



# Commercial Wild Stock Geoduck Fishery Management Plan for State-owned Aquatic Lands

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August 2008 Edition



WASHINGTON STATE DEPARTMENT OF  
**Natural Resources**  
Doug Sutherland - Commissioner of Public Lands



Washington  
Department of  
**FISH and  
WILDLIFE**

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# Acronyms

CFR	Code of Federal Regulation
Corps	U.S. Army Corps of Engineers
CWA	U.S. Clean Water Act
dba	decibel
DNR	Washington State Department of Natural Resources
Ecology	Washington State Department of Ecology
DOH	Washington State Department of Health
DOR	Washington State Department of Revenue
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	U.S. Endangered Species Act
Federal Services	NMFS and USFWS
IAC	Washington State Interagency Committee on Outdoor Recreation
GMA	Growth Management Act
L&I	Washington State Department of Labor and Industries
MLLW	Mean Lower Low Water
NMFS	NOAA National Marine Fisheries Service
OSHA	Occupational Safety and Health Administration
PSP	Paralytic Shellfish Poison
RCO	Washington State Recreation and Conservation Office
RCW	Revised Code of Washington
SCUBA	Self Contained Underwater Breathing Apparatus
Supplemental EIS	Supplemental Environmental Impact Statement
SEPA	State Environmental Policy Act
SMA	Shoreline Management Act
TAC	Total Allowable Catch
USFWS	United States Fish and Wildlife Service
WAC	Washington Administrative Code
WDF	Washington Department of Fisheries (now known as WDFW)
WDFW	Washington Department of Fish and Wildlife

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# Introduction

The Commercial Wild Stock Geoduck Fishery Management Plan has been prepared by the Washington State Department of Natural Resources (DNR) and the Washington Department of Fish and Wildlife (WDFW). Although the management of the resource is a joint effort between several State agencies and the Tribes, this updated plan will focus on the goals and practices that are followed for managing the state's subtidal geoduck resource. There are also management agreements and annual harvest plans which are negotiated and signed by the State and Tribes. Separate management agreements and harvest plans are written for each of the six management regions when they are to be fished. If a specific framework cannot be agreed upon, management practices fall back to Federal court decisions for conducting fisheries (see "Resource Managers" section on page 7).

This document, the 2008 Edition of the *Commercial Wild Stock Geoduck Fishery Management Plan for State-owned Aquatic Lands*, updates and replaces the previous edition dated May 23, 2001.

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## **2006 Changes to Commercial Wild Stock Harvest Rules and Concurrent Update to Commercial Wild Stock Geoduck Supplemental EIS**

In 2006, two changes were made to the rules governing the harvest of commercial wild stock geoduck in Washington State. One change came via legislation passed during the 2006 Legislative session, which changed a Revised Code of Washington (RCW) statute. The other change came through adoption by the Washington State Fish and Wildlife Commission, which amended Washington Administrative Code (WAC). The changes, discussed in detail below, were both carried out at the request of DNR and were aimed at more effective management practices for the State's commercial wild stock geoduck resource on State-owned aquatic lands.

It should be noted that both of the changes made to the geoduck harvest rules in 2006 have no significant effect on past analyses or conclusions included in previously released versions of the Wild Stock Geoduck Fishery Management

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Plan, or in the Environmental Impact Statement (EIS) written under State Environmental Policy Act (SEPA) guidelines.

The most recent revision of the EIS was published in 2001 and is entitled, *Final S.E.I.S, Supplemental Environmental Impact Statement, State of Washington Commercial Geoduck Fishery, May 23, 2001*. The Fishery Management Plan reflects the preferred alternative presented in the Supplemental EIS, and as such, any changes to the Fishery Management Plan must be linked to the Supplemental EIS. Under SEPA guidelines, this is accomplished through an Addendum to the Supplemental EIS. DNR and WDFW compiled such an Addendum and released it concurrently with the August 2008 Edition of the Fishery Management Plan. The Addendum catalogs the changes made to the Fishery Management Plan.

The 2006 RCW and WAC changes were made to clarify language that was viewed as technically unclear, and to ensure the State's efficient and equitable access to the commercial wild stock geoduck resource. The changes are administrative and operational in nature and have no effect on the fishery harvest models, resource survey methods, analyses or environmental protective measures in the Supplemental EIS. The following sections serve to highlight these changes.

### **REVISION TO THE 200-YARD HARVEST RESTRICTION**

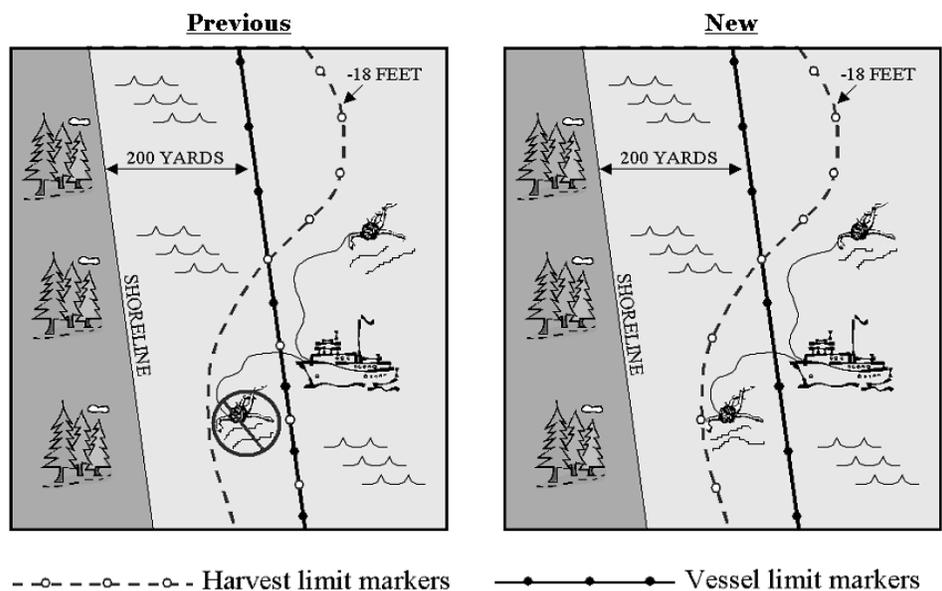
During the 2006 Legislative session, House Bill (HB) 2386 was introduced at the request of DNR. The bill proposed amending RCW 77.60.070, concerning restriction of geoduck fishery vessels and divers 200 yards from shore. HB 2386 was passed unanimously in both the House and Senate, was signed into law in March 2006 and became effective June 2006.

The bill removed the 200-yard restriction as it applied to geoduck divers, while maintaining the restriction as it applied to vessels. (See Figure 1). Original reasons for the restriction, which had initially been one-quarter mile but was changed to 200 yards in 1979, included uncertainty about environmental effects of harvest, and minimizing the visible and audible nuisance of geoduck fishing vessels to shoreline residents. Over time, uncertainty about the environmental effects of harvest has diminished, and the main reason for the limit has remained minimizing noise effects on shoreline residents. These noise effects are caused by vessel activities, including water compressors, intercom systems, boat engines and voices. Conversely, the only noticeable signs of geoduck divers in the water are visual—a length of compressed air hose and small bubbles visible at the water surface.

The 2006 House Bill 2386 was aimed at ensuring parity between State and Tribal geoduck fishers, who each are entitled to up to 50 percent of the wild stock geoduck Total Allowable Catch (also known as the TAC) or quota. While the previous law required State geoduck divers to remain 200 yards from shore, there was no such restriction on the Tribal geoduck fishery. As a result, the Tribal fishery had access to geoduck resources within 200 yards of

shore (while still adhering to the 18 foot minimum water depth harvest restriction) that State fishers did not. Further, WDFW's stock assessments of the geoduck resource, which determine the Total Allowable Catch, are based on the entire fishable area between 18 feet and 70 feet of corrected depth, regardless of the 200-yard from shore limit. DNR proposed removing the 200-yard restriction on State divers to allow for full and equal access to the state's geoduck fishery for all harvesters. By maintaining the 200-yard restriction on vessels, the original intent of minimizing the sound and sight nuisance of geoduck fishing vessels was still achieved.

**Figure 1: CHANGE TO THE 200-YARD RESTRICTION ON GEODUCK DIVERS**



As discussed earlier, it should be noted that the changes to the 200-yard restriction only will bring parity to diver depth restrictions and will not alter other State management practices for geoducks. The annual Total Allowable Catch for geoducks is unaffected, and all other management and enforcement measures shall remain in place. The only effect of the change is to allow State geoduck harvesters equitable access to the entire harvestable resource as assessed by WDFW and managed by DNR.

**REVISION TO 70 FOOT HARVEST DEPTH REGULATIONS**

Also during 2006, DNR requested that WDFW make an administrative change to its rules regarding harvest of geoducks. The proposed change was brought before the Fish and Wildlife Commission in August 2006, and was unanimously approved. (WAC 220-59-19).

State laws and regulations had previously set the depth restrictions (emphasis added) on geoduck harvest at deeper than 18 feet of depth *corrected* to Mean Lower Low Water (MLLW) (0.0feet) (RCW 77.60.070(\$1)); and shallower than 70 feet of depth *uncorrected* (WAC 220-52-19(\$11)).

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“Uncorrected” depth is dependent on the tide height at a given time, and is variable depending on the tidal cycle. As a result, while the shallow-depth boundary of a geoduck tract was static at 18 feet corrected to Mean Lower Low Water, the deep-water boundary moved with the tide to 70 feet uncorrected, which can vary greatly (up to 17 feet) in Puget Sound. (See Figure 2).

The change proposed setting the deep-water boundary for geoduck harvest at 70 feet corrected to Mean Lower Low Water (0.0 feet). The goal of this regulatory change was to clearly identify a consistent deep-water boundary for geoduck harvest areas, for both management and harvest purposes. The new depth boundary is set in State rule as well as in DNR’s harvest agreements with commercial fishers. WDFW’s tract area calculations extend to 70 feet corrected, meaning harvest practices now more precisely match tract survey activities.

To summarize, State laws and regulations now set harvest boundaries for geoduck tracts at (emphasis added):

- Deeper than 18 feet *corrected* to Mean Lower Low Water; and
- Shallower than 70 feet *corrected* to Mean Lower Low Water.



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## **Endangered Species Act— Habitat Conservation Plan for the State’s Commercial Wild Stock Geoduck Fishery**

The marine waters and subtidal lands where wild stock geoducks are harvested are home to several species that are listed as “threatened” or “endangered” under the Federal Endangered Species Act (ESA). DNR has voluntarily developed a Habitat Conservation Plan (commonly known as an HCP) specifically to address the agency’s management of the wild stock geoduck fishery and ensure that geoduck harvest activities are in compliance with the ESA. This document was published in July 2007 and is titled, *Habitat Conservation Plan for Washington Department of Natural Resources’ Geoduck Fishery*.

A Habitat Conservation Plan is an agreement between a landowner (in this case DNR representing Washington State) and the Federal Services (NOAA National Marine Fisheries Service, and the U.S. Fish and Wildlife Service) that administer the ESA. An HCP is a way that landowners can contribute to the protection of at-risk species and still continue their other activities. In the agreement the landowner avoids, minimizes and mitigates the potential for harm to federally listed species or habitats. In return, the landowner is granted an Incidental Take Permit from the Federal Services, and is not penalized for potential infrequent incidental harm to a listed species or its habitat.

Geoduck harvest activities managed by DNR, including harvest for the commercial fishery, research, stock assessment, and health sampling are all considered in the HCP. The *Habitat Conservation Plan for Washington Department of Natural Resources’ Geoduck Fishery* evaluates the possible effects geoduck harvest activities have on a number of species that are listed as threatened or endangered, or are of concern at the State or Federal level. The HCP is being proposed as “low-effect,” meaning the wild stock geoduck fishery has minor-to-negligible effects on federally listed species and their habitats. The species considered in the HCP are: bald eagle; California brown pelican; marbled murrelet; tufted puffin; common loon; black tern; bull trout; coastal cutthroat trout; steelhead; several salmon species (Chinook, coho, chum, pink); Pacific herring; orca; pinto abalone; and Olympia oyster. DNR officially submitted the *Habitat Conservation Plan for Washington Department of Natural Resources’ Geoduck Fishery* in application to the appropriate Federal agencies in September 2007.

The HCP application was accepted as a Low-Effect HCP by the Federal Services and published for a public review and comment period which ran from September 14 through October 17, 2007. As this 2008 Edition of the Fishery Management Plan is being published, the Federal Services are preparing biological opinions on the effects of DNR's implementing this Wild Stock Geoduck HCP, and on Federal issuance of the Incidental Take Permit. These documents are expected to be completed in summer of 2008. As part of

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DNR's adaptive management of the commercial wild stock geoduck fishery, future management practices may be modified to accommodate requirements contained within the incidental take permit issued by the Federal Services. Any future changes to management requirements will always be more, never less, stringent than current practices.

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## Resource Managers

The Wild Stock Geoduck Fishery is jointly managed by the State (DNR and WDFW) and the Puget Sound Treaty Indian Tribes (Tribes). The State and Tribes each have a right to fish up to 50 percent of the available quota of geoducks. A December 20, 1994 U.S. district court decision by Judge Edward Rafeedie affirmed and quantified the Puget Sound Treaty Indian Tribes' right to fish up to 50 percent of the available quota of shellfish (including geoducks) within their usual and accustomed grounds and stations (United States v. Washington, 873 F. Supp. 1422 W.D. Wa 1994; hereinafter "Rafeedie decision"). A subsequent Federal district court order and judgment confirmed the Tribes' management role and provided a management structure and processes to implement treaty shellfish fisheries. (Unites States v. Washington, 898 F. Supp. 1453 W.D. Wa 1995). The State and the Tribes are responsible for estimating geoduck population size, determining sustainable yield, and ensuring that adverse effects to the environment are kept to a minimum. DNR has proprietary rights over the State's half of the harvest and auctions the right to harvest geoducks to private companies. DNR and WDFW conduct civil and criminal enforcement of Washington State laws, regulations, and contract conditions that apply to the State's wild stock geoduck fishery.

Management of the wild stock geoduck resource is dynamic due to changes in market demand, resource economics, and new information on geoduck biology and population dynamics. This plan will continue to be periodically updated to describe the conditions and procedures under which the geoduck harvest is conducted. Management changes will be based on best available science and will continue to be made through established processes with the mutual consent of DNR, WDFW, and the Tribes in coordination with the industry and the public.

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## Wild Stock Geoduck Harvest *versus* Geoduck Aquaculture

The commercial harvest of wild stock geoducks is managed as a fishery that relies on natural recruitment to replenish the clams being harvested. This is different from geoduck aquaculture, or farming, which grows juvenile clams in hatcheries, plants the juvenile clams, and may install and maintain predator control devices such as netting or tubes for a portion of the growing cycle.

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None of these aquaculture practices are associated with the commercial wild stock geoduck fishery.

Geoduck aquaculture on State-owned and managed aquatic lands is currently restricted to a limited number of acres. As this 2008 Edition of the Fishery Management Plan is being published, there are no leases for geoduck aquaculture in place, but there are a number of lease applications pending. For more information on geoduck aquaculture activities on State-owned aquatic lands, see the DNR web site:

[www.dnr.wa.gov/BusinessPermits/Topics/ShellfishAquaticLeasing/Pages/aqr\\_aqua\\_geoduck\\_aquaculture.aspx](http://www.dnr.wa.gov/BusinessPermits/Topics/ShellfishAquaticLeasing/Pages/aqr_aqua_geoduck_aquaculture.aspx)

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## Management Goals

The goals for management of the State's wild stock geoduck resource are:

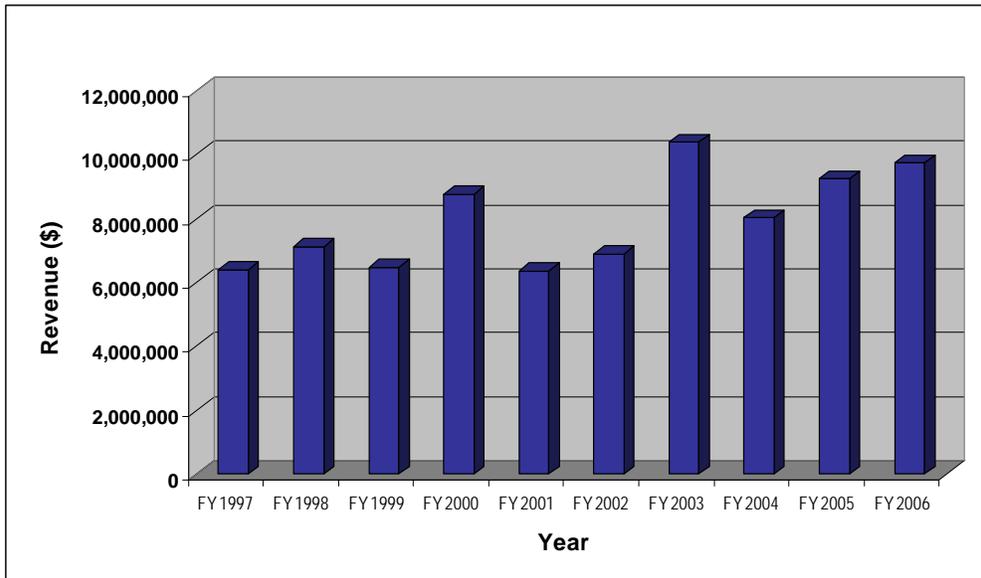
- To ensure biological sustainability of wild stock geoduck populations and minimize impacts to the marine environment;
- To maintain a stable and orderly harvest;
- To provide maximum benefits of wild stock geoduck resources to the citizens of the State;
- To minimize adverse impacts to shoreline residents; and
- To ensure effective enforcement of the State harvest rules and contracts.

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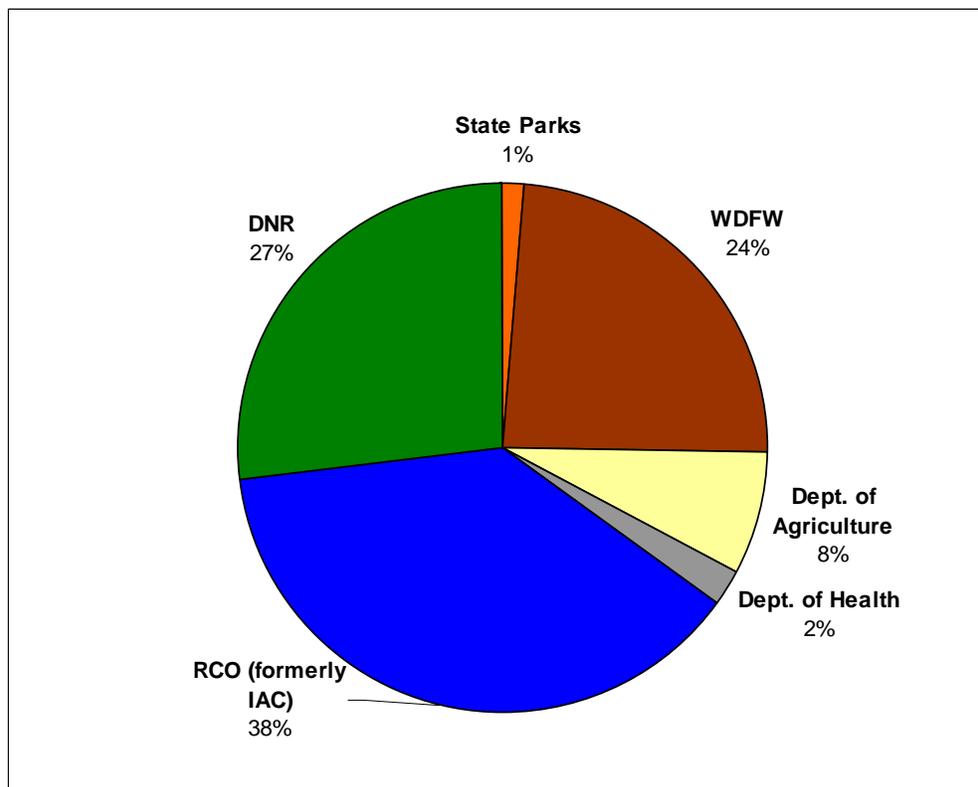
## Benefits of the State's Commercial Wild Stock Geoduck Fishery

The State's Commercial Wild Stock Geoduck Fishery has harvested between 1.7 and 2.2 million pounds of geoducks annually between 2000 and 2006, with average harvest at 1.98 million pounds per year, resulting in many public benefits. The fishery generates revenue for the citizens of the state (roughly \$6 million to \$10 million in annual revenue) while supplying food, jobs, and support to a positive international trade balance.

**Figure 3: HISTORICAL WILD STOCK GEODUCK REVENUE**



**Figure 4: 2005-07 WILD STOCK GEODUCK REVENUE—AGENCY DISTRIBUTION (VIA ALEA APPROPRIATIONS)**



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All revenue from the State's Wild Stock Geoduck Fishery is split evenly between two State accounts: the Aquatic Lands Enhancement Account (ALEA); and the Resource Management Cost Account–Aquatics (RMCA-A). While these two accounts receive funds from other revenue sources, such as leases for water-dependent uses and easements, geoduck revenue accounts for roughly half of the total funds in both accounts. Every two years, the Legislature appropriates the funds in these two accounts to multiple State agencies to perform ongoing activities related to aquatic land management, protection, and research, in addition to activities directly related to geoduck fishery management. Figure 4 (see previous page) shows the agency distribution of geoduck revenues from ALEA for the 2005-07 biennium.

Agency activities performed with funds appropriated from geoduck revenues include:

- DNR: management activities for 2.6 million acres of aquatic lands—tidelands, submerged lands, and navigable lakes and rivers. Specific activities include Wild Stock Geoduck Fishery management, enforcement and research, *Spartina* and other aquatic invasive species control, derelict vessel removal, an aquatic reserves program, and other actions.
- WDFW: Wild Stock Geoduck Fishery management, enforcement and research; salmon recovery; shellfish enhancement projects.
- Washington State Recreation and Conservation Office (RCO) (formerly the Interagency Committee on Outdoor Recreation, or IAC): the ALEA grants program, which funds State, Tribal and Local Government projects that provide public access to aquatic lands and the water, aquatic habitat restoration and aquatic habitat acquisition.
- Washington State Department of Agriculture: *Spartina* and other invasive species control.
- Washington State Parks and Recreation Commission: boating safety and vessel pump-out programs at marinas.

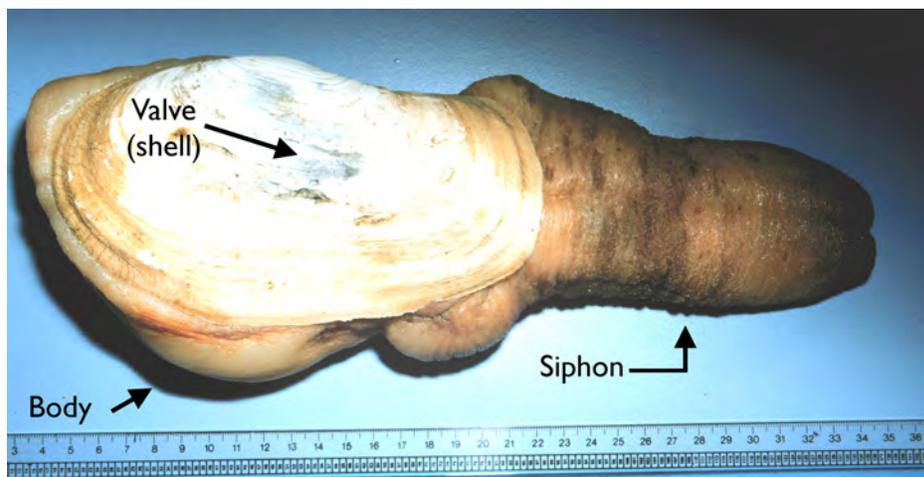
As the manager of State-owned aquatic lands, DNR has a legal obligation to protect and regulate use of those lands for the benefit of all Washington residents. Maintaining healthy aquatic ecosystems is paramount to the sustainability of plants and animals, and to the success of water-oriented businesses, recreation, and overall quality of life in Washington State. The management practices for the wild stock geoduck resource, outlined in this Fishery Management Plan, are aimed at ensuring the sustained health of the state's aquatic ecosystems, while continuing to realize successful long-term outcomes for geoduck harvesters and all state residents alike.

# Resource and Harvest Background

## Distribution and Abundance

Geoducks are found in North America from Alaska to Mexico, with abundant populations in many of Washington's inland marine waters. Commercial beds, also known as “tracts,” are present in southern and central Puget Sound, Hood Canal, Admiralty Inlet and, to a lesser extent, in the Strait of Juan de Fuca, northern Puget Sound and the San Juan archipelago. Geoducks, the world's largest burrowing clams, range from the low intertidal zone to at least 360 feet in water depth. Adults average 1.9 pounds each in Puget Sound, but size and population density vary geographically. For example, they tend to be larger and more densely populated in southern Puget Sound compared to northern Puget Sound.

**Figure 5:** THE GEODUCK CLAM (*PANOPEA ABRUPTA*)



Geoduck distribution is patchy, which may be due partly to substrate type and/or food availability. Geoducks are found in a variety of substrates, but are most abundant and largest when growing in sand or mixtures of sand, silt, and gravel. The average pre-fishing density on all identified commercial tracts statewide is 1.7 geoducks per square meter, although in some smaller areas densities are as high as 22.5 clams per square meter. Average density in southern Puget Sound, central Puget Sound, and Hood Canal is 1.9 geoducks per square meter. Generally, geoduck density increases with water depth between zero and 80 feet. Size, however, is inversely related to water depth.

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## Life History

Geoducks grow rapidly and can reach an average harvestable size of 1.5 pounds in four to five years. Geoducks usually attain their maximum size (shell length of 150 mm, or about six inches) and weight (up to roughly seven pounds) within 15 to 25 years, and some may live as long as 160 years. The average geoduck weight for Puget Sound is roughly two pounds per clam. They reproduce by releasing their sperm and eggs into the water column where fertilization occurs. They spawn primarily from April to September, when increased water temperatures and plankton blooms trigger the release of eggs and sperm. The microscopic larvae drift with the currents for a period of up to 47 days during which time the young may be carried by water currents many miles. The larvae then settle to the bottom and metamorphose into non-swimming juveniles and burrow two to three feet into the substrate by the time they are between three and five years old.

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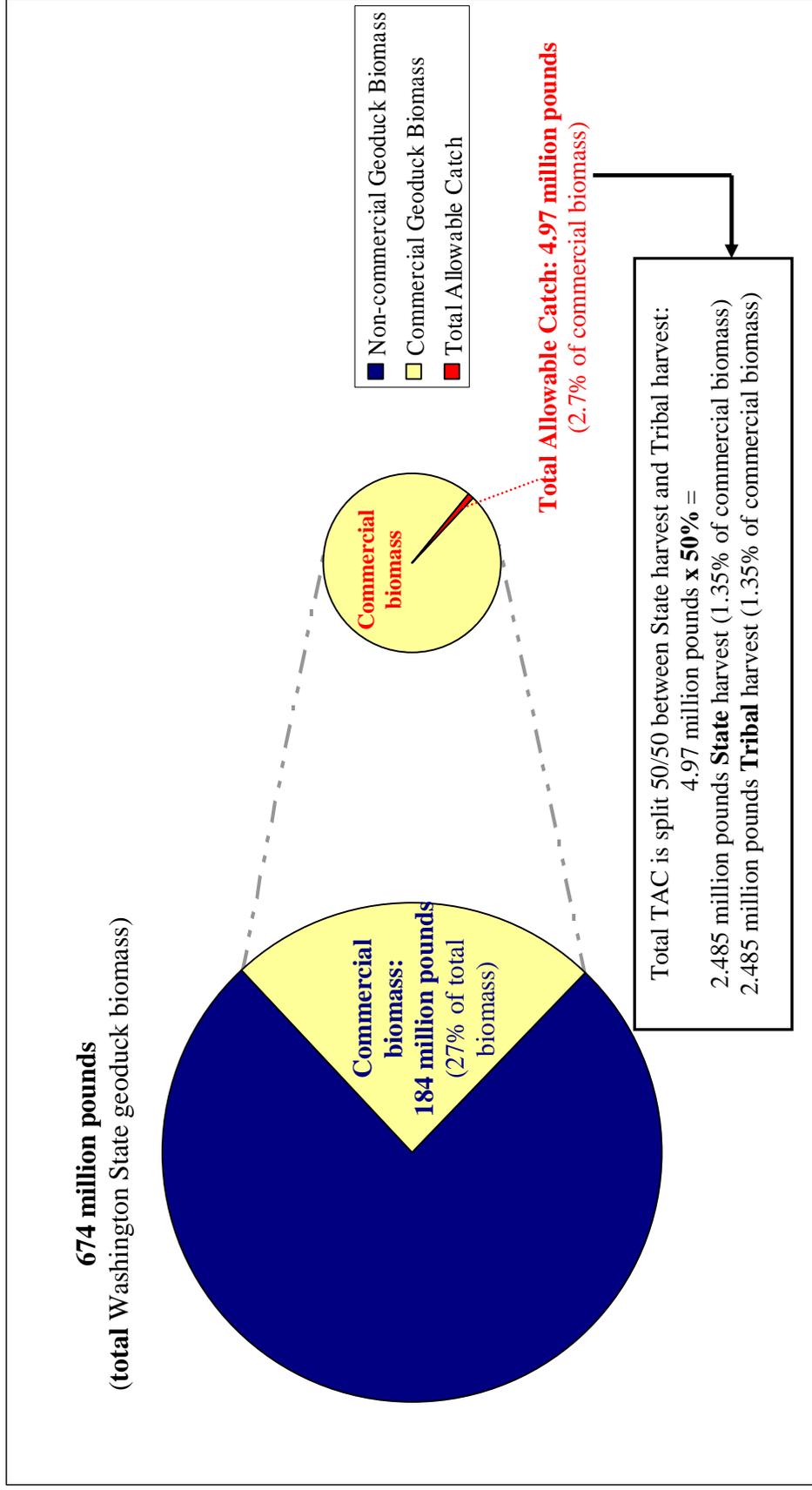
## Puget Sound Commercial Wild Stock Geoduck Harvest

Commercial wild stock geoduck harvest began in Washington State in late 1969 following the discovery and survey of extensive subtidal populations, but at that time the market demand was limited. Demand grew significantly, however, with the establishment of a major new market in Japan. By 1980 harvesting increased, as the Asian markets expanded for whole live geoducks and processed geoducks. Markets continue to vary with foreign competition, foreign exchange rates, and the supply of geoducks, but today the wild stock geoduck fishery is the largest and most economically important clam fishery on the west coast of North America.

State harvest is limited by management agreement to specific harvest areas ('tracts') which:

- Have geoducks in commercial quantities (normally greater than 0.04 geoducks per square foot) within the 18 feet to 70 feet water depth harvest zone;
- Are certified and opened for harvest by the Washington State Department of Health;
- Have undergone biological surveys and environmental assessments;
- Contain market-quality geoducks (judged by size and meat color) and present minimal operational difficulties for harvest (such as the ability to dig them from the seabed, and commercial densities);
- Do not conflict with existing uses, such as ferry routes, etc.; and
- Do not conflict with fish spawning and migration.

**Figure 6:** WASHINGTON STATEWIDE WILD STOCK GEODUCK RESOURCE AND COMMERCIAL HARVEST



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In 2007, the total statewide geoduck biomass was roughly estimated to be about 674 million pounds. However, this rough estimate is not used for fishery management purposes due to fishing constraints and uncertainty of unsurveyed or low intensity surveyed areas included in the estimate. Only 27 percent (184 million pounds) are surveyed and included in the commercial biomass when calculating the Total Allowable Catch for the State and Tribes. In 1999, another 57 million pounds of surveyed geoducks were determined to be non-commercial due to pollution, density too low to be economically viable, or other miscellaneous reasons. WDFW estimated that roughly 454 million pounds of geoducks may exist outside of the legally fishable depths (shallower than 18 feet and deeper than 70 feet water depth).

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## **Commercial Wild Stock Geoduck Harvest Allocation**

The harvest strategy for wild stock geoduck clams is considered risk-averse. State and Tribal managers adopted an equilibrium yield model and a sustainable annual harvest rate of 2.7 percent, on March 26, 1997, that is applied to the commercial wild geoduck standing stock of the state. This State-Tribal agreement to the sustainable harvest rate is based on a geoduck fishery age-based equilibrium yield model, described in detail in Bradbury and Tagart (2000) and the 2001 Final Supplemental EIS for the geoduck fishery, and is summarized below. (See Figure 6).

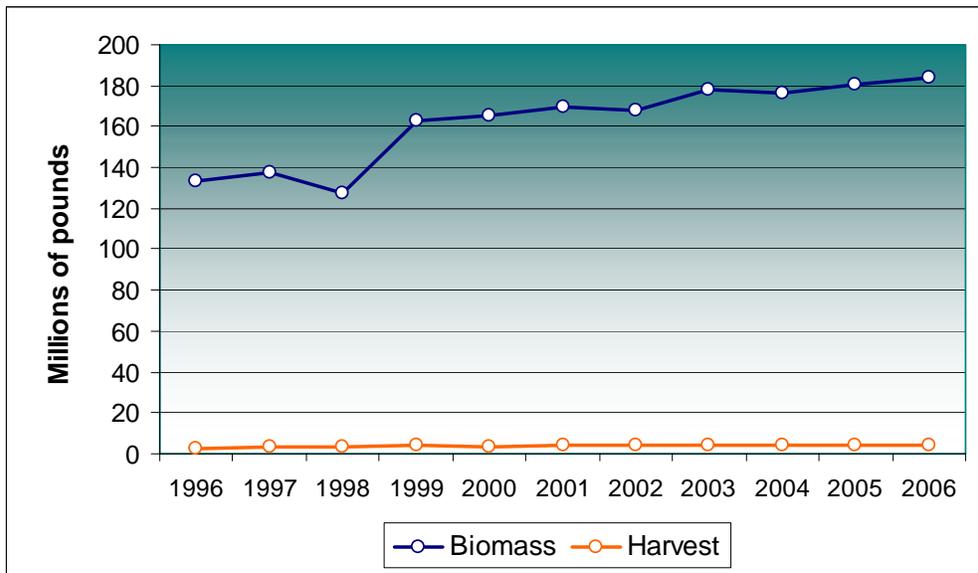
Most harvest strategies in current use for important fisheries maintain spawning biomass at or above 35 percent to 40 percent of unfished levels. In 1997, State and Tribal biologists agreed to adopt a risk-averse harvest strategy, which preserves 40 percent of the unfished spawning biomass of commercial wild geoduck stocks, meaning total commercial biomass is modeled to stabilize at this level. The geoduck age-based equilibrium yield model predicts this strategy is achieved by fishing at an annual harvest rate of 2.7 percent of the current commercial biomass. See Figure 7 for a comparison of total state commercial biomass and total harvest since 1996.

The harvest rate of 2.7 percent is applied to current commercial wild stock geoduck biomass estimates from surveys. As implemented in Washington State, advantages of this constant harvest rate strategy are many—including use of fishery independent estimates of population biomass and catch that is proportionate to current biomass. If the biomass decreases, then the catch decreases proportionately. To be effective, the constant harvest rate strategy requires good estimates of current biomass. The State is addressing this by conducting pre-fishing and post-fishing surveys on all commercial wild stock geoduck tracts and periodic verification surveys on other tracts when there are reports of illegal harvest or suspected changes in biomass.

Information analyzed during the 37 years of commercial wild stock geoduck clam harvest in Washington State indicates that a diverse and productive

environment in the vicinity of harvest sites has been maintained. Science-based management, which utilizes important biological parameters in the structural yield model for the fishery (2.7 percent harvest rate) and empirically verifies the recovery of geoduck tracts, indicates that sustainability is being achieved.

**Figure 7: COMMERCIAL WILD STOCK GEODUCK BIOMASS AND HARVEST IN WASHINGTON SINCE 1996**



## Commercial Geoduck Wild Stock Harvest Gear and Methods

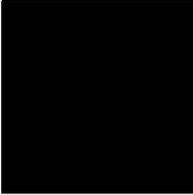
To harvest geoducks, commercial divers use water jets to loosen the substrate immediately around the clam which then allows the diver to remove the geoduck by hand. The water jet is a nozzle about 36 inches long with a 5/8-inch diameter tip at the digging end and a shut-off valve on the other. After the diver locates the clam by its “show” (siphon extended out of the substrate) or by feeling for the depressions it leaves in the substrate, the nozzle is inserted next to the exposed geoduck siphon, or in the hole which is left when the siphon is retracted. A burst of water with a pressure of 20 to 60 pounds per square inch loosens the sediment allowing individual geoducks to be easily removed. Divers using this method harvest around 800 pounds to 1,200 pounds (roughly 400 to 600 clams) per day, with harvest amounts sometimes reaching up to 1,500 pounds in a single day.

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**Figure 8: DIVER USING WATER JET TO HARVEST GEODUCK**



Harvest divers operate from anchored boats, normally 25 to 60 feet in length. (DNR's enforcement vessels, one of which is always onsite during State harvest, range in size from 27 feet to 42 feet in length.) Pumps and compressors on the boat provide divers with both air to breathe and pressurized water for the water jet nozzle, through hoses that are up to 400 feet long. The harvesters' boats may have one or two harvest divers in the water at a time. A tender works onboard the harvest vessel to monitor pumps and compressors and to haul harvested geoducks aboard. The tender and divers are in constant contact via an underwater communication system attached to their air hose. The daily amount of harvested geoducks for each vessel at a particular tract is weighed out on the water and reported on shellfish receiving tickets in the presence of DNR enforcement officers. The geoducks are then taken to shore and unloaded at a pre-approved marina or boat ramp, and transported live to a processor or market.



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## Authorities

Almost all subtidal lands in the state, and the living resources embedded in them, are owned by Washington State and managed by DNR (RCW 79.135.210). In 1969 DNR and the former Washington Department of Fisheries (now WDFW) jointly petitioned the Legislature to open the waters to commercial wild stock geoduck harvest. The Legislature did so and designated the revenue from the sales of geoducks to fund protection of aquatic resources and management of the geoduck resource. A 1994 court decision (referred to as the “Rafeedie decision,” named after the judge in the case) affirmed the Puget Sound Treaty Indian Tribes’ right to fish for up to 50 percent of the harvestable quantity of geoducks within their usual and accustomed grounds and stations, and defined cooperative management requirements for the State and the Tribes regarding shellfish resources, including geoducks. As a result, DNR, WDFW and the Tribes all have the responsibility to effectively co-manage commercial wild stock geoduck harvest in the state.

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### **State Department of Natural Resources**

Mandated by RCW 79.105.030, DNR seeks a balance of public benefits from the use of State-owned aquatic lands. DNR is directed to foster water-dependent uses, ensure environmental protection, encourage public use and access, utilize renewable resources, and generate revenue. DNR has proprietary rights over the state's subtidal geoduck resources, determines beds for harvest, and auctions the right to harvest geoducks to private companies. The DNR harvest agreement contract, which is awarded to successful bidders at auction, is the legal document that binds the State with the harvest companies (RCW 79.135.210). DNR marks the tracts, appraises the resource value, schedules and supervises on-site test harvests, conducts public auctions of geoduck resources, maps and surveys tracts, secures all necessary local government shoreline permits, and enforces contract provisions and State laws regarding geoduck harvest. DNR enters into a biennial contract with WDFW to partially fund activities for managing geoduck resources. Further details on DNR's roles are discussed in subsequent sections of this Fishery Management Plan.

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## **State Department of Fish and Wildlife**

RCW 77.04.012 mandates that WDFW shall preserve, protect, perpetuate and manage the food fish and shellfish in State waters and offshore waters. Proceeds from wild stock geoduck harvest fund the work performed by WDFW for the geoduck fishery. WDFW performs biological stock assessments of the commercial wild stock geoduck resource, calculates and recommends the annual Total Allowable Catch for each geoduck management region, conducts geoduck related research, and monitors the effects of harvest on the geoducks, the substrate, and the associated flora and fauna. The WDFW Enforcement Division also enforces the laws and regulations regarding wild stock geoduck harvest.

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## **Tribal Managers**

The 1994 Rafeedie court decision confirmed the rights of Puget Sound Treaty Indian Tribes to fish for up to 50 percent of the harvestable quantity of shellfish, including geoducks, in their usual and accustomed grounds and stations. As a result, the Tribes, DNR, and WDFW cooperatively manage the subtidal wild stock commercial wild stock geoduck fishery. The Tribes work with State managers to estimate geoduck population size, determine sustainable yield, and ensure that adverse effects to the environment are minimized. Tribal governments are also responsible for enforcing their own harvest management agreements and individual fishery regulations.

The following Tribes presently have treaty rights to harvest wild stock geoducks: Squaxin Island Tribe, Nisqually Indian Tribe, Puyallup Tribe of Indians, Tulalip Tribes, Muckleshoot Tribe, Skokomish Tribe, Port Gamble S'Klallam Tribe, Suquamish Tribe, Jamestown S'Klallam Tribe, Lower Elwha Klallam Tribe, Swinomish Tribe, Nooksack Tribe, Lummi Nation, Makah Nation, and Upper Skagit Tribe.

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## **Other State Agencies**

The Department of Health (DOH) ensures that the geoducks are safe for human consumption by monitoring the state's shellfish-growing waters and prohibiting harvest in polluted waters. A tract without DOH certification will not be authorized for harvest. DOH also monitors paralytic shellfish poison (PSP), commonly known as “red tide”. Shellfish containing over 80 micrograms of toxin per 100 grams of shellfish tissue cannot be sold for human consumption. Regular ambient water quality monitoring by DOH provides an early warning for declining water quality due to pollution well before there is any adverse biological impact on fish or shellfish. DOH will

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close a geoduck tract to harvest when the threshold of 80 micrograms of toxin is exceeded.

The Department of Revenue is responsible for collecting the fish tax for geoduck that have been harvested by the quota holders, who hold harvest agreements with DNR based on public auction results. DNR works cooperatively with the Department of Revenue by supplying them with auction information and harvest amounts upon request.

The Department of Ecology has broad responsibilities, including enforcement of noise and water quality standards, protecting the water from pollution, and administering the Shoreline Management Act and the State Environmental Policy Act. DNR is currently working with the Department of Ecology with the goal of providing local governments with guidance on how the State's Commercial Wild Stock Geoduck Fishery may be addressed under the Shoreline Management Act.

Some geoduck tracts are adjacent to Washington State Park areas, and for management of these areas DNR works in cooperation with the Washington State Parks and Recreation Commission in preparing aquatic land management plans, which includes guidelines for commercial wild stock geoduck harvest.

Due to the passage of House Bill 1949 during the 2007 Washington Legislative Session, the Department of Labor and Industries began providing workmans' compensation coverage to geoduck divers and tenders who are employed in the commercial wild stock geoduck fishery. (A subsequent legislative change in 2008—Substitute House Bill 2885—amended the law so that tenders, who are already covered under Federal Jones Act insurance, were removed from the state workmans' compensation coverage.) House Bill 1949 contained a statutory amendment to RCW 51.12.100 which became effective on July 22, 2007. The bill was proposed by the geoduck industry to ensure that divers and tenders working in the State's commercial wild stock geoduck fishery would have workmans' compensation insurance available in the event they were seriously injured or killed while harvesting geoduck.

The Department of Labor and Industries collects premiums from the employer of the covered individuals as a pre-requisite to providing workman's compensation insurance coverage. That agency also conducts inspections of job sites to ensure safe working conditions and performs investigations of accidents that have occurred and resulted in a compensatory claim.

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## **Federal Agencies**

DNR cooperates with several Federal agencies when siting an area for geoduck harvest. Harvest near Federal wildlife refuges, military facilities,

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military operation areas, or Federal prisons must be consistent with the management plans of each respective responsible Federal agency.

DNR also cooperates with the Occupational Safety and Health Administration (OSHA) housed within the U.S. Department of Labor. When requested, DNR provides full access to the industry so that OSHA can perform safety inspections to assure that all members of the harvest industry are in compliance.

The United States Army Corps of Engineers (Corps) Seattle District Regulatory Branch and DNR met on June 14, 2004 to discuss the State's Commercial Wild Stock Geoduck Fishery harvest methods and practices. The Corps reviewed the 2001 document *The State of Washington State Commercial Geoduck Fishery Management Plan*, along with the 2001 Supplemental EIS for commercial geoduck harvesting in Washington State and video footage of wild stock geoduck harvest. The Corps' Seattle District Regulatory Branch made a determination that geoduck harvest using the methods contained within the reviewed materials does not require a Corps 404 permit. The Corps made this determination on July 9, 2004 after determining that this activity does not constitute dredging and filling as defined under Federal regulations.

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## **Local Governments**

Local governments play a major role in management of shorelines and aquatic lands within their jurisdictions. Under the Shoreline Management Act guidelines, each local jurisdiction may develop its own Shoreline Master Plan (as approved by the Department of Ecology) for control of development. These plans are aimed at resolving conflicts between competing uses inside the local government's jurisdiction, and can enhance protection of many environmental elements, such as water quality at geoduck beds.

# Legal Framework Associated with the State's Commercial Wild Stock Geoduck Harvest Program

Commercial wild stock geoduck harvesting is ultimately governed by several statutes, regulations, and permits. Generally, commercial harvesting on State-owned bedlands is governed by laws that can be subdivided into three areas: environmental protection, benefits to the public, and aquatic lands (see Tables 1 and 2):

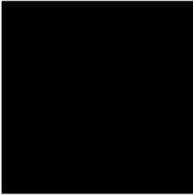
**Table 1: SUMMARY OF GENERAL WILD STOCK GEODUCK HARVEST-RELATED STATUTES AND LAWS**

<b>Environmental Protection</b>	
RCW 43.21.C WAC 197-11 State Environmental Policy Act (SEPA)	Requires proof the proposed activity will not have significant adverse environmental and social impacts through completion of an environmental checklist prior to state or local approval. An environmental impact statement may be required if there are probable significant environmental impacts.
RCW 90.58 Shoreline Management Act (SMA) 1971	Protects shorelines and assures orderly development.
WAC 173-225 Clean Water Act (CWA) Section 401	Protects water quality.
<b>Benefits to the Public</b>	
RCW 36.70 Growth Management Act (GMA)	Outlines land-use planning and regulates development in response to rapid growth challenges.
RCW 79.105.050 Multiple Use Concept in Management and Administration of state-owned Lands 1971	Requires DNR to allow both commercial and recreational use of state-owned lands and waters for the production of food, fiber, income, and public enjoyment.
<b>Aquatic Lands</b>	
RCW 79.105 Aquatic Lands Act 1984	Requires DNR to work toward providing a balance of public benefits concerning state-owned aquatic lands.

WAC 332-30-100 Aquatic Lands Management	Gives water-dependent uses preference over other uses of state-owned aquatic lands, and ensures environmental protection, among other management guidelines.
RCW 77.12.047 Scope of WDFW Commission's authority to adopt rules	The WDFW Commission may adopt, amend, or repeal rules specifying times, areas, gear used, disposal, quantities, etc., concerning food fish or shellfish harvesting.

**Table 2: SUMMARY OF STATUTES AND POLICIES SPECIFIC TO COMMERCIAL WILD STOCK GEODUCK HARVEST**

RCW 79.135.220 Geoduck Harvesting-- Designation of aquatic lands	DNR shall designate areas of state-owned lands that are available for commercial geoduck harvesting.
RCW 77.04.012 Mandate of the Department of Fish and Wildlife.	WDFW shall preserve, protect, perpetuate and manage the foodfish and shellfish resources in state and offshore waters, and conserve these resources in a manner that does not impair the resource. In a manner consistent with this goal, the department shall seek to maintain the economic well-being and stability of the fishing industry in the state. WDFW shall promote orderly fisheries and shall enhance and improve recreational and commercial fishing in the state.
WAC 220-52-018 Clams – Gear	Shellfish for commercial purposes may be harvested with a pick, mattock, fork or shovel operated by hands, except that permits for the use of a mechanical clam digging device to take clams other than geoducks may be obtained from the director of fisheries subject to some conditions.
WAC 220-52-019 RCW 77.60.070 Geoduck clams, commercial harvesting --Unauthorized acts	Geoducks for commercial purposes may not be taken from outside the harvest area designated in current DNR geoduck harvesting agreements, or from between areas shallower than eighteen feet or deeper than seventy feet below mean lower low water (0.0. feet). Geoducks may only be harvested during specified hours, and using specified water-jet harvesting equipment.
WAC 220-52-01901 Geoduck licenses	A geoduck fishery license issued by the WDFW director is required for the commercial harvest of geoduck clams.
RCW 77.65.010 Commercial licenses and permits required -- Exemption	All of the following require a license or permit issued by the WDFW director: commercial shellfishing; delivery of shellfish taken from offshore water; operation of a charter boat or commercial fishing vessel engaged in a fishery; processing or wholesaling shellfish.
RCW 77.65.410 Geoduck diver license.	Every diver engaged in the commercial harvest of geoduck clams shall obtain a nontransferable geoduck diver license.
RCW 77.70.220 Geoduck fishery license--Conditions and limitations--OSHA regulations--Violations	A geoduck fishery license is required for commercial harvest of geoduck clams. The WDFW director shall determine the number of geoduck fishery licenses that may be issued for each geoduck harvest agreement, the number of units of gear whose use the license authorizes, and the type of gear that may be used. In making those determinations, the director shall seek to conserve the geoduck resource and prevent damage to its habitat.
RCW 79.135.210 Geoduck harvesting-- Agreements, regulation	Geoducks shall be sold as valuable materials under the provisions of 79.105 RCW. After confirmation of the sale, DNR may enter into an agreement with the purchaser for the harvesting of geoducks, where DNR may place terms and conditions in the harvesting agreements, and enforce the provisions of any agreement.



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# Management of Commercial Wild Stock Geoduck Resources

Annual harvest management agreements are negotiated and signed by the State and Tribal managers of the resource for each management region. These plans establish guidelines and provisions governing the management and annual harvest of geoducks.

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## **Tribal Management**

While Tribes with treaty rights to harvest geoducks are co-managers of the Commercial Wild Stock Geoduck Fishery, and management decisions are a cooperative effort, the Tribes are not governed under State law regarding commercial geoduck harvest. For this reason, management of the Tribal fishery is planned in cooperation with the State's management programs, yet accomplished independent of Washington State's statutory authority.

Through harvest management plans, Tribal harvesters agree to harvest seaward of 18 feet and shoreward of 70 feet in depth, the same area open to State harvesters. However, these areas must be surveyed and opened to harvest based on biologically appropriate criteria, and agreed upon by the managers of the resource. The Tribes use the same sustainable harvest rate and harvest quota as established by WDFW and agreed upon by the State and Treaty Tribes. The Tribes are responsible for having an authorized Tribal official present to weigh and record the daily catch of all Tribal harvesters. In addition, other geoduck fishery management guidelines and provisions are agreed to by the State and Tribes in annual regional harvest management plans.

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## **State Biological Management Policies**

The preservation, protection and perpetuation of the state's wild stock geoduck resource are mandated to WDFW. WDFW studies the biology, ecology, and population dynamics of Washington's geoduck population. The Director of WDFW determines the amount of allowable harvest effort to achieve a sustainable fishery, as well as the methods and type of gear used for

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harvest in order to protect the resource and aquatic habitat. The Director also may set limits to prevent both waste of the resource, and destruction or permanent damage to the benthic environment and marine plant and animal populations.

DNR and WDFW, along with harvesting Tribes, determine where and when to conduct pre-harvest surveys of the geoduck resources and their habitat before beds can be harvested. Geoduck surveys are completed prior to a tract being opened for fishing. All stock assessment survey work is conducted according to the protocol described in Stock Assessment of Subtidal Geoduck Clams (*Panopea abrupta*) in Washington (1999).

## **ENVIRONMENTAL ASSESSMENTS**

In a WDFW environmental assessment of geoduck resources, tracts are inspected for important fish and marine mammal habitats, and the presence of different species of marine plants and animals are noted on a transect-by-transect basis. Environmental information about the area proposed for harvest is reviewed internally by WDFW fishery, habitat, and wildlife biologists. Other County, State and Federal agencies are consulted, as are Tribal representatives. WDFW biologists review the proposed harvest sites on a site-by-site basis and identify potential conflicts. If spawning areas or other important habitats are present, these areas are closed to harvest altogether, or closed seasonally during spawning periods or other critical periods. Based on these factors and the geoduck biomass for commercial tracts, WDFW calculates a Total Allowable Catch for each management region.

## **POST-HARVEST SURVEYS**

Once all managers agree that a tract has been fished down (typically to a minimum of 65 percent of pre-fishing biomass or 0.04 geoducks per square foot), State and Tribal managers conduct post-harvest surveys on these harvested tracts. Post-harvest surveys can be used to empirically verify changes in geoduck density following completion of harvest and to assist in verifying landings reported on fish receiving tickets or monitoring logs. These surveys also help to: monitor the compliance with harvest management agreements; establish a baseline density level for estimating recovery of geoducks; and determine changes to presence or absence of other benthic plants and animals. The purpose, need and protocol for conducting post-harvest surveys are developed by State and Tribal managers. Once the mean pre-fishing density is re-achieved on a given tract, the tract will again be eligible for commercial harvest. Geoduck tracts still considered in “recovery status” are not harvested during their recovery period.

## **WDFW GEODUCK DATABASE**

Historically, data collected from the pre- and post-harvest surveys have been compiled into a Geoduck Database, maintained by WDFW. The database also maintains or stores the general location of all known geoduck tracts confined

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to the 18 foot (MLLW) to 70 foot (MLLW) depth contours. All new geoduck tracts identified are added to the database, along with documentation of changes due to harvest, changes resulting from DOH certification, results of tract re-surveys, and other relevant information. The biomass and average geoduck density estimates for all commercial tracts are revised annually by WDFW, and updated in the database, to reflect changes that have occurred and further document the basis for computing annual Total Allowable Catches. Once a tract is fished down, the initial reported biomass will be the pre-fishing biomass estimate minus the total harvest amount. Within two years of harvest completion, a post-harvest survey provides the post-harvest tract biomass estimate.

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## **State Economic Management Policies**

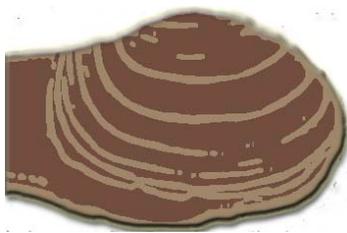
By State law, DNR is mandated to sell wild stock geoducks as a valuable material, and after a public auction to sell the rights to harvest set quotas, enter into a contractual agreement with the purchaser(s). DNR may also place specific terms and conditions in the harvesting agreements and enforce them fully.

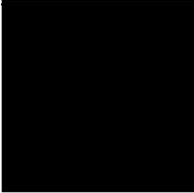
A DNR economist determines the minimum appraised value of the geoduck resource by examining factors such as market value and shipping costs, among other economic variables. DNR also schedules and supervises an on-site test harvest with interested purchasers before it auctions rights to harvest. The test harvest allows purchasers an independent confirmation of the quality and quantity of geoducks in the harvest area. The test harvests last one day per tract and each company may harvest up to 500 pounds of geoducks per tract during a single test harvest.

DNR then conducts sealed bid public auctions and identifies the highest responsible bidder for each quota on a tract. A “quota” is a set number of pounds on an identified geoduck tract, available for harvest during a contractually designated amount of time. Purchasers enter into a short-term contract with DNR, called a “harvest agreement.” During harvest, charges for the removal of geoducks are billed by DNR to the purchaser every two weeks, with payment due within ten business days of the date the bill is sent.

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# Wild Stock Geoduck Harvest Operational Restrictions

To ensure protection of the resource and the environment, management practices must be compatible with effective resource monitoring measures. DNR and WDFW carry out the State Wild Stock Geoduck Fishery management practices detailed below.

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## Wild Stock Geoduck Harvest Time and Location

DNR carries out day-to-day enforcement and compliance work; a DNR enforcement vessel is on the water at all times the State fishery is open. DNR enforces the following time and location rules:

- Harvest is permitted only on tracts designated through contract (Harvest Agreement) by DNR.
- Harvest is permitted only between 7:30 a.m. and 4:30 p.m. State regulations and DNR management guidelines also prohibit harvest on Saturdays, Sundays and State holidays (WAC 220-52-019).
- Areas opened for harvesting are set apart and marked with easily identifiable marker buoys.
- Latitude and longitude positions are recorded for all markers.
- State commercial wild stock geoduck harvest takes place in a clearly defined area between 18 feet (corrected to Mean Lower Low Water) and 70 feet (corrected to Mean Lower Low Water) in depth. Harvest vessels must remain at least 200 yards from shore at all times. The inner harvest boundary protects sensitive nearshore habitats like eelgrass beds. The outer boundary is the limit at which divers can effectively operate without extensive decompression.
- No harvest occurs in eelgrass beds or eelgrass buffer zones. Eelgrass beds and necessary buffer areas are determined, marked, and excluded from the designated harvest area prior to harvest.
- On tracts where an eelgrass bed extends deeper than 16 feet water depth (corrected to Mean Lower Low Water) the shoreward boundary of the tract will be two vertical feet deeper and seaward of the deepest

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occurrence of eelgrass. Alternatively, a buffer zone of at least 180 feet around eelgrass beds deeper than 18 feet (corrected to Mean Lower Low Water) can be used if the tract has a gradual slope.

- In order to protect herring populations, harvest is restricted in areas of known herring spawning activity. The State and Tribes agree to adjust the harvest area, or establish closure periods if herring stock information suggests a different management action is necessary, to protect the herring spawning population.
- DNR places protection measures for other fish species on a tract-by-tract basis, at the recommendation of WDFW. WDFW outlines these types of protection requirements in tract-specific Environmental Assessments, a current version of which must be in place before harvest can occur on a tract.

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## Wild Stock Geoduck Harvest Operations

Commercial wild stock geoduck harvest shall be conducted by divers with a hand-held, manually operated water jet. The water jet nozzle shall not exceed 5/8 inch inside diameter. All geoducks removed individually from the bottom must be brought to the surface for weigh-out.

Under terms of the DNR Harvest Agreement, all State geoduck harvest vessels must operate with noise levels of less than 50 decibels (dBA) measured at 600 feet (200 yards) away from the source. The State noise standard for residential areas is 55 dBA (WAC 173-60-040). Vessels found to exceed 50 dBA are suspended from harvest until the vessel is brought into compliance.

Vessel operators are required to have DNR tract maps and copies of harvest agreements on board the harvest vessel when harvesting. All geoduck harvest vessels must clearly display their assigned WDFW identification numbers.

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## Wild Stock Geoduck Harvest Quantity

The geoduck fishery is designed to limit harvest, in order to ensure sustainability. Each year, WDFW sets the season's harvest quota. The quota is called the Total Allowable Catch and it is 2.7 percent of the total commercial biomass in Puget Sound. The 2.7 percent harvest rate was calculated using an age-based equilibrium yield model (Bradbury and Tagart, 2000) described in the WDFW publication Stock Assessment of Subtidal Geoduck Clams (*Panopea abrupta*) in Washington (1999). (See expanded discussion in Harvest Allocation section above.) The Total Allowable Catch is shared equally by the State and Tribes; the State's share is only 1.35 percent

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of the commercial biomass. Other operational restrictions in place to protect the resource are as follows:

- A buffer is applied to the State’s share of the Total Allowable Catch, to further ensure sustainability. Each year, DNR reduces its share of the Total Allowable Catch by 2 percent, and auctions no more than that reduced number of pounds of geoduck. This set-aside means that the State actually harvests only 1.32 percent of the commercial biomass each year.
- When geoducks are damaged during harvest or handling, so weight loss is suspected, the whole body weight is estimated by applying a regional correction factor to provide a proxy weight. For example, if a harvester inadvertently recovers only the neck of the geoduck as it is removed from the seabed, a correction factor is applied so records (see Weigh-out section below) account for the weight of the entire animal. Each Harvest Agreement DNR issues quotes a “neck to body ratio”, which is region specific, so this correction can be applied.
- Removal of other species while harvesting geoducks is not allowed. However, albeit rarely, horse clams are inadvertently harvested, because they have a very similar appearance to geoducks. When this happens, they must be reported as horse clams, to ensure they can be accounted for in WDFW’s databases (see Weigh-out section below).

DNR keeps a running daily account of the number of pounds each Purchaser harvests under each quota it is assigned through the auction process. DNR watches this running total very carefully throughout the harvest agreement term, in order to ensure that no quota is overharvested.

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## **State’s Compliance and Enforcement**

During all commercial wild stock geoduck harvesting, a DNR enforcement vessel is required to be on tract or within visual distance of the tract, unless there is an on-the-water emergency. DNR enforcement personnel maintain direct oversight of the fishery to ensure that WDFW laws and regulations and DNR contract conditions are followed. Both DNR and WDFW conduct periodic patrols outside the harvest areas to identify unauthorized harvest of State resources, and share information on enforcement issues. DNR enforcement personnel observe on-water weighing out of daily catches, monitor vessel noise levels, and inspect vessels for unreported harvest or other regulatory violations, among other tasks (see below). DNR Harvest Agreements provide that violations of any provision, including WDFW regulations, may result in civil fines and possible suspension or termination of the harvest agreement. Violations can result in civil penalties (compensation to the State of up to three times the retail value of resource illegally removed),

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and criminal penalties including felony convictions with associated fines and jail time.

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## **Wild Stock Geoduck Weigh-out**

Each day the State fishery is open, weigh-outs are witnessed by DNR enforcement staff—geoducks are stacked in crates and DNR witnesses the weighing of every crate, writing down the weight of each crate and summing the total for each harvest vessel. All harvested geoducks are weighed on the water at the harvest tract, or, due to extreme weather conditions, at a previously designated offload site that is reasonably available to all parties.

DNR logs this information in its daily vessel log. In addition, all harvested geoducks must be logged on WDFW Fish Receiving Tickets on a daily basis. A copy of this Fish Ticket is transferred to WDFW by the harvest purchaser company, so harvest amounts can be entered into a database that tracks resource levels. DNR also enters daily catch numbers into its own database; this database is frequently shared with WDFW as a cross validation tool, in order to compare reported catch from fish tickets.

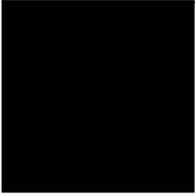
The Tribes are responsible for their own catch accounting, but State and Treaty Tribe harvest amounts are routinely shared between all parties to monitor total harvest amounts in a specific management region.

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## **DNR's Commercial Dive Program**

All DNR geoduck enforcement personnel are certified commercial divers and trained to use both SCUBA and surface supplied air. The DNR dive program is responsible for the following management tasks:

- Enforcement of the laws and regulations of the wild stock geoduck fishery;
- Maintenance of the geoduck tracts;
- Underwater enforcement surveys of harvest areas;
- Daily enforcement reports and logs; and
- Additional miscellaneous tasks to ensure a safe and orderly harvest.



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# Unreported Harvest Mortality

Unreported harvest mortalities may occur if geoducks that have been removed by the diver from the substrate are not turned in for weigh out and are not accounted for on WDFW fish receiving tickets. There are several different potential causes of unreported harvest mortalities, including both deliberate and inadvertent actions. DNR requires accounting for all geoduck removed from the substrate and enforces penalties contained within the harvest contract for any harvest violations, including terminating the contract. DNR sets aside up to 2 percent of the State's share of the regional Total Allowable Catch to ensure an adequate harvest buffer.

Inspections of both the harvest areas and harvest vessels are conducted by DNR staff on a routine basis to find, deter, and reduce unreported harvest mortalities that could occur on State-monitored harvest areas. DNR divers conduct regular randomized investigative dives to check for unreported mortalities and other harvest violations, and on-water enforcement crews perform vessel inspections and on-site daily harvest weigh outs to reduce the opportunity for waste or theft. If harvest violations occur, both criminal and civil penalties can be sought against the responsible harvest company and harvester by DNR and WDFW. This can result in a harvest company being deemed not responsible in its business practices and barred from being awarded future contracts.

All of the following are illegal forms of unreported harvest mortality. DNR and WDFW have adopted a zero-tolerance approach to these actions, irrespective of whether they are intentional or inadvertent.

- **High-grading** refers to an attempt by the harvester to judge the quality and size of a geoduck prior to removal from the substrate. This determination is made by either visual observation or physical touch.
- **Wastage** is the deliberate discard of geoducks after they have been removed from the substrate. Underwater wastage occurs when the geoduck is removed from the substrate then either left on the bottom or is re-inserted back into the hole left by extraction. Adult geoducks do not have the ability to dig themselves back into the substrate once they have been removed, and will die. Topside wastage on the harvest vessel occurs during the packing and sorting of the harvested geoducks. It is a form of wastage if poor quality or damaged geoducks are clandestinely thrown overboard or placed into separate containers

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for disposal at a later time, prior to a State monitored weigh-out and recording on a fish ticket.

- **Inadvertent harvest mortalities** might occur as a part of everyday harvest operations, e.g., a diver might miss their collection bag or a geoduck may not be found after sediment is loosened by the water jet. This type of wastage is usually minimal and is affected by diver experience, sea conditions, and speed of harvest operations.
- **Poaching** is an illegal harvest of geoduck, which is not authorized for harvest by DNR (through contract) or the Tribes (through Tribal regulation) and is not eligible for harvest under a State-Tribal management plan. DNR, WDFW and Tribal law enforcement programs are responsible for investigating and prosecuting poaching violations when they are discovered.

Penalties for all forms of unreported harvest mortality include cost recovery for the value of the product (up to triple damages) and associated investigative costs. In addition, poaching can result in felony criminal prosecution based on Federal and State laws. Penalties can include financial restitution, fines, vehicle and/or vessel seizure, and incarceration. Parties convicted of poaching may be banned by the courts from participating in the fishery for a period of time, and in some cases banned for life.