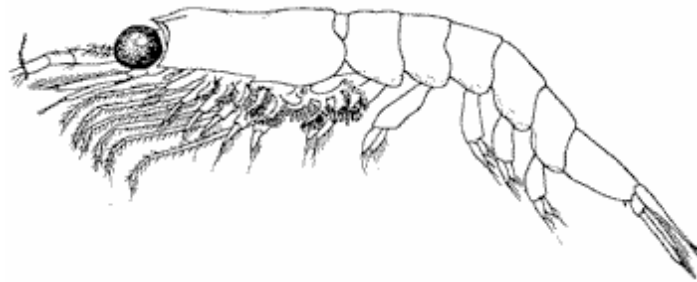


PACIFIC REGION

INTEGRATED FISHERIES MANAGEMENT PLAN

EUPHAUSIIDS

**JANUARY 1, 2013 TO
DECEMBER 31, 2017**



Euphausiids: *Euphausia pacifica*



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 regulations, the 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 Euphausiid 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 & 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.

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ATTACHMENTS

Appendix 1: 2013 - 2017 Euphausiid Commercial Harvest Plan

Appendix 2: Euphausiid Validation & Harvest Log

Appendix 3: Euphausiid Quota Management Area Maps

Appendix 4: Fishing Vessel Safety

Krill image on title page (with thanks): Kathman, R.D., J.C. Saltman, and J.D. Fulton. 1986. Identification manual to Mysidacea and Euphausiacea of the northeast Pacific Can. Spec Publ. fish Aquat. Sci. 93:411p.

1. OVERVIEW

1.1. Introduction

This multi-year Integrated Fisheries Management Plan (IFMP) for Euphausiids encompasses the period January 1, 2013 to December 31, 2017.

This IFMP provides a broad context to the management of the fishery for Euphausiids (or “krill”) in the Pacific Region (British Columbia, Canada). An overview of the fishery, biological synopsis and socio-economic profile are provided in Sections 1 to 3. Emerging management issues that may impact on management measures in the fishery are described in Section 4. Objectives for the fishery that reflect the biological synopsis and address emerging issues are provided in Section 5. Access and allocation are summarized in Section 6. The fishery management procedures, shared stewardship arrangements and compliance plan to achieve the objectives are described in Sections 7, 8 and 9. The ways and means by which achievement of the objectives will be measured is described in Section 10. References, a glossary and contacts are provided in Sections 11 to 14. A post-season review is provided in Section 15 to look back at the previous 6 years of the fishery based on the performance measures provided in Section 10.

The Commercial Harvest Plan is attached to this IFMP as Appendices 1 to 4. Commercial Euphausiids harvesters are advised to review the appendices for fishing information.

1.2. History

A trawl fishery for Euphausiids, also known as “krill”, using fine meshed plankton trawl nets began in 1970 in the Strait of Georgia, British Columbia (BC), as an experimental fishery. A 500 tonnes total allowable catch was established in 1975 to permit gear development. These limitations were established due to concerns for harvesting a forage species upon which salmon and other commercially important finfish depend. The experimental fishery was intended to be temporary and move out of the Strait of Georgia to outside waters where production was estimated to be greater if markets could be expanded above 200 tonnes.

The fishery changed from a scientific licence to a general purpose, category “C”, commercial licence in 1983. The total allowable catch was established at 500 tonnes with a season from November to March to minimise the incidental catch of larval and juvenile fish. The allowable catch was estimated to be less than 3% of the annual consumption of Euphausiids by all predator species in the Strait of Georgia (Jamieson et al. 1990).

The number of commercial licences issued increased annually from 7 in 1983 to 56 in 1990, then declined to 45 in 1991. The number of licences was limited in 1993, under category “ZF” licence, with 19 harvesters qualified after appeals.

The fishery remains small within the Strait of Georgia and a few adjacent mainland inlets. Catch is limited by low participation and few markets.

1.3. Type of Fishery and Participants

The Euphausiid fishery is a commercial fishery. The commercial fishery is a limited entry, competitive fishery. A personal “ZF” licence is required to participate in the fishery. There are 19 eligible participants under this licence. The “ZF” licence is held by an individual party who

must designate a commercially-licensed vessel each year (vessel length restrictions apply). One licence (category “FZF”) is available to First Nations for participation in the commercial fishery.

Participation in the fishery is limited due to economics and markets. Four vessels fished in 2011. Freezer vessels, whose daily catches are generally limited due to freezing capacity, and “fresh” vessels, which tend to land large quantities of Euphausiids for onshore processing and freezing, participate in the fishery. Catch must be frozen as soon as possible after landing, generally within seven to 12 hours to avoid a significant deterioration of the product, and corresponding reduction in quality and value. There are a limited number of buyers and registered processors involved in the BC Euphausiid industry. These facilities are located in the greater Vancouver area and in French Creek in some years.

A recreational harvest of “other shellfish” species is permitted under the BC Tidal Waters Sport Fishing Licence and may include Euphausiids by dip net but there is little, if any, interest.

First Nations are not known to harvest Euphausiids for food, social or ceremonial purposes.

1.4. Location of Fishery

The commercial fishery occurs in the upper Strait of Georgia and a few mainland inlets in the south coast of BC in Jervis, Knight, Bute, and Toba Inlets and Homfray-Lewis-Pryce Channels. Specific annual quotas are available in each area. Most of the catch comes from Jervis Inlet and the Strait of Georgia.

Euphausiid harvests have occurred in the past in Loughborough Inlet and Howe Sound and these areas continue to be included as possible harvest locations in the future as policy and stock assessment activities may provide, however, no directed fishing activities have occurred in these areas for a number of years.

Maps of commercial Quota Management Areas are provided in Appendix 3.

1.5. Fishery Characteristics

The Euphausiid fishery is a small limited entry, competitive commercial fishery managed through area-based quotas, seasonal openings, a precautionary 500 tonne total allowable catch (“TAC”) and a fishery notification (“hail”) and dockside validation program funded by commercial harvesters.

1.6. Governance

The Euphausiids fishery is 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 (1996)*, 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 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).

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 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 Endangered or Threatened animal or any part or derivative of an individual.

These documents are available on the internet at:

www.dfo-mpo.gc.ca/acts-loi-eng.htm

More information on the SARA is available at:

www.sararegistry.gc.ca

In addition, the Sustainable Fisheries Framework 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, and Policy on New Fisheries for Forage Species. Along with existing economic and shared stewardship policies, these will help DFO meet objectives for long-term sustainability, economic prosperity, and improved governance. See the internet at:

www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm

More recent information on Canada's Approach to Fisheries Modernization includes: Draft Policy Framework on Managing Bycatch and Discards, Precautionary Approach Framework Building Plan Guidelines and the Benthic Ecological Risk Analysis Framework.

1.7. Approval Process

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

2. STOCK ASSESSMENT SCIENCE AND TRADITIONAL KNOWLEDGE

2.1. Biological Synopsis

Euphausiids are an order of marine crustaceans found throughout the oceans of the world. There are 85 species of Euphausiids in the world, ranging in size from several millimetres to the largest deep sea species reaching 15 cm in length (Baker *et al.* 1990). Twenty species of Euphausiids occur in BC waters but biomass is dominated by five: *Euphausia pacifica*, *Thysanoessa spinifera*, *T. inspinata*, *T. longipes* and *T. rashii*. *E. pacifica* typically accounts for 70 - 100% of the Euphausiid biomass in the Strait of Georgia where the commercial fishery occurs (Jamieson *et al.* 1990).

E. pacifica is a widely distributed species in the North Pacific Ocean from Japan to southern California. It has only been fished commercially in the west of its range, off Japan, and the east of its range, off BC (Nicol and Endo 1997). A number of studies have been carried out on the biology and life history of the species harvested in BC. Much of this research has been focused on *E. pacifica* since it constitutes the predominant species harvested off Japan and BC.

In BC, Euphausiids release their eggs directly into the water where they develop independently. The main spawning season occurs in May to July with a second period of less intensive spawning in late August through September in the Strait of Georgia (Heath 1977). The life span

is estimated to be 19-22 months with growth cessation occurring in early autumn to winter when water temperatures and phytoplankton abundance is low.

Euphausiids are gregarious and aggregate into dense patches. This “aggregation” behaviour makes them attractive and susceptible to the directed commercial fishery.

2.2. Ecosystem Interactions

Euphausiids are a forage species and prey to many other species. The consumption of adult euphausiids was estimated for the seven most abundant fish species found on the continental shelf off southwestern Vancouver Island in August for each year from 1985 to 1997. The fish community was estimated to consume an average of 297 kilotonnes of Euphausiids in August. Pacific Hake (*Merluccius productus*) and Pacific Herring (*Clupea harengus*) accounted for most of the total Euphausiids consumed by fish (Robinson 2000).

Blue Whales feed almost exclusively on zooplankton, primarily Euphausiids (Gregr *et al.* 2006). Euphausiids are also the primary prey for Humpback Whales, although schooling fishes are also important components of the Humpback Whale’s diet (Ford *et al.* 2009; DFO unpubl. data). Fin whales feed on Euphausiids and schooling fish. Sei Whales have a more diverse diet that includes copepods and forage fish (which prey on zooplankton) (Gregr *et al.* 2006).

Euphausiids are an important component of the Strait of Georgia ecosystem. The available information indicates that they rank only behind Copepods (subclass Copepoda) in their contribution (as percentage) to total zooplankton biomass (Mackas *et al. in review* and Li *et al. in review*). Population fluctuations in euphausiid abundance almost certainly affect the growth, survival and distribution of their predators.

2.3. Aboriginal Traditional Knowledge / Traditional Ecological Knowledge

Aboriginal Traditional Knowledge is not readily available.

2.4. Stock Assessment

Surveys have been ongoing since the beginning of the fishery in the early 1970s. In 1994, 1995, and 1996 acoustical mapping surveys with verification tows were conducted by Fisheries and Oceans Canada (DFO) Science Branch in Jervis Inlet and Malaspina Strait in October and November, prior to fishing effort, and again in January and February after fishing efforts had ceased. Also between June 1994 and summer 1995, joint DFO and industry surveys were conducted monthly supported by external funding sources. The results of these surveys indicated that the present harvest levels are a small fraction of the annual average standing stock (Romaine *et al.* 1996).

In 1998, DFO Science Branch carried out hydroacoustical assessments during daylight hours in February, March, July, and October using standard gear from Canadian Coast Guard (CCG) Research Vessels in the Malaspina Strait and Lower Jervis Inlet areas where the majority of commercial harvest occurs. Results suggested biomass estimates 10-15% below the estimates derived from surveys conducted in 1997 (Romaine *et al.* 2002 and Mackas *et al.* 1996). These results seemed to contradict the increased yields and high catch per unit effort observed in the 1998 fishery.

A compilation of zooplankton data collected from the Strait of Georgia during the past 50 years showed decadal fluctuations shared by most zooplankton taxa including Euphausiids; declining from 1990-1995, increasing to a maximum ~1999-2002, declining to a minimum in 2005-2007, and then recovering to near-average levels by 2010. These zooplankton fluctuations correlated positively with the North Pacific Gyre Oscillation (NPGO) climate index, negatively with temperature anomalies throughout the water column, and positively (but less consistently) with survival anomalies of Strait of Georgia salmon and herring (Mackas *et al. in review*).

Annual estimates of Euphausiid biomass in the Strait of Georgia have been provided more recently to the Canadian Science Advisory Secretariat (CSAS) Fisheries Oceanography Working Group “State of the Ocean” report. State of the Ocean reports are available on the internet at:

www.dfo-mpo.gc.ca/csas-sccs/index-eng.htm

2.5. Stock Scenarios

The population size of Euphausiids in the Strait of Georgia has large seasonal and interannual variability. At present and past catch limits (<500 tonnes), the fishery removes only a small fraction of the Strait of Georgia annual average biomass, and an even smaller fraction of annual Euphausiid production (Romaine *et al.* 1996, Mackas *et al.* 1996 and Mackas and Moore 1994). However, in poor years, caused mostly by climate and predator effects on the Euphausiids, fishery removals may locally intensify the degree of “poor” but there is insufficient information currently available about within-year mobility within the Strait of Georgia to determine this (Romaine *et al.* 2002 and Mackas *et al.* 1996).

2.6. Precautionary Approach

Harvest control rules compliant with the Precautionary Approach (PA) framework (Section 1.6) have not been developed for Euphausiids.

The available information on the biology and abundance of Euphausiids in BC is considered to be “data limited”. The key scientific requirement in the development of a precautionary management strategy for “data limited” or “emerging” invertebrate fisheries has been identified as information on the abundance, distribution and productivity of the species (Perry *et al.* 1999).

2.7. Research

A study of Euphausiid aggregation mechanisms was conducted in Knight Inlet in 2001 and 2002 (Ianson *et al.* 2011).

Euphausiid monitoring and distribution mapping may be useful for the management of the Euphausiids’ seasonal and year-round predators, like coho, herring, sockeye and hake.

3. ECONOMICS OF THE FISHERY

3.1. Commercial

Section 15 describes value, catch and effort from 1983 to 2011 as reported historically on harvest logs and sales slips and, commencing in 1997, with validated landings. The landed value of the Euphausiid fishery as reported in fish slips has varied between \$23,107 in 2008 and peaking at \$541,000 in 2002. The landed price has varied between \$0.23 and \$1.54 kg⁻¹.

The maximum number of vessels reporting landings in a given year was 17 in 1990. Three to 6 vessels have fished in recent years (average 4.2 vessels/year, 2006 to 2011).

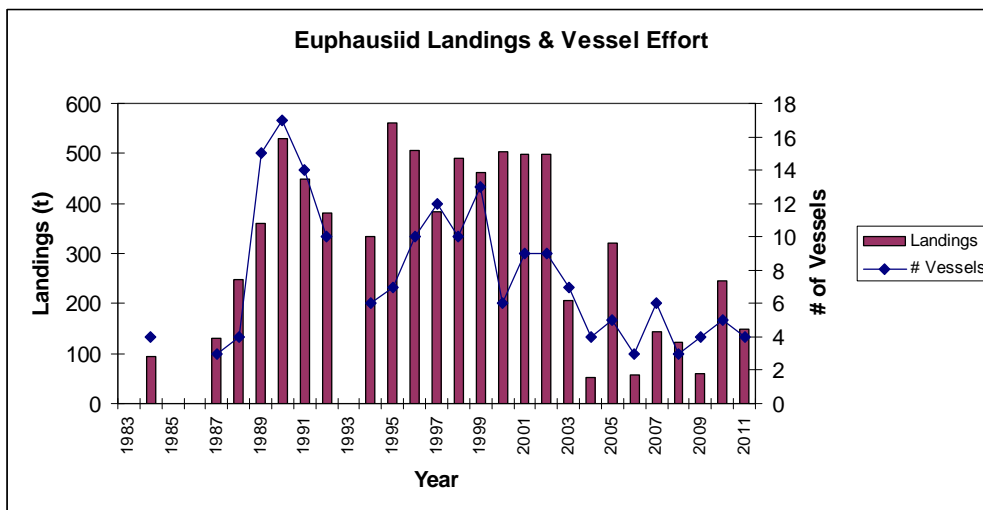


Figure 1. Annual Euphausiid Landings (tonnes) and Vessel Effort. Years with less than 3 vessels are confidential and not reported. Source: 1983-2006 fish slips, DFO; 1997-2011 validated landings, D&D Pacific Ltd.

Annual Euphausiids landings increased from less than 50 tonnes in 1983 to 530 tonnes (source: DFO fish slips) in 1990. The fishery moved into inlets in Pacific Fishery Management Areas 12 and 13 in 1990 as a result of mainland inlet quotas and closer monitoring of the fishery. Prior to 1990, the annual TAC had never been reached. Landings between 1990 and 2002 varied between 300 and 500 tonnes, except 1993 due to market limitations in that year. Limited fishing activity since 2002 resulted in significant reductions in catch landed. Annual landings since 2005 have remained below 250 tonnes. The majority of catch is taken from Jervis Inlet and the Strait of Georgia.

Catch per unit effort ($\text{kg}\cdot\text{hr}^{-1}$) reported on harvest logs has varied from $65 \text{ kg}\cdot\text{hr}^{-1}$ to $2,412 \text{ kg}\cdot\text{hr}^{-1}$ in 2005. Variations in catch per unit effort may result from a number and combination of factors such as changes in stock abundance, sea surface temperatures, stock distribution and competitive fishing effort resulting from improved markets.

3.2. Viability and Market Trends

Most of the commercial harvest of Euphausiids in BC is frozen for use in the manufacture of fish food. A small portion of the catch is freeze dried and used as aquarium pet food. There are also new and developing markets for “krill”, the common marketing name, as human food products, food additives, biochemicals, enzymes, and protein concentrates (Nicol and Endo 1997).

Market interest was increasing until 2002 but diminished significantly in 2003. The few active vessels appear to supply the available markets.

3.3. First Nations

First Nations are interested in economic opportunities through participation in BC’s commercial fishing industry. The Allocation Transfer Program (ATP) retires existing commercial licence eligibilities from fish harvesters on a voluntary basis and re-issues these to eligible First Nation

organizations as communal commercial licences. The Pacific Integrated Commercial Fisheries Initiative (PICFI), announced in 2007, is aimed at achieving environmentally sustainable and economically viable commercial fisheries, where conservation is the first priority and First Nations' aspirations to be more involved are supported. PICFI builds on fisheries reform work begun in response to the 2004 reports of the First Nations Panel on Fisheries and the Joint Task Group on Post-treaty Fisheries, as well as subsequent discussions in a wide variety of forums that have confirmed the need for PICFI. The Government of Canada committed \$175 million over five years to implement the initiative.

One of the 19 "ZF" licences is designated as a communal eligibility to provide economic opportunity to First Nations through participation in the commercial fishery (Section 3.1) but interest in fishing this licence is low.

For more information on the Aboriginal Fisheries Strategy (AFS) ATP, contact a resource manager listed in Section 15 or see the internet at:

www.pac.dfo-mpo.gc.ca/abor-autoc/index-eng.htm

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

www.pac.dfo-mpo.gc.ca/fm-gp/picfi-ipcip/index-eng.htm

4. MANAGEMENT ISSUES

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

4.1. Conservation and Sustainability

Basic biological information (i.e., age, growth, recruitment and migration) in support of the management of these species is limited. There is a minimal amount of available biological data with which to assess the fishery, and from which to develop and alter management plans.

A better understanding of the influence of varying exploitation rates on the resilience of local populations in years of poor survival (caused mostly by climate and predator effects on euphausiids) may be needed to support new policies developed under the Sustainable Fisheries Framework (Section 1.6).

4.2. Social, Cultural and Economic

4.2.1. Commercial Fishery

Catch levels and value remain limited and most licences are inactive.

There has been interest from some licence eligibility holders to investigate individual vessel quotas (IQs) for this fishery, however, there is not a unanimous view on proceeding in this direction and therefore a reluctance to bring the issue forward formally for review.

4.3. Compliance

There are no other emerging issues for enforcement other than those already highlighted in the Compliance Plan (Section 9).

4.4. Ecosystem

4.4.1. Forage Species

Euphausiids are a forage species (Section 2.2) and, as such, are subject to the new Policy on New Fisheries for Forage Species (Section 1.6). Under the Policy, existing fisheries for forage species that have an established record of sustainability, and the resource has been consistently conserved, may continue within the existing management approaches. Any proposals to change exploitation rates, gears, seasons, or other attributes of the fishery in ways that might affect conservation of the forage species or species feeding on it must be evaluated against the prerequisites outlined under the Policy.

The limited area and allowable catch on the Euphausiid fishery have been key mitigating factors in limiting competition with SARA-listed cetacean species in BC waters. Blue Whales (Endangered) show an on-shelf to deep water distribution off BC and are currently not at risk from direct competition with the Euphausiid fishery which is restricted to the mainland inlets and the Strait of Georgia (Gregr *et al.* 2006). Similarly, the Euphausiid fishery is not identified as a limiting factor to the further recovery of Humpback Whales (Special Concern; COSEWIC 2011). Historically, Fin Whales (Threatened) were occasionally observed in the more protected waters of the Strait of Georgia (Pike and MacAskie 1969) but contemporary sightings in Pacific Canadian waters are predominantly from the west coast of Vancouver Island, Hecate Strait and Queen Charlotte Sound (Gregr *et al.* 2006). Cetacean surveys in recent years off the BC coast and shelf-break region have not resulted in a single confirmed Sei Whale (Endangered) sighting and the number of these whales currently occurring in Pacific Canadian waters appears quite small (Gregr *et al.* 2006).

4.4.2. Depleted Species

Plankton trawl nets fish only the upper several meters of the water column and by-catch in the Euphausiids fishery is generally limited to small quantities of hake, herring and dogfish. A few juvenile rockfish have been mentioned as a rare occurrence due to the limited nature of the fishery and that it is targeted in the upper water column.

4.4.3. Gear Impacts

The plankton trawl nets used in this fishery fish only the upper several meters of the water column and are known to have minimal interaction with the benthic environment as part of normal fishing operations.

4.4.4. Oceans Act Considerations

Euphausiid fishing takes place in a limited area and does not overlap with established or proposed Marine Protected Areas (MPA) under Canada's *Oceans Act*, National Marine Conservation Areas under Canada's *National Marine Conservation Areas Act*, National Wildlife Areas under the *Canada Wildlife Act*, nor the Pacific North Coast Integrated Management Area.

The *Oceans Act* mandates DFO with leading and coordinating the development and implementation of a national system (or network) of marine protected areas. The *National Framework for Canada's Network of Marine Protected Areas* provides strategic direction for the design of a national network of marine protected areas (MPAs) that will be composed of a number of bioregional networks. Future network MPAs may overlap or include Euphausiids fishing areas depending on the type and nature of the MPA.

More information on Pacific MPAs and integrated management planning under Canada's *Oceans Act* can be found at:

www.pac.dfo-mpo.gc.ca/oceans/index-eng.htm

5. OBJECTIVES

Sections 5.1 to 5.3 and 5.5 outline the “longer term” objectives for this and other invertebrate fisheries in the Pacific Region. Section 5.4 describes the species-specific objectives for the Euphausiid fishery.

5.1. 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.

5.2. Pacific Region

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

- Ensure that subpopulations over as broad a geographical and ecological range as possible do not become biologically threatened (in the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) sense of “threatened”);
- Operationally, 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.

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

5.3. Invertebrate Resource Management

Management goals and objectives have been defined for invertebrate fisheries in annual management plans produced by DFO since 1990. The management goals and objectives, as written by Invertebrate Fisheries Management and revised in 1997, are:

- To ensure conservation and protection of invertebrate stocks and their habitat through the application of scientific management principles applied in a risk averse and precautionary manner based on the best scientific advice available;
- To meet the federal Crown's obligations regarding aboriginal fisheries for food, social and ceremonial purposes;
- To develop sustainable fisheries through partnership and co-management arrangements with client groups and stakeholders to share in decision making, responsibilities, costs, and benefits;
- To develop fishing plans and co-operative research programs which will contribute to improving the knowledge base and understanding of the resource;
- To consider the goals of stakeholders with respect to social, cultural and economic value of the fishery;
- To consider health and safety in the development and implementation of management plans, fishery openings and closures;
- To consider opportunity for the development of the aquaculture industry;
- To provide opportunities for a recreational fishery.

5.4. Euphausiids

5.4.1. Conservation/Sustainability

DFO's objective for conservation and sustainability of Euphausiids is to apply scientific management principles in a risk adverse and precautionary manner based on the best scientific advice available, and through comprehensive monitoring of fishing activities.

DFO's objectives for forage species are applied through the Policy on New Fisheries for Forage Species (Section 1.6).

5.4.2. Social, Cultural and Economic

DFO's objective is to continue to work collaboratively with the commercial industry on sustainable resource use and long-term economic viability of the seafood industry recognizing that commercial fisheries play a vital role in Canada's economy.

DFO's objective is to continue to provide opportunities for First Nations to harvest fish for food, social and ceremonial purposes, in a manner consistent with the decision of the Supreme Court of Canada in the *Sparrow Decision*, and other court decisions. For more information, see the internet at:

www.pac.dfo-mpo.gc.ca/tapd/default_e.htm

5.4.3. Compliance

DFO's objective is to pursue opportunities to monitor and enforce these fisheries, in conjunction with the monitoring and enforcement priorities in the Pacific Region.

5.4.4. Ecosystem

Changes to the exploitation rate or other attributes of the fishery in ways that might affect conservation of predator species feeding on Euphausiids must also be evaluated against prerequisites specified under the Policy on New Fisheries for Forage Species (Section 1.6).

DFO's objective is to use the Ecological Risk Assessment Framework drafted under the Policy for Managing the Impacts of Fishing on Sensitive Benthic Areas (Section 1.6) 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* (Section 4.4).

6. ACCESS AND ALLOCATION

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

6.1. Commercial

The commercial fishery is limited entry, with seasonal and area closures, a total allowable catch and area-based quotas.

6.2. Recreational

There is no recreational Euphausiids fishery. The daily limit under the BC Tidal Waters Sport Fishing Licence for "other shellfish" allows for a recreational harvest of 20 individual animals by dip net.

6.3. First Nations

First Nations' harvest for food, social and ceremonial purposes may occur where authorized by a communal licence. Euphausiids may be allocated under treaty, but were unallocated under the Maa-nulth, Tsawassen and Nisga'a Treaties.

6.4. Aquaculture

Consideration is given for aquaculturist access to relatively low numbers of Euphausiids (e.g., for broodstock development) for limited time periods where populations would face insignificant to low risk from the additional harvest pressure (DFO 2004).

For information on aquaculture or access to broodstock, contact the Aquaculture Management Division (Section 14 Contacts).

6.5. Experimental, Scientific, Educational or Public Display

DFO supports and facilitates scientific investigations related to Euphausiids. Scientific licence requests received from scientific, educational, and public display institutions, including biological collecting firms, are considered. Existing policies with respect to scientific licences apply.

7. MANAGEMENT MEASURES FOR THE DURATION OF THE PLAN

See the Commercial Harvest Plan (Appendix 1 and accompanying Appendices 2 to 4) for detail on the following:

- Fishings seasons / areas;
- Control and monitoring of removals;
- Decision rules;
- Licencing.

8. SHARED STEWARDSHIP ARRANGEMENTS

8.1. Commercial Fishery

The Krill Trawlers Association (KTA) was established in 1990, and since that time has contributed significant advice toward management and research program development. Annual harvest schedules are developed in consultation with both harvesters and processors.

DFO and the KTA agree on a fishery activity notification (“hail”) and catch validation program. The KTA funds the program, primarily through a royalty applied against the poundage landed in the fishery. Harvesters pay validation costs directly to the service provider as they occur. This includes logbooks for harvesters who have validation services provided as part of the catch validation program.

8.2. Fisheries and Oceans Canada

Two Fisheries Management personnel are directly involved in this fishery for part of their activities. Contributions to the IFMP are provided by Regional Headquarters, the Science Branch, Conservation & Protection, the Pacific Fishery Licence Unit, the Treaty and Aboriginal Program Directorate, the Oceans Directorate and administrative personnel. Generally, all personnel are multi-tasked.

9. COMPLIANCE PLAN

General information about the Conservation and Protection (C&P) program is available at:

www.dfo-mpo.gc.ca/fm-gp/enf-loi/index-eng.htm

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

Dockside monitors will continue to provide an “observe, record and report” capability.

9.1. Priorities

Priorities in this commercial fishery are to support investigation of reports received from the service provider and dockside monitors (Observers).

10. PERFORMANCE REVIEW

Stock Assessment

The available survey results, experimental studies and biological research will be documented.

Commercial Fishery

The effectiveness of the industry funded hail and dockside validation programs will be assessed and reviewed annually. The annual catch and any progress with changing or developing markets will be reported.

Compliance

The compliance evaluation will include the number of investigations based on reports.

Ecosystem

Changes arising as a result of initiatives under the *Oceans Act* or new policies under the Sustainable Fisheries Framework that may affect the Euphausiid fishery will be described.

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12. GLOSSARY

Area and Subarea	As in Schedule 2 of the <i>Pacific Fishery Management Area Regulations</i> .
Aquaculture	The process of spawning animals and rearing the progeny to marketable size, usually involving some level of intervention (e.g., feeder, predator protection) by the aquaculturist.
Catch Validation Program	A program designed to monitor, record, and verify catches. Also called the Verification Program.
Communal licence	Issued to First Nations organizations pursuant to the <i>Aboriginal Communal Fishing Licence Regulations</i> to carry on fishing and related activities.
Communal commercial licence	Issued to First Nations organizations pursuant to the <i>Aboriginal Communal Fishing Licence Regulations</i> for participation in the general commercial fishery. Licences issued are equivalent to the capacity of licences eligibilities that have been retired under the Allocation Transfer

	Program.
Euphausiids	An order of marine crustaceans related to shrimps and crabs. Also known and marketed as “krill”.
Forage species	A species which is below the top of the aquatic food chain, is an important source of food for at least some predators, experiences high predation mortality, and fully recruits to the fishery at ages which still experience high natural mortality due to predation. Forage species often undergo large fluctuations in abundance in response to environmental factors, on time scales comparable to or short than a generation. Forage species also usually form dense schools for at least part of the annual cycle, are relatively short lived and have a coastal distribution for at least part of the year.
Hail	Process of harvesters calling a service provider to advise of commencement of fishing activity.
Harvested	Euphausiids removed from the water, by means of a plankton trawl net.
Invertebrate	An animal without a backbone.
Landed or off-loaded	The transfer of Euphausiids from a vessel in water to land.
Observer	An individual who has been designated by the DFO Regional Director General for Pacific Region pursuant to Section 39 of the <i>Fishery (General) Regulations</i> to carry out fishery monitoring activities.
Quota Management Area	A defined portion of Pacific fisheries waters. Pacific Fishery Management Areas and Subareas, as described in the <i>Pacific Fishery Management Area Regulations</i> , are referenced in describing Quota Management Areas for Euphausiid fishing.
Sectoral committee	Provides a forum for the exchange of information and views, between the clients and Fisheries and Oceans Canada, on issues important to the management of all fisheries for Euphausiids.
Service provider	An agency contracted by harvesters, or their association on their behalf, to co-ordinate notification, catch validation, fishery monitoring, biological sampling and data submission requirements. The service provider may train and recommend candidates for certification by Fisheries and Oceans Canada as Observers.
Stakeholder	Used interchangeably with the term “resource-user”, to include all users of fisheries resources including First Nations, recreational and commercial harvesters of fish, marine mammals and aquatic plants. Depending on the fishery, it may also include crewmembers of charter services, other parties that provide support to the recreational fishery, and non-consumptive users.
Stock assessment	Results of analyses of fisheries and research data used to evaluate the effects of fishing on a stock or population and to predict the reaction of populations to alternative management choices.

TAC	Total allowable catch. The amount of catch that may be taken from a stock determined by analytical procedures to achieve management objectives.
Validated	An Observer has weighed the catch and entered the weight into the Euphausiid Validation and Harvest Logbook, or an approved alternative log.

13. CONTACTS

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

Fisheries Information and Shellfish Contamination Closure Update (24 Hours):		
	Toll free	1 866 431 3474
	Lower Mainland	604 666 2828
Commercial Fishery Hail Line		1 888 730 8709
D&D Pacific Fisheries Ltd.		1 800 775 5505
Marine Mammal and Sea Turtle Incident Reporting Hotline		1 800 465 4336

Fisheries Management

Regional Shellfish Co-ordinator	Jeff Johansen	(604) 666 3869
Regional Recreational Fisheries Co-ordinator	Devona Adams	(604) 666 3271

Lead Resource Management Biologist, Euphausiids	Laurie Convey	(250) 756 7233
3225 Stephenson Point Road, Nanaimo, B.C. V9T 1K3	Fax	(250) 756 7162

South Coast Area	General Inquiries	(250) 756 7270
3225 Stephenson Point Road, Nanaimo, B.C. V9T 1K3	Fax	(250) 756 7162
Fishery Manager - Shellfish, Comox	David Fogtmann	(250) 339 3799

Science

Institute of Ocean Sciences	Dave Mackas	(250) 363 6442
PO Box 6000, 9860 West Saanich Rd., Sidney, BC V8L 4B2		

Conservation and Protection

South Coast Area	Robert Kaatz	(604) 883 3060
PO Box 10, 12841 Madeira Park Rd., Madeira Park, BC V0N 2H0		

Lower Fraser River Area	Ken Green	(250) 756 7270
12551 No. 1 Road, Richmond, BC V7E 1T7		

Licensing

Pacific Fishery Licence Unit		(604) 666 0566
401 Burrard Street		
Vancouver, B.C. V6C 3S4		

Pacific Fishery Licence Unit (250) 754 0400
60 Front Street
Nanaimo, B.C. V9R 5H7

On-line Licencing information: www.dfo-mpo.gc.ca/fm-gp/sdc-cps/licence-permis-eng.htm

Aquaculture

Shellfish Advisor, Aquaculture Division Kerry Marcus (250) 754 0210

Canadian Food Inspection Agency

Molluscan Shellfish Program Specialist Deirdre Kelly (604) 666 3578

BC Ministry of Environment

Oceans and Marine Fisheries Division Dennis Chalmers (250) 714 9887

WorkSafe BC

Occupational Safety Officer, Courtenay Pat Olsen (250) 334 8777

Occupational Safety Officer, Courtenay Mark Lunny (250) 334 8732

Occupational Safety Officer, Victoria David Clarabut (250) 881 3469

Occupational Safety Officer, Richmond Bruce Logan (604) 244 6477

Occupational Safety Officer, Terrace Shane Neifer (250) 615 6640

Focus Sector Manager for Fishing, Richmond Mark Peebles (604) 279 7563

toll free 1 888 621 7233 (ext. 7563)

Projects related to commercial fishing contact: Ellen Hanson (604) 233-4008

toll free 1 888 621 7233 (ext. 4008)

Sighting Networks

BC Cetacean and Sea Turtle Sighting Network (866) 472 9663

Email: sightings@vanaqua.org or turtles@vanaqua.org

On the internet at: www.wildwhales.org/sightings/

www.bcreptiles.ca/reportsightings.htm#1

Basking Shark Sighting Network (866) 50 SHARK

Email: BaskingShark@dfo-mpo.gc.ca

On the internet at: www.pac.dfo-mpo.gc.ca/SharkSightings

14. CONSULTATION

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

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

The Euphausiid Sectoral Committee is the primary body guiding management decision-making processes for the fishery. The Committee meets periodically as needed to review and provide advice to DFO regarding management issues pertaining to the fishery and on the development of changes to the IFMP. The Sectoral Committee terms of reference and meeting calendar are available from the Resource Managers listed in Section 13 or from the DFO consultation website at:

www.pac.dfo-mpo.gc.ca/consultation/fisheries-peche/shell-inv/euph-krill/index-eng.htm

Euphausiid Sectoral Committee

Name	Address	Telephone	Fax
Fisheries and Oceans Canada			
Laurie Convey, Resource Management Biologist (Chair)	3225 Stephenson Pt. Rd. Nanaimo, B.C. V9T 1K3	(250) 756-7233	(250) 756-7162
David Fogtmann, Fishery Manager, Comox	148 Port Augusta St., Comox, B.C. V9N 3M6	(250) 339-2809	(250) 339-4612
Krill Trawlers Association Phil Burgess, President		(250) 248-9401	(250) 248-9415
D&D Pacific Fisheries Ltd. Darin Macey	Box 1445 Gibsons, B.C. V0N 1V0	(604) 886-4819	(604) 886-8288
Sports Fishing Advisory Board Chuck Ashcroft		(250) 338 9935	
BC Ministry of Environment Oceans and Marine Fisheries	PO Box 9359 Stn. Prov. Govt. Victoria, B.C. V8W 9M2	(250) 387-9574	(250) 356-0358

15. POST-SEASON REVIEW

Stock Assessment

Recent stock assessment and research initiatives are provided in Section 2 and include a compilation of zooplankton data collected from the Strait of Georgia during the past 50 years and annual estimates of Euphausiid biomass in the Strait of Georgia provided through the “State of the Ocean” report series.

Commercial Fishery

The following table describes catch effort and value in the Euphausiid fishery for the period 1983 through 2011 as reported historically on harvest logs and sales (fish) slips, and commencing in 1997 with validated landings. Landings are underestimated on sales slips because product is often marketed well after the season closes, including in the following calendar year.

Landings between 2007 and 2011 have remained well below the 500 tonnes total allowable catch. The highest catch in the last 5 years was 245 tonnes in 2010, compared to a low of 61 tonnes in 2009. The highest landed value (average price from available fish slips applied to validated landings) in the last 5 years was \$215,000 in 2010. Landed price has been \$1.54 kg⁻¹ in recent years. Landings and value appear to be market driven and highly susceptible to individual licence eligibility holders’ participation.

Table 1. Euphausiids landings (tonnes) and effort for British Columbia, 1983 to 2011, as reported on fish slips, harvest logs and validated landings.

Year	Type and Number of Licences Issued	Number of Vessels with Landings ¹	Quota (t)	Landings ² (t)	Landed Value ³ (\$10 ⁻³)	Whole Landed Value ³ (\$*t ⁻¹)	Effort ⁴ (hours)	CPUE ⁴ (kg hr ⁻¹)
1983	7 Z-F	<3	500	*	*	*	*	*
1984	8 Z-F	4	500	103	38	404	563	183
1985	5 Z-F	<3	500	*	*	*	*	*
1986	11 Z-F	<3	525	*	*	*	*	*
1987	18 Z-F	3	525	156	102	785	370	422
1988	24 Z-F	4	525	249	191	773	980	254
1989	45 Z-F	15	785	298	215	597	1150	259
1990	56 Z-F	17	500	499	415	783	1321	378
1991	45 Z-F	14	500	445	391	869	1211	367
1992	25 Z-F	10	500	343	318	835	470	730
1993	18 Z-F	<3	500	*	*	*	*	*
1994	18 Z-F	6	500	375	259	778	614	611
1995	18 Z-F	7	500	506	357	635	944	536
1996	18 Z-F	10	500	490	472	931	642	763
1997	18 Z-F	12	500	382	335	876	894	360
1998	17 Z-F	10	500	491	493	1004	503	883
1999	18 Z-F	13	500	460	447	972	777	529
2000	18 Z-F	11	500	504	482	957	435	1090
2001	18 Z-F	9	500	498	464	931	465	1066
2002	18 Z-F	9	500	499	541	1085	499	1012
2003	18 Z-F	7	500	205	230	1121	217	952
2004	18 Z-F	4	500	52	57	1102	26	1974
2005	18 Z-F	5	500	321	322	1003	131	2412
2006	18 Z-F	3	500	58	67	1152	49	1198
2007	18 Z-F	6	500	143	161	1129	175	826
2008	18 Z-F	3	500	124	164	1323	135	871
2009	18 Z-F	4	500	61	94	1543	39	1621
2010	18 Z-F	5	500	245	378	1543	123	2024
2011	18 Z-F	4	500	139	215	1543	104	1399

¹ Fish slips (1983-1996) and validated landings (1997-2011).

² Harvest logs (1983-1996; source: DFO) and validated landings (1997-2011; source: D&D Pacific Fisheries Ltd.).

³ Fish slips (source: DFO). Landed value from fish slips is extrapolated to validated landings from 1997 onwards.

⁴ Harvest logs.

* Data not provided for reasons of confidentiality where less than 3 boats report landings.

Compliance

No investigations were conducted (2007-12).

Ecosystem

New policies have been developed under the Sustainable Fisheries Framework (Sections 1.6) and have implications to the management of the Euphausiids fishery (see Sections 4.1 and 4.4).

Appendix 1: Euphausiid 2013-2017 Commercial Harvest Plan

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1. MANAGEMENT HIGHLIGHTS AND CHANGES FOR 2013-2017

- 1.1. A multi-year fishing plan will be implemented for the 2013 to 2017 seasons (5 years). Euphausiids harvesters will be apprised of changes annually, if necessary, via amendments to the commercial harvest plan, notices to industry, and/or direct contact through the service provider. Licences must be renewed annually.
- 1.2. Licensing service changes will be implemented in 2013. A web-based information system will replace in-person payments of licensing fees at Pacific Fishery Licencing Unit area offices early in 2013. This will include a phased roll-out of new client services to fish harvesters, including online assistance and a toll-free number for information and questions. Full use of the new online licensing system by the fishing industry will begin and service at the counter will cease to be available April 1, 2013 (Section 5.3.1).
- 1.3. A water drainage allowance of seven percent (7%) was introduced in November 2002 and will continue under this plan (Section 2.4).

2. MANAGEMENT MEASURES FOR THE COMMERCIAL FISHERY

2.1. Precautionary Total Allowable Catch (TAC)

Under the precautionary management plan, an arbitrary coastwide allowable harvest of 500 tonnes was established. Fisheries and Oceans Canada (DFO) is not prepared to authorise increases in the Euphausiid allowable harvest, as Euphausiids are a forage species upon which many other species depend. As such, the existing allowable harvest for the fishery is maintained at 500 tonnes, provided that management controls are sufficient to adequately track area quotas and collect accurate catch and effort data. No increase in allowable harvest will be considered until such time as a sound scientific basis is provided and accepted by DFO. Future management decisions will need to be consistent with the objectives of the Sustainable Fisheries Framework and the Policy for New Fisheries on Forage Species (available on the internet at: www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm).

2.2. Area Quotas

The coastwide commercial total allowable catch (TAC) is divided into area quotas (Section 3.1). Quota Management Areas are comprised of Pacific Fishery Management Areas, Subareas, and/or portions of Subareas. The quota for each Quota Management Area was based on historical commercial landings and from previous density surveys conducted in the lower Strait of Georgia.

Maps of the South Coast Quota Management Areas are provided in Appendix 3. Euphausiid harvesters are reminded to use these maps for reference purposes only. The final authority for the description of Areas and Subareas are set out in the *Pacific Fishery Management Area Regulations*.

2.3. Hail in and Dockside Validation

Prior to 1997, catch reporting was managed through weekly hails of catch to fishery managers, as a condition of licence. Compliance with this requirement was variable, in some cases adversely affected by poor communication links to remote coastal inlets. Quotas in some Quota Management Areas were exceeded on occasion. Changes to the management plan were introduced in 1997 as a result of these deficiencies. An industry funded hail in of fishing activity and dockside landing validation program was initiated in 1997 to address inadequate hailing of fishing activity practices, quota overages, and data inconsistencies.

Harvesters are required to advise the service provider when their fishing activities begin and terminate, and to have all product weighed and validated as it is landed at designated locations. To date, this management strategy has been successful in preventing quota overages, in improving data quality, and improving compliance with the commercial harvest plan.

2.4. Seven Percent Water Drainage Allowance

A trial seven percent (7%) water drainage allowance was introduced in November 2002 following receipt of supporting data confirming differences in dockside and final frozen weight, resulted from water drainage. This adjustment to dockside validated weight will continue to be permitted during the term of this commercial harvest plan provided the data available to DFO continues to support this level of water drainage allowance.

3. OPEN TIMES AND QUOTA MANAGEMENT AREAS

3.1. Euphausiid Quota Management Areas and Annual Quotas

Quota Management Area	Location	Pacific Fishery Management Area and Subarea	Quota (tonnes)
12A	Knight Inlet	12-28 to 12-34 inclusive	75
13A	Bute Inlet	13-18 to 13-22 inclusive	55
13B	Loughborough Inlet	13-42 and 13-43	0
15A	Homfray-Lewis-Pryce Channels	15-5	40
15B	Toba Inlet	15-6	20
16A	Jervis Inlet	16-11 to 16-15 inclusive	85
28A	Howe Sound	28-1 to 28-5 inclusive	0
	Total – Mainland Inlets		275

Quota Management Area	Location	Pacific Fishery Management Area and Subarea	Quota (tonnes)
16B	Other areas, Strait of Georgia	15-1 to 15-3 inclusive, 16-18 and portion 16-11 (See Section 3.2)	215
16C	Scientific Licence access	16-11 to 16-15	10
	Total Annual Allowable Catch		500 tonnes

Descriptions and maps of the Euphausiid Quota Management Areas are provided in Appendix 3.

3.2. Open Times

Mainland inlet areas of Jervis Inlet, Toba Inlet, Homfray-Lewis-Pryce Channels, Bute Inlet and Knight Inlet will open to euphausiid fishing 12:00 hours, noon, January 5, annually. These areas will remain open until either the individual inlet area quota is caught or until March 31 in each year, when all inlet areas will close.

Inlets with quota remaining may re-open August 16 upon request to the DFO Resource Manager, Shellfish, and will remain open until the inlet quota is caught or until October 31, whichever occurs first. Harvesters are reminded that no fishing can take place until the area re-opening has been confirmed by Variation Order and Fishery Notice.

Areas of the Strait of Georgia, Subareas 15-1, 15-2, 15-3, 16-18, and that portion of 16-11 westerly of a line from Ahistrom Pt. light 175° true to a point on the shoreline on Nelson Island, will open to euphausiid fishing 12:00 hours, November 1, annually. These areas will remain open until either the area quota of 215 tonnes plus the balance of the inlet area quotas are attained, or until December 31, whichever occurs first.

All fishing periods will open at 12:00 hours, noon, local time.

3.3. Closure Notification

It is the fish harvesters' responsibility to ensure that an area is open before setting gear and to ensure that the area has not closed while their gear remains in the water. Closures will go into effect as required with as much notice as possible when area quotas are achieved.

General information on openings and closures is available from the DFO Fisheries Managers (see Section 13 of the Integrated Fishery Management Plan for Euphausiids), from any local DFO office, or by calling the commercial shellfish information recordings at (604) 666-2828.

4. RESEARCH AND PERMANENT AREA CLOSURES

There are no specific research or permanent area closures. Time, area and quota restrictions control and limit access in the fishery.

5. LICENSING REQUIREMENTS FOR THE COMMERCIAL FISHERY

5.1. Licence Category

A Euphausiid category ZF or communal commercial category FZF licence is required to commercially harvest euphausiids (also known as krill).

5.2. Licence Fees

The individual licence fee for 2013 is \$100.

5.3. Licence Application and Issuance

Applications must be completed and submitted to a Pacific Fishery Licence Unit by December 31 of each fishery year with the required fee.

The licence eligibility holder must sign the application form. If the licence eligibility holder is a company or First Nation group, the Pacific Fishery Licence Unit must have on record a copy of either a Confirmation of Signing Authorities or an Amendment to Confirmation of Signing Authorities form listing the signing authorities for the company or First Nation group.

Prior to annual licence issue, licence eligibility holders must:

- Provide a letter confirming that arrangements have been made to provide services required by the conditions of licence. The services include, but are not restricted to, logbook coding, data entry and validation services. The confirmation letter must come from a corporation or individual designated by the Regional Director-General for Pacific Region pursuant to section 39 (individual) or 39.1 (corporation) of the *Fishery (General) Regulations*.
- Ensure any conditions of the previous year's licence such as submission and approval of logbook requirements are met.
- Designate a registered commercial fishing vessel eligible for a vessel-based licence (A, C, G, K, L, R, S, T or W) or one that has been designated to fish a category N/F licence for the current year. The designated vessel's overall length may not exceed the maximum vessel length (MVL) of the licence eligibility. Designated vessels must have a vessel survey on record with the Pacific Fishery Licence Unit, completed in accordance with DFO measurement guidelines, dated subsequent to May 1989.

5.3.1. Licensing service changes effective 2013

Licensing service changes will be implemented in 2013. A web-based information system will replace in-person payments of licensing fees at Pacific Fishery Licencing Unit offices early in 2013. For the first time, fish harvesters will be able to go online to

purchase and renew their commercial fishing licences and to receive in-season licensing services, including the ability to request their licences, obtain their licence conditions, as well as print and pay for their licences. DFO will begin a phased adoption of the new system by industry to obtain their fishing licences starting **January 1, 2013**, with full industry adoption by April 1, 2013. This will include a phased roll-out of new client services to fish harvesters, including online assistance and a toll-free number for information and questions.

January 1 to March 31, 2013: During the three-month phase-in period, service at the counter will continue to be available for fish harvesters who wish to take advantage of the Department's traditional method of service to obtain their 2013 fishing licences.

April 1, 2013: Full use of the new online licensing system by the fishing industry will begin and service at the counter will cease to be available. As part of the online services offered, fish harvesters will have the opportunity, if desired, to establish an alternate person to access his or her account and to make requests and payments on his or her behalf. The new client services will also include the ability for fish harvesters to make an appointment with DFO staff, as needed, to complete a licensing transaction. Fish harvesters will also have the opportunity to make credit card or Interac payments directly online through the new system or, if preferred, to pay for their licence at their bank.

Information on the new system may be found on the DFO internet site, at:

www.dfo-mpo.gc.ca/fm-gp/sdc-cps/licence-permis-eng.htm

5.4. Licence Eligibility Nominations

Euphausiid licence eligibilities may be nominated from one party to another. A Nomination for Category Z Licence Eligibility form must be completed by the licence eligibility holder.

The following requirements must be met:

- a) Logbooks have been submitted and approved by the Shellfish Data Unit.
- b) Valid current year licence documents and validation tabs must be returned.

Communal commercial category FZF licence eligibilities may not be nominated as these are designated annually to First Nation groups. First Nations groups may designate the licence to a vessel which meets the same requirements as the general commercial fishery licences.

5.5. Licence Length Restriction

Vessel length restrictions are in effect for vessels used to harvest euphausiids. ZF licences may be designated only to vessels of the same length permitted to harvest Schedule II species.

5.6. Licence Documents

Euphausiid licence documents are valid from the date of issue to December 31 of each calendar year.

Replacements for lost or destroyed licence documents may be obtained by completing a Declaration Concerning Licence Documents form. Please contact a Pacific Fishery Licence Unit for further details.

5.7. Vessel Redesignation

Vessel redesignation after annual licence issue is permitted when required. A Category “Z” Vessel Re-designation form must be completed by the licence eligibility holder and submitted to a Pacific Fishery Licence Unit office. Prior to vessel redesignation, licence eligibility holders must:

- Ensure all requirements for licence application detailed above are met with regard to the replacement vessel.
- Return the current year commercial fishing licence and validation tabs with the redesignation application.

5.8. Licence to Transport Euphausiids

Any registered vessel with a vessel-based licence (Categories A, C, F, G, K, L, N, R, S, T and W), one designated to fish a category F/N licence, a category D (packing) or a herring seine licence (HS) may transport euphausiids under conditions of licence which are included with all vessel-based licences issued for 2013 through 2017. For further information contact the Pacific Fishery Licence Unit.

6. CONTROL AND MONITORING OF COMMERCIAL FISHING ACTIVITIES

An industry-funded “hail in” and “dockside validation” program was developed collaboratively between Krill Trawlers Association (KTA), DFO, and D&D Pacific Fisheries Ltd. The program has been in place since 1997. It has been effective in providing the necessary fishing activity and quota tracking information required to properly manage the area base quotas in the fishery. All landings are validated. This has resulted in significant improvements in landing data and in a more orderly and safer fishery.

The approved dockside monitoring service provider contracted by the Krill Trawlers Association to provide notification, validation and data services for the 2013-2017 Euphausiid fishery is:

D&D Pacific Fisheries Ltd.
Box 1445, Gibsons, BC V0N 1V0
Tel: (604) 886-4819
Fax: (604) 886-8288
Hail-in Line: (888) 730-8709

6.1. Species

Euphausiids (Order: *Euphausiacea*).

6.2. Gear

Plankton trawl gear only.

6.3. Designated Landing Ports

Euphausiids must be landed at one of the following designated landing ports:

Lund, French Creek, Earl's Cove, Pender Harbour, Egmont, Richmond, False Creek, and Port McNeill (only by prior arrangement with the service provider – 48 hours notice).

6.4. Notification Procedures Commencement, Hails, and Validation of Landings

6.4.1. Before Fishing or Moving to a New Area

The vessel master shall notify the service provider by telephoning (888) 730-8709, at least 24 hours before commencing fishing or before moving to a new fishing area, with the following information:

- a) vessel name;
- b) vessel master's name;
- c) vessel registration number (VRN#);
- d) species to be fished (i.e. euphausiids);
- e) Subareas to be fished;
- f) date and time that fishing will begin or end; and
- g) estimate of the number of days to be fished.

If the vessel is unable to arrive in the declared Quota Management Area within 24 hours of the stated time, the vessel master shall so notify the service provider by telephoning (888) 730-8709:

- a) vessel master's name, vessel name, VRN #; and
- b) details of change in fishing plans

The vessel master shall notify the service provider at least 24 hours prior to moving to a new Quota Management Area.

6.4.2. Daily While Fishing

Before 12:00 hours (noon) each day during a fishing trip, on those days when a vessel is fishing but is not making a landing, the vessel master shall report to the service provider by telephoning (888) 730-8709:

- a) vessel master's name, vessel name and VRN #;
- b) species fished;
- c) number of days fished;
- d) Quota Management Area(s) fished;
- e) Subareas fished; and
- f) estimated catch in pounds.

6.4.3. Prior to Landing

Twenty-four hours prior to landing euphausiids, the vessel master shall report to the service provider by telephoning (888) 730-8709:

- a) vessel master's name, vessel name and VRN #;
- b) species to be landed;
- c) name of the designated port and location therein where the catch shall be landed;
- d) anticipated time of landing;
- e) the name of the observer who will be validating the catch if it is someone other than an observer acting on behalf of the Service Bureau contracted to the Krill Trawlers Association;
- f) name of the processor, buyer or other person who will be transporting the catch; and
- g) the method of transporting the catch from the designated landing port and the destination of the product.

6.5. Transshipment

All product harvested under a euphausiid ZF or ZFZ licence must be harvested from and retrieved by the vessel designated on the licence. If product is going to be transferred from the harvest vessel to another vessel (e.g., for landing purposes), the vessel to which it is transferred must be appropriately licensed for packing purposes.

At no time should unlicensed vessels be used to harvest, retrieve, store or tranship product.

6.6. Validation

The vessel master must be in possession of a DFO approved catch Validation and Harvest Logbook assigned to the Euphausiid licence. The Validation and Harvest Logbook must be on board the licensed vessel while fishing for Euphausiids and while Euphausiids are on board the licence vessel. Validation and Harvest Logbooks which meet DFO's approval are available from the service provider.

6.6.1. Validation and Harvest Log Entries

At the first point of off-loading, all Euphausiids will be weighed with a government-certified scale. The Observer shall record in the Euphausiid Validation and Harvest Logbook:

- a) Name and VRN# of the vessel;
- b) Name and Fishers Identification Number (FIN) of the vessel master;
- c) Licence tab number;
- d) Landing date;
- e) Pacific Fishery Management Area and Subarea;
- f) Number of days fished;
- g) Name of plant, buyer or storage facility destination;

- h) Total number of containers delivered;
- i) Total net validated dock weight; and
- j) The Quota Management Area fished.

If catch cannot be weighed due to extenuating circumstances, either an average total weight of 1,400 lbs. may be used to determine weight, or for frozen product, validation shall be postponed until a scale is available.

The Euphausiid Validation and Harvest Log must remain with the licensed vessel, with copies accompanying the off-loaded product to its destination.

At each landing and validation, the Observer to ensure timeliness, completeness and accuracy of recording fishing activities must examine the harvest section (B).

6.6.2. Examination of Logbooks

The Validation and Harvest Logbook must be produced by the vessel master on request by a fishery officer, fishery guardian or an Observer.

6.6.3. Termination of Fishing

After a fishing trip is completed, or when a vessel will not be fishing again within 24 hours, the vessel master shall report to the Observer validating the last landing or to the service provider by telephoning (888) 730-8709 the following information:

- a) Vessel master's name and FIN, vessel name and VRN#;
- b) Species fished; and
- c) Date and time that fishing stopped.

6.6.4. Quota Confirmation

Prior to fishing, the vessel master must confirm the remaining area quota from the service provider.

6.7. Validation and Harvest Log Data

It is a condition of licence and the responsibility of the licence eligibility holder to ensure that harvest information is received by the DFO Shellfish Data Unit, and meets the conditions outlined in Section 6.6. Harvesters who have validation services completed by D&D Pacific Fisheries Ltd. will receive these services as part of that contract. For harvesters who wish to have validation completed by an Observer other than the service provider under contract to the KTA, it will remain the licence eligibility holder's responsibility to ensure the requirements are fully completed.

6.7.1. Harvest Data

The vessel master is responsible for the provision and maintenance of an accurate record, a "log", of daily harvest operations. This log must be completed and a copy submitted in both hard (paper) copy and electronic form in an approved format as defined by the DFO Shellfish Data Unit.

To fulfil stock assessment objectives it is imperative that precise fishing locations be reported in this fishery. The vessel master is responsible for reporting latitude/longitude position on the harvest log in the “location” field for the starting position of each tow.

The original white page copy of the log, the accompanying location information and the electronic copy must be forwarded twice annually within four weeks following the termination of the euphausiid spring and fall fisheries. The information must be sent to:

Shellfish Data Unit
Fisheries and Oceans Canada
Pacific Biological Station
Hammond Bay Road
Nanaimo, B.C., V9T 6N7
Tel: (250) 756-7022 or (250) 756-7306

Catch information must be recorded in the harvest log no later than 12:00 p.m. for each 24 hours fished. The logbook must be kept aboard the licensed vessel. Logbooks must be produced for examination on demand of a fishery officer, guardian or an Observer designated under the *Fisheries Act*.

6.7.2. Submission and Release of Harvest Log Data

The licence eligibility holder of record reported with the Pacific Fishery Licence Unit is responsible to ensure that the vessel master has completed and submitted a copy of the harvest data. DFO may only release harvest data to the licence eligibility holder and only upon written request.

6.7.3. Nil Report for Harvest Log – Licence Issued but not Fished

In the event that a licence is issued but not fished, the licence eligibility holder is responsible for submitting a nil report for the season. The nil report must be submitted prior to the issuing of approval for licence renewal. One page from the harvest logbook identifying the vessel, licence tab number and the year with “nil” entered in the body of the log and signed by the licence holder constitutes a nil report.

DFO wishes to remind fish harvesters that harvest logs must be completed accurately during fishing operations and submitted to DFO in accordance with the timing set out in conditions of licence. Failure to complete or submit logs in a timely manner is a violation of condition of licence.

6.7.4. Confidentiality of Harvest Data

Harvest data, including fishing location data supplied through latitude/longitude coordinates, or chart records, collected under the Validation and Harvest Logbooks for shellfish fisheries programs, are collected for use by DFO in the proper assessment, management and control of the fisheries. Upon receipt by DFO of harvest data and/or fishing location information supplied by the harvester in accordance with conditions of licence, Section 20(1)(b) of the *Access to Information Act* prevents DFO 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 DFO from giving out information, the disclosure of which could reasonably be expected to result in material financial loss or could reasonably be expected to prejudice the competitive position of the harvester.

6.8. Fish Slip Requirements

It is a condition of this licence that 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:

Catch Statistics Unit
Fisheries and Oceans Canada
200-401 Burrard Street
Vancouver, B.C. V6C 3S4

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

7. OTHER RESTRICTIONS AND GENERAL INFORMATION

Vessel masters are requested to cease trawling in any location if the catch of larval or juvenile fish exceeds 10 per litre drained catch. Under these circumstances, the vessel master shall advise the Observer and the DFO Fishery Manager of the date, location, and level of by-catch so appropriate action can be taken to prevent any fishing of larval or juvenile fish.

EUPHAUSIID VALIDATION & HARVEST LOGBOOK

SECTION 'A' OBSERVER USE ONLY SECTION 'B' COMPLETED BY VESSEL MASTER

FROZEN BLOCK COUNT		AVG. WT. / BLOCK		VALIDATION ID #							
No. OF CONT.	CONT. TYPE	AVG. NET CONT. WT.									
OBSERVER		LANDING PORT		GROSS DOCK WT	TARE WT	NET DOCK WT	# OF CONTAINERS	OTHER VAL. ID #			
DATE		START	FINISH	WAIT	7% SHRINKAGE	ADJUSTED NET DOCK WT	SPLIT LOAD <input type="checkbox"/> Y <input type="checkbox"/> N		SITUATION REPORT #		
COMMENTS:				TOTAL TARE WT + 7%		CHECK LIST:		MATH CHECK			
						<input type="checkbox"/> FRESH / <input type="checkbox"/> FROZEN <input type="checkbox"/> LB / <input type="checkbox"/> KG		<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Y <input type="checkbox"/> N			
SKIPPER NAME		SKIPPER FIN #		VESSEL NAME		VRN		ZF TAB #			
QUOTA AREA	DAYS FISHED	Frozen Block Count	LOAD ESTIMATE	Fresh Cont. Count	PACKER NAME		PACKER VRN	BUYER NAME			
HARVEST DATE	HARVEST LOCATION (starting point of each tow) Latitude & Longitude Coordinates			STAT AREA	SUB AREA	DEPTH: FT / FM / ME MIN. MAX.		START TIME 24 hr clock	MINUTES FISHED	Est. CATCH lb (circle one) kg	COMMENTS
1											
2											
3											
4											
5											
6											
7											
8											

D&D PACIFIC FISHERIES WHITE COPY - OBSERVER YELLOW COPY - BUYER VIA TRUCKING PINK COPY - REMAINS IN LOGBOOK Revision: Dec 05, 2007

Appendix 3: Euphausiid Quota Management Area Maps

Quota Management Areas Descriptions

Quota Management Area	Name	Description (Pacific Fishery Management Area and Subarea)
12A	Knight Inlet	12-28 to 12-34 inclusive
13A	Bute Inlet	13-18 to 13-22 inclusive
13B	Loughborough Inlet	13-42 and 13-43
15A	Homfray-Lewis-Pryce Channels	15-5
15B	Toba Inlet	15-6
16A	Jervis Inlet	16-11 to 16-15 inclusive
28A	Howe Sound	28-1 to 28-5 inclusive
16B	Strait of Georgia	15-1 to 15-3 inclusive, 16-18 and that portion of 16-11 westerly of a line from Ahistrom Pt. light 175° true to a point on the shoreline on Nelson Island
16C	Jervis Inlet - scientific Licence access	16-11 to 16-15 inclusive

Harvesters are reminded to use the following maps for reference purposes only. The final authority for the descriptions of Areas and Subareas are as set out in the *Pacific Fishery Management Area Regulations*. The *Pacific Fishery Management Area Regulations* are available through the Internet at:

<http://laws.justice.gc.ca/en/F-14/SOR-82-215/index.html>

Maps of Pacific Fishery Management Areas and Subareas are available at:

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

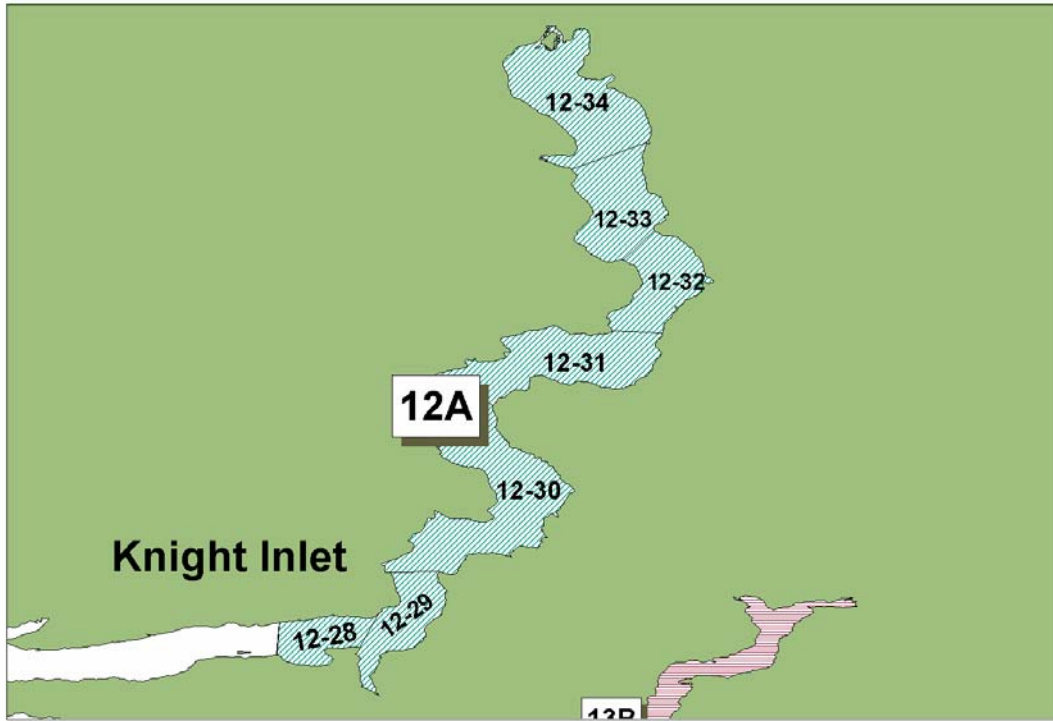


Figure 1: Quota Management Area 12A – Knight Inlet

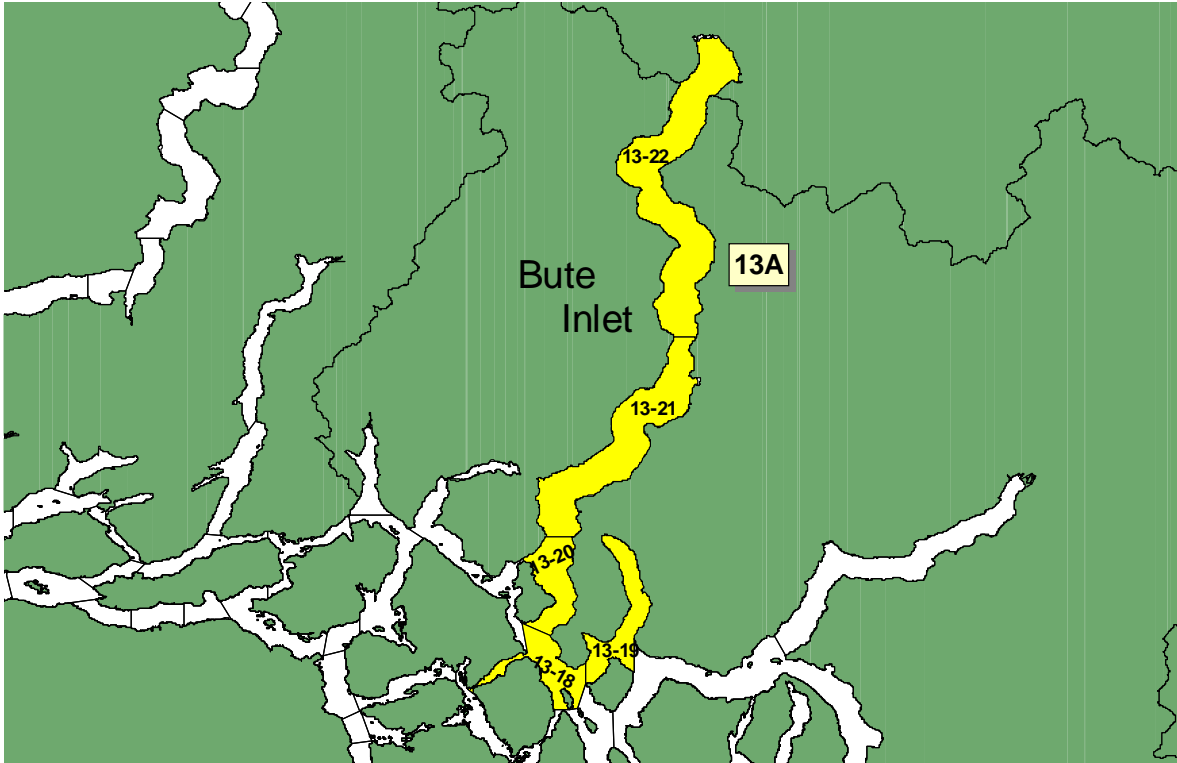


Figure 2: Quota Management Area 13A - Bute Inlet

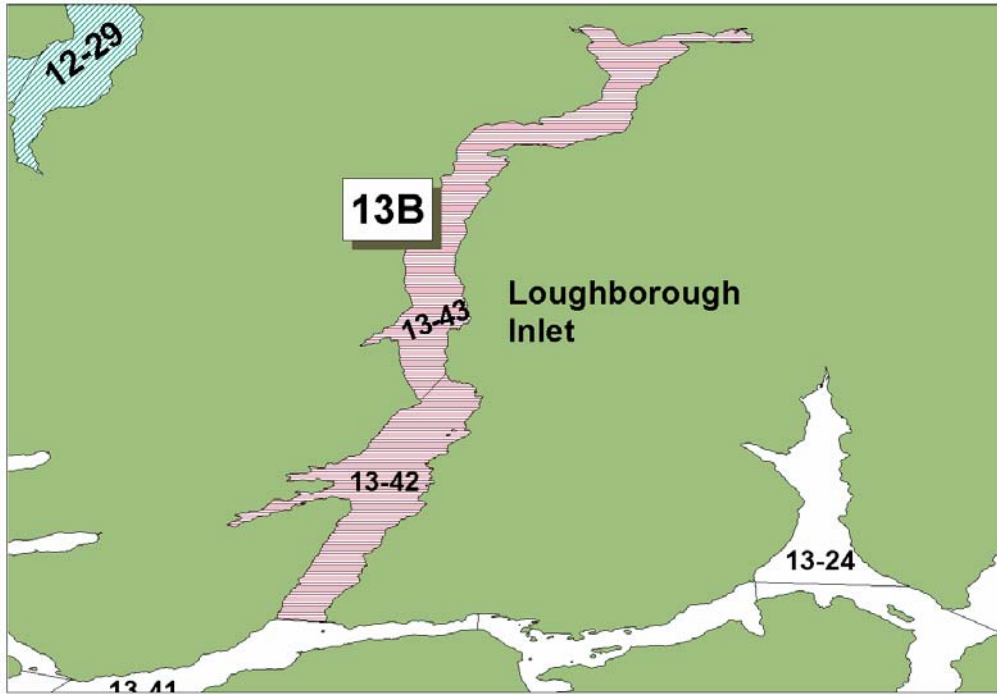


Figure 3: Quota Management Area 13B - Loughborough Inlet

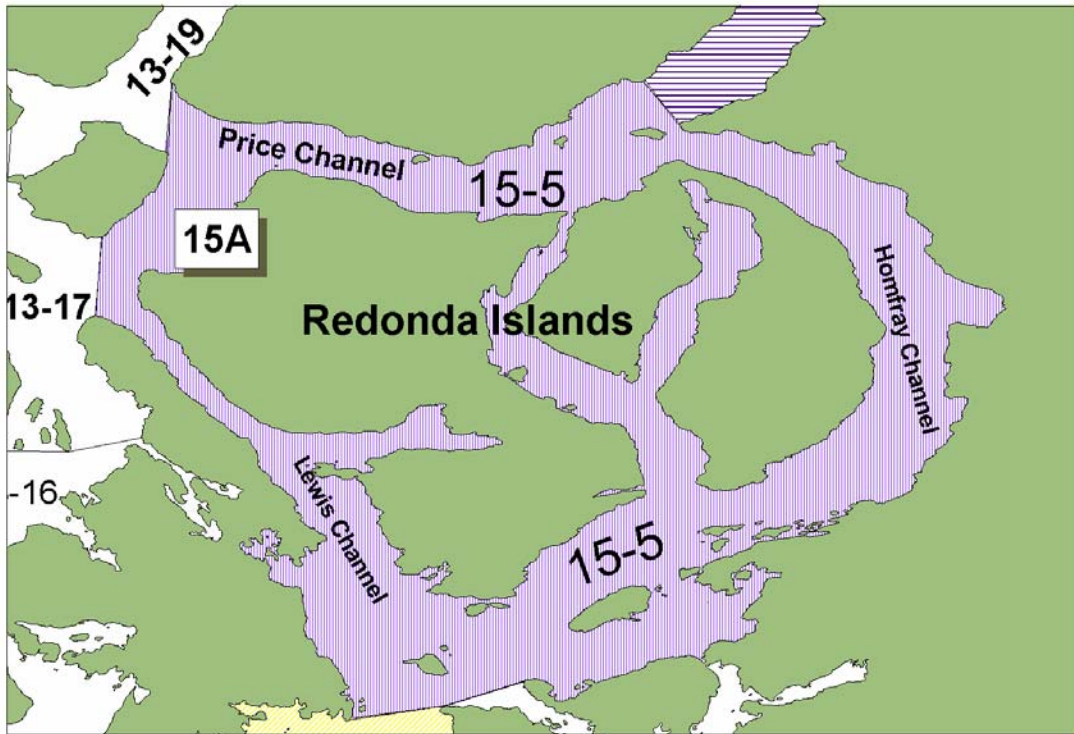


Figure 4: Quota Management Area 15A – Homfrey-Lewis-Price Channels

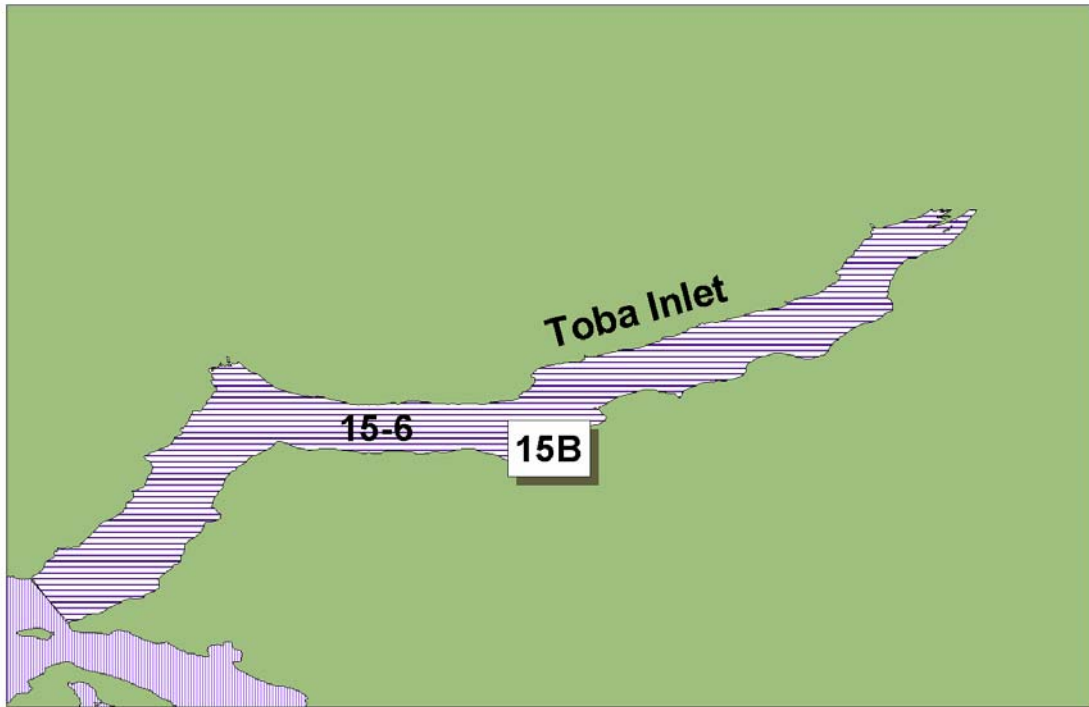


Figure 5: Quota Management Area 15B – Toba Inlet

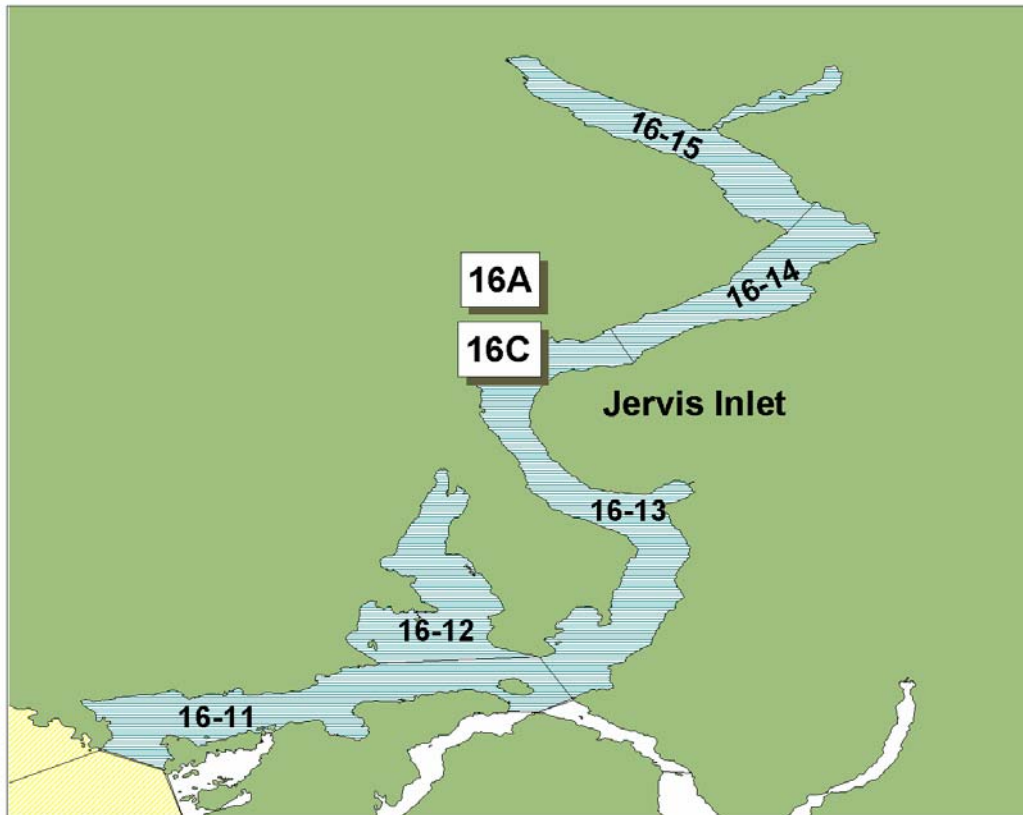


Figure 6: Quota Management Area 16A and 16C – Jervis Inlet

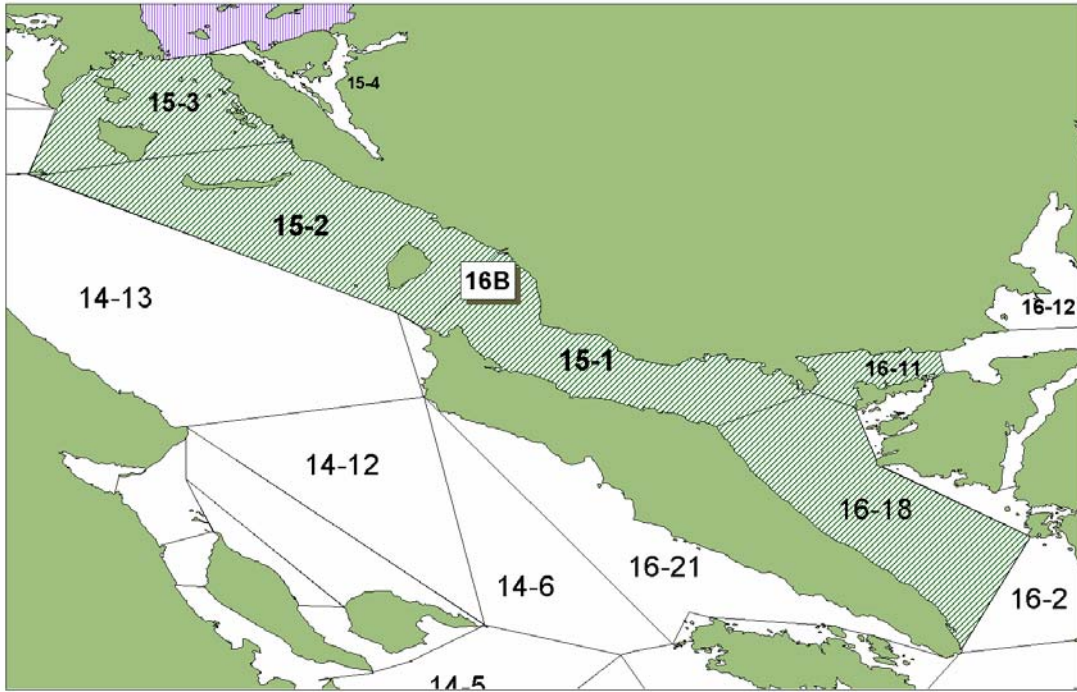


Figure 7: Quota Management Area 16B – Strait of Georgia

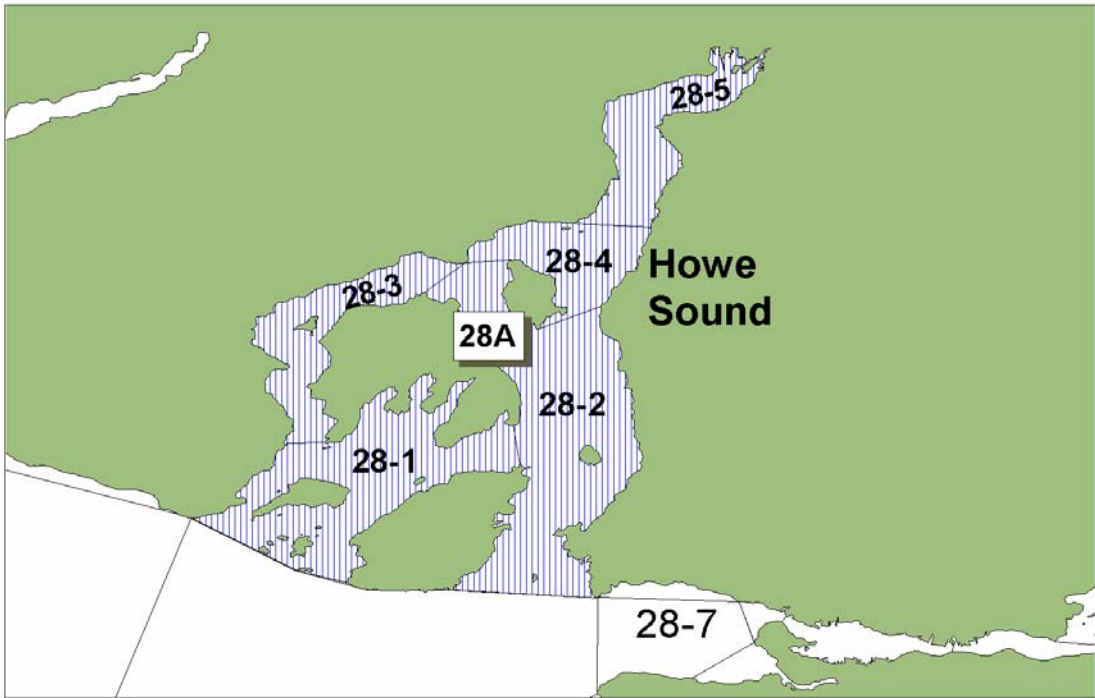


Figure 8: Quota Management Area 28A

Appendix 4: 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 Transport Canada (TC); emergency response with the Canadian Coast Guard (CCG) and DFO has responsibility for management of the fisheries resources. In B.C., WorkSafeBC also regulates health and safety issues in commercial fishing. This includes requirements to ensure the health and safety of the crew and safe operation of the vessel. DFO (Fisheries and Aquaculture Management (FAM) and CCG) and TC through an MOU have formalized cooperation to establish, maintain and promote a safety culture within the fishing industry.

Before leaving on a voyage the owner, master or operator must ensure that the fishing vessel is capable of safely making the passage. Critical factors for a safe voyage include the seaworthiness of the vessel, vessel stability, having the required safety equipment in good working order, crew training, and knowledge of current and forecasted weather conditions. As safety requirements and guidelines may change, the vessel owner, crew, and other workers must be aware of the latest legislation, policies and guidelines prior to each trip.

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

- Education and Training Programs

- Marine Emergency Duties

- Fish Safe - Stability Education Course

- Fish Safe – Safe on the Wheel Course

- Fish Safe – Safest Catch Program

- First Aid

- Radio Operators Course

- Fishing Masters Certificates

- Small Vessel Operators Certificate

- Publications:

- Transport Canada Publication TP 10038 *Small Fishing Vessel Safety Manual* (can be obtained at Transport Canada Offices from their website at:

 - <http://www.tc.gc.ca/eng/marinesafety/tp-tp10038-menu-548.htm>

- Gearing Up for Safety – WorkSafeBC

- Safe at Sea DVD Series – Fish Safe

- Stability Handbook – Safe at Sea and Safest Catch – DVD Series

- Safest Catch Log Book

- Safety Quik

For further information see: www.tc.gc.ca/eng/marinesafety/menu.htm
www.fishsafebc.com

1. Important Priorities for Vessel Safety

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

1.1. Fishing Vessel Stability

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

Fishing vessel owners are required to develop detailed instructions addressing the limits of stability for each of their vessels. The instructions need to be based on a formal assessment of the vessel by a qualified naval architect and include detailed safe operation documentation kept on board the vessel. Examples of detailed documentation include engine room procedures, maintenance schedules to ensure watertight integrity, and instructions for regular practice of emergency drills.

The *Small Fishing Vessel Inspection Regulations* currently require, with certain exceptions, a full stability assessment for vessels between 15 and 150 gross tons that do not exceed 24.4 metres in length and are used in the herring or capelin fisheries. Once the proposed new *Fishing Vessel Safety Regulations* take effect, more vessels will be required to have a stability booklet.

In 2006, Transport Canada Marine Safety (TC) issued [Ship Safety Bulletin \(SSB\) 04/2006](#) ("Safety of Small Fishing Vessels: Information to Owners/Masters About Stability Booklets"), which provides a standard interpretation of the discretionary power available under Section 48 and the interim requirements prior to the implementation of the proposed *Fishing Vessel Safety Regulations*. The bulletin calls for vessels more than 15 gross tons to have a stability booklet where risk factors that negatively affect stability are present. The bulletin also suggests vessels less than 15 gross tons assess their risk factors. Every fishing vessel above 15 GRT built or converted to herring or capelin after 06 July 1977 and engaged in fishing herring or capelin must have an approved stability book. Additionally Transport Canada has published a Stability Questionnaire (SSB 04/2006), and Fishing Vessel Modifications Form which enable operators to identify the criteria which will trigger a stability assessment. A stability assessment is achieved by means of an inclining experiment, which has to be conducted by a naval architect. Please contact the nearest Transport Canada office if you need to determine whether your vessel requires one.

In 2008, TC issued [SSB 01/2008](#), which sets out a voluntary record of modifications for the benefit of owners/masters of any fishing vessels. For vessels of more than 15 gross tons, the record of modifications was to be reviewed by TC inspectors during regular inspections and entered on the vessel's inspection record. However, information gathered during the Transportation Safety Board's (TSB) Safety Issues Investigation into the fishing industry showed minimal recording of vessel modifications prior to this date.

The TSB has investigated several fishing vessel accidents since 2002 and found that vessel modifications and loading of traps have been identified as contributing factors in vessel capsizings. Such as: [M02W0102](#) - *Fritzi-Ann*, [M05W0110](#) - *Morning Sunrise*, [M07M0088](#) -

Big Sisters, [M08W0189](#) - *Love and Anarchy*, [M09L0074](#) – *Le Marsouin I*, [M10M0014](#) - *Craig and Justin*. In 2012 two prawn fishing vessels in BC, *Jessie G* and *Pacific Siren* both capsized with prawn traps on deck and are currently under investigation.

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

1.2. Emergency Drill Requirements

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

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

1.3. Cold Water Immersion

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

1.4. Other Issues

1.4.1. Weather

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

http://www.weatheroffice.gc.ca/marine/index_e.html

1.4.2. Emergency Radio Procedures

Vessel owners and masters should ensure that all crew are able to activate the Search and Rescue (SAR) system early rather than later by contacting the Canadian Coast Guard (CCG). It is strongly recommended that all fish harvesters carry a registered 406 MHz Emergency Position Indicating Radio Beacon (EPIRB). These beacons should be registered with the National Search and Rescue secretariat. When activated, an EPIRB transmits a distress call that is picked up or

relayed by satellites and transmitted via land earth stations to the Joint Rescue Co-ordination Centre (JRCC), which will task and co-ordinate rescue resources.

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

Since August 1, 2003 all commercial vessels greater than 20 metres in length are required to carry a Class D VHF Digital Selective Calling (DSC) radio. A registered DSC VHF radio has the capability to alert other DSC equipped vessels in your immediate area and MCTS that your vessel is in distress. Masters should be aware that they should register their DSC radios with Industry Canada to obtain a Marine Mobile Services Identity (MMSI) number or the automatic distress calling feature of the radio may not work. For further information see the Coast Guard website at: <http://www.ccg-gcc.gc.ca/e0003845>

A DSC radio that is connected to a GPS unit will also automatically include your vessel's current position in the distress message. More detailed information on MCTS and DSC can be obtained by contacting a local Coast Guard MCTS centre (located in Vancouver, Victoria, Prince Rupert, Comox and Tofino) or from the Coast Guard website: www.pacific.ccg-gcc.gc.ca

1.4.3. Collision Regulations

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

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

Exceptions include:

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

More detailed information on VTS can be obtained by calling (604) 775-8862 or from the Coast Guard website: <http://www.ccg-gcc.gc.ca/e0003901>

1.4.4. Buddy System

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

1.5. Fish Safe BC

Fish Safe encourages Vessel masters and crew to take ownership of fishing vessel safety. Through this industry driven and funded program Fish Safe provides fishing relevant tools and programs to assist fishermen in this goal. The Fish Safe Stability Education Course is available to all fishermen who want to improve their understanding of stability and find practical application to their vessel's operation. The Safe on the Wheel Course is designed to equip crewmen with the skills they need to safely navigate during their wheel watch. The Safest Catch Program along with fishermen trained Safety Advisors is designed to give fishermen the tools they need to create a vessel specific safety management system.

Fish Safe is managed by Gina McKay, Project Coordinator John Krgovich, Program Assistant, Dionne Riley, and fishermen Safety Advisors. All activities and program development is directed by the Fish Safe Advisory Committee (membership is open to all interested in improving safety on board). The advisory committee meets quarterly to discuss safety issues and give direction to Fish Safe in the development of education and tools for fish harvesters.

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

Gina McKay	Phone: 604-261-9700
Program Manager	Cell: 604-339-3969
Fish Safe	Fax: 604-275-7140
#2, 11771 Horseshoe Way	Email: fishsafe@fishsafebc.com
Richmond, BC V7A 4V4	www.fishsafebc.com

2. WorkSafeBC

Commercial fishing is legislated by the requirements for diving, fishing and other marine operations found in Part 24 of the Occupational Health and Safety Regulation (OHSR). Many general hazard sections of the OHSR also apply. For example, Part 8: Personal Protective Clothing and Equipment addresses issues related to safety headgear, safety foot wear and personal floatation devices. Part 15 addresses issues on rigging, Part 5 addresses issues of exposure to chemical and biological substances, and Part 3 addresses training of young and new workers, first aid, and accident investigation issues. Part 3 of the Workers Compensation Act (WCA) defines the roles and responsibilities of owners, employers, supervisors and workers. The OHSR and the WCA are available from the Provincial Crown Printers or by visiting the WorkSafeBC website: www.worksafebc.com

For further information, contact an Occupational Safety Officer:

Shane Neifer	Terrace	(250) 615-6640
Bruce Logan	Lower Mainland	(604) 244-6477
Wayne Tracey	Lower Mainland	(604) 232-1960
David Clarabut	Victoria	(250) 881-3469
Pat Olsen	Courtenay	(250) 334-8777
Mark Lunny	Courtenay	(250) 334-8732

or the Manager of Interest for Fishing, Mike Ross (250) 881-3419.

For information on projects related to commercial fishing contact Ellen Hanson (604) 233-4008 or Toll Free 1-888-621-7233 ext. 4008 or by email: Ellen.Hanson@worksafebc.com.

3. Transportation Safety Board

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

In 2012, the TSB released the results of a three-year investigation into fishing safety in Canada. This report identifies 10 key factors and makes several suggestions to address the problems that persist throughout the industry.

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

To view a brief video about some of the issues on the TSB's recent safety Watchlist, visit: <http://www.tsb.gc.ca/eng/medias-media/photos/index.asp>.

Reporting an Occurrence - [TSB 1808 Form](#)

After a reportable occurrence happens you can fill out the TSB 1808 Form or call the TSB at the contact information below.

Glenn Budden, Investigator, Marine - Fishing Vessels
 Transportation Safety Board of Canada
 4 - 3071 No. 5 Road
 Richmond, BC, V6X 2T4
 Telephone: 604-666-2712
 Cell: 604-619-6090
 Email: glenn.budden@tsb.gc.ca