



Fisheries and Oceans
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Integrated Fisheries Management Plan Summary
Sea Cucumber (*Parastichopus californicus*) By Dive
Pacific Region
2013/2014



The purpose of this Integrated Fisheries Management Plan (IFMP) summary is to provide a brief overview of the information found in the full IFMP. This document also serves to communicate the basic information on the fishery and its management to 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. The full IFMP is available on request.

This IFMP summary 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.

Signature and title of DFO approval authority

General Overview/Introduction

IFMP Section 1

The giant red sea cucumber (*Parastichopus californicus*) is the only sea cucumber species harvested commercially in British Columbia. The commercial fishery is a limited entry fishery with 85 licence eligibilities. The fishery commences in October and is scheduled for 8 weeks. Harvest is by hand picking while SCUBA diving. The commercial fishery operates under a Total Allowable Catch (TAC), with Individual Quotas (IQ). All commercial landings are tracked using a coastwide Dockside Monitoring Program (DMP). Other management measures in place for the fishery include area quotas, area licensing and a precautionary harvest rate. The commercial fishery takes place along portions of the British Columbia coast in units called Quota Management Areas (QMA) which are comprised of Areas and Subareas, as described in the *Pacific Fishery Management Area Regulations*.

An Adaptive Management Plan (AMP) was undertaken in the sea cucumber fishery from 1997 to 2007 (see section 2.4 of the IFMP). Under the AMP, the Department restricted the commercial fishery to approximately 25 percent of the BC coastline in order to collect time-series information from the commercial fishery. This restriction was not meant to be permanent and areas closed for the AMP would be considered to reopen pending results from data collected from the AMP. The Department reviewed the results of the AMP in 2007 and started reopening portions of coastline closed for the AMP starting in 2008. The reopening process is on-going.

In 2011, the commercial fishery moved from an annual style fishery to a rotational style fishery. For the Adaptive Rotational Fishing Strategy (ARFS), each sea cucumber Quota Management Area will be harvested once every three years.

First Nations' fishing for food, social and ceremonial purposes is open coastwide throughout the year. Food, social and ceremonial harvest 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.

The recreational fishery is open coastwide year-round and is an open entry fishery with a daily bag limit, two-day possession limit and gear limits.

There is a keen interest by industry and investors to develop sea cucumber aquaculture technologies and methodologies both for aquaculture and enhancement of wild stocks. Further research in the areas of hatchery and grow-out techniques for sea cucumber species native to BC are required to support the growth of this sector.

Stock Assessment, Science & Traditional Knowledge

IFMP Section 2

Due to the data-limited nature of the sea cucumber fishery, a phased approach to new and developing fisheries was recommended in order to evaluate the fishery in 1995. Phase 0 (collecting existing information) started in 1995 and knowledge gaps were identified. A Phase 1 fishery (collecting new information) was recommended in order to collect data to address the gaps identified in Phase 0. In order to implement a Phase 1 fishery for sea cucumbers, a ten-year Adaptive Management Plan (AMP) was developed and implemented in 1997. Under the AMP commercial fishing was limited to approximately 25 percent of the BC coast in order to collect important time-series fisheries-dependent data. Additional research in the form of experimental fisheries and density surveys was also undertaken during the AMP. After extensive research over a ten year period and analysis of harvest data, experimental fishery data and density survey data, risk-adverse exploitation rates were determined that would ensure a sustainable fishery (Hand et al. 2008; *An Evaluation of Fishery and Research Data Collected During the Phase 1 Sea Cucumber Fishery in British Columbia 1998 to 2007*). The paper made several recommendations, among which was to re-open areas that were closed during the AMP and consideration of a rotational harvest strategy.

The commercial fishery started 'Phase 2' (fishing for commerce) in 2008, and since then, large portions of the BC coast that were closed for the AMP have reopened. All new areas are surveyed prior to reopening to ensure that there are sufficient densities of sea cucumber to support a commercial harvest.

The Department, in collaboration with First Nations and the Pacific Sea Cucumber Harvesters Association (PSCHA), continues to conduct stock assessment research leading towards an improved understanding of the sea cucumber resource. Scientific research and stock assessment surveys are of vital importance to this fishery as it continues to be managed under the precautionary approach to Canadian fisheries.

The long-term goal of the Department is to develop an ecologically-based management regime for a sustainable fishery through a better understanding of stock dynamics of the resource.

Economic Profile of the Fishery

IFMP Section 3

China is the largest market for sea cucumber, where the skins have been used for centuries as a medicinal food. Many different species of sea cucumber compete with BC sea cucumber in Asian markets. The domestic market for sea cucumber is small.

Sea cucumbers are processed into two products: frozen muscle strips and dried skin. The meat is removed from the skin and then frozen and shipped to Asian markets. The skin is semi-processed in Vancouver-based plants where it is boiled, salted and then shipped to China where it is dried.

The 85 commercial licence eligibilities are stackable and are usually distributed over 30 or more vessels (changes from year to year). Most of the vessels involved in the sea cucumber fishery are licensed for one or more other dive fisheries such as geoduck, green sea urchin or red sea urchin. Overall, the dive fleet generates slightly more revenue from its harvest of non-sea cucumber species than from sea cucumber. The commercial TAC remained relatively constant for many years at approximately 1.2 million pounds until 2011 when it was increased by approximately 9.5%. Sea cucumber harvesters have reliable access to the resource, with catch shares of a fishery that has had a consistent TAC over many years. The price paid to harvesters has more than doubled since 2008 from an average of \$2.30 per split pound to an average of \$5.50 per split pound in 2011.

Sea cucumbers are important to coastal First Nations, who harvest them for food, social and ceremonial purposes. First Nations are also interested in economic opportunities through participation in BC's commercial fisheries.

Recreational interest in harvesting shellfish species is directed mainly at crab, prawn and shrimp. The recreational harvest of sea cucumbers is believed to be minimal.

Access and Allocation

IFMP Section 6

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

The commercial fishery is managed through a TAC, limited entry licensing, IQ, area licensing, area quotas and a precautionary harvest rate.

To date there have been no limits placed on First Nations' harvest for food, social and ceremonial purposes. The daily limit for recreational sea cucumber harvest is 12 sea cucumbers with a possession limit of 24 and gear is limited to hand picking only.

The needs of aquaculturists will be given equitable consideration to those users in the commercial and recreational sectors.

Shared Stewardship Arrangements

IFMP Section 8

A collaborative agreement is typically developed that details the working relationship between the Department and the Pacific Sea Cucumber Harvesters Association (PSCHA). This agreement typically includes an annual work plan of activities related to the commercial sea cucumber fishery that are to be accomplished by both parties and the annual financial contributions of each party to the sea cucumber science, management and enforcement program.

Management Issues, Objectives and Measures

IFMP Sections 4, 5 and 7

#	Management Issue	Objectives	Management Measure
1	<p>Collection of biological information</p> <p>The life history characteristics of importance to understanding the productivity of <i>Parastichopus californicus</i> are still largely unavailable and may lead to uncertainties in sea cucumber stock assessment.</p>	<p>To conduct on-going surveys and research to improve information on sea cucumber stocks, biological characteristics and impacts of the commercial fishery.</p>	<p>A precautionary approach to management, which ensures the Department is meeting its conservation goals, will continue for the foreseeable future.</p> <p>Research will continue on sea cucumbers in collaboration with the Pacific Sea Cucumber Harvesters Association and First Nations.</p>
2	<p>Localized over harvesting and managing the commercial fishery to an appropriate scale.</p> <p>The concentration of fishing effort in relatively small areas may lead to local depletion of sea cucumber stocks.</p>	<p>To manage the commercial fishery to an appropriate scale in order to avoid any risks of localized overharvesting.</p>	<p>In order to minimize the effects of localized over harvesting, the size of a number of sea cucumber Quota Management Areas (QMA) have been decreased in order to spread harvest effort. Harvest effort will continue to be monitored and further adjustment to QMAs may be made in the future if necessary.</p>
3	<p>Commercial No-Take Reserves</p> <p>As an alternative to reference points (see section 2.7 of IFMP), commercial no-take reserves have been employed in the sea cucumber fishery. In future years, the number of no-take reserves will increase as a coastwide network is developed.</p>	<p>To develop a coastwide network of commercial no-take reserves in order to help ensure that there are portions of the BC coast that will remain closed to commercial harvest.</p>	<p>The number of commercial no-take reserves will be increased over time as a coastwide network is developed for the BC coast.</p> <p>A scientific paper is under development that will give direction on how to set up a coastwide network of reserves for low mobile benthic invertebrate species. Advice from this paper will be used for the sea cucumber fishery.</p>
4	<p>Quota Overages</p> <p>Any quota taken above the TAC is a conservation concern.</p>	<p>Meet conservation objectives and ensure healthy and productive fisheries and ecosystems.</p>	<p>The department will be monitoring quota overages during each season and may pursue enforcement action for repeat violators.</p>

5	<p>Sea cucumber aquaculture</p> <p>The practice of collecting wild-set juvenile sea cucumbers off of floating aquaculture (e.g. oyster strings) and growing them on tenures is a concern since potential impacts on wild stock and recruitment have not yet been assessed.</p>	<p>Meet conservation objectives and ensure healthy and productive fisheries and ecosystems.</p>	<p>The Department is in the process of drafting policy for sustainable sea cucumber aquaculture.</p>
6	<p>Managing a rotational fishery</p> <p>The 2011 season was the start of a three year rotational fishery in which different areas along the BC coast will be targeted in different years. There are conservation and logistical advantages to a rotational style fishery.</p>	<p>To consider the goals of stakeholders with respect to social, cultural and economic value of the fishery.</p> <p>Manage fisheries to provide opportunities for economic prosperity.</p>	<p>The rotational fishing strategy will be adaptive since the process of reopening the sections of coastline that were closed for the Adaptive Management Plan is not complete. Harvest rate, licence distribution between licence areas, QMA size and order of QMA harvest will be examined prior to each season.</p>
7	<p>Increase in the number of sea cucumber aquaculture tenures</p> <p>An increase to the number of aquaculture tenures licensed for sea cucumber will require consideration in the biomass and TAC estimates for the wild commercial fishery.</p>	<p>Meet conservation objectives and ensure healthy and productive fisheries and ecosystems.</p> <p>To consider opportunity for the development of the aquaculture industry.</p>	<p>The Department is in the process of drafting policy for sustainable sea cucumber aquaculture.</p>
8	<p>Hail notification infractions</p> <p>During the commercial fishery there may be issues with certain vessels not giving adequate hail notification. This creates difficulties for managing the fishery and may lead to quota overages.</p>	<p>Meet conservation objectives and ensure healthy and productive fisheries and ecosystems.</p>	<p>The Department will be monitoring hail notification infractions during each season and may pursue enforcement action for repeat violators.</p>

Governance Process

The sea cucumber fishery is governed by the *Fisheries Act* and regulations made thereunder.

The primary consultative body for sea cucumbers is the Sea Cucumber Sectoral Committee. The committee includes members from the Department, First Nations, commercial industry, and other sectors. The sea cucumber Sectoral Committee meets annually in June to provide advice to the Department on the IFMP. The draft IFMP goes out for a 30-day public consultation in July and the final version of the IFMP goes for approval by the Regional Director General for the Pacific Region in August. Licensing for the commercial fishery starts in September and the fishery opens on the first Monday of October. A research subcommittee meeting is generally held in December in order to plan research activities for the following year.

Compliance Plan

IFMP Section 9

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

Performance Review

IFMP Section 10

Performance indicators are reported in the Post-Season Review (Appendix 4 of the IFMP)

Stock assessment and research activities are outlined. The post season review may include outcomes from meetings with First Nations and other sector regarding sea cucumber. The delivery of the commercial fishery will be assessed by performance measures such as the amount of sea cucumbers landed and the value of the fishery. Input from members at the Sea Cucumber Sectoral Committee meetings will be included. The post season review will also include time spent attending to enforcement of the fishery.

Fisheries and Oceans Canada Contact

For additional information on this IFMP Summary or to request an electronic version of the full IFMP, please contact Pauline Ridings at 250-756-7118 or Pauline.Ridings@dfo-mpo.gc.ca