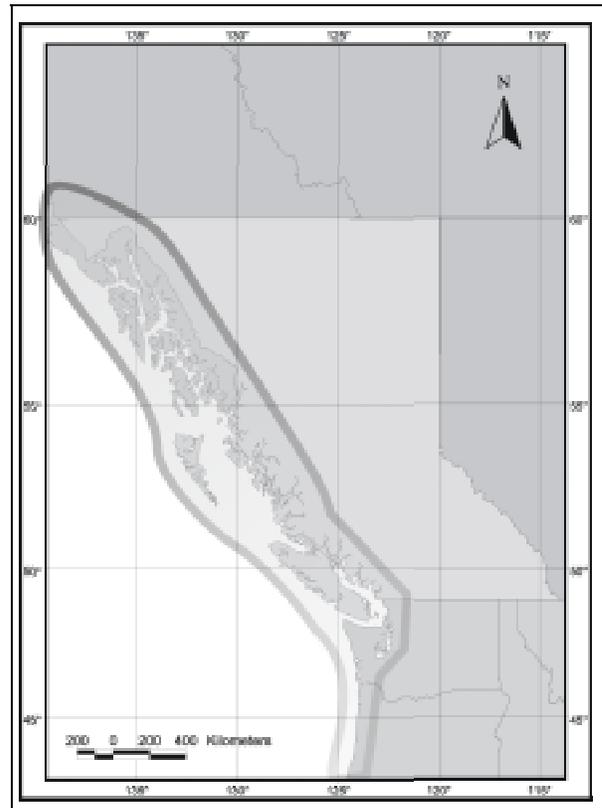




Surf Smelt

Background

Surf smelt (*Hypomesus pretiosus*) is a pelagic, schooling species that is found between Monterey Bay, California and Prince William Sound, Alaska. Commercial fisheries for surf smelt have existed since the mid-1800s but peaked in 1904 with more than 230 t harvested from B.C. Since the early 1960s, commercial landings of surf smelt have not exceeded 10 t. This reduction in commercial landings highlights the shift in this fishery from commercial harvest to recreational harvest. Early commercial fisheries existed along the coast of British Columbia but following World War I, commercial fisheries were concentrated around Vancouver on the lower mainland of British Columbia. Recreational fisheries also are centered in this region. Unfortunately, the recreational fishery does not require reporting of catch so there is considerable uncertainty regarding the actual recreational harvest of surf smelt. However, interest in this recreational fishery continues to grow and poses questions of sustainability for this stock.



Distribution of surf smelt in British Columbia

Summary

- There is growing concern regarding the unmonitored recreational harvest of surf smelt in British Columbia and the potential for overharvesting.
- Increasing recreational harvest combined with potentially decreasing abundance suggests that overharvesting may have occurred.
- Much of the product is for personal consumption making regulating (enforcing) the fishery difficult.

Species Biology

Surf smelt, *Hypomesus pretiosus*, is one of seven representatives of the Family Osmeridae in British Columbia. Globally, the family consists of 12 species belonging to six genera, with most species located in the eastern Pacific. Surf smelt are distributed from California to Alaska. There have been no studies to determine if there is more than one stock of surf smelt in British Columbia or to determine the amount of movement by individuals along the West Coast of North America. Evidence based on serological analyses, meristics, parasite incidence, and spawning time suggest more than one stock in Washington State but additional genetic studies are needed to determine stock status and distribution in British Columbia.

Spawning beaches in British Columbia have not been fully identified, but most fishing occurs at spawning beaches in Burrard Inlet (Vancouver). Surf smelt are repeat beach spawners with females depositing their eggs on gravel spawning beaches during summer months. Females produce about 20,000 eggs (1.0–1.2 mm diameter) per season (range 2,500–37,000), depending on size. Spawning events start a couple of hours prior to high tide with females leaving schools adjacent to the spawning beach and moving onshore. Several males pursue each female to the beach where milt and eggs are released. Fish then return to the school and the rising tide buries the fertilized eggs 2–15 cm in the upper tidal zone. Embryo development depends on temperature and spawning time but generally hatch after 11 days when larvae are about 3 mm long.

Surf smelt are indiscriminate feeders eating a variety of zooplankton and zoobenthos including copepods, amphipods, crabs, euphausiids, larvae, marine worms, combjellies, and a variety of larval fish.

Size varies as a function of age, which suggest two-year-old fish (138 mm males and 146 mm females) dominate most schools. In British Columbia surf smelt can reach a maximum length of 222 mm (five years).

The Fishery

Average BC Landings (metric tonnes)

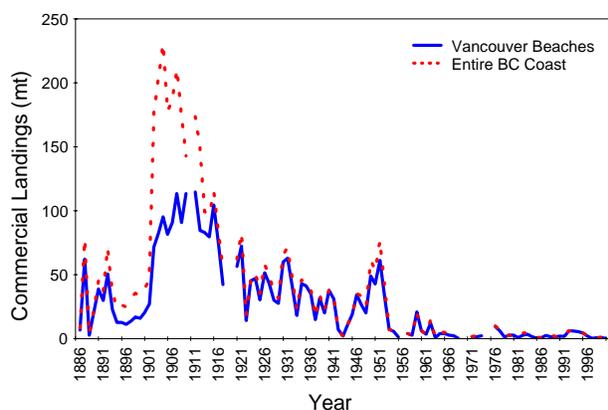
1886-99	1900-24	1925-49	1950-74	1975-00
34.2	119.0	35.4	12.6	3.2

Commercial fisheries have operated in British Columbia since the mid-1800s. There was a lack of export demand for these smaller fish so catches were primarily for personal consumption or local demand. Current catches are still intended for personal consumption but the species can be targeted via two commercial licenses or a recreational licence. Surf smelt commercial fisheries are unlimited entry and unlimited catch requiring either a “Schedule II Part II Other Species” or “Z8” licence to harvest the species. The recreational fishery operates via the “Tidal Sport Fishing Licence” and allows the harvest of 20 kg per day using dipnet or gillnets.

In the early 1900s surf smelt were caught along the entire coast of British Columbia with commercial landings peaking at more than 230 t in 1904. Since the early 1920s, most of the commercial catch has been landed from Burrard Inlet. The recreational fishery also is most concentrated in Burrard

Inlet but a growing dock fishery exists in Prince Rupert.

Over time, commercial landings have decreased significantly. This may reflect a lack of demand, low biomass, or a shift from commercial to recreational harvest.



Commercial landings of surf smelt in British Columbia between 1886 and 2000 for the entire British Columbia coast and Vancouver beaches.

Recent BC Landings (kg)

1997	1998	1999	2000	2001	2002
217	768	1061	1794	1668	710

Resource Status

No formal stock assessments for surf smelt have been conducted in British Columbia. It is assumed there is only a single stock, but the possibility exists that there are different stocks distributed along the coast. Furthermore, since surf smelt spawning beaches tend to be associated with the mouth of large river systems, stocks might home to these beaches. Anecdotal information suggests the Prince Rupert population spawns earlier than the Burrard Inlet population and could indicate reproductive isolation. Additional

studies are needed to verify the number of stocks in British Columbia.

There is anecdotal evidence to suggest that surf smelt populations, notably Burrard Inlet, are declining. However, additional studies are needed to verify this. Also, since the fishery operates as unlimited entry, the potential for rapid expansion and resource over-utilization is great. In addition, although there is a perceived limited demand for the product, incidence of illegal fishing is high.

There is an Integrated Fisheries Management Plan (IFMP) for surf smelt in British Columbia that controls licensing and is reviewed annually by Fisheries and Oceans Canada. This fishery currently operates as unlimited entry and unlimited catch via two commercial licenses and one recreational license. The commercial fishery is only opened by variation order in most coastal areas. In Burrard Inlet commercial fisheries and recreational harvest alternate fishing periods with a conservation closure between June 15 and August 15.

Outlook

Since little is known about factors that affect surf smelt biomass and distribution in British Columbia, it is difficult to forecast future stock trends. Fisheries and Oceans Canada has adopted a collaborative use policy between government and industry to fund assessments for commercial fisheries. Therefore, future assessments will depend on commercial interest and should develop following the “phased approach” currently endorsed for new and developing fisheries. A number of data deficiencies have been identified

for surf smelt in British Columbia and should be a priority for future research.

Management Considerations

There is a significant lack of compliance to the harvest log submission requirement for commercial surf smelt fisheries. Also, there is no method in place to measure the recreational harvest (i.e., creel survey), which is likely a significant proportion of the total catch. Commercial licenses have not been issued for areas outside Burrard Inlet since the early 1980s but catches are made routinely in those areas, most notably Prince Rupert.

The greatest fishing pressure is likely associated with population centres because of the recreational nature of the surf smelt fishery in British Columbia (i.e., intended for personal consumption).

For more Information

Science Contact: Tom Therriault
Pacific Biological Station
3190 Hammond Bay Road
Nanaimo, BC, V9T 6N7
Phone: (250) 756-7394
Fax: (250) 756-7138
E-Mail: therriaultt@pac.dfo-mpo.gc.ca

Management Contact: Barbara Mueller
Lower Fraser Area
100 Annacis Parkway, Unit 3
Delta, BC, V3M 6A2
Phone: (604) 666-2370
Fax: (604) 666-7112
E-Mail: muellerb@pac.dfo-mpo.gc.ca

References

- Hart, J.L. 1973. Pacific fishes of Canada. Bull. Fish. Res. Board Can. No. 180.
- Kilambi, R.V., Utter, F.M., and DeLacy, A.C. 1965. Differentiation of spawning populations of the surf smelt *Hypomesus pretiosus* (Girard) by serological methods. J. Mar. Biol. Assoc. India 7: 364-368.
- Levy, D.A. 1985. Biology and management of surf smelt in Burrard Inlet, Vancouver, B.C. Westwater Research Centre Tech. Rep. No. 28.
- Penttila, D. 1978. Studies of the surf smelt (*Hypomesus pretiosus*) in Puget Sound. Wash. Dep. Fish. Tech. Rep. No. 42.
- Penttila, D. 2001. Documented spawning areas of the Pacific herring, *Clupea*, the surf smelt, *Hypomesus*, and the Pacific sand lance, *Ammodytes*, in Whatcom County, Washington. Wash. Dep. Fish Wildl. Man. Rep.
- Schaefer, M.B. 1936. Contribution to the life history of the surf smelt (*Hypomesus pretiosus*) in Puget Sound. Wash. Dept. Fish., Biol. Rep. 35B:1-45.

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Phone: (250) 756-7208
Fax: (250) 756-7209
Email: psarc@pac.dfo-mpo.gc.ca
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