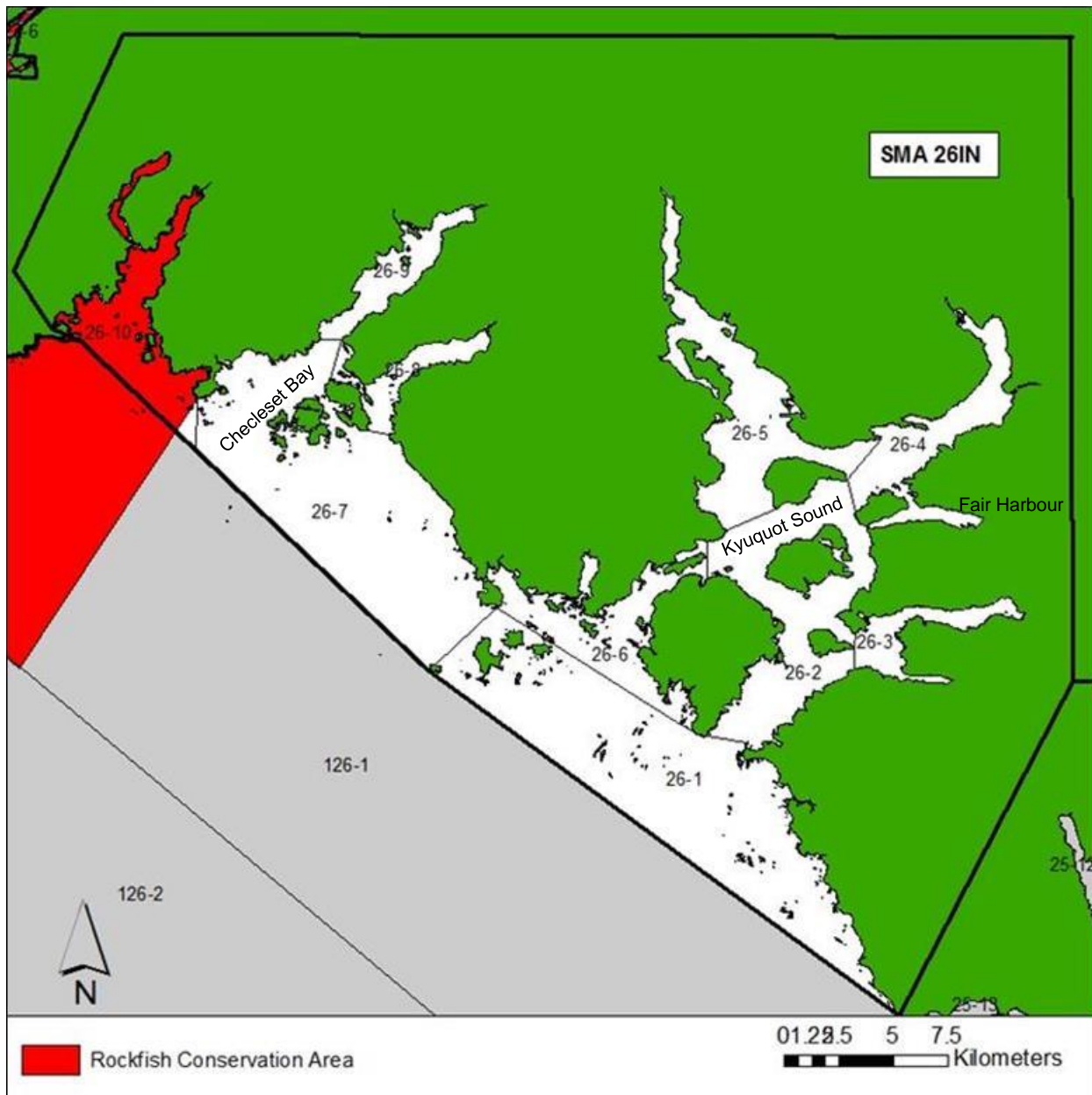


Figure 22. Shrimp Management Area: 26IN (Subareas 26-1 to 26-9). Closed in 26-10.

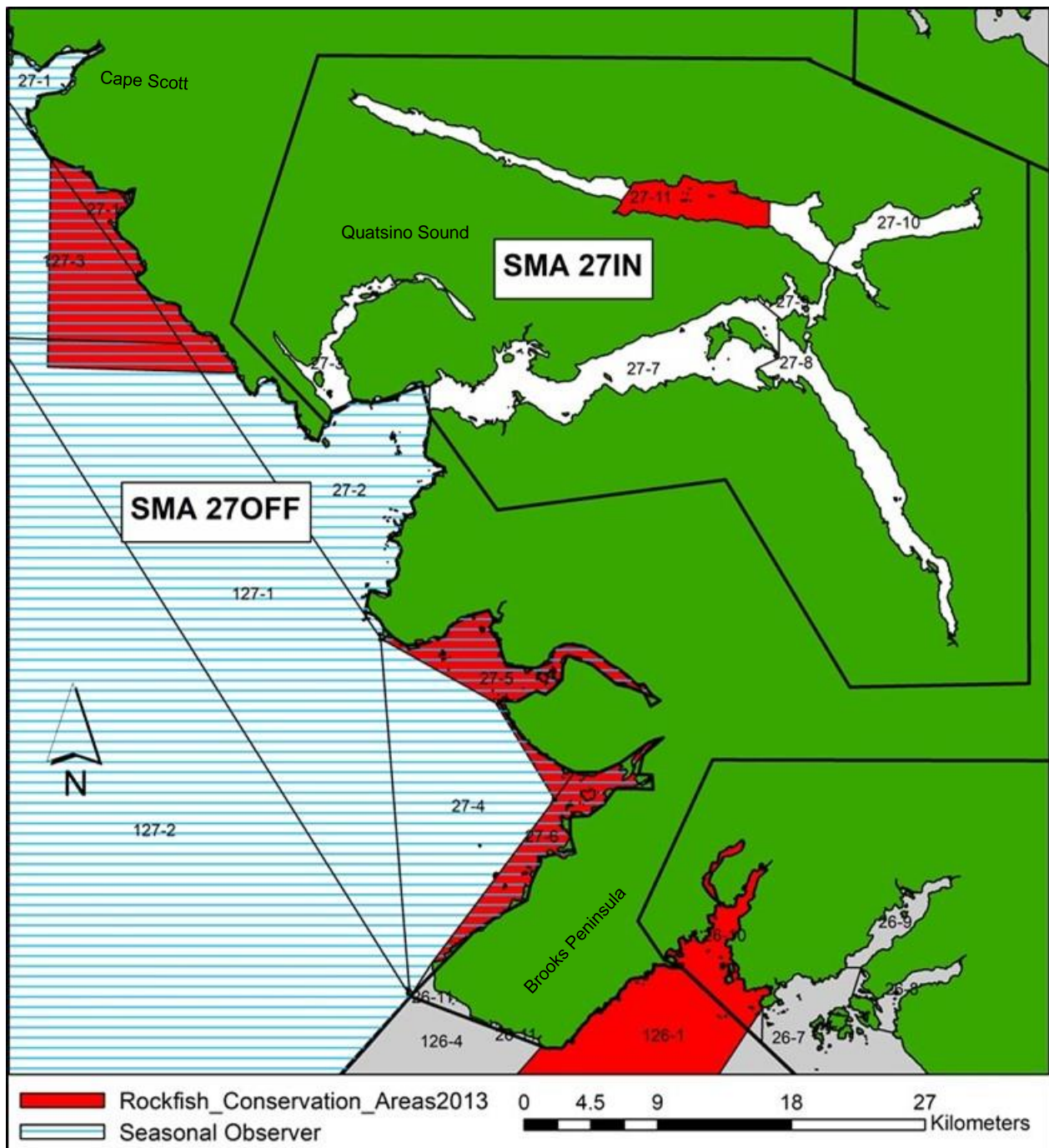


Figure 23. Shrimp Management Areas: 27IN (Areas 27-3, 27-7 to 27-11) and 27OFF (Areas 27-1, 27-2, 27-4, 127). Closed in 27-5 and 27-6.

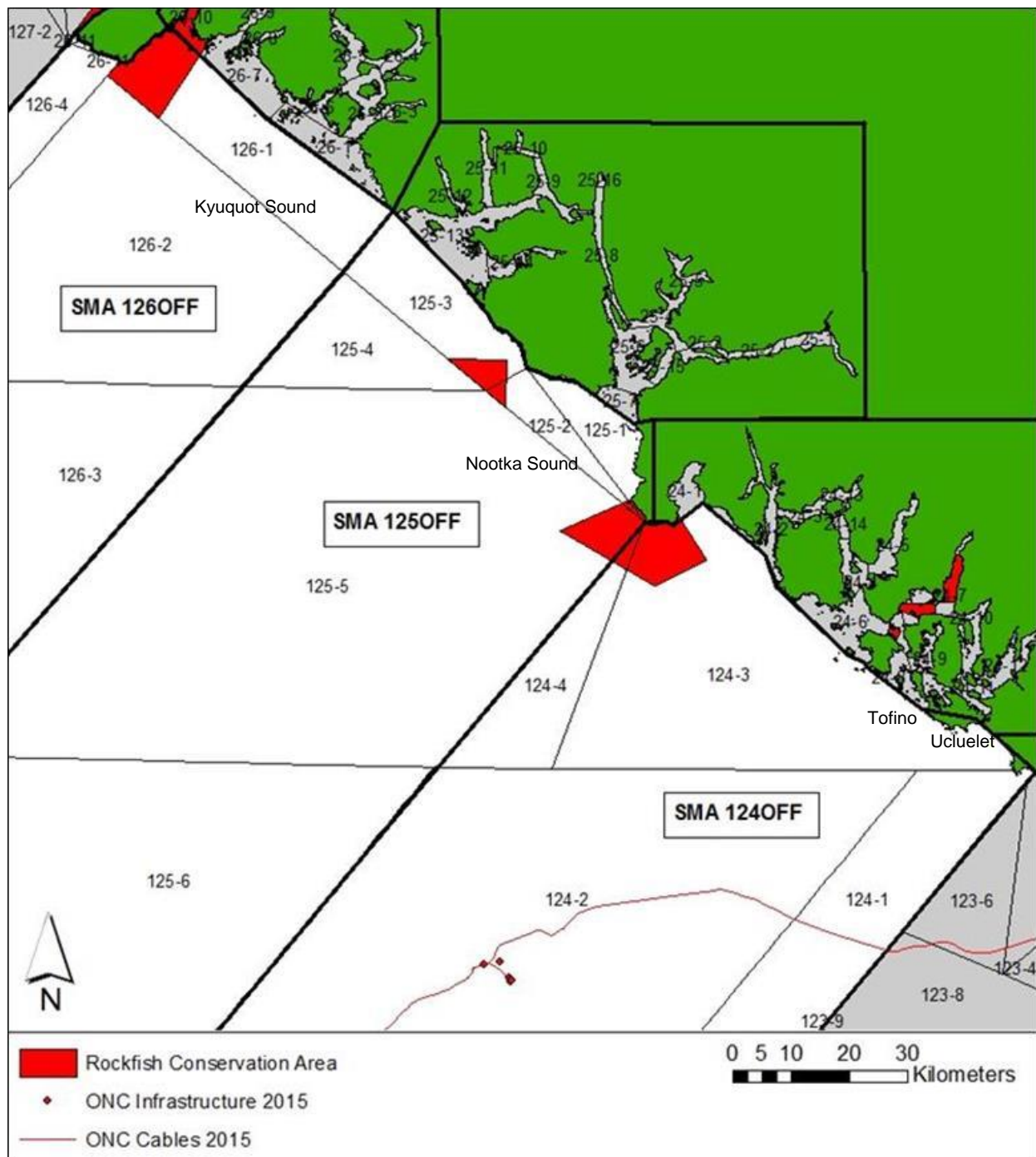


Figure 26. Shrimp Management Areas: 124OFF (Area 124), 125OFF (Area 125) and 126OFF (Area 126 and Subarea 26-11).

APPENDIX 10: FISHING HAZARD ADVISORY - VENUS GEORGIA STRAIT NODE, AREA 29

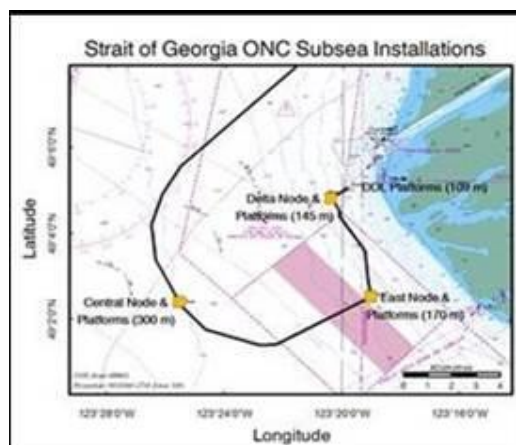
The Victoria Experimental Network Under the Sea (VENUS) is an oceanographic project managed by Ocean Networks Canada (ONC) of the University of Victoria. It consists of cabled observatories in both Saanich Inlet and the Strait of Georgia. From a shore landing, an armoured marine cable extends along the ocean bottom to large observatory “Nodes”, into which oceanographic instrument systems connect. High voltage power is supplied down the cable, and Ethernet communications along fibre optics bring data and images back to the University in real time. Project status, system information, and data are available from the Ocean Networks Canada web site: www.oceannetworks.ca

What: High voltage marine fibre optic cables and observatory systems.

When: Latest system and instrument deployments: 24 June 2017.

Where: Strait of Georgia – Subareas 29-3 and 29-4.

The following gear is considered permanent, and will be serviced for many years. Each “Node” is surrounded by a study area of approximately 250m radius, with instruments and cables. A cable connects these nodes providing power and communications. Cables and Obstruction Areas are noted on the most recent CHS charts #3492 and #3463.



Platforms:

Name	Latitude	Longitude	Depth	Notes	Description
Central Node	49° 2.4262' N	123° 25.5477' W	300 m	Chart 3463	Large (4 m) orange and black frame
Central VIP	49° 2.4410' N	123° 25.5486' W	298 m		Large (3 m) grey steel frame
Central Tripod	49° 2.4399' N	123° 25.5527' W	297 m		Small (1 m) aluminum tripod
Central Hydrophone	49° 2.4755' N	123° 25.5432' W	298 m		Small (1 m) grey aluminum tripod
East Node	49° 2.5701' N	123° 19.0359' W	170 m	Chart 3463	Large (4 m) orange and black frame
East VIP	49° 2.5548' N	123° 18.9987' W	168 m		Large (3 m) grey steel frame
East VIP Tripod	49° 2.5535' N	123° 19.9950' W	167 m		Small (1 m) Aluminum tripod
East ULS Platform	49° 2.5946' N	123° 19.0648' W	166 m		Large (3 m) grey and black steel tripod
Delta Node	49° 4.8400' N	123° 20.3970' W	145 m	Chart 3492	Large (3 m) white steel frame
Delta - BBL Platform	49° 4.8384' N	123° 20.3560' W	145 m		Small (2 m) white steel frame
Delta Hydrophone Array	49° 4.8493' N	123° 20.3538' W	147 m		1.5 m white and orange steel tripod with 20 m extension cable to a 1.5 m steel square platform
Delta Fish Acoustics Experiment	49° 4.8512' N	123° 20.3501' W	143 m		Small (1.5 m) grey steel trapezoidal frame
DDL Platform	49° 5.1057' N	123° 19.8093' W	109 m	Chart 3492	Large (4 m) white steel triangular frame with arms

Cable between East Node and DDL Node:

Cable Waypoint	Latitude	Longitude
A1	49° 2.5701' N	123° 19.0359' W
A2	49° 3.6423' N	123° 19.2406' W
A3	49° 4.3997' N	123° 20.0901' W
A4	49° 4.5607' N	123° 20.1173' W
A5	49° 4.7974' N	123° 20.2993' W
A6	49° 4.8238' N	123° 20.4189' W
A7	49° 4.8400' N	123° 20.3970' W

Cable between DDL Node and DDL Platform Site:

Cable Waypoint	Latitude	Longitude
B1	49° 4.8400' N	123° 20.3970' W
B2	49° 5.1043' N	123° 19.8128' W

Contacts: If you have any concerns, or would like further information, please contact either: Adrian Round, Ocean Networks Canada's Director of Observatory Operations at around@uvic.ca or 250-472-5364 or Karen Douglas, GIS Specialist at kdouglas@uvic.ca or 250-472-5359.

APPENDIX 11: FISHING HAZARD ADVISORY - NEPTUNE NODE, WEST COAST VANCOUVER ISLAND

NEPTUNE Observatory: Folger Passage May 2017

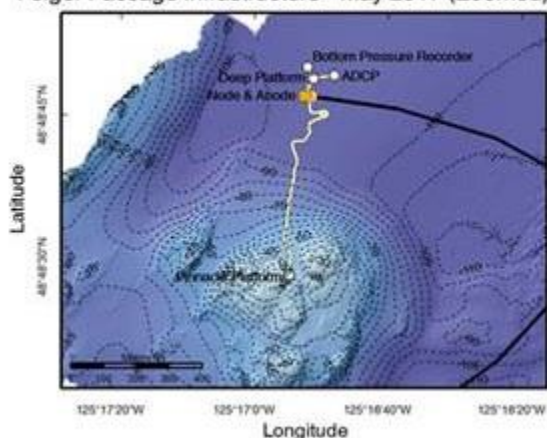
Project: The North-East Pacific Undersea Networked Experiments (NEPTUNE) is an oceanographic project managed by Ocean Networks Canada (ONC), an initiative of the University of Victoria. It consists of a cabled observatory off the west coast of Vancouver Island, beginning in Port Alberni and extending 300 km offshore along an 813 km loop. From a shore landing, an armoured marine cable extends along the ocean bottom to large observatory “Nodes”, into which oceanographic instrument systems connect. High voltage power is supplied down the cable, and Ethernet communications along fibre optics bring data and images back to the University in real time. Project status, system information, and data are available from the ONC website: www.oceannetworks.ca

What: High voltage marine fibre optic cables and observatory systems

When: Latest system and instrument deployments in Folger Passage: 2 May 2017

Where: Folger Passage, West Coast Vancouver Island. See chart # 3671 for obstructions and cables.

Folger Passage Infrastructure - May 2017 (Zoomed)



Folger Passage Infrastructure - May 2017



These figures have been produced by the University of Victoria based on Canadian Hydrographic Service (CHS) charts, pursuant to CHS Direct User License No. 2015-0223-1260-V. The incorporation of data sourced from CHS in these products shall not be construed as constituting an endorsement by CHS of these products. These products do not meet the requirements of the Charts and Nautical Publications Regulations, 1995 under the Canada Shipping Act, 2001. Official charts and publications; corrected and up-to-date, must be used to meet the requirements of those regulations.

Contacts: If you have any concerns, or would like further information, please contact either: Adrian Round, ONC's Director of Observatory Operations at around@uvic.ca or 250-472-5364 or Karen Douglas, GIS Specialist at kdouglas@uvic.ca or 250-472-5359.

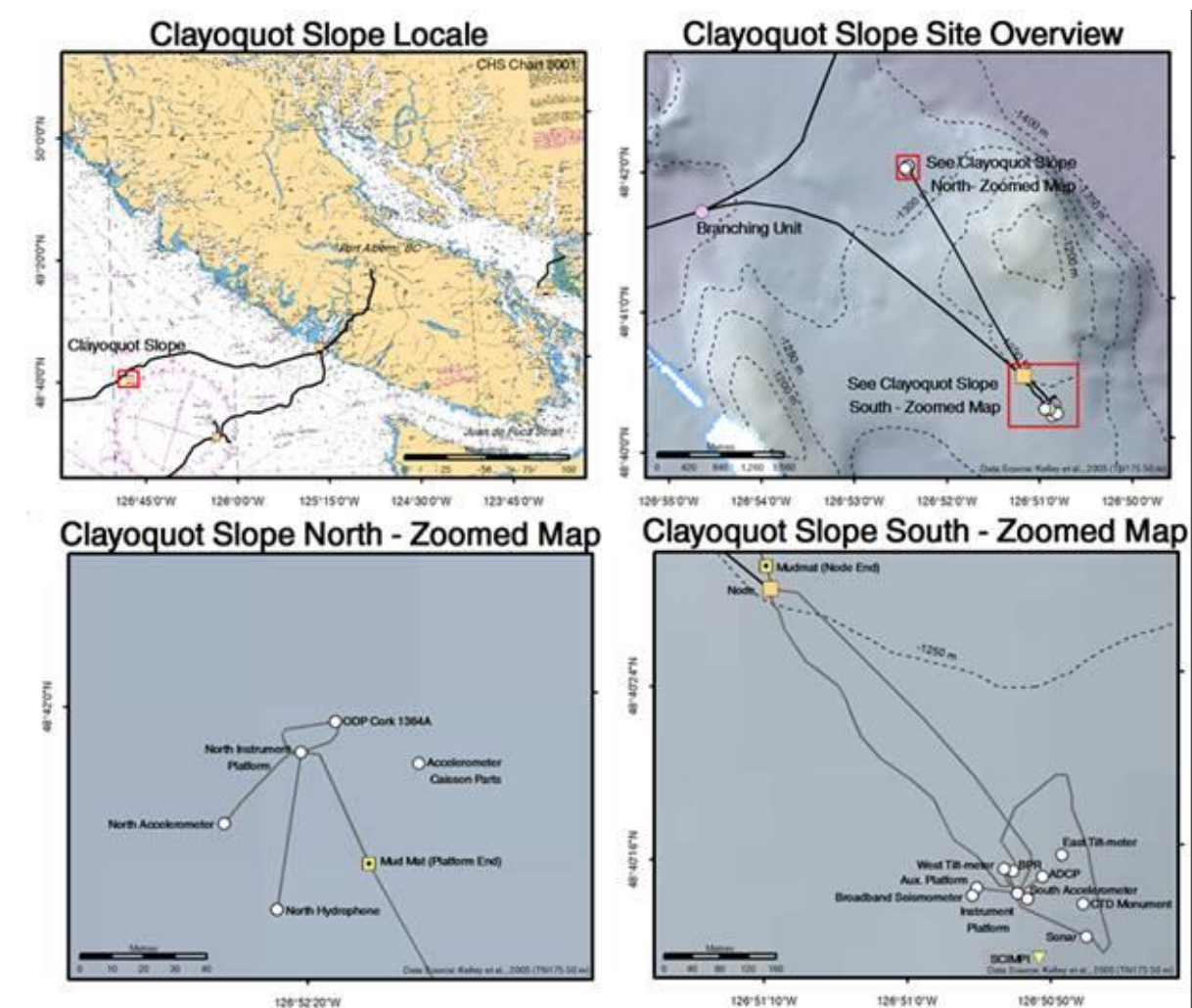
NEPTUNE Observatory: Clayoquot Slope (Formerly ODP 889) June 2017

Project: The North-East Pacific Undersea Networked Experiments (NEPTUNE) is an oceanographic project managed by Ocean Networks Canada (ONC), an initiative of the University of Victoria. It consists of a cabled observatory off the west coast of Vancouver Island, beginning in Port Alberni and extending 300 km offshore along an 813 km loop. From a shore landing, an armoured marine cable extends along the ocean bottom to large observatory “Nodes”, into which oceanographic instrument systems connect. High voltage power is supplied down the cable, and Ethernet communications along fibre optics bring data and images back to the University in real time. Project status, system information, and data are available from the ONC web site: www.oceannetworks.ca

What: High voltage marine fibre optic cables and observatory

When: Latest system and instrument deployments at Clayoquot Slope: June 8, 2017

Where: Clayoquot Slope, West Coast Vancouver Island. See chart # 3001 (ENC CA270389) for main cable route.



These figures have been produced by the University of Victoria based on Canadian Hydrographic Service (CHS) charts, pursuant to CHS Direct User License No. 2016-1003-1260-V. The incorporation of data sourced from CHS in these products shall not be construed as constituting an endorsement by CHS of these products. These products do not meet the requirements of the Charts and Nautical Publications Regulations, 1995 under the Canada Shipping Act, 2001. Official charts and publications; corrected and up-to-date, must be used to meet the requirements of those regulations.

NEPTUNE Observatory: Endeavour – June 2017

Project: The North-East Pacific Undersea Networked Experiments (NEPTUNE) is an oceanographic project managed by Ocean Networks Canada (ONC), an initiative of the University of Victoria. It consists of a cabled observatory off the west coast of Vancouver Island, beginning in Port Alberni and extending 300 km offshore along an 813 km loop. From a shore landing, an armoured marine cable extends along the ocean bottom to large observatory “Nodes”, into which oceanographic instrument systems connect. High voltage power is supplied down the cable, and Ethernet communications along fibre optics bring data and images back to the University in real time. Project status, system information, and data are available from the ONC web site: www.oceannetworks.ca

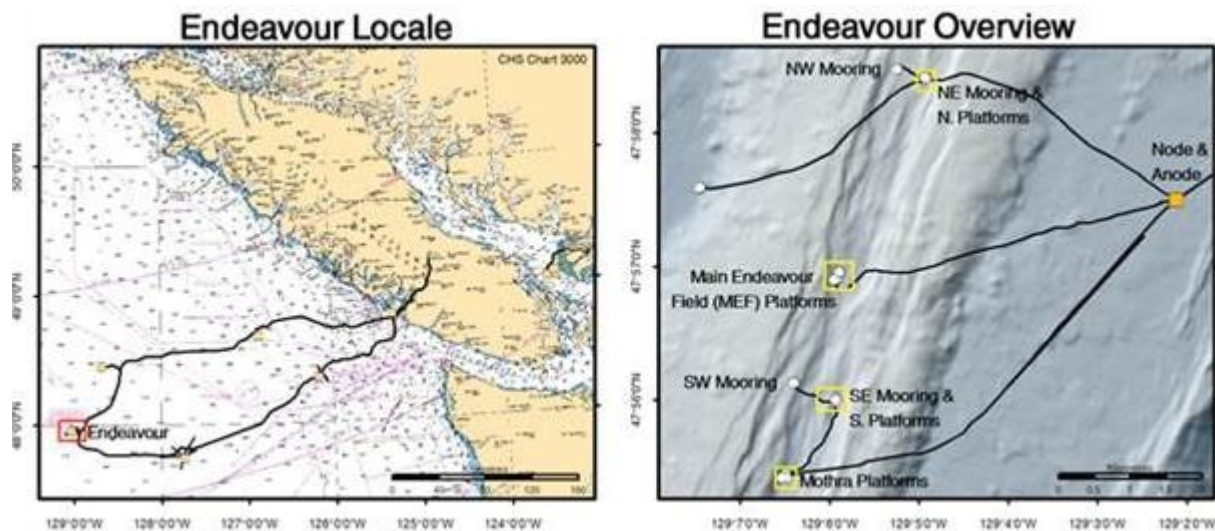
What: High voltage marine fibre-optic cables and observatory systems.

When: Latest system and instrument deployments at the Endeavour site: June 18, 2017

Where: Endeavour, Juan de Fuca Ridge, West Coast Vancouver Island. See chart # 3000.

The infrastructure at Endeavour is located within the Canadian Department of Fisheries and Oceans’ Marine Protected Area.

Remotely Operated Vehicle Operators should be made aware that there are 4 moorings at this site that extend 250 m into the water column. Please contact us for more information (contact information provided below).



These figures have been produced by the University of Victoria based on Canadian Hydrographic Service (CHS) charts, pursuant to CHS Direct User License No. 2015-0223-1260-V. The incorporation of data sourced from CHS in these products shall not be construed as constituting an endorsement by CHS of these products. These products do not meet the requirements of the Charts and Nautical Publications Regulations, 1995 under the Canada Shipping Act, 2001. Official charts and publications; corrected and up-to-date, must be used to meet the requirements of those regulations.

Contacts: If you have any concerns, or would like further information, please contact either:
Adrian Round, ONC’s Director of Observatory Operations at around@uvic.ca or 250-472-5364
or Karen Douglas, GIS Specialist at kdouglas@uvic.ca or 250-472-5359.

Figure 1: Regional Circulation Mooring Diagram

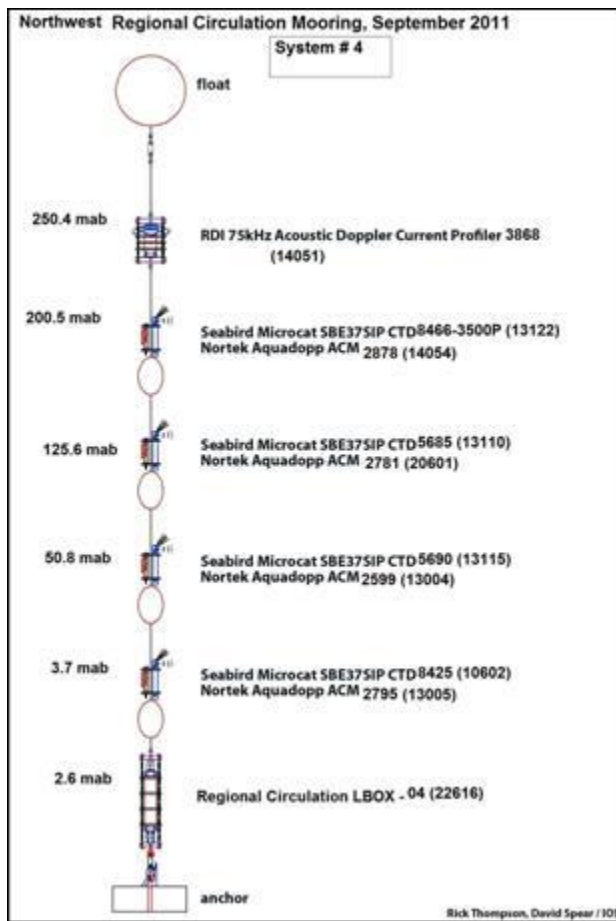
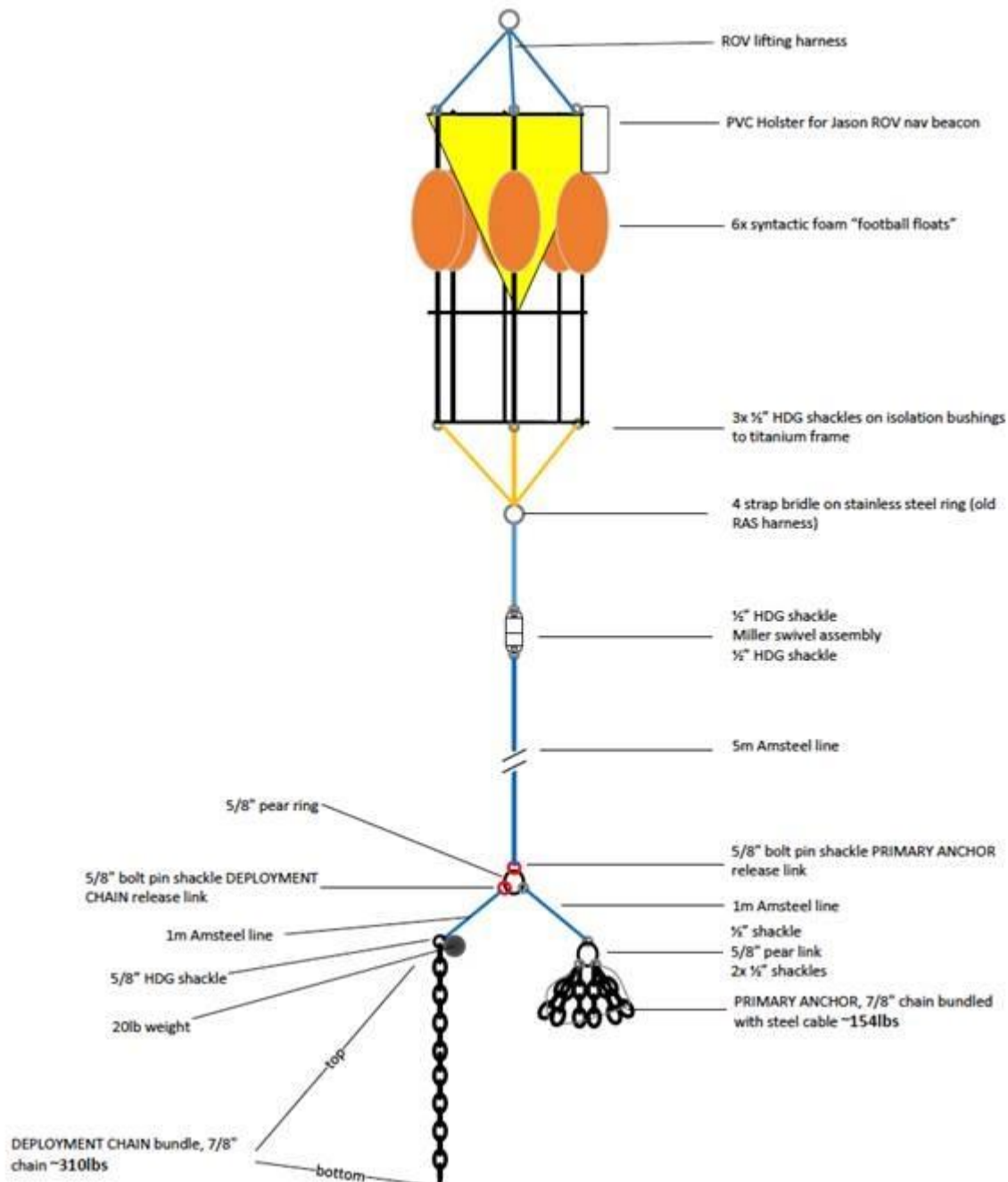


Figure 2: Sediment Trap Diagram



Contacts: If you have any concerns, or would like further information, please contact either: Adrian Round, ONc's Director of Observatory Operations at around@uvic.ca or 250-472-5364 or Karen Douglas, GIS Specialist at kdouglas@uvic.ca or 250-472-5359.

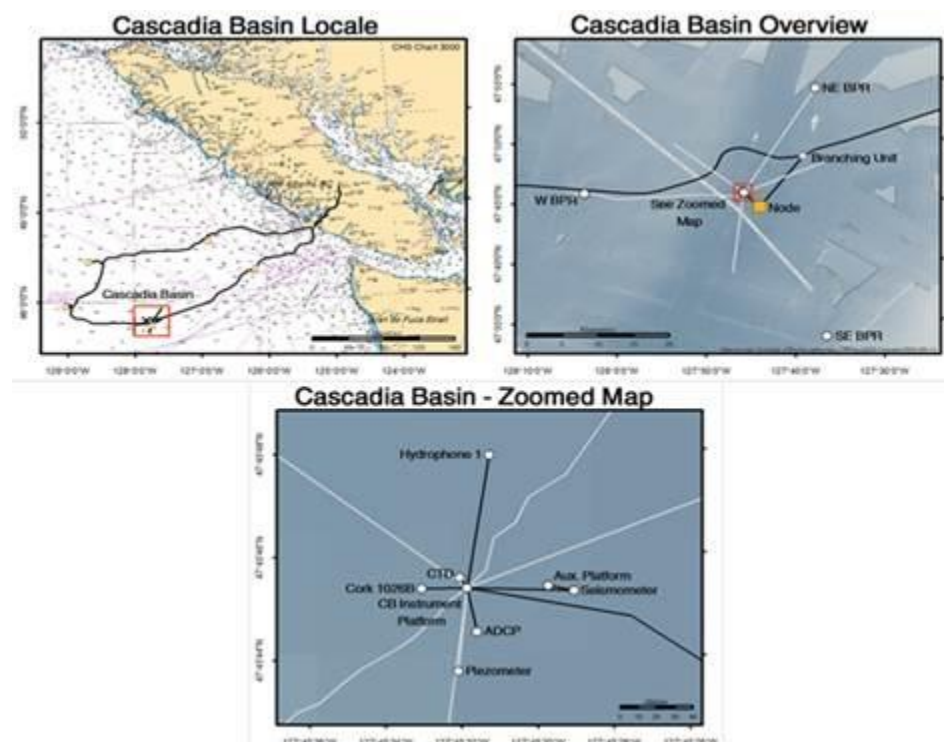
NEPTUNE Observatory: Cascadia Basin (Formerly ODP 1027) – June 2017

Project: The North-East Pacific Undersea Networked Experiments (NEPTUNE) is an oceanographic project managed by Ocean Networks Canada (ONC), an initiative of the University of Victoria. It consists of a cabled observatory off the west coast of Vancouver Island, beginning in Port Alberni and extending 300 km offshore along an 813 km loop. From a shore landing, an armoured marine cable extends along the ocean bottom to large observatory “Nodes”, into which oceanographic instrument systems connect. High voltage power is supplied down the cable, and Ethernet communications along fibre optics bring data and images back to the University in real time. Project status, system information, waypoint downloads and data are available from the ONC web site: www.oceannetworks.ca

What: High voltage marine fibre optic cables and observatory systems

When: Latest system and instrument deployments at the Cascadia Basin site: June 19, 2017

Where: Cascadia Basin, West Coast Vancouver Island. See chart # 3001 (ENC CA270389) for main cable route.



These figures have been produced by the University of Victoria based on Canadian Hydrographic Service (CHS) charts, pursuant to CHS Direct User License No. 2015-0223-1260-V. The incorporation of data sourced from CHS in these products shall not be construed as constituting an endorsement by CHS of these products. These products do not meet the requirements of the Charts and Nautical Publications Regulations, 1995 under the Canada Shipping Act, 2001. Official charts and publications; corrected and up-to-date, must be used to meet the requirements of those regulations.

Contacts: If you have any concerns, or would like further information, please contact either: Adrian Round, ONC's Director of Observatory Operations at around@uvic.ca or 250-472-5364 or Karen Douglas, GIS Specialist at kdouglas@uvic.ca or 250-472-5359.

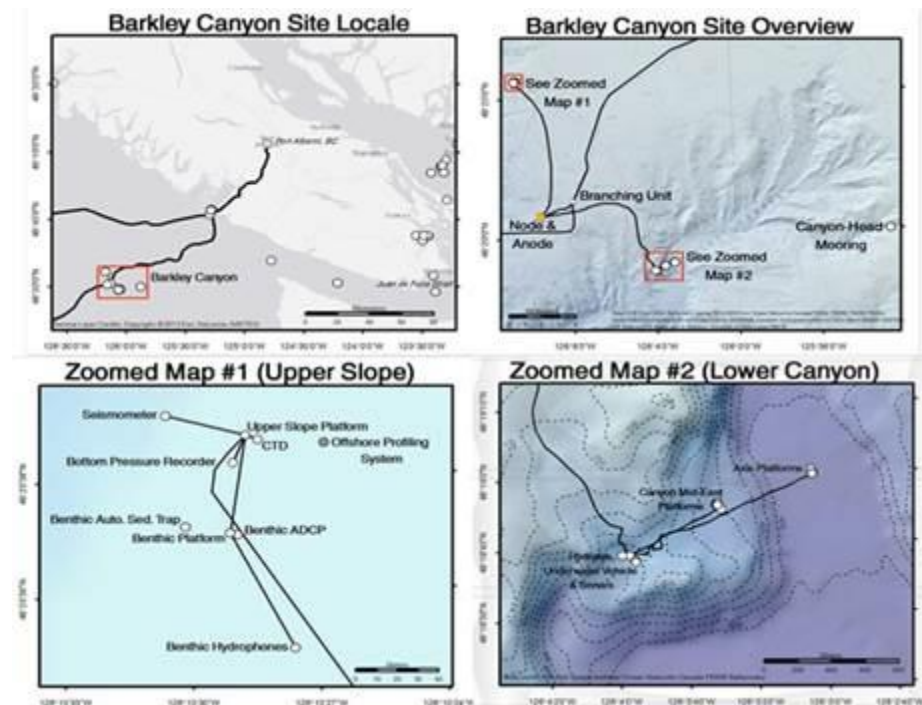
NEPTUNE Observatory: Barkley Canyon– June 2017

Project: The North-East Pacific Undersea Networked Experiments (NEPTUNE) is an oceanographic project managed by Ocean Networks Canada (ONC), an initiative of the University of Victoria. It consists of a cabled observatory off the west coast of Vancouver Island, beginning in Port Alberni and extending 300 km offshore along an 813 km loop. From a shore landing, an armoured marine cable extends along the ocean bottom to large observatory “Nodes”, into which oceanographic instrument systems connect. High voltage power is supplied down the cable, and Ethernet communications along fibre optics bring data and images back to the University in real time. Project status, system information, and data are available from the ONC website: www.oceannetworks.ca

What: High voltage marine fibre optic cables and observatory systems

When: Latest system and instrument deployments in Barkley Canyon: June 20, 2017

Where: Barkley Canyon and Upper Slope, West Coast Vancouver Island. See chart # 3001 (ENC CA270389) for main cable route. The Vertical Profiling System (a winched profiling buoy extending from the seafloor to the sea surface) is listed on the Automatic Identification System (AIS) as MMSI 993166003.



These figures have been produced by the University of Victoria based on Canadian Hydrographic Service (CHS) charts, pursuant to CHS Direct User License No. 2015-0223-1260-V. The incorporation of data sourced from CHS in these products shall not be construed as constituting an endorsement by CHS of these products. These products do not meet the requirements of the Charts and Nautical Publications Regulations, 1995 under the Canada Shipping Act, 2001. Official charts and publications; corrected and up-to-date, must be used to meet the requirements of those regulations.

Note: Cables are exposed at the surface. Please use caution when operating in this area.

Contacts: If you have any concerns, or would like further information, please contact either: Adrian Round, Ocean Networks Canada's Director of Observatory Operations at around@uvic.ca or 250-472-5364 or Karen Douglas, GIS Specialist at kdouglas@uvic.ca or 250-472-5359.

APPENDIX 12: TERMS OF REFERENCE OF THE SHRIMP TRAWL SECTORAL COMMITTEE

1. MANDATE

The Shrimp Trawl Sectoral Committee provides a forum for the exchange of information and views between the people involved with the industry and the Department of Fisheries and Oceans (DFO) on issues important to the management of the fishery. It should be noted that DFO's primary mandate remains the conservation and protection of stocks to ensure long-term, sustainable harvest. The Sectoral Committee is not a voting body; the intent is for DFO to receive a broad range of advice from stakeholders and other concerned parties. DFO, however, remains the decision making authority. The purpose of the sectoral committee is to act as a vehicle for positive change. It is essential that members assume the responsibility of keeping themselves informed to achieve effective and productive meetings.

1.1. The Sectoral Committee has the following goals.

- 1.1.1. Allow the exchange of information between First Nations, commercial, and recreational fishing interests, and DFO.
- 1.1.2. Advise on the development of annual Management Plans for the fishery.
- 1.1.3. Develop cooperative programs, joint projects, and partnerships to develop long-term management strategies for the fishery, including:
 - Provide information and advice regarding stock assessment and biological research for the fishery.
 - Develop means to reduce bycatch in the shrimp trawl industry.
- 1.1.4. Advise the Minister of Fisheries, Oceans and the Canadian Coast Guard on the use of discretionary penalties against harvesters caught violating the rules and regulations of the fishery.
- 1.1.5. Recommend representatives to other advisory bodies, as required.

2. ORGANIZATION

Advisors will be selected to represent the following stakeholders and will be responsible for keeping their constituents informed:

Licence holders	Up to 6 advisors, selected by S licenced vessel owners to represent current licence holders
Processors	Up to 4 advisors, selected to represent active buyers and processors
Executive Directors of licence holder associations	TBD
First Nations	1+ advisors, selected to represent First Nations interests
Other representatives	1+ advisors, if necessary, selected to represent other significant interests in the fishery (e.g., recreational harvesters, aquaculture, crew)

- Licence holder representatives will be selected either by a vote conducted by DFO of the licence holders of record or by organisations representing the licence holders. DFO may appoint additional advisors to ensure representation from all geographic areas and gear groups.
- Processors will be selected by DFO to represent all active buyers and processors in the fishery.
- First Nations representatives will be identified following consultation with First Nations groups.
- Advisors will be elected or appointed for a three year term. Licence holders may select another current advisor to represent them during the three years. Advisors will not be added unless the Committee provides unanimous consent.
- Each advisor will identify an alternate, who may attend all meetings but only participate if the advisor is absent.
- The Ministry of Agriculture, Food and Fisheries, and, if necessary, other Ministries, will represent the Province of B.C. on the Committee.
- DFO will chair the Committee meetings. Other DFO staff will attend as appropriate.
- The Committee can invite other people to participate when appropriate.

3. PROCEDURES

Minutes of all meetings will be taken. They will be distributed to all advisors for approval, then made available to the public. The information will be available on the internet following links from the Shellfish Consultations webpage at:

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

Committee recommendations will only be made with the agreement of all advisors. When complete agreement cannot be reached, all consenting and dissenting opinions will be recorded in the minutes.

All Sectoral Committee meetings can be attended by observers, subject to prior approval by the chairperson. These observers cannot participate in the meeting unless approved by the chairperson.

The chairperson can appoint subcommittees to report on specific tasks. The subcommittee will require clear objectives, members identified (including the chairperson), and set deadlines.

There must be at least one meeting a year to consider the annual management plan. The chairperson can call other meetings as required. The chairperson will prepare an agenda and circulate it to all advisors before the meeting.

The Sectoral Committee will consider developing a code of conduct that, if violated, provides the basis for dismissal from the Committee. Repeated absence from meetings and blatant violations against the *Fisheries Act* or Regulations would be considered adequate grounds for dismissal.

4. UPCOMING CHANGES TO THE SECTORAL COMMITTEE

With the recent changes in organization for the commercial licence holders, and increasing interest from other parties in participating on the formal sectoral committee, DFO will be putting forward recommendations for changes in the sectoral committee membership and mandate. DFO will consult with the current sectoral committee and others in developing the recommendations.

APPENDIX 13: EXAMPLE CONDITIONS OF LICENCE

EXAMPLE CONDITIONS OF SHRIMP BY TRAWL LICENCE - FOR REFERENCE ONLY

Licence Period: April 1, 20XX to March 31, 20XX

Authority

The Department of Fisheries and Oceans has authority to set licence conditions under subsection 22(1) of the *Fishery (General) Regulations* for the proper management and control of fisheries and the conservation and protection of fish.

Persons fishing under authority of this licence may only do so in accordance with the conditions stated below.

Also, it is the responsibility of individual fish harvesters to be informed of, and comply with, the *Fisheries Act* and the regulations made thereunder, in addition to these conditions.

For information on management of the shrimp-by-trawl fishery obtain a copy of the current Integrated Fisheries Management Plan for Shrimp by Trawl. The Management Plan is intended for general information purposes only. Where there is a discrepancy between the Plan and the *Fisheries Act* and regulations or these conditions, the *Fisheries Act* and regulations and these conditions prevail.

PART 1

Application

This Part applies to fishing for shrimp, by means of trawl gear.

Definitions

"Area" and "Subarea" have the same meanings as in section 2 of the *Pacific Fishery Management Area Regulations, 2007*.

"beam trawl" means a bag shaped net that is dragged through the water by a vessel for the purpose of catching shrimp, in which the mouth of the net is held open by a single rigid beam of wood or metal.

"Department (DFO)" means the Department of Fisheries and Oceans.

"designated service provider" means any private sector company or organization authorized by the Department for the purpose of assisting licence holders and vessel masters in meeting these conditions of licence with regards to reporting of information.

"fishing trip" means a voyage that commences at the time a fishing vessel leaves a port, dock or other permanent anchorage to engage in fishing and terminates at the time any fish caught during that period are offloaded.

"harvest log" means a log of all harvest operations that meets the requirements of the Department's Stock Assessment and Research Division Shellfish Data Unit and available from the designated service provider who provides the logbook and data keypunch services.

"landed" or "landing" means the transfer of any quantity of shrimp from a vessel to land including docks and wharves at the end of a fishing trip.

"observer" means a person who has been designated as an observer by the Regional Director-General for Pacific Region pursuant to section 39 of the *Fishery (General) Regulations*.

"offloading" means the landing or removal of catch from the vessel.

"otter trawl" means a bag shaped net dragged through the water by a vessel for the purpose of catching shrimp, in which the mouth of the net is held open by "otter" boards (or commonly known as "doors") of wood and/or metal.

"Shrimp Management Areas" are described in the current "Integrated Fisheries Management Plan for Shrimp by Trawl".

"vessel registration number (VRN)" means the number assigned to a vessel by the Department at the time the vessel is registered as a fishing vessel.

1. Species, quantity, and size of fish permitted to be taken:

(1) The following shrimp species may be caught and retained:

- (a) Northern Pink Shrimp (*Pandalus borealis*);
- (b) Pink Shrimp (*Pandalus jordani*);
- (c) Sidestripe Shrimp (*Pandalopsis dispar*);
- (d) Flexed Shrimp (*Pandalus goniurus*);
- (e) Coonstripe Shrimp (*Pandalus danae*); and
- (f) Humpback Shrimp (*Pandalus hypsinotus*).

(2) Prawn Shrimp (*Pandalus platyceros*) caught incidentally while fishing for those species of shrimp set out in subsection 1(1) may be retained in a quantity that does not exceed 100 individual whole, in the shell, Prawn Shrimp, provided that the area is open for fishing for Prawn Shrimp by means of trawl gear.

(3) The minimum size limit for prawns is 33 mm carapace length, measured from the posterior-most part of the eye orbit to the posterior mid-dorsal margin of the carapace.

(4) Opal Squid (*Doryteuthis opalescens*) caught incidentally while fishing for those species of shrimp set out in subsection 1(1) may be retained in a quantity that does not exceed 2% of the total weight of shrimp on board the vessel.

(5) Octopus (*Enteroctopus dofleini*) caught incidentally while fishing for those species of shrimp set out in subsection 1(1) may be retained.

2. Waters where fishing is permitted:

Subject to variation of the close times set out in the *Pacific Fishery Regulations, 1993*, fishing under the authority of this licence is permitted within all Areas and Subareas, except Areas 2, 107 to 111, 130, and Subareas 7-1, 7-25, 7-26, 7-31, 8-1, 10-1, 10-2, 11-1 and 11-2.

Note: See section 16 of these conditions for special requirements specific to fishing in Areas 124 and 125.

3. Fishing gear permitted to be used:

(1) An otter trawl net or beam trawl net modified to reduce by-catch of species other than shrimp in the manner described in subsections 3(2) and 3(3). Refer to the current Integrated Fisheries Management Plan for Shrimp by Trawl for further information.

(2)(a) Each trawl net used under this licence shall have a rigid grid (e.g. aluminum, PVC), sometimes called a Nordmore grate, inserted into the forward end of the cod end of the trawl net at an angle so that it entirely blocks access to the cod end, except for the spaces between the bars.

(b) Within Pacific Fisheries Management Areas 21, 121, 23-8 to 23-11, 123, 124, 125, and 127 the bars of the grid shall be not more than 19 mm apart. Within all other Pacific Fisheries Management Areas the bars shall not be more than 31.75 mm (1.25 inches) apart.

(c) The netting directly above the grid shall have a triangular opening ("escape hole") the full width of the grate. The sides of the opening shall be reinforced so that the opening remains unobstructed and maintains its shape while the net is being towed through the water.

(3) In addition, the top (hood or upper belly) of each otter trawl net used under this licence shall contain a minimum 4.4 m² panel of large mesh with minimum 4cm square openings, such as found in plastic lattice snow-fencing or large mesh netting hung on the square.

(4) Mechanized devices that automatically separate by-catch from shrimp (e.g. "smelt belts") shall not be used.

(5) On-board shrimp sorting devices to separate shrimp by size are allowed.

(6) The vessel master shall ensure that:

(1) vessels fishing for shrimp by trawl use footrope lighting devices (LEDs) on their trawl nets in all shrimp trawl management areas of the coast;

(2) at all times when the trawl nets are in the water;

(a) the lighting devices are operational;

(b) lighting devices are emitting light;

(c) lighting devices are securely attached within 6 inches (15.24cm) of the forward leading edge of the bottom panel of trawl netting; and

(d) each trawl net has a minimum of five (5) lighting devices spaced along the the central portion of the net.

4. The segregation of species on board the vessel:

(1) All prawn shall be segregated on board the vessel from all other species of shrimp.

(2) Subject to subsections (3) and (4), discarding of shrimp is not allowed. All shrimp (other than prawns and other species when areas are closed) that are caught shall be retained and reported in logbooks and hailed as landed catch.

(3) Undersize prawn, shrimp that the vessel is not permitted to retain and other by-catch for which the vessel does not have a licence shall be returned to the water immediately and in the manner that causes the least harm.

(4) Any prawns with an egg mass (berried females) shall be returned to the water immediately and in the manner that causes the least harm. Eggs shall not be removed from prawns carrying eggs.

5. If vessel is licensed for fishing for shrimp by means of trap gear:

Where this licensed vessel holds a shrimp-by-trap commercial fishing licence, any shrimp caught under authority of that licence shall be offloaded prior to the vessel fishing under authority of this licence.

6. Catch prohibited on board the licensed vessel while fishing:

(1) No prawns or shrimp that are not permitted to be retained under the authority of this licence shall be on board the licensed vessel.

7. Fishing Activity Reports:

(1) Prior to commencing fishing:

(a) Prior to commencing fishing and at least 24 hours prior to leaving port, the vessel master shall:

(i) obtain a Fishing Hail Number; and

(ii) record the Fishing Hail Number in the Shrimp Trawl Fishing Log.

The person identified as the vessel master in subsection 7(1)(b)(i) shall be considered to be the vessel master responsible for all fishing, vessel handling and reporting activities for the duration of the fishing trip.

(b) To obtain a Fishing Hail Number, the vessel master shall contact the designated service provider contracted by the licence holder during the hours of 08:30 h to 16:30 h, (Monday to Friday only, excluding official holidays) and the following information shall be provided:

(i) vessel name, vessel registration number, vessel master's name and contact telephone number, autotel or cellular phone number of vessel, and gear type (beam or otter trawl); or a shrimp fish harvester identification number assigned by the service provider;

(ii) Subarea or Shrimp Management Area to be fished;

(iii) anticipated date and time fishing will begin;

(iv) anticipated number of fishing days for the fishing trip;

(v) target shrimp species, i.e. which species the vessel master will direct the fishing effort towards;

(vi) type of product to be produced, (i.e. fresh, live, frozen at sea);

(vii) anticipated date and time of offloading at the end of the fishing trip; and

(viii) anticipated port and location of offloading at the end of the fishing trip.

(2) Prior to changing area:

(a) In the event of a change in the Subarea or Shrimp Management Area to be fished as reported under subsection 6(1), the vessel master shall notify the designated service provider contracted by the licence holder during the hours of 08:30 h to 16:30 h, (Monday to Friday only) and shall provide the following information:

(i) Fishing Hail Number which applies to the current fishing trip;

(ii) new Subarea or Shrimp Management Area to be fished;

(iii) the total weight of each species of shrimp as set out in subsection 1(1), on board the vessel from each Shrimp Management Area fished;

- (iv) anticipated number of fishing days in the new Subarea or Shrimp Management Area;
- (v) target shrimp species, i.e. which species the vessel master will direct the fishing effort towards;
- (vi) type of product to be produced, i.e. fresh, live, frozen at sea etc.; and
- (vii) anticipated port of landing at the end of the fishing trip.

(3) Fishing trips longer than seven days:

(a) Every seven days, the vessel master shall contact the designated service provider and provide the following information:

- (i) Fishing Hail Number which applies to the current fishing trip;
- (ii) the Shrimp Management Area or Subarea in which fishing occurred; and
- (iii) the total weight of each species of shrimp as set out in subsection 1(1), on board the vessel from each Shrimp Management Area fished.

(For example, if the Fishing Hail Report is made on Monday, then an update of catch information is required every Monday for the duration of the fishing trip.)

(4) Prior to landing catch:

(a) Prior to landing catch at the end of a fishing trip, the vessel master shall:

- (i) obtain a Landing Hail Number; and
- (ii) record the Landing Hail Number in the Shrimp Trawl Fishing Log.

(b) To obtain a Landing Hail Number, the vessel master shall contact the designated service provider contracted by the licence holder and the following information shall be provided:

- (i) Fishing Hail Number which applies to the current fishing trip;
- (ii) vessel name, vessel registration number, vessel master's name, or shrimp fish harvester identification number;
- (iii) date fishing began;
- (iv) date of offloading;
- (v) time of offloading;
- (vi) port and location of offloading;
- (vii) buyer;
- (viii) the Shrimp Management Area(s) or Subarea(s) in which fishing occurred;
- (ix) the total hours towed for each Shrimp Management Area fished; and
- (x) the total weight of each species of shrimp*, as set out in subsection 1(1), on board the vessel from each Shrimp Management Area fished.

*Northern Pink Shrimp (*Pandalus borealis*) and Pink Shrimp (*Pandalus jordani*), may be reported as "Pink Shrimp".

(5) Should the vessel master decide not to fish after obtaining a Fishing Hail Number, the vessel master shall obtain a Landing Hail Number by contacting the designated service provider and indicating that no fishing occurred.

8. Transporting shrimp:

(1) A copy of the fish slip (see section 12) shall be given to any person transporting shrimp or incidental catch caught under the authority of this licence and shall accompany the shrimp or incidental catch in transit, including shrimp or incidental catch for personal use.

9. Records - Harvest Log and fishing location information:

- (1) The vessel master shall maintain a log of all harvest operations and provide this information to the Department in accordance with the timing set out in subsection 15(8).
- (2) The vessel master shall ensure that the content and format of the harvest log meets the requirements as defined by the Department's Stock Assessment and Research Division Shellfish Data Unit for this licence period.
- (2) The vessel master shall enter latitude and longitude co-ordinates in the appropriate location in the log for each catch location.
- (3) The information for each day's harvest operations shall be recorded in the log no later than midnight of that day.
- (4) The vessel master shall ensure that the harvest and fishing location information recorded in the harvest log is complete and accurate.
- (5) The harvest log shall be kept on board the licensed vessel.
- (6) The harvest log shall be produced for examination on demand of a fishery officer.
- (7) The licence holder shall ensure that the completed harvest log pages (original white page copy) are forwarded not later than 28 days following the end of each month in which fishing occurred to:

Fisheries and Oceans Canada
Shellfish Data Unit
Pacific Biological Station
3190 Hammond Bay Road
Nanaimo, BC, V9T 6N7
Tel: (250) 756-7022 or (250) 327-3746

10. Requirement to take an Observer:

- (1) All vessels are required to take on board an observer designated pursuant to subsection 39(1) of the *Fishery (General) Regulations* when requested to do so by the Regional Director-General for the Pacific Region.
- (2) The vessel master shall ensure that At-Sea Observer Bycatch Worksheet summaries from all at-sea observer trips are delivered to the Department not later than five (5) days after the completion of the fishing trip.

11. Requirement for Dockside Observers:

- (1) The vessel master shall arrange for a minimum of 2 days of dockside observer monitoring coverage. Dockside observer monitoring shall be arranged through the designated service provider for the fishery.
- (2) When the observer is present at the offload:
 - (a) The weight of all fish shall be verified by the observer.
 - (b) When any fish taken under the authority of this licence are landed, all fish on board the vessel shall be landed at the same time.

(c) The vessel master shall provide to the observer, or fishery officer attending the landing, access to the vessel's fish holds, freezers and other fish storage locations at any time during the landing or at the conclusion of the landing.

12. Reporting catch on fish slips:

(1) A complete and accurate written report of all fish and shellfish caught and retained under the authority of this licence shall be submitted by the vessel master on a fish slip.

(2) The record shall contain the following information:

- (a) buyer's name, address and telephone number;
- (b) harvester's name and address;
- (c) processing plant name;
- (d) landing date;
- (e) vessel name and VRN;
- (f) gear used to harvest the fish;
- (g) Area(s) where fishing occurred and days spent fishing in each Area;
- (h) the individual species of each fish sold or offloaded;
- (i) the description of the product or landed form of each species sold or offloaded;
- (j) the weight of each species sold or offloaded;
- (k) the price paid for each species sold; and
- (l) the total value of each species sold or offloaded.

(3) A report shall be made even if the fish or shellfish landed are used for bait, personal consumption or disposed of otherwise.

(4) The report shall be mailed not later than seven days after the offloading and sent to:

Fisheries and Aquaculture Management Branch
FM Data Unit
Suite 200 - 401 Burrard Street
Vancouver, BC
V6C 3S4

Fish slips may be downloaded and printed at
<https://www.dfo-mpo.gc.ca/fisheries-peches/sdc-cps/fishslips-carnets/index-eng.html>.

Fish slip books may also be ordered from the printer at user cost at
<https://www.dfo-mpo.gc.ca/fisheries-peches/sdc-cps/fishslips-carnets/index-eng.html>.

Phone (604) 666-2716 for more information.

13. Species at Risk:

(1) Pursuant to subsection 73(2)(c) and section 74 of the *Species at Risk Act* (SARA), this licence authorizes the vessel master, subject to the following conditions, to engage in fishing activities that:

- (a) are conducted under licences issued under the *Fisheries Act*, and
- (b) incidentally kill, harm, harass, capture or take Basking Shark (*Cetorhinus maximus*).

(2) Pursuant to subsections 73(2)(c) through 73(6) of SARA, the vessel master shall ensure:

(a) that while the fishing activities are conducted, every measure will be taken to avoid the incidental capture of Basking Shark.

(b) that while the fishing activities are conducted, fishing gear is not set or hauled when Basking Sharks are within 10 m of the fishing vessel, and/or are visible at the water's surface.

(c) that while the fishing activities are conducted, any Basking Shark incidentally caught and live, is released in a manner that causes them the least harm.

14. Marine Mammal Reporting Requirements

(1) The vessel master shall provide information regarding all interactions with marine mammals during fishing trips;

(2) For the purpose of subsection 14(1), interactions refer to cases of incidental mortality and serious injury to marine mammals. This includes accidental drowning, bycatch, entanglements, collisions, and fatalities.

(3) The vessel master shall immediately phone the Marine Mammal Incident Hotline at 1-800-465-4336 to report cases of mortality and serious harm.

(4) The vessel master shall complete the DFO reporting form "MARINE MAMMAL INTERACTION FORM."

(5) The Marine Mammal Interaction Form shall be submitted as per the instructions provided on the form.

Note: The Marine Mammal Interaction Form is available from:

<http://www.dfo-mpo.gc.ca/species-especes/mammals-mammiferes/report-rapport/fish-harvester-pecheur-eng.asp>

15. Lost Gear Reporting:

(1) The licence holder shall report any lost fishing gear to Fisheries and Oceans Canada within 24 hours of landing by completing and submitting the Lost Fishing Gear form available online at: <http://www.dfo-mpo.gc.ca/fisheries-peches/reports-rapports/mobile-pac/index-eng.html>

(2) The licence holder/vessel master shall report the retrieval of any of their own previously reported lost gear to Fisheries and Oceans Canada within 24 hours of landing by completing and submitting the Retrieval of Previously Reported Fishing Gear form available online at: <http://www.dfo-mpo.gc.ca/fisheries-peches/reports-rapports/retrieval-pac-recuperation/index-eng.html>

16. Special conditions for fishing in Areas 124 and 125:

(1) To fish in Areas 124 and 125, the vessel master shall hail into those Areas only pursuant to subsection 7(1); fishing in other Areas may not occur while hailed out for Areas 124 and 125.

(2) All fish caught and retained in Areas 124 and 125 shall be landed and validated before hailing out and fishing in any other Areas.

(3) Requirement to take an Observer:

(a) The licensed vessel fishing in Areas 124 and 125 shall carry an at-sea observer designated by the Regional Director-General pursuant to subsection 39(1) of the *Fishery (General) Regulations* for the duration of the fishing trip.

(b) The licensed vessel fishing within Areas 124 and 125 shall not bring any fish aboard their vessel if the designated at-sea observer is not monitoring the catch brought aboard. Fishing shall cease for the duration of any period the designated at-sea observer is not present to monitor the catch.

(4) Maximum Total Individual Vessel Bycatch Allowance for Eulachon (*Thaleichthys pacificus*) within Areas 124 and 125:

(a) The maximum total individual vessel eulachon bycatch allowance authorized for this vessel during this licence year within Areas 124 and 125 combined is 250 lb (113 kg). Eulachon caught as bycatch may not be retained. All eulachon are to be discarded.

(b) The vessel master shall not continue fishing within Area 124 or 125 for the remainder of the licence year if the total estimated eulachon bycatch caught by the vessel during the season has reached or exceeded 250 lb.

(5) Permitted landing ports for shrimp harvested within Areas 124 and 125:

All shrimp harvested within Areas 124 and 125 shall be landed and validated at one of the following approved landing ports: Ucluelet, Tofino, Zeballos, Gold River, Winter Harbour, and Coal Harbour.

(6) Dockside Validation of Landings from Areas 124 and 125:

(a) In addition to the dockside observer requirement set out in section 11, all fish harvested within Areas 124 and 125 under the authority of this licence shall be validated at the point and time of landing by a dockside observer designated by the Regional Director-General pursuant to subsection 39(1) of the *Fishery (General) Regulations*.

(b) Prior to validation of fish no person shall dump, throw overboard, or otherwise discard fish which have been harvested and retained in accordance with the *Fisheries Act* and the regulations made thereunder.

(c) All weights must be determined using a scale approved by Industry Canada.

(d) If the requirement to weigh shrimp at the point of landing cannot be met because weigh scales are not available, the licence holder/or vessel master of the licensed vessel shall have the dockside observer enter the total number of totes in the validation log.

(e) The vessel master of the licensed vessel shall provide the dockside observer with a hard copy of the log prior to each validation.

(f) The vessel master of the licensed vessel shall provide to the dockside observer at the point of landing access to the vessel's fish holds, freezers and other fish storage areas at any time during the landing.

(g) The vessel master shall ensure that all dockside validation data is delivered to the Department within 28 days following the end of the month in which the landing occurred, and that it is delivered in a format approved by the Department.

APPENDIX 14: SHRIMP TRAWL DATA AND REPORTING STANDARDS

This document describes the official Fisheries and Oceans Canada standards for fishery monitoring and catch reporting in the commercial Pacific Shrimp by Trawl fishery. The requirements have been defined for the proper management and control of the fishery.

This document is intended to provide information to the industry association(s) and licence holders regarding their obligations for reporting during the season, and may be used by commercial licence holders in discussions with third-party Service Providers who may be interested in bidding on the opportunity to provide these programs and requirements on behalf of licence holders. Licence holders are ultimately responsible for ensuring that all data is delivered to DFO within the set deadlines, and following the proper format and delivery method.

Licence holders shall arrange for a Service Provider to coordinate the provision of the fishery monitoring and catch reporting programs to make arrangements for the hail service, at-sea observer coverage, individual vessel Eulachon bycatch tracking, and for dockside validation and monitoring programs prior to fishing.

Licence holders applying for a vessel-based shrimp trawl S licence or commercial communal FS licence will be required to ensure that they have made arrangements, either individually or through an association, for each element of these programs to be completed on their behalf.

Prior to the Department opening the fishery for the season all commercial licence holders, or associations acting on their behalf, are required to demonstrate to the Department how each of the fishery monitoring and catch reporting program requirements will be met. It is essential that programs function to meet at least the minimum program standards of the Department described in this document. Confirmation that arrangements are in place must be presented to the Department a minimum of ten (10) weeks prior to the Department opening the fishery. The Department will review proposals to ensure they meet all program standards, and may request discussion with proponents for clarification. Departmental approval of programs will be provided in writing. The Department recommends that licence holders refrain from committing to any contract arrangements with Service Providers prior to the Department confirming approval in writing for the proposal(s) submitted on their behalf.

All program components, as outlined in the proposal and approved by the Department, must be in place for the start of the fishery. If for any reason these programs fail to meet the stated requirements in-season, or are not in place, then the Department may take steps to restrict fishing opportunities or close the fishery in-season until the necessary programs are in place.

1 MONITORING OBJECTIVES

Objectives for the fishery monitoring and catch reporting program for the shrimp trawl fishery include:

- Provide a key compliance control function by issuing fishing hails and landing hails for fishing activity monitoring;
- Collect reported effort data and information on active vessels;
- Collect skippers' catch estimates by species and shrimp management area (SMA);
- Document fishing effort and catch in logbook format electronically;
- Monitor catch of non-target species on-board vessels in specific areas;
- Provide a sample of fishery independent landings estimates by species to monitor skippers catch estimate variability and species reporting;
- Record, accurately track, and report on Eulachon bycatch from each individual vessel within PFMA 124 and 125; and
- Record validated dockside catch weights of all shrimp landed within PFMA 124 and 125.

2 PROGRAM OVERVIEWS

The fishery monitoring and catch reporting for the shrimp trawl fishery includes:

- Fishing hails;
- Harvest logbook reporting;
- Weekly and annual summaries of fishing and landing information;
- Weekly summaries of Eulachon bycatch by vessel in SMA 124OFF and 125OFF;
- At-Sea Observer coverage;
- Random dockside observations;
- Mandatory dockside landing validation of all shrimp catch within SMAs 124OFF and 125OFF;
- Eulachon individual vessel bycatch tracking within SMAs 124OFF and 125OFF; and
- Fish slip reporting (provided to DFO directly – data and reporting standards not included in this summary).

2.1 Fishing Hails

Monitoring of fishing activity in the shrimp trawl fishery is by means of a fishing hail number to fish in an open area and a landing hail number prior to landing and selling the catch so that skippers' estimates of total catch by species for each SMA can be monitored. Licence holders shall arrange for a Service Provider to operate a phone-in toll free number to provide a fishing hail number that is available Monday to Friday, 08:30 to 16:30 hours. Only vessel owners with a valid S or FS licence who have arranged for the fishery monitoring, catch reporting, and at-sea observer program are eligible to obtain a fishing hail number. Vessel masters must obtain a hail number prior to beginning harvesting.

The Service Provider shall define a fishing hail number for a vessel with a valid S or FS licence to permit the vessel to fish in a SMA with remaining catch ceiling that is open to the commercial fishery.

Fishing hail number will not be provided if the area is closed, if a vessel has not met required conditions of licence such as agreement to carry an at-sea observer, or some other requirement defined by Resource Managers for the proper control and monitoring of the fishery.

See Section 3.1. for more information on detailed data delivery requirements.

2.2 Landing Hails

Licence holders must arrange for a Service Provider to provide vessels with a landing hail after each completed fishing trip, or every seven days for longer trips. The Service Provider shall receive the harvester's catch to date and provide a landing hail number or an updated fishing hail number in order to complete the fishing trip, or to continue fishing. Licence holders shall arrange for the Service Provider to provide a phone-in toll free number to receive landings, and this phone-in number shall be available 24 hours a day, 7 days a week. The Service Provider shall maintain a database of fishing and landing hails and deliver the data electronically to DFO on a regular basis through the DFO Fisheries File Transfer Protocol System. Individual vessel landings estimates are confidential and shall not be released without written permission of the vessel owner. Summaries of landings by species and SMA will be made available to the Department and interested parties through a weekly landing hail report.

See Section 3.1. for more information on details for data delivery requirements.

2.2.1 Weekly Landing Hail Reporting

Each week licence holders shall arrange for the service provider to prepare a summary of the cumulative hailed landings by SMA and species total allowable catch (TAC) or quota categories and make the landings summary available to DFO Managers, fishery participants and interested parties in a public Landings Quota Status (LQS) report. For SMAs with dockside validated shrimp landings, the dockside validated weights for shrimp shall be used for the weekly landed shrimp reports. The landings report should be a regular distribution made each Wednesday. The report shall include all fishing activity by all licenced vessels.

The summary will include landings by SMA and Species, showing for each SMA: cumulative landings, remaining catch ceiling and number of vessels still fishing. The report shall include the following headings:

SMA	Shrimp Management Area
Species	the specific species defined in the IFMP
Catch Ceiling	Total Allowable Catch as defined in the IFMP and updated during the season
Total Landed	Cumulative total landed in pounds
Lbs Remaining	Remaining TAC
% Remaining	Percent of TAC remaining
AreaStatus	Open or Closed
Active Vessels	Number of active vessels (if less than 3 it will be shown as an *)

2.3 Logbook Data Reporting

Licence holders are responsible for ensuring that accurate Shellfish Harvest Logs for the shrimp trawl fishery are maintained.

As a condition of licence, both a hardcopy (paper) and an electronic version of harvest log records must be submitted to the Shellfish Data Unit at the Pacific Biological Station in Nanaimo. The electronic version of the data may be submitted as a database table of specific design (described

in Section 3.2) created by one of the following database management tools: ACCESS 2016 (or earlier Access version).

The electronic version must be a true and accurate transcription of the hardcopy data. Each record will represent one tow. Incomplete, inaccurate or incorrect data will not be accepted, and it will be the responsibility of the Service Provider to obtain the required information from the individual fish harvester.

In order to fulfil stock assessment objectives, fish harvesters are required to supply on their logs a Lat/Long position.

Harvest data is to be submitted monthly to the Shellfish Data Unit FTP site with the filename following the convention of YY-MM-S, where YY is the Year, MM is the Month, and 'S' is the licence Tab Type for shrimp. The file type extension may be whatever is appropriate for the database tool used (e.g. .MDB for ACCESS 2016). Data submitted will remain the property of Fisheries and Oceans Canada.

2.4 At-sea Observations

Licence holders are responsible for ensuring that At-Sea Observer coverage is obtained for the fishery. Licence holders shall arrange for observers through an approved Service Provider who will deploy at-sea observers who will collect the information outlined in Section 3.3. In-season bycatch worksheet summaries will be provided to the Department within five (5) days following each observed fishing trip. Observer data will also be supplied to the Department in both hardcopy and electronic format, on a quarterly basis. The hardcopy and electronic data submitted quarterly must be reviewed, proofed, and corrected for any errors prior to submission to DFO. "Observer" means an individual who has been designated as an Observer by the Regional Director General for the Pacific Region of Fisheries and Oceans Canada pursuant to section 39 of the *Fishery (General) Regulations*.

Observers shall collect the following information for each vessel checked: vessel name, VRN, gear type, fishing hail number, observer, weather and set data, number of extruders (Nordmore grates), Area, Subarea, SMA, start and finish time of set, duration of tow, maximum and minimum depth, tow speed, total catch weight, shrimp weight and Eulachon weight and other species weight observed for each set. Summaries of total catch weight, total shrimp weight and total Eulachon weight for the trip will be summarized in a bycatch summary. Additional information on each species caught shall be collected and coded such as number per pound, condition and utilization.

In addition to collection of harvest data, observers shall collect biological samples (100 shrimp per tow) as directed by the Department and forward the samples to the Pacific Biological station following a protocol provided by the Department. For the 2022/23 fishing season, shrimp samples will be collected from 1 out of every 3 fishing tows where an observer is on-board. No Eulachon samples will be required during the 2022/23 season.

2.4.1 At-Sea Observer Coverage Requirements

Shrimp Management Areas 124OFF and 125OFF require 100% mandatory at-sea observer coverage. All fishing tows conducted within Pacific Fishery Management Areas 124 and 125 must be monitored by an at-sea observer, with required data recorded. If the at-sea observer cannot perform their duties, then fishing by that vessel cannot occur.

Shrimp Management Areas 23IN and 23OFF&21OFF require 25% at-sea observer coverage for all fishing days occurring within Pacific Fishery Management Areas 23, 121, and 123. At the time of obtaining a fishing hail, the Service Provider will determine which days shall require an at-sea observer and will obtain observer records for each vessel active in these areas.

In addition to the at-sea observer coverage listed above, licence holders must arrange for an additional 20 at-sea observer days to be funded and available for deployment in other SMAs along the coast.

2.4.2 Trip Report Information

The trip report for each trip observed provides background on the vessel, the fishing trip and the catch during the observed trip. Comments in the trip report shall include any issues that may contribute to an understanding of the operation of the vessel and to how the landings reported on logbooks might be interpreted. Specific issues such as dumping of shrimp or prawn bycatch may be defined as specific tasks for the at-sea observations, depending on issues identified by Fishery Managers, Conservation and Protection Officers to address specific information needs on a species or area basis.

The Trip Report should include information on:

- Vessel and trip summary (departure times, hail numbers, etc)
- Catch Estimation Procedures (how total catch was determined, species compositions, tow duration, missed tows);
- Biological Sampling Procedures (how a species catch/composition was obtained, what measurement equipment was used, if weights were determined using a scale, how randomness of a sample was defined, unusual biological samples, etc);
- Observer Working Conditions (conditions which might influence catch or bycatch estimation calculations);
- Vessel Safety Information;
- Fishing Summary (objectives, trawl type and modifications, deck working area; net characteristics and specific gear modifications); and
- Vessel Personnel Comments.
- Gear Questionnaire including the use/presence of LED lights.

2.4.3 Weekly Summary Reports of All At-Sea Observer Coverage

A weekly summary report shall be emailed to the Department which provides a summary table showing the total Eulachon bycatch observed within PFMA 124 and 125 for the year, and a summary table showing total cumulative Eulachon bycatch observed on each licenced shrimp vessel that has fished in these SMAs during the licence year. The tables shall include; VRN, vessel name, SMA, cumulative Eulachon bycatch for the licence year.

2.5 Dockside Monitoring Program for SMA 124OFF and 125OFF

Licence holders must make arrangements for all shrimp harvested within SMAs 124OFF and 125OFF to be validated by an independent third-party observer at the time of offloading.

Licence holders shall hail prior to landing, and make arrangements for all shrimp landed to be weighed with approved scales to obtain the accurate offload weight. These weights shall be used to track and monitor the shrimp harvest quotas for these SMAs in-season.

2.6 Eulachon Individual Vessel Bycatch Tracking Program

Licence holders shall arrange for the at-sea observer on-board their vessel to maintain a record of estimated Eulachon caught during the fishing trip and to enter the total trip estimated Eulachon catch into the dockside shrimp validation log at the time of offloading. At-Sea Observers shall inform vessel masters and DFO when the individual vessel Eulachon bycatch limit has been reached.

The vessel shall arrange for the Service Provider to maintain a record of the vessel's remaining Eulachon bycatch allowance for the season.

2.7 Random Dockside Observations (for SMAs other than 124OFF and 125OFF)

The objectives of the dockside observation program are to:

- Obtain accurate estimates of total catch and species composition of all product on board using sampling estimation methods, independent of the skipper's estimates.
- Collect biological samples of shrimp from the catch for analysis by DFO upon request.

Other issues may define in-season goals of the dockside program (such as gear in use, species targets, etc). Licence holders shall arrange for 20 days of random dockside observations by a third party Service Provider. These days shall be implemented throughout the year and throughout the coast, on the direction of the Department. Hardcopy and electronic data resulting from the dockside observation program shall be supplied to Resource Management on a quarterly basis or immediately following dockside observations in special circumstances if in-season management decisions require feedback from dockside information.

2.8 Annual Landings Reporting

Licence holders shall arrange for the service provider to write an annual report for the fishing season (April 1 to March 31). The report shall be submitted within five (5) months after the end of the fishing season. Landing information may be requested more often than specified, as required by Fisheries and Oceans Canada Shellfish Managers, particularly as areas approach the catch ceiling. The designated Shellfish Managers shall be notified immediately if it is anticipated that catch ceilings are nearing completion in any SMA. The format of the reports shall be specified and approved by Fisheries and Oceans Canada.

The final annual report shall include:

- Review of the season's Shrimp Trawl Fishery;
- Summary of fishery landings and fishing activity;
- Summary of catch monitoring program (at-sea and dockside observers);
- Observations regarding compliance concerns with the fishery management system;
- Current issues;
- Fish harvesters', processors' and Fisheries and Oceans Canada's Comments; and
- Recommendations.

Specific reports may be defined as required, such as an incident report detailing any suspected illegal landing activity, and submitted to the designated Shellfish Manager within one business

day of any suspected catch reporting violation. Any callers reporting any in-progress violations shall be directed to the ORR line (1-800-465-4336).

The Service Provider may be required to communicate between industry and Fisheries and Oceans Canada when necessary and attend meetings as required to discuss items or issues that impact the collection of information or performance of the requirements of the fishery monitoring and catch reporting program.

3 DATA STANDARDS AND REQUIREMENTS

The data collection standards and data requirements for each component of the shrimp trawl fishery monitoring and catch reporting program are detailed in the following sections. Some requirements are specific to interface with Departmental data management programs.

The following sections provide data standards and requirements:

- 3.1 - Fishing Hail and Landing Hail
- 3.2 - Fishing Activity (Harvest) Logbook
- 3.3 - At-Sea Observations
- 3.4 - Bycatch Summary
- 3.5 - Random Dockside Observations.
- 3.6 - Dockside Validation Program

3.1 Fishing Hail and Landing Hail



Project Name:	PacFish Information Management Framework
Document Title:	Shrimp Trawl Fishery Activity Hail Programs (Paper) Data Specifications
File Number:	
Author:	DFO
Organization:	Fisheries and Oceans Canada
Version:	1.0
Date:	December 9, 2016

This section provides information on the data requirements and specifications for programs collecting data for transfer to Fisheries and Oceans Canada, Pacific Region. The intended audience is both DFO staff and external groups involved in collecting, transferring or managing fisheries data. All data submitted becomes the exclusive property of Fisheries and Oceans Canada

3.1.1 Tombstone

- ▶▶ **Fishery(s):** Shrimp Trawl Fishery
- ▶▶ **Fishery Season:** 2022-23
- ▶▶ **Data Collection Program Name:** Fishery Activity Hail (paper-based)
- ▶▶ **Associated Fishery Data Service:** Resource Management – Invertebrates, Pacific Region

3.1.2 Document Change History

<i>Author</i>	<i>Date</i>	<i>Description of Change</i>
Dan Clark	Nov 27, 2015	Specifics for hail program

Rationale

This hail program is integral to the following activities:

- ▶▶ Monitoring and tracking fishing activity
- ▶▶ Tracking and monitoring harvest against species and area catch ceilings

Data Transfer Requirements

Format: Microsoft Excel (2016 or earlier versions)

Medium: DFO ftp site or Email to Local Area Shrimp Manager

Timeliness: The vessel master shall arrange to obtain a fishing hail number a minimum of 24 hours prior to fishing

All data shall be made available to DFO no more than 7 days after the data has been received by the service provider.

The file must be a running update of all data for the season (i.e. the file must include all previous records as well as the new information being provided to DFO).

File Naming Conventions: TempExpFileYYYYMMDD.mdb (latest date YYYYMMDD)

The following information shall be recorded for each fishing activity report:

3.1.3 Electronic Data Format For Fishing and Landing Hails

3.1.3.1 Fishing Hail

Database Field Name	Field Type	Size
HailID	Number (Long)	4
ShrVesselNo	Number (Integer)	2
CFV	Text	6
VesselName	Text	32
SkipCode	Text	7
FIN	Text	7
Anecdotal	Yes/No	1
Active	Yes/No	1
FakeHailOut	Yes/No	1
HailOutNbr	Text	8
HailOutCallDate	Date/Time	8
HailOutCallTime	Date/Time	8
DepartDate	Date/Time	8
PlanLandDate	Date/Time	8
PlanOffldPort	Text	3
PlanOffldLoc	Text	15
FakeHailIn	Yes/No	1

HailInNbr	Text	8
HailInCallDate	Date/Time	8
HailInCallTime	Date/Time	8
ActualLandDate	Date/Time	8
ActualOffldTime	Date/Time	8
ActualOffldPort	Text	3
ActualOffldLoc	Text	15
TotalHrsTowed	Number (Byte)	1
NbrOfDaysFished	Number (Byte)	1
Landed	Text	1
Species1	Text	2
ProductType1	Text	2
Species2	Text	2
ProductType2	Text	2
Species3	Text	2
ProductType3	Text	2
TotalWtOnBoard	Number (Long)	4
Comments	Text	255
ContactPhone	Text	20
AutoTel	Text	20
GearType	Text	1
Notes	Text	255
ObsRequired	Text	1
CreateDt	Date/Time	8
DtTime	Date/Time	8
User	Text	3

3.1.4 Landing Hail

Database Field Name	Field Type	Size
HailID	Number (Long)	4
HailOutNbr	Text	8
HailUpdType	Text	20
HailUpdNbr	Text	8
EffDate	Date/Time	8
CallDate	Date/Time	8
LoggedBy	Text	10

spec_AMR	Text	2
ActualFisheryArea	Text	6
ActualArea	Number (Integer)	2
ActualSubArea	Number (Integer)	2
EstimateWt	Number (Long)	4

3.2 Fishing Activity (Harvest) Logbook



Project Name:	PacFish Information Management Framework
Document Title:	Shrimp Trawl Harvest Log Program (Paper) Data Specifications
File Number:	
Author:	Leslie Barton
Organization:	Fisheries and Oceans Canada
Version:	1.0
Date:	November 16, 2015

This document provides information on the data requirements and specifications for programs collecting data for transfer to Fisheries and Oceans Canada, Pacific Region. The intended audience is both DFO staff and external groups involved in collecting, transferring or managing fisheries data, including Service Providers hired by harvesters or harvester associations to support compliance with Conditions of Licence.

3.2.1 Tombstone

- ▶▶ **Fishery(s):** Commercial Shrimp Trawl
- ▶▶ **Fishery Season:** 2022-23
- ▶▶ **Data Collection Program Name:** Shellfish Shrimp Trawl Harvest Log Program (paper-based)
- ▶▶ **Associated Fishery Data Service:** Shellfish Data Unit

3.2.2 Document Change History

<i>Author</i>	<i>Date</i>	<i>Description of Change</i>
Lorne Collicutt	Sept 7, 2011	First draft of template
Leslie Barton	Nov 16, 2015	Addition of specifics for shrimp trawl harvest log program
Leslie Barton	Jun 15, 2017	Minor edits
Rob Flemming	Jan 7, 2022	Reformat Data Transfer Requirements table, update 'Value if N/A or Unknown'. Minor edits.

3.2.3 Data Transfer Requirements

- ▶▶ **Format:** MS Access 2016 (or earlier version) database file following the prescribed data transfer format (below) + hardcopy (paper) from which electronic data were transcribed.
 - A separate file must be created for each calendar year.
 - Hardcopy (paper) must be sorted by Vessel Registration Number (VRN) (ascending), with multiple pages for a single vessel paper clipped together. For any given vessel with multiple pages for the batch, the pages should be sorted in chronological order.
 - Hardcopy (paper) must be separated by calendar year.

- Hardcopy (paper) must be accompanied by a batch summary report, consisting of the batch number/id, a listing of the VRN's contained in the batch, sorted in ascending order, with a count of records associated with each VRN. The total number of records associated with the batch must also be provided.
- ▶▶ **Conduit:** Data transfer to DFO to be effected via the DFO Contractor Data Exchange FTP site or other FTP service approved by the Shellfish Data Unit. Service Provider is to notify Shellfish Data Unit via email each time a file is posted to an FTP site.
- ▶▶ **Hardcopy delivery:** All deliveries of hardcopy and physical media must be via courier service, in-person or by a Shellfish Data Unit approved alternative. The mailing address is:

Fisheries and Oceans Canada
Shellfish Data Unit
Pacific Biological Station
3190 Hammond Bay Road,
Nanaimo, BC, V9T 6N7
- ▶▶ **Timeliness:** Within three weeks of the date of receipt of hardcopy by the Service Provider.
- ▶▶ **Data Ownership:** All data submitted becomes the exclusive property of Fisheries and Oceans Canada.
- ▶▶ **File Naming Conventions:** Files should be named such that the Service Provider, Fishery, Origin (paper-based [P]) Unique Batch number and year (YYYY) are all present in the file name (e.g. ABCCo_ShrimpTrawl_P_B389_2022). Table name shall be "new_logs".
- ▶▶ **Special Requirements:**
 - The electronic version must be a true and accurate transcription of the hardcopy data. Each record will represent one tow.
 - The database file submitted must consist of only one table named 'new_logs', with the fields and field characteristics as shown in the 'DATA TRANSFER FORMAT' section in this document. Regardless of the table design and relationships defined by the external group or Service Provider system for proprietary purposes, data transferred to DFO must be extracted in a manner which conforms to the design described in the 'DATA TRANSFER FORMAT' section.
 - To support consistency in interpretation of harvest log content, Shellfish Data Unit will review harvest logs received from harvesters in advance of the harvest logs being sent to the Service Provider for electronic data capture. Any modifications to the content of harvest log undertaken by the Shellfish Data Unit will be indicated using red pen.

3.2.4 Data Transfer Format Requirements

Note: Use Upper Case characters only for Text field data. A more extensive description of the Data Items marked with an asterisk follows on the next page.

Data Items from Logbook	Database Field Name	Database Field Type	Value if N/A or unknown
VRN of vessel	CFV	Long Integer	required
*Skipper Code	SKIPPER_CODE	Integer	NULL
Skipper FIN	Vessel_Master_FIN	Text – 50 characters	NULL
Year of fishing event	YEAR	Integer of Byte	required
*Page Number	PAGE_NUM	Long Integer	required
*Depth Unit	DEPTH_UNIT	Text – 1 character	required
*Weight Unit	WEIGHT_UNIT	Text – 2 characters	required
*Trawl Type	TRAWL_CODE	Text – 2 characters	required
Footrope Length	LEN_FTROPE	Integer of Byte	NULL
Headrope Length	LEN_HDROPE	Integer of Byte	NULL
Net Rise	NET_RISE	Integer of Byte	NULL
*Selectivity Gear Used	SELECTGEAR	Text – 8 characters	NULL
*Average Tow Speed	TOW_SPEED	Single (floating point)	NULL
Line number	LINE_NUM	Integer or Byte	required
Hail Number	HAIL_NUM	Long Integer	NULL
Month of fishing event	MONTH	Integer or Byte	required
Day of fishing event	DAY	Integer or Byte	NULL
Hour of fishing event	HOUR	Integer or Byte	NULL
Tow Duration (minutes)	TOW_TIME	Integer or Byte	NULL
*Tow Distance	TOW_DIST	Single	NULL
*Degrees of Latitude	LAT_DEG	Integer or Byte	required
*Minutes of Latitude	LAT_MIN	Single (floating point)	required
*Degrees of Longitude	LONG_DEG	Integer or Byte	required
*Minutes of Longitude	LONG_MIN	Single (floating point)	required
*Statistical Area	STAT_AREA	Integer or Byte	required
*Statistical Sub-Area	SUB_AREA	Integer or Byte	required
Minimum Depth	MIN_DEPTH	Integer	NULL
Maximum Depth	MAX_DEPTH	Integer	NULL
*Weight of Pinks	PINKS	Integer	0
*Weight of Sidestripes	SIDESTRIPES	Integer	0
*Weight of Prawns	PRAWNS	Integer	0
*Weight of Humpbacks	HUMPBCKS	Integer	0
*Weight of Dock Shrimp	DOCKS	Integer	0
*Remarks Code (PBS code)	REMARKS_CODE	Integer or Byte	0
Other Species (Hart Code)	OTHER_SPECIES	Text – 3 characters	NULL
Other Weight	OTHER_WEIGHT	Integer	NULL
*Weight of Spiny Pinks	SPINY_PINKS	Integer	0
*Weight of Smooth Pinks	SMOOTH_PINKS	Integer	0
*Weight of Flexed Pinks	FLEXED_PINKS	Integer	0
*Status of Record	REC_STATUS	Integer or Byte	0

Skipper Code

The Shellfish Data Unit will provide a list of Skipper Codes. If a skipper is not on the list, contact the Data Unit for a new code for this skipper.

Page Number

Record the page number in the upper right corner of the log sheet. Note that photocopied or other non-published pages still need to have a unique page number, even if it is entered by hand. The number only needs to be unique for that CFV for that year.

Depth Unit

Enter ‘**M**’ for Meters, or ‘**F**’ for Fathoms; use upper case characters only.

Weight Unit

Enter ‘**LB**’ for weights reported in Pounds, or ‘**KG**’ for Kilograms.

Trawl Type

Use the following codes to indicate the type of gear the fisher has indicated.

Note that “**Net Type**” for Stock Assessment purposes may differ from industry definitions.

Always use “**Flat Net**” where the Rise of the net is 5 feet or less.

If the Headrope is shorter than the Footrope by 10 feet or more, then use “**Semi-Balloon**”.

Otherwise, use “**High Lift**”.

DF - Doors (otter) with Flat Net (Rise of net is 5 feet or less)

DH - Doors with High-Lift Net

DS - Doors with Semi-Balloon Net (headrope is shorter than footrope by 10 feet or more)

PF - Post Beam with Flat Net (Rise of net is 5 feet or less)

PH - Post Beam with High-Lift Net

PS - Post Beam with Semi-Balloon Net (headrope shorter than footrope by 10 ft or more)

SB - Sled Beam with Flat Net (Rise of net is 5 feet or less)

SH - Sled Beam with High-Lift Net

SS - Sled Beam with Semi-Balloon Net (headrope shorter than footrope by 10 ft or more)

Selectivity Gear

Enter “**N**” when None are indicated.

Enter “**G**” when Separator Grate (Rigid BRD) used.

Enter “**S**” when Escapement Panel (Soft Mesh) used.

Enter “**F**” when Fish Extruder (Fisheye) used.

Enter “**W**” when Soft Web Excluder used.

Enter “**P**” when Plastic Lattice (Hard Mesh) escapement panel used

Enter “**O**” when some Other device was used.

Where more than one device has been indicated, they should be coded in alphabetical order, (e.g. “**OP**” rather than “**PO**”).

Average Tow Speed and Tow Distance

Record to one decimal place, e.g. 2.5

Latitude/Longitude Position Fields

Lat/Long fields must be supplied. Seconds of position are to be included as decimal minutes, i.e. a position of 23.833 minutes represents 23 minutes, 50 seconds.

Statistical Area and Sub-Area

This is the Pacific Fisheries Management Area (PFMA) as specified in the Regulations made under the Fisheries Act, it is NOT the SMA.

Weights

The weights of the various species caught are to be the Hailed Catch Weight for each tow.

Remarks Code

*Remarks codes serve to identify records where there is an element of uncertainty/estimation associated with the record **or** where the record is considered non-standard (events occurred outside of normal operating procedures). Remarks codes are to be applied by the individual or agency that is creating the electronic copy of the harvest log on behalf of the harvester.*

Please use the following codes.

<u>Code</u>	<u>Meaning</u>
-------------	----------------

- | | |
|-----------|--|
| 01 | Some uncertainty that the Area or Sub-Area are correct, if they're illegible or two are given in one record, etc. |
| 02 | Mechanical or other problems affecting the catch , such as crossed doors, something broke, snag, bag open, net fouled or flipped, hole in net, something not working properly, caught a log or boulder, etc |
| 03 | Fishy Catch , dogfish, ratfish, shiners, herring, bullheads, turbot, jellyfish, etc. |
| 04 | Mud, Dirty, etc. |
| 05 | Dumped Bag , reason could be fishy or junky or too small, etc. |
| 06 | Weather problems or tide problems, wind, rough weather |
| 07 | Towed too fast, or Flying Net |
| 09 | Junky , or full of Junk |
| 11 | Estimated Weights , especially where fisher gave a sum of weights and Coder has to break weights down for individual fishing events, or where value is illegible and a "best guess" is made. |
| 14 | Estimated set time , used where Hour not given (use Hour = 8) |
| 99 | Keypunch person had difficulty . Record should be checked by a data officer and edited if necessary. The hardcopy should have a sticky note to indicate what the difficulty is. |

Other Species

As identified in the **Remarks** column of the harvest log

If harvester has reported Octopus, use code **97A** (indicates Order Octopoda)

If harvester has reported Squid, use code **92A** (indicates Order Teuthida)

If harvester has reported Eulachon, use code **148** (indicates *Thaleichthys pacificus*)

For other species please contact the Shellfish Data Unit for correct codes

Other Weight

As identified in the **Remarks** column of the harvest log, along with “Other Species”

Above, enter the weight indicated, if available.

Status of Record

Use the following codes for the status of each record.

Status	Code
Record Newly Submitted to Shellfish Data Unit	0
Record has been Previously Submitted and is Unchanged	1
Record has been Edited and Re-submitted to Shellfish Data Unit	2

3.3 At-Sea Observations



Project Name:	PacFish Information Management Framework
Document Title:	Shrimp Trawl Fishery At-sea Observations (Paper) Data Specifications
File Number:	
Author:	DFO
Organization:	Fisheries and Oceans Canada
Version:	1.0
Date:	December 9, 2016

3.3.1 Tombstone

- ▶▶ **Fishery(s):** Shrimp Trawl Fishery
- ▶▶ **Fishery Season:** 2022-23
- ▶▶ **Data Collection Program Name:** At-sea Observations (paper-based)
- ▶▶ **Associated Fishery Data Service:** Resource Management – Invertebrates, Pacific Region
- ▶▶ **Timliness:** Hardcopy trip bycatch worksheet summaries from each fishing trip delivered to DFO within 5 days of the end of the fishing trip. Hardcopy and Electronic versions must be submitted quarterly to DFO after being reviewed, proofed, and corrected for any errors.

3.3.2 Document Change History

<i>Author</i>	<i>Date</i>	<i>Description of Change</i>
Dan Clark	Nov 27, 2015	Specifics for At-sea Observations program
Georg S. Jorgensen	14-JUN-2017	Specifics for At-Sea Observations actually sent.
Dan Clark	15 Jan 2020	Added field for LED lights Y/N

Data Format Note: Use Upper Case characters only for Text field data.

A more extensive description of the Data Items marked with an asterisk follows on the next page.

Data Items from Observer Database - Shrimp Header	Database Field Name	Field Type	Size	Value if N/A or Unknown
AMR Skipper Code	SKIP_AMR	Text	5	
DFO Skipper Code	SKIP_CODE	Text	3	
Depth Code	DEPTH_CODE	Text	2	
Weight Code	WT_CODE	Text	2	
AMR Fishery Code	FISHERY	Text	2	
Vessel VRN	CFV	Text	50	7

HAIL Number	HAIL_NUM	Long Integer	4	
AMR Sampler Code	SAM_CODE	Text	3	
Year of Tow	YEAR	Integer	2	
Month of Tow	MONTH	Integer	2	
Day of Tow	DAY	Integer	2	
Tow (SET) Number	SET_NUM	Integer	2	
AMR Gear Code	GEAR_AMR	Integer	2	
DFO Gear Code	GEAR	Text	50	
Extruder Code	EXTRUDER	Integer	2	
LED number of lights used	LED_USED	Integer	2	null
Beaufort Weather Code *	BEAUFORT	Integer	2	
Light Conditions Code *	LIGHT	Integer	2	
Atmospheric Pressure	PRESSURE	Long Integer	4	
PFMA Statistical Area	STAT_AREA	Integer	2	0
PFMA Sub Area	SUB_AREA	Integer	2	0
Shrimp Quota Area	QUOTA_AREA	Text	6	
Start Degrees Latitude	ST_LAT_DEG	Integer	2	0
Start Minutes Latitude	ST_LAT_MIN	Single	4	0
Start Degrees Longitude	ST_LON_DEG	Integer	2	0
Start Minutes Longitude	ST_LON_MIN	Single	4	0
Time when Tow Starts	ST_TIME	Text	50	
Finish Degrees Latitude	FIN_LAT_DEG	Integer	2	0
Finish Minutes Latitude	FIN_LAT_MIN	Single	4	0
Finish Degrees Longitude	FIN_LON_DEG	Integer	2	0
Finish Minutes Longitude	FIN_LON_MIN	Single	4	0
Time when Tow Finishes	FIN_TIME	Text	50	
Tow Duration in Minutes	MINUTES	Integer	2	
Maximum Depth in Meters	MAX_DEPTH	Integer	2	
Minimum Depth in Meters	MIN_DEPTH	Integer	2	
Tow Speed (kts)	SPEED	Single	4	
Total Weight for the Tow	TOTAL_WT	Long Integer	4	
AMR Species Code	SPECIES_AMR	Integer	2	
DFO Species Code (HART)	SPECIES	Text	3	
Number of animals caught	NUM_CAUGHT	Integer	2	
Weight for this species (KG)	SPECIES_WT	Integer	2	
Count per Pound this species	NUM_PER_LB	Single	4	
Utilization Code *	UTIL	Integer	2	
Estimation Code (SCM) *	ESTIMATION	Integer	2	
ByCatch Condition Code	BYCAT_COND	Integer	2	
DFO Record Status Code	REC_STATUS	Integer	2	

Beaufort Code (Bcode)			
BCode	Description	Knots	MpS
0	Calm	0 - 1	0 - 0.5
1	Light Air	1 - 3	0.5 - 1.5
2	Light Breeze	4 - 6	2.1 - 3.1
3	Gentle Breeze	7 - 10	3.5 - 5.2
4	Moderate Breeze	11 - 16	5.7 - 8.2
5	Fresh Breeze	17 - 21	8.7 - 10.8
6	Strong Breeze	22 - 27	11.3 - 13.9
7	Moderate Gale	28 - 33	14.4 - 17.0
8	Fresh Gale	34 - 40	17.5 - 20.6
9	Strong Gale	41 - 47	21.1 - 24.2
10	White Gale	48 - 55	24.7 - 28.3
11	Storm	56 - 66	28.8 - 34.0
12	Hurricane	above 66	above 34

Light Codes

LCode	Meaning
0	UNKNOWN
1	Sunny
2	Fog/Overcast
3	Rain
4	Dark

Utilization Codes

Code	Description
1	Retained
2	Discarded, marketable - DEAD
3	Discarded, Marketable - ALIVE
4	Discarded, unmarketable
5	Consumed on board, (eaten by crew)
14	Rolled Up 2 records, retained & discarded.

Species composition method (SCM) Codes

SCM Code	Description
1	Whole Haul, weights are Weighed
2	Partial Haul, weights are estimated
3	Basket Sample, weights are estimated
4	Piece Count * (Average Weight / Piece), weights are estimated
5	Observer Visual Estimate, weights are estimated
6	Logbook (or Skipper or Crew), weights are estimated
7	Other, weights are estimated
8	Trace Amount (less than 0.5 lb) Observer visual estimate. (Wgts converted to 0.1 in our database)
9	Volume Measurement was taken, See "At Sea Observer Program Ops Manual", section "Catch & Effort"

3.4 Bycatch Summary

For each observer boarding, a trip report shall be completed and forwarded to the Shrimp Trawl Manager. The trip report will include a summary of the catch observed during the trip.

Within five (5) days of the completion of the fishing trip an additional preliminary summary bycatch worksheet shall be provided to the Shrimp Trawl Manager outlining the observed shrimp and Eulachon caught during the trip.

The preliminary Bycatch Worksheet shall include the following information, in a format set by the Service Provider:

Fishery
VRN (aka CFV)
Hail Number
Sample Code
PFMA
PFM Subarea
Shrimp Management Area
Set Number
Date (Y/M/D)
Species Caught
Number of Species Caught
Weight of Species Caught
Number per Pound
Weight Code
Estimation
LED lights used (Y/N)

Notes:

Total Catch (lb)	Including all bycatch discarded and shrimp retained.
Shrimp Weight (lb)	Total weight of retained shrimp as reported in fisherman's log and hailed as shrimp catch
Eulachon Weight (lb)	Total Weight of Eulachon per set to the nearest 0.1 lb.

3.5 Random Dockside Observations



Project Name:	PacFish Information Management Framework
Document Title:	Shrimp Trawl Fishery Random Dockside Observations (Paper) Data Specifications
File Number:	
Author:	DFO
Organization:	Fisheries and Oceans Canada
Version:	1.0
Date:	December 9, 2016

3.5.1 Tombstone

- ▶ **Fishery(s):** Shrimp Trawl Fishery
- ▶ **Fishery Season:** 2022-23
- ▶ **Data Collection Program Name:** Random Dockside Observations (paper-based)
- ▶ **Associated Fishery Data Service:** Resource Management – Invertebrates, Pacific Region

3.5.2 Document Change History

<i>Author</i>	<i>Date</i>	<i>Description of Change</i>
Dan Clark	Nov 27, 2015	Specifics for Random Dockside Observations program

The dockside observations are a random opportunity to meet the vessel at the dock and compare the skipper's estimate of landings by species with actual retained weight by species. The hailed catch as recorded in logbooks is compared to the offload weight and a sample is obtained for species distribution.

For short duration trips of one or two days, the shrimp catch has been sorted and will be sold at the dock or offloaded for processing at a processing plant. There may be ice included in totes that requires back calculating from offload weight at the processing facility scales.

For long trips where the catch is frozen in 50 lb blocks and not offloaded at the end of each trip, there is a logistical problem to determine species composition and total weight to compare to logbooks.

This is also an opportunity for discovery of species that are not allowed to be retained. The observer has the opportunity for Observe, Record, Report witnessing of non-permitted species.

Random dockside observations shall include the following:

Data Items	Database Field Name	Field Type	Size
CFV Number of Vessel	CFV	Long Integer	
Skipper Code	SKIPPER_CODE	Integer	0
Vessel Master FIN	FIN	Long Integer	
Year of fishing event	YEAR	Integer or Byte	
Weight Unit	WEIGHT_UNIT	Text - 2 characters	UN
Line Number	LINE_NUM	Integer or Byte	0
Hail Number	HAIL_NUM	Long Integer	0
Statistical Area	stat_area	Integer or Byte	0
Statistical Sub-Area	sub_area	Integer or Byte	0
Days Fished:			
Weight of Pinks	PINKS	Integer	0
Weight of Sidestripes	SIDESTRIPES	Integer	0
Weight of Prawns	PRAWNS	Integer	0
Weight of Humpbacks	HUMPBACKS	Integer	0
Weight of coonstripes	DOCKS	Integer	0
Remarks Code	REMARKS_CODE	Integer or Byte	0
Other Species (Hart Code)	OTHER_SPECIES	Text – 3 characters	Null
Other Weight	OTHER_WEIGHT	Integer	0
Species Composition Method	SCM	Integer	0
Product Type Code	PT_PRODUCT_TYPE_CDE	Integer	0
Product Type Name	PRODUCT_TYPE_NME	Integer	0

Codes for Product Type

PT_PRODUCT_TYPE_CDE	PRODUCT_TYPE_NME
1	Round, Fresh
21	Round, Frozen
4	Tail, Fresh
31	Tail, Frozen



Project Name:	Shrimp Trawl Information Management Framework
Document Title:	Dockside Validation Program for PFMA 124 and 125 Data Specifications
File Number:	
Author:	Guy Parker
Organization:	Fisheries and Oceans Canada
Version:	1.3
Date:	December 9, 2016

This document provides information on the data requirements and specifications for programs collecting data for transfer to Fisheries and Oceans Canada, Pacific Region. The intended audience is both DFO staff and external groups involved in collecting, transferring or managing fisheries data, including Service Providers hired by harvesters or harvester associations to support compliance with Conditions of Licence.

3.6 Tombstone

Fishery(s): Commercial Shrimp Trawl

Data Collection Program Name: Shellfish Shrimp Trawl Dockside Validation Program

Associated Fishery Data Service: Shellfish

3.6.1 Document Change History

<i>Author</i>	<i>Date</i>	<i>Description of Change</i>
Guy Parker	9 Dec 2016	Updated for WCVI

3.6.2 Data Transfer Requirements

Format: MS Access 2016 (or earlier version) database file following the prescribed data transfer format (below) + hardcopy (paper) from which electronic data were transcribed.

- Hardcopy (paper) must be sorted by Licence Number (TAB, ascending)
- Hardcopy (paper) must be separated by calendar year.
- Hardcopy (paper) must be accompanied by a batch summary report, consisting of a listing of the TAB's contained in the batch, sorted in ascending order, with a count of records associated with each TAB. The total number of records associated with the batch must also be provided.

Conduit: Electronic data transfer to DFO to be effected via the DFO Contractor Data Exchange FTP site or other FTP service approved by the Department. Service Provider is to notify via email each time a file is posted to an FTP site.

Hardcopy delivery: All deliveries of hardcopy and physical media must be via courier service, in-person or by a DFO-approved alternative. The mailing address is:

Guy Parker
Fisheries and Oceans Canada
3225 Stephenson Point Road,
Nanaimo, BC, V9T 1K3

Timeliness: Electronic and hardcopy data to be received by the Department within 28 days following the end of the month in which the fishing season ends.

Data Ownership: All data submitted becomes the exclusive property of Fisheries and Oceans Canada.

File Naming Conventions: Files should be named following the convention YYYY(year), MM(month), Fishery(S), Data Program. Data programs will be VL (Validation program). Example of an acceptable file name is 202210SVL.mdb

Special Requirements:

- The database file submitted must consist of a cumulative running record of all data for the fishing season. Regardless of the table design and relationships defined by the external group or Service Provider system for proprietary purposes, data transferred to DFO must be extracted in a manner which conforms to the design described in the 'DATA TRANSFER FORMAT' section.

3.6.3 Data Transfer Format

A. ELECTRONIC DATA FORMAT FOR DOCKSIDE VALIDATION PROGRAM INFORMATION

Data Items from DMP form	Database Field Name	Field Type & Size	Value if N/A or Unknown
Fishery	Fishery	Text – 2	0
Hail Out Number	HailOutNumber	Number - 8	0

Data Items from DMP form	Database Field Name	Field Type & Size	Value if N/A or Unknown
Hail In Number	HailInNumber	Number - 8	0
Opening	Opening	Text – 50	0
	CommitDate	Date/Time	0
Form Number	Form_num	Number - 8	0
Vessel Registration Number	CFV	Text – 6	Null
Vessel Name	Vessel	Text – 100	
Landing Port Code	Port	Text - 3	Null
Landing Port Name	PortName	Text - 50	0
Fisher Identification Number	FIN	Text - 50	Null
Skipper's Name	SkipperName	Text – 50	Null
Date of Landing	d_landing	Date/Time	Null
Observer code	Observer	Text – 3	Null
Off loading company	Offloader	Text – 50	Null
Buyer Name	Buyer	Text – 50	Null
Second Buyer Name	Buyer2	Text – 50	Null
Hours to off load	Offld_Hrs	Text – 50	0
	d_export	Date/Time	Null
	Upd_Date	Date/Time	Null
Species Code	SppNumCD	Text – 3	U
Common Species Name	SppCommonName	Text – 50	0
Species Code 2	SppNumCD2	Text – 3	U
Common Species Name 2	SppCommonName2	Text – 50	0
Method	Method	Text - 1	Null
Number of Pieces	Pieces	Text - 38	Null
Total Weight	TotWeight	Text - 38	0
Remaining Eulachon Bycatch Limit	Verified_Remaining_ EBL	Text - 11	Null
			Null
Preliminary Trip Bycatch Limit	Preliminary_Trip_EB	Text - 10	
Eulachon Caught	Landed_Trip_EB	Text – 10	Null
Preliminary Remaining Eulachon Quota	Preliminary_Remaini ng_EB	Text - 10 Date/Time	
Updated Date	Upd_Date		Null

Data Items from DMP form	Database Field Name	Field Type & Size	Value if N/A or Unknown
-------------------------------------	--------------------------------	------------------------------	------------------------------------

Notes: Use pounds for all weight measurements Use upper case characters only for ‘text field’ data. Every field should have an entry. **If the value is unknown or not applicable, enter the default value indicated in the far right column of the table. Note that for all Data Items marked with an asterisk, there are more extensive field descriptions of the data required below.

A.1. Field Descriptions and Coding

Pacific Fishery Mgmt. Area and Pacific Fishery Mgmt. Subarea

These are the Pacific Fisheries Management Areas and Subareas as specified in the Regulations made under the *Fisheries Act, R.S.C.*

Shrimp Management Area

This is the area described in the Shrimp Trawl Integrated Fishery Management Plan.

VRN of Vessel

Use the Vessel Registration Number in this space.

Validated Landings

This is the total net weight of all landed shrimp from the vessel for fishing trip being landed. The ‘WEIGHT’ field must contain the ‘Net Offload Weight (dock weight) for the landing. In the case of split loads, this value will be the Total Net Weight for all Parts.

Species Code

The species code for shrimp species landed.

Weight Code

Always enter ‘P’ to indicate the landings (weights) are reported in pounds (except if this is unknown, enter ‘U’).

CONTACT INFORMATION FOR MORE INFORMATION

Resource Management	Guy Parker	(250) 756-7163
Stock Assessment	Andres Araujo	(250) 756-3367
Shellfish Data Unit	Rob Flemming	(250) 756-7306

APPENDIX 15: RISK ASSESSMENT

Under the Pacific Region Strategic Framework, a risk assessment tool has been used to assess monitoring levels required for the commercial Shrimp Trawl fishery in B.C. The Department drafted the risk assessment and consulted with commercial harvesters in 2018. Comments on the draft results were incorporated where possible and the draft risk assessment results were published for broader consultation as part of the 2019-20 IFMP. The risk assessments have now been finalized, a summary and key findings from the final risk assessment for the commercial Shrimp Trawl fishery is highlighted here.

1 Shrimp Trawl (Beam and Otter Trawl)

1.1 Fishery Overview

The commercial fishery is fished by beam and otter trawl gear and has the potential to occur over much of the BC Coast. The fishery can occur year round, subject to quota availability, and operates on area based quotas fished on a competitive basis.

There is high variability in stock abundance due to natural environmental factors and landings in the fishery have ranged from less than 2 M lb to approximately 14 M lb over the last 10 years.

1.2 Ecosystem Risks

Due to variability in stock status across and within stock assessment areas, the stock status of pink and sidestripe shrimp is considered to be of low concern with a moderate likelihood commercial shrimp trawl fisheries are driving the status of the stocks. In terms of bycatch, the fishery targets only shrimp; however observed bycatch of other species does occur. Therefore this fishery has a low risk to retained bycatch, but a high risk to released bycatch. One of the primary species of concern identified in the bycatch of the fishery is Eulachon. Finally, the fishery has a low impact on shrimp as a key prey species. Even though shrimp are a forage fish species for many marine mammals, sea birds and other fish, the fishery is managed using a conservative approach and therefore was identified as having a low impact on ecosystem processes. There is a high risk for direct or indirect habitat impacts in this fishery.

From this assessment, the preliminary fishery risk (comprised of risk to main species, bycatch, and community and habitat) was identified as high.

1.3 Monitoring Level

An overall risk score of high requires an “enhanced” monitoring level. The Risk Assessment identifies that the fishery currently has generic monitoring.

Current monitoring in this fishery includes; 100% dockside monitoring program and 100% at-sea observer coverage in a portion of the offshore fishery; partial at-sea observer coverage in other portions of the coast; requirements to hail-in, hail at-sea, and hail-out of the fishery, maintenance of paper harvest logbooks, and submission of fish slips. Information and monitoring gaps includes a lack of sufficient at-sea observer coverage in some portions of the coast.

1.4 Next Steps

The fishery currently meets many of the program requirements for the monitoring and reporting targets, with identified gaps in observer coverage. At-sea observer coverage is expensive and costs associated with increasing coverage would be relatively high compared to the value of the shrimp landed and earnings for the fishery. The Department and industry will continue to work collaboratively to make improvements in the monitoring where possible.

APPENDIX 16: FISHERY CLOSURES FOR GWAII HAANAS NATIONAL MARINE CONSERVATION AREA

Gwaii Haanas National Marine Conservation Area

As noted in the Shrimp Trawl IFMP, a new management plan for the Gwaii Haanas National Park Reserve, National Marine Conservation Area Reserve, and Haida Heritage Site was approved by Canada and the Haida Nation in November 2018, following an extensive consultation process. The final zoning plan includes several areas of strict protection, where commercial and recreational fishing are prohibited (See Strict Protection Zones in figure 8 below). The implementation of these closures may take some time. However, steps are being taken to undertake this work and each closure will be communicated via Fishery Notice as it is implemented.

Users of the Gwaii Haanas marine area should be aware that adjacent land is managed under the authority of the Canada National Parks Act and its regulations and, as specified in the Gwaii Haanas Agreement (1993), there is "no extraction or harvesting by anyone of the resources of the lands and non-tidal waters of the Archipelago for or in support of commercial enterprise" (s3.3). There are specific requirements for visiting the terrestrial portion of Gwaii Haanas, and advanced planning is necessary. Please contact the Gwaii Haanas administration office at 1-877-559-8818 for further information. For background information, see IFMP section 5.4.11.

The Gwaii Haanas Gina 'Waadluxan KilGuhlGa Land-Sea-People Management Plan available here: <https://www.pc.gc.ca/en/pn-np/bc/gwaiihaanas/info/consultations>.

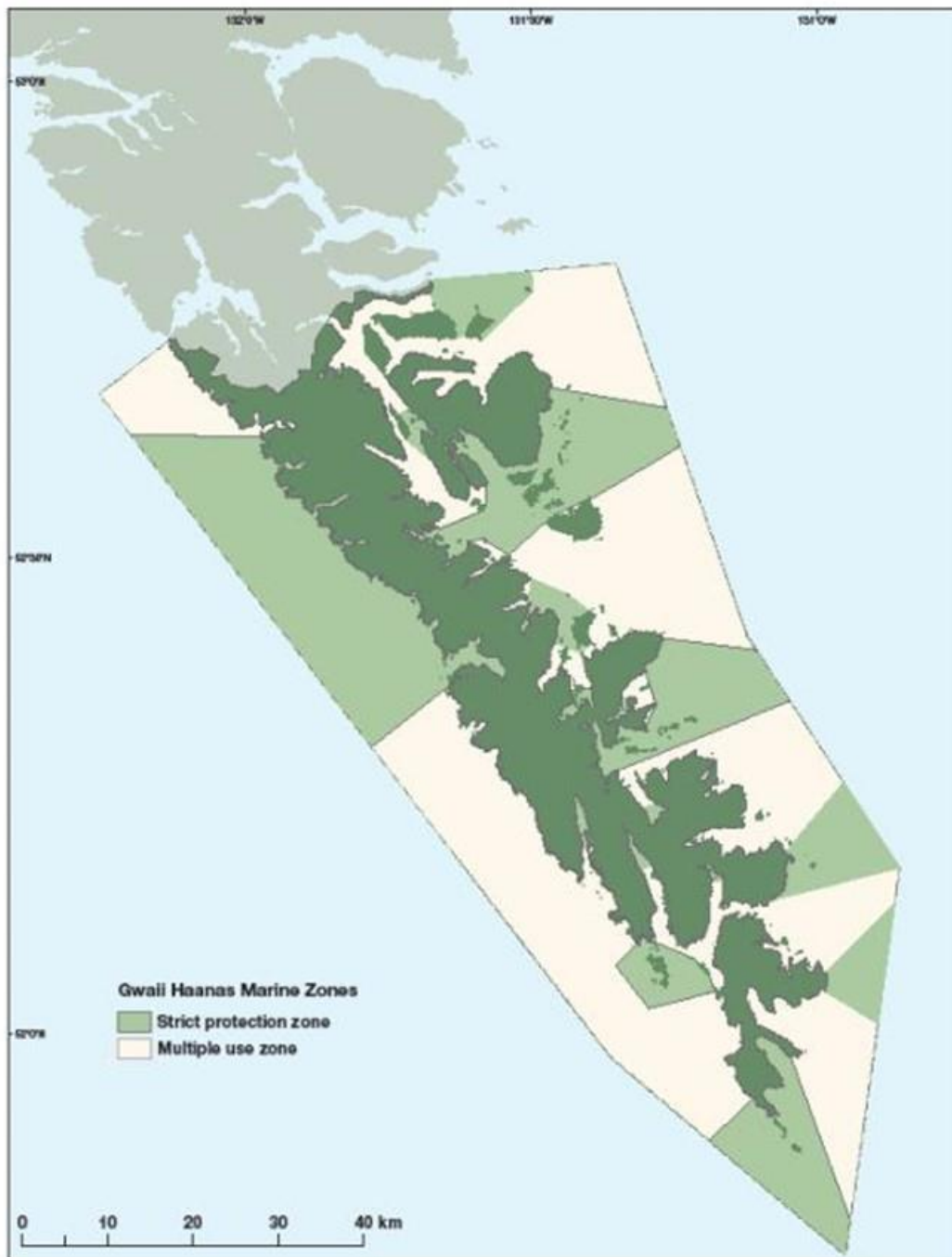


Figure 8: Gwaii Haanas National Marine Conservation areas