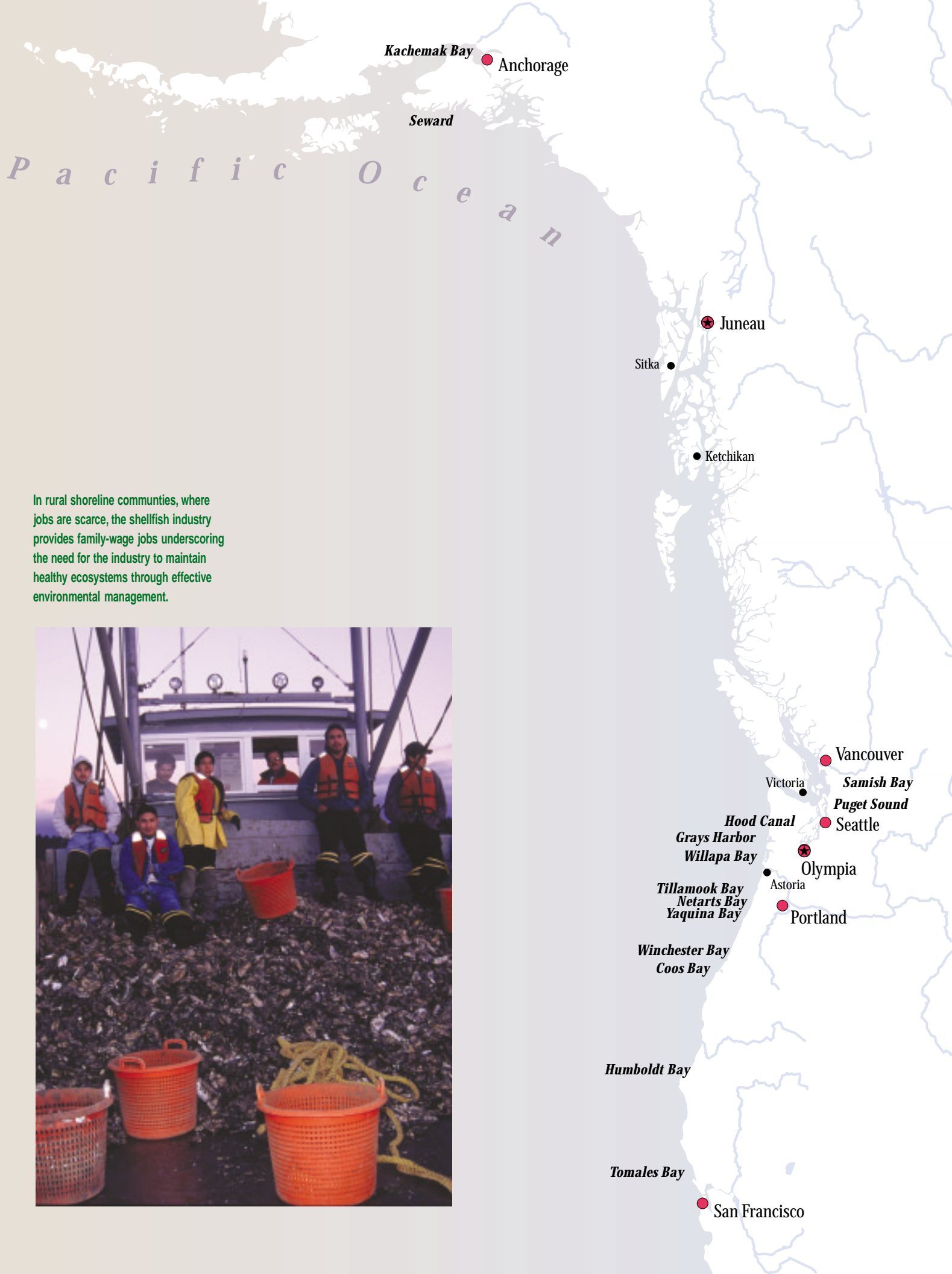


Environmental Policy

PACIFIC COAST
SHELLFISH GROWERS
ASSOCIATION

June 2001





In rural shoreline communities, where jobs are scarce, the shellfish industry provides family-wage jobs underscoring the need for the industry to maintain healthy ecosystems through effective environmental management.



Pacific Coast Shellfish Growers Association

SHELLFISH AND THE MARINE ENVIRONMENT

Shellfish farmers' livelihoods depend upon the delicate balance of the marine environment. For generations, farmers have played a critical stewardship role in protecting and restoring water quality and habitat. Since the industry first got its start in the mid-1800s, vast environmental and political changes have occurred. With increasing pressure on shellfish growing areas brought about by shoreline development and competition for natural resources, shellfish farmers recognize that long-term sustainability depends on the broader overall environmental health of the estuaries in which they work and cooperation with other estuary users.

The unique stewardship role of shellfish farmers, long-time champions for water quality, is beneficial to every water user. Shellfish farmers in the Pacific Coast Shellfish Growers Association recognize that long-term sustainability depends on the broader overall environmental health of the estuaries in which they work and a recognition and respect for and among other estuary users.

This Environmental Policy acknowledges the dependence of shellfish growers on a healthy estuarine ecosystem and serves as the foundation for the Environmental Management System for

the West Coast Shellfish Industry. This program is designed to assure shellfish farming operations continue in the model of stewardship that has long been the hallmark of the industry.

The Environmental Management System (EMS) consists of this Environmental Policy (EP) and Environmental Codes of Practice (ECOP) to implement the policy.

$$\begin{array}{ccccc} \text{EP} & + & \text{ECOP} & = & \text{EMS} \\ \text{Environmental} & & \text{Environmental} & & \text{Environmental} \\ \text{Policy} & & \text{Codes of Practice} & & \text{Management System} \end{array}$$



Environmental Policy

ENVIRONMENTAL STEWARDSHIP & RESPONSIBLE MANAGEMENT

Shellfish farmers serve as stewards of the estuaries and watersheds in which they operate. Growers support education, outreach, research and public policies that ensure activities in their watersheds are understood and negative impacts on the marine ecosystem are minimized. Members manage their farming operations and processing facilities in a sustainable and ecologically responsible manner to ensure a healthy estuarine ecosystem and the existence of safe, high-quality, healthful shellfish for this and future generations.

ENVIRONMENTAL EXCELLENCE

Shellfish farmers are committed independently and collectively to environmental excellence. To achieve this, member farms continually evaluate and improve their environmental performance to remain economically viable, environmentally sound and state-of-the-art.

REGULATORY COMPLIANCE

Shellfish farmers meet and strive to exceed compliance with all relevant local, state, federal and international environmental regulations.

WASTE MANAGEMENT

Shellfish farmers minimize impacts of waste generated from farming and processing activities through reduction, reuse, recycling and recovery measures.

SHARING RESOURCES

Shellfish farmers work to create and maintain positive relationships with other shoreline users through cooperative and educational efforts and by acknowledging and responding to community concerns.



Members of the Pacific Coast Shellfish Growers Association are committed to the policies intended to protect and preserve the health of the environment in which they work.

Implementation of an effective EMS ensures farming practices, such as this hand-harvesting of oysters in an estuary in Willapa Bay, Washington, have the lightest possible touch on the estuarine ecosystem.

Environmental Stewardship & Responsible Management



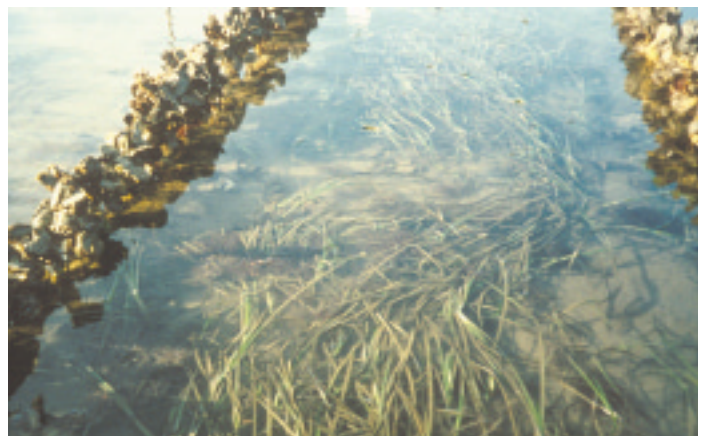
Growers support education, outreach, research and public policies that ensure activities in their watersheds are understood and negative impacts on the marine ecosystem are minimized. Members manage their farming operations and processing facilities in a sustainable and ecologically responsible manner to ensure a healthy estuarine ecosystem and the existence of safe, high-quality, healthful shellfish for this and future generations.

Above: Pacific Coast shellfish growers are committed to responsible stewardship of their own tidelands as well as the surrounding watershed.

The survival and growth of today's West Coast shellfish industry depend on growers' involvement in a variety of endeavors. A healthy estuarine ecosystem is central to the shellfish growers' economic future. In turn, healthy shellfish growing areas are central to a healthy ecosystem.

Shellfish growers' stewardship — in terms of monitoring, protecting and restoring water quality — is critical to the long-term health of

the estuary. With their vested interest, growers are uniquely qualified to serve in such a capacity. Pacific Coast Shellfish Growers Association (PCSGA) members take this responsibility seriously and reflect it in their work. They also involve themselves actively in local shoreline, watershed and growth management planning to ensure other activities in and around the estuary don't adversely affect its health.



Ecologically diverse habitat is created by these intertidal oyster longlines in Samish Bay, Washington.



Tideland stabilization and shellfish culture can stimulate seagrass and macroalgae growth. Light penetration for marine plant photosynthesis and nutrient recycling is improved as individual bivalves filter phytoplankton from up to 65 gallons of seawater per day.

Above: the nudibranch, *Archidoris montereyensis* grazes on biofouling attached to clam predator netting. Below, eelgrass thrives in a Willapa Bay oyster bed.

To be effective in this important role, growers need a thorough understanding of estuarine ecosystems. Understanding is the first step in being able to minimize and mitigate the potentially negative impacts of culture or processing activities. The habitat, refuge and forage opportunities created by the oyster crop structure, and the filtering capacity of the oysters themselves (as much as 65 gallons per day per oyster), have been shown to be crucial components of normal estuarine processes. Shellfish are often referred to as “canaries in a coal mine” or “sentinel” species, because they are excellent indicators of the overall health of the estuary.

In Chesapeake Bay and other estuarine systems on the East Coast of the United States, natural beds of oysters have all

but disappeared as a result of poor management, disease and pollution problems. Today, there are extensive efforts to restore the oyster populations to these estuaries because scientists have determined they are a keystone species in the ecosystem. While the cropping systems employed by many West Coast growers are different than natural reefs in Chesapeake Bay, cultured bivalves provide comparable ecological benefits.

Through the research and education arm of PCSGA, the Pacific Shellfish Institute, shellfish growers are supporting studies to improve understanding of the ecological interactions of their crops within the estuarine ecosystem. The goal of this research is to minimize the negative effects of culture activities while maximizing beneficial ones. PCSGA members

also facilitate this research through technical assistance and access to their farms. Growers commit to staying abreast of current science and adapting innovative culture systems as more environmentally sensitive, economically viable alternatives are developed.

Growers recognize that a healthy estuarine ecosystem is essential for all species of marine life. Estuarine health can be jeopardized if culture or processing activities spread pests, introduce diseases and non-indigenous aquatic nuisance species or compromise genetic integrity of natural bivalve stocks. Growers abide by all current transfer and import permit requirements to minimize these risks and continually work with resource management agencies to strengthen protective measures and ensure aquatic animal health.



Environmental Excellence



Harvesting oysters grown on intertidal stakes in Coos Bay, Oregon.

A credible environmental management program requires accountability. In their commitment to environmental excellence, PCSGA members routinely evaluate and improve their environmental performance, individually and collectively.

In many of the West Coast estuaries where shellfish farming occurs, salmon or other species have been listed as threatened or endangered under the federal Endangered Species Act. During portions of their life cycles, some of these species use the structure and habitat provided by shellfish beds to forage for prey or to escape from predators. A goal of the shellfish industry is to ensure that shellfish culture and harvest practices are compatible with and enhance the survival and recovery of these listed species. Developing Environmental Codes of Practice and being accountable for its implementation are key to the industry's sustainability and essential to operating in areas with listed species.

Shellfish farmers are committed independently and collectively to environmental excellence.

To achieve this, member farms continually evaluate and improve their environmental performance to remain economically viable, environmentally sound and state-of-the-art.



Regulatory Compliance

Shellfish farming and processing activities are governed by a complex assortment of local, state, federal and international laws and regulations. These laws and regulations and how they are implemented vary, depending on the state or county in which a farm is located.

The shellfish industry is committed to ensuring these laws and regulations are environmentally effective, based on sound science and do not place an unreasonable financial burden on growers or regulators.

The Environmental Codes of Practice identifies all laws and regulations relevant to the various culture practices used in West Coast growing regions. PCSGA members who adopt the EMS are knowledgeable of the laws and regulations in their regions and committed to meeting and, where practical, exceeding compliance.

Growers work to assure adequate safeguards and regulations are implemented and enforced to protect estuarine and marine resources, such as the development of a National Geographic Oil Spill Response Plan.

Shellfish farmers meet and strive to exceed compliance with all relevant local, state, federal and international environmental regulations.



Shellfish growers frequently meet with state and federal regulators to ensure practices are in regulatory compliance. Here, officials inspect an oyster bed in Tillamook Bay, Oregon.

Waste Management

Waste management is crucial to the financial and environmental success of any business. While the shellfish being grown are natural products, wastes are generated in the production and processing of them. Disposal of solid organic materials and wastewater is conducted according to regulations. Where practical, these by-products are reused or recycled. For example, shells from oyster shucking plants are reused as “cultch” for seeding juvenile oysters.

The shellfish industry is committed to finding environmentally sustainable, economically viable waste management alternatives. Culturists continually seek more durable plastics or alternative reusable materials, and use recyclable and reusable cultivation materials wherever feasible. Shellfish farmers are careful to minimize the visual impact of their operations. Should man-made materials accidentally escape the farmed areas, they will be promptly recovered. Processors periodically review their packaging and seek economically viable, environmentally friendly alternatives with which to market shellfish products.

Growers regularly patrol their tidelands and adjoining recreational areas for non-natural debris associated with their culture activities, as well as materials that wash onto their land from other sources. Growers work cooperatively with regulatory agencies (such as the state departments of health, Interstate Shellfish Sanitation Conference, U.S. Food and Drug Administration) to adapt to better environmental practices, such as the use of reusable tags, bags, etc.

Shellfish farmers minimize the impact of waste from farming and processing activities through reduction, reuse, recycling and recovery.



Used in packaging shucked oyster meats, PET plastics facilitate recycling by consumers.



Processing plant wastewater is reused to irrigate fir trees in Shelton, Washington.



Oyster shells, a by-product of the oyster shucking process, are reused by aging, washing and bagging for “cultch,” to which seed oysters will attach.

Sharing Resources

Shellfish growers recognize and respect the value of the estuarine ecosystem to other users. Growers strive to understand other users' needs and to educate other user groups regarding the benefits and needs of the shellfish industry.

Farms are maintained in a neat, attractive fashion to be compatible with the natural beauty of the surrounding shoreline. In an effort to avoid conflict, surrounding landowners, recreators and other users are provided opportunities to learn about shellfish farming activities. Complaints and concerns are promptly addressed.

The waters of the Pacific Coast are among the most pristine in the world. With proper stewardship, the shellfish industry and its benefits can be maintained indefinitely for the good of all.

Shellfish farmers work to create and maintain positive relationships with other shoreline users through cooperative and educational efforts and by acknowledging and responding to community concerns.



Shellfish growers meet with other shoreline property owners and users to answer questions about industry practices and to acknowledge and respond to concerns.



Background



THE PACIFIC COAST SHELLFISH INDUSTRY



Intertidal oyster longlines in Willapa Bay, off Oysterville, Washington.

The roots of the West Coast shellfish industry can be traced back to the mid 1800s, when oystermen began harvesting native Olympia oysters (*Ostrea conchaphila*) from San Francisco Bay. To keep up with the demand of hungry gold miners during the California Gold Rush, commercial oyster harvesting expanded north from San Francisco into Washington's Willapa Bay and Puget Sound.

Intensive cultivation began in Washington as a result of the Bush and Callow Acts passed by the Washington Legislature in 1895. These provided for the sale of tidelands into private ownership specifically for the purpose of culturing shellfish. The Bush and Callow Acts were intended to stimulate a culture industry to supplement dwindling native oyster stocks — and stimulate it did! Innovative oystermen acquired tidelands, leveled beaches and built dikes, creating the best environment for native Olympia oyster propagation, growth and survival.

Production of Olympia oysters rose steadily until pulp mill effluent destroyed water quality in crucial growing areas. To sustain the industry, the hardier Pacific oyster (*Crassostrea gigas*) was introduced from Japan and today dominates West Coast oyster culture. In the meantime, oystermen launched an exhaustive campaign to force pulp mills to clean up their effluent. The results of their efforts can be seen in the restoration of growing areas and the commercial breeding of remnant native stocks, bringing about a rebound of Olympia oysters in many bays and inlets.

Over the past three decades, modern private hatcheries have evolved and revolutionized the industry. Hatcheries provide the larvae and seed of a variety of shellfish species to farmers along the West Coast.

From Alaska to California, a variety of shellfish species are cultured using a wide array of systems and marketed in many forms, including live, shucked, smoked and frozen.

Washington state dominates the West Coast shellfish industry with expansive culture of Pacific oysters in the coastal bays of

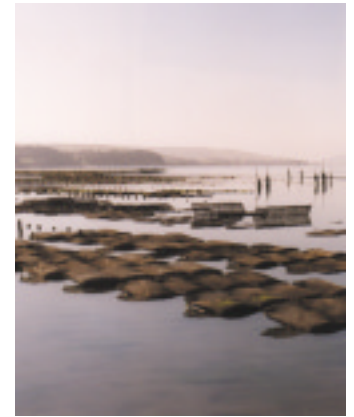


Young geoduck clams are carefully planted by hand in predator-exclusion tubes near Stretch Island, Washington.

Willapa and Grays Harbor. These are predominantly sold as fresh shucked meat and, to a lesser extent, live in the shell. Southern Puget Sound follows close behind the coastal region with tremendous crops of Pacific oysters and Manila clams (*Tapes philippinarum*) being cultivated in highly productive, nutrient-rich waters. Two species of mussel (*Mytilus trossulus* and *M. galloprovincialis*) are cultured, suspended from rafts in Totten Inlet in southern Puget Sound and Penn Cove in northern Puget Sound. Hood Canal, on the eastern boundary of the Olympic Peninsula, is a prolific shellfish fjord with expansive beds of Pacific oysters and Manila clams. These beds support numerous family farms and abundant tribal and recreational shellfish harvests. Samish, Portage and Lummi bays and the San Juan Islands in northern Puget Sound are home to a segment of smaller clam and oyster farms, mostly family-owned.

Washington state shellfish growers also culture a variety of specialty oysters targeted at the raw bar trade. These include the Kumamoto (*Crassostrea sikamea*), Eastern (*Crassostrea virginica*), European flat (*Ostrea edulis*) and native Olympia oysters. Washington also has a burgeoning geoduck clam (*Panopea abrupta*) culture industry, with substantial crops currently under cultivation.

California follows Washington in production. Tomales Bay supports a growing littleneck clam and bay mussel



Rack and bag culture of single Pacific oysters in Tomales Bay, California.

industry and a thriving oyster industry targeting a hungry San Francisco half-shell market. Tomales growers produce highly sought single oysters for the raw bar trade. A short distance southwest of Tomales Bay is Drakes Estero, where clustered oysters suspended from racks are grown. Humboldt Bay in northern California supports extensive bottom, intertidal longline and rack and bag culture of Pacific oysters as well as a nursery system that serves as one of the industry's key shellfish seed suppliers.



Above: Hand harvest of Manila clams in Oakland Bay, Washington.

Seeding Manila clams in Samish Bay, Washington.

Left: Cleaning suspended oyster culture lantern nets in Alaska.



Intertidal bag culture of single Kumamoto oysters in Totten Inlet, Washington.

Oregon's shellfish culture efforts are focused primarily on the Pacific oyster. Growers in Coos, Winchester, and Yaquina bays in the south and central parts of the state farm Pacific oysters on the bottom, on stakes, suspended from rafts, and in bags suspended from floating longlines.

Tillamook Bay in the north, once a leader in bottom cultured Pacific oysters struggles today to survive the impacts of expansive burrowing shrimp populations. Also in the north, Netarts Bay supports a small but expanding

single oyster industry, and is home to one of the West Coast's largest oyster hatcheries.

Alaska supports a hardy lot of family farms pioneering shellfish culture in the last frontier. Alaska growers produce outstanding half-shell Pacific oysters on suspended culture systems in their cold, pristine waters. Most seed is supplied to the industry by the new Qutekcak Shellfish Hatchery in Seward. Small amounts of mussels (*Mytilus edulis*), native littleneck clams (*Protothaca*

staminea) and rock scallops (*Crassadoma gigantea*) are also cultured in Alaska.

Hawaii, while not yet a significant player in cultivation of shellfish, has become a crucial link in West Coast farming. Two of the West Coast's largest producers have seed nurseries in Kona, taking advantage of the tropical climate to boost seed production. This practice is particularly beneficial for seed from the Pacific Northwest during that region's cool, slow-growing winter months.

Bottom-cultured Pacific oysters provide environmentally unique habitat that supports a diversity of marine flora and fauna such as this bed in Samish Bay, Washington.





This publication was funded in part by Washington Sea Grant Program, University of Washington, (NOAA Award No. NA76RG0119, Project A/FP-7), the National Sea Grant College Program and National Marine Fisheries Service, National Oceanic and Atmospheric Administration. The views expressed herein are those of the author(s) and do not necessarily reflect the views of NOAA or any of its sub-agencies.

Oyster harvest tubs and a Willapa Bay sunrise.

Front and back covers, pages 2, 3, 4, Michael Mathers. Page 4, clams, Robyn Ricks, Washington Sea Grant Program. Page 5, top, Phil Schofield; bottom, Bill Dewey. Page 6, top, Bill Dewey; bottom, Brett Dumbauld, Washington Department of Fish and Wildlife. Page 7, top, Michael Mathers; bottom, John Faudskar, Oregon Sea Grant Program; scallop, Robyn Ricks, Washington Sea Grant Program. Page 8, Bill Dewey. Page 9, Bill Dewey, except geoduck, Pacific Shellfish Institute. Page 10, muscle, Taylor Shellfish; intertidal longlines and young geoduck clams, Bill Dewey; rack and bag culture, John Finger, Hog Island Oyster Company. Page 11, Bill Dewey, except lantern nets in Alaska, Ray RaLonde, Alaska Sea Grant Program.

Pacific Coast Shellfish Growers Association

120 State Avenue NE, PMB #142

Olympia, WA 98501

360.754.2744

Fax: 360.754.2743

Email: pcsga@olywa.net

Web: www.pcsга.org

