



What is a GEODUCK?

HB 43 – Expanding Geoduck Farming

Geoduck

From Wikipedia, the free encyclopedia

The **geoduck** (pronounced /ˈɡuː.iː.dʌk/ i.e. "gooey duck"[1]), *Panopea abrupta* or *Panopea generosa*, is a species of large saltwater clam, also known as the **king clam** or **elephant trunk clam**.

The name is derived from a Nisqualli First Nation word meaning "dig deep", and its phonemically counterintuitive spelling is likely the result of poor transcription. Alternate spellings include *gweduc*, *gweduck* and *goiduck*.

Native to the Pacific Coast of the United States and Canada (primarily Washington, British Columbia, and Southeast Alaska), it is the largest burrowing clam in the world, weighing in at an average of one to three pounds (0.5 - 1.5 kg) at maturity, but specimens weighing over 15 pounds (7.5 kg) and as much as 2 meters (6 ft) in length are not unheard of.


It has a life expectancy of about 146 years, with the oldest recorded at over 160 years. This makes the Geoduck one of the longest-living organisms in the Animal Kingdom.

Scientists speculate that the geoduck's longevity is the result of low wear and tear. A geoduck sucks plankton down through its long siphon, filters them for food and ejects its refuse out through a separate hole in the siphon. Adult geoducks have few natural predators, which may also contribute to their longevity. In Alaska, sea otters and dogfish have proved capable of dislodging geoducks; starfish also attack and feed on the exposed geoduck siphon.

Geoducks are broadcast spawners. A female geoduck produces about 5 billion eggs in her century-long lifespan—in comparison, a human female produces about 500 viable ova during the course of her life. It is possible that this fact, in conjunction with the phallic shape of the siphon, has led to the belief that the shellfish has aphrodisiac properties.

Industry and impact

The world's first geoduck fishery was created in 1970, but demand for the semi-forgotten clam was low. Today, they sell in Asia for up to US\$30/lb (US\$65/kg). The Jumbo clam, like abalone, is highly regarded in Chinese cuisine. Its large, meaty siphon is prized for its savory (umami) flavor and crunchy texture. It is extremely popular in Hong Kong, China and Japan, where it is considered a rare tasty treat. Geoduck is mostly eaten cooked in a fondue-style Chinese hot pot or raw sashimi style, dipped in soy sauce and wasabi. On Japanese menus, geoduck is called *mirugai* or *mirukuigai*. (Although mirugai is sometimes translated to English as "Giant Clam", it is distinguished from "Himejako" sushi made from *Tridacna gigas*.)

Geoduck

Pacific geoduck clam
Scientific classification
Kingdom: Animalia
Phylum: Mollusca
Class: Bivalvia
Order: Myoida
Family: Hiatellidae
Genus: <i>Panopea</i>
Species: <i>P. abrupta</i>
Binomial name
<i>Panopea abrupta</i>
Conrad, 1849



Seafood Geoduck display in a Chinese restaurant with price

The geoduck's high market value has created an 80-million-U.S.-dollar annual industry, with harvesting occurring in both Washington state and the province of British Columbia. It is one of the most closely regulated fisheries in both countries; in Washington, Department of Natural Resources staff are on the water continually, monitoring harvests, and the same is true in Canada where the Underwater Harvesters' Association manages the Canadian Fishery in conjunction with Canada's Department of Fisheries and Oceans. Demand has also led to a rapidly developing aquaculture industry.

Geoduck aquaculture on private tidelands in Puget Sound, particularly in South Puget Sound, has been steadily growing over the last ten years, averaging

about 10 new acres of cultivation per year. Currently less than 0.001% of Puget Sound is dedicated to geoduck farming. Geoduck farms use "predator exclusion devices" in which to plant the seed geoducks. These devices are 10-14 inch long, 4-6 inch diameter PVC pipes pushed into the sediment of the tideland. There are approximately 20,000 to 43,500 of these PVC pipes planted per acre on tidelands. These nursery tubes typically stay in the beach for the first one to two years of a crop cycle.

The Environmental Defense Fund has done extensive studies of aquaculture and has found that bi-valve aquaculture like geoduck clams are very beneficial to the marine environment. {Goldburg, Rebecca, et al. "Marine Aquaculture in the United States," as prepared by Environmental Defense for Pew Oceans Commission, 2001.} The primary reason for this is because geoduck clams are filter feeders and eat micro algae which proliferates as more nitrogen enters the marine ecosystem. Increases in nitrogen are due to more septic systems as well as bigger flows from city sewage systems throughout Puget Sound, increasing quantities of pet wastes, and increased fertilizer use from farms and lawns. When farmed geoduck clams (which ingest and retain nitrogen in their tissues) are harvested there is a net reduction in nitrogen in the marine ecosystem.

It should be noted that the water must be certifiably clean in order to plant geoducks commercially. This is a requirement of the Washington State Department of Health, and of the Interstate Shellfish Sanitation Council.

While some communities in Puget Sound have installed state of the art septic systems to comply with efforts by environmental groups and state officials to clean up Puget Sound, more than 3000 acres (12 km²) of shellfish beds have been lost to farming between 1992 and 2004 due to fecal contamination from human activities and development. Substantial portions of the state's shorelines are already so developed or degraded that they are unsuitable for harvesting, and other areas continue to follow suit.

Some shoreline owners have expressed concerns including aesthetics, effects on native geoduck populations, wildlife interactions, farm debris, and harvest techniques. Although some marine shoreline owners take issue with the visual impacts, the tubes are actually only visible 2-3% of daylight hours over a 6-year crop cycle. The reason for the low visibility is because geoduck are farmed in the lower

elevations of the beach and are covered by water most of the time. However, since the lowest tides in the summer are during mid-day, the visual impact of the tubes is greatest at the very time when the people of Puget Sound are likely to be exploring the beach. During the summer, farms are visible for as much as 5 hours during the day, every other week.

Effects on native geoduck populations from geoduck farming will be minimal to non-existent. Each year new hatchery brood stock is taken from the wild stock. Farmed animals are not used as brood stock so genetically, farmed geoduck are the same as wild stocks. Moreover, wild geoduck occupy the intertidal zone down to 300 feet below sea level. DNR and the tribes co-manage the wild fishery and only harvest geoduck between the -18 to -70 foot depths. Most of the wild geoduck stock is left untouched and unaltered.

Wildlife interactions are a concern and geoduck growers are adapting growing techniques to minimize these effects. A biological assessment examining the impacts of geoduck farming was completed and no long term effects on threatened or endangered species were identified.

Farm debris includes displaced net tops, rubber bands, and tubes. The netting tops used on the nursery pipes can come off and float away onto other beaches as debris and the rubber bands also can become debris in Puget Sound. To offset these environmental impacts most geoduck farmers have been embraced environmental codes of practice including regular maintenance and debris clean-up of their own farms. In addition, the industry now does two annual beach cleanups to collect marine debris from all beaches in areas where they farm. Although as much as 20% of the debris collected in each cleanup has been aquaculture related, less than 5% of the 120 cubic yards collected to date has been related to geoduck farming. Unfortunately, because of the currents in Puget Sound, nets and tubing can be found far from any poorly maintained geoduck operations.

Harvesting takes place every 4-6 years. Water pressure hoses using up to 50 gallons of water per minute are used to liquefy the sediment in order to extract the geoducks. There are limited impact studies related to intertidal harvest of geoduck as of August 2006, although the sub-tidal environmental impact studies done for the fisheries in BC and WA have found no detrimental effects in harvesting the clams. Geoduck farming is only conducted in clean, uncontaminated sediments so concern is limited to short term increases in turbidity and short term effect on benthic organisms. It should be noted that the Department of Natural Resources of Washington State conducted the environmental impact study. DNR is itself in the business of leasing subtidal lands for commercial geoduck harvest and starting this year, intertidal lands for commercial geoduck farming.

Compared to terrestrial farming, shellfish farming in general and geoduck farming in particular produces high quality protein using natural systems without the use of antibiotics, fertilizers, herbicides, or pesticides.