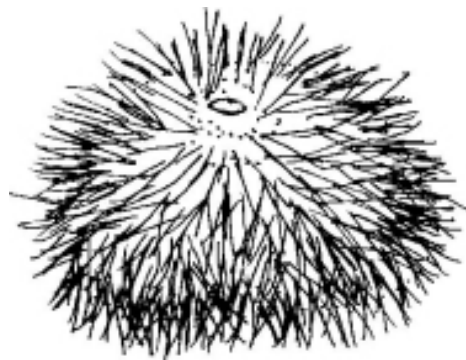


**PACIFIC REGION**

**INTEGRATED FISHERIES  
MANAGEMENT PLAN**

**GREEN SEA URCHIN**

**SEPTEMBER 1, 2018 TO  
AUGUST 31, 2021**



Green Sea Urchin: *Strongylocentrotus droebachiensis*



Fisheries and Oceans    Pêches et Océans  
Canada                            Canada

Canada

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

## FOREWORD

The purpose of this Integrated Fisheries Management Plan (IFMP) is to identify the main objectives and requirements for the Green Sea Urchin 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

The 2018/21 Pacific Region Green Sea Urchin Integrated Fisheries Management Plan (IFMP) is a multi-year plan that encompasses the period of September 1, 2018 to August 31, 2021.

The 2018/21 Green Sea Urchin Commercial Harvest Plan is attached as Appendix 6 to this IFMP. Commercial fish harvesters are advised to review the attachments for harvest information.

Additional information on Green Sea Urchins may be accessed through the Department's shellfish webpage at:

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

Research Documents and Stock Status Reports for Green Sea Urchins are available at the Centre for Scientific Advice, Pacific (CSAP) webpage:

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

### 1.2. History

A detailed history of the commercial Green Sea Urchin fisheries, showing areas open, quotas, landings, number of participants, number of licences and vessels, values and reasons for management decisions, is contained in annual Post-Season Reviews that are available from the Resource Manager (see contacts Appendix 10).

The Green Sea Urchin is one of three sea urchin species that have been fished in B.C. waters. Red and Green Sea Urchins are currently fished commercially under authority of a limited category “Z” licence, category “ZC” or “FZC” for reds and category “ZA” or “FZA” for greens. Purple Sea Urchins were fished under scientific permit from 1990 to 1992.

The Green Sea Urchin dive fishery began in 1987 and experienced steady increases in effort up to 1992. Landings peaked in 1992, when 49 vessels reported 1,042 tonnes for a landed value of \$4.4 million. Since 1992, landings have decreased as a result of a more conservative approach to establishing quotas. Quotas since have remained relatively constant, however commercial catch declined through the early 2000's to a low of 13 tonnes in the 2006/07 season because of increased competition in the markets, primarily from Russia. However, since then there has been a slow steady increase in landings to 2016/17 where approximately 221 tonnes, 99% of the Total Allowable Catch (TAC), was landed. Unlike Red Sea Urchins, where roe is extracted at British Columbia processing plants, Green Sea Urchins are shipped whole and live to Japan. The product quality, demand, and perishability have restricted the fishery primarily to accessible south coast areas.

The Green Sea Urchin fishery is managed by a minimum size limit of 55 mm test diameter, precautionary quotas, and time and area openings. The minimum size limit is precautionary and is intended to allow Green Sea Urchins several years of spawning before becoming available for the commercial fishery.

Licences were limited in 1991 due to concerns over increasing fishing effort. Currently there are 49 licences eligible for this fishery. Despite licence limitation, effort remained high and catch per unit effort (CPUE) continued to show a decline in most south coast areas

until about 1993. This decline in CPUE necessitated a more conservative approach to establishing quotas and resulted in an annual TAC. Since 1993 the CPUE has generally increased and is currently higher than in 1987 when the fishery first began.

Beginning in 1995, a program of individual quotas (IQ's) was implemented in the Green Sea Urchin fishery. Under the program, an industry funded catch validation and monitoring program was put in place to ensure monitoring of quotas and recovery of accurate catch data. During the first year of the program, south coast quotas were allocated equally among the licence holders, while the north coast remained as a competitive fishery. During the second year of the program, equal IQ's were again applied to south coast areas. However, north coast areas were opened only under an exploratory protocol.

### **1.3. Type of Fishery and Participants**

#### 1.3.1. First Nations

Aboriginal harvest for food, social and ceremonial (FSC) purposes may occur coast-wide where authorized by a communal licence or, under treaty, a harvest document. Green Sea Urchins are important to First Nations, who harvest them for food, social and ceremonial purposes. The number of Aboriginal harvesters for Green Sea Urchins is unknown.

Five Nuu-chah-nulth First Nations located on the West Coast of Vancouver Island - Ahousaht, Ehattesaht, Hesquiaht, Mowachaht/Muchalaht, and Tla-o-qui-aht (the T'aaq-wiihak First Nations) - have aboriginal rights to fish for any species of fish, with the exception of Geoduck, within their Fishing Territories (their Fishing Territories are located within portions of Pacific Fishery Management Areas (PFMA) 25/125, 124, 26/126 and all of PFMA 24) and to sell that fish. DFO is working with the First Nations to find the manner in which the rights of the five First Nations can be accommodated and exercised without jeopardizing Canada's legislative objectives and societal interests in regulating the fishery. The outcome of these discussions could lead to in-season management changes. DFO will make efforts to advise stakeholders of any such changes in advance of changes being implemented.

#### 1.3.2. Recreational

A recreational fishery may occur coast-wide. A British Columbia Tidal Waters Sport Fishing Licence is required for the recreational harvest of any species of fish including shellfish. Tidal Waters Sport Fishing Licences can be purchased at many tackle stores and marinas or online by using the DFO website:

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

The Tidal Waters licence includes access to numerous species, including Green Sea Urchin. The number of recreational harvesters fishing for Green Sea Urchins is unknown, however, based on advice from the Sport Fishing Advisory Board of BC (SFAB), it is thought to be minimal. The recreational catch is limited to 12 per day (all urchin species combined).

#### 1.3.3. Commercial

Green Sea Urchins are harvested commercially by divers. There are 49 commercial licences. Of these, one is designated communal commercial (FZC) licence for First Nations participation in the commercial fishery. It is common practice within the industry for vessels to stack multiple licence eligibilities in order to make fishing more economical.

#### 1.3.4. Aquaculture

Currently there is little interest in Green Sea Urchin aquaculture. See Appendix 5 for more information.

### 1.4. Location of Fishery

#### 1.4.1. First Nations and Recreational

Aboriginal and recreational harvest can occur coast-wide, where appropriately licensed.

#### 1.4.2. Commercial

With the exception of permanent closures for various purposes (Appendix 6, Section 6), the current commercial fishery occurs only on East Coast of Vancouver Island in units called Quota Management Areas (Appendix 6, section 3). These management areas are a defined portion of Pacific fisheries waters. Areas and Subareas, as described in the *Pacific Fishery Management Area Regulations*, are referenced in describing each management area. (Appendices 6 and 8).

Other areas of the coast may be considered for openings if an independent stock assessment survey of the area demonstrates that a sustainable harvest quota can be established. Fish harvesters will be required to fund any stock assessment surveys.

### 1.5. Fishery Characteristics

#### 1.5.1. First Nations

First Nations' fishing for food, social and ceremonial (FSC) purposes are the first priority after conservation and is open coast-wide throughout the year. First Nations' fishing effort for FSC domestic purposes has not been 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. While Green sea urchins were not allocated under the Tla'amin, Maa-nulth, Tsawassen or Nisga'a treaties, harvesting for domestic (FSC) purposes is permitted.

#### 1.5.2. Recreational

The recreational fishery is open year-round (except for areas closed to fishing) and is an open entry fishery with a daily bag limit, two-day possession limit and gear limits. There is no size limit for recreational harvesters and the type of gear permitted is limited to hand picking only.

#### 1.5.3. Commercial

The commercial licence year is from September 1 to August 31 of the following year. The fishery may open and close during that timeframe based on market demand and completion of area quotas. The majority of landings occur between October and February when roe quality is at its best. Harvest is by hand picking while diving.

The fishery operates under a Total Allowable Catch (TAC) with Individual Quotas (IQ). All commercial landings are tracked using a Dockside Monitoring Program (DMP). Other management measures include, limited entry licensing, a minimum size limit and area quotas.

## 1.6. Governance

### 1.6.1. Fisheries Management

The Green Sea Urchin fishery is governed by the *Fisheries Act* (R.S., 1985, c. F-14) and regulations made thereunder, including the *Fishery (General) Regulations* (e.g., conditions of licence), the *Pacific Fishery Regulations* (e.g., open times), the *British Columbia Sport Fishing Regulations (1996)*, the *Aboriginal Communal Fishing Licences Regulations* and the *Pacific Aquaculture Regulations*. Management Areas and Subareas are described in the *Pacific Fishery Management Area Regulations*.

In addition, the Sustainable Fisheries Framework is a toolbox of policies for DFO to sustainably manage Canadian fisheries by conserving fish stocks while supporting the industries that rely on healthy fish populations. It provides planning and operational tools that allow these goals to be achieved in a clear, predictable, transparent, inclusive manner, and provides the foundation for conservation policies to implement the ecosystem and precautionary approaches to fisheries management. These policies include: A Fishery Decision-Making Framework Incorporating the Precautionary Approach, Policy for Managing the Impacts of Fishing on Sensitive Benthic Areas, Ecological Risk Assessment Framework for Coldwater Corals and Sponge Dominated Communities, Policy on New Fisheries for Forage Species, Policy on Managing Bycatch, Guidance on Implementation of the Policy on Managing Bycatch, and Guidance for the Development of the Policy of Rebuilding Plans under the Precautionary Approach Framework: Growing Stocks out of the Critical Zone. 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. More information is available on the internet at:

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

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

The Green Sea Urchin Sectoral Committee (Appendix 13) is the primary body guiding management decision-making processes for the Green Sea Urchin fishery. The Green Sea Urchin Sectoral Committee meets once a year in March or April for a post-season review and pre-season planning.

### 1.6.2. Spatial Planning for Marine Conservation

A co-operative and collaborative approach to marine conservation is being implemented by Fisheries and Oceans Canada, Parks Canada, and Environment and Climate Change Canada for planning, establishing, and managing federal marine protected areas in a more systematic and efficient way.

**Marine Protected Areas** may be established by Fisheries and Oceans Canada under the *Oceans Act* (1996, c. 31) to protect and conserve important fish and marine mammal habitats, endangered marine species, unique features, and areas of high biological productivity or biodiversity.

More information is available on the internet at:

<http://dfo-mpo.gc.ca/oceans/mpa-zpm/index-eng.html>



**National Marine Conservation Areas** may be established by Parks Canada under the *Canada National Marine Conservation Areas Act* (2002, c. 18) to protect and conserve representative examples of Canada's natural and cultural marine heritage, and to provide opportunities for public education and enjoyment.

More information is available on the internet at:

<http://www.pc.gc.ca/en/amnc-nmca/>

**Marine Wildlife Areas** may be established by Environment and Climate Change Canada under the *Canada Wildlife Act* (R.S.C., 1985, c. W-9) to protect and conserve habitat for a variety of wildlife, including migratory birds and endangered species.

More information is available on the internet at:

<http://www.ec.gc.ca/ap-pa/default.asp?lang=En&n=2BD71B33-1>

### 1.6.3. Species at Risk

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

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

More information on the *SARA* is available at:

<http://www.sararegistry.gc.ca/default.asp?lang=En&n=24F7211B-1>

Endangered, threatened, and special concern marine species in Pacific Region currently listed under *SARA* can be found at:

<http://dfo-mpo.gc.ca/species-especies/sara-lep/index-eng.html>

## 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

Green Sea Urchins are a benthic invertebrate with a wide geographic distribution, occurring in cool temperate circumpolar waters of the Atlantic and Pacific oceans. In the Pacific, they occur from northern Washington State, through the Aleutian Islands, Alaska, and west to the Korean Peninsula, Kamchatka, Russia and Hokkaido, Japan. Green Sea Urchins occur intertidally and subtidally to depths of over 140 metres. Preferred habitat is rocky, gravel or shell substrates. Kelp and marine algae are their principal food, and Green Sea Urchins are an important food source for sea stars (especially the sunflower sea star *Pycnopodia*

*helianthoides*), crabs, large fish (including wolf eels *Anarrhichthys ocellatus*), and sea otters (*Enhydra lutris*).

Green Sea Urchins have separate sexes and are broadcast spawners. Spawning is seasonal and varies by region, occurring from February to March in BC. The larval period can last from 7 to 22 weeks (Strathmann 1978). In southern BC, Green Sea Urchins reach sexual maturity at a test diameter of about 25 mm (Waddell et al. 2002) and the minimum legal size is 55 mm, which in Alaska correspond to 2-3 year olds and 4 year olds, respectively (Munk 1992). Growth is highly variable and is dependent on food supply and environmental conditions.

## **2.2. Ecosystem Interactions**

Kelp forests are some of the most productive and complex marine habitats for many species of fish and invertebrates. Although Green Sea Urchins have a diverse diet, kelp is one of their preferred foods. Once Green Sea Urchin populations reach a certain threshold, they tend to aggregate and form high density fronts along the edge of the kelp forest and graze through it, potentially destroying the kelp forest. If this occurs, the area becomes urchin-dominated barren grounds, with a high density of crustose, coralline algae (Harrold and Pearse 1987). This leads to a simplification of the habitat and food webs, and consequent lowering of the productivity and species diversity in nearshore waters (Hagen 1983). The abundance of Green Sea Urchins alone is not enough to explain the grazing intensity of urchin populations (Harrold and Pearse 1987), and the switch to an active feeding mode depends on many factors, including the availability of drift algae in the area.

Sea Otters have been expanding throughout portions of BC. Sea Otters are known predators of Red and Green Sea urchins and other invertebrates. The commercial Green Sea Urchin fishery occurs in areas mostly void of sea otters. Expansions into some of these areas is being observed and decreases to these stocks is possible, however the true impact is largely unknown at this time.

## **2.3. Aboriginal Traditional Knowledge/Traditional Ecological Knowledge**

Aboriginal Traditional Knowledge regarding Green Sea Urchins is not generally available.

Traditional Ecological Knowledge in the form of observations and comments collected from commercial divers over many years contributes to the decisions on scientific survey locations and is considered in management decisions.

## **2.4. Stock Assessment**

The Science Branch of Fisheries and Oceans Canada and the Pacific Urchin Harvesters Association (PUHA) continue to conduct joint stock assessment surveys at selected study sites (since 1995) to obtain fishery-independent information on Green Sea Urchins. Fisheries and Oceans Canada developed the survey protocol, conducts the lab and data analyses, and prepares a technical report of the survey results. Together, the Department and the PUHA, select the survey site, and co-ordinate vessel and diver participation in the surveys. The main objectives of the surveys are to assess variability in Green Sea Urchin populations, calculate biomass estimates and monitor impacts of commercial harvesting. Fishery-independent surveys also provide information about the sublegal portion of the population and thus insight regarding recruitment into the fishery. See Waddell and Perry (2007) and DFO (2014) for survey methodology details.

Stock assessments of Green Sea Urchins are generally performed every three years and involve analyzing data collected from both fishery-dependent and fishery-independent (surveys) sources and running the information through a Bayesian Biomass Dynamics Model (Waddell *et al.* 2010; DFO 2010, DFO 2014, DFO 2016, DFO 2018). The model uses median commercial catch per unit of effort (CPUE) for each fishing season for each of the two main harvest areas: Northern Vancouver Island (PFMAs 11, 12 and 13) and Southern Vancouver Island (PFMAs 18, 19 and 20). The CPUE's are calculated using commercial landing and effort data obtained from the harvesters' Validation and Harvest Logbooks. The model also uses Green Sea Urchin biomass estimates from index sites, calculated from fishery-independent surveys. The Bayesian model provides the estimated Maximum Sustainable Yield (MSY) posterior distributions, and a probability of reaching the MSY by fishing a proportion of the MSY.

A table of harvest options is produced for each of the two main harvest areas. The harvest options include the median MSY estimates, a range of reductions from the median MSY estimates, and the probability that the reductions may be greater than or equal to the true MSY (i.e. the risk). For each harvest option, the allocations of quota to each of the PFMAs are also provided based on the proportion that area contributed to aggregate landings from past fishing seasons. The managers decide the risk level from the table, and set the quota limit for the fishery. Quotas assigned during previous years have had a very low probability (low risk) that they were equal to or greater than the true MSY. Refer to DFO (2018) for the most recent assessment results.

Scientific research and stock assessment surveys are of vital importance to this fishery as it moves from a precautionary management regime towards a biologically-based fishery.

## **2.5. Stock Scenarios**

The Green Sea Urchin fishery is managed conservatively and stocks are healthy. A precautionary approach to management, which ensures the Department is meeting its conservation goals, will continue for the future. This in turn, will ensure sustainable harvests in all areas. The long-term goal of the Department is to improve the assessment and management frameworks through a better understanding of the resource. This will be accomplished through a collaborative process involving First Nations organizations, the commercial industry, other stakeholders and the Department.

There is no indication of a conservation concern for Green Sea Urchin stocks at this time. A recent stock assessment (DFO 2018) indicated that the CPUE's (catch per unit of effort) for both the Northern and Southern Vancouver Island regions have dropped marginally since the last assessment but remain higher than in the early years of the fishery. Recent fishery-independent survey data indicate that densities are high for all size categories (DFO 2018).

The sea urchin fishery is a gonad (roe) fishery. Population levels in most areas are higher than can be supported by the available food (kelp) and, as a result, many of the urchins have poor or no gonad development. Since only those individuals with the highest quality gonads are targeted by the fishery, there is a natural reserve of animals that remain after commercial harvest that consists of urchins smaller than the minimum size limit, urchins with poor quality gonads. Urchins that are located in cracks and crevices and at deeper than safe diving depths, are inaccessible to harvesters, and represent additional reserves.

Sea otter populations are expanding in B.C. and, as sea otters are a major predator on Green Sea Urchins, they are expected to have impacts on the populations in some areas of the coast. Currently the fishery for green urchins is concentrated along the inside waters of Vancouver Island while the main sea otter populations exist along the outer exposed areas of Vancouver Island and the Central Coast.

In some areas of the BC coast there is an overabundance of Urchins which may negatively impact ecosystem function.

## **2.6. Precautionary Approach**

The Department is implementing the Sustainable Fisheries Framework (SFF), which is a toolbox of policies for DFO and other interests to sustainably manage Canadian fisheries in order to conserve fish stocks and support prosperous fisheries.

Fisheries worldwide are under increasing pressure, creating challenges for policy makers, resource managers, and industry leaders to make informed decisions regarding the conservation, recovery, and wise management of these resources. DFO held consultations throughout Canada in 2007 and 2008 to develop strategies to ease ecosystem pressures and enhance the capacity of the resource to sustain growing industry needs. Conservation policies have been developed to implement the ecosystem and precautionary approaches to fisheries management.

The fishery decision-making framework, incorporating the precautionary approach policy, applies to key harvested fish stocks managed by DFO, including commercial, recreational, or subsistence fisheries and can be found on the internet at:

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

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

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

The framework requires that a harvest strategy be incorporated into respective fisheries management plans to keep the removal rate moderate when the stock status is healthy, to promote rebuilding when stock status is low, and to ensure a low risk of serious or irreversible harm to the stock. It also requires a rebuilding plan when a stock reaches low levels.

In general, the precautionary approach in fisheries management is about being cautious when scientific knowledge is uncertain, and not using the absence of adequate scientific information as a reason to postpone or fail to take action to avoid serious harm to fish stocks or their ecosystem. This approach is widely accepted as an essential part of sustainable fisheries management.

The most recent stock assessment (DFO 2018) recommends reference points that are compliant with the DFO Precautionary Approach. The assessment suggests an empirical

approach for establishing biological reference points based upon lowest observed historical estimates of population density for legal-sized urchins. From time series data at index sites, the minimum observed mean density of legal-sized urchins, which the stocks recovered from without intervention by Fisheries Managers, was 0.9 urchins/m<sup>2</sup>. Based on results of the index site surveys, the assessments recommends adopting an USR = 0.9 legal-sized urchins/m<sup>2</sup> and a LRP = 0.45 legal-sized urchins/m<sup>2</sup>. Mean legal-size density in from the most recent index site surveys was 8.1 urchins/m<sup>2</sup> in Northeast Vancouver Island and 2.5 urchins/m<sup>2</sup> in Southeast Vancouver Island, indicating Green Sea Urchin stocks are in the Healthy Zone in both areas.

## **2.7. Research**

An understanding of the biology of Green Sea Urchins and the impacts of commercial harvest on Green Sea Urchin populations is required to ensure conservation and sustainable harvests while optimizing potential production in this fishery. Studies have included experimental growth and behavioural studies in the lab, developing reliable ageing techniques and conducting transect-quadrat surveys in various locations of the BC coast. From these fishery-independent surveys information is gathered on variations in population size distributions (for the whole size range, including sublegal-sized Green Sea Urchins), population densities, biomass estimates, preferred habitats (depth, substrate, and vegetation), length (or test diameter)-weight relationships and gonad (roe) weight and quality.

DFO Science is developing a multispecies benthic invertebrate survey protocol that is intended to gain efficiencies by combining single species survey protocols for the commercial dive fisheries. This may allow more spatial and temporal coverage than is possible under the current single species approach, and should enable the monitoring of stock abundance over time in commercially fished areas.

## **3. ECONOMIC PROFILE OF THE FISHERY**

The intent of this section is to provide a socio-economic context for the Green Sea Urchin fishery in BC. An overview of Aboriginal, recreational and commercial sectors of the fishery is provided.

### **3.1. First Nations**

The Allocation Transfer Program (ATP) and Pacific Integrated Commercial Fishery Initiative (PICFI) have relinquished existing commercial licence eligibilities from fish harvesters on a voluntary basis and re-issued these to eligible First Nation organizations as communal commercial licences. The ATP program facilitates the voluntary retirement of commercial licences and the issuance of licences to eligible Aboriginal commercial fishers in a manner that does not add to the existing fishing effort. The PICFI, announced in 2007, is aimed at achieving environmentally sustainable and economically viable commercial fisheries, where conservation is the first priority and First Nations' aspirations to be more involved are supported. The Government of Canada committed \$175 million over the first five years (2007-2012) to implement the initiative. The program was renewed on a temporary basis until Budget 2017 when it was announced that PICFI is to receive permanent long term funding of \$22.05 million annually.

Currently one (1) of the 49 (2%) of commercial Green Sea urchin licence eligibilities are held by First Nations for participation in the commercial fishery.

For more information on the Aboriginal Fisheries Strategy Allocation Transfer Program, contact a resource manager listed in Appendix 10 or see the internet at:

[www.pac.dfo-mpo.gc.ca/abor-autoc/atp-ptaa-eng.html](http://www.pac.dfo-mpo.gc.ca/abor-autoc/atp-ptaa-eng.html)

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

[www.pac.dfo-mpo.gc.ca/fm-gp/picfi-ipcip/index-eng.html](http://www.pac.dfo-mpo.gc.ca/fm-gp/picfi-ipcip/index-eng.html)

### **3.2. Recreational**

Recreational fishing may occur to provide food for personal use, as a leisure activity, or as a combination of the two. The recreational community includes local residents, multi-species charter operators and lodges, and visiting anglers and boaters. In 2016/17, 331,285 anglers fished in BC's tidal waters recreational fishery. Most (84%) were BC residents, with the remainder being divided between Canadians from outside BC and visitors to Canada (16%) (Fisheries & Oceans Canada 2017). These activities provide a range of benefits to the participants as well as contribute directly and indirectly to economic activity.

Recreational interest in harvesting shellfish species is directed mainly at crab, clam, prawns and shrimp. The recreational harvest of Sea Urchins is believed to be minimal.

### **3.3. Commercial**

Green Sea Urchins are harvested from both the West and East Coast of Canada. Green Sea Urchins on the West Coast of Canada are harvested by divers and sold whole and live, mainly to Japan where it is known as "uni". The product quality and perishability has restricted the fishery primarily to accessible South Coast Areas. The Japanese are the largest consumers of Green Sea Urchin but more recently sales have increased to the public and to local restaurants.

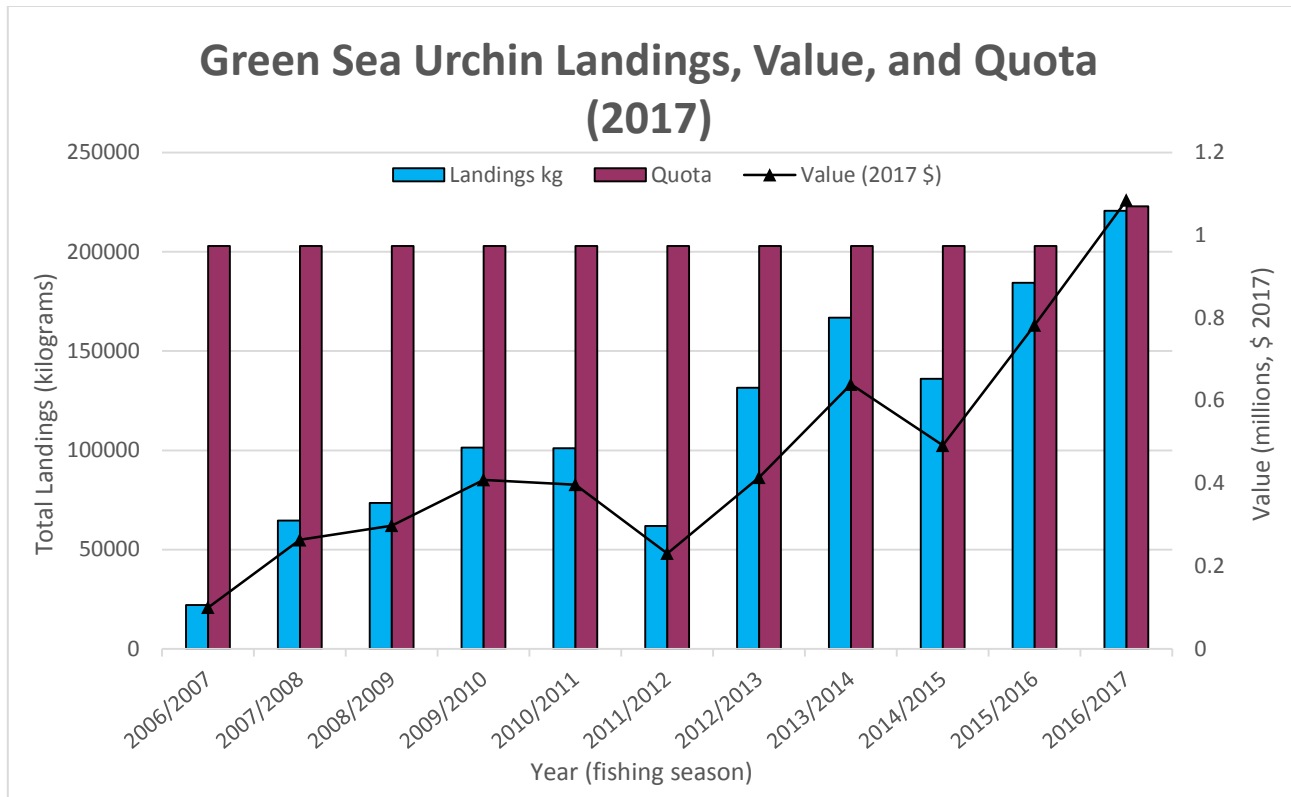
The Canadian industry has multiple competitors with the largest being the Illegal, Unregulated, Unreported (IUU) fishery in Russia. Russian urchins are fished close to Japan and are delivered to market fresher and are sold cheaper than the higher priced BC product.

- Canadian coastwide landings of Green Sea Urchin peaked in the 1992 season at approximately 954 Tonnes. Since then annual landings dropped consistently until the 2006/07 season. These drops were initially due to setting of Total Allowable Catches (TAC's) but continued to drop due to poor market conditions.
- Since 2006/07, the landings have shown a slow but steadily increasing trend, aside from small drops in landings in the 2011/12 and 2014/15 seasons. The highest landings on record since the 1994 season occurred in the 2016/17 season to 221 tonnes (over 98% of the TAC).
- Price was relatively constant from 2007/08 to 2011/12, with a small dip in price in the 2012/13 season. Over the past three years, price has been steadily increasing.
- The Coast wide quota increased in 2016/17 to 223 tonnes after remaining constant between the 2006/07 season and 2015/16 season at 203 tonnes.
- Competing markets, mainly from Russia, are identified as the largest threat to the sustainability of this fishery.

### 3.4. Viability and Market Trends

The best roe typically comes from sea urchins harvested between October and March, after which quality decreases as the sea urchins begin to spawn. The fishery generally operates from September to March with the highest market demand being between November and February.

Green Sea Urchin landings have been increasing somewhat steadily since the 2006/07 season harvest low. The 2016/2017 fishing season saw landings equating to over 98% of the TAC - the highest landings since the 2006/2007 low. The landed value for the Green Sea Urchin fishery has been generally increasing over the past 5 years.



Source: DFO Logbooks – multiple years, Shellfish Stock Assessments, quota is from Appendices of previous IFMPs.

### 3.5. Processing and Exporting

Green Sea Urchins are harvested for their reproductive organs (gonad) or “roe”. Green Sea Urchins are shipped live and whole, mainly to overseas markets in Japan, and, to a lesser extent, Hong Kong and Taiwan. The domestic market for Green Sea Urchins is small but increasing.

## 4. MANAGEMENT ISSUES

The following sections highlight the on-going or longer-term management issues that are being addressed in this fishery. Specific management objectives designed to mitigate these issues are

detailed in Section 5. There may be immediate or annual management issues that need addressing. However, when short-term issues arise, they will be detailed in this section.

#### **4.1. First Nations**

The level of First Nations' harvest of Green Sea Urchin for food, social and ceremonial purposes is unknown at this time. Catch monitoring programs are being developed in collaboration with some Aboriginal organizations.

#### **4.2. Recreational**

The level of recreational harvest of Green Sea Urchins is unknown at this time, although it is generally accepted by DFO to be minimal. Catch monitoring programs for all sport caught fish are being developed in collaboration with recreational fishery organizations and information on Green Sea Urchins will be included in the future.

#### **4.3. Commercial**

- Basic biological information regarding Green Sea Urchins is limited (i.e. age, growth, recruitment and migration) and is needed to support management objectives for this species. Increased monitoring of the commercially harvested populations through surveys is required to provide appropriate focus for assessment papers.
- Impacts of the commercial Green Sea Urchin fishery on the ability of First Nations to harvest for food, social and ceremonial purposes needs to be considered.
- A long-term strategy for collection of basic biological information, assessment techniques and management regimes is required.
- The IQ program does not fully address the distribution of fishing effort, quality-oriented harvest, continuous market supply and maintaining competitive access to the Japanese market.
- The impacts of sea otters on Green Sea Urchin populations need to be evaluated for future consideration in the management of this fishery.

#### **4.4. Conservation and Sustainability**

##### **4.4.1. Sea Otters**

The PUHA has identified Sea Otters as their biggest concern for the future sustainability of the Red Sea Urchin industry in BC. Currently, considering the location of the Green Urchin Fishery, Sea Otters have not significantly impacted the Green Urchin Fishery however this may change as the Sea Otter's range expands.

##### **4.4.2. Impacts of Climate Change**

Climate change will result in a wide variety of impacts, including rising sea level, loss of marine habitat, shifting distribution ranges for marine organisms and an imbalance between growth and recruitment within ecosystems. Ocean acidification is one of the climate impacts that could affect Urchin populations in BC. Oceans absorb anthropogenic carbon dioxide (CO<sub>2</sub>) which increases the acidity of the water. There are concerns about the ability of marine ecosystems to adapt to acidification. Organisms that form calcium carbonate (CaCO<sub>3</sub>) skeletons and shells, such as urchins, will be greatly limited in their ability to form their skeletons or shells since a decline in pH decreases the saturation state of CaCO<sub>3</sub>. Fecundity, juvenile survival and the ability to handle temperature stress may also be



impacted negatively by ocean acidification (Haigh et al. 2015). Another emerging issue has been higher than normal water temperatures over the last few years (Chandler et al. 2016). Warmer water temperatures cause the amount of dissolved nitrogen in seawater to decrease leading to reduced growth rates of kelp. Kelp, the main food source of Urchins, recruits most successfully in areas with continuously cold, high nutrient waters. Higher water temperatures may also place physiological stress on Urchins and could lead to increased instances of disease.

#### 4.4.3. Disease

In the spring of 2016 sick or dying urchins were observed along the North and Central coasts of BC. Some urchins were still attached to the substrate but were missing all or a portion of their spines and some had already died. Samples were collected from afflicted individuals and were sent in for testing. Preliminary examination of the samples done by a disease expert at DFO suggests that the urchins were suffering from ‘bald urchin disease’. This disease has been reported in species of urchins all over the world. It has been hypothesized that increasing sea temperature will lead to an increase in the frequency of disease outbreaks due to decreased host immunity, increased virulence of pathogens or pathogen range expansion (Burge et al., 2014).

Large scale disease events, such as what was seen with the ‘sea star wasting disease’ in 2014 and 2015, could have a large impact on Urchin stocks in BC.

### 4.5. Ecosystem

#### 4.5.1. Overabundance of Urchins (Urchin Barrens)

There are some areas of the BC coast where there are large areas of Sea Urchin overabundance (urchin barrens). Urchin barrens are detrimental to the ecosystem since the combined grazing activity of the urchins inhibits the growth of kelp and sessile invertebrates, which in turn affects other species that may rely on kelp and/or sessile invertebrates for food and/or habitat. Urchins also directly compete with other herbivores such as abalone, snails and other species of urchins for food resources. Harvesters do not typically harvest urchins out of barrens since the gonad quality is low due to a lack of food. Only a small portion of the population located right below the kelp line (where food is abundant) is taken.

#### 4.5.2. Depleted Species Concerns

The Green Sea Urchin fishery is a selective fishery and there are no concerns or potential impacts on depleted species.

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

The Northern abalone is listed as Endangered under the *SARA*, and is a species that is often found in the same habitat as Urchins. All harvest of Northern Abalone is illegal, including

commercial and recreational harvest and harvest for food, social and ceremonial harvest purposes.

If any harvest or harassment of Northern Abalone is observed, please call DFO's Observe, Record and Report line as soon as possible at 1-800-465-4336.

Endangered, threatened, and special concern species in Pacific region currently listed under the SARA can be found at:

<http://dfo-mpo.gc.ca/species-especes/sara-lep/index-eng.html>

#### 4.5.3. Oceans Management

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.

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

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

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

The Government of Canada is committed to protecting 10% of Canada's marine and coastal areas by 2020. The 2020 marine conservation target is both a domestic target (Canada's Biodiversity Target 1) and an international target as reflected in the Convention on Biological Diversity's Aichi Target 11 and the United Nations General Assembly's 2030 Agenda for Sustainable Development under Goal 14.

To meet these targets, Canada is establishing MPAs, National Marine Conservation Areas, marine National Wildlife Areas and "other effective area-based conservation measures" ("other measures"), in consultation with industry, non-governmental organizations, and other interested parties.

An overview of the DFO tools, including a description of the role of fisheries management measures that qualify as other measures, is available on the internet at:

[www.dfo-mpo.gc.ca/oceans/mpa-zpm-aoi-si-eng.html](http://www.dfo-mpo.gc.ca/oceans/mpa-zpm-aoi-si-eng.html)

More information on the background and drivers for Canada's marine conservation target is available on the internet at:

[www.dfo-mpo.gc.ca/oceans/conservation/index-eng.html](http://www.dfo-mpo.gc.ca/oceans/conservation/index-eng.html)

*Marine Protected Areas (MPAs)*: DFO is responsible for designating Marine Protected Areas (MPAs) under Canada's *Oceans Act*. Under this authority, DFO has designated three MPAs in the Pacific Region, the SGaan Kinghlas-Bowie Seamount, Endeavour

Hydrothermal Vents and the Hecate Strait/Queen Charlotte Sound Glass Sponge Reefs. All three areas are offshore and do not include Sea Urchin fishing areas.

Work is ongoing also to consider MPA designation for the Race Rocks area off Rocky Point south of Victoria currently designated as a Provincial Ecological Reserve. This area is already closed for commercial Sea Urchin harvest.

In May 2017, DFO announced a new Area of Interest (AOI) within the Offshore Pacific Bioregion off the coast of BC, with the intention of making it one of Canada's largest Marine Protected Areas by 2020. This Offshore Pacific AOI is an important part of DFO's national approach to achieve the Government of Canada's Marine Conservation Targets to increase Canada's marine and coastal protected areas to 10% by 2020. Since this AOI is offshore, it does not overlap with any Sea Urchin fishing areas. More information on the Offshore Pacific AOI can be found on the internet at: <http://www.dfo-mpo.gc.ca/oceans/aoi-si/offshore-hauturiere-eng.html>

More information on MPAs can be found at: <http://www.dfo-mpo.gc.ca/oceans/networks-reseaux/index-eng.html>

#### *Northern Shelf Bioregion MPA Network*

The *Oceans Act* mandates the Minister of Fisheries and Oceans with leading and coordinating the development and implementation of a national system (or network) of MPAs. The National Framework for Canada's Network of MPAs provides strategic direction for the design of a national network of MPAs that will be composed of a number of bioregional networks. This is an important step towards meeting Canada's domestic and international commitments to establish a national network of MPAs. Regionally, the Canada-British Columbia MPA Network Strategy has been developed jointly by federal and provincial agencies and reflects the need for governments to work together to achieve common marine protection and conservation goals. Bioregional MPA network planning will identify new areas of interest for protection by DFO, Parks Canada, Environment and Climate Change Canada (ECCC), the Province of BC, and any other agencies with a mandate for protecting marine spaces.

The Province of BC, the Government of Canada and 17 First Nations are working together to implement the Strategy in the Northern Shelf Bioregion, which extends from the top of Vancouver Island (Quadra Island/Bute Inlet) and reaches north to the Canada - Alaska border. This bioregion has the same footprint as the Pacific North Coast Integrated Management Area (Section 4.4.2.7). Ocean Advisory Committees have been established to provide input and advice on key elements of the planning process. The committees include broad representation from interested stakeholders, supporting dialogue and building shared understanding on MPA network planning.

Sites identified for marine conservation through the network planning process will contribute to the Government of Canada's commitment to protecting 10% of marine and coastal areas by 2020. Future MPAs in this network may overlap or include Green Sea Urchin fishing areas depending on the type and nature of the MPA.

More information on MPA Network Planning can be found at:

<http://mpanetwork.ca/bcnorthernshelf/whats-happening/>

### Gwaii Haanas and Strait of Georgia National Marine Conservation Area Reserves

Gwaii Haanas National Park Reserve, National Marine Conservation Area Reserve, and Haida Heritage Site is a 5,000 km<sup>2</sup> land and sea protected area in the southern portion of Haida Gwaii, approximately 100 kilometers off the north coast of BC. The Haida Nation declared a Haida Heritage Site in 1985. The terrestrial part of Gwaii Haanas was designated a National Park reserve by the Government of Canada soon after. In 2010, following an extensive public consultation process, the marine area of Gwaii Haanas was given the designation of National Marine Conservation Area Reserve.

Gwaii Haanas is managed by the Archipelago Management Board, a cooperative body made up of equal representation from the Government of Canada (represented by DFO and Parks Canada) and the Council of the Haida Nation. The Gwaii Haanas marine area is currently managed under the Interim Management Plan and Zoning Plan, which includes “balancing protection and ecologically sustainable use” in its guiding principles. The Zoning Plan identifies six areas that are closed to commercial and recreational fishing. These closures can be found in Section 5 of Appendix 1.

Development of a Land-Sea-People Management Plan for the Gwaii Haanas National Marine Conservation Area is underway. The Management Plan and zoning process will be developed in consultation with key stakeholders. Annual fishing plans will be developed in consultation through DFO’s established integrated fisheries planning and advisory processes. The management plan is due to be finalized in 2018. The final zoning plan could lead to in-season management changes. DFO will make every effort to advise stakeholders of any such changes in advance of changes being implemented.

Users of the Gwaii Haanas marine area should be aware that adjacent land is managed under the authority of the *Canada National Parks Act* and its regulations and, as specified in the Gwaii Haanas Agreement (1993), there is “no extraction or harvesting by anyone of the resources of the lands and non-tidal waters of the Archipelago for or in support of commercial enterprise”. There are specific requirements for visiting the terrestrial portion of Gwaii Haanas, and advanced planning is necessary. Please contact the Gwaii Haanas administration office at 1-877-559-8818 for further information.

Parks Canada, in partnership with the Government of British Columbia, launched a feasibility assessment for a NMCA reserve in the southern Strait of Georgia in 2004. Since then, consultations with First Nations, key stakeholders, communities and the public have occurred. Informed by those discussions, a proposed boundary for consultation was announced by the provincial and federal Ministers of Environment in 2011. Since 2011, the two governments have been consulting with First Nations, local governments and industry. A preliminary concept is currently being developed to help advance consultations on the feasibility assessment. If the results of the feasibility assessment indicate that establishment of an NMCAR is practical and feasible, an establishment agreement between the Governments of Canada and BC will be negotiated and an interim management plan developed. If the NMCAR is determined to be feasible, further consultations related to establishment agreements and Aboriginal rights will also take place with First Nations. Commercial and recreational fishing sectors, communities, landowners, recreational and environmental organizations and other stakeholders will also have opportunities to provide input in the development of the interim management plan. For more information on this proposed NMCAR please see:

<http://www.pc.gc.ca/en/amnc-nmca/cnamnc-cnmca/dgs-ssg>

*Cold-Water Coral and Sponge Conservation Strategy:* DFO's Pacific Region Cold-Water Coral and Sponge Conservation Strategy encompasses short and long-term goals and aims to promote the conservation, health and integrity of Canada's Pacific Ocean cold-water coral and sponge species. The Strategy also takes into consideration the need to balance the protection of marine ecosystems with the maintenance of a prosperous economy. It was created with input from stakeholders throughout the Pacific Region and will help regional partners and stakeholders to understand how DFO's existing programs and activities tie into cold-water coral and sponge conservation. Green Sea Urchins are collected by hand and the fishery occurs in depths shallower than 20 meters. Due to these factors, the Green Urchin fishery is unlikely to have an impact on coral and sponges.

The Cold-Water Coral and Sponge Conservation Strategy is available on the internet at:

<http://waves-vagues.dfo-mpo.gc.ca/Library/344719.pdf>

More information on the occurrence, ecological function, and sensitivity to fishing of coldwater corals and sponges (DFO CSAS Sci. Adv. Rep. 2010/041; DFO CSAS Res. Doc. 2010/067) is available on the internet at:

[www.meds-sdmm.dfo-mpo.gc.ca/csas-sccs/applications/publications/index-eng.asp](http://www.meds-sdmm.dfo-mpo.gc.ca/csas-sccs/applications/publications/index-eng.asp)

*Scott Islands Marine National Wildlife Area:* Under the *Canada Wildlife Act*, Environment Canada may establish marine National Wildlife Areas (NWAs). The Scott Islands proposed Marine National Wildlife Area, located off the northern tip of Vancouver Island, is being considered for designation through amendment to the *Wildlife Area Regulations*. DFO would continue to regulate and administer fisheries within the proposed area. Environment Canada and DFO will develop a collaborative approach and agreement regarding management of fisheries in the area.

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

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

The endorsement of the PNCIMA plan supports the Government of Canada's commitment to collaborative oceans management for the Pacific North Coast and provides a joint federal-provincial-First Nations planning framework for conservation and management of human activities in the Pacific North Coast. The plan includes marine protected area network development as a planning priority. It is anticipated that the network development will support the Government of Canada's commitment to protecting 10% of Canada's marine and coastal areas by 2020.

The Pacific North Coast Integrated Management Area Plan is available online at: [www.pncima.org](http://www.pncima.org).

#### 4.5.4. Gear Impacts

Green Sea Urchins are harvested by hand picking while diving. Suction devices are not permitted. It is believed that there are no habitat impacts from the gear used in this fishery.

## 5. OBJECTIVES

Sections 5.1 to 5.3 and 5.5 outline the “longer term” objectives for this and other invertebrate fisheries in BC. Section 5.4 describes the species-specific and “shorter term” objectives for Green Sea Urchins.

### 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 the Department 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. Green Sea Urchin**

### 5.4.1. Stock Conservation

A comprehensive understanding of the biology of Green Sea Urchins and the impacts of commercial harvest on Green Sea Urchin populations is required in order to ensure conservation and sustainable harvests in this fishery. Studies have included biomass estimates through transect surveys in various locations of the BC coast, and experimental harvest and study areas where populations are manipulated to examine urchin growth, migration, and recruitment.

A method to accurately determine the age of Green Sea Urchins has yet to be fully developed. In BC, an age validation project for Green Sea Urchins was initiated in 2001, however, work on the project ceased in 2007 due to funding constraints and competing priorities. Fisheries and Oceans Canada strives to revive research on age determination of Green Sea Urchins, as resources become available. Fisheries and Oceans Canada and the Research Subcommittee will continue to work toward a better understanding of the age of Green Sea Urchins in BC.

Given that we know little about the age of Green Sea Urchins, the Research Subcommittee may consider prioritizing the assessment of spatial and seasonal juvenile growth, survival and recruitment. This information could assist managers in determining the appropriate level of fishing pressure by time and area. Appropriate techniques for the assessment of juvenile recruitment are imperative for fisheries such as sea urchins, where recruitment is inconsistent throughout the fishing areas. An area devoid of juvenile Green Sea Urchins could indicate that the area is vulnerable to over-fishing.

### 5.4.2. Sustainability

There are no concerns for the sustainability of the Green Sea Urchin fishery at this time. The fishery is managed conservatively. The fishery currently occurs only in limited areas on the South Coast of BC.

### 5.4.3. Ecosystem

The Green Sea Urchin fishery is selective and the harvest rates are conservative. It is believed that harvesting practises have little impact on the surrounding ecosystem. However, In some areas of the BC coast there is an overabundance of Urchins which may negatively impact ecosystem function. See sections 4.5.1

### 5.4.4. Social, Cultural and Economic Considerations

#### **5.4.4.1. First Nations**

The Department will 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: <http://www.pac.dfo-mpo.gc.ca/abor-autoc/index-eng.html> or [Appendix 3](#).

#### **5.4.4.2. Recreational**

The Department will continue to provide opportunities for a recreational fishery for Green Sea Urchins. For more information, see [Appendix 4](#).

#### **5.4.4.3. Commercial**

The Department will continue to work collaboratively with Industry, First Nations organizations and other stakeholders to ensure conservation and sustainability of the Green Sea Urchin resource and fishery. Management of the Green Sea Urchin resource will progress from a precautionary regime to one based on better biological information, through assessment and application of data collected from harvest logs, population surveys and research areas. For more information, see [Appendix 6](#).

#### **5.4.4.4. Aquaculture**

Recognizing both the potential for aquaculture to benefit Canadians and the need to ensure the sustainable use of aquatic resources, Cabinet endorsed the Federal Aquaculture Development Strategy (FADS) in 1995. Building on FADS and more recent opportunities and challenges associated with aquaculture development, Fisheries and Oceans Canada released the “Aquaculture Policy Framework”. The policy framework recognizes aquaculture as a legitimate use of land, water and aquatic resources and the importance of providing aquaculturists with predictable, equitable and timely access to the aquatic resource base, including access to biological materials such as broodstock and seedstock.

In May 2004 Fisheries and Oceans Canada released the “National Policy on Access to Wild Aquatic Resources As it Applies to Aquaculture” to facilitate access to wild fish and aquatic plant resources for aquaculture purposes to support sustainable development of the industry. The policy is available from the following website:

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

Requests to access the wild Green Sea Urchin resource for the purpose of aquaculture must be addressed to Fisheries and Oceans Canada and supported by a project proposal. For more information on aquaculture or access to brood or seed stock, please contact the Aquaculture Management Division (see [Appendix 10](#)).



## **6. ACCESS AND ALLOCATION**

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

### **6.1. First Nations**

Under the commercial IQ program, two percent of the coast-wide TAC for Green Sea Urchins is reserved during planning for First Nations fisheries for food, social and ceremonial (FSC) purposes and domestic purposes under treaty. Additional allocations of Green Sea Urchins will be provided to First Nations who demonstrate that their needs are not being met. To date there are no limits on the Aboriginal harvest of Green Sea Urchins for these purposes. Fisheries and Oceans Canada is confident that with the precautionary approach to this fishery, the reserved allocation of TAC and the provision of additional allocations where necessary, First Nations in all areas will have sufficient opportunities to harvest Green Sea Urchins for food, social and ceremonial purposes.

### **6.2. Recreational**

The daily limit for urchins (aggregate of all species) is 12 with a possession limit of 24.

### **6.3. Commercial**

The annual commercial Green Sea Urchin total allowable catch (TAC) for 2018/21 is 578,200 lbs. (262.3 tonnes). The commercial TAC provides for an annual Individual Vessel Quota (IVQ) of 11,800 lbs.

### **6.4. Aquaculture**

The first priority in managing fish stocks is conservation followed by First Nations obligations. Beyond that, the needs of aquaculturists will be given equitable consideration to those of other users in the commercial and recreational sectors.

DFO will aim to facilitate access for relatively low numbers of wild juvenile or adult fish for limited time periods (e.g., for broodstock development), where populations would face insignificant to low risk from the additional harvest pressure.

## **7. MANAGEMENT MEASURES FOR THE DURATION OF THE PLAN**

See the Management Measures (Harvest Plans), Appendix 3 to 6 for detail on the following:

- Total Allowable Catch (TAC);
- Fishing Seasons/Areas;
- Size Limits
- Control and Monitoring of Removals
- Licensing

## **8. SHARED STEWARDSHIP ARRANGEMENTS**

### **8.1. Commercial**

The PUHA and DFO may undertake a collaborative agreement for annual stock assessment activities in support of the commercial fishery. The PUHA may fund density surveys and research activities and their costs include vessel time, diver salaries, travel costs and a salary for a biologist. DFO may also provide vessel and divers and provide in-kind support and data analysis.

The PUHA funds a dockside monitoring program and a hail program to track all commercial green sea urchin landings as required by conditions of licence for each licence holder.

Some coastal First Nations contribute time and expertise through collaborative research surveys with the PUHA and the Department by providing biologists, vessels and divers.

## **8.2. Fisheries and Oceans Canada**

One Stock Assessment and one Resource Management personnel are directly involved in this fishery. Contributions to the IFMP are provided by Fisheries Management, the Science Branch, the Shellfish Data Unit, Conservation and Protection, the Pacific Fishery Licence Unit, the Treaty and Aboriginal Policy Directorate, the Recreational Fisheries Division, the Oceans Directorate and numerous administrative personnel. Generally, all personnel are multi-tasked, i.e. fishery managers work on all dive fisheries. Therefore, costs incurred by the Department to manage this fishery are difficult to assess.

## **9. COMPLIANCE PLAN**

### **9.1. Overview**

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

[www.dfo-mpo.gc.ca/fm-gp/enf-loi/index-eng.htm](http://www.dfo-mpo.gc.ca/fm-gp/enf-loi/index-eng.htm)

The enforcement policy and activities of the Department are the responsibility of the Conservation and Protection program (C&P). Fishery officers and marine enforcement officers working throughout the Pacific Region carry out enforcement activities for the C&P program. First Nations fishery guardians may assist DFO Fishery Officers in a number of locations where joint enforcement protocols are in place. Observers designated by the Department complement enforcement staff by performing a monitoring and verification function.

Enforcement of the Green Sea Urchin fishery will remain a low priority to Fisheries and Oceans Canada. C&P staff will pursue opportunities to monitor and enforce issues and problems related to this fishery in conjunction with the monitoring and enforcement activities dedicated to the identified priority fisheries in the Pacific Region. This industry is mostly self-enforcing and, because of the present management principles, conservation is not an issue.

In general, compliance with the regulations and Conditions of Licence in the Green Sea Urchin commercial fishery is good, largely due to dockside validation, mandatory harvest logs and validation logs. Enforcement actions have resulted in charges in past years and misreporting may lead the Department to make management changes in the fishery to reduce problems.

Users of the resource have a responsibility to report violations. Any suspected or actual fisheries, wildlife or pollution violations can be quickly and discretely reported to the

appropriate enforcement officer by using the toll free observe, record and report hotline. This toll free number is available 24 hours a day.

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

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

## **9.2. Main Program Activities**

### **9.2.1. In-season**

Boarding's are conducted by at-sea fishery officers operating program vessels, marine enforcement officers operating Canadian Coast Guard (CCG) vessels and charter patrolmen on a variety of contracted vessels.

Commercial fishing vessels are boarded and checks are conducted for licensing of the vessel and participants, approved containers and tagging of harvested product and harvest log completion.

Packer vessels are checked for licensing compliance and to ensure adherence to the Conditions of Licence (requirements for containers, tags, and harvest log data).

### **9.2.2. Dockside Monitoring**

Commercial vessels and packer vessels are checked at dockside to ensure compliance with Conditions of Licence and to provide verification of all catch.

### **9.2.3. Vehicle Inspection**

Transport trucks are inspected during fishing seasons in concert with other enforcement agencies. They may be inspected at plants, loading and offload sites and other control points.

### **9.2.4. Fishery Patrol Vessels**

All at-sea patrols will be conducted using CCG patrol vessels staffed with marine enforcement officers and/or fishery officers and program vessels (primarily seven metre rigid hull inflatable boats) with fishery officers on board. Patrols will be conducted in both open and closed areas as priorities allow.

### **9.2.5. Air Surveillance**

Patrol coverage using charter aircraft is utilized by Fisheries and Oceans Canada to identify concentrations and distribution of fishing effort. In large geographical areas this allows for a better utilization of C&P resources.

Flight reports, photographs and other data collected from over flights are readily available to Departmental managers and fishery officers through an intranet-based flight information system. Digital images of vessels will be collected and added to a web-based licence system, providing fishery officers ready access to recent vessel photographs to assist in field identification.

## **9.3. Enforcement Issues and Strategies**

In the following table: PFR: Pacific Fisheries Regulations, 1993, F(G)R: Fisheries (General) Regulations, S: Section.

<b>ISSUE</b>	<b>SECTION</b>	<b>STRATEGY</b>
Licensing Verification <ul style="list-style-type: none"> <li>• Vessel licensed.</li> <li>• Experimental licence.</li> <li>• No Fisher Registration Card (FRC).</li> <li>• Fail to produce FRC.</li> </ul>	PFR S.22 F(G)R S.52 F(G)R S.68(1) PFR S.25 F(G)R S.11	At-sea and dockside inspections will occur when opportunities exist. These inspections may include checks of all licensing documents on board the vessel to ensure compliance with the regulations.
Fishing during closed time/area.	PFR S.63	Patrols utilizing patrol vessels will be pursued when opportunities exist. Possibilities may exist to use the regional enforcement charter aircraft in co-ordination with other patrols scheduled for priority fisheries.
Size Limit	PFR S 70(1)	At sea and dockside inspections will be pursued when opportunities exist.
Fail to provide proper landing and hail information, lack of notification for change of area, cancellation of trip, or incorrect reporting of area fished.	F(G)R S.22(7)	At sea and dockside inspections will occur when opportunities exist. Investigations will occur on an opportunistic basis after C&P have been notified by fisheries management that a violation has occurred. The investigation will be pursued when larger priorities permit. Possibilities may exist to use the regional enforcement charter aircraft in co-ordination with other patrols scheduled for priority fisheries, to track vessels in the fishery.
Fail to maintain a Validation & Harvest Logbook.	F(G)R S.22(7)	At sea and dockside inspections will occur when opportunities exist. Investigations may also occur on an opportunistic basis after C&P have been notified by fisheries management that a violation has occurred. The investigation will be pursued when larger priorities permit.
Marking and tagging of pick bags, and any other type of enclosures containing harvested Green Sea Urchins.	F(G)R S.22(7)	At sea and dockside inspections will occur when opportunities exist.
Landings validated at time of offloading.	F(G)R S.22(7)	Dockside inspections and monitoring will be pursued when opportunities exist.

ISSUE	SECTION	STRATEGY
Fail to carry on-board observer when requested by Fisheries and Oceans Canada.	F(G)R S.22(7)	At sea and dockside inspections will occur when opportunities exist.

## 10. PERFORMANCE REVIEW

Performance indicators are reported in the Post-Season Review (Appendix 1).

### 10.1. Stock Assessment and Research

Stock Assessment activities undertaken during the previous season will be outlined.

### 10.2. First Nations Fishery

The post season review may include outcomes of meetings with First Nations on specific issues, and green sea urchin information contributing to, or resulting from, the treaty process.

### 10.3. Recreational Fishery

The post season review may include interactions with the recreational fishing representatives of the Sport Fishing Advisory Board (SFAB). Any recommendations and action taken in response by DFO will be described.

### 10.4. Commercial Fishery

The delivery of the commercial fishery will be assessed by performance measures including the number of vessels participating in the fishery, the number of licence eligibilities fished, the amount of green sea urchins landed and the estimated value of the fishery. Input from representatives at the Green Sea Urchin Sectoral Committee meetings may also be included.

### 10.5. Compliance

The post season review may include time spent attending to enforcement of the fishery. 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.

## 11. REFERENCES

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## 12. GLOSSARY

Area	Defined in Section 2 of the <i>Pacific Fishery Management Area Regulations</i> . A map of Pacific Fishery Management Areas is available on the Department's Internet site at: <a href="http://www.pac.dfo-mpo.gc.ca/fm-gp/maps-cartes/areas-secteurs/index-eng.htm">http://www.pac.dfo-mpo.gc.ca/fm-gp/maps-cartes/areas-secteurs/index-eng.htm</a>
aquaculture	The process of spawning animals and rearing the progeny to marketable size, involving some level of intervention (e.g. feeder, predator protection) by the aquaculturist.
catch verification program	A program designed to monitor, record, and verify catches, also called the Validation Program.
Communal Licence	Issued to First Nations organizations pursuant to the <i>Aboriginal Communal Fishing Licences Regulations</i> , to carry on fishing and related activities.

communal commercial licence	Issued to First Nations organizations pursuant to the <i>Aboriginal Communal Fishing Licences Regulations</i> for participation in the general commercial fishery. Licences issued are equivalent to the capacity of licences that have been retired under the Treaty and Aboriginal Policy Directorate Licence Retirement/Allocation Transfer Program.
Centre for Scientific Advice – Pacific (CSAP)	Centre for Scientific Advice - Pacific, chaired by DFO and including other federal and provincial government agency representatives and external participants.
Canadian Science Advisory Secretariat (CSAS)	Canadian Science Advisory Secretariat - coordinates the peer review of scientific issues for Fisheries & Oceans Canada. The different Regions of Canada conduct their resource assessment reviews independently, tailored to regional characteristics and stakeholder needs. CSAS facilitates these regional processes, fostering national standards of excellence, and exchange and innovation in methodology, interpretation, and insight.
IQ	Individual quota. In the Green Sea Urchin fishery, equivalent to 1/49th of the commercial total allowable catch (TAC).
Invertebrate	An animal without a backbone.
Landed or off-loaded	The transfer of Green Sea Urchins from a vessel in water to land.
Observer	An individual who has been designated as an observer by the Regional Director General for Pacific Region pursuant to Section 39 of the <i>Fishery (General) Regulations</i> .
PUHA	Pacific Urchin Harvesters Association
Quota Area	A defined portion of Pacific fisheries waters. Areas and Subareas, as described in the <i>Pacific Fishery Management Area Regulations</i> , are referenced in describing Quota Areas. Each Quota Area has a name, e.g. 13A, and is assigned a maximum allowable catch in pounds (lb.).
Service provider	An agency contracted by fish harvesters or their harvesters association to coordinate notification, catch validation, fishery monitoring, biological sampling, and data submission requirements. The service bureau may train and recommend candidates for certification by Fisheries and Oceans Canada as observers.
Stakeholder	All people and groups with an interest in the fisheries resource.
Stock assessment	Results of analyses of fisheries and research data used to evaluate the effects of fishing on a stock or population and to predict the reaction of populations to alternative management choices.
Subarea	As in Section 2 of the <i>Pacific Fishery Management Area Regulations</i>
TAC	Total allowable catch. The amount of catch that may be taken from a stock, determined by analytical procedures to achieve management objectives.
Tranship	The transfer of Green Sea Urchins from a vessel to another vessel.

Validated

Green Sea Urchins that have been weighed by an observer and the weight entered into the Green Sea Urchin Validation and Harvest Logbook, or an approved alternative log.



## **APPENDIX 1: POST-SEASON REVIEW**

Overall, the in-season management of the fishery over the 2016 to 2018 period was successful. No major issues were documented and in general, compliance with licence conditions and the catch validation program was good.

### **1. Stock Assessment and Research**

Density surveys were completed in the following areas:

- 2016: Portions of Management Areas 11, 12, 13 and 19.
- 2017: Portions of Management Area 20

For more information on any of these surveys please contact Janet Lohead or Dan Leus (see contacts in Appendix 10).

### **2. First Nations Fishery**

Catch information is collected by some First Nations, by fisheries program personnel or by Band administration offices. Fisheries and Oceans Canada (DFO) is working on initiatives to receive, store and manage shellfish food, social and ceremonial (FSC) harvest information. Some catch data have been collected under Aboriginal Fisheries Strategy (AFS) agreements. Sea urchins (any species) constitute roughly 3% of the reported catch by weight of any shellfish species (1991-2008). No concerns were voiced from First Nations about access to Green Sea Urchins for food, social and ceremonial purposes. No actions were taken.

### **3. Recreational Fishery**

No advice or comments were received from the recreational sector over the last three seasons. The amount of green sea urchins harvested by the recreational sector is unknown.

### **4. Commercial Fishery**

The 2017/18 fishery opened on September 1, 2017 in all Quota Management Areas (QMA) except Area 12. Harvesting in Area 12 started the week of Sept 25<sup>th</sup>. The majority of landings occur in December. The quota was achieved in QMA 12, 13A, 13D, 18, 19 and 20. The only area without landings was Area 11. Overall, at the time of finalizing this IFMP the harvest was 91% of the TAC. These are the second highest landings on record since the 1994 season.

Minimal amounts of Green Sea Urchin are processed each year; the majority is marketed live. Industry has continued to developed new markets including live local dock sales.

### **5. Compliance**

In general compliance with the catch validation program and other management programs was considered good. There was one high priority incident reported for the 2017/18 season for a vessel not hailing in.

### **6. Historic Information**

**Table 1.** History of Management Actions in the Green Sea Urchin Fishery, 1987 to 2017/18.

Timeline	
1987	<p>Dive fishery began. Scientific permits were issued, July 22 to December 31, to fishing vessels for harvest by diving.</p> <p>Logbooks were issued with permits to collect data on stock abundance and distribution. Permits were limited to the inside waters of Vancouver Island, Areas 12 to 19, 28 and 29. Some minor area closures for parks or study areas were in effect as for most dive fisheries.</p> <p>A precautionary minimum size limit of 40 mm was set as a condition of the permit.</p> <p>Sales slip data did not have a separate species code, so green and red sea urchin landings are mixed. As a result, landings have been estimated from logbook returns and hauls from processors.</p> <p>Effort was restricted by limiting the season to the months of traditional peak market demand for sea urchins, Oct.-Dec. and Jan.-Feb</p>
1988	<p>Sales data for green sea urchins was recorded with a separate species code.</p> <p>Conservative closure set Jan. 16 to Feb. 28 in subareas 13-1 to 13-3 due to the intensive fishery in a small area.</p> <p>A Z category (Z-A) licence for green sea urchins was introduced for the fall fishery which opened Oct. 1.</p> <p>Minimum size limit increased to 55 mm test diameter and set as a condition of licence. The season was limited again, Jan. 1-Feb. 28 and Oct. 1-Dec. 31.</p>
1989	<p>A conservation closure was set for subareas 12-1 and 13-29 to 13-40, north of Campbell River, Jan. 31-Feb. 28/89 due to heavy fishing pressure and a high incidence of undersized urchins landed.</p> <p>A consultative process was initiated (the Green Sea Urchin Sectoral Committee)</p>
1990	<p>Licence limitation for 1991 was announced with the eligibility criteria of landings of 9,072 kg (20,000 lb.) over the two year period 1988 and 1989. At least 33 vessels were expected to qualify before appeals were held.</p>
1991	<p>Licence limitation - 47 vessels qualified and 47 vessels reported landings.</p>
1992	<p><u>South Coast</u>: A conservation closure was set in the Kelsey Bay area, subareas 12-1, 13-32, 13-33 and 13-35, Feb. 25-Feb. 28. These subareas did not reopen for fall fishing until Dec. 7.</p> <p><u>North Coast</u>: Fishery open year round, no quotas.</p>
1993	<p>Licences increased to 49. Notification of fishing required. No suction devices. Additional permanently closed areas for parks and reserves.</p> <p><u>South Coast</u>: Reduced fishing times; Inside waters: season Jan. 4 to Jan. 28, 7 days/wk; Feb. 1 to Feb. 25, 4 days/wk, Mon.-Thurs. Fall fishery Nov. 1 to Dec. 16, 4 days/wk, Mon.-Thurs.; Dec. 6 to Dec. 30, 7 days/wk. Kelsey Bay limited to 7 days, Jan. 4 to 10. W.C.V.I.: season reduced to Oct. 4 to 28, 1992, 7 days/wk.</p> <p><u>North Coast</u>: 7 days/wk, season reduced to Jan. 1 to Feb. 28 and Oct. 1 to Dec. 31.</p>
1994	<p><u>South Coast</u>: A ceiling catch of 990,000 lbs (449 t) was set along with area quotas. Fishers requested to harvest 25% in Jan.-Feb. and the balance in Nov.-Dec. The days fishing were limited to four days/week (M-R) for some periods and others at 7 days/week.</p> <p><u>North Coast</u>: No quota set; season reduced to periods Jan. 1 to Feb. 28 and Nov. 1 to Dec. 31. Consideration will be given for spring/summer fisheries depending on roe quality and landings.</p>
Prior to 1995	<p>Maximum of 100 lbs. quota overage allowed for transfer</p>
1995/96	<p>Fishing licences changed to expire on May 31, 1996. No fishing occurred prior to Nov.</p> <p>Licence stacking allowed up to 3 licences per vessel.</p> <p>Landings must be weighed and validated by a Service Provider at the time of offloading.</p> <p><u>South Coast</u>: Pilot individual licence quota (IQ) system implemented with port validation (49 licences with IVQ 3.539 t). Area quotas also established, with total of 382,276 lb (173.4 t). Only Areas 12, 13, 17 to 20, and 28 open; other areas available under an exploratory protocol. Fishing season was Nov.</p>

	<p>20, 1995 to May 31, 1996.</p> <p><u>North Coast:</u> No individual quotas. Areas 3 and 4 only open from Nov. 20, 1995 to Jan. 31, 1996, with quota of 20,000 lbs (90.72 t). Other areas open to fishing only under an exploratory protocol.</p>
1996/97	<p>Harvest logs and validation forms combined onto one sheet. Biosamples (sample test measurements) collected by validators. Commercial fishery restricted to areas with a known catch history.</p> <p><u>South Coast:</u> IQ system still in effect (quota divided between 49 licence holders), with port validation. Area quotas established, with a total of 359,435 lb (163.0 t). Only Areas 11, 12, 13, 17 to 20 and 28 open; other areas available under an exploratory protocol. Fishing season was Nov. 12, 1996 to Jan. 31, 1997</p> <p><u>North Coast:</u> North Coast closed, except under an exploratory protocol.</p>
1997/98	<p>Two year Management Plan (October 15, 1997 to May 31, 1999). Biological sampling of commercial catch.</p> <p><u>South Coast:</u> Areas 11, 12, 13, 17 to 20 and 28 open from Nov. 10, 1997 to Mar. 15, 1998. Area quotas, with total of 366,079 lb (166.1 t) (IQ 7,471 lbs).</p> <p><u>North Coast:</u> North Coast closed, except under an exploratory protocol. Survey undertaken in Area 4.</p>
1998	<p>The West Coast Green Urchin Association conducted a stock assessment survey of a portion of Area 4 in the North; a commercial quota was set for the 1999/00 fishery based on the survey results</p>
1998/99	<p>Biological sampling of commercial catch.</p> <p><u>South Coast:</u> Areas 11, 12, 13, 17, 18, 19, 20, and 28 open from Nov. 10, 1998 to Mar. 15, 1999. Area quotas, with total of 366,079lb (individual quotas 7,471 lb), other areas available under an exploratory protocol.</p> <p><u>North Coast:</u> Total quota of 13,000 lbs allotted to Area 4 from Nov. 10, 1998 to Mar. 15, 1999, other areas available under an exploratory protocol.</p>
1999/00	<p>Biological sampling of commercial catch.</p> <p><u>South Coast:</u> Areas 11, 12, 13, 18, 19, and 20 open from Nov. 10, 1999 to Mar. 15, 2000. Area quotas, with total of 414,393 lbs (individual quotas 8,457 lbs), other areas available under an exploratory protocol.</p> <p><u>North Coast:</u> Total quota of 13,000 lbs allotted to Area 4 from Nov. 10, 1999 to Mar. 15, 2000, other areas available under an exploratory protocol.</p>
2000/01	<p>Biological sampling of commercial catch.</p> <p><u>South Coast:</u> Areas 11, 12, 13, 18, 19, and 20 open from Nov. 10, 2000 to Mar. 15, 2001. Area quotas, with total of 414,393 lbs (individual quotas 8,457 lbs), other areas available under an exploratory protocol.</p> <p><u>North Coast:</u> Total quota of 13,000 lbs allotted to Area 4 from Nov. 10, 2000 to Mar. 15, 2001, other areas available under an exploratory protocol.</p>
2001/02	<p>Biological sampling of commercial catch.</p> <p><u>South Coast:</u> Areas 11, 12, 13, 18, 19, and 20 open from Nov. 20, 2002 to Apr. 19, 2002. Due to unstable market conditions the season closing ate of March 15, 2002 was extended until Apr. 19, 2002. Area quotas, with total of 394,646 lbs (individual quotas 8,054 lbs), other areas available under an exploratory protocol.</p> <p><u>North Coast:</u> Available under an exploratory protocol.</p>
2002/03	<p>Biological sampling of commercial catch.</p> <p><u>South Coast:</u> Areas 11, 12, 13, 18, 19, and 20 open from Oct. 15, 2002 to Mar. 15, 2003. Area quotas, with total of 394,646 lbs (individual quotas 8,054 lbs), other areas available under an exploratory protocol.</p> <p><u>North Coast:</u> Available under an exploratory protocol.</p>
2003/04	<p>South Coast fishing areas included Areas 11, 12, 13, 18, 19, 20 with a TAC of 410,055 lb. Fishery ran</p>

	<p>from Nov 1, 2003 to March 1, 2004.</p> <p>No north coast activity</p>
2004/05	<p>South Coast fishing areas included Areas 11, 12, 13, 18, 19, 20 with a TAC of 410,055 lb. Fishery ran from Nov 1, 2004 to March 1, 2005.</p> <p>No north coast activity</p>
2005/06	<p>South Coast fishing areas included Areas 11, 12, 13, 18, 19, 20 with a TAC of 410,055 lb. Fishery ran from Nov 1, 2005 to March 1, 2006.</p> <p>No north coast activity</p>
2006/07	<p>South Coast fishing areas included Areas 12, 13, 18, 19 with a TAC of 447,174 lb. Fishery ran from Nov 1, 2005 to March 1, 2006.</p> <p>Areas 11 and 20 were removed from IFMP due to limited effort.</p> <p>Biological Sampling program suspended.</p> <p>Fisher Identification Number (FIN) required on harvest logs</p>
2007/08	<p>South Coast fishing areas included Areas 12, 13, 18, 19 with a TAC of 447,174 lb. Fishery ran from Nov 1, 2005 to March 21, 2006. An extension was approved past March 1.</p>
2008/09	<p>South Coast fishing areas included Areas 12, 13, 18, 19 with a TAC of 447,174 lb. The Fishery opened September 3, 2008 and closed March 31, 2009.</p>
2009/10	<p>South Coast fishing areas included Areas 12, 13, 18, 19 with a TAC of 447,174 lb. The Fishery opened September 11, 2009 and closed March 31, 2010. Last recorded landing was March 11, 2010.</p>
2010/11	<p>South Coast fishing areas included Areas 12, 13, 18, 19 with a TAC of 447,174 lb. The Fishery opened September 13, 2010 and closed August 31, 2011. Last recorded landing was April 8, 2011.</p>
2011/12	<p>South Coast fishing areas included Areas 12, 13, 18, 19 with a TAC of 447,174 lb. The Fishery opened September 1, 2011 and closed August 31, 2012. Last recorded landing was August 31, 2012. Developing live local dock sales.</p>
2012/13	<p>South Coast fishing areas included Areas 12, 13, 18, 19 with a TAC of 447,174 lb. The Fishery opened September 1, 2012 and closed August 31, 2013. Last recorded landing was August 30, 2013. Licence stacking limit waived.</p>
2013/14	<p>South Coast fishing areas included Areas 12, 13, 18, 19 with a TAC of 447,174 lb. The Fishery opened September 5, 2013 and closed August 31, 2014. Last recorded landing was August 22, 2014.</p>
2014/15	<p>South Coast fishing areas included Areas 12, 13, 18, 19 with a TAC of 447,174 lb. The Fishery opened September 1, 2014 and closed April 22, 2014. Last recorded landing was February 3, 2015.</p>
2015/16	<p>South Coast fishing areas included Areas 12, 13, 18, 19 with a TAC of 447,174 lb. The Fishery opened September 1, 2015.</p>
2016/18	<p>Two year IFMP: South Coast fishing areas included Areas 11, 12, 13, 18, 19 and 20 with a TAC of 491,764 lb.</p>

**Table 2.** Overview of annual green sea urchin applied quota, landings, value and effort, 1978 to 2018, as reported on Validation and Harvest logs. Since 2002, harvest logs have provided the best estimate of catch and fish slips are no longer used. Average landed value is determined from a subsample of fish slips or an estimation of average price is provided by Industry.

Year	Type and Number of Licences Available	Number of Vessels with Landings	Fishing Days	Average Fishing Days/Vessel	Quota (t)	Landings (lbs)	Landings (t)	Landed Value <sup>3</sup> (\$-10 <sup>3</sup> )	Whole Landed Value <sup>1</sup> (\$/t)	X CPUE (t/vessel day)	X CPUE (kg/diver hr)	Total Diver Hours	Total # Divers
1987	Permit 38 <sup>2</sup>	29	290	10.0			207	127	614	0.71	170	1,216	49
1988	Z 89	63	688	10.9			378	584	1,545	0.55	156	2,418	119
1989	Z 191	93	1,095	11.8			484	1,020	2,107	0.44	131	3,691	170
1990	Z 155	51	923	18.1			353	939	2,660	0.38	107	3,310	107
1991	Z 47	45	1,510	33.6			753	1,795	2,384	0.50	100	7,523	153
1992	Z 49	53	1,987	37.5			954	4,424	4,637	0.48	81	11,835	200
1993	Z 49	52	1,267	24.4			533	3,777	7,086	0.42	70	7,667	184
1994	Z 49	42	673	16.0	449*		221	2,122	9,602	0.33	70	3,161	102
1995/96	Z 45	39	500	12.8	173.4* (90.7**)		157	946	6,027	0.31	71	2,201	86
1996/97	Z 49	32	458	14.3	166.1		150	942	6,282	0.33	65	2,300	73
1997/98	Z 49	27	423	15.7	166.1		160	1,004	6,277	0.38	82	1,958	59
1998/99	Z 49	26	376	14.5	166.1		156	967	6,200	0.41	84	1,861	61
1999/00	Z 49	27	357	13.2	193.9		186	1,157	6,210	0.52	103	1,810	65
2000/01	Z 49	28	315	11.3	193.9		181	1,020	5,626	0.58	107	1,701	56
2001/02	Z 49	15	185	12.3	179.0		123	614	5,006	0.66	125	977	32
2002/03	Z 49	17	206	12.1	179.0		144	622	4,324	0.70	148	973	30
2003/04	Z 49	17	213	12.5	186.0	370,929	168	725	4,311	0.79	171	985	34
2004/05	Z 49	16	113	7.1	186.0	182,164	83	331	4,001	0.73	163	506	24
2005/06	Z 49	11	62	5.6	186.0	83,995	38	136	3,576	0.61	164	232	22
2006/07	Z 49	6	28	4.7	202.8	28,756	13	46	3,502	0.47	113	116	13
2007/08	Z 49	7	70	10.0	202.8	142,553	65	199	3,075	0.92	200	323	18
2008/09	Z 49	12	76	6.3	202.8	161,901	73	245	3,341	0.97	238	308	18
2009/10	Z 49	11	145	13.2	202.8	223,425	101	324	3,197	0.70	170	595	19
2010/11	Z 49	12	143	11.9	202.8	222,684	101	334	3,307	0.71	156	646	21
2011/12	Z 49	13	99	7.6	202.8	136,312	62	209	3,373	0.62	155	398	28
2012/13	Z 49	11	123	11.2	202.8	286,349	130	438	3,373	1.06	192	678	19
2013/14	Z 49	14	190	13.6	202.8	366,971	166	561	3,373	0.88	180	923	23
2014/15	Z 49	13	165	12.7	202.8	300,061	136	459	3,373	0.82	158	862	29
2015/16	Z 49	12	223	18.6	202.8	406,541	184	711	3,858	0.83	159	1,158	35
2016/17	Z 49	12	260	21.7	223.1	486,487	221	851	3,858	0.85	144	1,528	32
2017/18	Z 49	14			223.1	445,350	202	779	3,858				

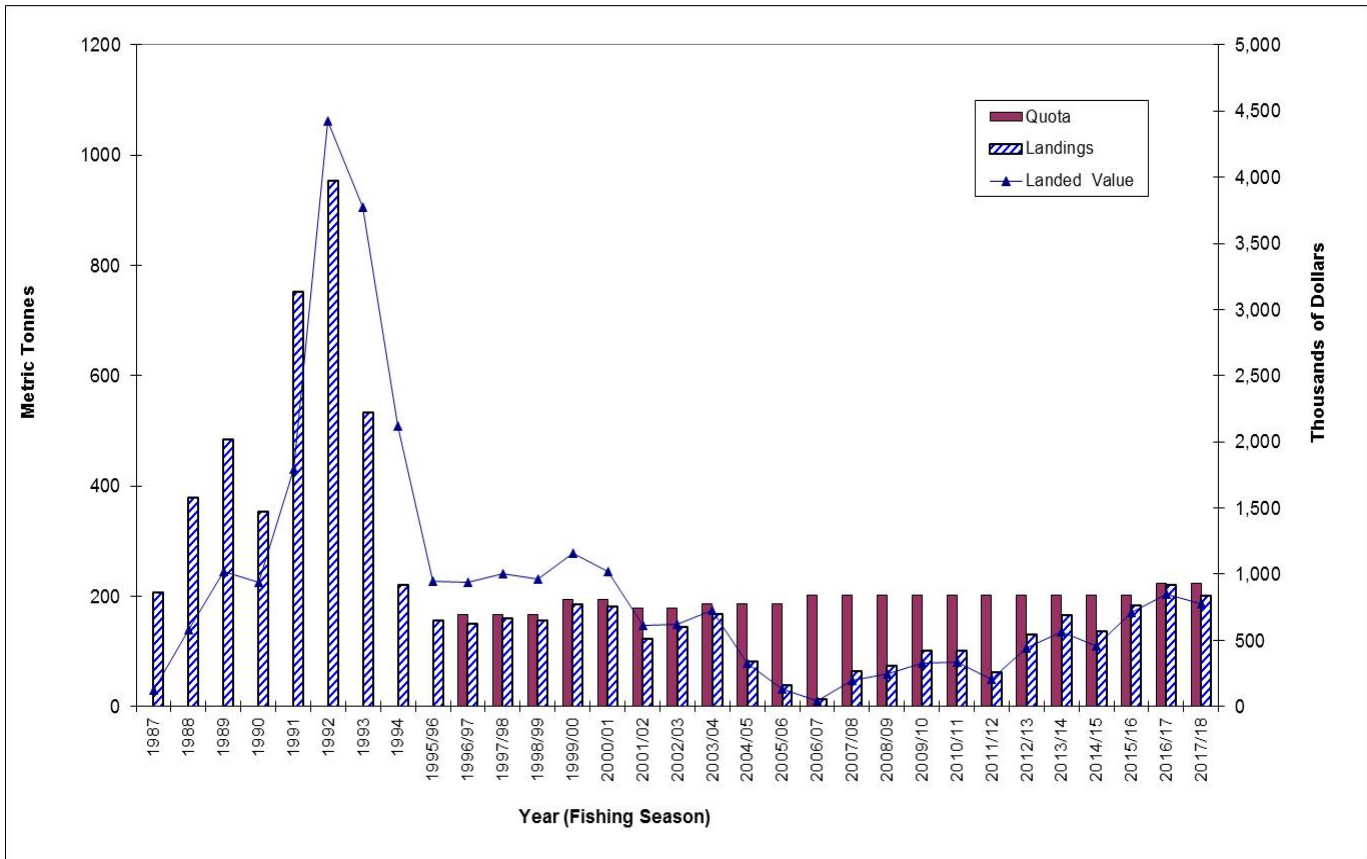
<sup>1</sup> from sales slip data  
<sup>2</sup> scientific permits were issued to 38 vessels for fall 1987 to spring 1988 fishery. Z licences were issued for the fall 1988 fishery.  
<sup>3</sup> Average Whole Landed Value (\$/t) \* Landings (t)  
\* south coast quota only  
\*\* north coast quota only

Some values have changed due to finalization of data

**Note:** Number of vessels with landings is greater than the industry report as licences were re-designated to different vessels inseason.

**Note:** 2015-2018 data preliminary

**Figure1:** Green Sea Urchin landings (tonnes), quotas (tonnes) and dollar value for 1987 to 2017/19 fishing seasons. (Note: 2015-18 values preliminary)



## APPENDIX 2: STOCK ASSESSMENT RESULTS

Stock assessments of Green Sea Urchins, generally performed every three years, involves analyzing data collected from both fishery-dependent and fishery-independent (surveys) sources and running the information through a Bayesian Biomass Dynamics Model (Waddell et al. 2010; DFO 2010; DFO 2014; DFO 2016; DFO 2018). The model uses median commercial catch per unit of effort (CPUE) for each fishing season for each of the two main Green Sea Urchin harvest locations: Northern Vancouver Island (NEVI; PFMA's 11, 12 and 13) and Southern Vancouver Island (SEVI; PFMA's 18,19 and 20). The CPUE's are calculated using commercial landing and effort data obtained from the harvesters' Validation and Harvest Logbooks. The model also uses Green Sea Urchin biomass estimates from index sites, calculated from fishery-independent surveys. All of this information is run through the Bayesian model to estimate probability distributions for Maximum Sustainable Yield (MSY).

A most recent stock assessment paper, reviewing all available data to date, was completed in the spring of 2018 (DFO 2018). The assessment recommends reference points that are compliant with the DFO Precautionary Approach. The assessment suggests an empirical approach for establishing biological reference points based upon lowest observed historical estimates of population density for legal-sized urchins. From time series data at index sites, the minimum observed mean density of legal-sized urchins, which the stocks recovered from without intervention by Fisheries Managers, was 0.9 urchins/m<sup>2</sup>. Based on results of the index site surveys, the assessments recommends adopting an  $USR = 0.9$  legal-sized urchins/m<sup>2</sup> and a  $LRP = 0.45$  legal-sized urchins/m<sup>2</sup>. Mean legal-size density in from the most recent index site surveys was 8.1 urchins/m<sup>2</sup> in Northeast Vancouver Island and 2.5 urchins/m<sup>2</sup> in Southeast Vancouver Island, indicating Green Sea Urchin stocks are in the Healthy Zone in both areas.

Mean biomass density (g/m<sup>2</sup>) estimates for both legal and sublegal-sized urchins from fishery-independent surveys in Area 12 are the second highest since the inception of the survey in 1995, and mean biomass density (g/m<sup>2</sup>) estimates for both legal and sublegal sized urchins from the Area 19 surveys have also remained higher than the first survey in 2008. With the exception of the peak CPUE in 2008-09, median CPUE's have remained relatively constant for the past decade at levels higher than those observed at the onset of the fishery. Population structure also appears healthy with a broad range of test diameters present in both surveyed areas.

As a result of the most recent stock assessment and quota options paper DFO Science advises that maintaining quotas at their current levels would represent a <3% risk of exceeding the true MSY. The results are similar to the previous stock assessment paper.

The most recent stock assessment paper was still in preparation when the IFMP was published. It will be available on the following website when final.

<http://www.meds-sdmm.dfo-mpo.gc.ca/csas-sccs/applications/publications/index-eng.asp#RES>

The latest stock assessment advisory report is available at:

[http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2014/2014\\_052-eng.html](http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2014/2014_052-eng.html)

## **APPENDIX 3: GREEN SEA URCHIN FIRST NATIONS MANAGEMENT MEASURES**

### **1. OVERVIEW OF THE FISHERY**

Fisheries & Oceans Canada'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. Fisheries & Oceans Canada 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. These may include, but are not limited to, habitat enhancement, FSC catch monitoring and enforcement, fish management and community research.

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

First Nations may also participate in the commercial fishery.

### **2. MANAGEMENT MEASURES FOR FIRST NATIONS' FISHERIES**

Under the Individual Quota (IQ) program for the Green Sea Urchin fishery, two percent of the coast-wide total allowable catch (TAC) for Green Sea Urchins is reserved, for planning purposes, for First Nations fisheries for food, social and ceremonial (FSC) purposes and domestic purposes under treaty. Additional allocations of Green Sea Urchins will be provided to First Nations who demonstrate that their needs are not being met. Fisheries and Oceans Canada is confident that with the precautionary approach to this fishery, the reserved allocation of TAC, and the provision of additional allocations, where necessary, First Nations in all areas will have sufficient opportunities to harvest green sea urchins for food, social and ceremonial (domestic) purposes.

There is no size limit for the First Nations Green Sea Urchins fishery.

### **3. OPEN TIMES AND AREAS**

Aboriginal harvests for Green Sea Urchins for FSC, and for domestic purposes under treaty, are open year round if authorized by a communal licence or harvest documents.

### **4. LICENCING**

First Nations access to fish for FSC purposes is managed through a communal licence, or under treaty, a harvest document which can permit the harvest of Green Sea Urchins. These licences are issued under the authority of the *Aboriginal Communal Fishing Licences Regulations*.



## 5. CLOSURES

### 5.1. Harvesting on Aquaculture Tenures

Aquaculture leases are considered private property. Aquaculture licences of occupation are activity (or species) specific and do not legally restrict access unless there are impacts to the species being cultured. The Department recommends that fishers familiarize themselves with the location of aquaculture tenures in fishing areas and that explicit permission be sought from the aquaculturist for access. All tenures must be marked.

## 6. CONTROL AND MONITORING OF FIRST NATIONS' FISHING ACTIVITIES

Aboriginal harvests for food, social and ceremonial purposes are the first priority after conservation. This fishery is regulated through the issuance of communal licences to First Nations organizations. These licences are issued under the authority of the *Aboriginal Communal Fishing Licence Regulations*. Further arrangements for Aboriginal fishing may be identified in agreements between the Department and individual First Nations organizations.

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

Aboriginal access to fish for food, social and ceremonial purposes is managed through a communal licence which can permit the harvest of Green Sea Urchins.

For additional information on communal licences, see the Internet at:

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

### 6.1. Treaty Fisheries

Fisheries chapters in modern First Nation treaties articulate treaty fishing rights for domestic purposes that is protected under Section 35 of the *Constitution Act*, 1982. Commercial access may be provided either through the general commercial fishery or a Harvest Agreement, which is negotiated at the same time as the treaty and is referenced in the treaty, but is not protected under the *Constitution Act*.

#### *Nisga'a Domestic Fishing*

The Harvest Agreement for domestic (FSC) purposes under the Nisga'a Final Agreement (Treaty) came into effect on May 11, 2000. The Nisga'a territory is located within the Nass River valley on the northwest coast of BC.

More information on the Treaty and the Nisga'a annual fishing plan can be found at:

[www.aadnc-aandc.gc.ca/eng/1100100031747/1100100031749](http://www.aadnc-aandc.gc.ca/eng/1100100031747/1100100031749)

#### *Tsawwassen Domestic Fishing*

The Tsawwassen fishery for domestic (FSC) purposes under the Tsawwassen Final Agreement (Treaty) came into effect on April 3, 2009. The Tsawwassen First Nation is located in the lower mainland near the city of Vancouver, and their territory spans portions of the Strait of Georgia

near the mouth of the Fraser River as well as portions of the Lower Fraser River and Boundary Bay.

More information on the Treaty can be found at:

[www.aadnc-aandc.gc.ca/eng/1100100022734/1100100022757](http://www.aadnc-aandc.gc.ca/eng/1100100022734/1100100022757)

#### *Maa-nulth Domestic Fishing*

The Maa-nulth First Nations fishery for domestic (FSC) purposes under the Maa-nulth First Nations Final Agreement (Treaty) came into effect on April 1, 2011. The Maa-nulth First Nations comprise five individual First Nations: Huu-ay-aht First Nations, Ka:'yu:k't'h'/Che:k'tles7et'h' First Nations, Toquaht Nation, Uchucklesaht Tribe and the Yuułu?il?ath First Nation on the west coast of Vancouver Island.

More information on the Treaty can be found at:

[www.maanolth.ca/downloads/treaty/2010\\_maa-nulth\\_final\\_agreement\\_english.pdf](http://www.maanolth.ca/downloads/treaty/2010_maa-nulth_final_agreement_english.pdf)

#### *Tla'amin Domestic Fishing*

The Tla'amin fishery for domestic (FSC) purposes under the Tla'amin Final Agreement (Treaty) came into effect on April 5, 2016. The Tla'amin Nation is located near the City of Powell River, 130 km northwest of Vancouver.

More information on the Treaty can be found at:

[www.aadnc-aandc.gc.ca/eng/1397050017650/1397050094605](http://www.aadnc-aandc.gc.ca/eng/1397050017650/1397050094605)

Treaty negotiations are on-going across British Columbia in 2018. Specifically, DFO is currently negotiating final agreements, which include fisheries chapters, with Kitselas, Kitsumkalum, Yekooche, K'omoks and Wuikinuxv First Nations.

## **6.2. T'aaq-wiihak First Nations**

In addition to fishing opportunities for FSC purposes (or domestic purposes for treaty bands), five Nuu-chah-nulth First Nations located on the West Coast of Vancouver Island - Ahousaht, Ehatesaht, Hesquiaht, Mowachaht/Muchalaht, and Tla-o-qui-aht (the T'aaq-wiihak First Nations) - have Aboriginal rights to fish for any species of fish within their Fishing Territories and to sell that fish, with the exception of geoduck.

DFO is working with the First Nations pursuant to the rights found by the courts, to find “the manner in which the plaintiffs’ rights can be accommodated and exercised without jeopardizing Canada’s legislative objectives and societal interests in regulating the fishery.” The outcome of these discussions could lead to in-season management changes. DFO will make every effort to advise stakeholders of any such changes in advance of changes being implemented.

## **APPENDIX 4: GREEN SEA URCHIN RECREATIONAL MANAGEMENT MEASURES**

### **1. INTRODUCTION**

A Vision for Recreational Fisheries in British Columbia is available on this link.

<http://www.pac.dfo-mpo.gc.ca/consultation/smon/sfab-ccps/docs/rec-vision-eng.pdf>

The following principles represent a collaborative attempt to bring together the existing guidance from a multitude of sources and where necessary clarify more general directions in the context of managing the recreational fishery. The following principles also define the underlying values that should guide decision-making, priority setting, and operational activities affecting the recreational fishery. They provide a context against which we can go about achieving the vision and fulfilling the mission.

1. Conservation of naturally reproducing fish and their habitat is the highest priority.
2. Shared responsibility for conservation, stewardship and careful harvesting of the fisheries resource is essential
3. Fish are a common property resource and fisheries are managed for the benefit of all Canadians.
4. After conservation, First Nations fishing for food, social and ceremonial purposes has priority.
5. Recreational fishing is a socially and economically valuable use of fishery resources and is the means by which many Canadians access and experience these resources.
6. The needs of the recreational fishery, such as for stable and predictable fishing opportunities, will be explicitly considered and clearly reflected in integrated fishery management plans.
7. Prior to making decisions on recreational fishery management issues, governments will seek advice through appropriate inclusive, transparent and accountable consultation processes.
8. Stock enhancement and habitat restoration may be used to rebuild fish stocks and create fishing opportunities.
9. The recreational fishery will be managed to foster its current and future potential.

More information is available on the Internet: <http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/index-eng.html>

### **2. LICENSING**

A British Columbia Tidal Waters Sport Fishing Licence is required for the recreational harvest of all species of fish in tidal waters, including shellfish. Tidal Waters Sport Fishing licences may be purchased for a 1, 3, 5 day, or annual period. Licences for juveniles (ages 15 and under) are free. Fees for adults depend on licence duration, age (adult or senior) and residency status. Check for applicable fees, Independent Access Providers (tackle stores and marinas) or, for convenience, purchase your licence online via the National Recreational Licensing System (NRLS) at the following link: <https://www-ops2.pac.dfo-mpo.gc.ca/nrls-sndpp/index-eng.cfm>.

For recreational licensing information, frequently asked questions, and a list of Independent Access Providers, please visit: <http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/licence-permis/index-eng.html>.

### **3. OPEN TIMES AND AREAS**

Recreational fisheries are open as described in the British Columbia Tidal Waters Sport Fishing Guide for the recreational fishery – see link in Section 5.

### **4. CLOSURES**

#### **4.1. Harvesting on Aquaculture Tenures**

Aquaculture leases are considered private property. Aquaculture licences of occupation are activity (or species) specific and do not legally restrict access unless there are impacts to the species being cultured. The Department recommends that fishers familiarize themselves with the location of aquaculture tenures in fishing areas and that explicit permission be sought from the aquaculturist for access. All tenures must be marked.

### **5. CONTROL AND MONITORING OF RECREATIONAL FISHING ACTIVITIES**

The recreational harvest of shellfish is regulated via the *British Columbia Sport Fishing Regulations, 1996* made under the *Fisheries Act*. The regulations are summarized on the DFO website (link below) showing the British Columbia Tidal Waters Sport Fishing Guide which lists closed times, daily and possession limits and closed areas. <http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/index-eng.html>

Please also refer to your Tidal Water Sport Fishing licence which lists important Conditions of Licence restrictions for many species/areas.

#### **5.1. Gear**

Green Sea Urchin may only be harvested by handpicking.

#### **5.2. Daily Limits**

The daily limit for all urchin species combined is twelve (12) per day.

#### **5.3. Possession Limits**

The possession limit for all urchin species combined is two times the daily limit, twenty- four (24).

#### **5.4. Size Limits**

There is no size limit for the recreational sea urchin fishery.

#### **5.5. Catch Reporting**

The Sport Fishing Advisory Board and the recreational fishing sector strongly support effective fishery monitoring and catch reporting programs in recreational fisheries. The Sport Fishing

Advisory Board has been working with DFO on initiatives to strengthen fishing monitoring and catch reporting in the recreational fishery for a number of years.

Recreational harvesters are required, as a condition of the Tidal Waters Sport Fishing Licence, to report information on their recreational fishing activity and catch to DFO representatives when requested to do so. Recreational harvesters may be requested by a Fishery Officer or designated DFO representative, through an internet survey, at the dock, or through a creel survey to provide important catch and effort information.

The Internet Recreational Effort and Catch (iREC) Survey was initiated in 2012 to provide monthly estimates of effort for all methods of recreational fishing, including angling, trapping, beach collecting, and diving and to provide monthly estimates of catch for all sport caught species. The internet survey contacts participants by email in advance of the survey period and allows for the selected participants to record their information periodically or to complete the survey on a single visit to the website after the month ends. Participants selected for the iREC survey also have their personal online survey access code printed on their licence (new in 2018). Participants who do not fish during the month are included in the survey as well, as an important component of the catch and effort estimation. The survey period normally covers one month but shorter periods may be used.

A recreational mail survey is also conducted nationally by DFO every 5 years.

More information on the internet recreational survey is available at:

[www.pac.dfo-mpo.gc.ca/fm-gp/rec/irec/index-eng.html](http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/irec/index-eng.html)

The Canadian Science Advisory Secretariat Science Advisory Report and Research Document (pending) are available at:

[www.isdm-gdsi.gc.ca/csas-sccs/applications/Publications/index-eng.asp](http://www.isdm-gdsi.gc.ca/csas-sccs/applications/Publications/index-eng.asp)

## **APPENDIX 5: GREEN SEA URCHIN AQUACULTURE MANAGEMENT MEASURES**

### **1. AQUACULTURE MANAGEMENT**

#### **1.1. Regulatory Regime:**

In December 2010 the Pacific Aquaculture Regulations came into effect, giving DFO the authority to govern the management and regulation of aquaculture activities at marine finfish, shellfish, freshwater/land-based and enhancement facilities. The Province of British Columbia continues to have authority over land tenures and workplace safety related to aquaculture in BC. New applications, amendments and related referrals are coordinated through Front Counter BC. More information is available on the BC government's website: <http://www.frontcounterbc.gov.bc.ca>. DFO approves and issues aquaculture licences.

DFO requires comprehensive environmental monitoring to be undertaken by industry, and the department also conducts additional monitoring, audits, and investigations (where warranted). Public reporting is undertaken to ensure the transparency and accountability of the management of aquaculture in BC. Associated reporting can be found on the DFO web pages: <http://www.pac.dfo-mpo.gc.ca/aquaculture/reporting-rapports/index-eng.html>.

Within the BC Aquaculture Regulatory Program there is a Compliance and Enforcement Unit dedicated to aquaculture compliance, as well as an Aquaculture Environmental Operations Unit, which monitors the activities of industry on an on-going basis. The Program provides oversight and works to ensure the orderly management of the industry, including planning and licencing, linkages with national and regional policy, as well as consultation and communications requirements. Contact information for staff with responsibilities related to aquaculture management within DFO can be found in the Departmental Contacts section of this plan.

#### **1.2. Integrated Management of Aquaculture Plans:**

Integrated Management of Aquaculture Plans (IMAPs) provide an overview of each aquaculture sector and associated management and regulation. IMAPs are available on the DFO Consultations web pages: <http://www.pac.dfo-mpo.gc.ca/consultation/aquaculture/index-eng.html>. IMAPs complement IFMPs and the two are reviewed periodically to ensure consistency of management approaches.

#### **1.3. Aquaculture Management Advisory Committees:**

Aquaculture Management Advisory Committee meetings (AMACs) engage the aquaculture industry, First Nations, and other stakeholders in development of IMAPs and on-going feedback relevant to the management of Aquaculture. Information relating to AMAC meetings is posted on the DFO Consultations web pages: <http://www.pac.dfo-mpo.gc.ca/consultation/aquaculture/index-eng.html>. Meetings are open to the public.

More information on IMAPs and AMACs is available through [IMAPS@dfo-mpo.gc.ca](mailto:IMAPS@dfo-mpo.gc.ca).

## **2. LICENSING**

### **2.1. Broodstock Collection**

The collection of broodstock for aquaculture purposes is facilitated through a collection licence and a licence from the Introductions and Transfers Committee to permit transfer of brood stock to a hatchery. National policy permits up to 0.1% of the total allowable catch, in addition to the commercial TAC, to be allocated for aquaculture purposes such as brood stock collection.

For further information please contact the Introductions and Transfers Committee at [famitc@dfo-mpo.gc.ca](mailto:famitc@dfo-mpo.gc.ca).

## **3. CLOSURES**

### **3.1. Harvesting on Aquaculture Tenures**

Licensed aquaculture facilities are considered private property. Under the Fisheries Act, fishing within an aquaculture facility already under federal licence (PAR aquaculture licence) is prohibited unless otherwise permitted by the occupant under the licence. The Department recommends that commercial harvesters familiarize themselves with the location of aquaculture tenures in fishing areas and that permission be sought from the aquaculturist for access.

## APPENDIX 6: 2018/21 GREEN SEA URCHIN COMMERCIAL HARVEST PLAN

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## 1. MANAGEMENT CHANGES AND HIGHLIGHTS

This Commercial Harvest Plan will be in effect from September 1, 2018 to August 31, 2021. However, annual updates to this plan may be required depending on circumstances. Any proposed updates to this plan will be communicated to stakeholders and First Nations, through regular consultative processes, prior to those changes being finalized.

There may be updates to many sections of the Commercial Harvest Plan. Fish harvesters are advised to carefully review all information.

- **Fishing Season:** The annual commercial fishery is anticipated to open in September and run until spring of the following year. See Section 3.
- **Commercial Total Allowable Catch (TAC) (changed):** An annual commercial TAC has been set at 262.3 tonnes (578,200 lbs). Increased from last management plan set at 223 tonnes (491,764 lbs). See Section 3.
- **Quota Area Split (changed):** Area 13 has been split into six quota management areas from the previous four as a result of reopening some subareas and to help distribute effort. The overall quota has increased. Area 20 has been split into two management areas. The overall quota has increased. See Section 3 and Appendix 8.
- **Individual Quota (changed):** The annual individual quotas (IQ) will equal 1/49<sup>th</sup> of the coast-wide commercial TAC or 5.35 tonnes (11,800 lbs) per licence. Increased from last management plan set at 4.55 tonnes (10,036). See Section 3.
- **Licence Stacking (unchanged):** The licence stacking limit will continue to be waived for the 2018/21 IFMP.
- **Seasonal Research Closures:** Specific areas of the coast may be closed temporarily or be delayed in opening to allow for research surveys. Area descriptions Section 6. Notification of closure will be through Fishery Notices.

## 2. MANAGEMENT MEASURES FOR THE COMMERCIAL FISHERY

### 2.1. Minimum Size Limit

A minimum size limit of 55 mm test diameter is in effect coast-wide in the commercial Green Sea Urchin fishery. This size limit is precautionary and is intended to allow Green Sea Urchins several years of spawning before becoming available for the commercial fishery.

### 2.2. Limited Entry Licensing

A limited entry licensing scheme was implemented in January 1991 to address concerns regarding uncontrolled effort observed in the fishery at that time. Green Sea Urchins are commercially harvested under the authority of a commercial licence (“ZA” or “FZA”).

Currently there is one licence designated as Communal commercial “FZA”. This license is monitored with the commercial fishery and has the same management constraints and

Conditions of Licence as other commercial licences. For more information on the Licence Retirement/Allocation Transfer Program contact a Resource Manager listed in Appendix 10. Currently there are 49 total (ZA and FZA) licences eligible for this fishery.

### **2.3. Individual Quota Program**

IQs were implemented for the Red and Green Sea Urchin and Sea Cucumber fisheries, starting as a pilot in November 1995. The IQ program includes an equal allocation of the coast-wide TAC among licences. A third party service provider was hired to monitor catch.

Under the IQ program for the Green Sea Urchin fishery, two percent of the coast-wide TAC is reserved, for planning purposes, for First Nations fisheries for food, social and ceremonial (FSC) purposes. Additional allocations of Green Sea Urchins will be provided to First Nations who demonstrate that their food, social and ceremonial needs are not being met.

The commercial TAC is calculated after subtracting the First Nations allocation.

### **2.4. Area Quotas**

The coast-wide commercial TAC is the sum of Area quotas. Quota Areas are comprised of Areas, Subareas and/or portions of Subareas. Survey information is incorporated into Bayesian biomass dynamic model from which estimates of MSY are obtained for PFMA 11, 12 & 13 (combined) and PFMAs 18, 19 & 20 (combined). Then the PFMA quota is based on the proportion that area contributed to aggregate landings. Refer to Section 3 for Quota Area commercial quotas.

## **3. OPEN TIMES AND QUOTA AREAS**

The commercial fishery will open no earlier than September 1, and close no later than August 31, of the following year. The commercial fishery generally opens early in the fall depending on market demand and generally closes in the spring of the following year. Markets generally guide harvest. The majority of the harvesting effort has historically occurred in December and January, however, more recently effort has been higher earlier in the season to get the most benefits from market conditions. Commercial harvest schedules are determined in consultation with the PUHA.

The Department would like to remind all fish harvesters of the importance of providing accurate harvest information. If problems of misreported landing or harvest locations to the Department and/or dockside validators exist, the openings for this fishery may be adjusted in-season to limited rotational openings. These limited openings will restrict the fleet to fish small areas as a group in order to concentrate the fleet for monitoring purposes. At-sea observers may also be required if obtaining accurate harvest information remains problematic.

Harvesters are encouraged to fish throughout the quota areas to prevent localized overharvesting. Localized overharvesting may result in quota decreases or quota areas may need to be split and portions may be closed.

### **3.1. South Coast**

The South Coast commercial Total Allowable Catch (TAC) is 262.3 tonnes (578,200 lbs) apportioned between the Quota Areas shown below. All weights referred to in the tables below are the weights that are determined during validation at the first point of landing (in pounds).

<b>Quota Area</b>	<b>Name</b>	<b>Statistical Areas</b>	<b>Commercial Quota (lbs)</b>
11	Allison Harbour	All of area 11	3,000
12	Port McNeill	12 (except research closures)	253,000
13A	Cape Mudge	13-1, 13-14 and 13-15	60,000
13B	Southern Johnstone Strait	13-27 to 13-35	56,000
13C	Cordero Channel	13-23 to 13-26 & 13-36 to 13-43	30,000
13D (changed)	Sonora/Discovery Pass. North	13-7 to 13-13 and 13-16 to 13-22	10,000
13E (changed)	Willow Point	13-2	25,000
13F (New)*	Discovery Passage South	13-3, 13-4, 13-5 and 13-6	25,000
18	Southern Gulf Islands	Area 18; plus subarea 19-6 and that portion of subarea 19-5 north of a line running due east from Cormorant Point	29,750
19	Victoria	Area 19 except subarea 19-6 and that portion of subarea 19-5 north of a line running east from Cormorant Point	36,450
20A	Sooke East	Portion of Area 20-5 East of Otter Pt. 20-6, 20-7	36,000
20B	Sooke West	Area 20-1 to 20-4 and portion of 20-5 West of Otter Pt.	14,000
<b>Coastwide Total</b>			<b>578,200</b>

\* Opening Quota Area 13F, Discovery Pass may be delayed to complete research work in the area. Quota in this area may be adjusted based on research work in-season. The overall TAC would not increase.

Any Quota Area overages may be deducted from the next year's quota for the Quota Area.

### 3.2. Urchin Barren Management

The Department, A-Tlegay Fisheries Society and PUHA are piloting an Urchin Barren Management Approach for both Red Sea Urchins and Green Sea Urchins as part of an ecosystem management approach in Management Area 13. Urchin barrens exist around Management Area 13 and may be negatively impacting the growth of kelp and sessile invertebrates. In order to reduce the number of Green Sea Urchins in this area, a TAC has been allocated to a previously closed area in Discovery Passage. A post-season discussion involving DFO, A-Tlegay Fisheries Society and PUHA will be held to see if there is support to continue this pilot program in the future. Please note that the opening of quota area 13F Discovery Passage may be delayed to allow completion of research in the area.

### **3.3. Other Areas**

Areas of the coast not listed in the Quota Areas above may be considered for openings if an independent stock assessment survey of the area demonstrates that a sustainable harvest quota can be established. Fish harvesters will be required to fund any stock assessment surveys. Proposals for new areas may be sent to the Department for review.

## **4. LICENSING REQUIREMENTS FOR THE COMMERCIAL FISHERY**

### **4.1. National Online Licensing System (NOLS) – Licensing Services**

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

Training materials, including step-by-step guides and a detailed user training manual, are available online (<http://www.dfo-mpo.gc.ca/FM-GP/SDC-CPS/licence-permis-eng.htm>) to guide users of the system in completing their licensing transactions. The Department also provides client support and assistance on how to use the system via email at [fishing-peche@dfo-mpo.gc.ca](mailto:fishing-peche@dfo-mpo.gc.ca) or by calling toll-free at 1-877-535-7307 (7:00AM to 8:00PM Eastern, Monday to Friday).

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

Please visit the Pacific Region Licensing website and subscribe to fishery notices for updates on the National Online Licensing System and licensing services: <http://www.pac.dfo-mpo.gc.ca/fm-gp/licence-permis/index-eng.html>

#### **4.1.1. Licence Renewal**

In order to retain the privilege to be issued a commercial licence in the future, it is critical that you renew your licence and pay the applicable licence renewal fees through the online system on an annual basis, whether fishing takes place or not. Should the licence not be renewed by August 31st of the next calendar year, the licence eligibility will cease to exist and DFO will be unable to consider any licence issuance requests in the future.

### **4.2. Licence Category**

A category ZA or FZA licence is required to commercially harvest Green Sea Urchins by dive.

### **4.3. Licence Fees**

The annual licence renewal fee for a commercial, category (ZA) licence is \$430. There is no licence renewal fee associated with communal commercial licence (FZA).

### **4.4. Licence Application and Issuance**

Renewal of a commercial Green Sea Urchin licence and payment of the fees must be done on an annual basis to retain the privilege to be issued the licence in the future, regardless of whether or not fishing is carried out. Those commercial green sea urchin licences not

renewed by August 31<sup>st</sup> will cease and licence issuance requests will be unable to be considered in future. Upon the Department receiving the required payment, and information (e.g. designated vessel) and any required documentation, the licence will be issued and notification will be sent via email to advise licence holders that a change has been made to their online account. The licence documents, licence conditions and receipts will be available to be printed at that time.

Prior to licence issuance, licence eligibility holder(s) must:

- Ensure any Ministerial conditions placed on the licence eligibility are met.
- Ensure any conditions of the previous year's licence, such as completion and submission of logbooks, are met and accepted.
- Designate a registered commercial fishing vessel eligible for a commercial or communal commercial licence for Salmon, Schedule II, Sablefish, Halibut, Crab, Shrimp, Prawn, Geoduck or Groundfish trawl.

Vessel length restrictions for vessels used to harvest Green Sea Urchins under the IQ program have been waived by Fisheries and Oceans Canada. Fisheries and Oceans Canada reserves the right to reinstate vessel length restrictions at the lengths associated with each licence eligibility.

The stacking limit has been discontinued. There is now no limit on the number of ZA or FZA licences allowed to be designated to a vessel at any given time. Harvesters should, however, keep in mind that the season extensions will not be granted for harvesters that have run out of time to complete Individual Quotas by the end of the season.

#### **4.5. Designation of Harvesters to Fish a Communal Commercial Licence**

Under the *Aboriginal Communal Fishing Licence Regulations*, every person working on a vessel that is fishing under authority of a Communal Commercial Licence must be designated by the First Nation that holds the licence. The designation must be made in writing and include the person's name and reference the Communal Commercial Licence.

First Nations licence holders interested in obtaining an example template to use to designate their fish harvesters may contact a DFO Resource Manager or Pacific Fishery Licencing Unit office (see Contacts in Appendix 10).

#### **4.6. Individual Quotas**

The holder of the licence eligibility to the commercial harvest of Green Sea Urchins is provided the opportunity to harvest up to 5.35 tonnes (11,800 lbs.) of Green Sea Urchins.

#### **4.7. Licence Documents**

Green Sea Urchin licence documents are valid from the date of issue to August 31 of the following year.

Replacements for lost or destroyed licence documents may be obtained by reprinting the licence document through the National Online Licensing System.

#### **4.8. Vessel Re-designations**

Re-designation of Green Sea Urchin licenses is allowed as long as any Conditions of Licence, such as the completion of logbooks, have been met and accepted by the Shellfish Data Unit.

Navigate to 'Submit a Request' Re-Designate a vessel. Full instructions can be found at

<http://www.pac.dfo-mpo.gc.ca/fm-gp/licence-permis/forms/vessel-redesignation-transfert-bateau-eng.htm>

#### **4.9. Licence Eligibility Nominations**

Category ZA Green Sea Urchin licence eligibilities may be nominated from one party to another. Nominations must be completed and submitted to the Pacific Fishery Licence Unit via the National Online Licensing System (NOLS) by the licence holder. Notarize the application 'Nomination for Party-Based Licence Eligibility'. Scan the document and attach it to a 'Submit Request' in NOLS. PDF or standard picture formats are accepted (jpg, etc.).

The following requirements must be met:

- a.) Any Condition of Licence such as the completion of logbooks have been submitted and approved by the Shellfish Data Unit.
- b.) Communal commercial (category FZA) licence eligibilities may not be nominated as these are allocated annually to First Nations groups.

#### **4.10. Vessels**

All diving and fishing operations for Green Sea Urchins must take place from the "ZA" or "FZA" licensed vessel. All product harvested under a "ZA" or "FZA" licence must be harvested from and retrieved by the vessel designated on the licence. Vessels used to hold or transport Green Sea Urchins must conform to Canadian Food Inspection Agency (CFIA) inspection regulations for holding or transporting fish and have appropriate licences.

#### **4.11. Licence to Transport Green Sea Urchins**

Any registered vessel with a commercial or communal commercial Salmon, Schedule II, Geoduck, Sablefish, Crab, Shrimp, Groundfish or Prawn licence, a transporting, category D or a Herring seine licence, category HS may transport Green Sea Urchins under special Conditions of Licence which are included with all vessel-based licences issued for the current fishing year. For further information contact a Pacific Fishery Licence Unit.

Note: 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 check the Province of British Columbia's website for additional information: <http://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/fisheries-and-aquaculture/seafood-industry-licensing>.

#### **4.12. Processing**

Effective June 1998, any processing beyond that permitted in Section 14 *Fish Inspection Regulations* (FIR) must be done in a registered fish processing facility and in full compliance with a Quality Management Program (QMP).

## 5. CONTROL AND MONITORING OF COMMERCIAL FISHING ACTIVITIES

To accompany the IQ program, an industry-funded monitoring and validation program was developed collaboratively between the Pacific Urchin Harvesters Association (PUHA) and Fisheries and Oceans Canada.

Fish harvesters are required to report harvest time and location information to a service provider prior to fishing, following fishing, and prior to landing Green Sea Urchins. In order to track daily harvests and ensure that area quotas are not exceeded, all catch must be weighed and validated at the first point of landing by a Fisheries and Oceans Canada certified observer.

The service provider contracted by the PUHA to provide notification, validation, biological sampling and data services for the Green Sea Urchin fishery is:

D&D Pacific Fisheries Ltd.  
Box 1445, Gibsons, B.C. V0N 1V0  
Phone: (604) 886-4819  
Fax: (604) 886-8288  
Hail-in Line: (800) 775-5055

The following sections complement those in the Conditions of Licence (issued with each commercial licence), that outline the requirements for fishery control and monitoring. See example in Appendix 9

### 5.1. Quantities Permitted

Annual IQ for the period of this management plan has been set at 5.35 tonnes (11,800 lbs). IQ and commercial area quotas are subject to change during the period of this IFMP based on new stock assessment information obtained by the Department or if management actions are required.

Harvest of Green Sea Urchins over the IQ, after the permitted quota overage adjustments, may be subject to prosecution and seizure of the overage.

### 5.2. Gear

Hand picking by divers. Suction devices are not permitted.

### 5.3. Containers used to Hold or Transport Green Sea Urchins

There are several requirements for the type, size and marking of containers used to hold or transport sea urchins and the condition of containers for food inspection purposes.

Any containers used in the transport of “fish” (including urchins) for export must meet the requirements of Schedule V of the *Fish Inspection Regulations*. This states that the contact surfaces of fish storage areas in vehicles and of containers used for transporting fish shall be smooth, free from cracks and crevices and made of non-corrodible material. There is also a requirement for containers to be covered. Acceptable materials include plastic, aluminium and fibreglass; however, an exemption has been granted for the use of well-painted wooden totes to transport fish to processing plants. See CFIA’s website for further

information:  
<http://www.inspection.gc.ca/food/fish-and-seafood/eng/1299799645255/1299799784160>

<http://www.inspection.gc.ca/food/fish-and-seafood/eng/1299799645255/1299799784160>

#### 5.3.1. Tagging of Green Sea Urchin Containers

All Green Sea Urchins delivered to packers, or to designated landing ports, shall be in containers which are tagged. The tags must clearly display the fishing vessel's name and VRN#.

#### 5.3.2. Marking of "Pick Bags"

"Pick Bags," or any other type of enclosures containing Green Sea Urchins left unattended in the water must be tagged with bag tags displaying the vessel registration number (VRN#), and name of the vessel used to harvest the product. All floats attached to pick bags or other types of enclosures must be labelled with the VRN# of the vessel harvesting the product.

### 5.4. **Transshipment**

All product harvested under a green sea urchin licence must be harvested from and retrieved by the vessel designated on the licence. If that product is to be retrieved at a later time by the licensed vessel, it must be appropriately tagged. If that product is going to be transhipped to another vessel (i.e. for landing purposes), that vessel must be appropriately licensed for packing purposes. At no time should unlicensed vessels be used to harvest, retrieve, store, or tranship product

### 5.5. **Landing Locations**

All Green Sea Urchins must be landed at one of the designated landing ports listed in the Conditions of Licence. Specific landing ports have been established as part of the IQ validation program. Fisheries and Oceans Canada certified observers are available at these ports to oversee offloading and validation of Green Sea Urchin catch.

### 5.6. **Validation**

All Green Sea Urchins harvested or removed from the sea bed floor must be validated at the point and time they are landed.

The vessel master must be in possession of a Fisheries and Oceans Canada approved catch Validation & Harvest Logbook assigned to the Green Sea Urchin licence. The Validation & Harvest Logbook must be on board the licensed vessel while fishing for Green Sea Urchins, or while Green Sea Urchins are on board. Validation & Harvest Logbooks that meet the Department's approval are available from the service provider or from the PUHA.

#### 5.6.1. Validation & Harvest Logbook Entries

At the first point of off-loading, all Green Sea Urchins will be weighed with a government-certified scale and the weight entered on the Validation & Harvest Logbook. The vessel master is responsible for completing sections A and C of the Validation & Harvest Logbook. The vessel master shall also ensure that chart entries are completed showing all locations fished for that validation. All harvest



information must be fully entered and complete before validation takes place. The Validation & Harvest Logbook will remain with the licensed vessel, with one copy accompanying the product to its destination and one copy handed over to the observer at the time of validation, along with the harvest charts. The observer shall compare harvest charts to Validation & Harvest Logbooks to ensure that harvest information is consistent between both. The original white copy of the Validation & Harvest Logbook handed to the observer, along with the harvest charts, must be received by the Fisheries and Oceans Canada Shellfish Data Unit within 28 days following the end of the month in which harvesting took place.

#### 5.6.2. Examination of Logbooks

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

#### 5.6.3. Quota Confirmation

Prior to fishing, the vessel master must confirm the remaining vessel quota from the Validation & Harvest Logbook. Harvesters taking product in excess of the individual licence quota are subject to prosecution.

#### 5.6.4. Lost Product

Product lost or wasted at sea will use the following protocol.

- i. The weight of product lost from the deck of the catcher vessel and/or packer vessel during transport will be applied to both the catcher vessel's individual quota and the applicable area quota.
- ii. The weight of product spoiled or wasted because of weather-related delays will also be applied to both the catcher vessel's individual quota and the applicable area quota.
- iii. The Department, in consultation with the service provider, will use the estimated packer or ground weight and appropriate water loss calculation for the harvest site to determine an estimated dock weight.

Situations requiring use of this protocol will be discussed with the PUHA prior to implementation.

#### 5.6.5. Conditions and Procedures for Quota Overage Transfer

##### 5.6.5.1. Quota Area Quota Overages

Any Quota Area overages may be deducted from the next year's quota for the Quota Area.

##### 5.6.5.2. IQ Overages

Small quantities of Green Sea Urchins, which exceed the licence's annual quota (up to 90.7 kg or 200 lbs), can be transferred to another Green Sea Urchin licence provided certain conditions are fulfilled. If all of these conditions are not met, observers will not transfer the overage to another licence. In the following explanation, the Green Sea Urchin licence which has exceeded its quota is called Licence "A" and the licence to which quota is transferred is called Licence "B".

Harvest of Green Sea Urchins over the IQ after the permitted quota overages adjustments may result in prosecution and seizure of the overage.

Transfer of Quota to a Second Licence on the Same Vessel - If two or more licences are assigned to the same vessel then a quota overage from one licence may be transferred to the Green Sea Urchin licence which has quota remaining. Overage of the last Green Sea Urchin licence quota on the same vessel may be transferred to another vessel's Green Sea Urchin licence in accordance with procedure described below.

Maximum Allowable Transfer of Quotas Between Licences on Different Vessels - In the event of a quota overage on Green Sea Urchin Licence "A", a maximum of 90.7 kg (200 lbs) of Green Sea Urchins may be transferred to another vessel's Green Sea Urchin licence (Licence "B"). Only one transfer of quota overage is allowed. The quota overage cannot be divided between a number of licences.

Remaining Quota on Second Licence - The amount transferred cannot exceed the remaining quota of Green Sea Urchin Licence "B".

Green Sea Urchin Licence Area - Both vessels involved in the transfer must be licensed to fish in the same licence area and have active licences for that licence year (the provision for landing at the same port has been removed).

Documentation - The Green Sea Urchin Validation & Harvest Logbook for each of the licences involved in the transfer must be present at the time of the validation. Both vessel masters must make their intention to transfer or receive quota overage clear to the observer prior to unloading. In the event of a packer landing, a note signed by both vessel masters should accompany the product to advise the observer that there is a mutual agreement to transfer.

## **5.7. Oral Reports**

The Conditions of Licence detail fishing notification requirements that must be followed by each licensed vessel in order for the service provider and the Department to track fishing effort and landing on a daily basis to ensure that harvest area quotas are not exceeded. This becomes imperative when a harvest area quota is near completion and remaining quota is divided amongst hailed vessels. When vessels do not hail into a harvest area, there is a risk of exceeding the area quota. In order to maintain a sustainable fishery, it is extremely important that effort and landings in a particular harvest area be reported and recorded accurately.

Please review the conditions of licence for further details on hailing requirements.

## **5.8. Harvest Logs and Chart Data**

It is a Condition of Licence and the responsibility of the licence holder to ensure that harvest and chart information is received by Fisheries and Oceans Canada Shellfish Data Unit and meets the conditions outlined below.

### **5.8.1. Harvest Data**

The vessel master is responsible for the provision and maintenance of an accurate record, a "log", of daily harvest operations. This log must be completed and a copy

submitted in both hard (paper) copy and electronic form in an approved format as defined by Fisheries and Oceans Canada, Shellfish Data Unit.

The vessel master is responsible for the provision of a daily harvest chart record for each location fished by each diver. This harvest chart must have marked directly on it the Vessel Registration Number (VRN), the licence tab number, and the validation ID numbers. The harvest site must be clearly marked on the chart with dive or record numbers pertaining to each harvest catch record and with dates that fishing activity occurred at each site. The vessel master is also responsible for the electronic capture of harvest location data into the Shellfish Data Unit Geographic Information System (GIS).

Validation & Harvest Logbooks meeting Fisheries and Oceans Canada requirements are available from the service provider contracted by the PUHA to provide data services for the Green Sea Urchin Fishery. The service provider will provide the Validation & Harvest Logbook coding and data entry service, including the electronic capture of harvest chart information into GIS, thus complying with the requirements for submission of a hard (paper) copy and electronic copy including fishing location information, for harvest data.

The original white page copy of the log, the accompanying chart record, and the electronic copies must be forwarded within 28 days following the end of the month in which fishing occurred. Fish harvesters having validation services completed by the service provider contracted by the PUHA will receive this service as part of that contract. The information must be sent to:

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

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

#### 5.8.2. Submission and Release of Harvest Log Data

The licence holder of record reported with the Pacific Fishery Licence System is responsible to ensure that the vessel master has completed and submitted a copy of the harvest data. Fisheries and Oceans Canada can only release harvest data to the reported licence holder and only upon written request.

#### 5.8.3. Nil Report for Harvest Log – Licence Issued but Not Fished

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

Fisheries and Oceans Canada wishes to remind fish harvesters that harvest logs must be completed accurately during fishing operations and submitted to Fisheries and Oceans Canada in accordance with the timing set out in Conditions of Licence. Failure to complete or submit logs in a timely manner is a violation of Condition of Licence.

#### 5.8.4. Confidentiality of Harvest Data

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

### 5.9. Fish Slip Requirements

It is a condition of this licence that an accurate written report shall be furnished on a fish slip of all fish and shellfish caught under the authority of this 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  
Catch Statistics Unit  
200-401 Burrard Street  
Vancouver, B.C. V6C 3S4

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

### 5.10. Export of Green Sea Urchins

Licence conditions regarding Validation & Harvest Logbooks and fish slips must be complied with for all sea urchins.

It is important to note that Green Sea Urchins being processed for export out of the province must be processed at a federally registered facility. Each country receiving Green Sea Urchins may have different import requirements. The Canadian Food Inspection Agency posts export requirements on the following website: [www.inspection.gc.ca/english/fssa/fispoi/export/coupaye.shtml](http://www.inspection.gc.ca/english/fssa/fispoi/export/coupaye.shtml). However, as these requirements can vary, exporters of sea urchins are encouraged to verify foreign country import requirements through their customers prior to export.

## 6. CLOSURES

It is the harvester's responsibility to ensure that an area is open to harvesting.

### 6.1. Human Waste Containment Regulation

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

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

### 6.2. Notification of Area Closures

Additional closures may be announced in-season by Fishery Notice. Prior to fishing in an area, fish harvesters are advised to consult the local Fisheries and Oceans Canada office or to contact a fishery manager listed in Appendix 10.

### 6.3. Research Closures

Some areas have been designated as research or study areas and as such are closed to commercial fishing. Fishing is permitted in these areas only under a scientific licence. Research undertaken in these areas are a co-operative effort between Fisheries and Oceans Canada, PUHA, and local First Nations and are aimed at quantifying interannual variability in population structure and density over time in commercially unfished areas.. For further information on the research areas please contact the Stock Assessment Division (see Appendix 10).

#### 6.3.1. Year Round Research Closures

6.3.1.1. Area 12: Stubbs Island/Plumber Islands: Portion of Subareas 12-5 and 12-18. All waters within 0.25 nautical miles of Stubbs Island. Those waters of the Plumber Islands commencing at the most westerly point on Ksuiladas Island thence in a straight line to Stubbs Island thence due east for 1.4 nautical miles, thence in a straight line to the most northerly point on Ksuiladas Island, thence following the western shore of said island to the point of commencement.

6.3.1.2. Area 13: Kelsey Bay: The waters of Subarea 13-34 (Salmon Bay) and that portion of Subarea 13-33 lying southerly or inside of a line from the ferry landing at the Kelsey Bay Government Dock easterly to Petersen Islet Light.

6.3.1.3. Area 18: Java Islets Research Closure: Those waters of Subarea 18-5 within 0.25 nautical miles of Java Islets.

6.3.1.4. Area 26: Kyuquot Sound Marine Communities Study Area: A portion of 26-6 inside or northerly of a line from White Cliff Head to Racoon Point (Kyuquot Bay). A portion of 26-6 on the west side of Union Island commencing at position 50°0.4' N, 127°19.3' W (Entrance to Crowther Channel)

#### 6.3.2. Seasonal Research Closures

Seasonal research closures will be determined in season. Larger areas around research closures may be closed prior to the survey to prevent pre-survey fishing effort to affect the survey results. These will be announced in-season by Fishery Notice.

6.3.2.1. Area 12: Stephenson Islets/Stubbs Island/Plumber Islands: Portion of Subareas 12-3, 12-4, 12-5 and 12-18 inside a line commencing on Malcolm Island at 50°37.13' N, 126°49.75' W to the most westerly point on Pearse Islands 50°35.04' N, 126°53.19' W along the shore to 50°34.51' N, 126°51.70' W then easterly to a point of Hanson Island at 50°33.88' N, 126°46.52' W along the shore to 50°35.37' N, 126°45.06' W to the point of commencement. (See Figure 4, Appendix 8)

6.3.2.2. Area 19: Chain Islets: That portion of Subarea 19-4 inside a line commencing at 48°25.62' N, 123°16.90' W south to 48°24.89' N, 123°16.63' W east to 48°24.99' N, 123°14.99' W northwest to 48°25.83' N, 123°16.11' W then back to the point of commencement. (See Figure 6, Appendix 5)

6.3.2.3. Area 19: Fulford Reef: That portion of Subarea 19-4 inside a line commencing at the North Cardinal Buoy located at 48°26.89' N, 123°14.38' W southwest to 48°26.74' N, 123°14.75' W southeast to 48°26.52' N, 123°14.13' W northeast to 48°26.62' N, 123°13.98' W northwest to the point of commencement the North Cardinal Buoy. (See Figure 7, Appendix 5)

### 6.4. Permanent Closures

The following areas will be closed for Green Sea Urchins.

#### 6.4.1. Area 1

6.4.1.1. Subarea 1-6. (First Nations access for food, social and ceremonial purposes)

#### 6.4.2. Area 2

6.4.2.1. Gwaii Haanas National Marine Conservation Area Reserve and Haida Heritage Site, **Burnaby Narrows**: Those waters of Subareas 2-13 and 2-16 inside a line commencing at 52°23.071' N and 131°20.427' W, east to a point at 52°23.079' N and 131°22.790' W, then following the southern shoreline of Kat Island east to a point at 52°23.104' N and 131°22.193' W, then east to a point at 52°23.303' N and 131°22.277' W, then following the western shoreline of Burnaby Island south to a

point at 52°20.982' N and 131°20.427' W, then west to a point at 52°20.733' N and 131°21.063' W, then north following the eastern shoreline of Moresby Island back to the point of commencement. (National Marine Conservation Area).

6.4.2.2. Gwaii Haanas National Marine Conservation Area Reserve and Haida Heritage Site, **Louscoone Estuary**: Those waters of Subareas 2-33 and 2-34 north of a line drawn from 52°11.828' N and 131°15.662' W east to 52°12.269' N and 131°14.579' W. (National Marine Conservation Area).

6.4.2.3. Gwaii Haanas National Marine Conservation Area Reserve and Haida Heritage Site, **Flamingo Estuary**: Those waters of Subarea 2-37 north of a line drawn from 52°14.523' N and 131°22.24' W southeast to 52°14.245' N and 131°21.481' W. (National Marine Conservation Area).

6.4.2.4. Gwaii Haanas National Marine Conservation Area Reserve and Haida Heritage Site, **Gowgaia Estuary**: Those waters of Subarea 2-41 east of a line drawn from 52°24.947' N and 131°32.13' W southeast to 52°24.233' N and 131°32.021' W. (National Marine Conservation Area).

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

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

#### 6.4.3. Area 5

6.4.3.1. Kitkatla Inlet and adjacent waters: Subarea 5-3 and that portion of Subarea 5-10 excluding the area of Beaver Passage and Schooner Passage inside of a line commencing at a fishing boundary sign at the northwest point of Spicer Island to the northwest point of McCauley Island, then following the shoreline of McCauley Island to Baird Point, then to Sentinel Islet, then to Boys Point, then to a boundary sign on the east side of Spicer Island. (First Nations access for food, social and ceremonial purposes)

#### 6.4.4. Area 12

6.4.4.1. Port Neville: Subarea 12-25. (Marine Reserve Area/Research Area)

#### 6.4.5. Area 13, 14, 15

6.4.5.1. 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)

6.4.6. Area 14

6.4.6.1. 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 239° true for 0.5 nautical miles, thence 126° true for 3.5 nautical miles, thence 64° true for 4.9 nautical miles, thence 304° true for 2.9 nautical miles, thence 213° true for 0.5 nautical miles to Cape Gurney on Hornby Island. (Marine Reserve)

6.4.7. Area 15

6.4.7.1. 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)

6.4.7.2. 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)

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

6.4.7.4. 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)

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

6.4.8. Area 16

6.4.8.1. 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)

6.4.9. Area 18

6.4.9.1. Subareas 18-7 (Sansum Narrows, Burgoyne Bay and Maple Bay) and 18-8 (Cowichan Bay): (Conservation)

6.4.10. Area 19

6.4.10.1. 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)

6.4.10.2. 10 Mile Point: Those waters of Subareas 19-4 and 19-5 within 0.4 nautical miles of Cadboro Pt. navigation light. (Marine Reserve)

6.4.10.3. Race Rocks: Those waters of Subareas 19-3 and 20-5 within 0.5 nautical miles of Great Race Rock. (Marine Reserve) This area is being considered for a Marine Protected Area (MPA). The closure boundary description may change.



#### 6.4.11. Area 20

6.4.11.1. 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)

6.4.11.2. 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)

6.4.11.3. Beecher Bay: Those waters of Subarea 20-5 north of a line running from Church Point to Beechy Head. (First Nations access for food, social and ceremonial purposes)

#### 6.4.12. Area 23

6.4.12.1. Pacific Rim National Park: Those waters lying within Park Boundaries as shown, since 1989, on Canadian Hydrographic Service Chart 3671. (Park)

6.4.12.2. 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 northwestern tip of Haines Island to the southern tip of Seppings Island; from the northwestern tip of Seppings Island to Kirby Point on Diana Island; from Kirby Point directly to the northwest tip of Fry Island; from the northwestern 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)

#### 6.4.13. Area 24

6.4.13.1. Barney Rocks: Those waters of Subarea 24-2 and 24-3 within 25 m of Barney Rocks. (First Nations access for food, social and ceremonial purposes)

6.4.13.2. Pacific Rim National Park, Grice Bay & McBey Islets: The waters of Tofino Inlet within Pacific Rim National Park including McBey Islets and Dinner Island in Tsapee Narrows, Browning Passage in Subarea 24-9 and Grice Bay west and south of Indian Island in Subarea 24-11. (Park)

#### 6.4.14. Area 25

6.4.14.1. Friendly Cove and Santa Gertrudis Cove: That portion of Subareas 25-6 and 25-7 inside a line from a white triangular fishing boundary sign on Nootka Island near the northerly entrance to Santa Gertrudis Cove, thence true east 0.25 nautical miles, thence true south one nautical mile, thence westerly to Yuquot Point on Nootka Island, thence to the point of commencement. (First Nations access for food, social and ceremonial purposes)

#### 6.4.15. Area 26

6.4.15.1. Checleset Bay Fishery Closure Area: Those portions of Areas 26 and 126 enclosed by a line drawn from a point on the Brooks Peninsula (at 127°49.58' W long., 50°05.18'N lat.), thence due south to the 50° parallel, thence due east to Alert Point on Lookout Island, thence northeasterly to a point on Vancouver Island near

McLean Island (at 127°25.03' W long., 50°02.1' N lat.), thence northwesterly along the shore of Vancouver Island to Malksope Point (at 127°28.95 W long., 50°05.53' N lat.), thence due west to a point mid-channel on the southeast end of Gay Passage (at 127°30.1' W long., 50°05.53' N lat.), thence mid-channel through Gay Passage to a point mid-channel on the northwest end of Gay Passage (at 127°31.8' W long., 50°06.7' N lat.), thence northwesterly to the shore of Vancouver Island, just west of Theodore Point (at 127°32.8' W long., 50°07.7' N lat.), thence westerly along the Vancouver Island shore to an unnamed point on the east side of Nasparti Inlet (at 127°38.6 W long., 50°08.75' N lat.), thence westerly across Nasparti Inlet to an unnamed point on Vancouver Island (at 127°37.8' W long., 50°08.7' N lat.), thence along the Vancouver Island shore to the point of commencement

#### 6.4.16. Area 28

6.4.16.1. 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)

6.4.16.2. 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 m east of the most southeasterly point of Whyte It.; thence following the southern shoreline of Whyte It. at a distance of 100 m to a point lying 100 m from the most southwesterly point of Whyte It.; thence in a straight line to a point lying 100 m west of White Cliff Point; thence following the shoreline at a distance of 100 m in a northerly direction to a point 100 m north of Lookout Point; thence following the shoreline at a distance of 100 m in an easterly direction to a point 100 m perpendicular to the most northerly point of Whytecliff Park; thence to the most northerly point of Whytecliff Park on the mainland. (Marine Reserve)

#### 6.4.17. Portions of Subareas 101-1 and 142-2

6.3.18.1 Area bounded by a series of rhumb lines drawn from a point 53°03'07.6" N, 135°50'25.9" W, to a point 53°16'20.9" N, 134°59'55.4" W, then to a point 53°39'49.2" N, 135°17'04.9" W, then to a point 53°39'18.0" N, 135°53'46.5" W, then to a point 53°52'16.7" N, 136°30'23.1" W, then to a point 53°49'19.6" N, 136°47'33.1" W, then to a point 53°40'02.5" N, 136°57'03.5" W, then to a point 53°13'59.2" N, 136°10'00.0" W, then back to the point of commencement as laid out in the Bowie Seamount Marine Protected Area Regulations. (Marine Protected Area)

## 7. WORKSAFE BC

Jurisdiction over health and safety on commercial fishing vessels in Canada is the mandate of the provinces. In British Columbia, jurisdiction over health and safety issues on commercial fishing vessels is with WorkSafeBC (previously Workers' Compensation Board of British Columbia). Health and safety issues on fishing vessels include the health and safety of the crew and design, construction and use of fishing equipment on the vessel. Matters of transportation and shipping fall to the federal government and are administered by Transport Canada, Marine Safety (TCMS). WorkSafeBC and TCMS have entered into a Memorandum of Understanding on fishing vessel safety that addresses, as much as possible, jurisdiction. The document also contemplates that each party will work co-operatively to ensure that vessels and their crew remain healthy and safe.

The green sea urchin fishery, and other dive fisheries, is legislated by the requirements for occupational divers, found in Part 24 of the Occupational Health and Safety Regulation (OHSR) and as commercial fishing ventures, also found in Part 24 of the OHSR. Many of the general sections of the Regulation also apply, for example: Part 8 - Personal Protective Equipment, addresses issues related to safety head gear, safety foot ware and personal floatation devices. Part 17 addresses issues on rigging and Part 5 addresses issues of exposure to chemical and biological substances. The entire regulation can be acquired from the Provincial Crown Printers or by visiting the WorkSafeBC website at:

[www.worksafebc.com](http://www.worksafebc.com)

For further information, contact an Occupational Safety Officer:

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

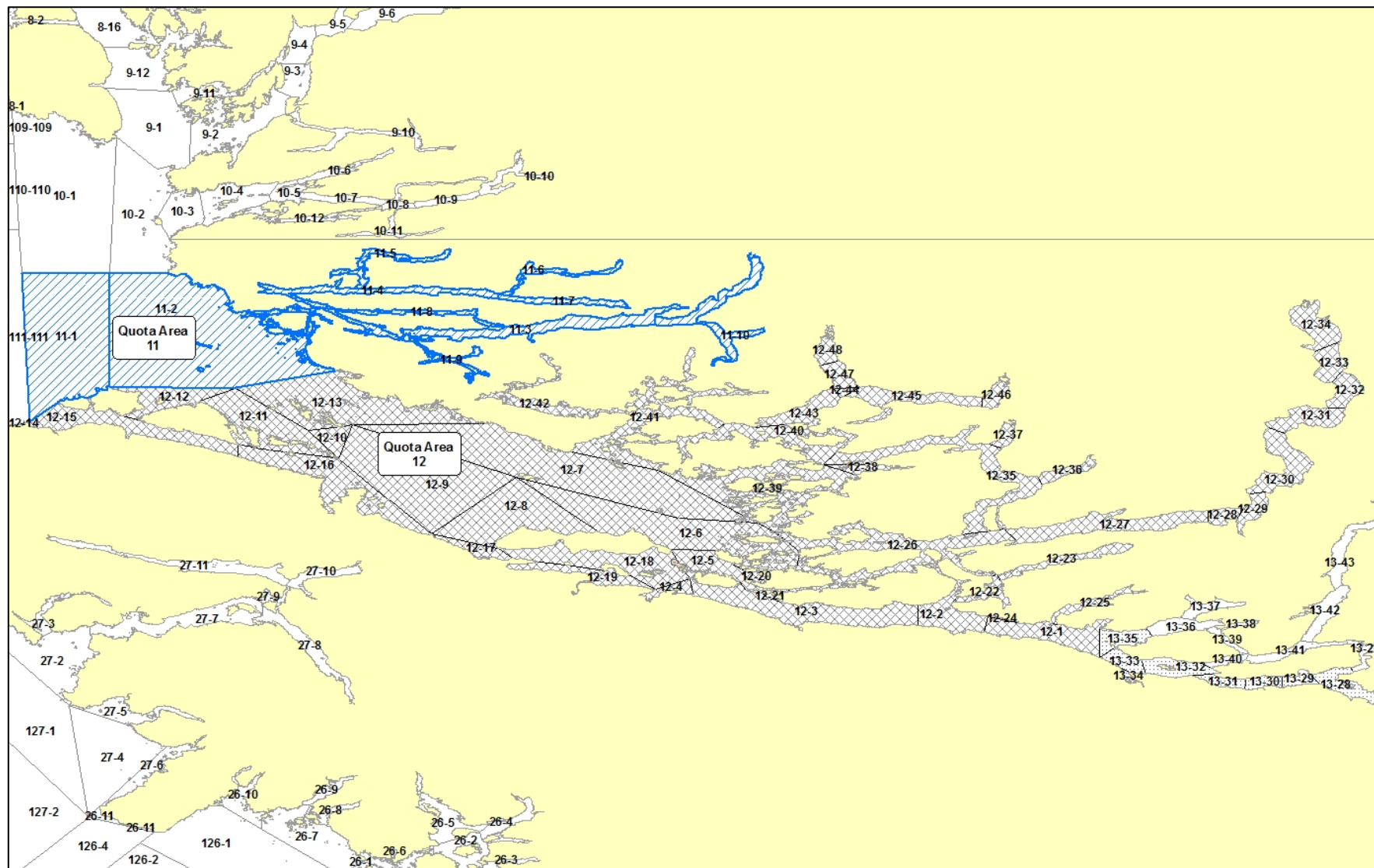
Or the Manager of Interest for Marine and Fishing, Pat Olsen (250) 334-8777.

For information on projects and initiatives related to commercial fishing health and safety please contact Tom Pawlowski (604) 233-4062 or by email: [tom.pawlowski@worksafebc.com](mailto:tom.pawlowski@worksafebc.com)

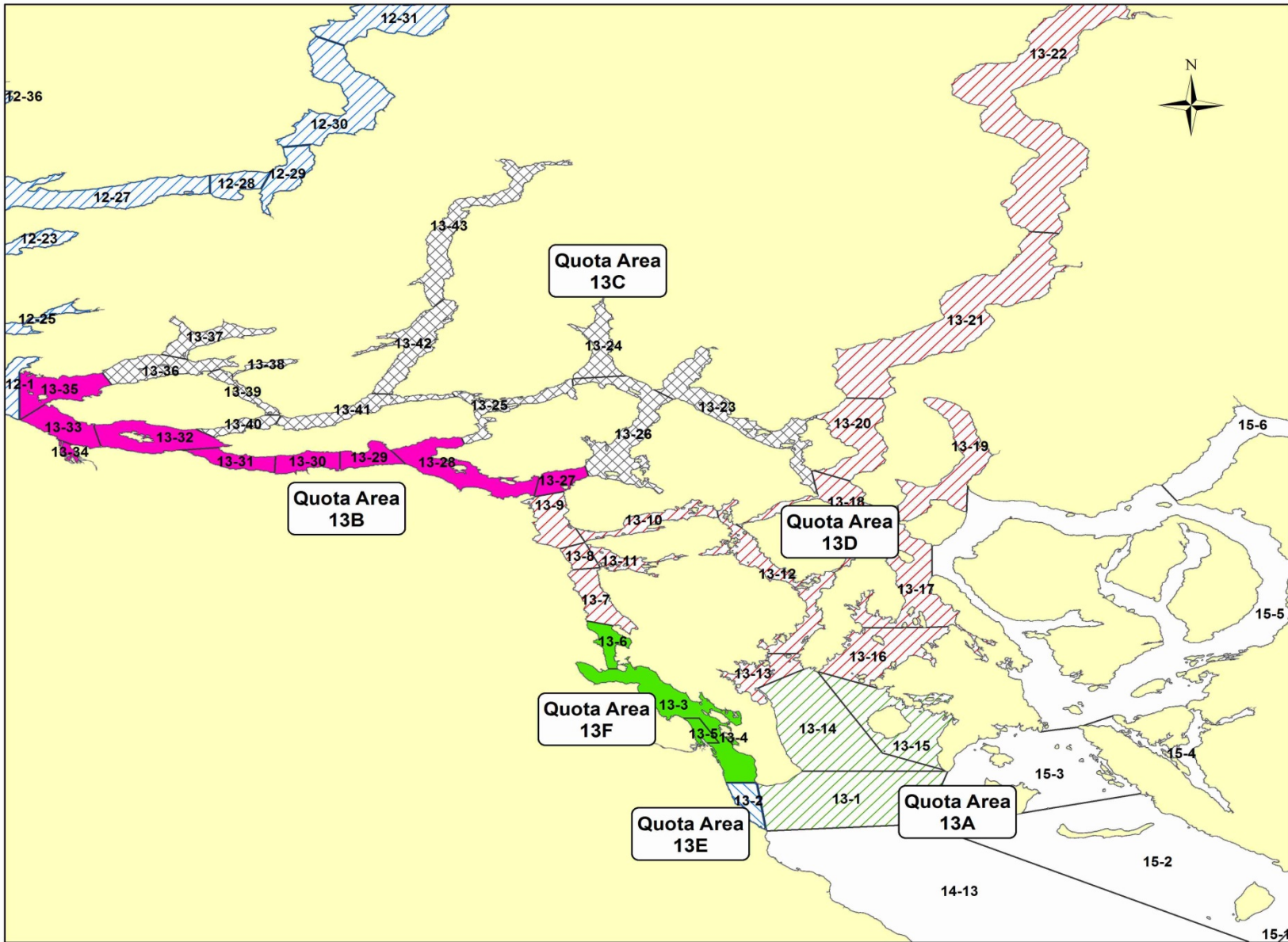
# APPENDIX 7: EXAMPLE OF GREEN SEA URCHIN VALIDATION & HARVEST LOGBOOK

HAIL VERIFICATION #		<b>GREEN SEA URCHIN VALIDATION &amp; HARVEST LOGBOOK</b>				VALIDATION ID #:			
SECTION 'A' - TO BE COMPLETED BY VESSEL MASTER									
VESSEL NAME			VESSEL REGISTRATION NUMBER (VRN)		VESSEL MASTER NAME		FISHERIES IDENTIFICATION NUMBER (FIN)		
ZA TAB #	DAYS FISHED	QUOTA AREA	STAT AREA	SUB AREA	BUYER NAME		CONTAINER IDENTIFICATION LABEL		
						FLAGGING TAPE COLOUR	TAG YES / NO		
PACKER VESSEL NAME			VESSEL REGISTRATION NUMBER (VRN)		GROSS PACKER WEIGHT ( lb. )		NUMBER OF CONTAINERS		
					BAGS		CAGES TOTES OTHER		
SECTION 'B' - TO BE COMPLETED BY OBSERVER <span style="float: right;">PLEASE PRINT - USE PEN</span>									
OBSERVER NAME		No. of VALIDATED CONTAINERS			GROSS DOCK WEIGHT ( lb. )	TARE WEIGHT ( lb. )	PREVIOUS R.Q. ( lb. )		
		BAGS	CAGES	TOTES	OTHER				
OVERAGE lb.		TRANSFER: TO / FROM		OTHER VALIDATION ID #		NET DOCK WT. ( lb. )			
		ZA #:				NEW R.Q. ( lb. )			
LANDING PORT		LANDING DATE		START TIME	OFFLOAD SEQ.	SITUATION REPORT #			
						No. of TRANSPORT CONTAINERS			
COMMENTS :						CONTAINER LABELS			
						CONTAINER COUNT			
						Y N Y N			
						HARVEST COMPLETE			
						BAG / TOTE TAGS			
						MATH CHECK			
						FISH HOLD CHECK			
						Y N Y N Y N Y N			
SECTION 'C' - TO BE COMPLETED BY VESSEL MASTER <span style="float: right;">PLEASE PRINT - USE PEN</span>									
HARVEST INFORMATION - COMPLETE A SEPARATE LINE FOR EACH DIVE - USE ANOTHER PAGE IF MORE SPACE IS REQUIRED									
DIVE No.	DIVE SITE	HARVEST DATE (Sep. 01/04)	HARVEST LOCATION (NAME OF NEAREST LANDMARK)		DIVER NAME (FIRST & LAST NAME)		DIVE TIME (minutes)	DEPTH (ft)	No. of PICKBAGS
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
SPLIT LOAD		YES NO	NUMBER OF LOADS	VALIDATION NUMBER(S) OF OTHER LOADS		SPLIT LOAD COMMENT			
WHITE COPY - Observer		YELLOW COPY - Buyer via trucking		PINK COPY - Vessel via packer		GOLD COPY - Remains in Logbook		Revision: Aug.2006	

**Appendix 8: Maps of Green Sea Urchin Quota Areas – Refer to Appendix 6 for Quota Area descriptions and Closure descriptions**



**Figure 1: Green Sea Urchin Quota Area 11 and 12 (excluding research closure, Figure 4).**



**Figure 2: Green Sea Urchin Quota Areas 13A, 13B, 13C, 13D (changed), 13E (changed) and 13F(new).**



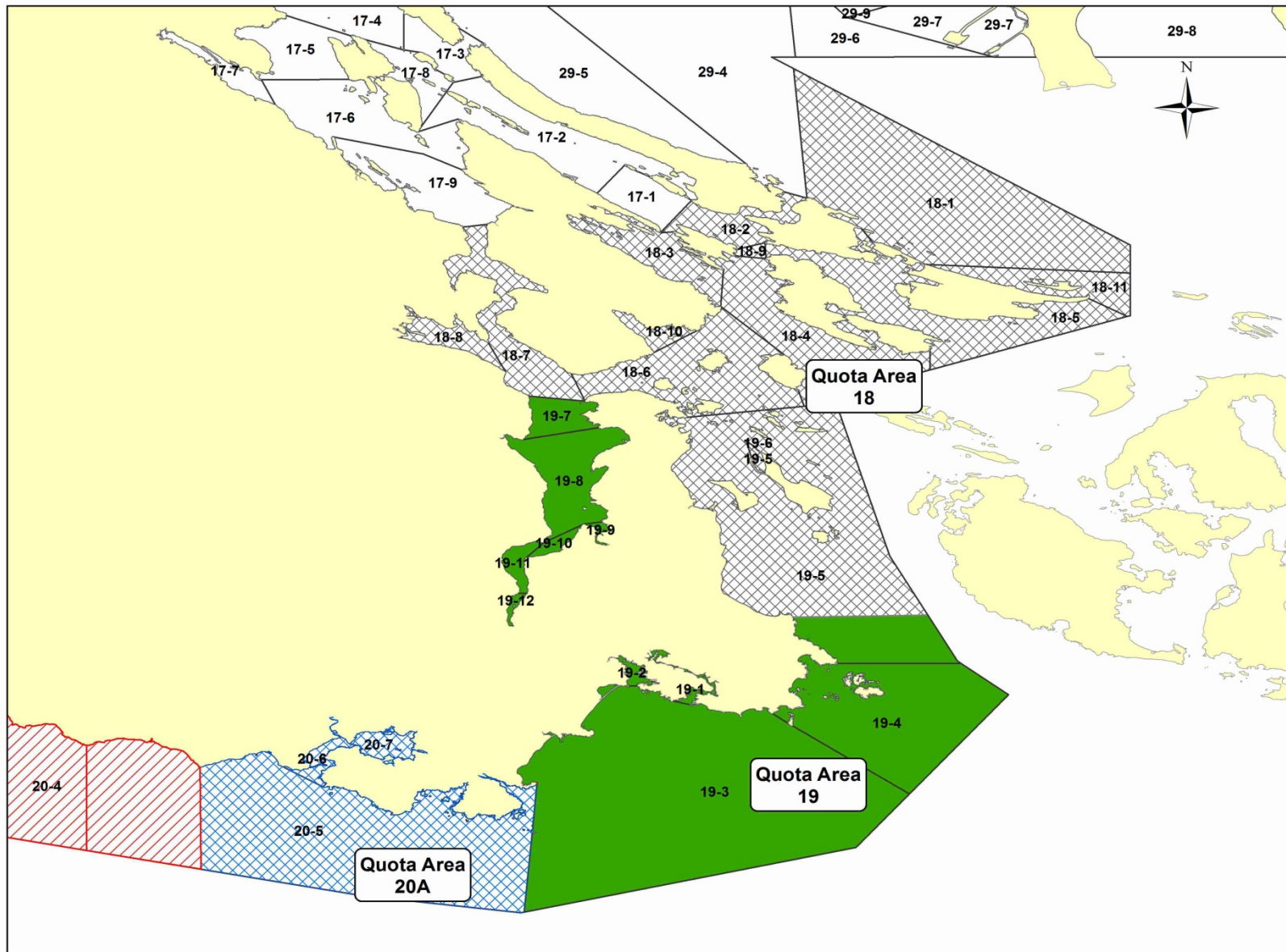
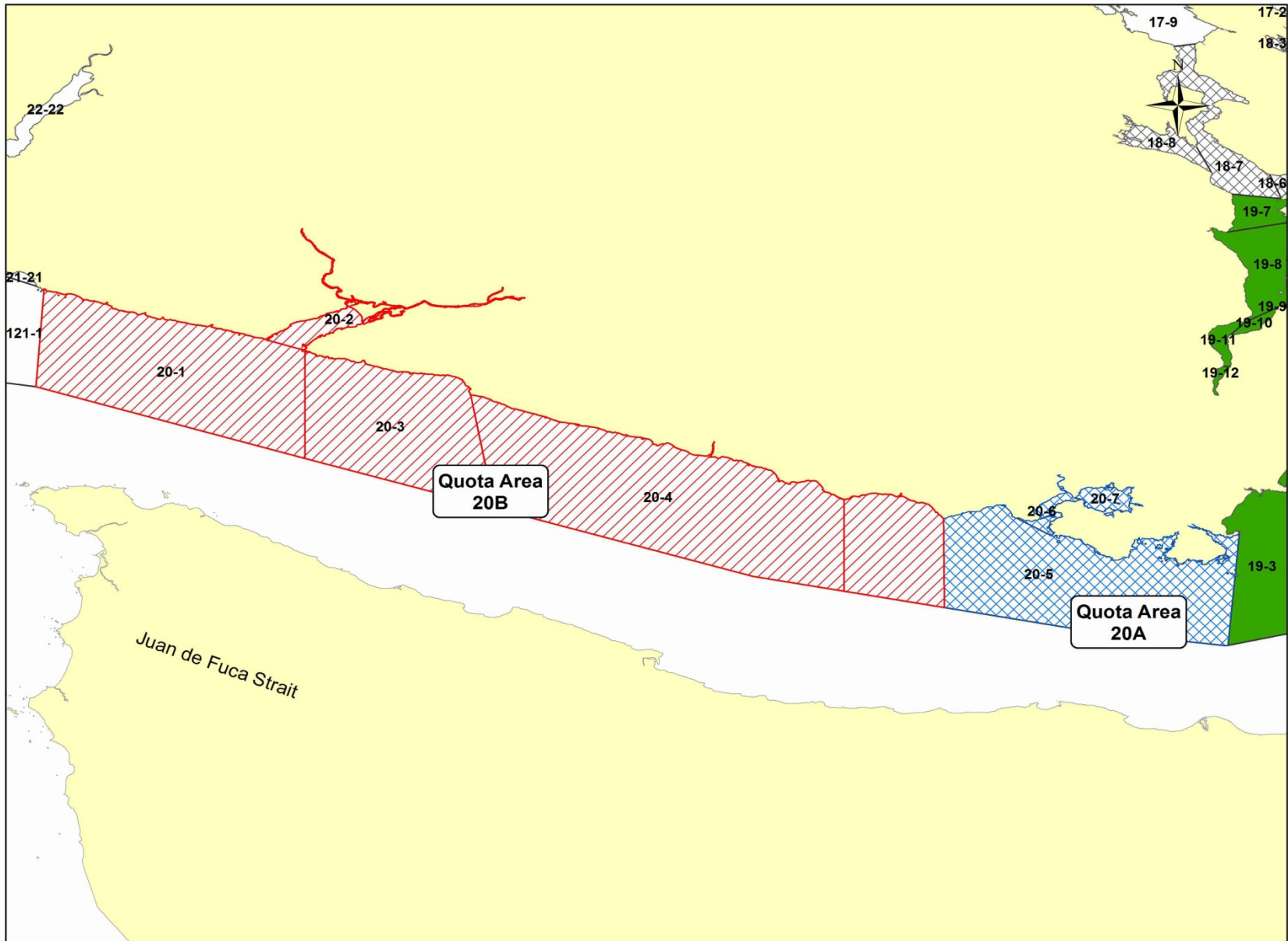


Figure 3: Green Sea Urchin Quota Areas 18, 19 and 20A(changed).



**Figure 4: Green Sea Urchin Quota Areas 20A and 20B (changed).**



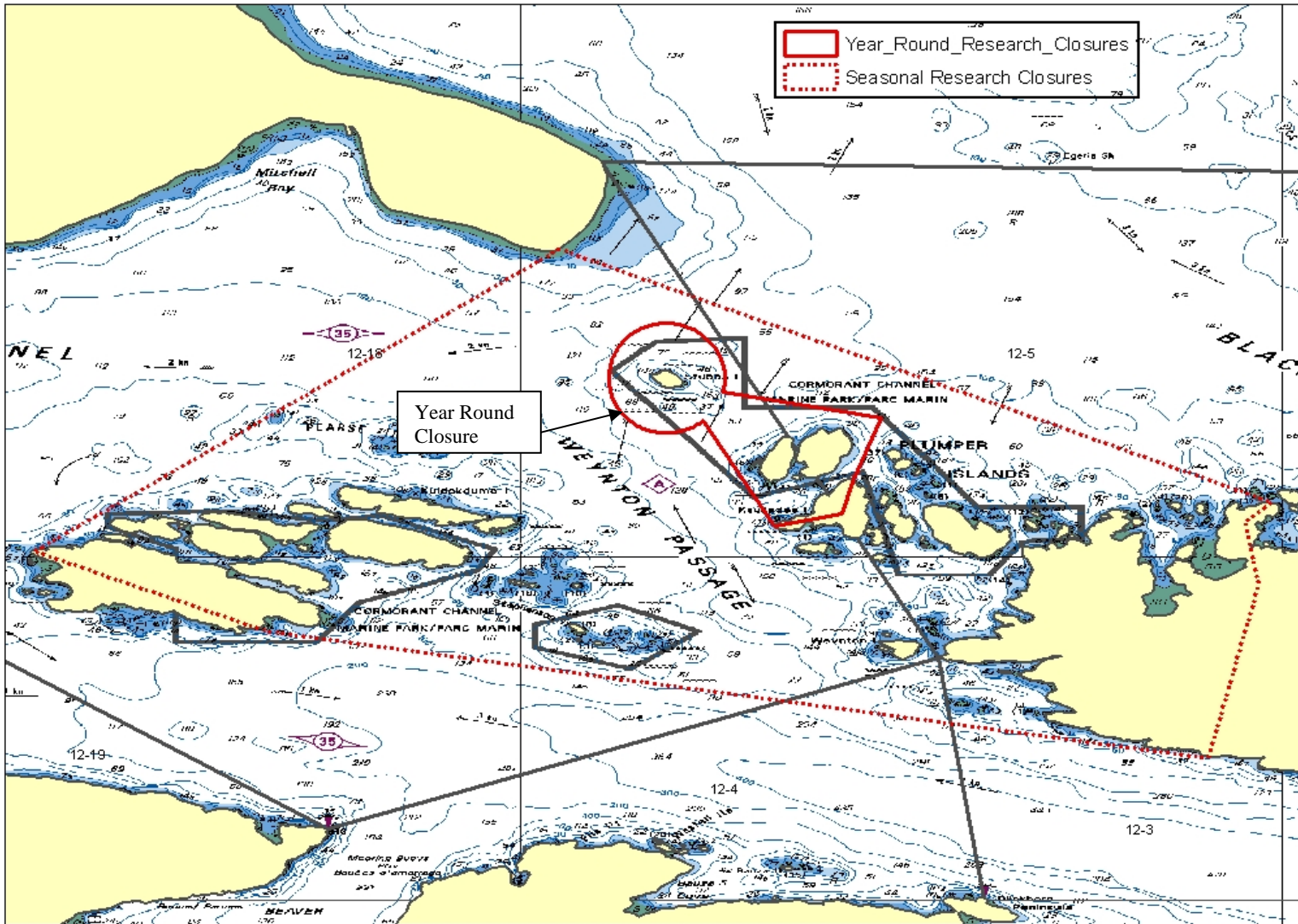


Figure 5: Area 12 Seasonal and Year Round Research Closures.

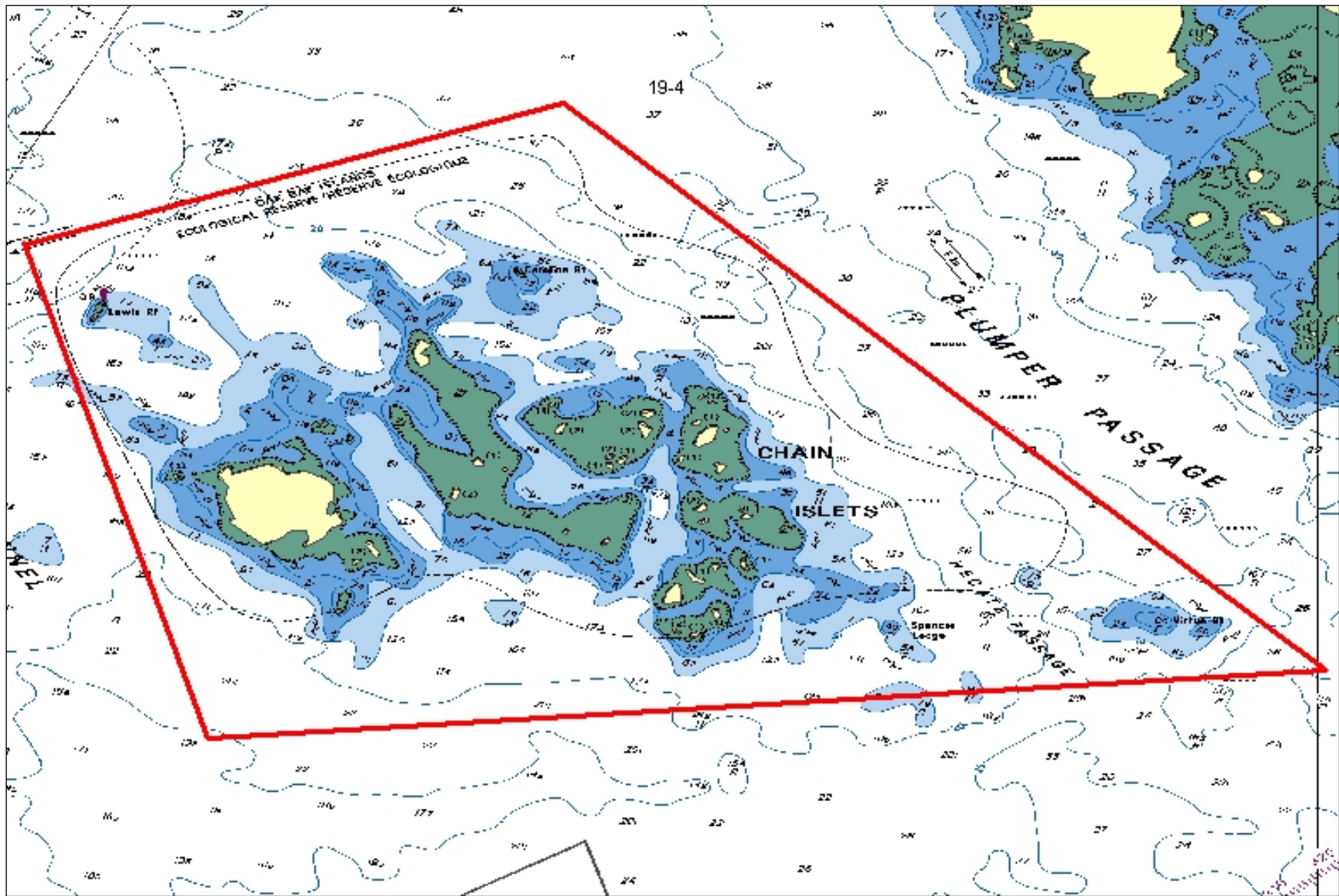


Figure 6: Area 19 Seasonal Research Closure Chain Islets.

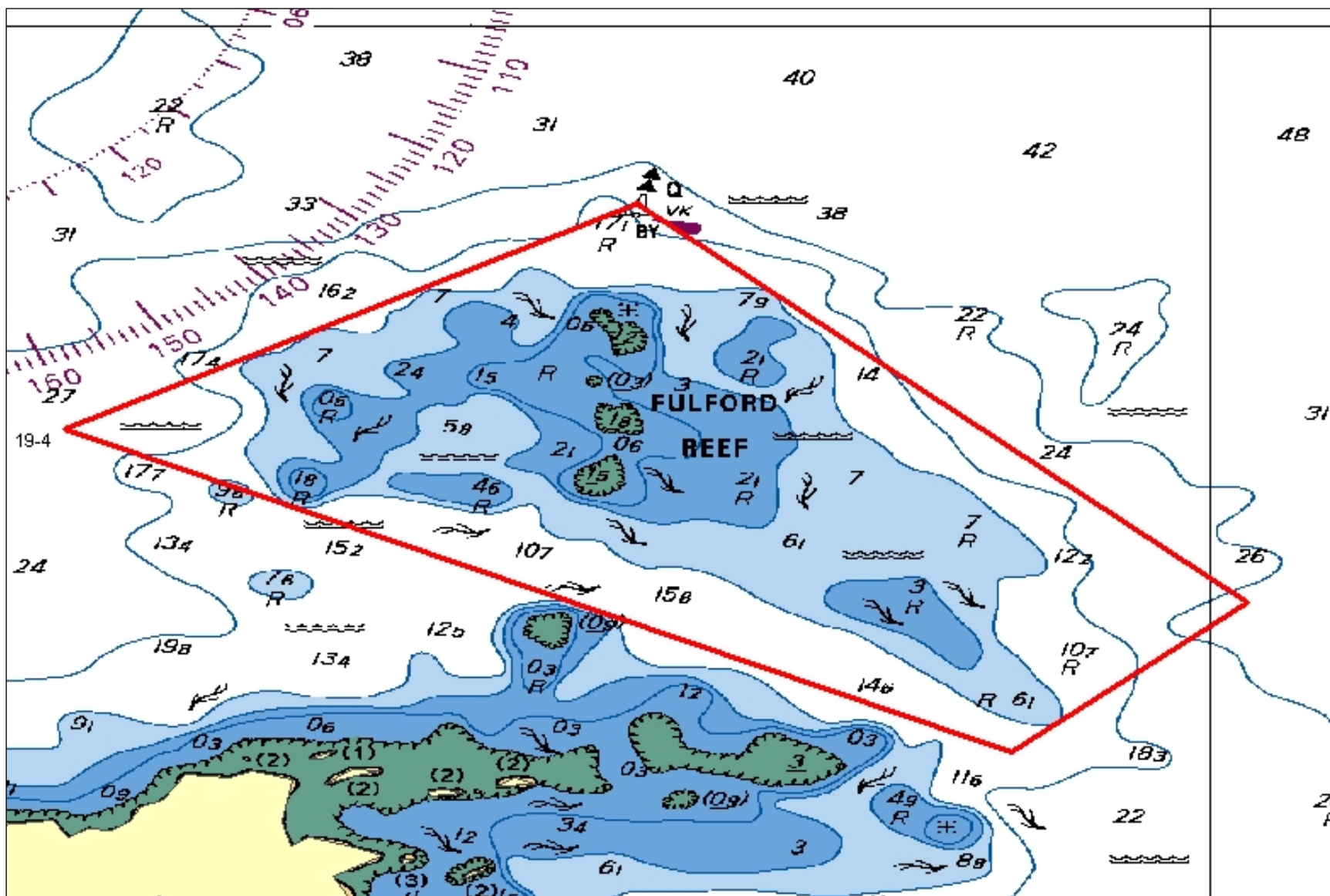


Figure 7: Area 19 Seasonal Research Closure Fulford Reef.

## Appendix 9: Example of Green Sea Urchin Commercial Conditions of Licence

*This example of conditions of licence is provided for your information only. These conditions of licence are generic and may not be the same as those provided when a licence is issued. The actual conditions of licence will be attached to the licence issued by a Pacific Fishery Licensing Unit.*

### CONDITIONS OF GREEN SEA URCHIN LICENCE

Licence Period: September 1 to August 31.

#### Authority

The Department of Fisheries and Oceans has authority to set licence conditions under subsection 22(1) of the *Fishery (General) Regulations* for the proper management and control of fisheries and the conservation and protection of fish.

Persons fishing under authority of this licence may only do so in accordance with the conditions stated below.

Also, it is the responsibility of individual fish harvesters to be informed of, and comply with, the *Fisheries Act* and the regulations made thereunder, in addition to these conditions.

For information on management of the Green Sea Urchin fishery obtain a copy of the current Integrated Fisheries Management Plan for Green Sea Urchin from a Pacific Fishery Licensing Unit Office. The Management Plan is intended for general information purposes only. Where there is a discrepancy between the Plan and the *Fisheries Act* and regulations or these conditions, the *Fisheries Act* and regulations and these conditions prevail.

#### Definitions

"Area" and "Subarea" have the same meaning as in the *Pacific Fishery Management Area Regulations, 2007*.

"container" means a mesh pick bag, a mesh transport bag, a plastic tote, or a cage used for the gathering, handling or transportation of Green Sea Urchin.

"Department" means the Department of Fisheries and Oceans.

"discarded" means not placing the Green Sea Urchin in a container or removing a Green Sea Urchin from a container and not validating that Green Sea Urchin.

"harvested" means removing, by any means, Green Sea Urchin from the substrate of the ocean floor.

"landed" or "landing" means the transfer of Green Sea Urchin from a vessel in water to land.

"observer" means an individual who has been designated as an observer by the Regional Director General for Pacific Region pursuant to section 39 of the *Fishery (General) Regulations*.

"Quota Area" means those areas enumerated and described in the current Integrated Fisheries Management Plan for Green Sea Urchin.

"tranship" means the transfer of Green Sea Urchin from a vessel to another vessel.

"validated" means Green Sea Urchin that have been weighed by an observer and the weight entered into the Green Sea Urchin Validation & Harvest Log or an alternative log approved by the Department.

"vessel registration number" or "VRN" means the number assigned to a vessel by the Department at the time the vessel is registered as a fishing vessel.

1. Species of fish permitted to be taken:  
Green Sea Urchin (*Strongylocentrotus droebachiensis*)

2. Licence Expiry Date:  
This licence expires on August 31.

3. Quantities permitted to be taken:  
The maximum quantity of Green Sea Urchin authorized to be taken under this licence is 5,352.4 kg (11,800 lb.) of Green Sea Urchin harvested from within the area set out in this licence subject to all applicable regulations.

4. Minimum size limit:  
The minimum size of Green Sea Urchin that may be taken is 55 mm in shell diameter, measured between the spines, through the greatest diameter of the shell.

5. Disposition of fish:  
Fish caught under authority of this licence may be sold, traded or bartered.



6. Designated fishers:

Individuals fishing under authority of this licence shall carry proof of designation and shall provide proof of designation on request by any fishery officer or fishery guardian.

Designations are personal and non-transferable.

7. Waters in which fishing is permitted:

Area of fishing is as set out in this licence.

8. Identification of fishing vessel and gear:

(1) The designated vessel shall be identified in accordance with section 26 of the *Fishery (General) Regulations*.

(2) Fishing gear shall be identified in accordance with sections 27 and 29 of the *Fishery (General) Regulations*.

9. Fishing gear permitted to be used:

Hand picking by divers only. Suction devices are not permitted to be used.

10. Fishing multiple Quota Areas:

All Green Sea Urchin caught in a Quota Area shall be landed or transhipped prior to the commencement of fishing in a new Quota Area.

11. The type, size and condition of containers to hold or transport Green Sea Urchin and the marking of such containers:

(1) All Green Sea Urchin delivered to designated landing ports or transhipped to another vessel licensed for the transportation of fish shall be placed in containers which are labelled. The label shall be waterproof and contain the vessel name and vessel registration number.

(2) All "pick bags" or any other type of container containing harvested Green Sea Urchin left unattended in the water shall be labelled. The label shall be waterproof and marked with the vessel name and the vessel registration number of the vessel used to harvest that product. Floats attached to containers left unattended in the water shall also be marked with the vessel registration number.

12. Transhipment:

Green Sea Urchin may be transhipped from the licensed vessel to another vessel licensed for the transportation of fish provided the vessel master complies with the following conditions:

1) all Green Sea Urchin are in containers and tagged as per section 10;

(2) the number of containers are recorded in the log;

(3) the "packer weight" (determined by subtracting the weight of the containers from the weight of the product) is recorded in the log; and

(4) a copy of the log accompanies the transhipped Green Sea Urchin.

13. Locations permitted for the landing of Green Sea Urchin:  
Green Sea Urchin shall be landed at one of the following ports:

(1) South Coast: Port Hardy, Port McNeill, Kelsey Bay, Quadra Island, Campbell River, Brown's Bay, Sidney, Sooke, Victoria or Vancouver.

(2) North Coast: Prince Rupert or Port Edward.

This condition applies to both the licensed vessel and, if the vessel master chooses to tranship his catch to another vessel, to the vessel receiving the Green Sea Urchin.

14. Validation:

(See Explanatory Note after section 17)

(1) All Green Sea Urchin harvested or removed from the sea bed floor under the authority of this licence shall be validated at the point and time the fish is landed.

(2) Prior to validation of Green Sea Urchin no person shall:

(a) smash the shells or slit the membranes of the Green Sea Urchin to drain the waters; or

(b) dump, throw overboard, or otherwise discard Green Sea Urchin which have been harvested and retained in accordance with the *Fisheries Act* and the regulations made thereunder.

(3) All weights shall be determined using a scale approved by Industry Canada.

(4) The vessel master of the licensed vessel or, if the catch is transhipped to another vessel, the vessel master of that vessel, shall provide the observer with a hard copy of the Green Sea Urchin Validation & Harvest Log upon completion of each validation.

(5) The vessel master of the licensed vessel or, if the catch is transhipped to another vessel, the vessel master of that vessel, shall provide to the observer at the point of landing, access to the vessel's fish holds, freezers and other fish storage areas at any time during the landing.

15. Oral Reports:

(1) The vessel master shall, under the circumstances set out in subsections 14(2) to 14(6), report the information set out therein by notifying in person an observer or by telephoning (800) 775-5505.

(2) At least 24 hours before a fishing trip:

- (a) vessel name, vessel master's name and vessel registration number;
- (b) species to be fished;
- (c) Subarea(s) to be fished;
- (d) anticipated time of arrival at the fishing location; and
- (e) anticipated time that fishing will begin.

(3) Upon failure to arrive at fishing location within 24 hours of time stated in subsection 14(2):

- (a) vessel name and vessel registration number; and
- (b) details of change in fishing plans.

(4) At least 24 hours prior to moving to a new Quota Area:

- (a) vessel name, vessel master's name and vessel registration number;
- (b) species to be fished;
- (c) Subarea(s) to be fished;
- (d) anticipated time of arrival at the fishing location; and
- (e) anticipated time that fishing will begin.

(5) After a fishing trip:

- (a) vessel name, vessel master's name and vessel registration number;
- (b) species fished;
- (c) Subarea(s) fished; and
- (d) time that fishing stopped.

(6) At least 24 hours prior to landing Green Sea Urchin:

- (a) vessel name, vessel master's name and vessel registration number;
- (b) species to be landed;
- (c) name of the designated port and location therein where the catch shall be landed;
- (d) anticipated time of landing;
- (e) name of fish processor or buyer that is buying or transporting the catch; and
- (f) if applicable, the method of transporting the catch to a fish processor.

16. Harvest Logs and Chart Data:

(See Explanatory Note after Section 17)



(1) The vessel master shall maintain a log of all harvest operations and provide this information in both hard (paper) copy and electronic copy to the Department. The content and format of this log (paper and electronic) shall meet the requirements as defined by the Shellfish Data Unit for the current licence year.

(2) The harvest and fishing location information recorded in the log shall be complete and accurate.

(3) The information for each day's harvest operations shall be recorded in the log no later than midnight of that day.

(4) The log shall be kept on board the licensed vessel.

(5) The log shall be produced for examination on demand of a fishery officer, a fishery guardian or an observer.

(6) The vessel master shall provide a chart record of the locations fished to the Department.

(a) The chart shall be marked with:

(i) the vessel registration number;

(ii) the licence tab number; and

(iii) the validation I.D. numbers.

The validation I.D. number is the unique page number assigned to each validation page of the Green Sea Urchin Validation & Harvest Log. If an alternative log is used, the validation I.D. number is the unique page number assigned by the Shellfish Data Unit when the licence holder contacts the Unit to obtain the information necessary to fulfil the log requirements.

(b) Each harvest site shall be clearly marked on the chart with dive number, validation I.D. number and the dates that fishing activity occurred at each site. The dive numbers on the chart record must correspond to the dive numbers in the log.

(c) The information for each day's harvest operations shall be recorded on the chart record no later than midnight of that day.

(7) The vessel master shall make provisions to have chart information referred to in subsection 15(6) electronically captured into Geographic Information System (GIS) software and forwarded to the Pacific Biological Station, Nanaimo.

(8) The completed log pages (original copy), electronic copy of the log, and the chart record of locations fished, shall be forwarded within 28 days following the end of each month in which fishing occurred to:

Fisheries and Oceans Canada  
Shellfish Data Unit  
Pacific Biological Station  
3190 Hammond Bay Road  
Nanaimo BC V9T 6N7

Tel: (250) 756-7022 or (250) 756-7306

(9) In the event that a licence holder does not fish during the current fishing season, the licence holder is responsible for submitting a nil report. One page from the harvest logbook identifying the vessel, licence tab number and the year with 'nil' entered in the body of the log and signed by the licence holder constitutes a nil report.

17. Fish Slips:

(1) An accurate written report shall be provided on a fish slip of all fish caught and retained under the authority of this licence.

(2) A report shall be made even if the fish are used for bait, personal consumption or disposed of otherwise.

(3) The report shall be mailed not later than seven days after the offloading and sent to:

Fisheries and Oceans Canada  
Fisheries and Aquaculture Management Branch, FM Data Unit  
Suite 200 - 401 Burrard Street  
Vancouver B.C. V6C 3S4

Fish slips may be downloaded and printed at <http://www.pac.dfo-mpo.gc.ca/stats/fishslips-carnets/index-eng.html>. Fish slip books may also be ordered from the printer at user cost at <http://www.pac.dfo-mpo.gc.ca/stats/fishslips-carnets/index-eng.html>. Phone (604) 666-2716 for more information.

18. Workers' Compensation Board Requirements

All Green Sea Urchin divers shall be in possession of a Workers' Compensation Board Seafood Harvesting Diving Certificate.

Explanatory Note - Harvest Log, Chart Data and Validation: The Green Sea Urchin Validation & Harvest Log issued by the service provider contracted by the West Coast Green Urchin Association is approved for both form and content by the Shellfish Data Unit. This service provider will provide, for a fee, the logbook, and

coding, keypunching, electronic chart data capture and validation services.

Fish harvesters who do not use the logbook and coding, keypunching and electronic chart data capture services provided by this service provider must contact the Shellfish Data Unit at (250) 756-7306 or (250) 756-7022 in order to obtain the information necessary to fulfil these requirements.

## APPENDIX 10: CONTACTS

**Observe, Record and Report (Enforcement Line)** (800) 465-4336  
Fisheries Information and Shellfish Contamination Closure Update (24 Hours) (866) 431-3474  
or (for Greater Vancouver) (604) 666-2828

Invertebrate Internet Page

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

### Fisheries Management

Regional Resource Manager - Invertebrates	Jeff Johansen	(604) 666-3869
Lead Green Sea Urchin Manager	Erin Wylie	(250) 756-7271
Regional Recreational Fisheries Co-ordinator	Carol Eros	(604) 666-3271

North Coast, Areas 1 through 10	General inquiries	(250) 627-3499
417 2nd Avenue West, Prince Rupert, B.C. V8J 1G8	Fax	(250) 627-3498
Resource Management Biologist	Pauline Ridings	(250) 756-7118
Aboriginal Affairs Advisor – First Nations Fisheries	Amy Wakelin	(250) 627-3492
Resource Manager - Recreational Fisheries		(250) 627-3409

South Coast, Areas 11 to 27	General Inquiries	(250) 756-7270
3225 Stephenson Point Rd, Nanaimo, B.C. V9T 1K3	Fax	(250) 756-7162
Resource Management Biologist	Erin Wylie	(250) 756-7271
Resource Manager - First Nations Fisheries	Kevin Conley	(250) 756-7196
Resource Manager - Recreational Fisheries	Brad Beath	(250) 756-7190

Lower Fraser Area, Areas 28 and 29	General Inquiries	(604) 666-8266
Unit 3, 100 Annacis Parkway, Delta, B.C. V3M 6A2	Fax	(604) 666-7112
Resource Management Biologist	Anna Magera	(604) 666-6390
Resource Management - Recreational Fisheries	Barb Mueller	(604) 666-2370
Resource Management – First Nations Fisheries	Matthew Parslow	(604) 666-6608

### Conservation and Protection

Enforcement Plan	Patricia DeMille	(250) 627-3430
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### Science Branch

Pacific Biological Station	Janet Lohead	(250) 756-7139
Hammond Bay Road	Dan Leus	(250) 756-7147
Nanaimo, B.C. V9T 6N7		

### Commercial Licensing

Pacific Fishery Licence Unit (By appointment only)  
200-401 Burrard Street Vancouver, B.C. V6C 3S4  
Email [fishing-peche@dfo-mpo.gc.ca](mailto:fishing-peche@dfo-mpo.gc.ca)

Toll-Free: 1-877-535-7307

### Aquaculture Resource Management

Regional Manager  
Senior Shellfish Coordinator  
Chief, Conservation and Protection  
General Shellfish Aquaculture Mailbox email address:  
E-mail

Brenda McCorquodale (250) 949-6434  
Gabrielle Kosmider (250) 754-0404  
Claire Doucette (250) 618-8985

[Shellfish.Aquaculture@dfo-mpo.gc.ca](mailto:Shellfish.Aquaculture@dfo-mpo.gc.ca)

**BC Ministry of Agriculture**

Industry Specialist, Marine Fisheries & Seafood Allison Witter (250) 356-5362

**Canadian Food Inspection Agency**

Molluscan Shellfish Operations (604) 666-3737

**WorkSafe BC**

Occupational Safety Officer, Courtenay Mark Lunny (250) 334-8732  
Occupational Safety Officer, Courtenay Greg Matthews (250) 334-8734  
Occupational Safety Officer, Courtenay Cody King (250) 334-8733  
Occupational Safety Officer, Victoria Jessie Kunce (250) 881-3461

Manager of Interest for Marine and Fishing Pat Olsen (250) 334 8777  
toll free 1 888 621 7233 (ext. 8777)

Projects related to commercial fishing Tom Pawlowski (604)233-4062  
toll free 1 888 621 7233 (ext. 6922)

**Pacific Urchin Harvesters Association (PUHA)**

[www.puha.org](http://www.puha.org)

President Mike Featherstone (604) 230-1686

**Green Sea Urchin Service Provider**

[www.d-dpacificfisheries.com](http://www.d-dpacificfisheries.com)

D&D Pacific Fisheries Ltd. Darin Macey (604) 886-4819  
Box 1445 Fax (604) 886-8288  
Gibsons, BC V0N 1V0 Hail-line (800) 775-5505

**Sighting Networks**

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

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

On the internet at:

[www.wildwhales.org/sightings/](http://www.wildwhales.org/sightings/) or [www.bcreptiles.ca/reportsightings.htm#1](http://www.bcreptiles.ca/reportsightings.htm#1)

Basking Shark Sighting Network 1 (877) 50 SHARK

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

On the internet at:

[www.pac.dfo-mpo.gc.ca/science/species-especes/elasmobranch/sightings-signaleng.html](http://www.pac.dfo-mpo.gc.ca/science/species-especes/elasmobranch/sightings-signaleng.html)

## APPENDIX 11: 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 Fisheries and Oceans Canada (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 Memorandum of Understanding (MOU), have formalized cooperation to establish, maintain and promote a safety culture within the fishing industry. In keeping with the MOU, this appendix provides some information on vessel safety.

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

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

- Education and Training Programs
- Marine Emergency Duties
- Fish Safe - Stability Education Course
- Fish Safe – Safe on the Wheel Course
- Fish Safe – Safest Catch Program – FREE for BC commercial fishers
- First Aid Training
- Radio Operators Course
- Fishing Masters Certificates
- Small Vessel Operators Certificate

Publications:

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

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

Gearing Up for Safety – WorkSafeBC  
Safe at Sea DVD Series – Fish Safe  
Stability Handbook – Safe at Sea and Safest Catch – DVD Series  
Safest Catch Log Book  
Safety Quick

For further information see: [www.tc.gc.ca/eng/marinesafety/menu.htm](http://www.tc.gc.ca/eng/marinesafety/menu.htm)  
[www.worksafebc.com](http://www.worksafebc.com)  
[www.fishsafebc.com](http://www.fishsafebc.com)

## **1. Important Priorities for Vessel Safety**

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

### **1.1. Fishing Vessel Stability**

Vessel stability is paramount for safety. Care must be given to the stowage and securing of all cargo, skiffs, equipment, fuel containers and supplies, and also to correct ballasting. Fish harvesters must be familiar with their vessel's centre of gravity, the effect of liquid free surfaces on stability (i.e. loose water or fish on deck), loading and unloading operations, watertight integrity and the vessel's freeboard. Know the limitations of your vessel; if you are unsure contact a 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. These instructions must include detailed safe operation documentation kept on board the vessel. Examples of detailed documentation include: engine room procedures; maintenance schedules to ensure watertight integrity; and, instructions for regular practice of emergency drills.

The *Fishing Vessel Safety Regulations* currently require, with certain exceptions, a full stability assessment for vessels between 15 and 150 gross tons that do not exceed 24.4 metres in length and include fishing vessels involved in the catch of herring or capelin. In 2017, Transport Canada Marine Safety (TC) issued Ship Safety Bulletin (SSB) [No. 03/2017](#) announcing the coming into force of the *New Fishing Vessel Safety Regulations*. The initial regulations were published in the Canada Gazette Part II on July 13, 2016 and came into force on July 13, 2017. The bulletin includes important information on changes to requirements for Written Safety Procedures, Safety Equipment and Vessel Stability.

As of July 13, 2017, the following fishing vessels must successfully undergo a stability assessment by a competent person:

- A new fishing vessel that has a hull length of more than 9 m;

- A fishing vessel more than 9 m and that has undergone a major modification or a change in activity that is likely to adversely affect its stability ;
- A fishing vessels that is fitted with an anti-roll tank at any time;
- A fishing vessel more than 15 gross tonnage and used for catching herring or capelin during the period beginning on July 6, 1977 and ending on July 13, 2017

A fishing vessel that is not required to undergo a stability assessment shall have adequate stability to safely carry out the vessel's intended operations. Guidelines are still being developed to help small fishing vessel owners and operators meet their regulatory requirements.

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

In 2008, TC issued [SSB No. 01/2008](#), which sets out a voluntary record of modifications for the benefit of owners/masters of any fishing vessels. For vessels of more than 15 gross tons, the record of modifications was to be reviewed by TC inspectors during regular inspections and entered on the vessel's inspection record. However, information gathered during the Transportation Safety Board's (TSB) Safety Issues Investigation into the fishing industry showed minimal recording of vessel modifications prior to this date.

The TSB has investigated several fishing vessel accidents since 2002 and found a variety of factors that effected the vessel's stability were identified as contributing factors in vessels capsizing, such as with: [M02W0102](#) - *Fritzi-Ann*, [M05W0110](#) - *Morning Sunrise*, [M07M0088](#) - *Big Sisters*, [M08W0189](#) - *Love and Anarchy*, [M09L0074](#) - *Le Marsouin I*, [M10M0014](#) - *Craig and Justin*, [M12W0054](#) - *Jessie G*, [M12W0062](#) - *Pacific Siren*, [M14P0121](#) - *Five Star* and [M15P0286](#) - *Caledonian* .

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

In 2013, Fish Safe developed a code of best practices for the food and bait herring fishery and the prawn fishery: 'Food and Bait – Best Practice Reminders'; 'Prawn Industry - Best Industry Recommended Practices.' Please contact Ryan Ford at Fish Safe for a copy of the program materials they developed to address safety and vessel stability in these fisheries. Ryan Ford – Cell phone: (604) 739-0540 - Email: [ryan@fishsafebc.com](mailto:ryan@fishsafebc.com).



## 1.2. Emergency Drill Requirements

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

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

Between 2011 and 2015 the TSB investigated 17 fishing vessel accidents which resulted in 17 fatalities. The report's findings highlighted the lack of safety drills and safety procedures and practices.

The Safest Catch program, delivered by Fish Safe and **free** to BC commercial fishers, includes comprehensive practice of drills such as abandon ship, man overboard and firefighting drills.

## 1.3. Cold Water Immersion

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

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

## **1.4. Other Issues**

### **1.4.1. Weather**

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

[http://weather.gc.ca/marine/region\\_e.html?mapID=02](http://weather.gc.ca/marine/region_e.html?mapID=02)

### **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 8 metres in length are required to carry a Class D VHF Digital Selective Calling (DSC) radio. A registered DSC VHF radio has the capability to alert other DSC equipped vessels in your immediate area and MCTS that your vessel is in distress. Masters should be aware that they should register their DSC radios with Industry Canada to obtain a Marine Mobile Services Identity (MMSI) number or the automatic distress calling feature of the radio may not work. For further information see the Coast Guard website at: <http://www.ccg-gcc.gc.ca/eng/CCG/Home> or go directly to the Industry Canada web page: [www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01032.html](http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01032.html)

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

### **1.4.3. Collision Regulations**

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

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

Exceptions include:

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

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

### **1.4.4. Buddy System**

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

### **1.5. Fish Safe BC**

Fish Safe encourages Vessel masters and crew to take ownership of fishing vessel safety. Through this industry driven and funded program Fish Safe provides fishing relevant tools and programs to assist fishers in this goal. The Fish Safe Stability Education Program and 1 Day Stability Workshop are available to all fishers who want to improve their understanding of

stability and find practical application to their vessel's operation. The SVOP/Safe on the Wheel Course is designed to equip crew with the skills they need to safely navigate during their wheel watch. The Safest Catch Program, along with fisher-trained Safety Advisors, is designed to give fishers the tools they need to create a vessel specific safety management system.

Fish Safe is managed by Ryan Ford, Program Coordinator John Krgovich, interim Program Assistant Yana Ingelsman, bookkeeper Rhoda Huey and an experienced team of fisher Safety Advisors. All activities and program development is directed by the Fish Safe Advisory Committee (membership is open to all interested in improving safety on board). The advisory committee meets quarterly to discuss safety issues and give direction to Fish Safe in the development of education and tools for fish harvesters.

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

Ryan Ford	
Program Manager	Cell: 604-739-0540
Fish Safe	Fax: 604-275-7140
#100, 12051 Horseshoe Way	Email: fishsafe@fishsafebc.com
Richmond, BC V7A 4V4	www.fishsafebc.com

## 2. WorkSafeBC

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

For further information, contact an Occupational Safety Officer:

Mark Lunny	Courtenay	(250) 334-8732
Cody King	Courtenay	(250) 334-8733
Gregory Matthews	Courtenay	(250) 334-8734
Jessie Kunce	Victoria	(250) 881-3461
Bruce Logan	Lower Mainland	(604) 244-6477

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

For information on projects and initiatives related to commercial fishing health and safety please contact Tom Pawlowski (604) 233-4062 or by email: [tom.pawlowski@worksafebc.com](mailto:tom.pawlowski@worksafebc.com)

### 3. Transportation Safety Board

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

In 2014 the TSB released three investigation reports:

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

In 2016 the TSB released one investigation report:

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

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

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

Moreover, these operating limits must be easily measurable, and relevant to the vessel's operation. For example, that could mean marking the sides of a vessel's hull to indicate the maximum operating waterline. Or maximum permitted loads can be specified in the most relevant unit of measure—total catch weight for instance, or the safe number of traps. Regardless, for it to be of real, practical use, the information must be presented in a format that is clearly understood and easily accessible to crew.

The other two recommendations address the most basic step that fishers can take: wearing a personal flotation device. Here in British Columbia, roughly 70 percent of all fishing-related fatalities in the past decade came while not wearing a PFD. Yet many fishers still don't wear them. Regulations currently require that PFDs be worn only if fishers identify a risk, however; you never know when you could end up in the water. So the TSB is recommending to TC and WorksafeBC to require persons to wear suitable personal flotation devices at all times when on the deck of a commercial fishing vessel or when on board a commercial fishing vessel without a deck or deck structure and that programs are developed to confirm compliance.

For more information about the TSB, visit the website at [www.tsb.gc.ca](http://www.tsb.gc.ca)

For information about the TSB's investigation into fishing safety, or to view a brief video, visit:

<http://www.tsb.gc.ca/eng/medias-media/videos/marine/m09z0001/index.asp>

To view a brief video about some of the issues on the TSB's recent safety Watchlist,

visit: <http://www.tsb.gc.ca/eng/medias-media/photos/index.asp>

Reporting an Occurrence: [www.tsb.gc.ca/eng/incidents-occurrence/marine/](http://www.tsb.gc.ca/eng/incidents-occurrence/marine/)

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

Glenn Budden, Investigator, Marine - Fishing Vessels

Transportation Safety Board of Canada

4 - 3071 No. 5 Road

Richmond, BC, V6X 2T4

Telephone: 604-666-2712

Cell: (604) 619-6090

Email: [glenn.budden@tsb.gc.ca](mailto:glenn.budden@tsb.gc.ca)

## **APPENDIX 12: CONSULTATION**

### **GREEN SEA URCHIN SECTORAL COMMITTEE AND RESEARCH SUBCOMMITTEE**

A consultative process exists for the Green Sea Urchin fishery and is a major part of the planning for the fishery. The primary consultative process is the Green Sea Urchin Sectoral Committee. This committee invites representation from Fisheries and Oceans Canada, commercial vessel owners, processors, First Nations, BC Ministry of Agriculture and Lands and recreational fish harvesters. Members of the Pacific Urchin Harvesters' Association (PUHA) represent commercial fish harvesters on this committee.

The Sectoral Committee typically meets in the spring prior to the new Integrated Fisheries Management Plan (IFMP) to review and provide advice to the Department regarding management issues pertaining to the fishery and on the proposed IFMP. The Sectoral Committee and Research Subcommittee terms of reference and meeting calendar are available from the Resource Managers listed in Contacts.

The draft IFMP incorporates any new science advice and all practical advice on quota options, and is made available to all interested parties: PUHA, First Nations, recreational organizations, DFO (Science Branch, Conservation and Protection, Commercial Licensing, the Oceans Directorate, the Aquaculture Division, Treaty and Aboriginal Policy Directorate, Policy Branch), and the Province (Ministry of Environment or MOE) for review and comment.

A multi-sector advisory committee (Green Sea Urchin Sectoral Committee) meeting is held. Discussion arising from this meeting may result in some final changes to the plan, which then progresses through an internal DFO approval process.