



DEPARTMENT OF
ECOLOGY
State of Washington

Shellfish Aquaculture Regulatory Committee

Guidelines for Geoduck Aquatic Operations

*Developed under the Authority of Section 4 of Second
Substitute House Bill 2220 Chapter 216, Laws of 2007*

January 2009
Publication no. 09-06-001

Publication and Contact Information

This report is available on the Department of Ecology's website at www.ecy.wa.gov/biblio/0906001.html

For more information contact:

Publications Coordinator
Shorelands and Environmental Assistance Program
P.O. Box 47600
Olympia, WA 98504-7600

E-mail: tisc461@ecy.wa.gov

Washington State Department of Ecology - www.ecy.wa.gov/

- Headquarters, Olympia (360) 407-6000
- Northwest Regional Office, Bellevue (425) 649-7000
- Southwest Regional Office, Olympia (360) 407-6300
- Central Regional Office, Yakima (509) 575-2490
- Eastern Regional Office, Spokane (509) 329-3400

If you need this publication in an alternate format, call Ecology's Shorelands and Environmental Assistance Program at (360) 407-6096. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

Shellfish Aquaculture Regulatory Committee

Recommendations On Guidelines for Geoduck Aquaculture Operations

*Developed under the Authority of Section 4 of Second Substitute
House Bill 2220 Chapter 216, Laws of 2007*

*This report, as well as agendas, presentations, meeting notes and
background documents related to the work of the Shellfish Aquaculture
Regulatory Committee, are available at
<http://www.ecy.wa.gov/programs/sea/shellfishcommittee>*

Shorelands and Environmental Assistance Program
Washington State Department of Ecology
Olympia, Washington 98504-7710

This page is purposely left blank

Shellfish Aquaculture Regulatory Committee Recommendations On Guidelines For Geoduck Aquaculture Operations

January 2, 2009

SUMMARY

In 2007 the Shellfish Aquaculture Regulatory Committee was established to provide advice on shellfish aquaculture. The legislation, Second Substitute House Bill 2220 (Chapter 216, Laws of 2007), directs the Committee to develop recommendations as to appropriate guidelines for geoduck aquaculture operations to be included in shoreline master programs.

The membership of the Committee is diverse, including representatives of local government, the shellfish aquaculture industry, the environmental community, shoreline property owners, state agencies and tribal governments.

The Committee reviewed background documents, met with a wide range of experts on aquaculture and marine sciences, visited a geoduck aquaculture operation and discussed how geoduck aquaculture should be addressed by local shoreline master programs.

The Committee developed consensus recommendations on a number of issues. For issues where the Committee did not reach consensus, the Committee agreed to present the range of recommendations by Committee members in the report. Committee members continue to disagree on many issues and these disagreements lead to opposing recommendations.

Only the consensus recommendations of the Committee are listed in this summary.

Consensus Recommendations

Overall Principles

The Committee recommends that guidelines for geoduck aquaculture be designed to meet the shoreline goal of achieving no net loss of ecological functions provided by shorelines and to minimize conflicts with other land uses.

Shoreline Use Designations

The Committee recommends that local jurisdictions identify where geoduck aquaculture would or would not be allowed, subject to site-specific reviews, when establishing shoreline designations.

Requirements for Siting and Operation

The Committee recommends:

- Local jurisdictions consider the extent and sensitivity of ecological features like eelgrass beds when considering whether a specific site is appropriate for geoduck aquaculture.
- Basing consideration of the sensitivity of habitat features on the site location.
- Restricting geoduck aquaculture at sites requiring major physical alterations before use.
- Local jurisdictions consider possible conflicts with surrounding land uses before approving new or expanded geoduck aquaculture operations.
- Local jurisdictions defer to the Department of Fish and Wildlife on minimizing the risk of introducing parasites and disease with geoduck seed.

- Requiring buffers between sensitive habitats and planted geoducks.
- Restricting geoduck aquaculture to sites that are fundamentally suitable for geoduck harvesting without the need for grading or rock removal.
- Guidelines address the ecological effects of tubes, nets and other predator exclusion devices.
- The guidelines not require public access to private tidelands used for geoduck aquaculture.
- Growers make every effort to prevent the loss of tubes, nets and other items and should recover litter and debris to the extent feasible.

Approval Process

The Committee recommends:

- The local jurisdiction provide public notice of a proposal for a new or expanded geoduck aquaculture operation regardless of the type of approval process being followed.
- As part of any local approval process, two types of information be provided by the applicant: a baseline survey of the proposed site to allow consideration of the ecological effects and a narrative description of the proposed aquaculture activities.
- New or expanded geoduck aquaculture operations receive prior approval through a shoreline substantial development permit, a conditional use permit or a written exemption determination. An approach allowing new or expanded geoduck aquaculture operations without any prior approval is inadequate to meet the general principles of achieving no net loss of ecological function and minimizing land use conflicts.

INTRODUCTION

Background on Geoduck Aquaculture

The Pacific geoduck, *Panopea abrupta*, is an exceptionally large clam native to the marine waters of Washington. Geoducks normally live over a wide range of water depths, from the lower intertidal down to more than 200 feet. Geoducks can live longer than 100 years. In recent years domestic and international demand for geoducks has increased dramatically. Wild geoducks are commercially harvested by divers. Over the last decade shellfish growers have developed aquaculture techniques to grow geoduck clams in the intertidal zone. The most common method involves inserting plastic tubes into the beach at low tide, planting cultured geoduck seed in the tubes, and covering the tubes with netting. The tubes and nets protect the baby clams from predators. After the geoducks grow for one to one and a half years, the tubes and nets are removed. When the geoduck clams reach market size, usually after four to six years, they are harvested by workers using water jets to loosen the sediment surrounding the clams so they can be removed. Planting, maintenance of the tubes and nets and harvest usually occur during low tides when the area where the clams are planted is exposed. In certain times of the year the low tides occur at night.

Currently geoduck aquaculture occurs only on privately-owned intertidal lands. In the mid-1990s Washington State Parks planted geoducks in plastic tubes on intertidal lands in front of six state parks to create a recreational intertidal harvest. The Department of Natural Resources, which administers state-owned aquatic lands, has been developing a pilot geoduck aquaculture program

on state owned tidelands but so far no geoduck aquaculture on state owned tidelands has been authorized¹. Natural Resources has received lease applications for several sites and may have one or more leases approved by the summer of 2009.

The conversion of intertidal beaches to geoduck aquaculture has resulted in conflicts with some existing shoreline residents who feel geoduck aquaculture alters the nature of their shorelines. Some private owners of tidelands see geoduck aquaculture as an appropriate water-dependent use that allows them to receive an income from their properties.

The Shoreline Management Act is the key state law addressing shoreline land uses and providing for the designation and protection of critical areas located with shoreline areas. Because geoduck aquaculture is a relatively new activity, local shoreline master programs lack specific provisions to address it.

Background on the Shoreline Management Act

Many federal, state and local laws and regulations address the types of issues raised by geoduck aquaculture. Perhaps the most important law that applies to uses along shorelines in Washington is the Shoreline Management Act (Chapter 90.58 RCW). All land uses and development in the defined shoreline area must comply with the Act.

Most developments that occur on or near the shorelines are required to obtain and comply with shoreline permits, although single family residences are exempt from the need to obtain a permit². Permitting for most development is administered at the city or county level, with standards and requirements outlined in the local jurisdiction's shoreline master program. Each city or county with shorelines within its jurisdiction adopts its own master program, which is a comprehensive use plan for the area. Once a master program is approved by the Department of Ecology, the city or county is the entity responsible for reviewing projects and issuing permits for activities in the shoreline zone. Depending on the type of permit issued (i.e., Substantial Development, Conditional Use, or Variance) the Department of Ecology may have a review and approval role.

The shoreline zone is a very limited resource and there are many competing uses. The Shoreline Management Act recognizes this competition and establishes priorities for uses (WAC 173-26-201(2)(d)).

Local governments use this list when determining allowable uses and resolving use conflicts on shorelines within their jurisdiction, in this order:

1. Protecting and restoring ecological functions to control pollution and prevent damage to the natural environment and public health.
2. Water-dependent and associated water-related uses³.

¹ Natural Resources determined during 2008 that geoduck clams had been planted on state-owned lands in Totten Inlet without authorization and, in December, 2008, proposed leasing the affected lands to allow the clams to be harvested.

² A number of activities are exempt from substantial development permits, including single family residences, bulkheads for single family residences, docks designed for pleasure craft (subject to a cost limit), farming, irrigation systems, and watershed and habitat restoration projects

³ Geoduck aquaculture is a water dependent use.

3. Other water-related and water-enjoyment uses that are compatible with ecological protection and restoration objectives.
4. Single-family residential uses where they are appropriate and can be developed without significant impact to ecological functions or displacement of water-dependent uses.
5. Nonwater-oriented uses, limited to those locations where the above described uses are inappropriate or where nonwater-oriented uses demonstrably contribute to the objectives of the Shoreline Management Act.

On shorelines of statewide significance, local governments give preference to uses in the following order of preference:

Uses which:

1. Recognize and protect the statewide interest over local interest;
2. Preserve the natural character of the shoreline;
3. Result in long term over short term benefit;
4. Protect the resources and ecology of the shoreline;
5. Increase public access to publicly owned areas of the shorelines;
6. Increase recreational opportunities for the public in the shoreline;
7. Provide for any other element as defined in RCW 90.58.100 deemed appropriate or necessary.

While each local jurisdiction develops its own shoreline master program, the Department of Ecology adopts, by rule, guidelines for local master programs (Chapter 173-26 WAC). The Committee recommendations contained in this document will be used by the Department in developing new guidelines for how local master programs should address geoduck aquaculture.

The existing guidelines address aquaculture generally but do not have specific provisions related to geoduck aquaculture.

“Aquaculture is the culture or farming of food fish, shellfish, or other aquatic plants and animals. This activity is of statewide interest. Properly managed, it can result in long-term over short-term benefit and can protect the resources and ecology of the shoreline. Aquaculture is dependent on the use of the water area and, when consistent with control of pollution and prevention of damage to the environment, is a preferred use of the water area. Local government should consider local ecological conditions and provide limits and conditions to assure appropriate compatible types of aquaculture for the local conditions as necessary to assure no net loss of ecological functions.

Potential locations for aquaculture are relatively restricted due to specific requirements for water quality, temperature, flows, oxygen content, adjacent land uses, wind protection, commercial navigation, and, in marine waters, salinity. The technology associated with some forms of present-day aquaculture is still in its formative stages and experimental. Local shoreline master programs should therefore recognize the necessity for some latitude in the development of this use as well as its potential impact on existing uses and natural systems.

Aquaculture should not be permitted in areas where it would result in a net loss of ecological functions, adversely impact eelgrass and macroalgae, or significantly conflict with navigation and other water-dependent uses. Aquacultural facilities

should be designed and located so as not to spread disease to native aquatic life, establish new nonnative species which cause significant ecological impacts, or significantly impact the aesthetic qualities of the shoreline. Impacts to ecological functions shall be mitigated according to the mitigation sequence described in WAC 173-26-020.” WAC 173-26-241(3)(b)

In addition to the guidelines for shoreline master programs, which are adopted as a rule, the Department of Ecology can provide technical guidance for local shoreline master programs that is more detailed than the rule. Technical guidance can also be quickly changed as new information becomes available.

The Shellfish Aquaculture Regulatory Committee

In 2007 the Washington State Legislature passed Second Substitute House Bill 2220 (Chapter 216, Laws of 2007) relating to shellfish aquaculture. Among other provisions, the bill establishes the Shellfish Aquaculture Regulatory Committee to serve as the state advisory committee on geoduck aquaculture.

The director of the Department of Ecology appoints the members of the Shellfish Committee. The membership consists of:

- Two representatives of county government, one from a county located on the Puget Sound, and one from a county located on the Pacific Ocean;
- Two individuals who are professionally engaged in the commercial aquaculture of shellfish, one who owns or operates an aquatic farm in Puget Sound, and one who owns or operates an aquatic farm in state waters other than the Puget Sound;
- Two representatives of organizations representing the environmental community;
- Two individuals who own shoreline property, one of which does not have a commercial geoduck operation on his or her property and one of which who does have a commercial geoduck operation on his or her property; and
- One representative each from the following state agencies: The department of ecology, the department of fish and wildlife, the department of agriculture, and the department of natural resources.

In addition, the Governor invited the full participation of two tribal governments.

A list of Committee members is included as Appendix A.

Assignments to the Shellfish Aquaculture Regulatory Committee

The Committee is assigned three tasks under this legislation:

Task 1: Develop recommendations for an integrated regulatory process for all current and new shellfish aquaculture projects.

Task 2: Oversee the intertidal geoduck scientific research program authorized by the bill.

Task 3: Develop recommendations as to appropriate guidelines for geoduck aquaculture operations to be included in shoreline master programs under section 5 of the legislation⁴. When developing the recommendations for guidelines, the committee must examine the following:

- i. Methods for quantifying and reducing marine litter; and
- ii. Possible landowner notification policies and requirements for establishing new geoduck aquaculture farms.

The Committee's recommendations to Ecology on guidelines for geoduck aquaculture are presented below.

Shellfish Aquaculture Regulatory Committee Process

The Committee is a diverse group representing a wide range of perspectives on shellfish aquaculture. The Committee began meeting in July 2007 and generally met monthly through November 2008. The Committee heard presentations by a wide range of experts on aquaculture and marine sciences and visited a geoduck aquaculture operation on Totten Inlet in Thurston County.

Through these presentations and extensive discussions among the Committee members, the members have reached general agreement on the need to manage geoduck aquaculture to achieve the goal of no net loss of ecological functions and to minimize conflicts with surrounding land uses. The Committee recommendations that follow reflect this general agreement while respecting the range of opinions held by the members. The phrase "The Committee recommends" indicates a consensus among Committee members. Where the Committee did not reach consensus, the Committee agreed to present the recommendations of the members of the Committee.

Remaining Disagreements

While the Committee members were able to reach agreement on a number of general recommendations, they remain far apart on many details. Some private tideland owners, including shellfish companies, want to raise geoducks for market. Some shoreline residents dislike having what they see as an industrial activity occurring near them. Many people are concerned that geoduck aquaculture will harm the ecological functions of the shorelines. Shoreline residents point out that residential use is one of the preferred uses of the shoreline under the Shoreline Management Act. Shellfish growers point out that water-dependent uses like aquaculture are also priority uses of the shoreline. Protecting and restoring ecological functions, a key priority, has been emphasized by environmental group representatives on the Committee.

The differing positions among Committee members results in conflicting recommendations. Some members recommend setbacks along property boundaries, some oppose setbacks. Some recommend a prohibition on mooring over submerged vegetation, others oppose a prohibition. In the end, these disagreements will need to be addressed by local jurisdictions—in many cases on a site-by-site basis.

⁴ Section 5 directs the Department of Ecology to develop, by rule, guidelines for the appropriate siting and operation of geoduck aquaculture operations to be included in any local shoreline master program.

RECOMMENDATIONS FOR GUIDELINES FOR GEODUCK AQUACULTURE

Overall Principles

The Committee recommends that guidelines for geoduck aquaculture be designed to meet the shoreline goal of achieving no net loss of ecological functions provided by shorelines and to minimize conflicts with other land uses.

In making its recommendations, the Committee recognizes that while requirements included in the Ecology guidelines and local master programs are enforceable, the guidelines and local master programs will not be revised very often. Many Committee members recommend the management of geoduck aquaculture have the flexibility to respond to new aquaculture techniques or new scientific information about the ecological effects of geoduck aquaculture and recommend putting detailed requirements, when appropriate, in a technical guidance document developed and periodically updated by the Department of Ecology. The technical guidance document should contain detailed recommendations and best management practices that can be used by local jurisdictions in administering the local master programs.

One Committee member opposes giving the geoduck aquaculture industry the flexibility to introduce new aquaculture techniques.

Specific Recommendations

The Shellfish Aquaculture Regulatory Committee organized recommendations into five sections:

- I. Shoreline use designations,
- II. Requirements for siting,
- III. Requirements for operation,
- IV. Approval processes, and
- V. Other recommendations.

I. Shoreline Use Designations

When a local shoreline master program is adopted, the local jurisdiction divides the shoreline zone into a number of separate shoreline environments. Specific shoreline uses are only allowed in certain environments. In addition to dividing the shoreline zone into these classifications, the local government may designate critical areas and can establish other overlays that allow or prohibit specific uses or impose more requirements.

The Committee recommends local jurisdictions identify where geoduck aquaculture would or would not be allowed, subject to site-specific reviews, when establishing shoreline designations. When designating the shoreline, local jurisdictions should compile and analyze information on existing intertidal habitats and function as well as current land uses. Jurisdictions can then decide to allow, or not allow, geoduck aquaculture along sections of the shoreline both to ensure meeting the overall principle of no net loss of ecological functions and to reduce the likelihood of land use conflicts.

Several Committee members recommend protecting habitats of sensitive species.

Some Committee members also mentioned that upland uses can cause pollution that prevents shellfish harvest.

One Committee member considers the topic of upland pollution irrelevant to the work of the Shellfish Committee.

Several Committee members recommend local jurisdictions consider cumulative effects when designating areas for geoduck aquaculture by reviewing the current extent of geoduck aquaculture and possible expansions.

Many Committee members recommend Ecology provide more specific information on habitat issues to local jurisdictions as well as sources of data.

Some Committee members are concerned that prohibiting geoduck aquaculture based on shoreline designations would likely eliminate some of the most appropriate areas for geoduck farming, where neighbors might embrace the activity.

One Committee member recommends against prohibiting geoduck aquaculture through shoreline designations because it may raise concerns with tribal governments.

Designation Tools

The Committee discussed several tools available to local governments to designate areas where geoduck aquaculture is or is not allowed. One approach is to define sub-categories of the “aquatic” environment, with geoduck aquaculture only allowed in one (or some) of the sub-categories. Another approach is to define at least two critical saltwater habitat designations in the local shoreline master program with geoduck aquaculture only allowed in one. Finally, local jurisdictions can do a special area plan for geoduck aquaculture that would be a separate overlay to the land use map. The Committee has no recommendation on which approach each local jurisdiction should take but offers this list of pros and cons.

Use Shoreline Critical Area designations to better identify where geoduck aquaculture may be allowed.

Pros:

1. Recreational and commercial shellfish beds are critical areas under SMA. Other critical areas (e.g., salmon, forage fish, eelgrass, bird nesting or rearing) may be located on shorelines where shellfish beds occur.
2. Critical Area designations provide opportunities for broad citizen participation.

Cons:

1. Spatial mapping of eelgrass beds, forage fish, salmon rearing and migration, and other critical areas, as well as land use inventories, would likely be needed prior to drawing specific geoduck aquaculture sites or districts on the map. Many jurisdictions have not mapped all their critical areas, making this difficult.
2. The purpose of Critical Area designations is to designate and protect critical area functions and values. Critical Area designations are good for protecting critical areas from water quality and habitat impacts. However, they are not set up to address siting or conflicts between geoduck aquaculture and adjacent land uses or navigation or public access issues.

Use Shoreline Master Program (SMP) aquatic environment designation to identify areas where geoduck aquaculture would be allowed.

Pros:

1. SMP updates need extensive inventory and characterization of natural resources and land use patterns within shoreline jurisdictions that would provide a framework for creating a specialized aquatic designation for geoduck aquaculture.
2. Aquaculture is a preferred water-dependent use under the Shoreline Management Act when properly managed to assure no net loss of shoreline ecological functions.
3. SMP guidelines provide guidance for regulating uses such as aquaculture. The guidelines also provide guidance for shoreline modifications associated with aquaculture (piers, fill, groins, etc.).
4. SMP adoption is a good opportunity to inventory shoreline uses and prevent uses that are incompatible with preferred water-dependent uses or other uses or with navigation or public access.
5. SMP environmental designations provide a framework for adopting shoreline policies and regulatory measures specific to local shoreline conditions.
6. SMP updates include broad citizen input and participation.
7. Several jurisdictions have already defined areas suitable for aquaculture in their SMPs (Island County, Pierce County).

Cons:

1. There is disagreement within the Shellfish Committee as to the level of detail that should be included for geoduck aquaculture in the guidelines rule adopted by Ecology or in technical guidance that may be updated more frequently. Less rule detail provides less certainty for property owners concerned about conflicts and fewer criteria for Ecology to assess consistency of the SMP with the Shoreline Management Act. Having less detail in rule may provide jurisdictions more flexibility in developing their SMPs and shellfish farmers more flexibility in improving technologies.

Create a special overlay (special area planning) to identify those areas where geoduck aquaculture may be allowed.

Pros:

1. This regulatory tool may be used to implement shoreline critical area designations or SMPs in shorelines.

Cons:

1. Unless undertaken as part of Critical Area Ordinance or Shoreline Master Program analyses, there may be additional costs associated with the inventory and analyses needed to provide technical rationale.

II. Requirements for Siting of Geoduck Aquaculture Projects

The Committee discussed issues related to whether geoduck aquaculture should be allowed on a specific site. An important consideration is whether the site has ecological characteristics that would be harmed by geoduck aquaculture to such a degree the goal of achieving no net loss could not be met.

The Committee recommends that local jurisdictions consider the extent and sensitivity of ecological features like eelgrass beds when considering whether a specific site is appropriate for geoduck aquaculture. If only part of a site has sensitive features, the local jurisdiction may consider buffers to protect those features.

Many Committee members recommend the applicant prepare a baseline habitat survey to determine what ecological features are present at a proposed site.

The Committee recommends basing the consideration of the sensitivity of habitat features on the site location. For example, a habitat feature common in Willapa Bay may be considered sensitive in a portion of Puget Sound.

One Committee member recommends that the guidelines prohibit geoduck farming in designated forage fish spawning areas.

The Committee recommends restricting geoduck aquaculture at sites requiring major physical alteration before use.

One Committee member recommends the guidelines address the risk of sediment contamination from past industrial activities being released by geoduck aquaculture activities.

To minimize conflicts with adjacent land uses, the Committee recommends local jurisdictions consider possible conflicts with surrounding land uses before approving new or expanded geoduck aquaculture operations. Public beaches, boat launches and upland residential developments might conflict with geoduck operations.

One Committee member states that geoduck farming impinges on rural as well as high-density housing and recommends upland owners be afforded protections from aquaculture changing the nature of the shorelines they purchased.

III. Requirements for Operation of Geoduck Aquaculture projects

Stock selection and health

Growers obtain geoduck seed from hatcheries. Since the geoducks planted by aquaculture operations may reproduce before harvest, there is a potential for the cultured clams to interact with the genetics of the wild populations. Research is currently being done on the genetics of wild and cultured geoducks.

Many members of the Committee recommend the genetics issue be included as a general issue in the guidelines and specific recommendations be included in technical guidance when they become available. Many Committee members recommend deferring to the Department of Fish and Wildlife on this issue.

Hatchery seed may also carry diseases and parasites. The Washington Department of Fish and Wildlife has a shellfish transfer permitting system designed to minimize the risk of transferring

or introducing parasites and disease into areas where they currently do not exist. The Committee recommends deferring to the Department of Fish and Wildlife on this issue.

Growing and Holding Pools

The Committee discussed using plastic pools in the intertidal zone to hold geoduck seed before planting. Representatives of geoduck growers told the Committee holding pools are not part of each geoduck aquaculture site but are located at only a few locations. The Committee also considered the possibility of holding pools placed in the uplands or floating on barges.

Committee members recommend local jurisdictions address upland holding pools like other upland aquaculture facilities.

Many Committee members recommend that intertidal holding pools, those placed directly on the intertidal substrate, should be limited in the total area covered and number of sites where they are permitted. Several Committee members recommend that intertidal holding pools not be included in the Ecology guidelines for geoduck aquaculture operations.

Buffers Between Planted Geoducks and Sensitive Habitats

The Committee recommends requiring buffers between sensitive habitats and planted geoducks. Many Committee members recommend a general statement about buffers be included in the guidelines and recommended distances be included in technical guidance documents as recommended best management practices. Several Committee members recommend buffers of at least 25 feet from sensitive habitat elements.

Setbacks Along Property Boundaries

Many Committee members recommend against requiring setbacks between planted geoducks and property lines. Several Committee members recommend the guidelines have a general statement that setbacks may be appropriate along property boundaries to avoid the need to cross property lines to plant and harvest the geoducks. One Committee member recommends setbacks between planted geoducks and adjacent intertidal properties to prevent silt from harvesting from harming adjacent properties and to allow workers and equipment to reach the geoducks without crossing property lines.

Alterations to the Site Before Planting

The Committee discussed how physical alterations to a site which is not “ready to go” may result in damage to ecological functions. The Committee recommends restricting geoduck aquaculture to sites that are fundamentally suitable for geoduck culture without the need for grading or rock removal. Many Committee members recommend including a statement that alterations should be restricted. Several Committee members recommend the guidelines include standards that prohibit grading that changes shoreline profiles or removes natural epibenthic organisms and vegetation. They recommend that the guidelines minimize removal of rocks.

One Committee member recommends not allowing tideland modifications that alter the natural substrate, vegetation, organisms, natural gravel/rocks essential for forage fish, or fish habitat. This Committee member also recommends not allowing tractors and dragging barges.

Harvest of Wild Clams Before Planting

Many Committee members recommend the guidelines include a general statement about the need to respect Tribal shellfish rights when harvesting wild clams. Some Committee members

recommend not including this issue in the guidelines because court rulings establish Tribal shellfish rights and are not subject to a local Shoreline Master Program.

Planting Density

Many Committee members recommend against establishing a limit for the number of tubes or clams per square foot or square meter. Many Committee members recommend local consideration of the overall carrying capacity of the affected water body and the overall scale of geoduck aquaculture operations in each region. Many Committee members recommend dropping the issue of planting density from the guidelines.

Timing of Planting or Harvest to Minimize Fish and Wildlife Effects

Many Committee members recommend a general statement in the guidelines that local jurisdictions may restrict intensive aquaculture activities like inserting tubes or harvesting clams during times when sensitive fish or wildlife may be present. The need for such restrictions should be identified in the baseline identification of sensitive habitat features for the site. Several Committee members recommended that guidelines developed by the Washington Department of Fish and Wildlife for in-water construction be considered. One Committee member recommends avoiding operations that would disturb sensitive marine bird congregating and nesting areas during any sensitive period.

Materials Used for Predator Exclusion Devices (Tubes and Nets)

The visual impact of the tubes and nets used to protect geoducks from predators has been identified as an issue that should be addressed. Many Committee members recommend a general statement in the guidelines that materials should be selected to minimize their visual impact. Several of these Committee members recommend that best management practices be included in technical guidance. One Committee member recommends prohibiting plastics in intertidal or subtidal areas. Several Committee members recommend not including this issue in the guidelines.

One Committee member recommends the aesthetics of geoduck aquaculture operations be considered as a whole because aesthetics cannot be quantified in terms of the color of the tubes or whether they are in straight rows, but rather is a pervasive value related to the entire industrial operation on the shoreline and how it alters the beach habitat.

Ecological Effects of Predator Exclusion Devices

The Committee recommends the guidelines address the ecological effects of tubes, nets and other predator exclusion devices. Several Committee members recommend including a general statement about reducing ecological effects in the guidelines. Several Committee members recommend designing predator exclusion devices to minimize ecological effects, including effects on birds and mammals. Several Committee members recommend that growers remove tubes and nets as soon as they are no longer needed for predator exclusion. Several recommend there be limits on the portion of a site that is covered by tubes and nets at any one time. One Committee member recommends establishing standards for net sizes to minimize harm to birds and other species. One Committee member recommends establishing standards for net sizes, the percentage of tidelands that can be covered by nets, the length of time nets are left in place and the timing of placing nets.

Effects of Harvest

Many Committee members recommend the guidelines include a general statement on the need to manage the effects of water jets or other methods used to harvest geoduck clams. They recommend including best management practices in the technical guidance. Several Committee members recommend against harvesting during periods of spawning and incubation in identified forage fish spawning areas. Several Committee members recommend limits on noise from water pumps if there are not general limits on noise. One Committee member recommends a process for people to make complaints and have them resolved. Many Committee members recommend that local jurisdictions consider performance-based standards tailored to the locations where geoduck aquaculture is allowed.

Notifying Property Owners and Tribes of Operations

The Committee considered whether notice should be sent to nearby properties owners or tribes prior to geoduck planting or harvesting operations. Many Committee members recommend local jurisdictions follow their normal notification procedures to inform nearby property owners and Tribes of the types of activities that will occur at a geoduck aquaculture operation. They recommend providing this notice once when the operation is first established. Some Committee members recommend that local jurisdictions have specific notice procedures for geoduck aquaculture, which may differ by site depending on the surrounding uses. Several Committee members suggest that growers should notify neighbors when they are harvesting or replanting as a courtesy and to avoid potential conflicts but recommend the guidelines allow local governments to decide whether to require additional notification. Many Committee members recommend the notice include information on how to make a complaint.

Site Boundary Marking or Identification

Many Committee members recommend surveying and marking geoduck aquaculture sites when they are established. Because most work at a geoduck aquaculture site occurs during low tides, several Committee members recommend surface markers rather than buoys. Some Committee members recommend marking the waterway side. Some Committee members recommend marking sensitive habitat features on the site to prevent harm. Some Committee members recommend against having special marking requirements for properties used for geoduck aquaculture.

Public Access

The Committee recommends the guidelines not require public access to private tidelands used for geoduck aquaculture. Two Committee members recommend allowing public access on public shorelines that are leased for geoduck aquaculture.

Access for Workers and Equipment

Many Committee members recommend the guidelines include a statement that growers must have legal access to a site and the means and location of access must not result in impacts to critical areas. Several Committee members recommend restricting vessel operations and worker access to protect eelgrass beds or known forage fish spawning areas. They recommend including best management practices in the technical guidance. To protect the vegetation from disturbance by workers and equipment, one Committee member recommends buffers of at least 25 feet around eelgrass or other attached vegetation for Puget Sound farms. One Committee member

recommends that regulations insure that growers cannot cross private land without an easement recorded with the county.

Locations of Parking and Staging Areas

Many Committee members recommend that local Shoreline Master Programs address parking and staging areas to minimize conflicts and effects on ecological functions. Several Committee members recommend growers describe planned parking and staging areas during the approval process. Several Committee members recommend against addressing this issue other than through best management practices.

Limits on Barge and Vessel Mooring

Many Committee members recommend a general statement that local jurisdictions consider restricting barge and vessel mooring. They recommend including best management practices for barge and vessel mooring in the technical guidance. Some Committee members support and other Committee members oppose recommending a prohibition on mooring over submerged vegetation. One Committee member recommends limiting beaching of vessels on the shoreline. One Committee member recommends anchoring vessels only at the grower's site or state land lease and not for more than 3 days in any consecutive 30-day period. This Committee member also recommends marking all vessels with navigation lights. One Committee member recommends against addressing this issue in the guidelines.

Restrictions on Lights

Many Committee members recommend a general statement about keeping lights near residential areas to a minimum and not directing bright lights towards shore. They recommend that any best management practices be included in technical guidance. Several Committee members recommend that local shoreline programs have standards for lights for all shoreline activities, to minimize impacts to adjacent uses and sensitive species. One Committee member recommends not allowing harvesting at night in residential neighborhoods.

Restrictions on Noise

Many Committee members recommend that local jurisdictions address noise in shoreline areas from all sources, including geoduck aquaculture, using State noise standards as a starting point. Several Committee members recommend that noise controls also protect birds. One Committee member recommends not allowing harvesting activity at night in residential neighborhoods. One Committee member recommends against addressing this issue in the guidelines.

Limits on Timing of On-Site Work

Several Committee members recommend the guidelines contain a general statement that this issue should be addressed based on local conditions and adjacent land uses. One Committee member recommends not allowing harvesting activity at night in residential neighborhoods and recommends limiting daytime harvesting to weekdays. Several Committee members recommend avoiding on-site operations during periods of spawning and incubation in identified forage fish spawning areas. Several Committee members recommend that restrictions on hours of operation should not apply only to geoduck aquaculture. One Committee member recommends against addressing this issue in the guidelines.

Debris and Litter Management

The Committee was specifically directed in SSHB 2220 to examine methods for quantifying and reducing marine litter.

The Committee recommends that growers make every effort to prevent the loss of tubes, nets and other items and should recover litter and debris to the extent feasible. Committee members recommend considering best management practices including selecting equipment and methods to prevent loss of tubes and nets and marking tubes and nets to identify the source of litter. Several Committee members recommend that local governments be a clearinghouse for litter reports. Other Committee members recommend against this approach. One Committee member recommends requiring each grower to post a bond to pay for litter cleanup.

Requirements for Site Maintenance and Worker Training

Many Committee members recommend the guidelines include a general statement on the importance of site maintenance, sanitation and worker training with best management practices included in a technical guidance document. One Committee member recommends specific restrictions on storing materials on-site and requirements for adequate sanitation and garbage facilities. One Committee member recommends growers have copies of other permits or approvals on site when workers are present.

Spill Prevention and Response

Many Committee members recommend preparing a spill prevention and response plan for each geoduck aquaculture operation. One Committee member recommends a reference to Coast Guard and Ecology requirements. One Committee member recommends including best management practices in a technical guidance document. One Committee member recommends against addressing this issue in the guidelines.

Prevention of Air, Water and Sediment Pollution

Several Committee members recommend a general statement on the need to prevent pollution. One Committee member recommends against including this issue in the guidelines. Some Committee members recommend prohibiting the use of pesticides and herbicides while other members oppose addressing pesticides and herbicides through local shoreline master programs as they are already subject to state and federal regulations. One Committee member recommends including best management practices to prevent pollution in a technical guidance document.

Equipment Maintenance

Many Committee members recommend a general statement in the guidelines on the importance of equipment maintenance to preventing pollution and limiting noise. Several Committee members recommend including best management practices in a technical guidance document. One Committee member recommends requiring annual maintenance records. One Committee member recommends against including this issue in the guidelines.

Recordkeeping and Reporting

Many committee members recommend a general statement in the guidelines that growers should keep records of planting and harvest activities. Some Committee members recommend requiring detailed planting and harvesting records and counts of tubes and nets installed and removed to

measure losses. Several Committee members recommend against requiring recordkeeping through local shoreline programs.

Monitoring, Performance Measures and Adaptive Management.

The Committee recommends developing an adaptive management framework for geoduck aquaculture. Many Committee members recommend requiring a baseline survey of the habitat features of a proposed site as part of the approval process. Several Committee members recommend integrating monitoring and adaptive management into the local permitting process. Some Committee members recommend that geoduck proposals or farm plans include a monitoring and adaptive management program that provides a method for incorporating results of ongoing scientific studies into farm management practices. Some Committee members recommend applying adaptive management to the overall activity rather than to individual sites, others favor adaptive management of individual operations. One committee member recommends using adaptive management terminology only if funding is available for the required monitoring, enforcement and action components.

IV. Approval Processes

Under the Shoreline Management Act, all uses in the shoreline zone must be consistent with the local Shoreline Master Program. Only some activities are considered developments and only developments that exceed a certain dollar amount need permits. Many developments are exempt from the permit requirement. The Washington Attorney General has issued an opinion⁵ that geoduck aquaculture does not, in all cases, qualify as development.

Many members of the Committee recommend a local approval process that provides for notice to the public and adjacent land owners, documents the local jurisdiction's determination that the operation is allowed by the local shoreline master program, allows for enforcement of the provisions of the local master program and allows for adaptive management.

Several Committee members recommend the approval process ensures compliance with the Shoreline Management Act regarding no net loss of eelgrass and kelp beds and fish and wildlife habitat areas. They recommend a special emphasis on maintaining Puget Sound health.

Some Committee members recommend having provisions for experimental aquaculture methods.

Some Committee members favor an approval process that includes compliance with other required approvals and requires posting a bond.

One Committee member recommended that the approval process include agreement on how complaints should be made and addressed.

Public Notice

The Committee discussed notification of the public and adjacent landowners when a geoduck aquaculture operation is established. This is one of the specific assignments to the Committee.

The Committee recommends the local jurisdiction provide public notice of a proposed new or expanded geoduck aquaculture operation regardless of the type of approval process being

⁵ AGO 2007 No. 1.

followed. When possible, the jurisdiction should follow the normal notice procedures for a shoreline permit.

Committee members differed on which landowners should receive a specific notice, some recommending all properties within 1000 feet, others recommending 300 feet or three shoreline parcels, whichever is greater.

Application Information

As part of any local approval process, the Committee recommends two types of information be provided by the applicant: a baseline survey of the proposed site to allow consideration of the ecological effects and a narrative description of the proposed aquaculture activities.

Some Committee members favor an extensive baseline survey of all fish and wildlife critical areas, including the presence of kelp and eelgrass and use of the site by salmon, forage fish and marine birds. They recommend the application include proposed actions to minimize impacts to habitats and wild species and mitigation to ensure achieving no net loss.

Many Committee members recommend the description of the proposed aquaculture activities include information on the source of seed, predator exclusion devices, timing and areas of planting and harvest and access to the site. Committee members differed in the level of detail desired and the need to allow flexibility.

Approval Options

The Committee discussed the following list of approval options:

1. Shoreline Substantial Development Permit
2. Conditional Use Permit
3. Exemption statement
4. Enforcement on a complaint basis
5. Document other approvals
6. Posting a Bond

1. Shoreline Substantial Development Permit

Many of the Committee members recommend requiring a Substantial Development Permit only when it is triggered by project-specific characteristics, for example, when operations substantially interfere with normal public use of the surface of state waters.

One Committee member recommends requiring a Substantial Development Permit for all geoduck operations and involving Ecology in assuring no net loss of ecological functions.

Several Committee members recommend that all new or expanded geoduck aquaculture operations in Puget Sound obtain either a Substantial Development Permit or a Conditional Use Permit, to support the State goal to recover Puget Sound by 2020.

2. Conditional Use Permit

As mentioned before, several Committee members recommend that all new or expanded geoduck aquaculture operations in Puget Sound obtain either a Substantial Development Permit or a Conditional Use Permit, to support the State goal to recover Puget Sound by 2020.

One Committee member recommends involving Ecology in assuring no net loss of ecological functions. A Conditional Use Permit requires review by Ecology.

Many Committee members recommend against requiring a Conditional Use Permit.

3. Exemption Statement

A local jurisdiction can issue a written determination that a proposed activity is consistent with the local Shoreline Master Program but exempt from obtaining a Substantial Development Permit. Many Committee members recommend local governments follow this procedure when a Substantial Development Permit is not otherwise required. Several Committee members recommend always requiring a permit.

4. Enforcement on a Complaint Basis

Shoreline uses exempt from a Substantial Development Permit are sometimes undertaken without any prior approval by the local jurisdiction. The jurisdiction only becomes involved and seeks compliance with provisions of the local Shoreline Master Program when the jurisdiction receives a complaint.

The Committee recommends that new or expanded geoduck aquaculture operations receive prior approval through a shoreline substantial development permit, a conditional use permit or a written exemption determination. An approach allowing new or expanded geoduck aquaculture operations without any prior approval is inadequate to meet the general principles of achieving no net loss of ecological function and minimizing land use conflicts.

5. Document Other Approvals

Many Committee members recommend local Shoreline Master Programs require geoduck aquaculture operations to show they have obtained other necessary approvals. Examples include certification that the growing area meets shellfish sanitation requirements or a permit from the U.S. Army Corps of Engineers. Some Committee members recommend that local jurisdictions only require documentation of other approvals for geoduck aquaculture if they require it for other shoreline uses. Some Committee members recommend against this approach.

6. Posting a Bond

Many Committee members recommend against any special requirement that geoduck aquaculture operations post a bond.

One Committee member recommends requiring a bond that can be used for debris collection and to repair environmental damage assessed from the baseline study information.

Several Committee members recommend that local jurisdictions follow their general practice for deciding when a bond should be required.

V. Other Recommendations

Many Committee members recommend that Ecology work with the other state agencies to provide information to local jurisdictions on the locations and sizes of existing geoduck aquaculture operations.

One Committee member recommends the Legislature give the Washington Department of Fish and Wildlife the authority to use its expertise in developing regulations for the aquaculture industry.

Several Committee members recommend Ecology provide a definition and guidance on how to achieve the Shoreline Management Act policy of no net loss of ecological functions.

Many Committee members recommend against requiring local jurisdictions to collect and compile information on geoduck aquaculture activities and debris, with one member recommending the State compile information

Several Committee members recommend including predator exclusion devices and growing pools to the section of the guidelines addressing Shoreline Modifications.

Background Materials

Agendas, presentations, meeting notes and background documents related to the work of the Shellfish Aquaculture Regulatory Committee are available on the Committee's web pages at:

<http://www.ecy.wa.gov/programs/sea/shellfishcommittee/index.html>.

Appendix A: List of Shellfish Aquaculture Regulatory Committee Members

Member represents:	Past Committee Members	Committee Members	Alternates/Staff Contacts
County located on the Puget Sound	Pat Prendergast Pierce County	Dave Risvold Pierce County Planning and Land Services	Mike Erkinen Pierce County Planning and Land Services
County located on the Pacific Ocean		Bryan Harrison Pacific County Administrative Officer	None
Owner or operator of an aquatic farm in Puget Sound		Diane Cooper Taylor Shellfish Farms, Inc.	Peter Downey Discovery Bay Shellfish
Owner or operator of an aquatic farm in state waters other than the Puget Sound		Nick Jambor Ekone Oyster Co.	David Hollingsworth Markham Oyster Inc.
Organization representing the environmental community		Krystal Kyer Tahoma Audubon	Miranda Wecker Willapa Hills Audubon
Organization representing the environmental community		Bruce Wishart People for Puget Sound	Cyrilla Cook People for Puget Sound
Shoreline property owner who does not have a commercial geoduck operation on his or her property		Patrick Townsend Olympia	Laura Hendricks Gig Harbor
Shoreline property owner with a commercial geoduck operation on his or her property		Ward Willits Olympia	None

Member represents:	Past Committee Members	Committee Members	Alternates/Staff Contacts
Department of Ecology	Dick Wallace Department of Ecology SW Regional Office	Sally Toteff Department of Ecology Southwest Regional Office	Jeannie Summerhays Department of Ecology, Northwest Regional Office
Department of Fish and Wildlife	Morris Barker Lisa Veneroso	Rich Childers Department of Fish & Wildlife	Bob Sizemore Department of Fish & Wildlife
Department of Agriculture	Linda Crerar	Eric Hurlburt Department of Agriculture	Lee Faulconer Department of Agriculture
Department of Natural Resources	Sarah Dzinbal Department of Natural Resources	Blain Reeves Department of Natural Resources	None
Tribal government within the Puget Sound drainage		Andy Whitener Squaxin Island Tribe	Jeff Dickison Squaxin Island Tribe
Tribal government		Russ Svec Fisheries Manager Makah Tribe	Yongwen Gao Makah Tribe

Other Interested Agencies

Representing:	Representative	Alternate
Department of Health	Jessie DeLoach and Cathy Barker Department of Health	Maryanne Guichard Division of Environmental Health Department of Health
Puget Sound Partnership	Ron Schultz Puget Sound Partnership	Stuart Glasoe Puget Sound Partnership
Corps of Engineers	Casey Ehorn Corps of Engineers - Seattle District	None