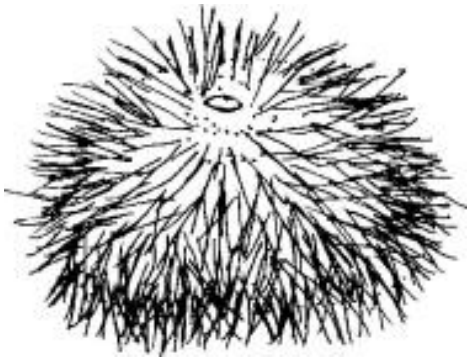
PACIFIC REGION

INTEGRATED FISHERIES MANAGEMENT PLAN

GREEN SEA URCHIN

SEPTEMBER 1, 2016 TO AUGUST 31, 2018



Green Sea Urchin: Strongylocentrotus droebachiensis

Fisheries and Oceans Canada | Pêches et Océans Canada

Canada

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

FOREWORD

The purpose of this Integrated Fisheries Management Plan (IFMP) is to identify the main objectives and requirements for the 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 2016/18 Pacific Region Green Sea Urchin Integrated Fisheries Management Plan (IFMP) is a multi year plan that encompasses the period of September 1, 2016 to August 31, 2018.

The 2016/18 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 we have seen a slow steady increase in landings to this past season (2015/16) when we reached approximately 184 tonnes, just over 90% of the TAC. 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, 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 coastwide where authorized by a communal licence. 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.

1.3.2. Recreational

A recreational fishery may occur coastwide. 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/index-eng.htm

The Tidal Waters licence includes access to numerous species, so the number of recreational harvesters fishing for Green Sea Urchins is unknown.

The fishing effort by recreational harvesters is thought to be minimal.

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 coastwide, 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 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 coastwide 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 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

The *Fisheries Act* and the regulations made thereunder.

Areas and Subareas, as described in the Pacific Fishery Management Area Regulations, are referenced in describing Geoduck Management Areas.

Fishery (General) Regulations (i.e. Conditions of Licence) and the Pacific Fishery Regulations, 1993 (i.e. open times).

- The British Columbia Sport Fishing Regulations (1996) and the Aboriginal Communal Fishing Licences Regulations.
- The Oceans Act.
- The Species at Risk Act.

These documents are available on the Internet at:

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

In addition, the national Sustainable Fisheries Framework (SFF) contains policies for adopting an ecosystem-based approach to fisheries management including:

- A Fishery Decision-Making Framework Incorporating the Precautionary Approach;
- Managing Impacts of Fishing on Benthic Habitat, Communities and Species;
- Policy on New Fisheries for Forage Species.

Along with existing economic and shared stewardship policies, these will help the department meet objectives for long-term sustainability, economic prosperity, and improved governance. See the Internet at:

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

Scientific advice for this fishery is peer-reviewed through a committee called Fisheries and Oceans Canada's Centre for Science Advice Pacific (CSAP) formerly the Pacific Region Scientific Advice Review Committee (PSARC).

The Green Sea Urchin Sectoral Committee (Appendix 12) 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 the spring for a post-season review and pre-season planning.

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 one 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.

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) [1] 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, 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). The model uses median commercial catch per unit of effort (CPUE) for each fishing season for each of the two main harvest locations: Northern Vancouver Island (PFMAs 12 and 13) and Southern Vancouver Island (PFMAs 18 and 19). 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), and a probability distribution of reaching the MSY by fishing a proportion of the MSY.

MSY values have traditionally been considered as targets which management actions should try to achieve. However, many of the assumptions of surplus production models may not be true in a fishery such as for Green Sea Urchins. The present approach, adopted in 2003, is

1 In 2015, the West Coast Green Urchin Association (WCGUA) dissolved and members joined the Pacific Urchin Harvesters Association (PUHA)

precautionary and defines MSY as a limit reference point (LRP) which management actions should ensure is not exceeded. The target reference point (TRP), to which management actions should aim, should be set sufficiently far from the LRP so that there is a low probability that the TRP is equal to or larger than the true LRP (MSY).

A table is produced for each of the two main harvest areas, with MSY LRPs for each region, and a range of TRPs (equivalent to various percent reductions from the MSY values), and the probability of reaching MSY (i.e. the risk). For each TRP, 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 DFO (2014) or DFO (2016) 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

There is no indication of concern for Green Sea Urchin stocks at this time. A recent stock assessment (DFO 2016) 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 in 2013 but remain higher than in the early years of the fishery. Poor market price in Japan due to competition from other countries is the main limiting factor to achieving the TAC in British Columbia. The market condition for BC product appears to be improving but is still uncertain.

The Green Sea Urchin fishery is managed conservatively and stocks appear 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.

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.

2.6. Precautionary Approach

The Department has implemented the Sustainable Fisheries Framework (SFF), which is a toolbox of existing and new 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. New conservation policies have been developed to implement the ecosystem and precautionary approaches to

fisheries management. These new policies, incorporated into development of new Integrated Fisheries Management Plan (IFMP) templates, have joined existing policies in a framework to promote sustainable fisheries.

The new *fishery decision-making framework incorporating the precautionary approach* policy (http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/precaution-eng.htm) applies to key harvested fish stocks managed by DFO, including commercial, recreational or subsistence fisheries.

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 a sustainable fisheries management.

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

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

The Department plans to review the existing assessment framework for the Green Sea Urchin fishery against the new policy.

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.

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 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 PICFI program was extended with two consecutive one-year extensions until March 31, 2014 and a further extension of two years to March 2016.

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

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

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 2010, over 245,000 anglers fished in BC's tidal waters recreational fishery. Most (74%) were BC residents, with the remainder divided between Canadians from outside BC (12%) and visitors to Canada (14%) (Fisheries & Oceans Canada 2010). 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, prawns and clam. The recreational harvest of Green 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. 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 1992/1993 season at approximately 978 Tonnes. Since then annual landings dropped consistently until the 2006/07 season. Initially due to setting of Total Allowable Catches (TAC's) but then followed by poor market conditions.

- Since the 2006/07 harvest low, the harvests have slowing but steadily showing an increasing trend. The highest landings on record since the 1999/00 season occurred in the 2015/16 season to over 90% of the TAC at 184 tonnes.
- Landed value peaked during the 1994/1995 season at $7,251/t. Since then the price dropped consistently to a low of $3,146/t for the 2007/08 season. Price has been relatively steady since 2007/08. Again this is believed to be due to large amounts of product coming from other markets.
- The coastwide Green Sea Urchin quota has remained 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.
- There are limited recreational and First Nations fisheries for Green Sea Urchin.

3.4. Viability and Market Trends

The best roe 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.

3.5. Processing and Exporting

Green Sea Urchins are harvested for their reproductive organs (gonad) or "roe". Green Sea Urchins are shipped whole and live mainly to overseas markets in Japan. 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 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. Ecosystem

4.4.1. Depleted Species Concerns

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

4.4.2. Oceans and Habitat

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.

Pacific North Coast Integrated Management Area (PNCIMA): As part of Canada's Oceans Strategy, DFO has initiated an integrated management planning process for the Pacific North Coast Integrated Management Area (PNCIMA). The PNCIMA is bounded by the BC-Alaska border, the base of the shelf slope and the mainland, stretching south as far as Campbell River and the Brooks Peninsula. As such, it encompasses over 73% of the BC Geoduck fishing area. The PNCIMA planning process marks a shift toward a broader ecosystem approach to ocean management. This is consistent with the Government of Canada's overall direction. The PNCIMA planning process is bringing the area's regulators, First Nations, and stakeholders together to develop an integrated management plan for the region that will identify goals and objectives for achieving conservation, sustainable resource use, and economic development for oceans and coastal areas. These goals and objectives will provide guidance to the management of oceans activities. The integrated management plan will also identify valued ecological, socio-economic and cultural components of PNCIMA and outline a risk-based approach to identifying potential management priorities for these valued components. The plan will also help coordinate various ocean management processes, complementing and linking existing processes and tools, including IFMPs.

Marine Protected Areas (MPAs): DFO is responsible for designating Marine Protected Areas (MPAs) under Canada's Oceans Act. Under this authority, DFO has designated two

MPAs in the Pacific Region, the Bowie Seamount and the Endeavour Hydrothermal Vents. Both areas are offshore and do not include Geoduck fishing areas.

Work is ongoing to consider MPA designations for other areas along the Pacific Coast, including the Race Rocks area off Rocky Point south of Victoria (currently designated as a Provincial Ecological Reserve), which is already closed to commercial Geoduck harvest, and the Hecate Strait / Queen Charlotte Sound Glass Sponge Reefs, an offshore area where commercial Geoduck fishing also does not occur. Changes to existing IFMPs with respect to fishing activities may be required upon designation of these MPAs. In addition, alignment of IFMPs and MPA Management Plans will be necessary.

The Oceans Act mandates DFO with leading and coordinating the development and implementation of a national system (or network) of marine protected areas. The National Framework for Canada's Network of Marine Protected Areas provides strategic direction for the design of a national network of marine protected areas (MPAs) that will be composed of a number of bioregional networks. Future network MPAs may overlap with and/or include Geoduck fishing areas depending on the type and nature of the MPA. More information on integrated management planning and Pacific MPAs under Canada's Oceans Act can be found at:

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

National Marine Conservation Areas (NMCAs): The Canada National Marine Conservation Areas Act provides for the establishment of National Marine Conservation Areas (NMCAs).

Gwaii Haanas National Park Reserve, National Marine Conservation Area Reserve, and Haida Heritage Site is a 5000 km^2 land-and-sea protected area in the southern portion of Haida Gwaii (formerly the Queen Charlotte Islands), approximately 100 kilometres off the north coast of British Columbia. The Haida Nation declared the area a Haida Heritage Site in 1985. The terrestrial part of Gwaii Haanas was designated a National Park Reserve by the Government of Canada soon after, and the two parties have been managing the area cooperatively since 1993. 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 Fisheries and Oceans Canada 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, (see section 3 Appendix 6), that are closed to commercial and recreational fishing.

Development of a long-term management plan for the Gwaii Haanas marine area is underway. This process will take place in consultation with the commercial and recreational fishing sectors through Fisheries and Ocean's established integrated fisheries planning and advisory processes. Annual fishing plans will be developed in consultation with stakeholders.

Users of the Gwaii Haanas marine area should be aware that adjacent land is managed under the authority of the Canada National Parks Act and its regulations and, as specified in the

Gwaii Haanas Agreement (1993), there is "no extraction or harvesting by anyone of the resources of the lands and non-tidal waters of the Archipelago for or in support of commercial enterprise" (s3.3). There are specific requirements for visiting the terrestrial portion of Gwaii Haanas, and advanced planning is necessary. Please contact the Gwaii Haanas administration office at 1-877-559-8818 for further information.

The Governments of Canada and British Columbia announced a proposed boundary for the proposed National Marine Conservation Area Reserve in the Southern Strait of Georgia in October, 2011. It encompasses a portion of the Geoduck fishing area in BC. The two governments will now begin in-depth consultations with First Nations and local governments and a final boundary will be determined only after consultations are complete and the feasibility assessment is concluded. If the results of the feasibility assessment indicate that establishment of a national marine conservation area reserve is practical and feasible, an establishment agreement between the Governments of Canada and British Columbia will be negotiated and an Interim Management Plan developed. First Nations, commercial and recreational fishing sectors, stakeholders, communities and the public will have opportunities to provide input to the development of the interim management plan. More information on the proposed National Marine Conservation Area Reserve in the Southern Strait of Georgia is available on the internet at:

http://www.pc.gc.ca/eng/progs/amnc-nmca/dgs-ssg/index.aspx

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.

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

http://www.pac.dfo-mpo.gc.ca/oceans/protection/docs/cscs-pcce-eng.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

Marine National Wildlife Areas: Under the Canada Wildlife Act, Environment Canada may establish marine National Wildlife Areas (NWAs). The Scott Islands marine National Wildlife Area, located on off the northern tip of Vancouver Island, has been proposed 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.

4.4.3. 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 only occurs 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.

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 recently 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. 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. To date there are no limits on the Aboriginal harvest of Green Sea Urchins for FSC 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 2016/18 is 491,764 lbs. (223 tonnes). The commercial TAC provides for an annual Individual Vessel Quota (IVQ) of 10,036 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 provides 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.

Several 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 the Fisheries Management Directorate, the Science Branch, the Shellfish Data Unit, the Conservation and Protection Directorate, 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

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 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 verification of all catch.

9.2.3. Vehicle Inspection

Transport trucks are inspected during fishing seasons in concert with other enforcement agencies; they can 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.

ISSUE	SECTION	STRATEGY

ISSUE	SECTION	STRATEGY
Licensing Verification • Vessel licensed. • Experimental licence. • No Fisher Registration Card (FRC). • Fail to produce FRC.	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

10.1. Management Plan Evaluation Criteria

10.1.1. Pacific Region Objectives

- Were adequate steps taken to insure that Green Sea Urchin stocks are not biologically threatened?
- Were there enough spawners to provide replacement progeny?
- Were stocks managed so as to have no collateral ecological effects?

10.1.2. Invertebrate Resource Management Objectives

- Were goals for conservation and protection of Green Sea Urchin stocks and their habitat met?
- Did the Department meet the food, social, and ceremonial needs of First Nations with respect to Green Sea Urchins?
- Were co-management goals achieved?
- Were goals around health and safety achieved?
- What opportunities for aquaculture development were provided?
- What opportunities for a recreational fishery were provided?

10.1.3. Green Sea Urchin Objectives

- Were there advances in the understanding of oceans and aquatic resources relative to Green Sea Urchins? How many research and survey activities were conducted?
- Did the commercial Dockside Monitoring Program function appropriately, and what advances in catch monitoring for other sectors were made?

10.1.4. Current Green Sea Urchin Issues

- Have any advances been made in determining appropriate scale of management?

11. REFERENCES

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12. GLOSSARY

Area	Defined in Section 2 of the *Pacific Fishery Management Area Regulations*. A map of Pacific Fishery Management Areas is available on the Department's Internet site at: http://www.pac.dfo-mpo.gc.ca/fm-gp/maps-cartes/areas-secteurs/index-eng.htm
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 *Aboriginal Communal Fishing Licences Regulations*, to carry on fishing and related activities.
communal commercial licence	Issued to First Nations organizations pursuant to the *Aboriginal Communal Fishing Licences Regulations* 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 (formerly, Pacific Scientific Advice Review Committee), 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 *Fishery (General) Regulations*.
PUHA	Pacific Urchin Harvesters Association
PSARC	Pacific Scientific Advice Review Committee. Now known as CSAP, see above.
Quota Area	A defined portion of Pacific fisheries waters. Areas and Subareas, as described in the *Pacific Fishery Management Area Regulations*, 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 co-ordinate 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 *Pacific Fishery Management Area Regulations*
TAC	Total allowable catch. The amount of catch that may be taken from a stock, determined by analytical procedures to achieve management objectives.
Transhipment	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.