



Geoduck Evaluation Tool

To be used in conjunction with the Food Alliance Whole Shellfish Farm Evaluation Tool.
Geoduck clams are *Panopea abrupta/generosa*.

Operation Name:	
Address:	
Evaluation Date:	
Evaluator/Inspector:	

Scored Evaluation Criteria: To have geoduck clam production certified by Food Alliance, an operation must score an average of 3.0 out of 4 overall in the three areas listed below:

Healthy and Humane Care for Shellstock

Cultural Conditions (growout)

Holding and Handling Operations and
Facilities (nursery and growout)

Production and Culture System Management

Habitat Protection of Growout and Buffer
Areas

Harvest Management
Genetic Integrity of Native Shellfish

Pest Management

Predator Management (growout)

Noxious Weed Management (growout)

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Instructions for Use

1. Production practices are evaluated according to Food Alliance criteria (listed on the following pages of this document) and then ranked in a four-step process from Level 1 to Level 4. Points are only earned for the highest Level achieved.
2. Scoring partial points is allowed. Example: Half of a farm employs predator protection devices that increase benthic access for other species. As a result, you may score 2.5 points or half the increase between Level 2 and Level 3.
3. No points are earned for a criterion that is not applicable (N/A) to the operation or region.
4. For producers reviewing this evaluation tool: The scorecard at the end of this document identifies the minimum number of points required to be considered for certification. This is only a guideline for your use and does not guarantee acceptance of your application.
5. Inspectors should make notes on each criterion describing how they arrived at decisions, including means used to verify all specific producer claims. These notes will provide important background, which will be carefully considered in the final certification decision. A section for notes is also included at the end of this document. Please make note of any sections that were not applicable and the reason. Also include any Best Management Practices (BMPs) implemented by the producer that are not listed in this inspection tool.

Healthy and Humane Care for Shellstock

Culture Conditions (growout)

Level 1: All legal requirements and industry association standards (if any) are met for space/stocking rate. All the following apply:

- Manager is aware of legal requirements/industry standards.
- Manager can explain how operation meets those requirements.

Level 2: As per Level 1, animals are planted in suitable habitats. All the following apply:

- Substrate is assessed prior to planting for suitability.
- Water quality, water currents, and wind wave conditions are assessed prior to planting.
- Other (please specify):

Level 3: As per Level 2, trampling and heavy equipment beaching/driving is avoided, and planting densities are maintained to avoid stunting/death. All the following apply:

- Manager takes care to avoid the crushing of juvenile shellstock from repeated footfalls.
- Heavy equipment (vessels, barges, tractors) is not repeatedly beached or driven on top of juvenile shellstock.
- Growout densities are maintained to reduce food related stress leading to poor/slow growth and/or mortalities.
- Other (please specify):

Level 4: Animals spend most of their growout phase uninterrupted by footfalls, beaching, and driving. Growth and survival of the clams indicate adequate food levels for the entire population during growth seasons. A written plan is available that describes these policies.

Score:

Verification methods and notes:

Holding and Handling Operations and Facilities (nursery and growout)

Level 1: Animals are handled carelessly. No efforts are made to reduce time to temperature (cooling) after harvest beyond what is required, or to prevent body damage during planting and harvest.

Level 2: Animals are handled with care. There is little sign of shell breakage during times of harvest and at handling facilities.

Level 3: As per Level 2, and growers/operators/harvesters are well trained and understand the factors that cause stress or injury to the clams in culture. Facility maintenance and design are effective in reducing stress and injury. All the following apply:

- Grower/operator can discuss stress factors to watch out for, such as shell gape or flaccid/unresponsive siphons in harvested clams, or poor burrowing rates for seed.
- Grower/operator can discuss facility maintenance and design such as cleanliness, etc. that may result in injury/disease to animals.
- Animals are not showing stress (e.g., a low percentage of shell gape, flaccid/unresponsive siphons).
- Geoduck are processed and moved to storage facility (sink float, upland tank storage, refrigeration) within 12 hours after they are removed from the sediment.

Level 4: As per Level 3 and holding and transport facilities match the natural conditions (e.g., temperature, salinities, etc.) of the animals and grower/operator can discuss and document the features. All the following apply:

- Holding and transport facilities are kept at cool temperatures and records are available to document this action.
- Holding facilities are either sink floats or incorporate cool and properly maintained recirculating or flow through saline salt-water holding tanks.
- Producer has a written operations plan and identified handling procedures manual.
- Signs of stress are recorded and ways to decrease visible stress and increase shelf life are explored.
- Other (please specify):

Score:

Verification methods and notes:

Production and Culture System Management

Habitat Protection of Grow-out and Buffer Areas (growout)

Level 1: Manager has no plan for protecting Endangered Species Act (ESA) listed species and Essential Fish Habitat (EFH) such as submerged aquatic vegetation (SAV), and to document spawning grounds beyond what is required by law.

Level 2: EFH buffers exist, are maintained, and can be documented. Buffer is appropriate to site and environmental conditions. Management plan is minimal or nonexistent. Check all that apply:

- SAV appears to be trampled/destroyed/removed.
- Presence of documented forage fish (pacific herring, sand lance, surf smelt) spawning ground is not researched.

Level 3: As per Level 2, manager can describe how the farm management plan specifically protects EFH areas and listed species. All the following apply:

- SAV areas are visually monitored annually.
- Documented forage fish spawning areas are known and protected during spawning periods, (e.g., harvesters will adhere to WDFW work windows for documented herring

spawning areas.) Additionally, harvesters will avoid disturbing herring by avoiding harvest if herring spawn is observed on attached algae or aquaculture structures.)

- Production is managed to protect or enhance EFH and listed species.
- Tubes, nets, and/or other mesh materials are not placed over areas containing native eelgrass.
- Buffers between farm operations and native eelgrass are set at 10 feet or more and are based on surveys conducted prior to planting.
- Staging areas or paths are avoided in areas containing native eelgrass.
- Other: (please specify).

Level 4: Written production management plan specifically considers EFH areas and their enhancement or maintenance in good condition, which include at least 2 of the following:

- SAV is annually systematically monitored and mapped. This knowledge is spread to farm employees. This information is also used to make management decisions to better protect the SAV resource.
- Farm manager participates in forage fish spawning surveys (state, federal, or provincial).
- Other (please specify):

Score:

Verification methods and notes:

Harvest management

Level 1: All laws and regulations are followed, but manager does not have harvest guidelines/plans.

Level 2: All laws and regulations are followed and at least 2 the following apply:

- Trainings are conducted to increase efficiency and to reduce shell breakage during harvest.
- Best Management Practices (BMPs) are implemented during geoduck dive harvest with training and instruction to dive technicians for proper handling of water jets to minimize sediment disturbance and turbidity.
- High volume/low pressure nozzles are used for harvest.
- Engines for compressors and pumps are selected or muffled to reduce noise levels, especially during night time harvests.
- Harvest activities are conducted to avoid conflicts (e.g., sedimentation) with documented forage fish spawning grounds and native eelgrass.

Level 3: As per Level 2 and all from Level 2 apply. Pre-harvest site evaluations are conducted where harvest sites are marked to assure an effective/targeted harvest. Prior to cleanup harvests, siphon shows are marked to allow for pinpoint harvesting.

Level 4: As per Level 3, and a written harvest plan is available and periodically updated to reflect current science, regulations, and recommendations.

Score:

Verification methods and notes:

Genetic Integrity of Native Shellfish

Level 1: Producer/manager has no regard to retaining the genetic integrity of native shellfish beyond to what is required by law.

Level 2: Producer/manager communicates some knowledge of the importance of retaining genetic integrity of native stocks. Producer/manager not only abides by but also can describe the following state/provincial and federal laws and management practices. All the following must apply:

- State/provincial and/or federal transfer permits requirements.
- New existing species source or new species importation requirements.

Level 3: As per Level 2 and producer/manager establishes a written policy or protocol to retain genetic integrity of native shellfish.

Level 4: As per Level 3, and producer/manager uses only local (for native oyster, *Ostrea conchaphila*) or regional (for native geoduck, *Panopea generosa*) broodstock, triploid shellfish or harvests shellfish prior to known reproduction periods when growing native species in proximity to wild populations.

Score:

Verification methods and notes:

Pest Management

Predator management (growout)

Level 1: Predators (Scoter ducks, crab, starfish, moon snails, etc.) are routinely destroyed when found on the farm site. No anti-predation devices are employed.

Level 2: Anti-predator devices such as netting or bags are employed to reduce predation. Devices are selected with no regard to benthic access and tanglement issues for other species. Benthic predators are not routinely destroyed. When anti-predator devices are ineffective, predators are relocated or destroyed. If predators are destroyed, producer/manager can explain why removal from the farm and relocation to other areas in the water body is ineffective for controlling predators.

Level 3: Devices are selected so other species have access to the benthic environment (via bag spacing, mesh size, etc.) while still providing protection to the farmed clams. When anti-predator devices are ineffective, predators are relocated or destroyed. If predators are destroyed, producer/manager can explain why removal from the farm and relocation to other areas in the water body is ineffective for controlling predators. All the following apply:

- Anti-predator devices are laid out in an orderly fashion.
- Anti-predator devices are maintained to prevent loss of material and to improve efficacy.
- Anti-predator devices are removed when no longer useful.

Level 4: As per Level 3, and alternative anti-predator devices are researched and tested on grower supplied areas to increase benthic access and farm production.

Score:

Verification methods and notes:

Noxious Weed Management (growout)

Note: Currently only *Spartina alterniflora* (smooth or saltmarsh cordgrass) is targeted by herbicides in the aquatic environment. Total eradication is required. This criterion only applies in areas with a history of, or geographical proximity to, infestations of *Spartina alterniflora*.

- N/A: No chemicals are applied to the aquatic environment.

Level 1: Herbicides are applied every year to the same noxious weeds or all conspicuous weed species at the same place.

Level 2: Every 2 or more years, an inventory is taken or monitoring activity is performed to determine location of new noxious weed infestations and effectiveness of previous year's treatment methods. Herbicides are used only after areas are scouted.

Level 3: As per Level 2 and every year, an inventory is taken or monitoring activity is performed to determine location of new noxious weed infestations and effectiveness of previous year's treatment methods. Herbicide use is limited to targeted/spot applications.

Level 4: A yearly evaluation of noxious weed infestations is performed consistent with a written noxious weed control plan that includes 3 or more of the following items. Herbicides are only used when conditions are assessed, and only with carefully timed and targeted applications. All the following apply:

- Regular inventory and monitoring done to determine location of new noxious weed infestations and effectiveness of last year's treatment methods.
- Monitoring information used to plan current year's noxious weed control and at least 2 or more years into the future, specifically target small new infestations where treatment takes least resources, is most effective and very low costs.
- Control methods applied based on plant phenology so they have the most impact on target weed.

Other (please specify):

Note: If area is relatively free of noxious weeds, manager must be aware of potential problems, and monitor the area regularly. They must also have a plan to control calling for some of the elements in Level 4 in order to score at Level 4:

Score:

Verification methods and notes:

Scorecard

CRITERIA	SCORE/LEVEL
Healthy and Humane Care for Shellstock	
Culture Conditions (growout)	
Holding and Handling Operations and Facilities (nursery and growout)	
Production and Culture System Management	
Habitat Protection of Growout and Buffer Areas	
Harvest Management	
Genetic Integrity of Native Shellfish	
Pest Management	
Predator Management (growout)	
Noxious Weed Management (growout)	
Total points earned	
Total points available	28
Total points N/A	
(Total points available) – (Total points N/A) = Total applicable points	
(Total points earned)/(Total applicable points) = Average score	

Acknowledgements

The evaluation criteria included in this inspection tool were developed using information from many sources, including*:

British Columbia Ministry of Agriculture, Food and Fisheries, “BC Shellfish Aquaculture Code of Practice”, Final Submission, July 03, 2002.

National Organic Standards Board (NOSB), Livestock Committee, “Recommendation on 205.257 Molluscan Shellfish Standards,” September 9, 2009.

Pacific Coast Shellfish Grower’s Association” Environmental Codes of Practice for the Pacific Coast Shellfish Farmers”, January 2009.

Sustainable Shellfish, “Recommendations for responsible aquaculture”, Heather Deal, David Suzuki Foundation, 2005.

Taylor Shellfish, “Environmental Codes of Practice”, December 19, 2008.

United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, “Endangered Species Act – Section 7 Programmatic Consultation Biological and Conference Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation, Nationwide Permit 48 Washington” (State), April 28, 2009.

United States Fish and Wildlife Service, “Endangered Species Act -Section 7 Consultation, Biological Opinion, U.S. Fish and Wildlife Service Reference: 13410-2008-F-0461 , Nationwide Permit #48 for Shellfish Aquaculture, State of Washington”, March 2009.

Aquaculture on State Owned Aquatic Lands in Washington State, June 13, 2006.

Washington Department of Ecology’s 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.

Washington Department of Natural Resources, “Best Management practices (BMP’s) for Geoduck.

World Wildlife Fund’ “Draft Environmental and Social Standards for Bivalve Aquaculture,” February 1, 2010.

These evaluation criteria were developed in collaboration with Andrew D. Suhrbier, Senior Biologist with the Pacific Shellfish Institute, Olympia, WA., suhrbier@pacshell.org

Brian Kingzett, Blue Revolution Consulting Group, reviewed and provided comment on the evaluation criteria**:

*Not all practices from these sources were incorporated into the final draft of these evaluation criteria, so acknowledgement of their use does not constitute an endorsement of these criteria.

**Not all reviewer comments and suggestions were incorporated in the final draft of these evaluation criteria, so recognition of their contribution does not constitute an endorsement.

Document Review:

11/9/2018	Complete document review, removed copyright notion, removed fillable form function, updated footer.	Completed by Shaila Cook, Certification Manager
10/20/2022	Complete document review, updated footer, corrected spacing/white space, converted to pdf fillable, added document review table.	Completed by Shaila Cook, Certification Manager