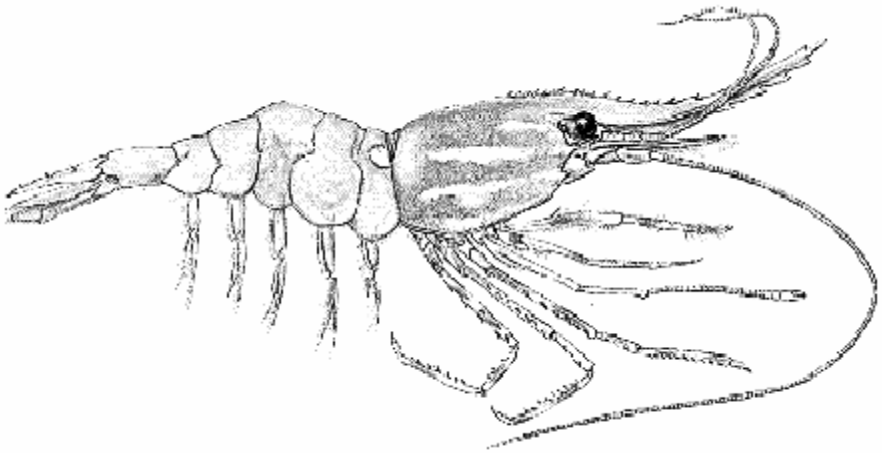
PACIFIC REGION

INTEGRATED FISHERIES MANAGEMENT PLAN

PRAWN AND SHRIMP BY TRAP

MAY 1, 2010 TO APRIL 30, 2011



Pandalus platyceros

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 Prawn and Shrimp by Trap fishery in the Pacific Region, as well as the management measures that will be used to achieve these objectives. This document also serves to communicate the basic information on the fishery and its management to Fisheries and Oceans Canada (DFO) staff, legislated co-management boards and other stakeholders. This IFMP provides a common understanding of the basic "rules" for the sustainable management of the fisheries resource.

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

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

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1. OVERVIEW

1.1. Introduction

This Integrated Fisheries Management Plan (IFMP) for Prawn and Shrimp by Trap covers the period May 1, 2010 to April 30, 2011.

This IFMP provides a broad context to the management and interrelationships of all fishing sectors of the prawn (*Pandalus platyceros*) and shrimp (humpback, coonstripe, and pink shrimp) trap fishery. Section 1 provides an overview of the commercial, recreational and First Nations fisheries. Section 2 considers present stock status. Section 3 provides a socio-economic profile. Section 4 describes the emerging management issues that may impact on management measures in the fishery. Section 5 describes objectives for the fishery reflecting stock status presented in Section 2 and to address the issues identified in Section 4. Section 6 discusses access and allocation. Section 7 directs to the Appendices for the management procedures that will be employed during the year to meet the objectives. Section 8 describes shared stewardship arrangements to achieve objectives. Section 9 describes the enforcement measures to achieve the objectives. Section 10 describes the ways and means by which the achievement of the objectives will be assessed in the following year. Sections 11, 12 and 13 provide references, internet sites and a glossary to define terms. Section 14 provides an annual review of the previous year of the fisheries based on the performance measures provided in Section 10. Sections 13 and 15 provide Contacts and information on the Prawn Sectoral Committee, the main consultation process for the fishery.

The Commercial Harvest Plan for prawn and shrimp by trap is attached to this IFMP as Appendix 1. Appendix 2 is the Recreational Harvest Plan. Appendix 3 is the First Nations Harvest Plan. Appendix 4 has diagrams of commercial prawn size limits and traps. Appendix 5 is an example of a prawn and shrimp trap commercial harvest log. Appendix 6 discusses vessel safety. Appendix 7 includes information from the Canadian Food Inspection Agency regarding commercial vessel sanitation procedures. Appendix 8 provides a diagram of prawn life stages. Appendix 9 provides maps of Pacific Fishery Management Areas.

1.2. History

The commercial prawn and shrimp by trap fishery began prior to 1914, and reached prominence in the mid 1970s. The fishery experienced a period of growth between 1979 and 1989, with the number of vessels reporting landings increasing from approximately 50 to 305 vessels out of an eligible 900 licences issued in 1989. In 1990, licence limitation was implemented and there are currently 252 commercial licence eligibilities. The recent history of the management of the commercial fishery is one of incremental steps to improve conservation of prawns and sustainability of the associated fisheries. Collectively these changes represent a significant and sustained effort to improve management and stock assessment in the last two decades. The Pacific Region's commercial trap caught prawns are rated "Best Choices" by the Monterey Bay Aquarium Seafood Watch.

The history of the recreational and First Nations fisheries has not been documented but certainly required introduction of gear. Recreational interest has peaked with increased prawn abundances in the south coast since the 1990s and with changes in recent years in salmon and halibut

fisheries. First Nations' interest in prawns for food, social and ceremonial purposes is also increasing as gear has become more readily available and with declines in other species, such as salmon.

The target species is prawns (spot prawn, *Pandalus platyceros*), with a small incidental catch of other shrimp species and small commercial fisheries directed at coonstripe shrimp (*P. danae*) and humpback shrimp (*P. hypsinotus*). A fixed escapement model, the prawn 'spawner index', was first introduced in 1979 as the main assessment and management tool to provide for sustainability of the fisheries and conservation of prawn stocks.

Information in addition to that presented here is available in the Canadian Manuscript Report of Fisheries and Aquatic Sciences series (Harbo and Wylie 2006).

1.3. Type of Fishery and Participants

The Pacific Region prawn and shrimp by trap fisheries include commercial, recreational and First Nations fisheries.

The commercial fishery is a limited entry fishery with 252 licence eligibilities. Of these, 15 are "grandfathered" (i.e., non-transferable and the eligibility expires when the licence eligibility holder leaves the fishery) and 36 are designated communal commercial licences for First Nations participation in the commercial fishery (as of March, 2010). Vessel sizes in the commercial fishery range from 3.9 m to 20.68 m. Most are single-licensed vessels, in-season "stacking" of a second licence eligibility on a vessel is permitted with a reduced complement of traps. The number of crew varies with the size of the vessel. A single person may operate smaller vessels while larger vessels may operate with a captain and three or four crewmembers.

A British Columbia Tidal Waters Sport Fishing Licence is required for the recreational harvest of all species of fish, including shellfish. Tidal Waters Sport Fishing Licences can be purchased at many tackle stores and marinas or online by using the website:

www.pac.dfo-mpo.gc.ca/fm-gp/rec/licence-permis/index-eng.htm

There were 295,646 licensed tidal water anglers in British Columbia (BC) in 2009. Most (85%) were BC residents (Fisheries & Oceans Canada Tidal Waters Sportfishing Database and National Recreational On-line System). Most out-of-province anglers come from Alberta and Washington State (GS Gislason and Associates 2004). However, the Tidal Waters licence includes access to numerous species, so the number of recreational harvesters taking advantage of the bag limit for prawns or shrimp is unknown. In 2005, 27% of the estimated 2,216,970 angler days were spent harvesting shellfish. Crabs, prawns and shrimp, clams and oysters were the main species of shellfish harvested (surveys are conducted every 5 years; Fisheries & Oceans Canada 2005).

First Nations' harvest for food, social and ceremonial purposes may occur where authorized by an aboriginal communal licence. Fifty-nine communal licences may be issued annually in the Pacific Region including harvest for a number of shellfish species. The communal licence may contain provisions for the designation of individuals by the First Nation or First Nation organization but the number harvesting prawns or shrimp by trap is otherwise unknown. Nine First Nations organizations have reported prawn landings in annual reports between 2003 to 2008.

1.4. Location of Fishery

The Pacific Region prawn and shrimp trap fishery takes place along the BC coastline in near-shore areas in depths of 40 to 100 m. The majority of commercial landings have historically come from the fishing grounds inside of Vancouver Island (>60%), with the remainder from the west coast of Vancouver Island (<10%) and north and central coasts (25%). The presence of prawns in areas offshore (Pacific Fishery Management Areas (PFMA) 101 to 111, and 121 to 143) is known from shrimp trawl and groundfish trawl fisheries, however, the short commercial fishing season provides insufficient time and incentive for the prawn fleet to search for additional fishing opportunity in these areas. While there have been a number of proposals for surveys of offshore areas, to date these surveys have not found any concentrations of prawns of particular note. A small directed trap fishery for humpback shrimp occurs in Prince Rupert Harbour (PFMA 4-10 and 4-11) and, occasionally, Masset Inlet (PFMA 1-6). A small directed trap fishery for coonstripe shrimp takes place in Sooke Harbour and Basin (PFMA 20-6 and 20-7).

The recreational fishery takes place in near-shore areas in depths of 40 to 100 m mainly within proximity to population centres, mostly concentrated in the south coast of BC. The highest recreational prawn effort is in Saanich Inlet, Stuart Channel, and Alberni Inlet. The waters around Howe Sound, Campbell River / Quadra Island, Powell River and Sechelt, Nanaimo, Barkley Sound, and Gold River / Tahsis are also areas important to recreational harvesters.

First Nations' communal licences specify the locations permitted for use by First Nations for food, social and ceremonial harvest. First Nations' harvest areas are not restricted but generally front reserves.

Permanent area closures are listed in Appendix 1. These restrict commercial fishing only and have no impact on the First Nations' food, social and ceremonial fishery, or on the recreational fishery. Recreational closures are listed in Appendix 2 and in the British Columbia Tidal Waters Sport Fishing Guide available on the internet at:

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

1.5. Fishery Characteristics

1.5.1. Commercial

The commercial fishery is a limited entry, competitive fishery with seasonal closures, in-season area closures, gear limits, gear marking requirements, trap mesh size requirements, minimum size limits, daily fishing time restrictions and a daily single haul limit. Over 90% of the catch is prawns. Small commercial fisheries occur in the fall for humpback shrimp in Prince Rupert Harbour (six vessels) and Masset Inlet and for coonstripe shrimp in Sooke Harbour and Basin (no vessels in 2009).

The commercial fishery has been managed since 1979 using a fixed escapement model, referred to as the Spawner Index Model (Boutillier and Bond 2001). This is a standardized catch per unit effort (CPUE) model based on ensuring a minimum number of female spawners available at time of egg hatch, which normally occurs around the end of March. The fishery has been managed coastwide to a more conservative spawner index level (10% higher) since 2000. The harvest control rules used for in-season management in this fishery are compliant with the Precautionary Approach and reference points are documented in Rutherford *et al*. (2008). Seasonal closures are implemented as fishing effort reaches the minimum monthly index. Once implemented, the area

remains closed to commercial fishing to the end of the spawning cycle and the opening date of the commercial season the following year. The closure protects the remaining egg bearing females from commercial fishing mortality through to the end of the larval hatching period. The commercial fishery opens no earlier than May 1 to allow for increased growth of the prawns prior to harvest, improving catch weight and value, and generally lasts about 60 days in recent years.

The directed humpback and coonstripe fisheries take place in the fall to the end of December.

1.5.2. Recreational

The recreational fishery is an open entry fishery with a daily bag limit, two-day possession limit, gear limits and gear marking requirements. The main target species is prawns. There is no size limit. Humpback shrimp and coonstripe (or dock) shrimp may also be caught in localized areas.

The recreational fishery is open for most of the coast throughout the year, except in ten coastal areas with recreational effort (Section 1.4) as well as commercial effort where spawner index sampling is conducted in the fall. Seasonal winter closures are implemented in those areas where fishing effort exceeds the minimum monthly index. Once implemented, the area remains closed to recreational fishing to the end of the spawning cycle. The closure protects the remaining egg bearing females from recreational fishing mortality through to the end of the larval hatching period. The recreational fishery remains open in all other areas and re-opens coastwide April 1.

Special measures are in place in high-use recreational fishing areas; Saanich Inlet and Stuart Channel since 2006 and Alberni Inlet since 2007. At these locations, additional management measures (the ‘9 point plan’) include higher spawner index targets, a one-week closure in May, and “pulse fishing” (2 weeks closed, 2 weeks open) beginning in September. The plan was agreed to by the commercial and recreational sectors and local First Nations in effort to increase prawn abundance to benefit all sectors and reduce the need for winter recreational closures.

1.5.3. First Nations

First Nations’ fishing for food, social and ceremonial (FSC) purposes are the first priority after conservation and are open coast-wide throughout the year. First Nations fishing effort for an FSC domestic purpose is not limited by catch quantity, except in those Nations where the Council or fisheries program has established their own catch limits for band members, or where allocated under treaty. Prawns and shrimp were not allocated under the Maa-nulth and Tsawassen treaties. Gear marking is required. The main target species is prawns. Humpback shrimp and coonstripe (or dock) shrimp may also be caught in localized areas.

Spawner index management to leave female spawners at levels 10% or greater in excess of the minimum monthly index and the increased commercial size limit are measures supportive of year round FSC harvest opportunities. Winter closure of First Nations FSC fisheries has not been required to date when recreational fishing areas closed.

1.5.4. Aquaculture

There are currently no applications or projects pertaining to the culture of prawns or shrimp. However, a land-based closed containment aquaculture facility for white-legged shrimp (*Litopenaeus vannamei*), a tropical species, has been licensed by the province of BC.

1.6. Governance

The prawn and shrimp by trap fisheries are governed by the *Fisheries Act* (R.S., 1985, c. F-14) and regulations made thereunder, including the *Fishery (General) Regulations* (e.g., conditions of licence), the *Pacific Fishery Regulations* (e.g., open times), the *British Columbia Sport Fishing Regulations (1996)* and the *Aboriginal Communal Fishing Licences 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 Conservations 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.

These documents are available on the Internet at:

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

In addition, the new national Sustainable Fisheries Framework contains policies for adopting an ecosystem based approach to fisheries management, including: A Fishery Decision-Making Framework Incorporating the Precautionary Approach, Managing Impacts of Fishing on Benthic Habitat, Communities and Species, and Policy on New Fisheries for Forage Species. Along with existing economic and shared stewardship policies, these will help Fisheries & Oceans Canada (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

Scientific advice for this fishery is peer-reviewed primarily through a committee called the Pacific Scientific Advice Review Committee (PSARC).

The Prawn Sectoral Committee (Section 15) is the primary body guiding management decision-making processes for these fisheries. The Prawn Sectoral Committee meets annually for a post-season review (September), pre-season planning (November) and in April.

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

Seven species of shrimp are harvested in BC in commercial, recreational and First Nations fisheries: *Pandalus platyceros* (prawns), *P. hypsinotus* (humpback shrimp), *P. danae* (coonstripe or dock shrimp), *P. jordani* (smooth pink shrimp), *P. borealis eous* (northern or spiny pink shrimp), *P. goniurus* (flexed shrimp), and *Pandalopsis dispar* (sidestripe shrimp). All are members of the family Pandalidae.

The trap fishery primarily targets prawns with limited effort directed towards humpback and coonstripe shrimp. Prawns are the largest of the Pacific coast shrimp species and are generally

found on rocky or hard bottom. The global distribution of *P. platyceros* ranges from Unalaska Island AK in the north to San Diego CA in the south, and westward to Vladivostok, the Sea of Japan, and Korea Strait. Most commercial fishing in BC waters occurs in depths of 40 to 100 m in near-shore waters.

All pandalid shrimp species undergo a change of sex in midlife. They mature first as males and mate. Their sexual characteristics change during a transition phase and they become females in the final year or two of their lives. The biological term for this sex change is protandric hermaphrodism.

Spawning typically occurs in late autumn or early winter and the females externally carry the developing eggs until the eggs hatch in spring. Larvae are then released into the water column and are thought to have a 3 month pelagic phase prior to settlement.

Prawns live to four years of age. Following release of the larvae, spent female mortality is rapid, usually within several weeks. Few if any prawns survive past the fourth year. Most prawns are harvested at age 2+ and 3+.

2.2. Ecosystem Interactions

Prawns, like all other organisms, play a role in ecosystem interactions. Species-specific ecosystem linkages are difficult to identify owing to the multivariate nature of ecosystem function. However, prawn larvae are likely prey items for other pelagic and planktonic marine organisms as reported on the northern shrimp (Parsons, 2005). Once prawns have settled to the bottom and have found suitable protective habitat, mortality is likely reduced. At this stage they are preyed upon by bottom fish and octopus (Bergstrom, 2000).

Prawns are opportunistic foragers, consuming fresh, moribund or dead organic material. Stomach contents of prawns near Vancouver held remains of polychaete worms and unidentified crustaceans (Butler, 1980).

2.3. Aboriginal Traditional Knowledge/Traditional Ecological Knowledge

Aboriginal Traditional Knowledge is not generally available.

2.4. Stock Assessment

Prawn stocks are managed and assessed based on an escapement-based model. Growth and mortality parameters for the model are obtained through semi-annual fishery independent surveys. Fishery independent index surveys are also conducted in the fall to monitor stock status prior to spawning. During the commercial fishing season, a sub-set of the commercial traps hauled are sampled by independent observers to monitor stock status relative to the in-season harvest reference points.

2.5. Stock Scenarios

Annual commercial fishery landings are considered a reasonable proxy of overall stock abundance. Annual landings have generally shown an increasing trend from the development of the fishery up to 2009. A slight decrease in abundance was observed in 2008. The primary indicator of stock status for 2010 will be the sample results obtained at the start of the 2010/11 commercial prawn season.

Saanich Inlet, Stuart Channel, and Alberni Inlet are being managed to a higher spawner index as part of an adaptive management program. Potential benefits may be realized in the long term if higher escapement results in increased prawn abundance.

2.6. Precautionary Approach

Provisional Harvest Control Rules (HCR) compliant with the Precautionary Approach (PA) have been developed. The reference points are expressed as base spawner index values and removal reference is accomplished through sequential Subarea closures. A detailed description of the PA for prawns is available in Proceedings of the PA workshop on Canadian shrimp and prawn stocks and fisheries, CSAS Proceedings Series 2008/031.

2.7. Research

Several research projects are underway that include: improving understanding of prawn population dynamics, addressing juvenile rockfish by-catch issues, and gear standardization studies. Recent release of National policies may prompt new research into understanding ecosystem function and evaluating benthic impacts as they relate to prawns and prawn harvest.

3. ECONOMICS OF THE FISHERY

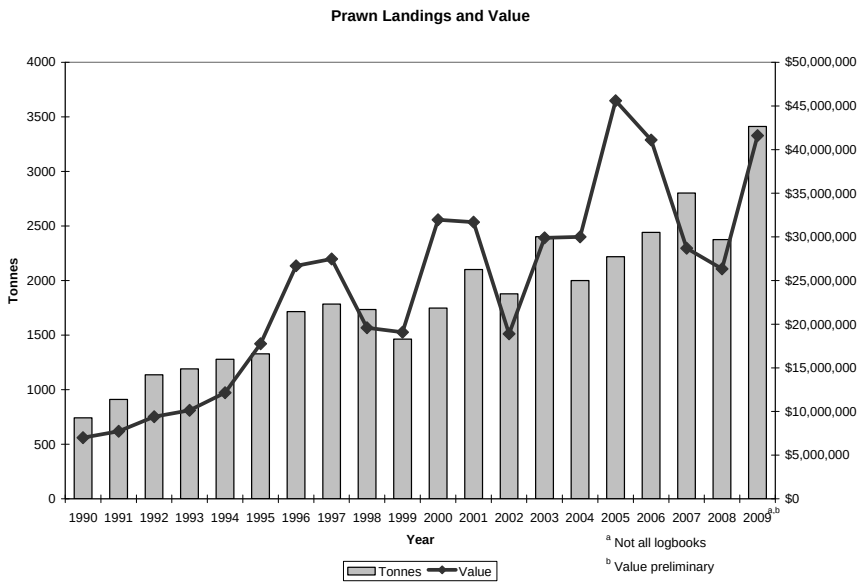
3.1. Commercial

The commercial prawn and shrimp by trap fishery is one of the most valuable fisheries in the Pacific Region. It was the 3rd most valuable commercial fishery in 2008, after the crab and halibut fisheries (BC Ministry of Environment 2010).

A high proportion of vessels fully engage in the fishery and catch distribution within the fleet is not highly skewed, as it is in other more marginal fisheries. Over half of the 252 license eligibilities participate only in the prawn fishery and only 21% hold two or more additional fishing categories (Nelson 2009a). Most licence eligibility holders live around Vancouver Island or the Sunshine Coast and lower mainland, a few are from the north coast and interior of BC.

In the 2009 prawn season, 169 single licensed (300 trap) and 28 “stacked” (500 trap, 2 licences) vessels fished. This was 15 vessels fewer than 2008 and 25 fewer than in other recent years due to relinquishments in process to communal commercial licence eligibilities (Section 3.3).

Prawn abundances have been at their highest levels in recent years. Coastwide catch in 2009 was in excess of 3,411 tonnes, the highest on record. The preliminary estimate of landed value for 2009 is $41.6 million (average price from fish slips applied to preliminary landings), a significant improvement from $26.3 million in 2008. Landed value peaked at $43.2 million in 2005. A history of landings (Fisheries & Oceans Canada commercial logbooks) and value (BC Ministry of Environment - BC Seafood Industry Year in Review series) is provided in the following graph.



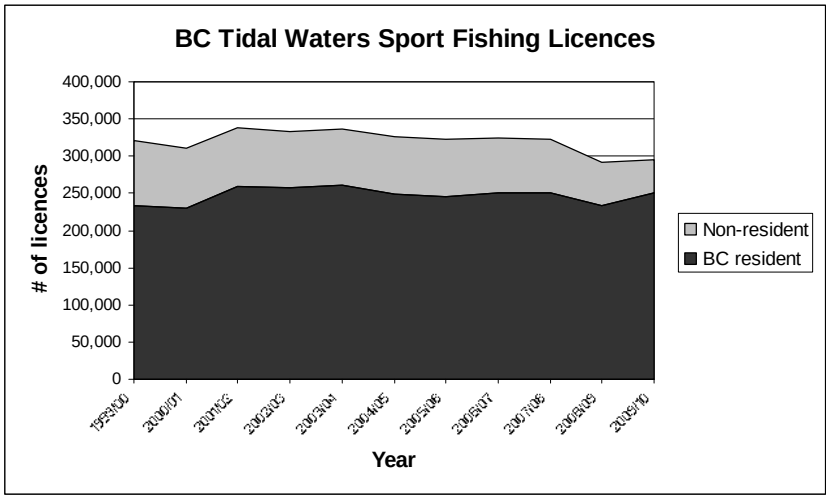
3.1.1. Viability and Market Trends

More than 80% of commercial prawn landings[1] are packaged at sea or on shore as 1 kg frozen product boxes exported to the Japanese market and so are susceptible to foreign price fluctuations, dollar exchange rates, and market competition. Live and fresh prawns are sold to

years, with record harvest in 2009. High catches are alleviating the impact of softening prices in the Japanese market. The commercial sector recognizes some structural and market issues, but has difficulty dealing with them when catch levels are strong, and individual financial results are satisfactory. BC spot prawns are recognized as a sustainable fishery by certain eco-groups, creating market opportunities (Nelson 2009b).

3.2. Recreational

The Sport Fishing Advisory Board (SFAB) has identified prawns as a key species of interest to the recreational community. Interest has increased as a result of conservation measures introduced for salmon, halibut and rockfish. The recreational community includes local residents, multi-species charter operators and lodges, and visiting anglers and boaters. Most (85% in 2009/10) are BC residents. The annual number of licensed tidal water anglers in BC is provided in the following graph (Fisheries & Oceans Canada Tidal Waters Sportfishing Database and National Recreational On-line System).



Fishing days spent on shellfish harvesting had increased by 30% in 2005 compared to 2000, and recreational catch of prawns and shrimp had increased by 29% overall. The increased recreational catch was attributed wholly to BC residents whose catch increased by 40% compared to non-resident Canadians and non-Canadians whose catch declined by 38% and 35%, respectively. Recreational catch constituted 8% of the combined recreational and commercial catch of prawns and shrimp in 2005 (Fisheries & Oceans Canada 2005). The survey is conducted every five years; the next survey will be in 2010.

The Survey of Recreational Fishing in Canada 2005 is available at:

www.dfo-mpo.gc.ca/stats/rec/can/2005/index-eng.htm

3.3. First Nations

First Nations are interested in economic opportunities. There are currently 36 communal commercial prawn and shrimp by trap licence eligibilities to provide economic opportunity to First Nations through participation in the commercial fishery. 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. This

program will be supplemented until March 2012 with additional funds from the Pacific Integrated Commercial Fishery Initiative (PICFI).

For more information on the Aboriginal Fisheries Strategy (AFS) ATP, contact a resource manager listed in Section 14 or see the DFO website at:

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

More information on the PICFI is available at:

www.pac.dfo-mpo.gc.ca/ops/fm/PICFI/default_e.htm

4. MANAGEMENT ISSUES

The following emerging issues may impact the management measures in place for the prawn and shrimp by trap fisheries.

4.1. Conservation and Sustainability

4.1.1. Fall spawner index testing

The Larocque court decision affected licences issued by DFO for fishery management or stock assessment purposes where catch may have been sold to offset survey costs. In consequence, some of the 2006 and 2007 fall spawner index sampling surveys were cancelled. An arrangement was eventually made in 2007 between DFO and the Pacific Prawn Fishermen's Association (PPFA) to conduct sampling. However, interim funding provided by DFO runs out in 2012. This has implications to ensuring a minimum number of spawners available at time of egg hatch in fall surveyed areas (Section 1.5.2). Funding for surveys or a change in the management strategy will be needed for 2012.

4.1.2. Fall spawner abundance

Data collected from fall sampling and the resultant winter closure history show that the fall spawner abundances have fallen below the minimum monthly index in some areas in some years. To reduce the probability of falling below the minimum monthly index, an adjustment to the spawner index closure level has been made in three areas for 2010 while the commercial and recreational sectors work out an alternate strategy. This will provide a buffer to managers to protect spawner abundance should sampling near spawner index closure levels. The commercial and recreational sectors have focused their attention on addressing the recreational sector's concern for winter area closures (Section 4.2.2).

4.2. Social, Cultural and Economic

4.2.1. Commercial

A significant decline in landed value was observed in 2007 (Section 3.1), urging the commercial prawn industry to a crossroads. Future management options to diversify markets and maintain economic viability continue to be the most significant issue under discussion for the commercial fishery. Given a diverse commercial fleet, First Nations interests in food, social and ceremonial harvesting and economic opportunities to participate in commercial fisheries and to resolve treaties, and an extensive recreational community that has identified prawns as a key species of

interest the discussions and development of an alternative management strategy will continue to be challenging.

The Transportation Safety Board in investigations of the sinking of the F/V Fritzi-Ann and F/V Morning Sunrise expressed concern for the vessel length policy in constraining vessel replacements and contributing to vessel bow alterations and stern extensions. In December 2006, DFO requested advice of the industry caucus on a mechanism that would allow vessel length changes and to reduce incentives for bow alterations and stern extensions. In November 2007, the Prawn Sectoral Committee agreed to establish a subcommittee to develop recommendations to DFO on reviewing existing licence conditions, including rules of application such as vessel length restrictions. DFO's review and the discussion are pending.

4.2.2. Recreational

The level of recreational effort and catch of prawns and shrimp is unknown, which makes management difficult particularly in areas where issues arise between sectors. Although limited information on recreational shellfish, including prawn, harvesting is gathered annually in dockside creel surveys, these surveys were designed primarily to gather salmon and finfish catch information. Annual estimates by the national survey of recreational fishing are only made every five years (Section 3.2). Catch monitoring programs for all sport caught fish are being developed in collaboration with recreational fishery organizations. Prawns and shrimp is a priority for shellfish species to be included in the compilation.

Standardized recreational prawn buoys, to identify prawn gear from crab fishing gear, are being considered for ease of identification in support of improved catch monitoring in the recreational fishery. Requirements to sink buoy lines (navigation concern) and to also identify the harvesters' phone number on the float are also being considered.

Winter closures in fall surveyed areas (Section 1.5.2 and 4.1.2) are a concern to many resident recreational harvesters, particularly in years of high prawn abundance. The SFAB (motion MB-SC-01-02-09) would like to increase winter access by raising the commercial fishery spawner index closure level and to continue to raise it until fall spawner abundance is sufficient for the areas to remain open to recreational harvest in the winter. More information and further review of impacts is required before the request can be considered.

4.2.3. First Nations

The A-Tlegay Fisheries Society and Campbell River Indian Band have raised concern for recreational and commercial effort, at times, in Heydon Bay and Loughborough Inlet. They believe some are taking advantage of the isolated locale and using poor fishing practices. Special attention will be given to Loughborough Inlet during in-season management of the commercial fishery. Further discussion with A-Tlegay and the Campbell River band to resolve these issues is ongoing.

Concerns have been expressed by a number of First Nations for the Sectoral Committee process which on some occasions has been described as less than fully satisfactory for discussing First Nation's concerns. Progress has been made on the Prawn Sectoral Committee process to be more open and inviting of First Nations' comments and input. The main issue at this time appears to be First Nations' commonly voiced interest in being more involved in management planning within their claimed traditional territories. This is acknowledged, and local consultations are encouraged. Information from local consultations will be brought to the Sectoral Committee's

attention. First Nations interested in bilateral discussion with DFO should contact the resource manager for their area (Section 14).

The level of First Nations' harvest of prawns and shrimp for food, social and ceremonial purposes is unknown. This presents challenges for management of the fishery. Catch monitoring programs are being developed in collaboration with some First Nations organizations and standards for all catch monitoring programs are being developed. Prawns and shrimp is a priority for shellfish species to be included in the compilation.

A number of First Nations are interested in economic opportunities to get involved in the commercial fishery. This is being addressed through the ATP and PICFI programs (Section 3.3).

4.3. Compliance

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

4.4. Ecosystem

4.4.1. Depleted Species Concerns

Until recently, by-catch of non-target species has not been a concern in the prawn and shrimp by trap fisheries due to the nature of trap fishing and the minimal diversity of by-catch. Non-target species are easily sorted and quickly returned to the water with presumed low mortality. However, juvenile rockfish (*Sebastes* spp.) that enter trap tunnels and do not leave before being brought to the surface are presumed not to survive release due to their inability to equilibrate air bladders to rapid changes in depth.

A rockfish conservation strategy was first proposed in 1998, and measures were implemented in 2002 to protect inshore rockfish populations. These measures included catch restrictions, fishery monitoring, assessment programs and establishment of areas closed to certain fishing activities. Rockfish encounters in the commercial prawn and shrimp by trap fishery are a rare event (0.000 to 0.045 rockfish/trap) and the prawn and shrimp by trap fisheries were allowed to continue in the newly established Rockfish Conservation Areas (RCAs) with the collection of additional by-catch information. A sampling program to estimate total rockfish by-catch in the commercial fishery was initiated in 2002 and estimates have recently been made (Rutherford et al. 2009, *in press*).

Recent assessments by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) have focused on rockfish. Potential legal listing of these species under the *SARA* may have further implications if existing mitigations are insufficient.

Maps of RCAs are available at:

www.pac.dfo-mpo.gc.ca/fm-gp/rec/restricted-restreint/rca-acs-eng.htm

More information on species listing under the *SARA* is available at:

www.sararegistry.gc.ca

4.4.2. Oceans and Habitat Considerations

In 1997, the Government of Canada enacted the *Oceans Act*. This legislation provides a foundation for an integrated and balanced national oceans policy framework supported by

regional management and implementation strategies. In 2002, Canada's Oceans Strategy was released to provide the policy framework and strategic approach for modern oceans management in estuarine, coastal, and marine ecosystems. As set out in the *Oceans Act*, the strategy is based on the three principles of sustainable development, integrated management, and the precautionary approach.

PNCIMA: As part of Canada's Oceans Strategy, DFO is initiating an integrated management planning process for the Pacific North Coast Integrated Management Area (PNCIMA). The PNCIMA is bounded by the BC-Alaska border, the base of the shelf slope and the mainland, stretching south as far as Campbell River and the Brooks Peninsula. The PNCIMA initiative marks a shift toward a broader ecosystem approach to ocean management. This is consistent with the Government of Canada's overall direction and with Fisheries and Oceans Canada's new Wild Salmon Policy. The PNCIMA initiative will bring the area's stakeholders together to develop an integrated management plan for the region that achieves conservation, sustainable resource use, and economic development goals for oceans and coastal areas. The PNCIMA initiative will also function as an umbrella for various ocean management processes, complementing and linking existing processes and tools, including IFMPs.

Marine Protected Areas (MPAs): DFO is also responsible for designating Marine Protected Areas (MPAs) under Canada's *Oceans Act*. Under this authority, DFO has designated two MPAs in the Pacific Region. The Endeavour Hydrothermal Vents, designated in 2003, lie in waters 2,250m deep 250 km southeast of Vancouver Island. The Bowie Seamount, designated in 2008, is 180 km west of Queen Charlotte Islands (Haida Gwaii) rising from a depth of over 3,000 m to within 25 m of the sea surface. Work is ongoing to consider MPA designations for other areas along the Pacific Coast, including the Race Rocks area off Rocky Point south of Victoria (currently designated as a Provincial Ecological Reserve) and the Hecate Strait / Queen Charlotte Sound Glass Sponge Reefs. The Bowie Seamount closure is included in Appendix 1.

National Marine Conservation Areas (NMCAs): The Canada *National Marine Conservation Areas Act* provides for the establishment of National Marine Conservation Areas (NMCAs). Parks Canada, DFO and the Council of the Haida Nation are currently working together to establish the Gwaii Haanas NMCA through the exchange of information on marine resources, fisheries and cultural data and coordinated consultations. Following establishment, measures respecting the management of the Gwaii Haanas NMCA will be articulated in future IFMPs.

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

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

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

Coldwater Coral and Sponge Conservation Strategy: DFO is working with other federal and provincial agencies, First Nations, and stakeholders to develop a coldwater coral and sponge conservation strategy for the Pacific Coast. The Strategy outlines DFO's approach to the management of corals and sponges along Canada's Pacific coast. Fishing activities will be evaluated against DFO's national Policy for Managing the Impacts of Fishing on Sensitive Benthic Areas.

4.4.3. Gear Impacts

Prawn and shrimp by trap gear is bottom contact gear (groundlines and traps). The Ecological Risk Assessment Framework drafted under the national Policy for Managing the Impacts of Fishing on Sensitive Benthic Areas will be used to determine the level of risk in these fisheries and whether mitigation measures are required. See the internet at:

www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/benthi-back-fiche-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 "shorter-term" objectives for the prawn and shrimp by trap fisheries.

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. Prawn and Shrimp by Trap

5.4.1. Conservation and Sustainability

DFO's species-specific objectives for the conservation and sustainability of prawn and shrimp stocks are:

To ensure a minimum number of female spawners available at time of egg hatch by using a fixed escapement model, the prawn spawner index. The spawner index model meets DFO's objective to adopt harvest control rules that are compliant with the Precautionary Approach;

To limit directed fisheries for humpback and coonstripe shrimp to the existing fisheries in Prince Rupert / Masset Inlet and Sooke, respectively, until basic biological parameters to develop a biologically-based management strategy are determined. Any directed fishery for humpback or coonstripe shrimp in non-traditional areas, or with new or modified trawl or trap gear, is subject to the Pacific Region Guidelines on New and Developing Fisheries.

5.4.2. Social, Cultural and Economic

DFO's objective is to continue to work collaboratively with the Prawn Sectoral Committee to ensure sustainable fisheries and to collect input from all fishing sectors in the annual development of the IFMP.

Commercial Fishery: DFO's objective is to continue to work collaboratively with the commercial industry on sustainable resource use and long-term economic viability of the prawn seafood industry. This will include adapting to changing resource and market conditions and extracting optimal value from world markets.

Vessel safety is an objective shared between DFO, Transport Canada, Transportation Safety Board, and WorkSafeBC (Appendix 6). All parties acknowledge the role of vessel masters and crew in responsibility for their own decisions regarding fishing vessel operations. DFO's objective in conjunction with other responsible agencies is to adopt an affirmative action profile in respect of vessel safety considerations.

First Nations involvement in the commercial fishery is a shared goal between DFO and Aboriginal people. First Nation participation in the commercial fisheries is being addressed through the ATP and PICFI (Section 3.3).

Recreational Fishery: DFO's objective is to affirm the social and economic importance of the recreational fishery, provide sustainable recreational harvesting opportunities as part of integrated management plans consistent with DFO's policies, to create an environment within the advisory process in which recreational fishing representatives are welcome to express their concerns and opinions at the table, and to establish working mechanisms in conjunction with the other fishing sectors to reduce conflict and mitigate issues.

The document "Recreational Fisheries in Canada, An Operational Policy Framework" may be requested from any fishery manager listed in this plan or is available on the internet at:

www.dfo-mpo.gc.ca/fm-gp/policies-politiques/op-pc-eng.htm

DFO's objective is to develop standards for catch monitoring for all sectors, including recreational, commercial and First Nations.

First Nations Fishery: 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

It is an objective to provide DFO treaty negotiators and First Nations with fishery related information in support of treaty negotiations, expeditiously.

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. Dedicated funding is provided under a Joint Project Agreement with the Pacific Prawn Fishermen's Association (Section 8).

5.4.4. Ecosystem

DFO's objective is to use the Ecological Risk Assessment Framework drafted under the national Policy for Managing the Impacts of Fishing on Sensitive Benthic Areas to determine the level of risk in these fisheries and whether mitigation measures are required in any areas (Section 4.5). Ecosystem objectives may also arise with initiatives under the *Oceans Act* (Section 4.4). In the interim, it is a shared objective with the commercial fishery to avoid sponge reefs and cloud sponges in areas identified in the Commercial Harvest Plan (Appendix 1), including the Hecate Strait / Queen Charlotte Sound Glass Sponge Reefs (Section 4.4).

DFO's objectives with respect to rockfish are being identified through the rockfish/lingcod conservation strategy announced in May 2002.

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, gear limits, minimum size limits, daily fishing time restrictions, and a single haul limit.

6.2. Recreational

The recreational daily limit for prawns and shrimp species combined is 200 per day. The possession limit is two-times the daily limit.

6.3. First Nations

To date, no limits have been placed on First Nations' harvest for food, social and ceremonial purposes. Prawns and shrimp may be allocated under treaty, but were unallocated under the Maa-nulth and Tsawassen treaties.

6.4. Aquaculture

Access for relatively low numbers of wild juvenile or adult prawns and shrimp for limited time periods (e.g., for broodstock development) where populations would face insignificant to low risk from the additional harvest pressure are considered (DFO 2004). There are currently no applications or projects pertaining to the culture of prawns or shrimp.

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 prawns and shrimp. Scientific licence requests received from scientific, educational, and public display institutions, including biological collecting firms, are considered. Existing policies with respect to scientific licences and the Larocque court decision apply.

Co-operative scientific assessment programs of mutual interest and agreement between DFO and industry may be established with the PPFA named as the scientific licence holder. Industry representatives will undertake vessel selection and provide advice to DFO on aspects of the assessment program.

6.6. Requests for Access

From time to time, DFO receives requests from First Nations to improve access to shellfish for FSC purposes. First Nations interested in bilateral discussion with DFO regarding FSC access issues should contact the resource manager for their area (Section 14).

Requests for increased recreational access are directed to DFO through the SFAB process and the representatives to the Prawn Sectoral Committee (Section 15). The SFAB usually meets twice a year (in the late spring and mid winter) to discuss and advise DFO on recreational fishing

plans, recreational fishery regulations, and any areas of concern to the recreational fishing community. Information on the SFAB is available at:

www.pac.dfo-mpo.gc.ca/fm-gp/rec/sfab-ccps-eng.htm

7. MANAGEMENT MEASURES FOR THE DURATION OF THE PLAN

See the Commercial, Recreational and First Nations Harvest Plans, Appendices 1 to 3, for detail on the following:

- Fishing Seasons/Areas;
- Control and Monitoring of Removals;
- Decision Rules;
- Licensing.

8. SHARED STEWARDSHIP ARRANGEMENTS

8.1. Commercial Fishery

A joint project agreement (JPA) is established annually between DFO and the Pacific Prawn Fishermen's Association (PPFA), for delivery of co-management programs supportive of the commercial fishery. The PPFA contributed $36.5K for in-season support by fisheries management personnel and $59.2K for in-season Fishery Officer activities throughout the coast, including special investigations. Unused funds are returned to the PPFA annually. A review of DFO use of JPA funding is prepared in March. Following the Larocque court decision, DFO contributed additional support by science personnel and partial funding for post-season spawner index surveys in 2009.

Vessel owners/licence eligibility holders are required to make arrangements with an industry service provider for the delivery of in-season information to DFO as required by conditions of licence regarding trap tags, vessel fishing locations, vessel and gear characteristics, and spawner index information. The cost of this service to licence eligibility holders is established by the service company and is negotiated by the PPFA on behalf of prawn licence eligibility holders. Harvest logbook costs may be included or provided separately. The PPFA distributed a Request for Proposals to private sector companies interested in providing in-season management services for prawn licence eligibility holders in December 2004. The industry service provider for 2010 is J.O. Thomas and Associates, Ltd. of Vancouver, British Columbia.

8.2. Fisheries and Oceans Canada

Two Science, Marine Ecosystem and Aquaculture Division (MEAD) and six Fisheries Management personnel are directly involved in this fishery for some part of their activities. Contributions to the IFMP are provided by Fisheries and Aquaculture Management in the areas and at regional headquarters, the Science Branch, the Shellfish Data Unit, Conservation & Protection, the Pacific Fishery Licence Unit, the Treaty and Aboriginal Policy Directorate, and numerous 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.pac.dfo-mpo.gc.ca/ops/CP/Default.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.

On-grounds monitors will continue to provide an "observe, record and report" capability.

9.1. Priorities

Priorities for the commercial fishing season are related to enforcement of the single haul management program, coast-wide. This includes monitoring of early or late gear handling outside of daily fishing hour limits, and inadequate reporting of haul time in logbooks. Funding for the enforcement of the single haul management program is provided to DFO from industry within the terms of the JPA. These are "mobilization funds" for surveillance, vehicle and vessel fuel and minor repairs, travel expenses and for extra duty time to set up case files, take the cases to court and to complete prosecutions.

The investigation of illegal sales of prawns is an important enforcement priority.

Other enforcement effort may be directed to monitoring for early setting before the season opening, patrolling for late fishing in local closures announced in-season, undersize prawns and follow up on delinquent logbook reporting.

10. PERFORMANCE REVIEW

Performance indicators are reported in the Post-season Review (Section 16).

10.1. Stock Assessment

The number of spawner index samples will be compared to previous years. The number of spawner index tests undertaken in the fall and winter period will be reported.

10.2. Commercial Fishery

The delivery of the commercial fishery will be assessed by performance measures including the number of days fished, landed value compared to previous years, input from representatives at Prawn Sectoral Committee meetings and other DFO program measures and assessments.

First Nations presently holding FW communal commercial licence eligibilities will be invited to comment on their experience and satisfaction within the commercial prawn fishery.

10.3. Recreational Fishery

The evaluation will include a description of surveys to assess spawner index in important recreational fishing areas, and any fall and winter closures resulting from those surveys.

Interactions with the recreational fishing representatives of the SFAB, their recommendations and action taken in response by DFO will be described.

10.4. First Nations Fishery

The evaluation will include training or stock survey programs established between DFO and First Nations and will be reported in the IFMP. The report may include the numbers and outcomes of meetings with First Nations on specific issues, and prawn and shrimp trap information contributing to or resulting from the treaty process.

10.5. High Use Areas

The progress in implementing the '9 point plan' in Saanich Inlet, Stuart Channel, and Alberni Inlet will be described.

10.6. Compliance

Evaluation will include time spent attending to enforcement of the fishery, counts of infractions by type, and counts of prosecutions initiated. Patrol hours will measure effort to achieve compliance with the single haul management program, for monitoring of fishing activity outside of daily fishing hour limits and for assessing closure compliance. It should be noted that low numbers of violations may be indicative of a successful proactive program, establishing a visible presence of enforcement authority as a deterrent to non-compliance.

10.7. Ecosystem

Results of the rockfish by-catch program will be described. Changes arising as a result of initiatives under the *Oceans Act* or the Ecological Risk Assessment Framework drafted under the national Policy for Managing the Impacts of Fishing on Sensitive Benthic Areas will also be described.

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12. INTERNET SITES

Fisheries and Oceans Canada Pacific Region Prawn page, and links to the prawn and shrimp by trap fishing plan:

www.pac.dfo-mpo.gc.ca/fm-gp/commercial/shellfish-mollusques/prawn-gcrevette/index-eng.htm

Pacific Region Area and Subarea maps:

www.pac.dfo-mpo.gc.ca/ops/fm/Areas/areamap_e.htm

Pacific Region, Fisheries Management, Commercial Openings and Closures notices:

www-ops2.pac.dfo-mpo.gc.ca/xnet/content/fns/index.cfm?pg=search_options&lang=en&id=commercial

Pacific Region, Fisheries Management, Recreational Openings and Closures notices:

www-ops2.pac.dfo-mpo.gc.ca/xnet/content/fns/index.cfm?pg=search_options&lang=en&id=recreational

Pacific Region, Recreational Fisheries information web site:

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

Pacific Region, Pacific Scientific Advice and Review Committee (PSARC) research documents, proceedings and Invertebrate stock status reports, including prawn and shrimp:

www.pac.dfo-mpo.gc.ca/science/psarc-ceesp/index-eng.htm

Pacific Region, Science, Infectious diseases of shrimp and prawns:

www.pac.dfo-mpo.gc.ca/sci/shelldis/title_e.htm

13. GLOSSARY

Aboriginal Traditional Knowledge (ATK)	Knowledge that is held by, and unique to Aboriginal peoples. It is a living body of knowledge that is cumulative and dynamic and adapted over time to reflect changes in the social, economic, environmental, spiritual, and political spheres of the Aboriginal knowledge holders. It often includes knowledge about the land and its resources, spiritual beliefs, language, mythology, culture, laws, customs and medicines.
abundance	Number of individuals in a stock or a population.
aquaculture	As defined by the United Nations Food and Agriculture Organization (FAO), aquaculture is the culture of aquatic organisms, including fish, molluscs, crustaceans and aquatic plants. Aquaculture implies some form of intervention in the

	rearing process to increase production, such as regular stocking, feeding, protection from predators, etc. It also implies individual or corporate ownership of the cultivated stock.
Area and Subarea	Defined in Section 2 of the *Pacific Fishery Management Area Regulations*. A map of Pacific Fishery Management Areas is available on the DFO Internet site at: www.pac.dfo-mpo.gc.ca/ops/fm/Areas/areamap_e.htm
ATP	Allocation Transfer Program - DFO's ATP facilitates the voluntary relinquishment of commercial licence eligibilities and the designation of the equivalent commercial fishing capacity to eligible Aboriginal groups as communal commercial licence eligibilities.
berried prawns	Refers to adult females carrying eggs under their tail (ovigerous). The eggs are visible and appear like a cluster of tiny red "berries" each about 1 mm in size. A female prawn will carry 2000 to 4000 eggs.
By-catch	The unintentional catch of one species when the target is another.
C&P	Fisheries & Oceans Canada, Conservation and Protection Branch
carapace	The exoskeleton that covers the head and thorax, upon which commercial fishing size limits are based.
Caucus	Elected industry representatives of the Prawn Sectoral Committee. Elections are held every 2 years.
communal commercial licence	Issued to First Nation organizations pursuant to the *Aboriginal Communal Fishing Licences Regulations* for participation in the commercial fishery.
communal licence	Issued to First Nation's organizations pursuant to the *Aboriginal Communal Fishing Licences Regulations* to carry on fishing and related activities for food, social and ceremonial (FSC) purposes.
COSEWIC	The Committee on the Status of Endangered Wildlife in Canada.
crustaceans	A biologically related group of the class Crustacea that includes crabs, lobsters and shrimps.
DFO	Fisheries & Oceans Canada.
escapement	The number of fish escaping the fishery and reaching the spawning grounds.
FAS	Frozen at sea.
fishing mortality	Death caused by fishing, often symbolized by the mathematical symbol F.
Food, Social and Ceremonial (FSC)	A fishery conducted by First Nations for food, social and ceremonial purposes.
forager	An animal searching (foraging) for food.
inshore	Coastal waters landward of the "surfline".

invertebrate	An animal without a backbone.
landed value	Value of the product when landed by a licensed fishing vessel.
landings	Quantity of a species caught and landed.
larvae	The stage of development between egg and juvenile; in prawns this is the planktonic stage.
moribund	The state of being dead; dead.
mortality	Relating to cause of dying; death.
natural mortality	Mortality due to natural causes, symbolized by the mathematical symbol *M*.
Observer	An individual who has been designated as an Observer by the Regional Director General for the Pacific Region of Fisheries and Oceans Canada pursuant to section 39 of the *Fishery (General) Regulations.*
offshore	Coastal waters seaward of the "surfline".
pelagic	Belonging to the upper layers of the open sea.
PICFI	The Pacific Integrated Commercial Fisheries Initiative (www.pac.dfo-mpo.gc.ca/ops/fm/PICFIC/default_e.htm).
plankton / planktonic	The chiefly microscopic organisms drifting or floating in the sea.
polychaete worms	An aquatic worm of the class Polychaeta.
population	Group of individuals of the same species, forming a breeding unit, and sharing a habitat.
PPFA	Pacific Prawn Fishermen's Association, registered in 2000, which enters into Joint Project Agreements with DFO for delivery of the commercial fishery.
prawn and shrimp	*Pandalus* and *Pandalopsis* species: In this plan, the term prawn refers solely to spot shrimp *Pandalus platyceros*, while the generic term shrimp refers to all other species of *Pandalus* and *Pandalopsis*. Prawns are the largest shrimp harvested on Canada's Pacific coast.
Precautionary Approach (PA)	In resource management, the PA is, in general, about being cautious when scientific information is uncertain, unreliable or inadequate and not using the absence of adequate scientific information as a reason to postpone or fail to take action to avoid serious harm to the resource. Information on the adoption of a PA framework for fisheries management in Canada is available at: www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/precaution-eng.htm
protandric hermaphrodism	All pandalid shrimp species undergo a change of sex in midlife. They mature first as males and mate. Their sexual characteristics change during a transition phase and they become females in the final year or two of their lives. The biological term for this sex change is protandric hermaphrodism.
PSARC	Pacific Scientific Advice Review Committee, chaired by DFO and including other federal and provincial government agency

	representatives and external participants.
PSC	Prawn Sectoral Committee, the primary advisory body to DFO on issues pertaining to the management of all prawn and shrimp trap fisheries, including First Nations, commercial and recreational prawn fisheries.
quota	Portion of the total allowable catch that a fishing licence eligibility is permitted to take from a stock in a given period of time.
recruitment	The process whereby young animals are added to a fishable stock or population.
sampling program	A program in which representative samples of animals are collected for the calculation of parameter estimates that describe such things as weight, length or age within the general population.
shellfish	Any species of invertebrate that may be harvested in commercial, recreational or First Nations fisheries.
SMA	Special Management Areas include Saanich Inlet, Alberni Canal, Howe Sound and Indian Arm, and Salmon and Sechelt Inlets. They have reduced trap limits.
spawner	Sexually mature individual. For prawns, this refers to females.
spawner index	The biological reference point to which the prawn fishery is managed. It is a measure of the average number of females or transitions (pre-females) caught per standard trap with standard bait fished for a 24-hour period (soak).
Spawning Stock	The sexually mature individuals in a stock. For prawns, this refers to females.
Species at Risk Act (*SARA*)	A federal Act to prevent wildlife species from being extirpated or becoming extinct and to provide for their recovery. It provides the legal protection of wildlife species and the conservation of their biological diversity.
stakeholders	Individuals or groups with an interest in a particular fishery or activity.

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15. CONSULTATION

A consultation process exists for the prawn and shrimp by trap fisheries and is a major part of the planning for these fisheries. The primary consultation body is the Prawn Sectoral Committee (PSC). This committee includes representatives from DFO, elected representatives of commercial licence eligibility holders, processors, Sport Fishing Advisory Board (SFAB) representatives for recreational fishing interests, First Nations, and the Province of B.C. The PSC meets 3 times annually to provide advice to DFO, usually in April, September (post-season review), and November (pre-season planning).

The PSC meeting calendar is available from Resource Managers (Section 14 Contacts) or from DFO's consultation Internet site at:

www-ops2.pac.dfo-mpo.gc.ca/xnet/content/consultations/shellfishInvertebrates/prawn/default_e.htm

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Representative	Name	Phone	Fax
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B.C. Ministry of Environment, Oceans and Marine Fisheries Division	Dennis Chalmers	(250) 387-0389	(250) 953-3401

DFO appreciates First Nations, recreational and commercial fishing representatives' participation in Prawn Sectoral Committee meetings. Their commitment to the resource is acknowledged.

16. POST-SEASON REVIEW

16.1. Stock Assessment Program

16.1.1. In-season Spawner Index Sample Analysis

During the 2009 commercial fishing season, the Marine Ecosystems and Aquaculture Division (MEAD) received 1,929 spawner index samples for processing. This spawner index sample data was processed and interpreted by MEAD and in-season advice on stock strength was provided to prawn fishery managers based on sample results.

16.1.2. Post-season Spawner Index Surveys

Fall spawner index surveys were carried out in 10 selected areas of the coast. Surveys in 9 of the areas were jointly co-ordinated by the Pacific Prawn Fishermen's Association and DFO and conducted by commercial vessels. These areas included Saanich Inlet, Stuart Channel, Alberni Inlet/Barkley Sound, Nanaimo, Salmon/Sechelt Inlets, Powell River, Madeira Park, Campbell River, and Gold River. DFO conducted the survey in Howe Sound. As part of the plan for high use areas, Saanich Inlet, Stuart Channel, and Alberni Inlet were sampled on three occasions (August, October, and January). Funding for industry conducted post-commercial season spawner index surveys was provided by DFO through interim funding following the Larocque court decision and by the PPFA.

16.1.3. Rockfish By-catch

The rockfish by-catch monitoring program continued for the 2009 season. The program has been in place since 2002. The data collection for this program is funded by industry. On-grounds monitors are responsible for collection of rockfish by-catch data as part of the in-season spawner index sampling. Sampling methodology, analysis and results of this program were reviewed by the Pacific Scientific Advice Review Committee (PSARC) at the December 1-3, 2009 meeting. The report on rockfish by-catch in the British Columbia commercial prawn trap fishery will be published in early 2010 and available at

www.dfo-mpo.gc.ca/science/advice-avis/index-eng.html

The commercial prawn industry also funds by-catch research program(s) outside of DFO.

16.1.4. Howe Sound Study Area

MEAD continued its semi-annual survey of Howe Sound prawn stocks, with surveys in February and November, 2009. Established in 1985, this represents a unique and invaluable time series data set for understanding prawn recruitment and productivity parameters.

16.1.5. Exploratory/Experimental

There were no experimental fisheries or other research projects in 2009.

16.2. Commercial Fishery

A post-season review of the 2009 commercial prawn fishing season was undertaken at the Prawn Sectoral Committee meeting in September 2009. The commercial season opening was delayed to allow additional time to complete the prawn spawning cycle in the north. The commercial season commenced May 7, 2009 and was 69 days long, ten days longer than 2005, 2006, and 2007 due to a strong spawning year class and the reduced number of vessels fishing as a result of active voluntary relinquishment of commercial licence eligibilities to the PICFI and ATP. This compares to 63 days in 2004, 72 days in 2003, 66 days in 2002, and 78 days in 2001.

Preliminary commercial landing figures for 2009 indicate an estimated catch in excess of 3,411 tonnes (all logbooks not yet accounted). This compares to 2,371 in 2008, 2,802 tonnes in 2007 which had been the highest on record, 2,425 tonnes in 2006, 2,100 tonnes in 2005, 2,000 tonnes in 2004, 2,400 tonnes in 2003, 1,900 tonnes in 2002, and 2,100 tonnes in 2001. Following a significant decline in price in 2007, prices in 2009 ranged between $11.79/kg and $13.67/kg, depending on product type and grade. Demand for medium grade improved. This compared to $9.37/kg to $17.64/kg in 2008, $7.70/kg to $14.02/kg in 2007, $13.20 to $17.60/kg in 2006, $17.60 to $23.15/kg in 2005, $13.20 to $17.60/kg in 2004, $13.20 to $18.70/kg in 2003, $8.80 to $17.60/kg in 2002, and $12.20 to $17.66/kg in 2001. The preliminary estimate (average price per kg applied to preliminary landings) of landed value for 2009 is $41.6 million, compared to $26.3 in 2008, $28.7 million in 2007 (despite high landings), $41.1 million in 2006, $45.6 million in 2005, $30.0 million in 2004, $29.9 million in 2003, $18.9 million in 2002, and $31.7 million in 2001. More than 80 percent of commercial landings are packaged at sea or on shore as 1 kg frozen product boxes exported to the Japanese market and so are susceptible to foreign price fluctuations, dollar exchange rates, and offshore competition. The commercial prawn fishery is one of the top valued wild fisheries in BC, with the halibut, crab, and geoduck and horseclam fisheries (British Columbia Seafood Industry Year in Review).

This was the 15th fishing season since the adoption of trap limits in the fishery in 1995 and the 9th year in which an industry selected service provider (J.O. Thomas and Associates Ltd. (JOT)) delivered significant at-sea monitoring components of the fishery. JOT issued trap tags to 169 single licensed (300 trap) vessels and 28 stacked licence (500 trap) vessels, which was 15 vessels fewer than 2008 and 25 fewer than in other recent years. The total number of vessels was reduced this year with 24 licence eligibilities relinquished to the PICFI and in inventory with the ATP. Ten on-ground monitor assignments were deployed coast-wide. Two of 11 assignments set in previous years were consolidated in order to increase program efficiency. All on-ground monitors have at least five years of experience and several of them have participated annually since monitors have been an integral component of the commercial fishery. In 2009, three new monitors received training and on-grounds work with the experienced monitors. Their experience and contribution to delivery of the fishery is invaluable.

The commercial fishery was managed aggressively in-season in 2009 with respect to sampling and conservatively with respect to management targets. Closures were decided and implemented expeditiously; spawner index goals were generally met or exceeded. On-ground monitors collected 1,808 spawner index samples, which is the largest number of samples ever taken in comparison to 1,620, 1,602, and 1,604 samples in 2007, 2006 and 2005 respectively. These years represent the greatest number of samples and the greatest sampling intensity since the at-sea monitoring program commenced. More than 26 samples per day were collected coast-wide since 2005, compared to 25 per day in 2004, 20 per day in 2003, and less than 15 per day in previous years. 210 of the 213 active fishing vessels were sampled for spawner index. 518 days of on-grounds monitoring occurred with 40% in waters north of Cape Caution and 60% of the days in southern waters. Sampling commenced early in priority interest areas in Saanich Inlet, Stuart Channel, Alberni Canal, and Howe Sound. An additional 121 samples were collected by DFO personnel in-season, providing supplemental data for closure decisions.

On-ground monitors also provided vessel gear inspections of 185 of the 197 active vessels. Inspections provide an "Observe, Record and Report" function for assessment of each vessel's compliance with basic licence requirements for trap tagging, trap mesh size, buoy identification and logbook completion. On-ground monitors continued to collect information about rockfish by-catch for the eighth year in this fishery.

The 2009/10 Joint Project Agreement (JPA) was the ninth year in which delivery of the commercial fishery was supported by industry funding arrangements between DFO and the Pacific Prawn Fishermen's Association (PPFA).

There is a limited trap fishery for humpback shrimp in Prince Rupert Harbour open from Sept. 1 to Dec. 31, annually. Six vessels fished in this area with preliminary landings of 30,500 kg. 2009 was the sixth year in which fish harvesters had to arrange for in-season catch samples which are measured and sexed to improve biological knowledge of this stock. Masset Inlet in the Queen Charlotte Islands may be open from May 1 to Dec. 31 annually, but commercial effort in this area is rare. Sooke Harbour and Basin is open for coonstripe trap fishing from Nov. 1 to Dec. 31 annually. This trap fishery uses original cedar lathe style traps. No vessels fished in 2009.

Octopus retention is permitted in the prawn and shrimp trap fishery, with octopus catch information recorded on the vessel's fishing log. The recording of such information has significantly improved from past years. The Caucus and the PPFA encourages all prawn and shrimp trap harvesters to accurately record octopus catch so that this privilege may be retained within the fishery.

16.3. Recreational Fishery

There is limited information about catch and effort in the recreational prawn and shrimp trap fishery. The most intensive recreational fishing areas are: Saanich Inlet, Stuart Channel, and Alberni Canal. A mid week survey counted 330 recreational prawn buoys in Saanich Inlet in July 2009, compared to 177 in April 2008, 552 in April 2007, 127 in November 2007, 389 in April 2006, 301 in August 2006, 352 in July 2005, and 300+ in April 2004. Past sampling has demonstrated that there is an average of 1.75 traps for each buoy. Mid week surveys in Stuart Channel found 124 recreational prawn buoys in July 2009, compared to 57 in July 2008, 125 in April 2007, 48 in April 2006, 78 in August 2006, 147 in April 2005, and 60 in August 2005.

There were 111 recreational prawn buoys in Alberni Inlet mid week in May 2009, compared to 127 on a weekend day in July 2008, 73 in April 2006 and 119 in April 2004.

Buoy count surveys were increased in effort and number in 2009 to collect a baseline index of recreational effort between weekends and weekdays in different seasons. These results, along with a review of the available shellfish data collected from recreational anglers in dockside creel surveys, are anticipated to inform discussions towards designing recreational catch monitoring programs for prawns within the Regional Catch Monitoring Program. The Regional Catch Monitoring Program is developing standards for all fisheries coast-wide.

Spawner index surveys in fall 2009 were undertaken again in Saanich Inlet, Stuart Channel, Alberni Inlet and Trevor Channel in Barkley Sound, the waters between Quadra and Cortez Islands near Campbell River, Nanaimo, Sechelt / Salmon Inlets, Powell River, Malaspina Strait and lower Jervis, Howe Sound, and Tahsis / Muchalat Inlet near Gold River. This was the eleventh year in which fall sampling occurred. Specific closure areas have varied considerably from year to year. Six areas had winter closures in 2009/10: Saanich Inlet (Subareas 19-7 to 19-12), portion of Stuart Channel (Subareas 17-6 and 17-9), portion of Alberni Canal (Subarea 23-1), Powell River (15-1 and 15-2), Malaspina Strait / lower Jervis (16-1, 16-9, 16-10, 16-17, 16-18), and outside Nanaimo (Subareas 17-12 and 17-18) closed January 1, 2010. Closures allow the remaining female prawns to complete egg incubation and release larvae with reduced fishing disturbance and handling mortality. These areas re-open April 1, 2010. All other areas remained open year-round.

In 2008 and 2009, the SFAB requested an increase the commercial spawner index level in areas with winter closures (Section 4).

16.4. First Nations

Tsartlip and Tsawout First Nation members trained in spawner index collection were employed again in post-season surveys in Saanich Inlet and Stuart Channel. The assistance of the commercial fish harvesters and First Nations' members in these surveys is gratefully acknowledged. The A-Tlegay Fisheries Society is interested in developing biological sampling programs where needed to support FSC fisheries and in understanding how prawn stock assessment is conducted. Initial training in spawner index testing was held with the A-Tlegay in fall 2009. T'sou-ke have been interested in collecting information about coonstripe shrimp stocks in Sooke Basin but sampling has been limited by the need to develop a standardized trap for that type of fishing.

Catch information is collected by some First Nations, by fisheries program personnel or by Band administration offices. DFO is working on initiatives to receive, store and manage shellfish FSC harvest information. Some catch data have been collected under Aboriginal Fisheries Strategy (AFS) agreements. Prawns constitute roughly 12% of the reported catch by weight of any shellfish species (2003-2008). Based on the available reports, 5.5 t of prawns or shrimp were caught in 2008. Some bands living on the shores of Stuart Channel have established catch limits in fishing permits issued to band members.

Prawn Sectoral Committee or Subcommittee meetings in 2009 were attended by A-tlegay Fisheries Society, Campbell River Band, Da'naxda'xw First Nation, DMT Fisheries Society, Ehattesaht First Nation, Kwiksutaineuk Band, Musgamagw-Tsawataineuk Tribal Council, Namgis First Nation, Nisga'a Lisims Fisheries Department, Nuxalk First Nation, Nuu-chah-nulth

Tribal Council, Tsawataineuk First Nation, Tseycum First Nation, IFRAWG/Tsawout First Nation, Tseshaht First Nation, We Wai Kai Band, and Wuikinuxu Fisheries.

Areas previously identified as important by First Nations continued to be monitored with special attention in the 2009 commercial fishing season. This included Saanich Inlet, Village Island area in Johnstone Strait, Uchucklesit Inlet in Alberni Canal, Cumshewa Inlet in Queen Charlotte Islands, and Loughborough Inlet northeast of Campbell River.

Seven communal commercial (FW) licence eligibilities were held by First Nations again in 2009: the Nuu-chah-nulth Tribal Council (Ahousaht Fisheries Corporation (near Tofino), Tseshaht First Nation (Port Alberni), and Huu-ay-aht First Nation (Bamfield)), the Sliammon First Nation (Powell River), Kitimaat Village Council, Tseycum First Nation (Saanich Inlet), and Tsawout First Nation (Saanich Inlet).

Information on prawn stocks is provided to the Treaty and Aboriginal Policy Directorate for support in treaty discussions. The Maa-nulth and Tsawassen treaties are moving into implementation.

16.5. High Use Areas

An experimental management strategy (the '9 point' plan) was agreed upon in 2006 for high use areas: Saanich Inlet, Stuart Channel, and Alberni Inlet. The intent was to leave more female prawns carrying eggs on the spawning grounds, with an anticipated benefit of more prawns for all harvest sectors beginning 2 years later and a reduction in the need for winter recreational fishing closures. The nine point plan began with Saanich Inlet and Stuart Channel and includes higher index targets for the commercial and recreational fishery, pulse recreational fishing in the fall (half month closed, half month open) beginning in September the first day after Labour Day, and additional spawner index surveys to ensure that index targets are achieved. First Nations' representatives were consulted on the proposed management changes to be tested in these areas.

Alberni Inlet, except the head of the Canal, stayed open without need for winter closures in 2007 and 2009 and Subarea 23-2 stayed open in 2008. The higher index target also held up during the 2008 and 2009 commercial seasons. Saanich Inlet has the highest recreational effort and has closed each winter. Stuart Channel has raised concern with the SFAB due to winter closure in 2007/8 and 2008/9, and Subareas 17-6 and 17-9 in 2009/10 (*from January 1, 2010). Stuart Channel closed early in the 2008 commercial fishery, also raising concern with commercial harvesters and displacing effort elsewhere.

Generally, there was poor compliance on the first recreational pulse fishing period in all three areas in both 2007 and 2008 but it is catching on. Benefits of the program have included removal of long-soaking, sunken, or stolen fishing gear.

A sub-committee of the Prawn Sectoral Committee includes recreational and commercial representatives and local First Nations from the areas. It met in September and December 2009 for post-season review and planning for the upcoming season.

It is too early in the prawn 4-year life cycle to determine benefits to prawn abundance. Benefits to recruitment from increased spawning potential is also dependent on natural factors and will not be seen in every year.

16.6. Compliance

Notwithstanding the collective efforts of Fishery Officers and of on-ground monitors, industry representatives continue to report “double hauling”; hauling traps more frequently than the limit of once per day. Reports of this activity are more common from remote areas. DFO and industry remain concerned for the potential erosion of this management control intended to reduce handling mortality of undersize prawns. Although implementing an electronic monitoring requirement in the fishery could enhance enforcement, such a program would be costly and labour intensive.

16.6.1. Conservation and Protection

Enforcement was again provided with $59.2K of industry funding in 2009. This is mobilization funding, intended for vehicle and vessel fuel, operating expenses, overtime and travel expenses for fishery officers to become engaged in enforcement of the single haul management feature of the Commercial Harvest Plan.

Conservation and Protection registered 46 violations during the 2009 commercial fishing season. These covered issues such as thirteen gear conflicts, nine fishing in closed times/areas, three late or no hails, complaints about early or late sets and double hauls (no evidence observed), seven illegal process sales, six licence issues, unmarked gear and seizure of gear. This resulted in 21 violations in which court or other action was taken. In nine cases, the action consistent of warnings. Cases sent to court included failure to submit logs, four closed time/ area violations, three cases of fishing without a registration card and two for un-marked gear.

Conservation and Protection from Victoria, Duncan and Port Alberni offices spent considerable time to remind recreational harvesters about the one week closure at the beginning of the commercial fishery and the ‘pulse’ closures in September, including hauling of gear during closed times, that were part of the plan for the high use areas.

16.6.2. On Grounds Monitors

In 2009, JOT on-ground monitors undertook 548 vessel boardings for biological sampling. In so doing, they also provided an Observe, Record and Report (ORR) function including 185 gear and catch inspections specifically for trap web size, trap tags and product size. In all, 94% of the fleet was checked for general compliance on board during the season.

16.7. Ecosystem Initiatives

Results of the rockfish by-catch sampling program are being published in early 2010 (Section 16.1.3). The Bowie Seamount MPA closure area was formally described under regulation in January, 2010.

Presentations on the proposed Gwaii Haanas NMCA and the Hecate Strait / Queen Charlotte Sound glass sponge reefs as an area of interest for designation as a Marine Protected Area under the *Oceans Act* were held with the Prawn Sectoral Committee in 2009.

Appendix 1: 2010/11 Prawn and Shrimp by Trap Commercial Harvest Plan

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1.

COMMERCIAL HARVEST PLAN CHANGES FOR 2010

1.1. The 2010 commercial season will open no earlier than noon, May 6, 2010. This is a delayed opening to allow additional time for the spawning cycle (release of eggs) to complete in the north (Section 2.1).

1.2. To reduce the probability of falling below the minimum monthly index, an adjustment has been made to the buffer in the in-season spawner index closure level in three areas to the same level that applies to Howe Sound and Indian Arm (Section 3). This is for one year only while the commercial and recreational sectors work out a longer-term strategy for 2011/2012.

1.3. A closure has been implemented in Subareas 101-1 and 142-2 of the Bowie Seamount Marine Protected Area (MPA), which was established under the *Oceans Act* in 2008 (Section 3.3.25). The Bowie Seamount is an ancient subsea volcano (seamount), located west of Haida Gwaii (Queen Charlotte Islands) approximately 180 km offshore. For more information on the Bowie Seamount MPA see the internet at:

www.pac.dfo-mpo.gc.ca/oceans/mpa/bowie/default_e.htm

1.4. The Gwaii Haanas National Marine Conservation Area (NMCA) may be formally established under the *Canada National Marine Conservations Areas Act* as an NMCA Reserve under an interim management plan (see Section 4.4.2 of the 2010/11 Prawn & Shrimp by Trap Integrated Fishery Management Plan). Consultations and discussions on the development of a long-term management and zoning plan will continue throughout the Interim Management Plan phase. Changes could be announced in 2010/11.

1.5. Licence eligibility holders and vessel masters are reminded to provide notification of fishing areas by Subarea in advance of setting or moving gear (Section 7.1). Electronic monitoring of real-time vessel location to support the prawn spawner index testing program is being trialed on volunteer vessels. Licence eligibility holders and vessel masters are advised that electronic monitoring of real-time vessel location to support the prawn spawner index testing program has been postponed but may become mandatory in 2011.

2. OPEN TIMES

2.1. Coast-wide

The commercial prawn and shrimp by trap fishing season will open no earlier than 12:00 hours, noon, May 6. This will include all in-shore and offshore areas and the Special Management Areas (SMA). A fishery notice will announce the actual opening date and time. All openings referred to in this plan are tentative until confirmed by issuance of a variation order accompanied by a fishery notice.

2.2. Sooke Harbour and Basin

Sooke Harbour and Basin (Subareas 20-6 and 20-7) is planned to open at 12:00 hours, noon, November 1 for a coonstripe shrimp trap fishery. Alternative opening dates for a two month fishery will be considered if recommended by the Prawn Industry Caucus. A variation order accompanied by a fishery notice will confirm the opening.

2.3. Prince Rupert Harbour

The Prince Rupert harbour humpback shrimp fishery will open 12:00 hours, noon, September 1. The opening will be confirmed by a variation order accompanied by a fishery notice.

Fish harvesters are required to request and receive amended Conditions of Licence from a Pacific Fishery Licence Unit (PFLU) office. Amended Conditions of Licence are issued if arrangements have been made to provide observer coverage and sampling as described in Section 5.1. Improved standardized biological sampling information is being collected.

2.4. Daily Fishing Hours

Other than the first day of any opening, trap gear may only be set, hauled, handled, or re-set between 07:00 hours and 19:00 hours. On the first day of an opening, trap gear may only be set, hauled, handled, or re-set between 12:00 hours noon and 19:00 hours. Only one haul per day of each string is permitted.

3. CLOSURES

3.1. In-season Closures

There is no fixed date for the coast-wide closure of the regular commercial fishery. In-season commercial fishery closures of local areas will be announced as spawner indices in those areas approach management targets; baseline + 10% in most coastal areas, baseline + 25% in Howe Sound and Indian Arm, Powell River, Malaspina Strait / lower Jervis and Nanaimo (north), and baseline + 50% in Saanich Inlet, Stuart Channel, and Alberni Canal.

Coast-wide closure of the commercial fishery occurs when the remaining open fishing grounds are considered by Fisheries & Oceans Canada (DFO) fishery managers to be too limited in extent to support continued fishing by the remainder of the fleet. Based on recent performance, the commercial fishery is expected to be approximately 59 days long in 2010.

All closures will take effect at 1900 hours unless otherwise announced.

3.2. Procedure for In-season Decision Making

During the commercial fishery, there is a weekly in-season conference call at which time DFO fishery managers, Science (Marine Ecosystem and Aquaculture Division) personnel and a representative of the company co-ordinating on-grounds monitors review the available spawner index sample results. Comments that have been received from the on-grounds monitors, fish harvesters, and buyers are considered. Vessel movement patterns in the past week are summarized to assess changing distribution of effort. The ability to sample areas showing signs of fishing effort is determined. Decisions are made about areas for closure. Subareas close in-season as required on the basis of the following:

a.) Spawner index values;
b.) Spawner index values in an adjacent Subarea where prawn grounds are contiguous;

c.) To provide a stock reservoir for adjacent areas having low spawner indices;
d.) Adequacy of spawner index sampling and time to next achievable sampling by on-grounds monitors;
e.) If the Department is of the opinion that there is too great a concentration of vessels such that the fishery in an area is considered to be unmanageable;
f.) If non-compliance is occurring and enforcement cannot be achieved;
g.) If there are insufficient funds to continue to manage and monitor the fishery, or to continue in a specific remote coastal area;
h.) At the end of the season as determined by the Department.

The time from sampling to closure is usually seven to 10 days. On occasion, closures may be put into effect within a week of sampling and in some cases within 48 hours. As individual coastal areas close during the season, fleet mobility increases, and vessel effort is concentrated into the remaining open areas. The effect of fishing may be seen as more variable spawner index results. Manageability of the remaining fishing effort becomes increasingly challenging due to the concentration of gear contributing to the decision for a final coast-wide closure. A coast-wide closure decision is made when most of the remaining open coastal areas are showing signs of being fished to the target index. Fish harvesters' and buyers' comments from the fishing grounds may also be considered in the decision for final closure of the prawn fishing season.

Areas remain closed until the prawn spawning cycle completes and the opening date is announced in the following year.

3.3. Area Closures, Prawn and Shrimp by Trap, Octopus and Advisories

There are additional area closures for octopus retention. In those areas noted for octopus closures, octopus must be released unharmed at all times of the year, even when the area is open for prawn and shrimp trap fishing.

3.3.1. Area 1 Closure

3.3.1.1. Masset Inlet (Subarea 1-6): Closed to retention and possession of prawns. Prawns must be offloaded before vessels commence fishing in these waters. All trap mesh size restrictions apply. Trap limits, ground line limits, and tagging requirements apply. This fishery will open on request no earlier than 12:00 hours May 6, and will remain open until further notice or until 19:00 hours, December 31, whichever occurs first. (Humpback shrimp trap fishing area).

3.3.2. Area 2 Advisory

3.3.2.1. Gwaii Haanas National Marine Conservation Area: The Gwaii Haanas National Marine Conservation Area (NMCA) may be formally established as an NMCA Reserve under an interim management plan. Consultations and discussions on the development of a long-term management and zoning plan will continue throughout the Interim Management Plan phase. Changes could be announced in 2010/11.

3.3.3. Area 4 Closure

3.3.3.1. Prince Rupert Harbour (Subareas 4-10 and 4-11): Closed to retention of prawns at all times. Closed until September 1 (earliest) for humpback shrimp trap fishing. This fishery will open no earlier than 12:00 hours noon September 1, and will

remain open until further notice or until 19:00 hours, December 31, whichever occurs first. All trap mesh size restrictions apply. Hail, trap limit, ground line limit, tagging and observer requirements apply. (Humpback shrimp trap fishing area).

3.3.4. Area 6 Octopus Closure

3.3.4.1. Subarea 6-2. (First Nations access for food, social and ceremonial purposes)

3.3.5. Area 12 Closure

3.3.5.1. Robson Bight - Michael Bigg Ecological Reserve: Subarea 12-3 (portion). From a point on shore due north to a point at 50°30.33'N 126°37.47'W then east to a point at 50°29.65'N 126°30.23'W then due south to the shoreline (Ecological Reserve). Additional details and a map are available at:

www.env.gov.bc.ca/bcparks/eco_reserve/robsonb_er.html

3.3.6. Area 13 Octopus Closure

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

3.3.7. Area 14 Octopus Closures

3.3.7.1. Hornby Island: Those waters of Lambert Channel and the Strait of Georgia, Subarea 14-7, inside a line commencing at Shingle Spit on Hornby Island, thence 239º true for 0.5 nautical miles, thence 126º true for 3.5 nautical miles, thence 64º true for 4.9 nautical miles, thence 304º true for 2.9 nautical miles, thence 213º true for 0.5 nautical miles to Cape Gurney on Hornby Island. (Marine Reserve)

3.3.7.2. Mitlenatch Nature Park: As described in Area 15 Octopus Closures.

3.3.8. Area 15 Octopus Closures

3.3.8.1. Vivian Island: All waters within 0.5 nautical miles of Vivian Island, located approximately 5.0 nautical miles west of Powell River in Subarea 15-2. (Marine Reserve)

3.3.8.2. Rebecca Rock: All waters within 0.25 nautical miles of Rebecca Rock, located 2.5 nautical miles west of Powell River in Subarea 15-2. (Marine Reserve)

3.3.8.3. Dinner Rock: All waters within 0.25 nautical miles of Dinner Rock, located 2.5 nautical miles south of Lund in Subarea 15-2. (Marine Reserve)

3.3.8.4. Emmonds Beach Reef: All waters within 0.5 nautical miles of the unnamed reef off Emmonds Beach, located approximately 4.0 nautical miles south of Lund in Subarea 15-2. (Marine Reserve)

3.3.8.5. Mitlenatch Nature Park: All waters within 1.0 nautical mile of Mitlenatch Island, located in the upper Strait of Georgia intersected by the Subareas 15-2, 13-1, 13-3 and 14-13. (Marine Reserve)

3.3.8.6. All waters within a 0.25 nautical mile radius of the southerly end of the Beach Gardens breakwater in Subarea 15-2. (Marine Reserve)

3.3.9. Area 16 Octopus Closure

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

3.3.10. Area 18 Closures

3.3.10.1. Satellite Channel: Closed year round in Subareas 18-6 and 18-7 starting at 48°42.472'N and 123°30.216'W then to 48°42.815'N and 123°28.800'W, then to 48°41.883'N and 123°28.285'W, then to 48°41.540'N and 123°29.699'W and then back to the point of origin. (British Columbia Provincial Ecological Reserve #67)

3.3.11. Area 19 Sponge Reef Advisory

3.3.11.1. Saanich Inlet: It is recommended that gear should avoid cloud sponge areas in Saanich Inlet in waters less than 40 metres depth at Henderson Point, at the mooring buoy northwest of Senanus Island, Willis Point, Repulse Rock, the point south of Misery Bay, Christmas Point, McCurdy Point and adjacent to the Bamberton cement plant.

3.3.12. Area 19 Saanich Inlet VENUS Advisory

3.3.12.1. Subarea 19-8, Pat Bay: Fish harvesters are advised to avoid setting gear within in that portion of Pat Bay in Saanich Inlet bounded by 48°39.18' N and 123°29.35'W, 48°39.18'N and 123°29.02'W, 48°38.97'N and 123°29.02'W, 48°38.97'N and 123°29.35'W in order to avoid entanglement with sea bed oceanographic instruments deployed by the University of Victoria VENUS project. Please note that there is also a power and data cable from this location running to shore in Pat Bay, as described in a notice to mariners. For additional information see:

www.venus.uvic.ca/

3.3.13. Area 19 Octopus Closures

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

3.3.13.2. 10 Mile Point: Those waters of Subareas 19-4 and 19-5 within 0.4 nautical miles of Cadboro Point navigation light. (Marine Reserve)

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

3.3.13.4. Saanich Inlet: Subareas 19-7 to 19-12 inclusive. (First Nations access for food, social and ceremonial purposes; recreational fishing permitted)

3.3.14. Area 20 Mooring Buoy Advisory

3.3.14.1. Constance Bank: Mooring AS04 is deployed by the Institute of Ocean Sciences to help define the inflow of ocean water into the Georgia Basin along submarine depressions of Juan de Fuca Strait and Georgia Strait. The mooring is located at 48°18.00'N and 123°22.50'W in 117 metres depth. The mooring is entirely subsurface, standing only six metres tall above the bottom and consists of ocean current measuring devices, suspended from a three foot diameter yellow steel subsurface float and a cluster of one foot diameter orange plastic floats providing approximately 1/2 ton of buoyancy. It is held in place by a one ton anchor. If it is seen on the surface it will appear as a cluster of orange floats, closely attached to the large yellow float with a xenon flashing light active in the dark hours only at one flash per two seconds, and it will also transmit its location to satellite. A one kilometre clearance zone has been recommended by the Institute of Ocean Sciences. For additional information or to report gear hang ups, contact Tamás Juhász, telephone: (250) 363-6598; fax: (250) 363-6746; pager: (250) 389-8806 or email: juhaszt@pac.dfo-mpo.gc.ca. If Mr. Juhász is unavailable for reports of gear hang ups, contact the Coast Guard Regional Operations Centre at (250) 413-2802.

3.3.15. Area 20 Octopus Closures

3.3.15.1. Botanical Beach Provincial Park: That portion of Subarea 20-3 between the lowest low water on record and the highest high water on record from San Juan Point thence following the Vancouver Island shoreline easterly to the mouth of Tom Baird Creek. (Marine Reserve)

3.3.15.2. Pacific Rim National Park, Juan de Fuca: That portion of Subarea 20-1 between the lowest low water on record and the highest high water on record from Bonilla Light thence following the shoreline of Vancouver Island easterly to Owen Point. (Park)

3.3.16. Area 21 Octopus Closure

3.3.16.1. Pacific Rim National Park: That portion of Area 21 between the lowest low water on record and the highest high water on record from Pachena Point thence following the Vancouver Island shoreline easterly to Bonilla Point. (Park)

3.3.17. Area 23 Prawn and Octopus Closure

3.3.17.1. Pacific Rim National Park, Broken Group Islands: Closed, those waters of the Broken Group Islands in Barkley Sound within park boundaries as shown, since 1989, on Canadian Hydrographic Service Chart 3671. This area was closed by regulation to all fisheries for shellfish other than crab. All commercial resource extraction is prohibited by the Park Act. (Park)

3.3.18. Area 23 Octopus Closures

3.3.18.1. Pacific Rim National Park: That portion of Subarea 23 between the lowest low water on record and the highest high water on record from Whittlestone Point to Cape Beale. (Park)

3.3.18.2. Bamfield Marine Station Research Area Closure: Those waters of Pacific Fishery Management Subareas 23-4, 23-6 and 23-7 bounded by a line commencing at the light at Whittlestone Point and running directly to the southern tip of Haines Island; from

the north-western tip of Haines Island to the southern tip of Seppings Island; from the north-western tip of Seppings Island to Kirby Point on Diana Island; from Kirby Point directly to the northwest tip of Fry Island; from the north-western tip of Fry Island to the nearest adjacent point on Tzartus Island; from Foucault Bluff on Tzartus Island to the northwest tip of Nanat Island; from the eastern tip of Nanat Island to the nearest adjacent point on Vancouver Island and thence along the coastline of Vancouver Island to the point of commencement. (Research Area)

3.3.19. Area 23 Neptune Project Advisory

3.3.19.1. Neptune Project Advisory: The Neptune project includes data and power cables departing the shoreline just north of Polly Pt., then following the centre line of Alberni Canal and Trevor Channel to Barkley Canyon, Endeavour Ridge, and Middle Valley in the offshore. Other than the offshore, there is one instrument cluster proposed for Folger Passage near Hornby Rock in 23-7. Alberni Canal and Barkley Sound fish harvesters are recommended to get additional up to date information and maps from the Neptune web site:

www.neptunecanada.ca/

3.3.20. Area 25 Sponge Reef Advisory

3.3.20.1. Tahsis Narrows: It is recommended that gear should avoid cloud sponges and corals in Tahsis Narrows around Mozino Point in waters less than 80 metres depth.

3.3.21. Area 26 Octopus Closures

3.3.21.1. Checleset Bay Fishery Closure Area: Those waters of Checleset Bay within Subareas 26-7, 26-8 and 26-10 and 126-1 on the northwest coast of Vancouver Island enclosed by the coordinates 49°59’ to 50°6.3’ N and 127°26’ to 127°39’ W. (Ecological Reserve)

3.3.21.2. Kyuquot Sound Marine Communities Study Area: Those waters consisting of:

Kyuquot Bay: A portion of 26-6 inside or northerly of a line from White Cliff Head to Racoon Point; and

Entrance to Crowther Channel: From the western point of Union Island at 50°0.35’N and 127°19.29’W, northerly along the shoreline to 50°0.50’N and 127°19.25’W, then westerly to a point on an island at 50°0.52’N and 127°19.29’W, then along the western shoreline to 50°0.58’N and 127°19.35’W, then westerly to a point on an island at 50°0.58’N and 127°19.40’W, then along the western shoreline to 50°0.71’N and 127°19.60’W, then south-westerly to a drying rock at 50°0.45’N and 127°20.18’W, then south-easterly to the point of commencement. (Research Area)

3.3.22. Area 28 Closures

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

3.3.22.2. Whytecliff Park: That portion of Subarea 28-2 bounded by a line commencing from the most southerly point of Whytecliff Park; thence in a straight line to a point

located 100 metres east of the most south-easterly point of Whyte It.; thence following the southern shoreline of Whyte It. at a distance of 100 metres to a point lying 100 metres from the most south-westerly point of Whyte It.; thence in a straight line to a point lying 100 metres west of Whytecliff Point; thence following the shoreline at a distance of 100 metres in a northerly direction to a point 100 metres north of Lookout Point; thence following the shoreline at a distance of 100 metres in an easterly direction to a point 100 metres perpendicular to the most northerly point of Whytecliff Park; thence to the most northerly point of Whytecliff Park on the mainland. (Marine Reserve)

3.3.22.3. Point Atkinson Reef: That portion of Subarea 28-6 bounded by a line commencing at the southwest entrance to Starboat Cove thence seaward in a southwest direction for 85 metres, thence westerly following the shoreline for 100 metres, thence in a northeast direction to a point on land. (Conservation Closure)

3.3.22.4. False Creek (Subarea 28-8). (Navigation)

3.3.22.5. Burrard Inlet (Subarea 28-10). (Navigation)

3.3.23. Area 29 Sponge Reef Advisory

3.3.23.1. Georgia Strait (Subarea 29-4): Fish harvesters are advised that concern has been expressed for the impact of commercial fishing gear on sponge reefs in the lower Gulf at a location 12 kilometres offshore of Sturgeon Bank at approximately 49°09.5' N and 123°23.0' W in 160 to 220 meters of water.

3.3.24. Areas 105, 106, 107, 110 Sponge Reef Advisory

3.3.24.1. Four unique sponge reef ecosystems in Hecate Strait (in Subareas 105-2 and 106-1, Subareas 106-2 and 107-1, and Subarea 107-2) and Queen Charlotte Sound (in Area 110) are being considered as an Area of Interest for establishment of a Marine Protected Area (MPA). Maps are available from the North Coast Area Resource Management Biologist (see Contacts in Section 15 of the 2010/11 Prawn & Shrimp by Trap Integrated Fishery Management Plan).

3.3.25. Areas 101 and 142 Closure

3.3.25.1. Bowie Seamount Marine Protected Area: Those waters of Subareas 101-1 and 142-2 inside a line commencing at 53º03'07.6" N and 135º50'25.9" W, to a point 53º16'20.9" N and 134º59'55.4" W, then to a point 53º39'49.2" N and 135º17'04.9" W, then to a point 53º39'18.0" N and 135º53'46.5" W, then to a point 53º52'16.7" N and 136º30'23.1" W on the EEZ Boundary, then following the EEZ Boundary to 53º49'19.6" N and 136º47'33.1" W on the EEZ Boundary, then to a point 53º40'02.5" N and 136º57'03.5" W, then to a point 53º13'59.2" N and 136º10'00.0" W, then back to the point of commencement. (Marine Protected Area)

3.4. Rockfish Conservation Areas

New Rockfish Conservation Areas (RCAs) are in effect in inside waters as of February 2007. Hook and line fishing for Schedule II species is prohibited in RCAs. For maps and up to date information on RCAs, refer to links on the Pacific Region internet site:

www.pac.dfo-mpo.gc.ca/recfish/Restricted_Areas/rca_e.htm

3.5. Closure Notifications and Announcements

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.

3.5.1. Routine Notification Procedures

Public notices of variation orders that open and close fisheries are available on the internet:

www-ops2.pac.dfo-mpo.gc.ca/xnet/content/fns/index.cfm?pg=search_options&lang=en&id=commercial

Information about closures is also available from any manager listed in this plan, or from any local Fisheries and Oceans Canada office. Fisheries and Oceans Canada enforcement vessels and industry service company vessels may also have information about impending closures.

3.5.2. Recorded Announcements

Telephone answering machine recordings are available after office hours and on weekends for North and Central Coast waters at (250) 627-3477 and for South Coast waters and Fraser River / Howe Sound at (250) 756-7233.

3.5.3. Canadian Coast Guard Announcements

Once a week, Canadian Coast Guard will announce current prawn fishery openings and closures. This announcement will only be made if time permits, following regular WX scheduled broadcasts. The announcement may be interrupted or delayed for Search and Rescue (SAR) priorities. Broadcast times are as follows:

Tofino MCTS (south coast)	Tuesdays	2115 UTC	14:15 DST
Victoria MCTS (south coast)	Tuesdays	1510 UTC	08:10 DST
Comox MCTS (south coast)	Tuesdays	1520 UTC	08:20 DST
Pr. Rupert MCTS (north coast)	Tuesdays	1905 UTC	09:05 DST

4. MANAGEMENT MEASURES – PRAWN FISHERY

4.1. Species

Prawns and other shrimp species (*Pandalus* species and *Pandalopsis dispar* sidestripe shrimp). In this commercial harvest plan, the term prawn refers solely to the spot shrimp *Pandalus platyceros*, while the term shrimp refers to all other species of shrimp other than prawns.

All fish harvesters are authorized to catch and retain octopus *Octopus dofleini*. Conditions of Licence require all fish harvesters to accurately complete octopus catch and retention information in the prawn and shrimp trap logbook.

Prawn and shrimp by trap licence eligibility holders are also permitted to fish for species described in Schedule II Part 2 of the *Pacific Fishery Regulations*. Conditions of Licence for these species are included with all Prawn and Shrimp by trap licences. Schedule II Conditions of Licence apply even if the catch is only intended for bait. For information regarding the harvest of Schedule II, Other Species please refer to the IFMP for lingcod, dogfish, sole and flounder, skate and pacific cod. For information regarding transporting please refer to Part III of the Conditions of Licence.

4.2. Size Limit

The minimum legal size limit for prawns is 33 millimetres carapace length measured from the most posterior part of the eye orbit to the posterior mid-dorsal margin of the carapace (see Appendix 4 for a diagram). Catch shall be sorted and undersized prawns released immediately.

The minimum legal size limit for headed prawns is 22 millimetres telson length, measured along the mid-dorsal line of the telson from the anterior margin to the posterior margin. The telson is the central piece of the tail "fan." This size limit applies **only** to product that has had the head and thorax removed including the carapace. The telson should be measured before "tailing" to ensure that the product will meet the size limit.

Do not assume that a prawn that met the carapace length requirement will also meet the telson length requirement once it is headed. Due to natural variability, some will not. If you will be tailing, measure the telson on the prawn tails before removing the head. Release prawns with undersize telsons, unharmed, immediately.

There is no minimum size for species of shrimp other than the prawn *Pandalus platyceros*.

Undersized prawns shall be returned to the water immediately. Traps shall be pulled, emptied and undersized prawns sorted out for release, **on a trap by trap basis**. **Waiting until the entire string is pulled before sorting begins is illegal. Prawns may not be kept in a tank or bucket for later sorting and release.** All undersized prawns must be released in the area of capture and shall not be removed from the general location of capture, prior to release, for any reason. In no instance are prawns to be chemically treated or "dipped" prior to sorting and release of the undersized prawns.

Industry representatives have discussed various means of releasing undersized and berried prawns to increase their survival. In particular, those locations with fresh water runoff on the surface and increased water temperatures may increase mortality. Prawn vessels should have sorting tables to improve the speed with which undersized and berried prawns may be released. Survival may be increased if prawns are released into a bucket or tube on the side of the boat, which extends below the surface through the fresh water layer.

4.2.1. Warning, Undersize Prawns and Wastage of Medium Prawns

Significant numbers of undersize prawns were found in boxed product intended for export, in a small study of product size undertaken at the end of the 2006 season. The Department is concerned for those fish harvesters who are not using accurate measuring devices or not measuring their prawns at all. Fish harvesters should measure small

prawns with a set of inexpensive vernier callipers to ensure that no undersize are inadvertently retained. We recommend that buyers check product size upon delivery, that undersize prawns should be sorted out and not boxed. If the Department is obliged to initiate investigations to correct this problem, it will prove disruptive to fish harvesters and buyers.

On at least one occasion in 2006, small legal size prawns were dumped following landing. If reports of this are received, it will be investigated.

4.3. Berried Females

Fisheries and Oceans Canada requires that all berried female prawns be released from the date of season opening to June 30. Catch must be sorted as it comes on board and the females released **on a trap by trap basis**. **Waiting until the entire string is pulled before sorting is considered to be illegal**. It is recommended that fish harvesters relocate to other grounds if they find that they are catching large numbers of berried females. High proportions of berried females may result in closure.

4.4. Gear

4.4.1. Trap Limits and Ground Lines

A single licence may fish a maximum of 300 traps on six ground lines. All traps must be tagged with numbered tags authorized by Fisheries and Oceans Canada. Tag numbers must correspond to numbers registered with the Department for that vessel. Registration is accomplished by entry of the information into a Department database, by means of an internet page provided for this purpose. Vessel owners may make arrangements with the Fisheries and Oceans Canada approved service company for tags and registration of trap tag numbers. The trap tag number shall be registered with the Department within 24 hours of issuance of a trap tag set by the industry service company.

There is an allowance for an annual transfer of traps from one W licence to another regardless of vessel length or licence configuration, for the purpose of stacking trap allotments. Where two trap limits are combined and fished from a single vessel, a maximum of 500 traps on 10 ground lines will be permitted on the receiving vessel. The second W licence will be issued with a trap allocation of zero for the licence year.

The capsizing of prawn vessels carrying 500 traps has been investigated by the Marine Transportation Safety Board. Vessel masters are advised to carefully consider stability when transporting gear. Vessel masters are reminded that a second vessel or skiff may be used to transport gear, provided that all gear setting and hauling is done from the licensed vessel.

Trap allocation transfer from a vessel may only occur on the first occasion of licence renewal. For example, a licence may be issued for 300 traps. A subsequent gear allocation transfer may occur allowing this vessel to fish 500 traps, but the traps may only be transferred from a licence that has not yet renewed for the present season. A licence that has already renewed for the present season cannot subsequently transfer its trap limit to another vessel. Further, a licence that has already transferred its trap limit and is allocated zero traps may not acquire additional traps. Trap allocation transfers can only

be requested and authorized at a Fisheries and Oceans Canada licensing office. Trap allocations revert to the original licences at the end of the licence year.

4.4.2. Trap and Ground Line Limits in Special Management Areas

Trap limits are reduced in the following Special Management Areas (SMAs): Howe Sound and Indian Arm (Subareas 28-1 to 28-5 and Subareas 28-11 to 28-14), Salmon and Sechelt Inlets (Subareas 16-5 to 16-8), Alberni Inlet (Subareas 23-1 to 23-3), and Saanich Inlet (Subareas 19-7 to 19-12). Individual W licences are permitted to fish 150 traps on three ground lines and stacked (two combined) licences are permitted to fish 250 traps on five ground lines in these areas.

A vessel fishing in both an SMA and in an adjacent non-SMA area at the same time, shall not fish more than a combined total of 300 traps on six ground lines for a single licensed vessel or 500 traps on 10 ground lines for a vessel with a stacked trap allocation.

4.4.3. Trap and Groundline Limits in Sooke Harbour

A vessel fishing in the Sooke Harbour and Basin coonstripe fishery in the fall may use a maximum of 50 traps. These may be set on groundlines buoyed at each end, or may be single buoyed traps.

4.4.4. Maximum Groundline Length

The maximum allowable length of ground line between each buoy line is two skates (1,100 metres or 3,600 feet).

4.4.5. Gear Hauling Limits

Trap gear may be hauled only once per day. This applies to all parts of the gear.

Holding cages may be hung on the same buoy and line as trap gear. However, the stipulation that the fishing gear may only be handled once daily also applies to the holding cages if they are on the same buoys and lines as trap gear. Holding cages may be hung on separate buoys, and marked in the same manner as fishing gear, and handled more than once daily if there are no traps on the line.

4.4.6. Marking of Gear

Following the opening of the season, all prawn traps on board the fishing vessel, with the exception of replacement gear described in the subsequent paragraph, must be tagged with prawn trap tags. Tag numbers must correspond to numbers registered with the Department for use by that vessel, by means of the Fisheries and Oceans Canada internet page and database established for that purpose. Tags must be securely fastened and attached to the frame or webbing of the trap such that it is visible from the outside, without opening the trap. New tags issued by the service company will be required each year.

Trap tags are only available from the industry service company. The Department does not issue tags and does not issue replacement tags in-season.

All previous trap tags shall be removed from the traps when new trap tags are attached. Once tag replacement begins, no trap may be returned to the water until the tag has been

replaced and all previous tags removed. Once tag replacement begins, all tags are required to be replaced within 96 hours.

4.4.7. Replacement Traps on Board

Replacement traps may be carried provided that they are in a non-fishable condition as follows: no tags are to be attached and there must be no snaps on the bridles or any other means of immediately attaching the replacement trap to the ground line, until such time as it is needed for replacement purposes.

4.4.8. Buoys

Prawn gear must be marked at both ends of the ground lines by 127 centimetre (50 inch) circumference or larger, red, or orange buoys or by 10 centimetre diameter x 122 centimetre (4 inch x 48 inch) white PVC pipe weighted at one end and painted orange at the other. The latter has been recommended by the Prawn Sectoral Committee (PSC) for use in areas of frequent boat traffic.

The commercial fishing vessel registration number (VRN) and the letters PRN or PRNS, must be painted or otherwise affixed to each buoy such that it is visible at all times without raising the gear from the water. PRN will signify gear being fished from a vessel holding a single W licence with an allotment of 300 traps. PRNS is required to identify gear for those vessels fishing stacked (combined) W licences with a total allotment of 500 traps. The VRN number shall be in solid black Arabic numerals, without ornamentation. Numbers and characters shall not be less than 75 millimetres in height. Improperly marked gear may be removed from the water.

The vessel name may also be displayed. The DOT licence number shall not be displayed on buoys or PVC pipes, in order to avoid confusion with the VRN number.

Fish harvesters may add single identifying numbers, letters or symbols to pairs of buoys so that other vessels can better tell where ground lines are located if this may help to reduce oversetting. Any marking shall not obscure the VRN number.

4.4.9. Buoys – Sooke Coonstripe Fishery

Individual traps in the Sooke coonstripe shrimp trap fishery may be marked with individual bullet floats. The minimum bullet float size is 10L. The commercial fishing vessel registration number (VRN) and the letter W must be painted or otherwise affixed to each buoy such that it is visible at all times without raising the gear from the water. VRN number and the letter W shall be in solid black Arabic numerals, without ornamentation. Numbers and characters shall not be less than 75 millimetres in height. Improperly marked gear may be removed from the water.

4.4.10. Trap Mesh Size

Other than the frame, trap mesh must be unobstructed. Trap mesh size requirements apply to the prawn trap fishery and to the humpback shrimp trap fishery. Minimum mesh sizes do not apply to the coonstripe trap fishery in Sooke Harbour and Basin, Subareas 20-6 and 20-7.

The trap escapement modifications described below will significantly reduce the capture of undersize prawns but will not totally eliminate them from the catch, particularly in

areas when there are high concentrations of small prawns. Fish harvesters are required to sort their catch as each trap comes on board and to release undersized prawns immediately, before the next trap is recovered. Sorting must occur prior to any transfer of catch to live tanks, buckets or other holding devices.

4.4.10.1. Web or Soft Mesh Traps

Web or soft mesh traps shall be covered with a single layer of mesh. The mesh shall measure a minimum of 38.1 millimetres (1 1/2 inch). Mesh size is measured as described in the definition section of the *Pacific Fishery Regulations, 1993* as follows: "means the total length of twine measured along two contiguous sides of a single mesh, including the distance across the knot joining those sides but not including any other knots." All mesh used in the trap including the tunnels must conform to this minimum size. Other than the trap frame, trap mesh must be unobstructed.

Industry representatives have recommended tools for fish harvesters to make a quick assessment of soft web mesh size. This is a "flat slat" made out of high-density nylon or other equivalent material 38 millimetres wide (1.5 inch), 3 millimetres thick (1/8 inch), and as long as may be convenient (6 inch), tapered at one end. If the flat slat cannot be pushed through the mesh, or if it is difficult to do so, then the mesh is likely too small. This is not a legal measuring device; however, fish harvesters can use the flat slat as a quick check. A ruler may also be used. Vernier callipers are the legal measuring tool for determination of legal mesh size. Fish harvesters are encouraged to check their gear in advance of the fishing season and to check the web when receiving new traps or re-webbed traps from suppliers. If the trap mesh appears to be undersize when checked by Fisheries and Oceans Canada personnel during the fishing season, traps may be collected for further testing and for legal procedures, or the fish harvester may be requested to remove all gear from the water for inspection.

Fisheries and Oceans Canada is concerned about fish harvesters using stretched and distorted web to reduce the sorting efficiency of web traps.

The sort area on these traps is considered to be the lower 15 centimetres of the side wall above the bottom ring. It is recommended that mesh on the trap be constructed, so that upon insertion, a high density round plastic peg that is 19 millimetres (3/4 inch) in diameter and 20.3 centimetres (8 inch) long, weighing no less than 50 grams and no more than 60 grams, will drop completely through the web by its own weight. The bottom of the trap may also be important for sorting. Fisheries and Oceans Canada will continue to assess this and additional measures will be introduced if sorting appears to be compromised by mesh stretching or bunching.

4.4.10.2. Wire Mesh Traps

These traps must have either/or:

Four opposing tunnels constructed of an unobstructed rigid square mesh material having a minimum dimension (after dip coating) that will allow the passage of a 22.2 millimetre (7/8 inch) square peg through the mesh without altering the shape of the mesh opening. The lower side of each tunnel must extend to the bottom edge of the trap and must be at least one-half the length of the trap side.

The bottom and two opposing sides must be constructed of an unobstructed square mesh material that will allow the passage of a 19 millimetre (3/4 inch) square peg

rmitted for this trap

4.4.12. Maximum Allowable Trap Size, Sooke Coonstripe Fishery

Cedar lathe traps may be used in the Sooke coonstripe shrimp trap fishery, with a maximum volume of 230L. Trap volumes are based on the overall outside dimension of the trap, inclusive of the frame and the tunnels.

4.4.13. Recovery of Lost Trap Gear

In-season, a W or FW licensed vessel may not carry, set or recover tagged traps for another W or FW licensed vessel.

If a fish harvester locates and recovers lost gear, all catch must be released. Recovered traps must be emptied and rendered non-fishable immediately as they come on board. Alternatively the fish harvester may attach a marker and line to the gear and advise a Fisheries and Oceans Canada manager of the location of the gear.

4.4.14. Recreational Fishing Gear Conflicts

Commercial harvesters are required to exercise care when setting gear near recreational fishing gear. Fouled gear should be untangled without cutting and returned to the water intact. If a line must be cut, it should be the commercial harvester's line.

Continued gear conflict with recreational harvesters will lead to further closure requests from that sector. Fisheries & Oceans Canada's preference is to provide a mutually satisfactory harvest experience for all user groups through respect of the other person's gear and fishing practices, rather than invoking closures to separate fishing effort.

4.4.15. Extra and Replacement Sets of Trap Tags

4.4.15.1. Additional Tags

The licence holder or vessel master may receive additional tags with the main tag set. These additional tags are only to be used as required to replace tags on traps lost on the grounds. A fishery officer or guardian may request to see the unused tags. Vessels are permitted to fish only the maximum number of traps specified on the licence, and may not use the additional tags to increase gear in the water greater than the licence limits.

4.4.15.2. Full Replacement Sets

In-season full replacement tag sets are available from the industry service company. They are not available from the Department. Once installation of the new tags has commenced, all tags must be replaced and no traps can be returned to the water with old tags attached to them. All previously issued tags must be removed from the gear.

4.5. Multi-licensed Vessels

Where a Shrimp and Prawn by Trap (category W or FW) licensed vessel also holds a Shrimp Trawl (Category S or FS) licence eligibility, all shrimp including prawns caught under the authority of the S or FS licence must be offloaded prior to that vessel fishing under the authority of the W or FW licence. Likewise, all prawns caught under the authority of the W or FW licence must be offloaded before fishing commences under the authority of the S or FS licence.

5. MANAGEMENT MEASURES - HUMPBACK AND COONSTRIPE FISHERIES

5.1. Masset Inlet and Prince Rupert Harbour Humpback Fisheries

A directed fishery for humpback shrimp (*Pandalus hypsinotus*) occurs in Subareas 1-6 (Masset Inlet), and in 4-10 and 4-11 (Prince Rupert Harbour). Prawns may not be retained or possessed in these fisheries. Vessels must offload all prawns prior to fishing humpback shrimp in these areas. Trap limits, tag requirements, ground line limits, minimum mesh size, and hail requirements are in effect (Section 4).

The Prince Rupert Harbour Commission and the Prince Rupert harbour humpback shrimp harvesters requested a later opening date of September 1 for this fishery commencing in 2003. This was reviewed and unanimously agreed to by elected industry representatives. The Department supports this change as it reduces growth over fishing (allows for increased growth of the shrimp prior to harvest), improving catch weight and value.

The Minister wrote in 1997: "Any directed fishery for humpback shrimp in non-traditional areas, or with new or modified trawl or trap gear, will be subject to the Pacific Region Guidelines on New and Developing Invertebrate Fisheries." It also includes: "industry is responsible for providing biological, management, and assessment information that will lead to the proper understanding of this fishery and of these stocks." Accordingly, additional fishing effort on humpback shrimp will only be considered where there is a scientific plan established to collect stock assessment information, supported by funding from industry.

Humpback shrimp samples are required from Prince Rupert Harbour, as discussed with local harvesters and industry representatives in 2003. Results from the pilot study in 2003 indicated that index sampling may be an effective management tool however base index levels need to be determined. Beginning in 2004, fish harvesters participating in the Prince Rupert Harbour humpback trap fishery have been required to make arrangements for the collection of samples by trained observers. Each participating fish harvester is required to arrange for one day of observer sampling. The W or FW licence issued in April does not include fishing access to Prince Rupert Harbour. Prior to the September opening, fish harvesters make arrangements for extra observer sampling, request a letter from the industry service company indicating that arrangements have been made, and provide that letter to the Prince Rupert Licensing Unit office with the request for amended Conditions of Licence to allow for fishing humpback shrimp by trap in Prince Rupert Harbour.

The use of small mesh in humpback shrimp trap fisheries was discontinued in 1999. Prior to this, catch per unit effort (CPUE) had plummeted. With the adoption of larger mesh, CPUE has improved. Total annual catches have stabilized at approximately 22,680 kg (50,000 lbs), comparable to or greater than historic landings. The Department received a request for a return to small mesh in this fishery for 2006. This request was refused on the basis of risk to sustainability of the fishery. Humpback shrimp data was reviewed in a PSARC paper by DFO Science, delivered in 2006.

5.2. Sooke Harbour and Basin Coonstripe Fishery

A directed fishery for coonstripe shrimp (dock shrimp, *Pandalus danae)* occurs in Subareas 20-6 and 20-7. There is no minimum mesh size requirement for traps used in this fishery. The fishery has occurred from November 1 to December 31. Prawns may not be retained or possessed in this fishery. Tag requirements and hail requirements are in effect (Section 4). A maximum of 50 traps per vessel may be fished. Traps may be set on groundlines or individually buoyed.

Industry representatives have expressed interest in varying fishing times in this fishery. The commencement date may be varied but there is insufficient biological information to extend the length of the fishing period beyond 2 months. Fish harvesters who want to contribute through the collection of on-board samples with Department or observer staff are invited to contact the Department prior to the fishery opening.

6. LICENSING

6.1. Licence Category

A prawn and shrimp by trap, category W or communal commercial category FW licence is required to commercially harvest prawn and shrimp by trap gear. Category W licence eligibilities are limited entry and vessel based. Category FW eligibilities are party based; a First Nations group is the licence eligibility holder and the eligibility must be designated annually to a commercially registered fishing vessel that meets length restrictions.

6.2. Licence Fees

Currently the annual licence fee for a category W licence is $320.00. There is no annual licence fee for communal commercial licences.

6.3. Licence Application and Issuance

Applications must be completed and submitted to a Pacific Fishery Licence Unit by December 31 of each year along with the required fee. The vessel owner must sign the application form. If the vessel owner is a company, the Pacific Fishery Licence Unit must have on record either a Confirmation of Signing Authorities or an Amendment to Confirmation of Signing Authorities form advising the signing authorities for the company.

Prior to annual application for either a category W or FW licence, please ensure:

i.) Any Ministerial conditions placed on the licence eligibility are met.
j.) Any conditions of the previous year's licence such as submission and approval of logbooks have been met.
k.) That you have a letter to Fisheries and Oceans Canada from an approved service company indicating that arrangements have been made for trap tags, reporting vessel fishing location (hails) to the Department, inspection of the vessel and gear during the fishing season and the sampling of spawner index information on the fishing grounds.

The Service Company approved by Fisheries & Oceans Canada for the 2010 Prawn and Shrimp by Trap fishery is J.O. Thomas and Associates, Ltd.

6.4. Octopus Retention

All fish harvesters are required to accurately report information about the octopus catch. This information is required to develop further understanding of the distribution and strength of octopus species caught by commercial trap harvesters. Failure to provide this information will result in termination of this privilege. The elected industry representatives encourage all commercial fish harvesters to accurately report octopus catches so that this privilege may continue.

6.5. Stacking Trap Allocations

Temporary trap allocation stacking is permitted, on an annual basis. Where 2 x 300 trap allocations are stacked onto a vessel, the total trap allocation that may be fished is reduced to 500 traps. Application for stacking of trap allocations will only be accepted at the same time that application and payment for licence renewal is submitted. This applies to both vessels.

6.6. Vessel Replacement

Only one shrimp & prawn by trap licence is allowed on a vessel at a time.

Replacing vessels may not exceed the overall length of the existing vessel.

Category W licence eligibilities become married to other vessel based licence eligibilities when combined on a vessel.

6.7. Fish Buying Station Licence and Transporting Licence Requirements

When product is transferred from one vessel to another vessel or a vehicle, that vessel or vehicle requires a provincial Fish Buying Station licence. This licence is required for all types of vessels and vehicles, including aircraft. The licence may also be required for personal vehicles in some instances, when a vehicle is carrying the catch from more than one vessel, even if the licence holder owns both vessels. Fish harvesters should contact the Ministry of Agriculture and Lands, Courtenay Access Centre (250) 897-7540, for additional information.

www.agf.gov.bc.ca/fisheries/licences/main.htm

If catch is transferred from a category W or FW licensed vessel to another vessel, the receiving vessel must have a commercial fishing licence or a transporting, category “D”, licence according to *Pacific Fishery Regulations*, Part II, Section 24.

7. CONT

7.1.

ing vessel location information to be provided by the
mpany to the Department by means of an Internet reporting system
purpose.

e the service company notify Fisheries and Oceans Canada

ing:

e and date that fishing will commence.

. This information is necessary for in-season assessment of effort and for

This will reduce search and travel costs, improve opportunities for sampling, and avoid unnecessary closures by the Department due to lack of information.
The Departm **observers cannot locate vessels and there is insufficient**

An electronic hat provides real-time vessel location to the industry servic s of collecting spawner index samples is being trialed by volu nic vessel monitoring system is

7.2. **ports from Sea (Prawn Spawner Index Sampling)**

all provide a fishing report from sea and

observers during fishing operations. Each spawner index sample consists of a sample of one complete string of gear which has been set for a minimum of 12 hours, with a minimum of every fourth trap contributing to the sample. A minimum of 12 traps is sampled from each string of gear.

7.3. Catch Reporting

7.3.1. Harvest Log Data

A new logbook format that includes octopus information was introduced in 2004. Only new format logbooks may be used.

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 Fisheries and Oceans Canada Marine Ecosystem and Aquaculture Division's Shellfish Data Unit.

To fulfil stock assessment objectives it is imperative that much finer resolution of fishing location now be reported in this fishery. The vessel master is responsible for reporting latitude/longitude position on harvest logs in the "location" field for each string of traps fished.

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

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

Fisheries and Oceans Canada
Shellfish Data Unit
Pacific Biological Station
3190 Hammond Bay Road
Nanaimo, B.C., V9T 6N7
Phone: (250) 756-7022 or (250) 756-7306

As an alternative to harvest log provision through a Service Company, the vessel master may provide a hard copy log in the same form and providing the same particulars as shown in the fishing log sample Appendix 5: Example of Prawn and Shrimp by Trap Harvest Log. The vessel master must also provide an electronic copy of the harvest data, which is required to be a true and accurate transcription of the hard copy data, delivered on a Windows compatible mini CD or other Shellfish Data Unit approved media. Mini CD's will remain the property of Fisheries and Oceans Canada. The electronic copy must be either:

a) An ASCII text file in the data format specified by Fisheries and Oceans Canada Shellfish Harvest Log Program.
b) A database table of specific design created by Microsoft Access XP (or earlier version).

Contact the Shellfish Data Unit at the above address to obtain the full requirements and acceptable data formats that meet the Conditions of Licence. The hard copy and the electronic copy of the harvest log must be forwarded within 28 days following the end of the month in which fishing occurred. This information must be sent to the above address.

For enforcement purposes, information regarding the latitude and longitude of each string of fishing gear, and the haul time of that gear shall be entered in the logbook within ½ hour (30 minutes) of the string being hauled and prior to any additional hauling of gear. The latitude and longitude shall be entered in the "location" field of the harvest log. The time of haul shall be entered in the "time of haul" field. This information shall be entered on a string by string basis.

The remaining logbook harvest information must be recorded in the harvest log by 23:59 hours of the day of fishing. The logbook must be kept aboard the licensed vessel. Logbooks must be produced for examination on demand of a fishery officer, guardian, or a fishery observer designated under the *Fisheries Act.*

7.3.1.1. Submission and Release of Harvest Log Data

The vessel owner 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 log data. The Department can only release harvest log data to the vessel owner of record, and only upon written request.

7.3.1.2. Nil Report for Harvest Log - Licence Issued but not Fished

In the event that a licence is issued but not fished, the vessel owner is responsible for submitting a Nil Report for the season. The Nil Report must be submitted prior to the issue of approval for licence renewal. One page from the harvest logbook identifying the vessel, licence tab number, and the year with "Nil" entered in the body of the log and signed by the vessel owner constitutes a Nil Report.

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

7.3.1.3. Confidentiality of Harvest Data

Harvest data, including fishing location data supplied through latitude/longitude co-ordinates, loran or chart records, collected for use under the harvest logbooks for Shellfish Fisheries programs are collected for use by the Department in the proper assessment, management and control of the fisheries. Upon receipt by the Department of harvest log data and/or fishing location information, supplied by the fish harvester in accordance with conditions of licence, Section 20(1)(b) of the *Access to Information Act* prevents the Department from disclosing to a third party, records containing financial, commercial, scientific or technical information that is confidential information. Further, Section 20(1)(c) of the *Act* prevents the Department from giving out information, the disclosure of which could reasonably be expected to prejudice the competitive position of the fish harvester.

7.3.2. Fish Slip Requirements

It is a Condition of 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:

Fisheries and Oceans Canada
Regional Data Unit
200 - 401 Burrard St.
Vancouver, B.C. V6C 3S4
Phone: (604) 666-3784

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

8. GENERAL INFORMATION

8.1. Rockfish and Assistance to At-Sea Observers

The commercial prawn trap fishery has been allowed to continue fishing in the Rockfish Conservation Areas with the understanding that additional by-catch information will be collected. Observers are required to identify and record all of the rockfish caught in strings of gear that are sampled for spawner index data. This applies coast-wide. To accomplish this, while an observer is on board, the skipper or crew is requested to put all rockfish from the sample string into a holding bucket for later identification and counts by the observer. Skippers or crew who are experienced in rockfish identification are requested to assist the observer. Additional strings may not be hauled until the rockfish data recording is complete, unless other arrangements have been made with the observer. It is understood that this may cause some delays on board. However, collection of the data is essential to allow the prawn trap fishery to continue within the RCAs.

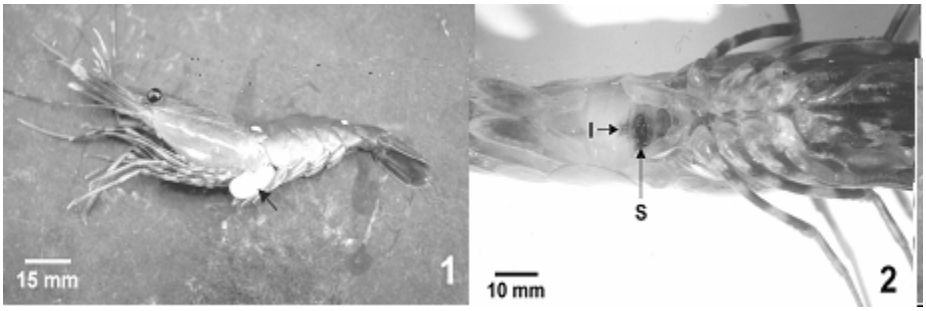
In addition, vessel masters and crew are invited to identify to the elected industry representatives or the Association, those types of traps and bait combinations which appear to capture the greatest numbers of rockfish.

Maps of RCAs are available at:

www.pac.dfo-mpo.gc.ca/recfish/Restricted_Areas/RCAs/booklet/default_e.htm

8.2. Sylon Parasites and Live Transport of Prawns

Live transport of prawns from northern and central coast areas could result in the unintentional introduction of a parasitic barnacle, *Sylon sp.* (see pictures below), to southern waters where it is currently not known to occur on prawns. Introduction of this parasite could occur through the release of viable larvae in water discharged from live holding tanks. Precautions can be taken by disinfecting all seawater in which prawns are transported, prior to discharging holding tanks.



Examples of sylon parasites on prawns.

Contact the following for more information:

Gary Meyer
Pacific Biological Station
Nanaimo, B.C. V9T 6N7
Phone: (250) 756-7000

Or on the Internet at: www.pac.dfo-mpo.gc.ca/sci/shelldis/pages/sylonsp_e.htm

8.3. On-Board Freezing

Prawns may be frozen at-sea (FAS) on the catcher vessel only. They may be transferred to a second vessel only after freezing is complete (for FAS product), or as live or fresh product. The transfer of catch to a second vessel for freezing is not permitted. If transferred to another vessel, the receiving vessel requires a provincial Fish Buying Station Licence. The receiving vessel must also have a commercial fishing licence or a transporting, category "D", licence according to *Pacific Fishery Regulations, Part II*, Section 24.

8.4. Glazed Prawn Sale Requirements

Fish harvesters are reminded that prawns that have been "dipped" or otherwise chemically treated must be done in a manner such that compliance to the Food and Drug Regulations and the Fish Inspection Regulations is maintained.

Where additives have been used, the additive must be declared in the label's list of ingredients. In the case of sulphites, the name of the actual sulphite used must be declared on the label or box.

Sulphite mixtures or other mixtures which include additives not specified in the Food and Drug Regulations may only be used via an exemption whereby the product will be exported through a federally registered plant (not simply a cold storage) to a country that permits their use. The exemption is issued to the processor as products must be "processed" in a registered plant under an acceptable Quality Management Program.

For further information, contact the local Canadian Food Inspection Agency (CFIA) fish inspection office:

Burnaby: (604) 666-6513
Victoria: (250) 363-3830
Parksville: (250) 248-4772

Commercial fish harvesters are reminded that a fisher's vending licence is required to sell prawns or shrimp directly to the public for that person's personal use. Fish harvesters should contact the Ministry of Agriculture and Lands, Courtenay Access Centre (250) 897-7540 for additional information. Information is also available at:

www.agf.gov.bc.ca/fisheries/licences/main.htm

8.5. Commercial Vessels Participation in First Nation's FSC Fisheries

There are restrictions during the commercial season on commercial vessel participation in First Nations food, social and ceremonial (FSC) fisheries authorized under an aboriginal communal licence. Conditions of the aboriginal communal licence must be followed.

8.6. Groundfish Taken for Bait

Fish harvesters are reminded that any groundfish taken for bait must be taken in accordance with the appropriate groundfish licence and attached to Conditions of Licence. Dockside monitoring is an essential element of groundfish stock monitoring and quota management. Therefore, it is important that fish harvesters using any groundfish for bait (e.g. dogfish) land and validate that groundfish catch prior to using it for bait, in accordance with the Schedule II Conditions of Licence under which authority that groundfish species is taken. Hook and line gear is prohibited in RCAs.

8.7. Sponge Reefs

Concern has been expressed for the impact of commercial fishing gear on sponge reefs at several locations in southern waters that should be avoided. This includes a lower Gulf location 12 kilometres offshore of Sturgeon Bank in 160 to 220 metres of water, cloud sponge areas in Saanich Inlet in waters less than 40 metres depth at Henderson Point, the mooring buoy northwest of Senanus Island, Willis Point, Repulse Rock, the point south of Misery Bay, Christmas Point, McCurdy Point and adjacent to the Bamberton cement plant, and in Tahsis Narrows around Mozino Point in waters less than 80 metres depth.

Four unique sponge reef ecosystems in Hecate Strait (in Subareas 105-2 and 106-1, Subareas 106-2 and 107-1, and Subarea 107-2) and Queen Charlotte Sound (in Area 110) are being considered as an Area of Interest for establishment of a Marine Protected Area (MPA) under the *Oceans Act* (see Section 4.4.2 of the 2010/11 Prawn & Shrimp by Trap Integrated Fishery Management Plan).

Appendix 2: 2010/11 Prawn and Shrimp by Trap Recreational Harvest Plan

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1. RECREATIONAL HARVEST PLAN HIGHLIGHTS AND CHANGES FOR 2010/11

1.1 Recreational prawn fishery regulations are described in the British Columbia Tidal Waters Sport Fishing Guide.

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

1.2 The management measures introduced for high use recreational fishing areas - Saanich Inlet and Stuart Channel in 2006 and Alberni Canal in 2007 – will continue for 2010/11. This includes higher spawner index targets, a one-week closure in May, and 'pulse' fishing beginning in September (the day after Labour Day)(Sections 4.1.1 and 6.6).

1.3 The one-week closure under the 9 point plan for Saanich Inlet, Stuart Channel, and Alberni Canal will be delayed to May 6 - 12, 2010 to coincide with the delayed opening date of the commercial fishery (Sections 4.1.1 and 6.6).

1.4 Consideration is being given to standardize recreational prawn buoys to identify recreational prawn gear from crab fishing gear. Requirements to sink buoy lines (navigation concern) and to also identify the harvesters' phone number on the float are also being considered. Changes could be reflected in the 2012 British Columbia Tidal Waters Sport Fishing Guide.

1.5 The Gwaii Haanas National Marine Conservation Area (NMCA) may be formally established under the *Canada National Marine Conservations Areas Act* as an NMCA Reserve under an interim management plan (see Section 4.4.2 of the 2010/11 Prawn & Shrimp by Trap Integrated Fishery Management Plan). Consultations and discussions on the development of a long-term management and zoning plan will continue throughout the Interim Management Plan phase. Changes could be announced in 2010/11.

2. CONTACTS AND SOURCES OF INFORMATION

Fisheries and Oceans Canada Contacts including the Recreational Fisheries Co-ordinator are listed in Section 1 of the IFMP. Sport Fishing Advisory Board representatives to the Prawn Sectoral Committee are listed in Section 2.

Information for recreational fisheries is available on the internet at:

www-comm.pac.dfo-mpo.gc.ca/english/sfg/

Inform

use areas (see Section 3.1.1), and seasonal closures implemented in important recreational fishing areas (see Section 3.1.2) when fall spawner index testing indicates that female abundance is low (Section 2.3). If necessary, the seasonal closures will be established by variation orders and announced by public fishery notices.

3.2. Daily Fishing Hours

Trap gear may be hauled, handled, or set 24 hours/day.

4. CLOSURES

4.1. Seasonal Closures

4.1.1. High Use Areas

Saanich Inlet, Stuart Channel, and Alberni Canal are closed to recreational fishing for one week in May, then open through the summer, then begin a "pulse fishing" regime in September with closures for the first part of the month followed by 2 week openings for the remainder of the month. This continues for the remainder of the winter unless results from fall spawner index surveys are evaluated and determine that a winter closure may be necessary from January 1 until March 31, 2011 (see Section 6.6).

The one week closure in May will move to May 6 - 12, 2010 to coincide with the delayed opening date of the commercial fishery.

4.1.2. Important Fishing Areas

Prawn fishing areas that have been sampled in the fall and closed for the winter when needed, have included (besides the high use areas above) Barkley Sound, Tahsis – Muchalat Inlet, waters near Nanaimo, Campbell River / Quadra, Powell River, Malaspina Strait / lower Jervis, Sechelt / Salmon Inlets, and Howe Sound / Indian Arm. Following index sampling in the fall, 2010, some of these areas may be subject to closure January 1 until March 31, 2011, if needed to protect spawning stocks.

4.1.3. Procedure for In-season Decision Making

Fall surveys generally consist of six strings of 25 traps fished for 24 hours for six haul days. Participating vessels distribute sampling effort throughout the area, in locations and in a manner comparable to commercial fishing season activity. Pre-set sampling locations have been established for the 3 high-use areas. Every vessel has an experienced index sampler on-board for all haul days to collect and record data from each trap. Data sheets are received and reviewed by Science, Marine Ecosystem and Aquaculture Division (MEAD). Sets outside commercial prawn locations or that have missed the prawn grounds are excluded from the analysis.

Data is reviewed by DFO fishery managers and Science staff by conference call. If the results are at or below the baseline spawner index level for that month, then the area is closed. If samples are consistently greater than baseline + 10%, the area remains open. Areas with index values between the baseline spawner index level and baseline + 10% are considered for reduced fishing effort, such as partial weekly closures, or are closed. Baseline + 35% is applied to the high use areas. Data is considered first on a Subarea

basis, then with respect to patterns in the overall sampling area. Adjacent areas are also closed if they are logical extensions of the area sampled, or are required to simplify enforceability of the closure boundaries. Closures are scheduled to provide at least two weekends of advance notice to recreational harvesters to become informed of the impending closure and to allow time for gear removal. Closures take effect by January 1. Closures are in place until the end of the spawning cycle, allowing recreational gear to go back into the water on April 1.

4.2. Permanent Closures

Closure descriptions are provided in the British Columbia Tidal Waters Sport Fishing Guide.

4.2.1. Victoria Area Ecological Reserves

Harvesting of all shellfish is prohibited in waters shallower than 40 m at Race Rocks and in waters within 1/3rd nautical mile of Cadboro Point navigation light.

4.2.2. Vancouver Harbour

Harvesting of crab, shrimp, and prawns is closed between Lions Gate Bridge and Ironworkers Memorial (Second Narrows) Bridge for navigation purposes.

4.2.3. Area 28 Whytecliffe Park, Porteau Cove and Point Atkinson

Harvesting all marine life is prohibited in those waters off Whytecliff Park, Porteau Cove and Point Atkinson.

4.3. Closure Notifications and Announcements

Permanent closures are published in the British Columbia Tidal Waters Sport Fishing Guide. New closure announcements are made by public fishery notice distributed to all local community Fisheries and Oceans Canada offices, e-mailed to all recreational fishing outlets which have made arrangements for this service, and posted to the fishery notice system on the internet.

Recreational fishery notices and in-season changes are available on the internet at:

www.pac.dfo-mpo.gc.ca/recfish/Opportunities/shellfish_e.htm

5. LICENSING

5.1. Licence Category

A Tidal Waters Sport Fishing Licence is required to fish and retain shellfish, including prawn and shrimp by trap. These may be purchased for a 1, 3, 5 day, or annual period. Fees depend on licence duration, age (senior, adult, juvenile) and residency status. Fees are published in the British Columbia Tidal Waters Sport Fishing Guide.

Tidal Waters Sport Fishing Licences can be purchased at many tackle stores and marinas or online at:

www.pac.dfo-mpo.gc.ca/fm-gp/rec/licence-permis/index-eng.htm

6. MANAGEMENT MEASURES

6.1. Species

There are more than 85 species of shrimp found in the waters of Canada's Pacific coast. Of these, recreational fishing commonly catches 3: prawn, which is the common name for the largest shrimp on this coast; humpback (king) shrimp; and coonstripe (dock) shrimp. Diagrams that may aid in identification are available on the internet at:

www-ops2.pac.dfo-mpo.gc.ca/xnet/content/shellfish/shrimp/biology.htm

(A one time sign on procedure is required to access this web site.)

Prawns have a 4 year life cycle, and so are larger than the other species which have 3 year life cycles. Prawns and most shrimp begin life as a male, and then change to females at a later stage in the life cycle. More information is available in Appendix 8 and on the internet at the above noted site.

6.2. Size Limit

There is no minimum size for recreational caught prawn or shrimp species.

6.3. Harvest

The daily catch limit is 200 pieces of prawn and shrimp (combined) and the possession limit is 400 pieces.

6.4. Gear

6.4.1. Trap Limits and Groundlines

Each harvester may fish 4 ring nets or traps for prawn and shrimp. There is no mesh size restriction. Two ring nets or traps may be attached to a single buoy. If 3 or 4 traps are set together on a single bottom line (ground line), then a buoy is required at either end of the groundline. Only one fisher's traps may be set on a single groundline, that fisher's name must be on each of the buoys, and the gear must be hauled and set only by that fisher.

Regulations also permit fishing for prawns and shrimp with spears while diving. Although this sounds unusual, some persons have related that other means of catching shrimp or prawns underwater are difficult, and that small spears like fondue forks fired by elastic, have been tried.

6.4.2. Buoy Marking

The name of the harvester of the gear must be clearly marked on the buoy in printed solid black capital letters, not less than 75 mm (3 in.) high. Only one name can appear on a buoy. It is recommended that the harvester include their telephone number so that they may be contacted if the gear floats away or if it is necessary for it to be hauled by the Department.

Buoys must be highly visible and of sufficient size for the tides and currents in the area so as not to submerge.

6.4.3. Recovery of Lost Trap Gear

Fishery Officers and Canadian Coast Guard personnel may collect recreational fishing gear from the water if the floats are improperly marked, if the gear poses a navigation hazard, or if the area is closed to fishing. In some cases, single buoyed traps set on a low tide will float away on a high tide, or the float may be submerged and crushed by water pressure. Gear that has been found may be returned if it can be identified in some manner. Contact the local Fishery Office if you believe that your gear may have been lost and found from the water.

6.4.4. Recreational/Commercial Fishing Gear Conflicts

Commercial and recreational harvesters are advised to exercise care when setting gear near other gear in similar locations, when those fisheries co-occur. Fouled gear should be untangled without cutting and returned to the water intact. If a line must be cut, it should be the line of the harvester who is hauling the gear. Recreational harvesters are advised that commercial harvesters do not usually set their gear in a straight line from buoy to buoy, as they may be following a depth contour, or fishing different depths in order to find the prawns. So gear may be set in a zig zag, and occasionally even a circular pattern. Setting gear away from commercial sets or other recreational fishing gear will often improve your catch, as traps start to compete for the prawns if they are closer than about 20 m.

The presence of small and medium prawns only in an area may reflect harvesting effects. However, the absence of any prawns at all, indicates some other factor affecting abundance; behaviour, episodic predation or disease.

6.5. High Use Areas

The high use areas of Saanich Inlet, Stuart Channel, and Alberni Canal are managed in the commercial fishery to the greatest index levels on the coast, well above the “baseline” set by Science. The recreational fishery in those areas is managed to a target that is 15 points lower than the commercial target. There is also a one week recreational closure at the start of the commercial fishery, and “pulse” recreational fishing begins no later than September.

The measures are intended to leave more female prawns carrying eggs on the spawning grounds, to release more larvae, with an anticipated benefit of more prawns for all harvest sectors beginning 2 years later, and a reduction in the need for winter recreational fishing closures. The measures that are limited to the high use areas, consist of: a one week recreational fishing closure in May to allow for comprehensive spawner index sampling, increased spawner index targets for management of the commercial fishery, “pulse” recreational fishing commencing in September until March with closures for the first half of the month openings for the remainder of the month, increased spawner index targets for management of the recreational fishery, spawner index sampling in October to determine if winter closures are necessary, and index sampling in January to confirm that increased numbers of spawning females have survived to the end of their life cycle. Spawner index sampling in July or early August has been dropped for not being able to meet its objective.

For 2010, the schedule for the recreational fishery in Saanich Inlet, Stuart Channel and

Alberni Canal, is as follows:

April 1 to May 5	Open in all coastal areas.
May 6 to 12	Closed in Saanich Inlet, Stuart Channel, and Alberni Canal; open in all other coastal areas.
May 13 to Sept. 6	Open.
Sept. 7 to 15	Closed in Saanich Inlet, Stuart Channel, and Alberni Canal only.
Sept. 16 to 30	Open.
Oct. 1 to 15	Closed in Saanich Inlet, Stuart Channel, and Alberni Canal only.
Oct. 16 to Oct 31	Open.
Nov. 1 to Nov. 15	Closed in Saanich Inlet, Stuart Channel, and Alberni Canal only.
Nov. 16 to Nov. 30	Open.
Dec. 1 to Dec. 15	Closed in Saanich Inlet, Stuart Channel, and Alberni Canal only.
Dec. 16 to Dec. 31	Open.

After Jan. 1, 2011, the schedule is dependent on the outcome of spawner index sampling results collected in October. If closures are necessary, they will be announced by public fishery notice (Section 4). Otherwise the "pulse" fishing will continue to the end of March.

The special management measures in Saanich Inlet, Stuart Channel, and Alberni Canal are intended to reduce the need for winter closures. However, given the prawn's 4 year life cycle and their age at harvest, it will take at least 2 years before any benefits may be seen. For Saanich Inlet and Stuart Channel where increased index levels were introduced in 2006, benefits are anticipated commencing in 2008 and increasing by 2009. For Alberni Canal that commenced this program in 2007, benefits are anticipated to begin in 2009 and to be fully expressed in 2010. It may still be necessary to have full winter closures in these areas in the fall and winter, in which case these areas may close January 1 until March 31, 2011. Benefits to spawning potential will take longer and may not be seen in every year.

7. GENERAL INFORMATION

7.1. Release of Undersized and Berried Prawn and Shrimp

"Berried" refers to prawns and shrimp that are carrying eggs held under their tails. There are various means of releasing undersized and berried prawns and shrimp in order to increase their survival. Release at the fishing location is recommended so that there is a greater chance of the prawn and shrimp returning to their preferred habitat. Release in other locations after or during moving will needlessly increase their mortality. Release as soon as possible is recommended to reduce the potential damage to eyes from UV radiation or from air exposure.

Do prawns and shrimp survive when released? They don't have swim bladders so

pressure change is not a problem. DFO has tagged and released prawns in the past and they have re-entered traps to be hauled again. We expect 50% or better survival, depending on the circumstances.

7.2. Bacteria

As with any seafood, catch in some areas may be exposed at various times to bacteria. Keep catch clean, cool and covered on-board. Refrigerate if it will not be consumed immediately. Wash during preparation. Proper cooking kills bacteria.

Appendix 3: 2010/11 Prawn and Shrimp by Trap First Nations Harvest Plan

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1. OVERVIEW OF THE FISHERY 1
2. MANAGEMENT MEASURES FOR THE FIRST NATIONS FISHERY 1
3. OPEN TIMES 1
4. LICENSING 2
5. CONTROL AND MONITORING OF FIRST NATIONS FISHING ACTIVITIES 2

1. OVERVIEW OF THE FISHERY

The Department's policy on the management of First Nations fishing identifies First Nations harvests for food, social and ceremonial (FSC) purposes as the first priority after conservation. The Department seeks to provide for the effective management and regulation of the First Nation fishery through negotiation of mutually acceptable and time-limited agreements which outline provisions pertaining to the fisheries and co-management activities. The agreements include provisions by which First Nations manage fishing by their members for FSC purposes, in addition to outlining First Nation involvement in a range of co-management activities and economic development opportunities which may include, but not be limited to, habitat enhancement, FSC catch monitoring and enforcement, fish management and community research.

Communal licences are issued annually to First Nations under the authority of the *Aboriginal Communal Fishing Licences Regulations* made under the *Fisheries Act*. Communal licences can be amended in-season for resource conservation purposes. Even where an agreement cannot be concluded, Fisheries and Oceans Canada issues communal fishing licences to First Nations organizations.

First Nations may also participate in the commercial fishery (see Section 3.3 of the Integrated Fishery Management Plan and Appendix 1 Commercial Harvest Plan).

2. MANAGEMENT MEASURES FOR THE FIRST NATIONS FISHERY

First Nations fishing effort for an FSC domestic purpose is not limited by catch quantity or size limits, except in those Nations where the Council or fisheries program has established their own catch limits for band members.

3. OPEN TIMES

First Nations fishing for food, social and ceremonial (FSC) purposes are open coast-wide throughout the year. Spawner index management to leave female spawners at levels 10% or greater in excess of the baseline and the increased commercial size limit leaving all 30-33 mm carapace length prawns in the water are measures supportive of year round FSC harvest opportunities.

Winter closure of First Nations FSC fisheries has not been required to date when recreational fishing areas closed. In winter recreational fishing closure areas, First Nations are recommended to fish outside of the closures and to release all berried females. Information is provided on areas of likely prawn abundance outside of the recreational fishery closures, so that effort can be redirected and FSC catch improved.

4. LICENSING

First Nations access to fish for food, social and ceremonial purposes is managed through a communal licence which can permit the harvest of prawn and shrimps. These licences are issued under the authority of the *Aboriginal Communal Fishing Licences Regulations*.

5. CONTROL AND MONITORING OF FIRST NATIONS FISHING ACTIVITIES

Communal licences and Fisheries Agreements may contain provisions for the designation of individuals by the First Nation, or First Nations organizations, to access the allocation provided under the communal licence, as well as provisions for monitoring and reporting by the group of the First Nations fishery in co-operation with the Department.

First Nations communal licences specify the locations permitted for use by First Nations for food, social and ceremonial harvests. Harvesting generally takes place in areas fronting or adjacent to reserves. The First Nations will provide the number of pounds of shellfish harvested by species to the DFO Resource Manager on a quarterly basis (every 3 months).

Appendix 4: Diagrams - Prawn Size Limits and Trap Requirements

FIGURE 1: PRAWN SIZE LIMIT

33 mm carapace length as measured from the posterior margin of the eye orbit (a) to the posterior mid-dorsal margin of the carapace (b).

For headed product only, 22 mm. telson length (c) to (d).

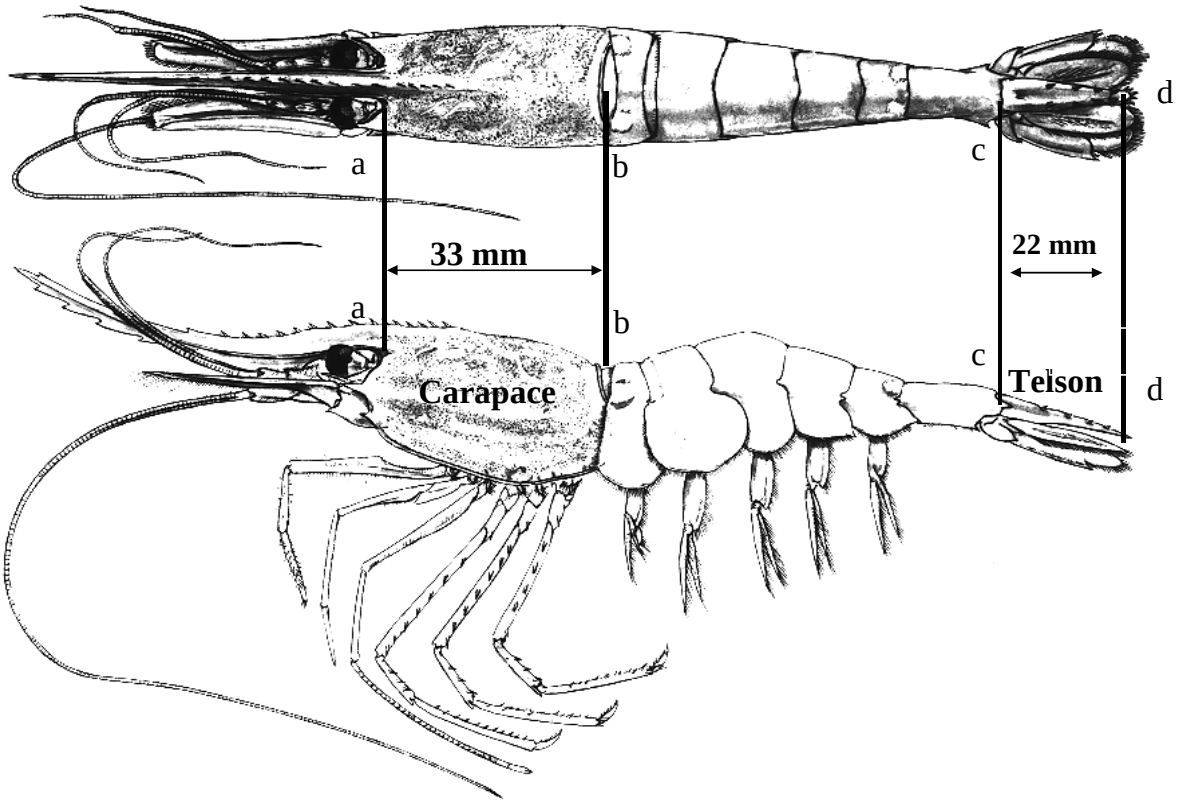
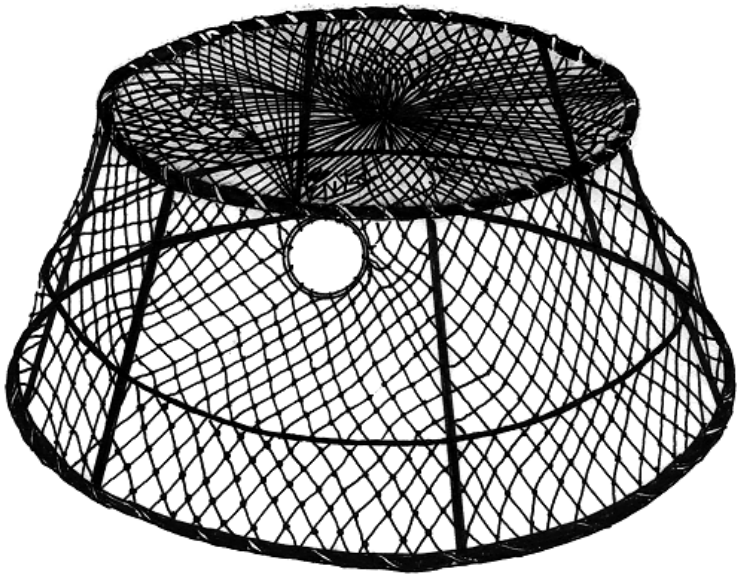


FIGURE 2: WEB TRAP MESH REQUIREMENTS

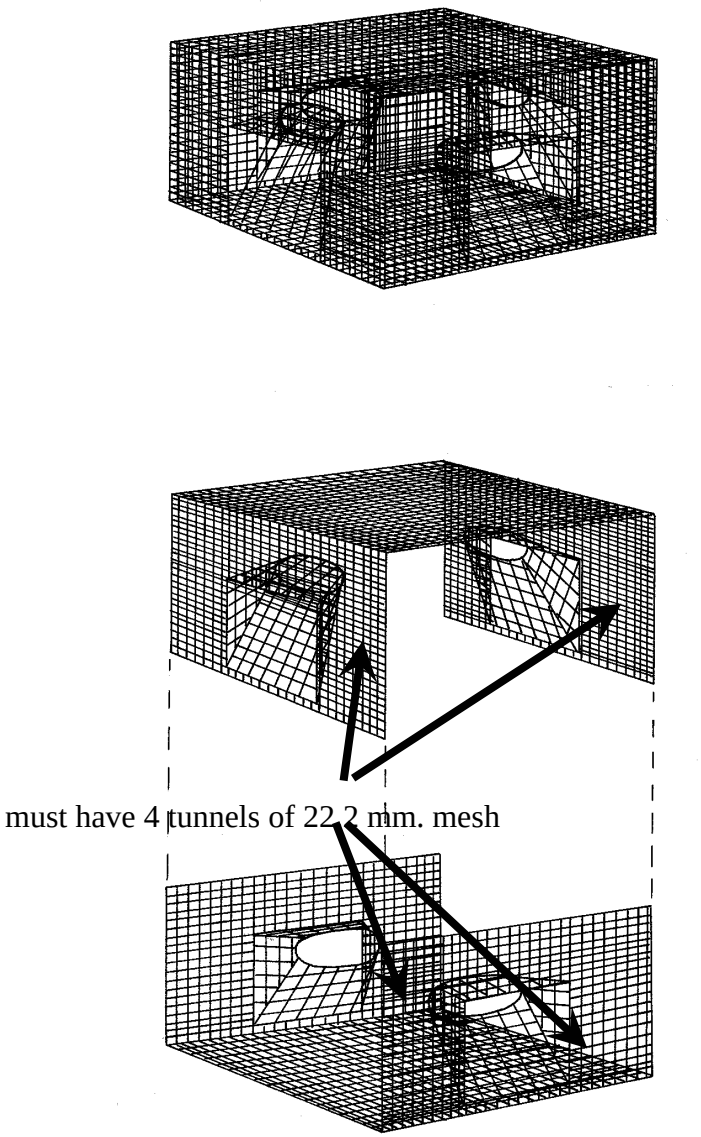
Web or Soft Mesh Traps: Maximum Volume 170 Litres



Web or Soft Mesh Traps are to be covered with a single layer of mesh. The mesh must measure a minimum of 38.1mm (1.5 inches). Mesh size is measured as described in the definition section of the *Pacific Fishery Regulations, 1993*. Mesh size means the total length of twine measured along two contiguous sides of a single mesh, including the distance across the knot joining those sides but not including any other knots. All mesh used in the trap including the tunnels must conform to this minimum size.

FIGURE 3: WIRE MESH TRAPS - OPTION 1 (4 TUNNELS)

Maximum Volume 100 Litres



Minimum 22.2 mm (7/8 Inch) Opening Mesh in at Least 4 Tunnels, 50 per cent of Side

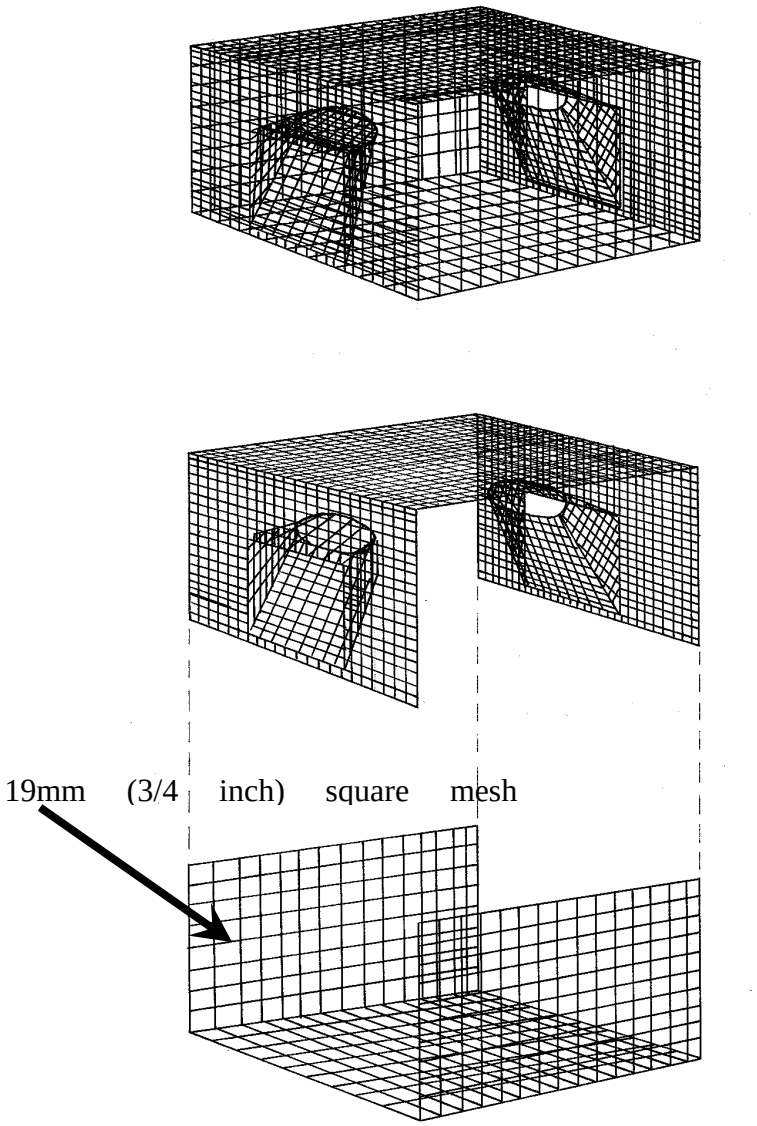
Wire or Hard Mesh Traps - These traps must have either:

Four opposing tunnels constructed of a rigid square mesh material having a minimum dimension (after dip coating) that will allow the passage of a 22.2mm (7/8 inch) square peg through the mesh without altering the shape of the mesh opening. The lower side of each tunnel must extend to the bottom edge of the trap and must be at least one half the length of the trap side, or:

Refer to Wire Mesh Trap Options 2 and 3 on the following pages.

FIGURE 4: WIRE MESH TRAPS - OPTION 2 (SMALL VOLUME)

Minimum 19 mm (3/4 inch) Opening Mesh on 2 Sides and Bottom
Maximum Volume 100 Litres

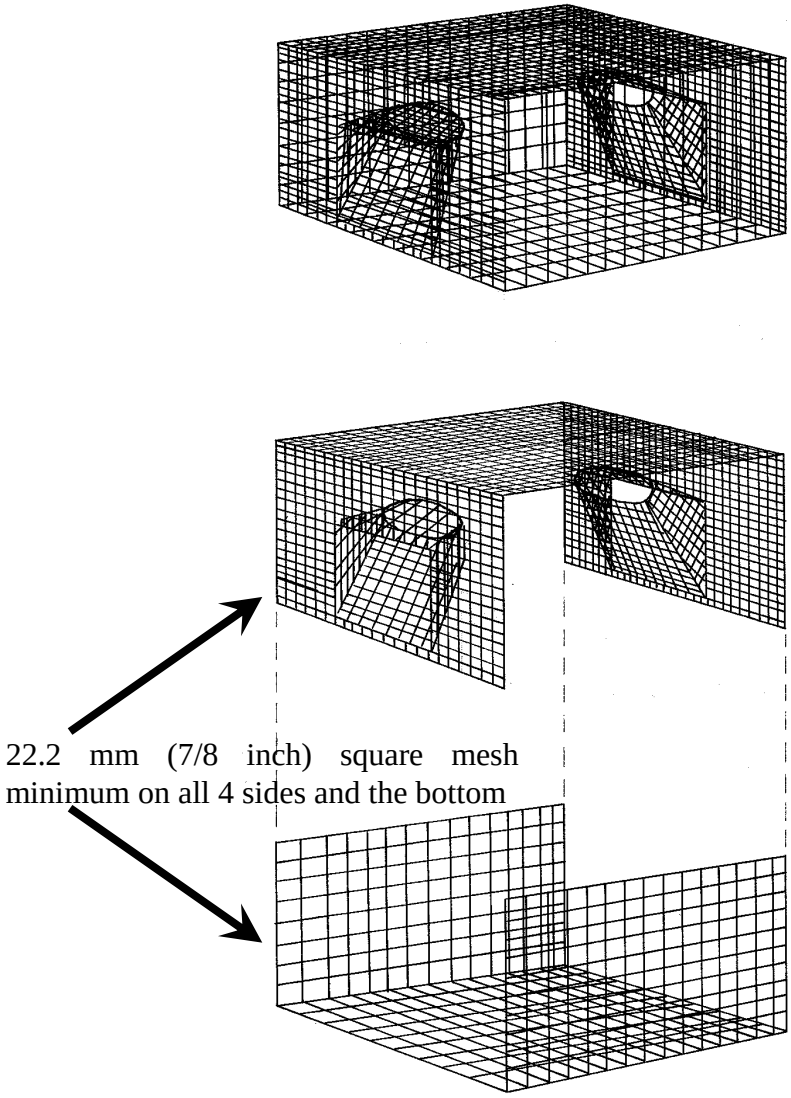


The bottom and two opposing sides must be constructed of a square mesh material that will allow the passage of a 19mm (3/4 inch) square peg through the mesh without altering the shape of the mesh opening, or

Also Refer to Wire Mesh Trap Options 1 and 3 on the adjacent pages.

FIGURE 5: WIRE MESH TRAPS - OPTION 3 (LARGE VOLUME)

Minimum 22.2 mm. (7/8 inch) Opening Mesh on 4 Sides and Bottom
Maximum Volume 170 Litres.



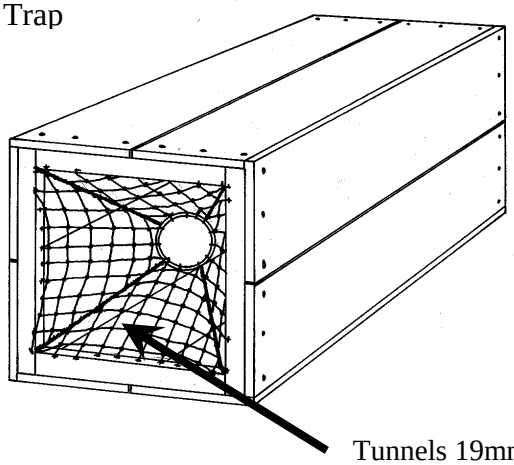
The bottom and all 4 sides must be constructed of a square mesh material that will allow the passage of a 22.2 mm (7/8 inch) square peg through the mesh without altering the shape of the mesh opening; or

Refer to Wire Mesh Options 1 and 2 on the preceding pages.

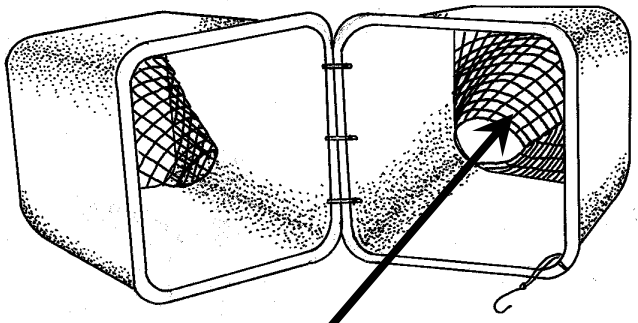
FIGURE 6: SOLID SIDED TRAP OPTIONS

Maximum Volume 50 Litres, except max. volume of 230 L in Sooke coonstripe fishery in Subarea 20-6 and 20-7

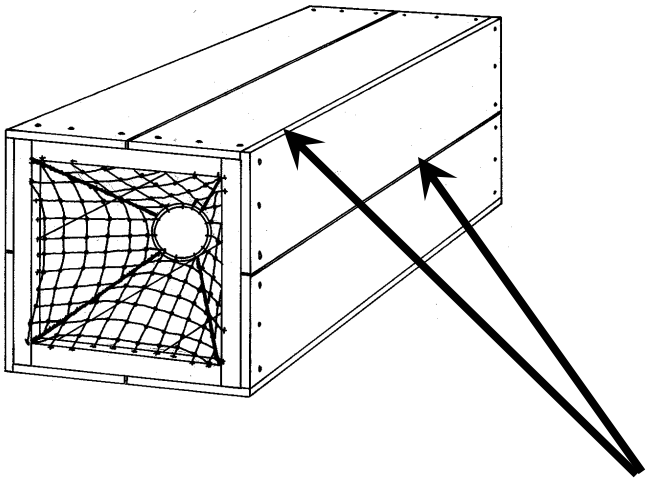
Box Trap



Bucket Trap



Tunnels 19mm (3/4 inch) square minimum



Box Trap Option - Escapement Slots, 16mm (5/8 inch) slots

Solid Sided Traps

The tunnels are to be constructed of a mesh material in such a manner that a 19mm (3/4 inch) round peg will readily pass through the mesh without altering or stretching the shape of the mesh openings, or;

Four slots a minimum of 16mm (5/8 inch) wide for the entire length of the trap, top and bottom of each side. (This is not recommended due to the warping of the trap sides and significant loss of legal sized prawns.)

TABLE 1: STACKING CONE NESTING TRAP, MAXIMUM DIMENSIONS

Height in inches:

Average trap diameter in inches (calculated as the top ring diameter + the bottom ring diameter / 2)	9	10	11	12	13	14	15
26	78	87	96	104	113	122	131
27	84	94	103	113	122	131	141
28	91	101	111	121	131	141	151
29	97	108	119	130	141	152	162
30	104	116	127	139	151	162	174
31	111	124	136	148	161	173	186
32	119	132	145	158	171	185	198
33	126	140	154	168	182	196	210
34	134	149	164	179	193	208	223
35	142	158	173	189	205	221	237
36	150	167	184	200	217	234	250
37	159	176	194	212	229	247	264
38	167	186	205	223	242	260	279
39	176	196	215	235	255	274	294
40	185	206	227	247	268	288	309

Max. legal volume = 170 L.

Shaded areas are volumes in excess of the limit.

Appendix 5: Prawn and Shrimp Trap Harvest Log Example

SHRIMP TRAP LOG

V.R.N. ☐☐☐☐☐☐ Vessel _____ Skipper _____ Year 2 0 0 ☐ Page No. _____

Catch Weights: (check one)
☐ Pounds (LB)
☐ Kilograms (KG)

Record By String

TRAP DESCRIPTIONS
A 3-Ring Frame, Cone Nesting
B 2-Ring Frame, Cone Nesting
C Circular, Non-nesting
D Collapsable Oval, Round or Rectangular
E Plastic Buckets, Round or Rectangular
F Wire Mesh, Square or Rectangular
G 4-Ring Frame, Cone Nesting
H Other (describe) _____

MUST FILL OUT TRAP INFORMATION ON FIRST PAGE OF EACH MONTHLY SUBMISSION AND EACH TIME TRAP INFORMATION CHANGES Trap information same as previous page? (check for yes) ☐

TRAP TYPE (s) (select letter)	Bottom Diameter (")	Top Diameter (")	Height (")	Length (")	Width (")	No. of Tunnels	No. of each trap type	Code
☐	☐☐	☐☐	☐☐	☐☐	☐☐	☐	☐☐☐	☐☐
☐	☐☐	☐☐	☐☐	☐☐	☐☐	☐	☐☐☐	☐☐
☐	☐☐	☐☐	☐☐	☐☐	☐☐	☐	☐☐☐	☐☐

For TAILED Prawns, **multiply weight by 2** & enter in **Whole Prawn Weight** ☐ KG ☐ LB

	TIME HAULED			SOAK TIME	LOCATION		STATISTICAL		DEPTH		NO. OF TRAPS	Whole Prawn Weight	FREEZER BOATS ONLY - RECORD SIZES BY **WEIGHT**					Dock Shrimp	Humpback Shrimp	Octopus				Remarks
	month	day	Time (24hr) hh:mm	(Hours)	Latitude/Longitude dd° mm.mmm	ddd° mm.mmm	area	sub-area	Fathoms min.	max.			Medium 34-42/KG	Large 25-33/KG	X-Large 19-24/KG	Jumbo 15-18/KG	S-Jumbo < 15/KG	(coonstripe)	(king)	Released #	Wt.	Kept #	Wt.	
					Latitude	Longitude																		
1			:																					1
2			:																					2
3			:																					3

Header Information

Catch Weights - indicate Pounds or Kilograms
Do NOT mix pounds and kilograms on the same page

Trap Information - Each time harvest logs are submitted, the first page **MUST** include the detailed trap information, including:
Trap type - choose appropriate letter
Trap size - all measurements in inches (")
No. of tunnels
No. of traps
For additional pages, use check box if trap information is unchanged
If trap information changes, fill in new header trap details

Detailed Fishing Information

Time Hauled - give month, day, hour and minutes (24 hour clock)
Soak time - record in hours
Location - record Latitude / Longitude for start location of each string

Detailed Fishing Information cont'

Statistical - Pacific Fishery Management Area and sub-area must be provided for each string
Depth - record in fathoms; min. = minimum depth of set max. = maximum depth of the set
No. of traps - record the number of traps fished for the corresponding catch data

Whole Prawn Weight - record as whole weights only
For tailed prawns, **multiply weight by 2** and enter under Whole Prawn Weight
DO NOT fill in the whole weight if your product has already been recorded in the freezer weight section. Only product in addition to your freezer weight should be recorded here.
***Record of sizes by weight** - For use by Freezer Boats
USE AS A GUIDELINE THE SPECIFIED COUNTS PER KILOGRAM FOR EACH SIZE CLASS EG 15-18 PIECES PER KG

Dock Shrimp - record as whole weights (also known as coonstripe shrimp)
Humpback Shrimp - record as whole weights (also known as king shrimp)
Octopus - for each string of gear record the **total number and total weight** of octopus released and kept
Indicate Pounds or Kilograms for Octopus weights
Remarks - make note of any problems, unusual catch, unusual weather, berried females, etc.

Appendix 6: 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
- First Aid
- Radio Operators Course
- Fishing Masters Certificates
- Small Vessel Operators Certificate

Publications:

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

  www.tc.gc.ca/MarineSafety/Tp/Tp10038/tp10038e.htm

- Gearing Up for Safety – WorkSafeBC
- Safe At Sea DVD Series – Fish Safe
- Stability Handbook – Fish Safe and Measuring Stability –DVD

For further information see:

www.tc.gc.ca/marine/menu.htm

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.

1.2. Emergency Drill Requirements

The master must establish procedures and assign responsibilities to each crew member for emergencies such as crew member overboard, fire, flooding, abandoning ship, and calling for help.

The Crewing Regulation under the Canada Shipping Act (CSA) states that as of July 30th 2002 all seafarers, including fish harvesters, must have a Basic Safety Certificate (MED A1 or A3 depending upon vessel and operating waters) within 6 months of becoming a crewmember, regardless of time at sea. The MED A1 is a three day course, and must be taken by all crew regardless of duty station.

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).

1.4. Other Issues

1.4.1. Weather

Vessel owners and masters are reminded of the importance of paying close attention to current weather treads 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:

www.weatheroffice.ec.gc.ca/marine/region_03_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 Industry Canada site at:

www.ic.gc.ca/eic/site/ic1.nsf/eng/h_00014.html

A DSC radio that is connected to a GPS unit will also automatically include your vessel's current position in the distress message. More detailed information on 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 Coast Guard website:

www.pacific.ccg-gcc.gc.ca/mcts-sctm/index_e.htm

1.4.4. Buddy System

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

2. 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 regulations do change and are updated from time to time, so check with WorkSafeBC for up-to-date versions. 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
Pat Olsen	Richmond	(604) 244-6477
Mark Lunny	Courtney	(250) 334-8732

or the Focus Sector Manager for fishing:

Bruce Clarke	Prince George	(250) 612-3708

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. FISH SAFE BC

Fish Safe is coordinated by Gina Johansen and 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.

Vessel masters and crew are encouraged to become more knowledgeable regarding vessel stability. Fish Safe BC developed the Fish Safe Stability Education Course, which is available to all fish harvesters who want to improve their understanding of stability and find practical application to their vessel's operation.

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

Gina Johansen, Safety Coordinator
Fish Safe BC
2-11771 Horseshoe Way
Richmond, BC V7A 4V4

Phone: 604-261-9700
Email: fishsafe@telus.net
Website: www.fishsafebc.com

Canadian Food Inspection Agency | Agence canadienne d'inspection des aliments

PRAWN / SHRIMP SANITARY GUIDELINES

Potential contamination of fish products may occur if adequate controls over sanitation and hygiene are not followed during the fishing and handling, both on board the vessel and during holding and transporting to the processing plant.

Adherence to the following guidelines will reduce potential contamination of fish products.

1. Water Supplies, and Fishing Locations

The seawater used to fill live tank systems must be taken from open and clear offshore waters away from harbours, coves, and vessel mooring locations. Intake pipes should be located as deep as possible to avoid taking in surface water.

Open live tank systems that run with continuous fresh seawater circulation must be shut off when entering harbours or unloading docks.

Do not fish near locations of known sewage outfalls, discharge pipes or other contamination sources.

2. Sanitation Controls for the Vessel and Equipment

After each delivery, the entire live tank holding and chilling system must be thoroughly cleaned and then sanitized with a bleach solution consisting of approximately a capful of bleach per gallon of approved source of potable freshwater (follow manufactures directions). At least a 20 minute contact time is needed for the solution to properly sanitize the lines. If systems cannot be drained completely overnight, the bleach solution should remain in the lines and be flushed out thoroughly in the morning before taking on fresh seawater for the day's fishing. This is especially crucial for parts of the chilling system located in warm engine compartments where the water inside the system could warm up and cause bacteria to grow.

In addition to the live tank system, all other pieces of equipment, utensils, and surfaces used in the handling of prawns/shrimp must be thoroughly cleaned & sanitized using the following 5 step method:

i) rinse with cold water to remove excess debris & pieces of prawn, etc…,
ii) scrub all surfaces thoroughly with detergent and scrub brush,
iii) rinse with cold water to remove all traces of detergent,
iv) rinse with mild bleach solution and allow to air dry,

v) rinse with cold water prior to beginning the next day's production.

3. Personal Hygiene Controls

Fishers and all handlers of prawns/shrimp must exercise good personal habits which includes thoroughly washing hands with soap and water prior to any handling of prawns/shrimp or equipment.

4. Other

Protect product from exposure to elevated temperatures while onboard the fishing vessel.

5. Prawn/Shrimp Fishers and Federally Registered Processors

To meet the Federal Fish Inspection Regulations all prawns/shrimp (live or frozen) **must be processed in a federally registered establishment before they can be exported out of B.C. or Canada.** Legal action may be taken if it is determined prawns/shrimp have been exported without being processed at a federally registered facility.

The federally registered prawn/shrimp processor must describe the controls required from harvest to transportation, holding and processing in their Quality Management Plan (QMP).

Processors may use a Supplier Quality Agreement (SQA), or other agreement, between the processor and the fisher, to outline the handling practices of the product and the cleaning and sanitation practices on the vessel.

Additionally the processor must include controls for the mixing and dipping of preservative solution and an inventory control of boxes provided to the fisher for freezing product.

Processors will verify the SQA or other agreement is working and is effective. Methods of verification could include reviewing written records from the vessel for requirements outlined in the SQA, physically inspecting catch vessels to confirm compliance to the SQA and product testing at the beginning of the season and at regular intervals during the season.

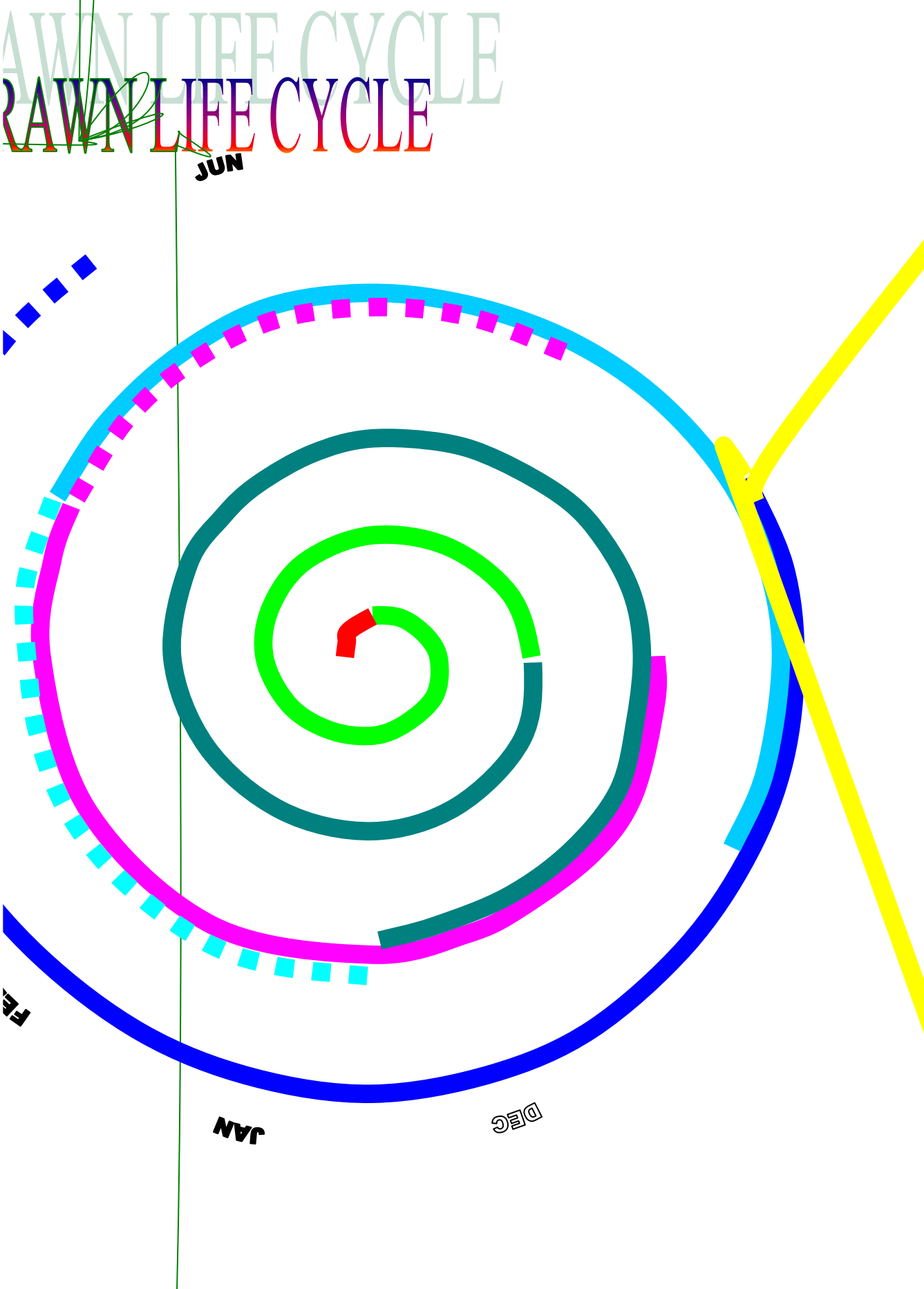
For more information contact your federally registered processor or local Canadian Food Inspection Office:

CFIA - Vancouver
400 – 4321 Still Creek. Dr.
Burnaby B.C.
V5C 6S7
(604) 666-6513

CFIA - Victoria
103 – 4475 Viewmont Ave.
Victoria, B.C
V8Z 6L8
(250) 363-3455

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

ix 8: Prawn Life Cycle



1. LIFE CYCLE NOTES

The diagram is based on the 12 months of the year, and the four year life cycle of the prawns. It provides information about what life stages may be present, their size, and for the last year of the life cycle, the spawner index to which the fisheries are managed.

The diagram was first created in March 2003. It is still under review and correction with respect to size at age, and timing of moult occurrences. In particular, the size increases from 30 months to 42 months appear insufficient, and the shape of the timing of the moult period occurring in the late summer needs some clarification.

Solid spiral lines indicate that most prawns are in that stage at that time and portion of their life cycle. Hatched lines indicate that some prawns may be in the leading or trailing portions of a life cycle stage. All prawns begin life as males, spawn at about 2.5 years of age, then undergo a change at 2.5 to three years of age to become females, spawn again as adult females, extrude and carry eggs at 3.5 to four years, hatch out the larvae and then die.

The light spiral line near the centre of the diagram indicates immature prawns from larval settlement to 18 months. This continues out to a dark spiral line indicating male prawns from 18 months to 30 to 36 months. The next portion of the spiral line indicates transition prawns which are in the process of changing from male to female life forms, from 30 to 37 months. The last light portion of the spiral line indicates adult female prawns from 37 to 43 months, before they extrude and carry eggs under their tails. The last portion of the line indicates female prawns carrying eggs under their tails, from 41 to 48 months. This is the end of the life line.

The numbers on the horizontal line through the middle of the diagram indicate an average length and weight by months of age. For example, a 30 month prawn is approximately 30 gm. weight and 37 mm. carapace length. Carapace length is the distance measured from the back of the eye socket to the middle of the back of the shell that covers the head and thorax, in front of the tail. Following on this example, a prawn at 30 month age is likely to be either a late stage male or an early stage transition, and at a time of life when they are likely to moult.

The figure also includes a series of numbers which follow the spiral for the last year of the prawn's life cycle. These are spawner index values. The spawner index is the average number of females or transitional prawns which will become females and complete their life cycle in the final year, caught by a standardized trap fished for 24 hours. From April to July there are three index numbers listed. From August to March there are only two. In all cases, the first number of the series is the original "base line" spawner index which was established more than 20 years ago. In all cases, the second number is a value 10 percent greater than the original base line number. This is the index number that is presently used to manage prawn fisheries throughout the coast. It is higher than the baseline to provide an additional margin of safety, for example, by providing a buffer for possible delays in invoking closures in fisheries on prawns, whether they closures of the commercial fishery in-season or recreational fishery when needed. The third number is an index value 25 percent higher than the base line. This index number only appears for the period of the commercial fishery from April through July. It is the management target for closures in areas where there are a large number of recreational fishers following the commercial fishing season.

2. EXAMPLE OF USE OF THE DIAGRAM

Consider November when there are fall index surveys in important recreational fishing areas. From the outside working in, the diagram indicates you may expect to find berried female prawns of 42 mm average carapace length and 42 gm average weight. There are also small transition prawns which have recently come out of a moult and large male prawns which have not yet moulted into the transitional stage. Both of these are of like size, 37 mm CL and 30 gm. weight. Note that these 2.5+ year old prawns are in excess of the commercial legal size limit. There will also be smaller 1.5+ year old male prawns of average size 30 mm and 17 gm weight. Finally, although not often seen in traps due to their size, there will be 14 mm 2 gm immature 0.5+ year old prawns. As well, these prawns may be in shallower water, still moving down slope to the preferred adult habitat at greater depths.

At this same time, note the spawner index management levels which are the two numbers on the outer edge of the spiral. Fishery managers prefer to see values in the fall index surveys in excess of an average of 3.5 females per trap. Note that at this time of year, almost all adult female prawns will be carrying eggs, so are easy to identify and count. Also note that although large transition prawns are present, they do not count towards the index as they will not complete their life cycle in this spawning season. These transitional prawns will count in the spawner index measurement, beginning in April as by that time they will complete their life cycle by the following winter. With respect to the index number, if the sampling returns an index between 3.2 and 3.5, managers will be concerned and will consider if closures may be necessary, based on fishing intensity and the indexes seen in adjacent areas in a common geographic water body. If the index number is less than 3.2, managers will take action, usually a closure. In this case, adjacent areas in a common water body may also be closed if it is considered to be potentially beneficial to ensure increased larval production from those areas to offset reduced larval production from the area with the low index.

3. INFORMATION SOURCES

The length and weight numbers in this diagram are from a table presented by C.S. Wright and P. Panek, which is referenced back to Butler, Boutillier and Bond, Mikkelsen, and Ricker. Of these, Butler's publication was visited for additional information. Note that Butler's length/weight descriptions are generally lower than provided in the Wright and Panek table, and lower than represented on the diagram, suggesting that a range of values should be presented on the diagram. The length/weight values need to be checked against recent measurements made in field programs. For example, in southern Gulf of Georgia in March 2003, male lengths were 30 to 32 mm and transitions were 35 to 37 mm.

Further, there will be variations based on geography. For more northern areas, the whole diagram may have to be rotated or lengths of development periods altered to represent growing conditions in those waters. As well, size and weight characteristics may change. One enduring question is how those northern prawns can be so much larger than their southern cousins. Genetics, food supply, or a five year life cycle?

Finally, the diagram began in response to a question from a prawn fishery observer, asking what could be expected when sampling was undertaken in March, 2003. The diagram used information from that sampling in Georgia Strait, as well as earlier work in February 2003 and

December 2002 from Saanich Inlet, to identify a winter moult period and to confirm portions of the size ranges (Butler, T., 1980).

Maximum male carapace length = 48.1 mm.
Maximum female carapace length = 61.1 mm.
One year after hatching = 12 mos = 21.1 mm, 6.5 gm.
Second autumn = 18 mos = 27.0 mm, 13 gm, prawns mature as males.
Most function as males for another year (=30 mos).
The remainder begin sex change at 24 mos.
30 months; mixed group of males and slightly larger females.
30 months males = 32.9 mm, 23 gm.
36 months; all prawns are female or undergoing sex change, transitions.
Spawning over at end of October.
Ovigerous period lasts 5 to 5.5 mos.
48 months; 38 mm, >35 gm.
Large females 43 to 50 mm C/L are either fast growing or in fifth year.