



Native littleneck clam (*Protothaca staminea*)

Native Littleneck Clam

Background

Littleneck clams (*Protothaca staminea*) are found from the Aleutian Islands to Baja California Sur, though they are generally abundant only north of Oregon. They inhabit the mid to lower intertidal zone in British Columbia, in mixed substrates of gravel, sand and mud. Although occasionally recorded to 10 metres depth, there are no significant subtidal populations of littleneck clams in B.C.

Littleneck clams have separate sexes. They mature at between 22 and 35 mm in length, or approximately 2 to 3 years of age. In B.C., they spawn from April to October. Larvae are planktonic for 3 or 4 weeks before settling in suitable habitat. Adult populations, once settled on one beach, cannot move to another. Although there may be some movement of clams on a beach, distinct growth rates on upper and lower portions of a beach indicate that these movements are relatively limited.

Age is estimated from counts of annual rings on the shell surface. Maximum age in B.C. is 14 years. Growth varies considerably from beach to beach, and between tide levels on a given beach. Growth is rapid to 5 years of age, and then slows. Littleneck clams can reach legal size (38 mm length) in the Strait of Georgia in 3 years. Maximum size (70 mm) is reached in 10 years.

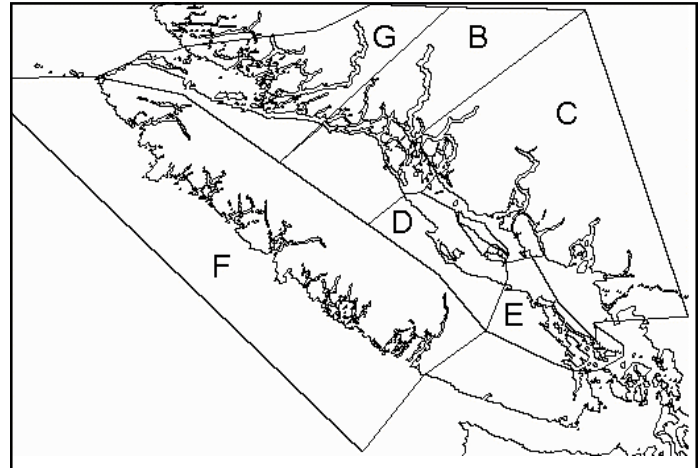


Fig. 1. Clam fishery licence areas in the South Coast area of British Columbia

The Fishery

Clam harvesters fish during low tides, using rakes or scrapers to turn littleneck clams out of the substrate and collect them by hand.

Intertidal clam landings have been recorded since the turn of the century, and clams were important to First Nations peoples long before contact. The littleneck clam resource currently supports commercial, depuration and recreational harvests, and First Nations food and ceremonial requirements. These fisheries also exploit stocks of Manila clams (*Venerupis philippinarum*) and to a lesser extent, butter clams (*Saxidomus gigantea*).

Licensed commercial clam diggers are required to designate one of six Clam Areas (B-G) they wish to fish each year and then compete for available clams during short intense openings. In 1998, the intertidal clam fishery underwent licence limitation, resulting in a reduction from approximately 2,500 licensed diggers in 1988 to 1,160 eligible participants.

Several collaborative pilot projects that provide First Nations with communal commercial harvest opportunities on beaches fronting reserves are

underway in the Strait of Georgia and on the west coast of Vancouver Island.

Intertidal clam fisheries have been closed in the north coast region since 1963. These closures are the result of concerns regarding water quality and paralytic shellfish poison (PSP), which, in the absence of monitoring programs, create potential human health risks. A pilot commercial communal fishery occurs near Bella Bella, with special water quality and product monitoring programs.

The depuration fishery utilizes relatively new technology to allow access to product which is marginally contaminated by fecal coliform either from human (sewage or agricultural) or natural sources. Depuration is the process of maintaining live bivalves in purified seawater for a period sufficient to purge them of fecal coliform contamination. Depuration harvests are carried out on marginally contaminated beaches. Depuration opportunities are allocated to certified depuration processing facilities, or jointly to depuration processors and First Nations where beaches fronting reserves are contaminated, and harvests are coordinated by the processors over the permit year. Total allowable catches are determined from assessment surveys carried out by industry or First Nations.

There are no limits on the number of recreational harvesters, but recreational harvests are assumed to be minor relative to commercial harvest levels. Since 1995, recreational fishermen wishing to harvest clams are required to purchase a Tidal Water Sport Fishing Licence. Recreational and First Nations food, social and ceremonial harvests are open year-round, except for time and area closures due to fecal contamination or Paralytic Shellfish Poisoning (PSP).

Catch

Commercial clam landings since the 1950s were dominated by butter clams until a shift in market preference increased demand for Manila and native littleneck clams. The shift in market was

primarily driven by demand for Manila clams, which are attractive clams that are easily removed from the shell after cooking. Landings of littleneck clams increased dramatically in the early 1980s, averaging 225 tonnes annually from 1980-95, up from a 149-tonne annual average from 1951-79. Recent maximum landings were 465 tonnes in 1990, second only to 631 tonnes in 1972. Since 1992, littlenecks have not accounted for more than 10 % of the total reported landings of steamer clams.

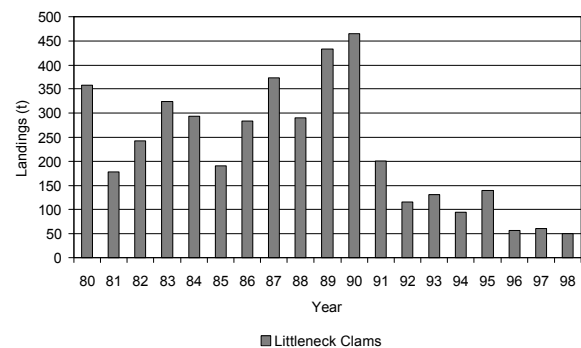


Fig. 2. Annual landings of littleneck clams in British Columbia, 1980-1998. 1997 and 1998 statistics are preliminary.

Recent landings of littleneck clams are primarily from Johnstone Strait (Clam Area G) and the Strait of Georgia (Areas B-E). Since 1963, most central and north coast areas have been closed to commercial harvest of clams due to chronic PSP and a lack of monitoring programs. The pilot commercial communal fishery in Bella Bella, has landed almost exclusively Manila clams.

Table 1. Average annual landings of native littleneck clams in British Columbia, 1985-1998.

Clam Area	Average Landings (t)
Strait of Georgia (Clam Areas B-E)	89.5
West Coast Vancouver Island (Clam Area F)	10.9
Queen Charlotte Strait (Clam Area G)	105.7

1997 and 1998 statistics preliminary

Effort

Information regarding historic levels of effort in B.C. clam fisheries is scarce. Clam harvesters were not required to obtain a separate licence prior to 1989. Age requirements for licences have changed since 1989 (commercial diggers under

16 years of age were not required to have licences from 1990 through 1994), thus, interpretation of trends in effort is difficult.

Licence limitation has resulted in more days open to digging in each area and increased benefit to individual diggers as available harvest is divided among fewer participants in the fishery.

Table 2. Number of commercial clam licences issued and landings of native littleneck clams in British Columbia, 1980-1998.

Year	No. of Licences	Littleneck Landings (t)
1980	n/a	358
1981	n/a	179
1982	n/a	242
1983	n/a	324
1984	n/a	294
1985	n/a	191
1986	n/a	284
1987	n/a	373
1988	n/a	290
1989	1,870	433
1990	2,068	465
1991	1,908	201
1992	1,814	116
1993	1,639	131
1994	1,844	94
1995	2,448	140
1996	1,906	56
1997	1,572	60
1998	907	50

1997 and 1998 statistics preliminary
n/a = not available

Fishery Management

The commercial fishery is managed primarily for Manila clams, using a minimum size limit of 38 mm, which allows clams to spawn at least once before reaching legal size and also applies to littleneck clams, area licensing and time and area closures. As landings in an area approach recent production levels, managers monitor landings from the fishery for evidence that available legal size stock is becoming depleted. Indicators include increased incidence of sublegal clams, higher proportion of the less desirable littleneck clam in the catch, encroachment into closed areas, decreases in average landing per digger or decreased number of diggers. When managers observe indications that legal stocks are becoming depleted, they close the area.

Depuration harvests are managed more conservatively than other commercial fisheries. In addition to the size limit, total allowable catches are set as a proportion of the estimated legal stock from the most recent assessment survey.

The recreational fishery does not have a size limit

and is managed under a daily bag limit of 75 clams. Catch and effort in recreational and First Nations food and ceremonial harvests are not well documented.

Resource Status

Intertidal clam landings are recorded by Pacific Fisheries Management Area and/or Subarea, therefore, catch and effort histories for specific beaches are not available.

Littlenecks are landed incidentally in intertidal clam fisheries in the Strait of Georgia and on the west coast of Vancouver Island, which are primarily directed at Manila clams. Littleneck landings have accounted for less than 21 % of the total steamer clam landings since 1983, and have not exceeded 10 % of total steamer landings since 1992. Concerns in the fishery center around Manila clams, and littleneck clams are assumed to be adequately protected by the minimum size limit, and decreased fishing pressure due to lesser desirability.

Outlook

There is concern that intensive harvests and repeated digging may affect clam survival and growth rates. The legal size limit, which is based on size of first maturity, also may not provide adequate protection from poor recruitment when harvests remove the majority of legal-sized clams. A number of beaches in the depuration fishery are being harvested under an experimental program that examines stock response to various levels of harvest. These beaches are monitored to develop demographic parameters (natural mortality estimates and recruitment patterns) required for scientifically rigorous assessments of clam populations, and further development of management plans.

Additional beaches are lost each year to fecal contamination closures, which may be a result of municipal sewage and stormwater outfalls, faulty septic fields, agricultural run-off, discharge from vessels, or natural sources. Incidence of contaminated bivalves is of concern, both in terms

of lost access to a valuable fishery resource, and in terms of potential health hazards and market perception of B.C. product should illegally harvested contaminated clams make their way to market.

Market competition with Manila clams from aquaculture and depuration harvests, U.S. product and imported species from Mexico and New Zealand has affected market price for Manilas from the commercial fishery. Lower prices could result in decreased value from the fishery, even with stable production.

The varnish clam (*Nuttallia obscurata*) was introduced into B.C. in the early 1990s, and is widespread in the Strait of Georgia and present in Barkley Sound. This species is highly invasive, and exhibits habitat preferences similar to littleneck and Manila clams. Preliminary information indicates that varnish clams have commercial potential, and work is underway to develop a commercial fishery for this species. Whether this species will affect littleneck clam productivity through ecological competition is uncertain.

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