

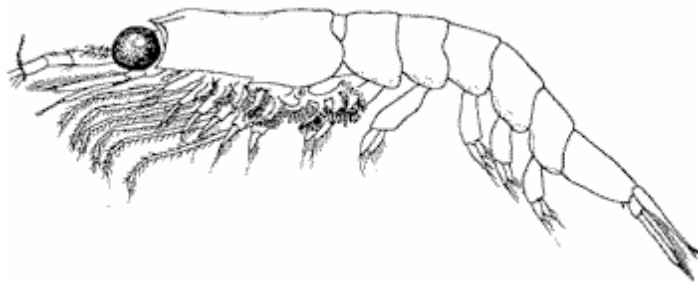


Fisheries and Oceans
Canada

Pêches et Océans
Canada

Integrated Fisheries Management Plan Summary

Euphausiids



Euphausiids: *Euphausia pacifica*

Pacific Region

January 1, 2013 to December 31, 2017

S. Farlinger, Regional Director General

General Overview/Introduction

IFMP Section 1

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

The Euphausiid fishery is a small limited entry, competitive commercial fishery managed through area-based quotas, seasonal openings, a precautionary 500 tonne total allowable catch (“TAC”) and a fishery notification (“hail”) and dockside validation program funded by commercial harvesters. The total allowable catch is 500 tonnes with a season from November to March to minimise the incidental catch of larval and juvenile fish. The allowable catch is estimated to be less than 3% of the annual consumption of Euphausiids by all predator species in the Strait of Georgia.

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

Participation in the fishery is limited due to economics and markets. Four vessels fished in 2011.

Stock Assessment, Science & Traditional Knowledge

IFMP Section 2

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

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

In BC, Euphausiids release their eggs directly into the water where they develop independently. The main spawning season occurs in May to July with a second period of less intensive spawning in late August through September in the Strait of Georgia. The life span is estimated to be 19-22 months with growth cessation occurring in early autumn to winter when water temperatures and phytoplankton abundance is low.

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

The population size of Euphausiids in the Strait of Georgia has large seasonal and interannual variability. At present and past catch limits (<500 tonnes), the fishery removes only a small fraction of the Strait of Georgia annual average biomass, and an even smaller fraction of annual Euphausiid production.

Economic, Social, Cultural Importance

IFMP Section 3

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

The landed value of the Euphausiid fishery as reported in fish slips has varied between \$23,107 in 2008 and peaking at \$541,000 in 2002. The landed price has varied between \$0.23 and \$1.54 kg⁻¹. Landings between 1990 and 2002 varied between 300 and 500 tonnes, except 1993 due to market limitations in that year. Limited fishing activity since 2002 has resulted in significant reductions in catch

landed. Annual landings since 2005 have remained below 250 tonnes. The majority of catch is taken from Jervis Inlet and the Strait of Georgia.

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

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

Shared Stewardship Arrangements

IFMP Section 8

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

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

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

Governance Process

IFMP Section 1

The Minister of Fisheries and Oceans has ultimate and final responsibility for the management of fisheries in Canadian waters, and for the conduct of Canadian vessels operating in international waters. The euphausiids fishery is governed by the *Fisheries Act* and regulations made thereunder and other applicable federal legislation.

Access and Allocations

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

These species are generally not harvested recreationally. The daily limit under the BC Tidal Waters Sport Fishing Licence for “other shellfish” allows for a recreational harvest of 20 individual animals by dip net.

First Nations’ harvest for food, social and ceremonial purposes may occur where authorized by a communal licence. Euphausiids may be allocated under treaty, but were unallocated under the Maa-nulth, Tsawassen and Nisga’a Treaties. These species are generally not harvested by First Nations for food, social or ceremonial purposes.

Management Issues, Objectives and Measures

#	Management Issue	Objectives	Management Measure
1	<p>Basic biological information (i.e., age, growth, recruitment and migration) in support of the management of these species is limited. There is a minimal amount of available biological data with which to assess the fishery, and from which to develop and alter management plans.</p>	<p>Continue to conduct assessments and biomass surveys as resources allow.</p>	<p>A better understanding of the influence of varying exploitation rates on the resilience of local populations in years of poor survival (caused mostly by climate and predator effects on euphausiids) may be needed to support new policies developed under the Sustainable Fisheries Framework</p>
2	<p>Euphausiids are a forage species and prey to many other species. As such, this fishery is subject to the new Policy on New Fisheries for Forage Species. Under the Policy, existing fisheries for forage species that have an established record of sustainability, and the resource has been consistently conserved, may continue within the existing management approaches. Any proposals to change exploitation rates, gears, seasons, or other attributes of the fishery in ways that might affect conservation of the forage species or species feeding on it must be evaluated against the pre-requisites outlined under the Policy.</p>	<p>Continue with a conservative, precautionary setting of the total allowable catch.</p>	<p>If the exploitation rate changes in the future, this fishery will need to be evaluated against the pre-requisites outlined under the Policy.</p>

Performance Review

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

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

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

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

Fisheries and Oceans Canada Contact

For additional information on this IFMP Summary or to request an electronic version of the full IFMP, please contact Laurie Convey at 250-756-7233 or Laurie.Convey@dfo-mpo.gc.ca .