Fee Assessment Final Report

Prepared for: The Honorable Robert W. Ferguson, Governor of Washington, and the Honorable Members of the Washington Legislature

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Executive Summary

This independent review of the Washington Department of Health (DOH) commercial shellfish fee structure arose from a straightforward tension: while RCW 43.70.250 mandates DOH to recover the full cost of its regulatory program through fees, license rates for commercial shellfish have not changed since 2007, and other fees (for biotoxin testing) have not changed since 2015. When DOH proposed a "Proposed Full-Cost Recovery" (PFCR) schedule in 2022 (which would have increased total base fees by 340 percent to 620 percent and instituted nine new charges), strong opposition from the shellfish industry and Tribes prompted the Legislature to commission this study.

Background and Proposed Fee Increases

The DOH shellfish program, overseeing growing area sanitation, licensing, and testing, has historically relied on a combination of commercial fees and state General Fund (GFS) revenue. Due to outdated fee rates, the reliance on GFS has grown over time. The 2022 PFCR plan was based on a comprehensive analysis by DOH to align fees with actual service costs as required by state law. The PFCR plan met with significant industry and Tribal opposition and led to a legislative proviso mandating this independent review, with the 2022 fee structure remaining in effect.

Key Findings

- **Washington's shellfish aquaculture industry is a national leader**, generating over $252 million in sales in 2023 and contributing a total of $416 million to the state's economy while supporting nearly 2,400 jobs in that year. However, interviews with growers revealed an industry facing significant pressure from rising costs for labor, fuel, and seed, coupled with stagnant market prices that are squeezing profit margins, particularly for smaller, family-owned farms.
- A forensic cost review shows that the DOH **shellfish program costs about $2.2 million a year.** Critically, biotoxin and paralytic-shellfish-poisoning (PSP) tests account for $546,000 annually, roughly a quarter of expenses but nearly half of the proposed fee increase.
- A review of six other shellfish-producing states revealed that **none mandate a full cost recovery** burden comparable to what WA DOH proposed. Critically, no other state reviewed charges the industry directly for biotoxin testing. Rather these costs are typically covered by general funds or other state revenue sources.
- This report concludes that **biotoxin testing and monitoring should be considered a public good**. The benefits of protecting public health, preventing illness, and ensuring consumer confidence in seafood safety extend to the entire public, not just the shellfish industry. A single food safety event could devastate the industry and the regional economic impact of the industry, making state-funded monitoring an essential economic safeguard.
- Additionally, while larger operations could likely absorb the PFCR fee increases, the report finds that the **proposed hikes would disproportionately harm smaller producers**, risking a fundamental change in the character and diversity of the industry. Biotoxin fees alone account for an average of 42 percent of the total proposed base fees.

Recommendations

Based on its findings, the report puts forth two primary options but **strongly recommends Option B**:

- Option A (Full Cost Recovery): Not Recommended. Implementing the PFCR as proposed by DOH would generate sufficient revenue to cover all program costs but is not recommended due to the significant financial strain it would place on the industry, especially smaller operators.
- Option B (Remove Biotoxin Fees): Recommended. The report's primary recommendation is for the legislature to adopt the PFCR license fee proposal but commit to fully funding the biotoxin testing program as a public good **(estimated at approximately $674,000 annually).** in annual GFS revenue to cover the costs of the biotoxin testing program for both commercial and Tribal operations. This would align Washington with other states and allow for necessary increases in licensing fees, while ensuring the economic viability of the entire industry.
- It is also recommended that the legislature provide funds to help the DOH Public Health Lab transition to newer, less expensive testing technologies.

Under this recommended approach, the industry annual total fee burden would be approximately $1.1 million, leaving a GFS shortfall of about $674,000, compared to the $1.78 million the industry would pay under the PFCR. Since the values used to develop the PFCR were originally developed in FY2022, a subsequent fee analysis will need to be done to estimate actual current and future costs.

1. Introduction

Greene Economics was retained by the Washington Department of Health (DOH or Department) in July 2024 to respond to a legislative proviso directing the Department to secure an independent consultant to assess how DOH sets commercial shellfish fees under RCW 43.70.250. The proviso states,

> *(132)(a) $450,000 of the general fund—state appropriation for fiscal year 2025 is provided solely for the department to contract with an independent third-party consultant to review the department's commercial shellfish regulatory program, including licensing, testing, and certification practices and requirements. The consultant must assess how the department sets commercial shellfish fees under RCW 43.70.250.*
>
> *(i) The consultant must seek input from the department, the commercial shellfish industry, and tribes and must consider:*
>
> *(A) Data sources and methods used by the department in setting or proposing increases to commercial shellfish fees;*
>
> *(B) All costs associated with administering the department's regulatory authority over the testing of shellfish, the certification of operations and the issuance of licenses, and issuing export certificates for the commercial shellfish industry;*
>
> *(C) Activities conducted by the department related to regulating the shellfish industry's regulatory activities that should be exempt from inclusion in the fee; and*
>
> *(D) Relevant fees, methods, and considerations from other states that regulate the commercial shellfish industry under the Model Ordinance of the Interstate Shellfish Sanitation Conference for comparable services the department is providing the shellfish industry.*
>
> *(ii) The consultant must also evaluate the viability of the industry to support full cost recovery as required under RCW 43.70.250 and recommend strategies to address any shortfalls. The consultant shall submit a report to the governor and legislature by June 30, 2025.*

Following this guidance, the Greene Economics research team has worked with DOH, the industry, and tribes to consider the fees, analyze the viability of the industry to support cost recovery, and develop a recommended strategy for fees going forward.

1.1. Background and History of Shellfish and DOH

There are four components to the sanitary shellfish program in Washington. These are,

- the **Growing Area program** that evaluates, classifies, and monitors commercial shellfish growing areas as well as recreational beach harvesting areas;
- the **Shellfish Licensing and Certification program** that oversees the licensing, inspection, and certification of commercial shellfish operations;
- a **Recreational Shellfish Program** that provides information to the public about where and how to harvest molluscan shellfish, and

- the state **Public Health Lab (PHL)** in Shoreline that provides testing support across all aspects of the program. The expenditures for these programs are shown in Figure 1 below.

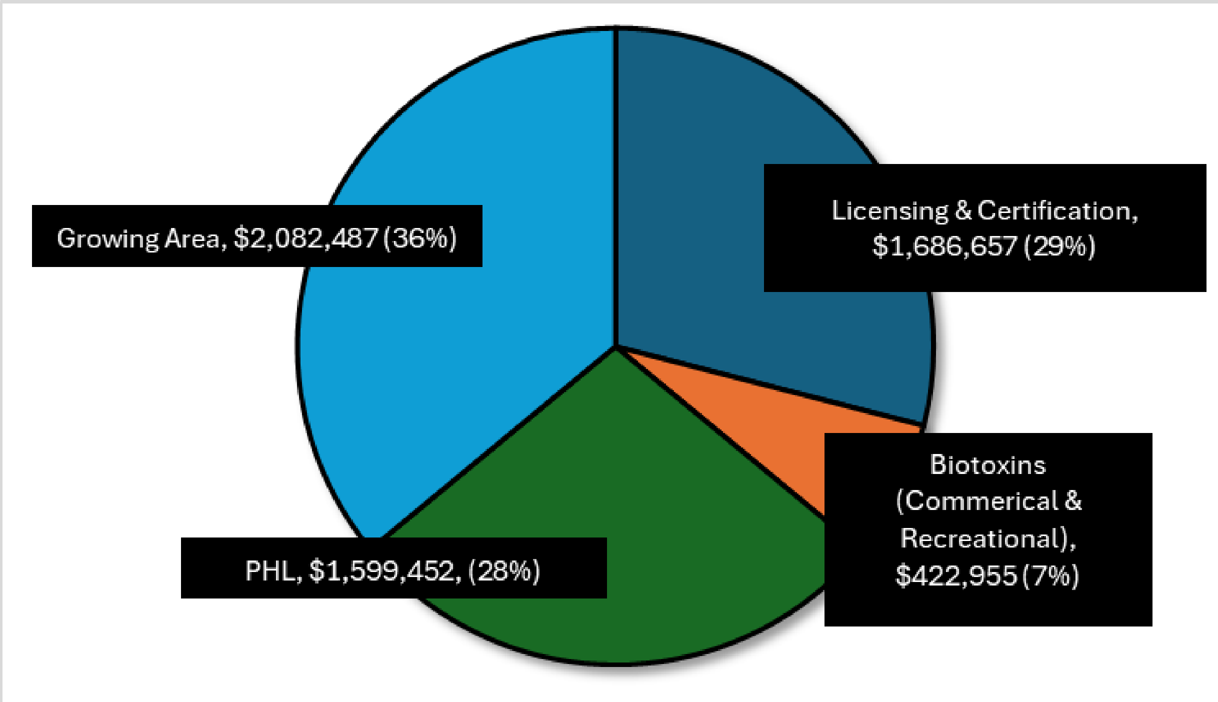

Figure 1. Average Annual Shellfish Program Expenditures by Program Component (FY24 and FY25)[1]

The Shellfish program at DOH is currently funded by a combination of General Fund State (GFS), revenue generated from commercial fees, and revenue generated from a surcharge on recreational shellfish licenses. The application of this revenue to each program area is depicted below in Figure 2. These figures include revenue from all sources. Commercial shellfish license fee revenue figures, shown in the striped portions of the pie, are based on average FY 2024-25 actual expenditures and result from revenue generated based on the 2022 commercial shellfish fee structure[2] that is currently in place.

[1]Washington Department of Health. Average of Submitted Actual Biennium Budget FY 2024-2025
[2] See fee structure, WAC 246-282-990, available here.

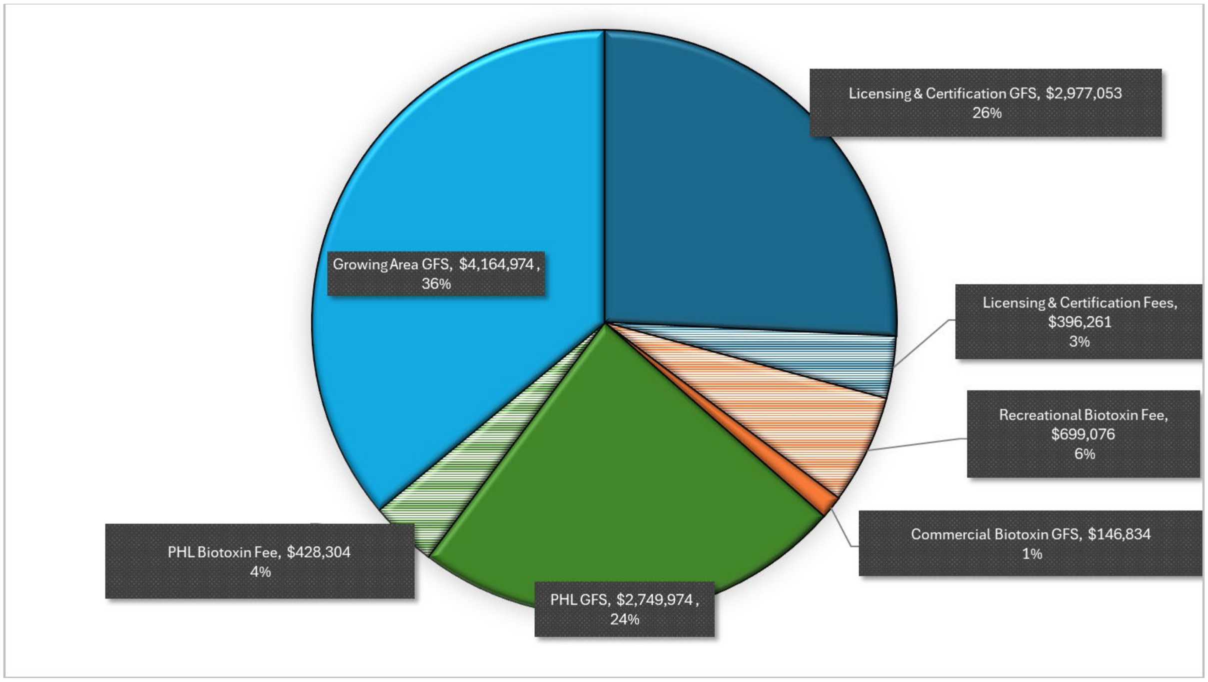

Figure 2. Shellfish Program Expenditures by Funding Source[3]

RCW 43.70.250 mandates that regulated industries cover the full cost of regulatory services provided by the department and authorizes DOH to establish such fees. Historically however, the shellfish program has not been fully funded by fees, and there is some debate about which fees should be included in the cost recovery program. Expenses that are not currently covered through fee revenue and costs that are not eligible for fee recovery (such as Tribal licensing fees, water quality monitoring and classification, and growing area restoration) are covered through GFS.

In 2003, the Department implemented a fee structure to generate revenue to support program operations. The fee structure included separate fees for commercial licenses, export certification, and biotoxin testing. Licensing fees were last updated in 2007.[4] Other biotoxin testing fees and export fees were last updated in 2015.[5] Despite these increases, the programs have consistently and continually relied on GFS revenue to underwrite costs. Figure 3 illustrates the increased reliance on general fund revenue to offset the cost of operating the programs.

[3] Washington Department of Health. Submitted Actual Biennium Budget FY 2024-2025

[4] Across the Board Increase Options here

[5] Ibid.

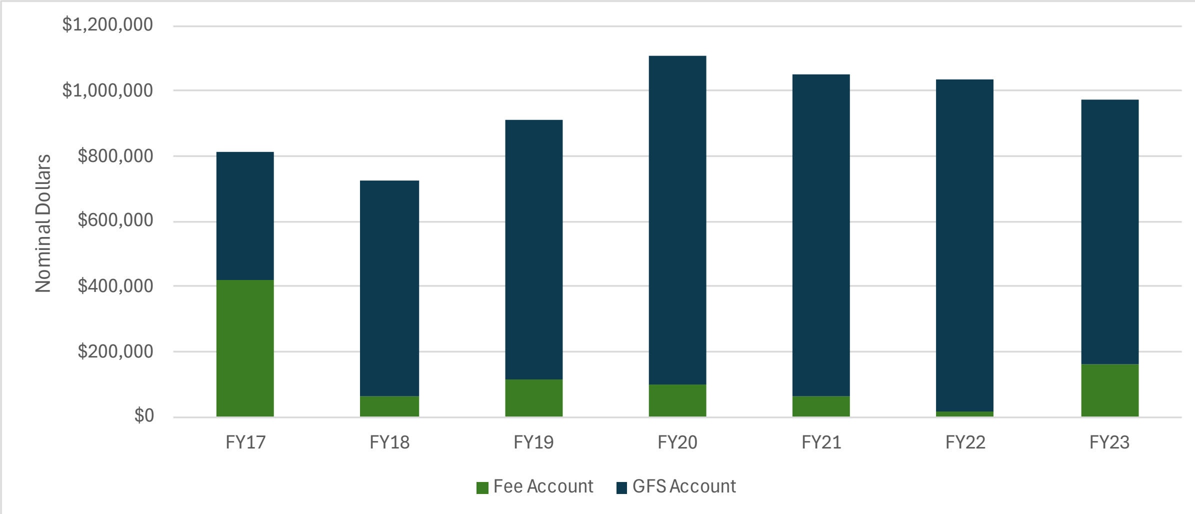

Figure 3. Shellfish Program by Funding Source (FY2017 – FY2023)

1.2. Proposed Full Cost Recovery Fee Plan (PFCR)

In 2022, the Department initiated an in-depth fee analysis to evaluate the various required regulatory services, the cost of each service, and the appropriate fee schedule to recover eligible services. This was the first comprehensive analysis of its kind since the 2003 implementation of the fee structure. The department determined the program was not generating sufficient revenue to cover the cost of the program and that rulemaking was needed to create or update fees for operator licenses, export certificates, and biotoxin testing.

Based on this analysis, the Department filed a CR-101 or "Preproposal Statement of Inquiry"—the first stage in the rulemaking process, as mandated by Washington's Administrative Procedure Act, on January 27, 2023, to update the fee structure and rates in order to achieve full cost recovery.

The Department initially proposed a full cost recovery (PFCR) fee structure which would have resulted in one-time fee increases ranging from 340 to 620 percent increase in total base fees paid by the different facility types. The PFCR plan was also intended to have inflationary increases thereafter at regular intervals. The PFCR plan was designed to cover all of the fees that DOH had analyzed to be in compliance with RCW 43.70.250 (which directs that those activities that specifically relate to the cost of doing business be funded through fee recovery) and designed so that, in addition to base fees (those for licenses and biotoxins) and the "add-on," or "use fees" relative to export certificates and Geoduck biotoxin testing, there would be an additional set of these "add-on" fees that would only apply to certain specific activities, such as voluntary permitting and harvest sites. The 2022 fees, and the PFCR fee structures are compared in Table 1.

Table 1. Current Base Fees (2022 Rates) and PFCR Base Fees

Facility Type	Billing Type Group	2022 License Fee	PFCR License Fee	% Increase	2022 Biotoxin Fee	PFCR Biotoxin Fee	% Increase	Total 2022 Base Fee	Total PFCR Base Fee	% Increase
Harvester	2 or less	$263	$1,037	394%	$353	$1,200	340%	$616	$2,237	363%
	Tribal Harvester 2 or less				$353	$1,200	340%	$353	$1,200	340%
	3 or more	$263	$1,046	398%	$535	$1,819	340%	$798	$2,865	359%
	Tribal Harvester 3 or more				$535	$1,819	340%	$535	$1,819	340%
Shellstock Shipper	(0-49 acres) 2 or less	$297	$2,382	802%	$393	$1,336	340%	$690	$3,718	539%
	Tribal (0-49 acres) 2 or less				$393	$1,336	340%	$393	$1,336	340%
	(0-49 acres) 3 or more	$297	$2,561	862%	$610	$2,047	336%	$907	$4,608	508%
	Tribal (0-49 acres) 3 or more				$610	$2,047	336%	$610	$2,047	336%
	(50 or more acres)	$476	$2,560	538%	$961	$3,267	340%	$1,437	$5,827	405%
	Tribal (50 or more acres)				$961	$3,267	340%	$961	$3,267	340%
Shellstock Shipper (Wholesale Only)	(0-49 acres) WC	$297	$2,396	807%	$198	$673	340%	$495	$3,069	620%
	Tribal (0-49 acres) WC				$198	$673	340%	$198	$673	340%
	SS - DNR Tracts Only	$297	$2,178	733%	$198	$673	340%	$495	$2,851	576%
	Tribal SS - DNR Tracts Only				$198	$673	340%	$198	$673	340%
Shucker-Packer	(plants < 2000 sf) 2 or less	$542	$5,397	996%	$752	$2,557	340%	$1,294	$7,954	615%
	Tribal (plants < 2000 sf) 2 or less				$752	$2,557	340%	$752	$2,557	340%
	(plants < 2000 sf) 3 or more	$542	$6,709	1238%	$1,076	$3,658	340%	$1,618	$10,367	641%
	Tribal (plants < 2000 sf) 3 or more				$1,076	$3,658	340%	$1,076	$3,658	340%
	(plants > 5000 sf)	$1,210	$5,737	474%	$2,412	$8,201	340%	$3,622	$13,938	385%
	Tribal (plants > 5000 sf)				$2,412	$8,201	340%	$2,412	$8,201	340%
	(plants 2000-5000 sf) 2 or less	$656	$5,737	875%	$882	$2,999	340%	$1,538	$8,736	568%
	Tribal (plants 2000-5000 sf) 2 or less				$882	$2,999	340%	$882	$2,999	340%
	(plants 2000-5000 sf) 3 or more	$656	$6,775	1033%	$1,297	$4,410	340%	$1,953	$11,185	573%
	Tribal (plants 2000-5000 sf) 3 or more				$1,297	$4,410	340%	$1,297	$4,410	340%

The proposed "use fees" are shown in Table 2. Note that for the export certificates, and for geoduck tests, fees are proposed to increase, while the fees proposed for other permit types would be new.

Table 2. Current Additional ("Add on" or "Use") Fees (2022) and PFCR Fees

Fee Type	2022 Fee	PFCR Fee	Projected Annual Number of Category Items
Export Certificate	$55	$75	1,744
PSP geoduck	$158 per test	$305 per test	366
***Harvest Site Permit**	None	$31	6,083
***Wet Storage Permit (recirculating)**	None	$904	20
***Wet Storage Permit (flow-through)**	None	$582	16
***Relay Permit**	None	$700	17
***Bait Permit**	None	$204	18
***Non-Compliance Inspection (virtual)**	None	$56	237
***Non-Compliance Inspection (in-person)**	None	$252	1
***New/Expired License Fee**	None	$279	55

*Designates a new fee

In response to concerns from the shellfish industry about implementing PFCR, in September 2023 the Department proposed an alternative approach for implementing the full cost recovery that would have phased in the increases over a three-year period with 50 percent in year 1, an additional 25 percent in year 2, and full cost recovery in year three. This proposal, however, was also met with significant concern from industry representatives.

As a result, the Department re-evaluated the cost allocations, identifying $435,203 in annual costs, primarily related to staff time allocations, for further evaluation. These costs were removed from the cost analysis pending a future LEAN analysis or program audit to identify any potential program efficiencies. The Department recalculated the fee structure and proposed adding 50 percent of the proposed increase to the existing base fee for two years. After two years, the Department intended then to do another fee analysis. On November 22, 2023, the Department filed a CR-102 (Proposed Rule Making) to initiate the formal public comment period. The public hearing associated with the CR-102 also showed concern from industry and tribes. Before filing the CR-103 (Rule-making Order) to adopt the proposed fees and make the rulemaking effective, a legislative proviso was adopted which directed the Department to hire a third-party consultant (ultimately Greene Economics) to perform a fee analysis and LEAN analysis. The Department withdrew the CR-102 and started working on the proviso in the summer of 2024. Consequently, the fees that are currently in place have remained the same. Further detail on these rule revision actions is available here. This evolution is depicted in Figure 4.

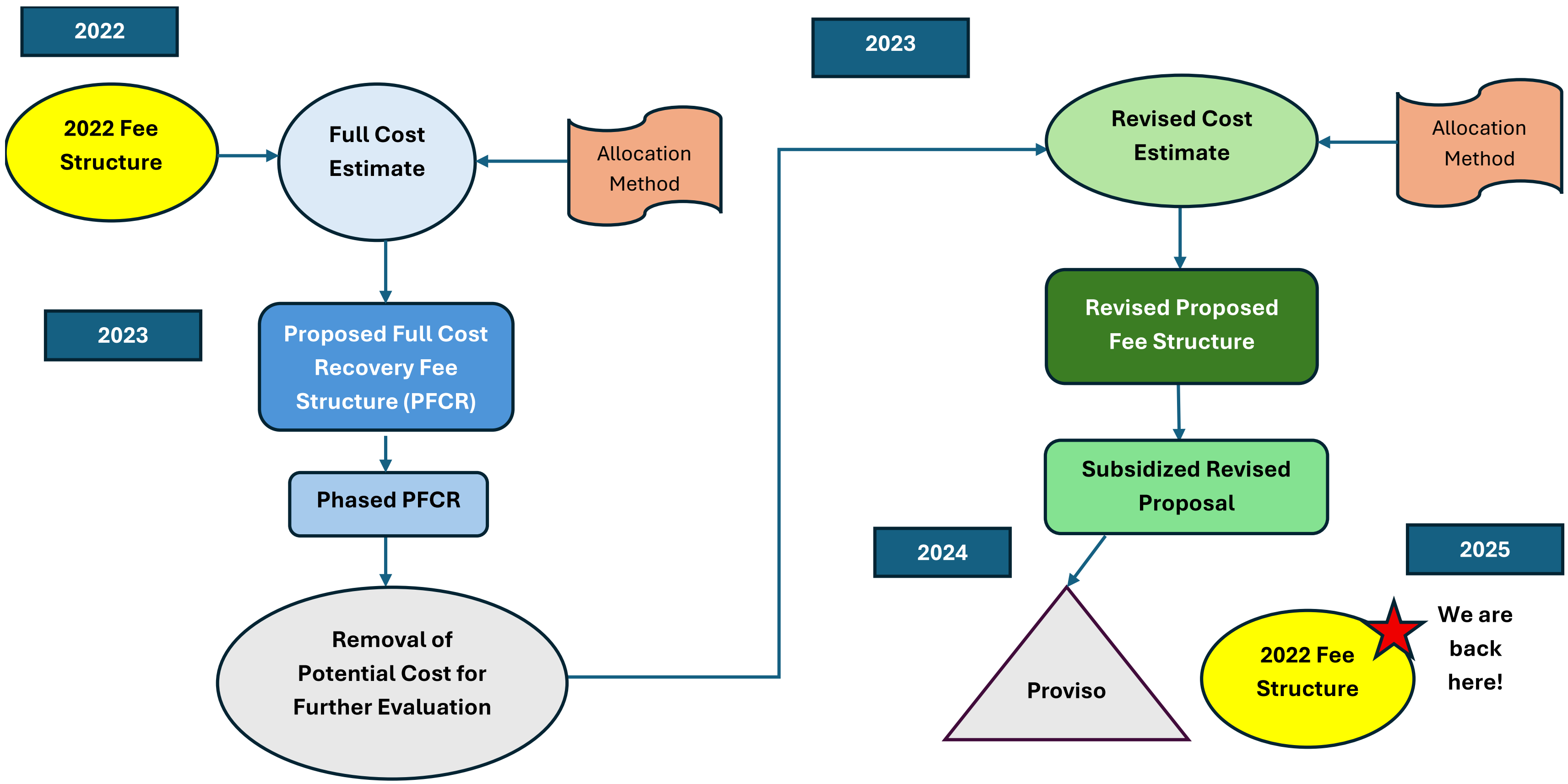

Figure 4. Chronology of Fee Assessment Process

1.3. Organization of the Report

The Greene Economics analysis began with a thorough review of over one hundred documents provided by DOH including spreadsheets, workbooks, presentations, and responses received during public comment periods. The team also explored program structures and conducted interviews with program staff in other states operating under the Model Ordinance of the Interstate Shellfish Sanitation Conference to better understand alternative approaches to service provision. These findings are summarized in Chapter 3 of this report.

Building on this background information, Greene interviewed producers and Tribes in Washington and conducted a four-day LEAN workshop with DOH program staff. The findings from the industry and Tribal interviews are summarized in Chapter 4. The results and recommendations from the LEAN assessment were presented to the Department in a separate report and are summarized in Chapter 5 of this report. Greene also conducted a comprehensive review of the assumptions, data sources, and methods that were used by the Department to derive the program operating cost estimates that underpinned the PFCR fee increase recommendations. These findings were shared with the Department in a technical memorandum and are summarized in Chapter 6 of this report.

This information supports an analysis of the viability of the industry to support full cost recovery (PFCR) as required under RCW 43.70.250 as well as alternative strategies to address any shortfalls. These findings are presented in Chapter 7. The team identified one opportunity that could be removed from the fee structure. Chapter 8 explores this construct and its implications for a revised fee structure. Chapter 9 concludes with a discussion of the benefits and risks associated with alternative fee structures as they relate both to the industry's capacity to support these alternatives and to the current and anticipated future budget limitations that the state is facing. Chapter 2 covers basic information surrounding the economic importance of the shellfish aquaculture industry.

2. Shellfish Industry in Washington

Washington is a national leader in shellfish aquaculture. Shellfish farms are significant contributors to the regional economy, providing thousands of family wage jobs and meeting the demand for seafood within the US and globally. Shellfish farms contribute to ecosystem health, providing critical habitat for marine species. Shellfish farming also helps reduce erosion and contributes to shoreline stabilization. Washington is a member of the Interstate Shellfish Sanitation Conference (ISSC) and participates in the National Shellfish Sanitation Program (NSSP) which oversees the sanitary control of shellfish produced for human consumption. These two programs promote public health protection and facilitate the shellfish trade within the US and internationally.

This chapter provides an overview of the role that commercial shellfish plays in Washington and the enabling regulatory environment, including the role of the Department of Health.

2.1 Washington Shellfish Aquaculture Industry Basics

Shellfish aquaculture is an important industry in the Washington economy as it provides employment and revenue for participants in the industry as well as food for the public. Shellfish cultivation and harvest are also culturally important for historic and Tribal traditions within the state. DOH licenses and inspects growers that harvest both aquaculture and wild stock shellstock, including both tribal and non-tribal operations. Following information from the National Agricultural Statistics Survey (NASS) gathered by the U.S Department of Agriculture, there were a total of 147 aquaculture-related firms in Washington in 2023, farming a variety of clams, oysters, and other mollusks. The number of operations increased 18 percent between 2013 and 2023 from 125 to 147, with the greatest increases occurring in the Geoduck sector which saw a 47 percent increase. The number of oyster growers also increased overall by 34 percent during the same period. Mussel and hard clam production decreased, possibly due to ocean warming and over harvesting (see Table 3).

Table 3. Number of Shellfish Aquaculture Operations in Washington[6]

	2013	2018	2023	Change from ’13 to ‘23
Total Operations	*125*	*112*	*147*	*18%*
clams	82	79	91	*11%*
clams, (excl. Geoduck & Hard & Manila)	3	6	10	*233%*
clams, Geoduck	19	25	28	*47%*
clams, Hard	4	3		*-100%*
clams, Manila	75	59	67	*-11%*
mussels	13	6	6	*-54%*
Other species	4	3		*N/A*
oysters	89	86	116	*30%*
oysters, (excl. Eastern & Pacific)	9	6	20	*122%*
oysters, Eastern	1	1	1	*0%*
oysters, Pacific	88	86	114	*30%*

It is not uncommon for operations to encompass multiple species or activities, so the numbers of operations do not sum to 147.

The total sales reported in shellfish aquaculture in Washington also increased between 2013 and 2023, with total sales increasing by more than 24 percent overall, as shown in Table 4.

[6] US Department of Agriculture, National Agricultural Statistics Survey Quick Stats online, available here.

Table 4. Washington Shellfish Aquaculture Sales[7]

	2013	2013 Sales in 2025 Dollars	2023	2023 Sales in 2025 Dollars	10-year change
Total Sales	***$149,319,676***	***$204,567,956***	***$242,786,000***	***$252,497,440***	***23%***
clams	$55,212,388	$75,640,972	$111,501,000	$115,961,040	*53%*
clams, (other)	(D)		$1,832,000	$1,905,280	
clams, Geoduck	(D)		$51,557,000	$53,619,280	
clams, Hard	$11,430	$15,659			
clams, Manila	(D)		$58,113,000	$60,437,520	
mussels	$9,764,242	$13,377,012	$12,953,000	$13,471,120	*1%*
Other species	$3,228,832	$4,423,500			
oysters	$81,114,214	$111,126,473	$118,331,000	$123,064,240	*11%*
oysters, (other)	(D)		(D)		
oysters, Eastern	(D)		(D)		
oysters, Pacific	$67,349,166	$92,268,357	$106,801,000	$111,073,040	*20%*

(D) signifies that data were withheld by NASS to protect individual farm confidentiality.

Figure 5 shows the sales for 2013, 2018, and 2023 in nominal dollar values (the dollar values of the year reported). Through time the revenue from clams increases steadily, in correlation with the increased number of operations (Table 3). Revenue from oyster sales also increases in alignment with the increasing number of operations.

[7] US Department of Agriculture, National Agricultural Statistics Survey Quick Stats online, available here.

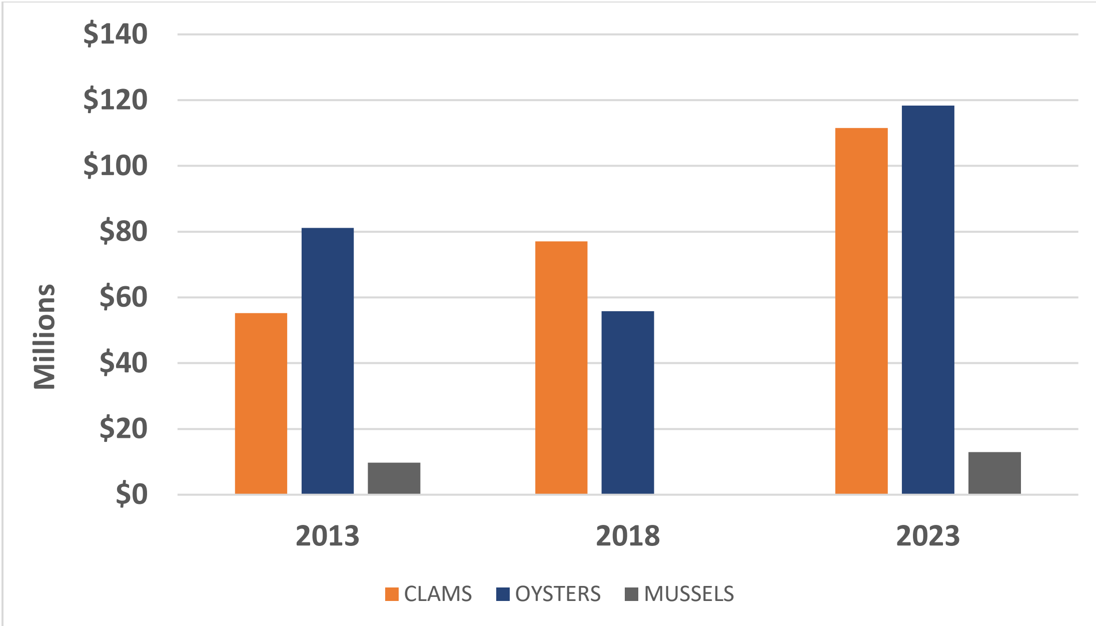

Figure 5. Washington Shellfish Aquaculture Sales

2.2 Regional Economic Role of Shellfish Aquaculture

The role of shellfish aquaculture in the regional economy goes beyond the $252 million in annual sales or output. This is because the industry supports backward and forward economic linkages. The forward linkages are for the industries such as seafood wholesalers, restaurants, and other industries that use shellfish in those businesses and generate revenue from the outputs of the shellfish aquaculture industry. Backward linkages are the firms that sell inputs to the shellfish aquaculture industry, such as fuel sellers, seed producers, and equipment providers. So, every industry has a ‘ripple effect’ in the regional economy.

To estimate this ‘ripple effect’ an input output model can be used to assess the magnitude of the impact (which varies by industry). The research team used IMPLAN, which is an input output model that has specific data for all industrial sectors, and the Washington state model was used. The results show how the **direct impact,** or the output from the industry (the $252 million in 2025 dollars) in turn has an **indirect effect**, which measures the stimulus to the input suppliers. The third impact in the regional economy is called the **induced impact**, and it derives from the stimulus that the income brings to households and then gets spent in the local economy on a broad variety of goods and services. The direct, plus the indirect, plus the induced impact create the total impact.

For the shellfish aquaculture industry in Washington, the estimates suggest that for every dollar of sales the local economy is stimulated by another 68 cents, or the industry has a multiplier of 1.68. So, the $252 million in annual direct output generates another $75 million annually in indirect output, and another $88 million annually in induced output, for a total of $416 million in total annual industry impact to the local economy. The annual employment is estimated at 1,729 for the industry, with another 0.39 employees for each direct employee in terms of the indirect and induced employment generated, for a total annual employment impact of 2,396. The results are shown in Table 5 below.

Table 5. Annual Regional Economic Impact of Shellfish Aquaculture

	Employment	Average Wage (2025 Dollars)	Output (Millions of 2025 Dollars)
Direct	1,729	$57,878	$252.50
Indirect	297	$78,818	$75.49
Induced	371	$78,264	$88.06
Total	2,396	$63,626	$416.05

In addition to the economic impacts, the IMPLAN data offers an estimate of the average wage within the sector and within each impact type—showing an average annual wage of $57,878 for shellfish aquaculture, and an average wage for the indirect and induces sectors of over $78,000 per year.

In addition to the revenues, employment, and economic stimulus provided to Washington State, the same industry activity generates state, county and local taxes. These fiscal impacts that reach the public sector make up another important economic role of shellfish aquaculture. Nearly $13 million in taxes go to state, county, and local governments through direct (totaling nearly $3 million), indirect ($3.8 million) and induced impacts annually (totaling over $6 million) (Table 6).

Table 6. Annual Fiscal Impacts Generated through Shellfish Aquaculture (2025 Dollars)

	State	County and Local	Total
Direct	$2,030,769	$896,947	**$2,927,716**
Indirect	$2,424,923	$1,379,734	**$3,804,657**
Induced	$3,819,953	$2,204,245	**$6,024,198**
Total	**$8,275,645**	**$4,480,925**	**$12,756,570**

2.3 Regulatory Environment

At the national level the US Food and Drug Administration (FDA) is responsible for setting and enforcing regulations for seafood safety, including shellfish, ensuring that seafood is safe, sanitary, and properly labeled.[8] Through the National Shellfish Sanitation Program (NSSP), FDA sets standards and enforces controls on the growing, harvesting, processing, packaging, and transport of molluscan shellfish to ensure their safety for consumption; this includes implementing Hazard Analysis and Critical Control Point (HACCP) systems for shellfish processors to minimize food safety risks.[9] The NSSP has four components that work to help keep contaminated molluscan shellfish out of the marketplace:

[8] FDA. Seafood. Available here.

[9] The National Shellfish Sanitation Program (NSSP).Available here.

- Classifying and monitoring shellfish growing areas based on potential pollution sources, water quality, marine biotoxin status, and other factors that indicate suitability for harvest including pre-harvest *Vibrio* control,
- inspecting facilities that handle shellfish to ensure the use of proper sanitary measures and adequate post-harvest *Vibrio* control,
- patrolling closed or prohibited waters to deter illegal harvesting, and
- conducting laboratory testing and analysis of shellfish and water samples.[10]

In 1982 the Interstate Shellfish Sanitation Conference (ISSC) was formed to encourage collaboration between state and federal agencies responsible for monitoring and regulating shellfish growing, harvesting, and processing.

As a voluntary organization, the ISSC:

- adopts uniform procedures, incorporated into an Interstate Shellfish Sanitation Program, and implemented by all shellfish control agencies,
- gives state shellfish programs current and comprehensive sanitation guidelines to regulate the harvesting, processing, and shipping of shellfish,
- provides a forum for shellfish control agencies, the shellfish industry, and academic community to resolve major issues concerning shellfish sanitation, and
- informs all interested parties of recent developments in shellfish sanitation and other major issues of concern through the use of news media, publications, regional and national meetings, internet, and by working closely with academic institutions and trade associations.[11]

The uniform procedures and current comprehensive sanitation guidelines are encapsulated in a Model Ordinance which works to ensure that the shellfish produced in states follow the guidelines and are safe and sanitary. The Model Ordinance also provides readily adoptable standards and administrative practices necessary for the sanitary control of molluscan shellfish.[12] The Model Ordinance establishes the minimum requirements necessary to regulate the interstate commerce of molluscan shellfish and establishes programs to protect the public health of consumers. Participation in the ISSC and adherence to the guidelines in the Model Ordinance not only provides standardization across states, but it also reduces the administrative, tracking, and reporting burdens for participating states. This uniformity and surety also facilitates interstate sales and shipping of shellfish.[13]

[10] Ibid.

[11] Conference Administration. About Us. Available here.

[12] National Shellfish Sanitation Program Guide for the Control of Molluscan Shellfish 2007. Available here.

[13] National Shellfish Sanitation Program (NSSP) Guide for the Control of Molluscan Shellfish 2019 Revision. Available here.

There are 24 member states that are grouped into regions based on similar characteristics and interests. As of 2012, the six regions are:

Region 1 - Maine, New Hampshire, Massachusetts, Rhode Island
Region 2 - Connecticut, New York, New Jersey
Region 3 - Maryland, Delaware, Virginia
Region 4 - North Carolina, South Carolina, Georgia, Florida
Region 5 - Florida, Alabama, Mississippi, Louisiana, Texas
Region 6 - Alaska, Washington, Oregon, California, Hawaii[14]

2.4 Role of the Washington Department of Health

In Washington, the Department is responsible for ensuring that shellfish intended for markets and restaurants are harvested, handled, and shipped in a safe and sanitary manner. The Department regularly tests bivalve molluscan shellfish and the waters where they grow to make sure the shellfish are safe to eat. The Department classifies growing areas based on water quality and current and potential pollution sources. They monitor shellfish for biotoxins, pathogens, and other contaminants. They also regularly test water quality in shellfish growing areas, and check shorelines and surrounding areas for pollution sources. The department also licenses and inspects companies that harvest and sell shellfish commercially, ensuring they follow strict state and federal sanitation standards. In the event spills, stormwater runoff or other events that compromise water quality, through RCW 69.30, Sanitary Control of Shellfish, and WAC 246-282, DOH has the authority to close shellfish areas.[15]

[14] Interstate Shellfish Sanitation Conference. Constitution, Bylaws, and Procedures. Available here.

[15] Shellfish Program. Washington Department of Health. Available here.

3. State Analysis

Six states that are part of the ISSC were evaluated during this analysis based on their identification by industry stakeholders during the public comment period as states of interest to Washington. In addition to the review of publicly available documents, in-depth interviews were conducted with staff from each of those states' programs to gain an understanding of their respective fee structures and what services those fees covered. Greene Economics was not able to interview staff from Massachusetts or New Jersey, but state program materials were reviewed. The results of that analysis are summarized below.

3.1. The States

Each of the eight states is reviewed below. Table 7 illustrates the total number of shellfish leases for each state, as well as their associated acreages. This lease data and the associated acreage serve as an indicator of the size of the industry in each state. Data is from 2020 unless otherwise noted.[16] Of the states assessed for this analysis, Washington has the greatest number of leases and the largest number of acres. Virginia is the next largest with 5,217, and Hawaii has the fewest with 4. Washington also has the largest total area dedicated to shellfish leases, with 380,145 acres. Virgina is second at 136,136 acres. It is important to keep this in mind when assessing the structure and function of program operations in the different states and when comparing those structures to Washington.

Table 7. Total Shellfish Leases and Acreage

State	Number of Leases	Total Acreage	Notes
Washington	6,579	380,145	Total number of shellfish harvest sites includes privately owned tidelands and state lands for a total of 115 growing areas
Alaska	64	615	Total number and total acreage of shellfish leases include areas with kelp or marine plants
California	17	907	Only 185 out of 907 acres of state shellfish leases are in active use; the total acreage increases to 5,740 with the inclusion of Humboldt Bay and other local areas
Hawaii	4	No information	Only 2 out of 4 state shellfish leases are in active use
Maryland	420 (2017)	6,803 (2017)	
Massachusetts	646	1,283	
New Jersey	1,856 (2019)	38,450 (2019)	
Oregon	77	3,847	
Virginia	5,217	136,136	

[16] NOAA. 2021. State by State Summary of Shellfish Aquaculture Leasing/Permitting Requirements. Available here.

Alaska

The fees and management responsibilities for the Alaskan shellfish program are split between the Department of Natural Resources, the Department of Environmental Conservation, and the Department of Fish and Game. These departments manage roughly 160 shellfish permits between the various types of shellfish harvesters, dealers, and processors. The fees for these permits are intended to cover the processing and inspection process for the permits themselves, but no more.[17] [18] The current fees for each type of shellfish processer can be found in Table 8.

Table 8. Alaska Shellfish Fees

Fee Type	Specification	Per-Item or Unit Fee Amount
Shellfish harvester application	All	$162
Shellfish dealer application	Shipper	$162
	Reshipper	$162
	Repacker	$325
	Shucker-Packer	$649
Application for creation of Joint-Agency Aquatic Farm	Less than one acre	$600
	One to three acres	$1,200
	Greater than three acres	$2,000
State-owned lease – aquatic farm	First acre	$450
	Each additional acre	$125
	Performance Guarantee Bond	$2,500
Wild stock survey for shellfish on-bottom culture	Varies	Up to $5,000
Shellfish growing area classification fee	All	$500

California

California does not charge a fee for a shellfish handling and marketing certificate, which is required for any post-harvest shellfish activity via the California health and safety code. The department is currently in the process of updating its regulations, but the proposed changes have not yet been subject to public comment. These proposed changes would aim to offset the cost of the program and would be based on the average time requirements for the inspection of different shellfish activities. The program currently receives state funding to cover the costs of water and tissue testing for wet storage depuration processors as well as paralytic shellfish poison (PSP) and amnesic shellfish poison (ASP or domoic acid). Approximately 500 post-harvest entities are monitored and regulated via the program every year.

[17] State of Alaska. Available here.
[18] Alaska Aquaculture Permitting. Available here.

Hawaii

In Hawaii, edible molluscan and bivalve shellfish are regulated by the Department of Health, but no fees are associated with this administrative process. Hawaii's commercial shellfish industry was largely dormant for two decades before being revived recently, and the lack of fees is an intentional policy decision intended to stimulate growth. Food establishment permits are required for post-harvest handling and are associated with a fee that ranges from $100 to $400 annually depending on the scale of the operation. The state will conduct a water quality test on behalf of a new operation, but said operation is required to secure an encouraging preliminary test result via a third-party source beforehand. Primary costs for the program include staffing, laboratory equipment, sampling supplies, sample shipping and processing costs, and travel costs. Currently, the state manages four certified interstate dealers - which typically sell their products to the military or private cruise industry, four certified farms, one wet storage facility, and about a dozen certified intrastate dealers.

Maryland

Like Alaska, Maryland divides the responsibilities for managing its commercial shellfish program between three state agencies: the Department of Health, the Department of Natural Resources, and the Department of Ecology. The fees imposed by each department go either to the state general fund, or to specific programs within that department.

Maryland utilizes a single commercial license, known as a "tidal fish license" to authorize activity on tidal waters, including the harvesting of oysters and clams. The requirements and fees associated with a tidal fish license are specified in Maryland Code, § 4-701.[19] The state imposes fees specific to the type of fishing activity; for example, the fee associated with harvesting clams is $100, and the fee associated with harvesting oysters is $100 or $250 if using a dredge boat. The state has a total of 2,600 licenses, but only 1,000 of these are actively used.

Commercial harvesters must obtain a harvester registration, and in order to buy, process, pack, resell, or market harvested shellfish, a processor must pay additional fees dependent on their Tidal Fish License status. Processors pay an additional surcharge for processing oysters, and an additional fee is imposed by the states Seafood and Aquaculture Products Marketing Fund, which varies depending on whether the business is a processor and/or a harvester. For aquaculture operations, applications to lease submerged land or water columns can be obtained for an additional flat application fee, as well as a further per-acre fee, however aquaculture operations are exempt from harvester registration fees. Currently, there are 475 active commercial aquaculture leases totaling roughly 8,000 acres. Lastly, there is an additional fee for obtaining a shellfish Nursery Permit.

Many of these fees were based on the precedent set by prior fees and are not necessarily established or maintained with the goal of cost recovery. A 2012 overhaul of aquaculture raised the water column fees significantly, accounting for the discrepancy in per-acre submerged land verses water column fees.

All fees described herein are listed in Table 9.

[19] FindLaw. Available here.

Table 9. Maryland Shellfish Fees

Fee Type	Specification	Per-Item or Unit Fee Amount
Tidal fish license	clams & oysters	$100
	oyster dredge boat	$250
Commercial harvester registration	None	$215
Buy/process/pack/resell	fee if already licensed	$50
	no pre-existing license	$250
	oyster surcharge	$300
Product marketing surcharge	fee if already licensed	$20
	no pre-existing license	$50
Commercial aquaculture base fee	water column or submerged land	$300
Commercial aquaculture add-on	submerged land	$2.50 (per acre)
	water column	$25 (per acre)
Nursery permit	5-year duration	$100

Massachusetts

Those looking to harvest shellfish within the state of Massachusetts are required to obtain a commercial fishing permit.[20] When applying for a commercial fishing permit, fees vary based on permit type.[21] For example, if applying for a Shellfish & Rod & Reel permit, the associated fees are $55 for a Massachusetts state resident and $130 for a non-resident. If applying for a Shellfish & Sea Worms permit, the associated fees are $40 for a Massachusetts state resident and $80 for a non-resident. Permits are also required to sell raw fish, shellfish, lobsters or bait. Fees range from $65 to $260 depending on permit type and residency. [22] In addition, aquaculture permitting and dealer costs are estimated at $1,300 through their permitting tool,[23] though permits and licenses vary by municipality.

New Jersey

In order to obtain a commercial shellfish lease or otherwise engage in commercial aquaculture activities within the state of New Jersey, an individual entity must possess a commercial shellfish license.[24] Licenses are renewed on an annual basis and require the completion of a shellfish harvester training course before approval.[25] Any post-harvest shellfish operation looking to hold, transport, buy, or sell shellfish intrastate or interstate must become a Certified Dealer, which requires a license to operate a

[20] Commonwealth of Massachusetts. Available here.
[21] Commonwealth of Massachusetts. Available here.
[22] Commonwealth of Massachusetts. Available here.
[23] Commonwealth of Massachusetts, Massachusetts aquaculture permitting tool, available here.
[24] State of New Jersey. Available here.
[25] State of New Jersey. Available here.

wholesale food-cosmetic establishment and comes with a fee dependent on the operations gross income.[26] According to New Jersey state law, commercial shellfish fees are to be fixed by the state at more than $50 and less than $100 for a resident's commercial shellfish license, and at more than $250 and less than $500 for a nonresident's commercial shellfish license.[27] A summary of these fees is provided in Table 10.

Table 10. New Jersey Shellfish Fees

Fee Type	Specification	Fee Amount per License
Annual license shellfish	New Jersey resident	$50
	non-residents	$250
Certified dealer license	annual income less than $100,000	$150
	annual income $100,000 to $500,000	$500
	annual income greater than $500,000	$1,000

Oregon

Certificates of shellfish sanitation are renewable on an annual basis in the state of Oregon and are required for all shellfish dealers, defined by the state as a person engaged in the business of growing, harvesting, processing or distributing shellfish for human consumption.[28]

Grower licenses are almost exclusively issued to aquaculture farmers and are often applied for in tandem with a distributor license. The state processes approximately 25 grower licenses and approximately 50 distributor licenses in an average year. Shucker-packer licenses are more niche, with Oregon only being host to about half a dozen active shucker-packer operations. Harvester operations fluctuate between roughly 30 and 40 licenses annually.

According to the Department of Agriculture, the program is not self-supporting and is financed through an interagency partnership with the Oregon Department of Fish and Wildlife. Program costs involve water quality monitoring for state land tracts, biotoxin testing, standard administrative costs, and inspections, which occur four times a year for shucker-packers and twice a year for distributors. Licenses are valid for a full calendar year and cannot be prorated. Inspections for new applicants are all conducted in person and include a conversation centered around how the applicant plans to conduct their business. Following a passed inspection, the applicant is added to an electronic database and their license is sent to them via paper mail. The entirety of the fee program is managed by a single state organization. The program received its most recent updates in 2011, when unique fees for each industry role were introduced.

The fees associated with receiving a certificate of shellfish sanitation are based on the annual gross income of the certified entity and their role or roles within the commercial shellfish industry.[29] The state

[26] State of New Jersey Department of Health. Available here.
[27] Casetext. Available here.
[28] Oregon Department of Agriculture. Available here.
[29] State of Oregon Legislature. Available here.

also manages a leasing program, where growers can utilize state owned land for oyster production at a rate of $14 per standard acre or $4 per acre of 'prohibited' land. The removal of shellfish from these lands is also taxed, at a rate of 10 cents per gallon (or bushel) of oysters, or 1 cent for every dozen oysters. A summary of these fees is provided in Table 11.

Table 11. Oregon Shellfish Fees

Fee Type	Specification	Per-Item or Unit Fee Amount
Shellfish dealer, shucker-packer	Annual gross income less than $50,000	$300
	Annual gross income $50,000 to $500,000	$600
	Annual gross income greater than $500,000	$1,200
Shellfish dealer, grower	Annual gross income less than $50,000	$200
	Annual gross income $50,000 to $500,000	$400
	Annual gross income greater than $500,000	$800
Shellfish dealer, distributor	Annual gross income less than $50,000	$200
	Annual gross income $50,000 to $500,000	$450
	Annual gross income greater than $500,000	$900
Commercial harvester license	Annual gross income less than $50,000	$125
	Annual gross income $50,000 to $500,000	$200
	Annual gross income greater than $500,000	$250
State-owned lease – oyster production	Standard acre (per acre)	$14
	'Prohibited' land (per acre)	$4

Virginia

The Virginia Department of Health Shellfish Division performs inspections for certified shellfish dealers but has never administered any formal fees for this process. There is no legal prohibition on fees for inspections. An attempt was made in 2016 to develop a fee program for the department, but it did not pass through the state legislature. These proposed fees would have scaled to the relative size of a given operation, protecting the interests of small growers. The department oversees approximately 250 licensed entities annually, with some seasonal variability. All certifications expire on September 30th and applications are required to be mailed or emailed in a minimum of 90 days prior to that date. The implementation of an electronic database has significantly increased the efficiency of the application process.

While not instituted to cover the cost of inspections, Virginia does impose a large number of different fees for shellfish operations.[30] [31] These fees are the most granular of any state reviewed here and

[30] Virginia Marine Resources Council. Available here.
[31] Virginia Marine Resources Council. Available here.

depend not only on the type of operation and the species being harvested, but also the scale of the business and the specific harvesting methods being used. These fees are included in Table 12.

Table 12. Virginia Shellfish Fees

Fee Type	Specification	Per-Item or Unit Fee Amount
Clam or oyster aquaculture product owner's permit	All	$10
Commercial clam or oyster aquaculture harvester's Permit	All	$5
Oyster collection	By hand or with ordinary tongs	$10
	Single-rigged patent tong boat	$35
	Double-rigged patent tong boat	$70
	oyster dredge on public ground	$50
	oyster hand scrap	$50
Shucking and packing oyster fees	Less than 1,000 gallons	$12
	1,000 to 10,000 gallons	$33
	10,000 to 25,000 gallons	$74
	25,000 to 50,000 gallons	$124
	50,000 to 100,000 gallons	$207
	100,000 to 200,000 gallons	$456
Commercial entity purchasing oysters caught on the public grounds of the Commonwealth or Potomac River	One boat or motor vehicle	$50
	Multiple boats or motor vehicles	$100
Clam collection	By hand, rake, or ordinary tongs	$24
	Single-rigged patent tong boat	$58
	double-rigged patent tong boat	$84
	Per boat using hand clam dredge	$19
	Per boat using power clam dredge	$44
	Per boat using hydraulic dredge to catch soft shell clams	$83
	Per person taking surf clams	$124
	Water rake permit	$24
Conch collection	Per boat using a conch dredge	$58
	Conch pot, per person	$51

Fee Type	Specification	Per-Item or Unit Fee Amount
Oyster resource user fees	Commercial fisherman harvesting oysters by hand	\$50
	Per harvester using one or more gear types	\$300
Shucking or packing oysters	less than 1,000 gallons	\$500
	1,000 to 10,000 gallons	\$1,000
	10,000 to 25,000 gallons	\$2,000
Oyster buyers	Single truck or location	\$100
	Multiple trucks or locations	\$300

3.2. State Comparison

The table below compares Washington State's shellfish fee program to the fee programs of all states discussed in the previous section. Fees are separated into three categories: growing and harvest, post-harvest, and testing. When listing the fees associated with any testing performed by the state on behalf of its citizens or entities within the commercial shellfish industry, the types of tests performed (if any) will be stated first, followed by the fees associated with these tests (if any). The number of licensees for a given program is provided alongside these fees whenever possible. All values represent an annual value unless otherwise stated.

Table 13. Comparison of State Shellfish Annual Fee Structures

State	Growing and Harvest Fees	Post-Harvest Fees	Testing Fees	Total Number of Licensees
Washington	Harvester - $263 Shellstock Shipper - $297 to $476 Shucker Packer -$542 to $1,210	N/A (covered under the Growing and Harvest Fees)	Biotoxin - $198 to $2,412 PSP geoduck - $209 to $11,266	≈330 licensed entities
Alaska	Harvester - $162	Shellstock shipper or reshipper - $162 Shucker Packer - $649 Repacker - $325	None (general funds)	≈160 shellfish processing permits
California	None (general funds)	None (general funds)	None (general funds)	≈500 post-harvest entities
Hawaii	None (general funds)	None (general funds)	None (general funds)	≈12 intrastate dealers 4 interstate dealers 4 farms 1 wet storage facility
Maryland	Harvester - $215 Oyster harvester - $100 Clam harvester - $100 to $250 Oyster surcharge - $300 Marketing surcharge - $20 to $50	Post-harvest - $250 (or $50 if already licensed as a Harvester) Shipper, reshipper, shucker packer or repacker - $150 annual or $100 seasonal	None (general funds)	2,600 licensed harvesters 475 private aquaculture leases ≈180 to 230 food processing licenses
Massachusetts	Harvester - $40 to $55 (or $80 to $130 if non-resident)	None (general funds)	None (general funds)	Unknown
New Jersey	Harvester - $50 (or $250 if non-resident)	Post-harvest - $150 to $1,000	None (general funds)	Unknown

State	Growing and Harvest Fees	Post-Harvest Fees	Testing Fees	Total Number of Licensees
Oregon	Grower - $200 to $800 Harvester - $125 to $250	Distributor - $200 to $900 Shucker Packer - $300 to $1,200	None (interagency partnership)	≈25 grower licenses ≈30 to 40 harvester licenses ≈50 distributor licenses ≈6 shucker-packer licenses
Virginia	Grower - $10 Harvester - $5 Oyster harvester - $10 to $70 Clam harvester - $24 to $124 Conch harvester - $51 to $58 Gear fee - $300 Additional harvester - $50	Shucker packer - $12 to $456 Oyster buyer - $50 to $300 Additional shucker packer - $500 to $2,000	None (general funds)	≈250 licensed entities

Comparing all the states evaluated, none imposes fees in as many of the described categories as Washington does. It is striking that, apart from Washington, none of the surveyed states charge for biotoxin testing. It is important to note that Washington has a very large biotoxin program which monitors three different biotoxins, due to the public health threat these toxins pose to consumers of shellfish. Washington also conducts bed specific testing in order to avoid blanket industry wide shutdowns during biotoxin events, which is a significant difference. In Washington, the initial fee analysis worksheet provided to Greene Economics by DOH indicates that nearly half of the proposed annual fee increases ($406,138 of $938,921 or $572,761 of $1,643,031), representing a potential increase of 277 percent, would be associated with biotoxin testing.[32]

Comparing the specific values of certain fees across different state programs reveals that some departments have established similar fees for analogous services. Maryland and Oregon appear to charge growing and harvesting fees at rates which are comparable to those found in Washington State. Additionally, Shucker-Packer and distribution entities located in Washington pay similar amounts to receive their licenses as equivalent operations in Oregon, Virginia, and New Jersey.

It is important to put the comparison of states into appropriate context. Washington is the largest producer of shellfish both in terms of the number of operations and the total revenue in 2023. The next largest producing state on the list is Virginia, which has 119 operations compared to 147 in Washington, and produced revenue totaling $88 million, or just 36 percent of Washington output which was $243 million in 2023 (see Table 14).

Table 14. Relative Industry Size in States Reviewed[33]

	Number of Operations	Total 2023 Revenue ($ Millions)
Washington	**147**	**$243**
Virginia	119	$88
Maine	86	N/A
New Jersey	65	$12
Maryland	49	$9
New York	37	$7
California	22	$36
Oregon	17	$21
Hawaii	9	$2

32 Shellfish Fee Analysis Workbook. Final. Updated October 19, 2023.
33 NOAA. 2021. State by State Summary of Shellfish Aquaculture Leasing/Permitting Requirements. Available here.

3.3. Conclusions

Many states spread administrative responsibilities for their fee programs across multiple departments, often distinguished by growing and harvesting activities, and post-harvest activities like testing. While this doesn't appear to have a direct impact on fees themselves, the distribution of labor is likely to result in higher program costs overall due to the amplification of major cost-drivers, such as staffing and travel. In this respect, Washington enjoys a cost advantage by consolidating administrative responsibilities under a single program.

While Washington is not alone in mandating separate annual fees for different industry roles, such as growing, harvesting, processing, and distributing, most other states do not tier their fees based on the same metrics that Washington does. Instead of basing fees on factors such as floor space and number of harvest sites, other states more commonly use factors such as an operation's associated acreage or annual income.

After communicating with several state specialists, it is evident that most programs do not establish their fees using any specific form of cost-recovery analysis, as is required in Washington. Many of the individuals interviewed for this study expressed that their programs were not adequately supported by income from fees, leases, or any other sources of direct revenue. In these instances, program costs are paid for via other revenue sources including general funds.

Only two of the eight specialists interviewed for this report possessed any clear memory of previous attempts, successful or otherwise, to change the structure of their state fee program. Others estimated that the most recent attempt to pass such changes occurred more than a decade ago.

Common issues discussed by interviewees across state programs included a lack of staffing and an excessive scope of work. The most significant and frequently mentioned cost-drivers for each program involved the testing of field samples for toxins and water quality. A common response to questions focused on strategies which have helped them increase workplace efficiency in recent years is that the digitization of important forms and documents has resulted in the streamlining of their application review process.

This review highlights that while there may be opportunities for the DOH to modify or refine its underlying fee structure to better balance the distribution of fee burdens, no other state imposes a burden of full cost recovery that is imposed by Washington code.

It is important to keep in mind that none of the states reviewed have commercial shellfish industries that are anywhere near comparable to Washington, either in terms of scale, diversity or economic value. None run biotoxin testing programs that mirror Washington's in term of complexity or in terms of offering growers the amount of flexibility related to growing area closures (The DOH Public Health Lab and biotoxin testing program is structured to allow for growing area and bed specific testing, which has the potential to limit the areas that are subject to closure during a biotoxin event). Washington also frequently provides additional testing support for other states (Oregon, Alaska, California) in the event of an outbreak.

4. Grower Interviews

In the first half of 2025, Greene Economics conducted a series of 22 interviews with 18 different members of the Washington State commercial shellfish industry. In January, an initial wave of nine interviews sought to gather general industry-related information with the hope of gaining insight into the industry perspective regarding the DOH permitting and licensing process. These interviews were critical to the planning of the LEAN assessment that the team conducted in early February. Following the LEAN assessment, a second wave of 13 interviews were completed throughout March and April, which involved several individuals from the first wave as well as a number of industry members new to the study. This second series of interviews focused on identifying the most significant economic and financial conditions in the industry, as well as addressing an assortment of follow-up questions inspired by the LEAN assessment. The results of these interviews are discussed below and are separated into categories based on cost, market, regulatory, and environmental factors. The identities of individuals involved in the interview process have been kept confidential to respect their right to privacy, but it should be noted the research team took care to gather a range of perspectives from contacts at operations of varied sizes, geographies, and practices.

4.1. Cost Factors

Across the board, those interviewed remarked that the general cost of doing business – including labor, fuel, seed, materials, maintenance, utilities, and shipping and packaging expenses – had increased dramatically over the last decade. **Labor costs** were identified as one of the largest drivers of costs, with 80 percent of interviewers mention that labor is a major cost, and labor costs have been increasing in many cases. Even **finding suitable labor** is another key challenge to the industry because the work is physically challenging, and workers have to work at night and outside subject to the elements. The availability of labor has intensified this financial burden. As a result, there has been a reported decrease in the number of individuals directly employed by the industry in recent years; many farms now rely on contract work in order to keep production consistent on an annual basis. This creates its own unique set of challenges, seeing as the planting and harvesting processes demand long hours of skilled labor for days or even weeks on end, with the quality of labor often being directly correlated to the size of the yield, and hence the profitability of the industry. One individual stated that wages accounted for 44 percent of their annual revenue, and another reported that the wage rate had increased $10 over the past 15 years, or roughly 50 percent.

The **cost of shellfish seed** has also increased over time, although these prices fluctuate depending on the chosen species – Manila clam seed, for instance, increased in price by five percent between 2023 and 2024 for one farmer, whereas Geoduck seed prices have apparently remained consistently substantial across recent years. Maintaining good relationships with seed distributors is critical to the operations of these farms, as without seed there is functionally no harvest, and because poor quality seed can lead to mortality events that waste a year’s worth of time and expenses.

The **cost of fuel** to power boats and other vehicles needed for production was also identified to be a large source of production costs, with more annual variance than the costs associated with labor or seed. In addition to fuel, many farms within the state reportedly rely on aged equipment, leading to **high maintenance costs**, with **utilities** and material inputs like **gear, nets, bags, and tubing** rounding out the list of notable expenses mentioned by the majority of those interviewed. For larger operations which possess their own shellfish processing facilities, **shipping and packaging** constitute another area where costs have increased, at rates as high as 7.5 percent annually, according to one business interviewed. A breakdown of these expenses organized by how many of those interviewed considered them to be a major cost for their operation is presented in Figure 6.

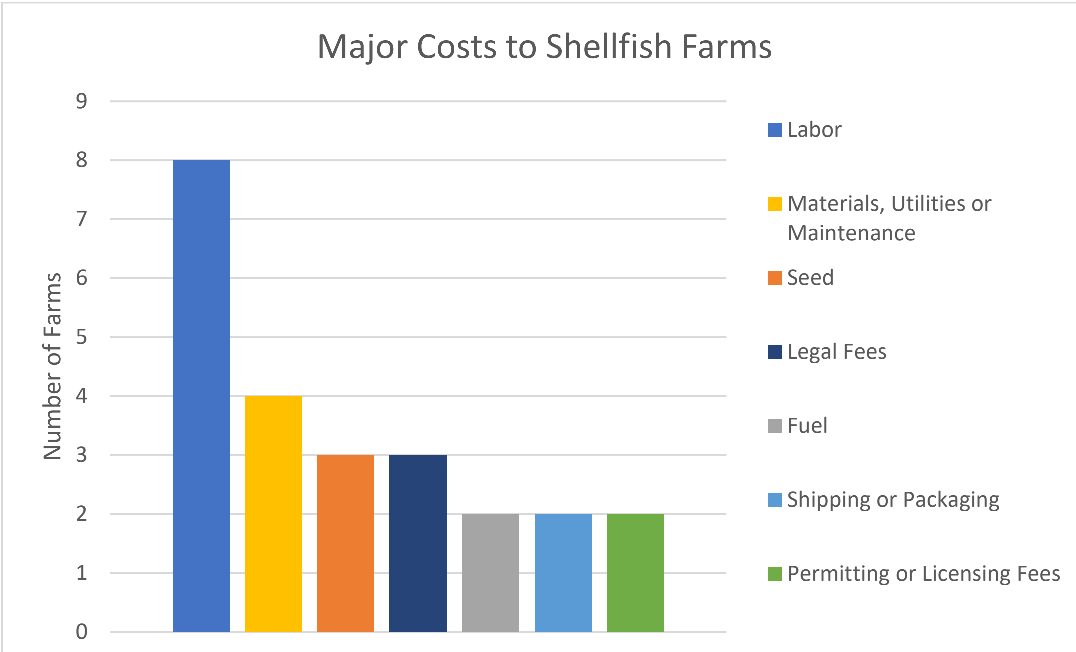

Figure 6. Major Costs

The **cost associated with establishing a new shellfish farm** is also substantial, especially in the case of geoduck clams, which require a time investment of six to seven years before an initial harvest can be completed. On top of this investment, developing a new area for shellfish farming necessitates the acquisition of several **unique licenses and permits.** In addition to the costs associated with application and processing for these permits (which are issued by the US Army Corps of Engineers and/or other city county or state agencies), there is also the risk of opposition from local organizations or citizens who take issue with the presence of a shellfish operation in their immediate vicinity on the basis of community or aesthetics. The regulatory fees associated with these licenses and permits are not always of significant cost to the individuals acquiring them, but the **legal fees** resulting from their opposition can be considerable.

Additionally, there were a subset of those interviewed who stressed the **dichotomy between the largest and smallest businesses within the industry**. Many of the smaller operations stated that licensing and permitting fees already make up a significant portion of their costs, and that it is more difficult for them to acquire the labor necessary for production because of their inability to provide full-time work for their employees. It was also posited that market competition stemming from within the shellfish industry has had an adverse effect on smaller businesses, with larger businesses invading the economic space occupied by operations unable to keep up with shrinking profit margins.

4.2. Market Factors

Washington State shellfish farmers currently produce a **wide variety of valuable products**. The most common species farmed among the operations interviewed for this study were Pacific oysters, with 71 percent of interviewees growing them in some capacity. Nearly just as popular were Manilla clams, at 64 percent, with Geoduck coming in third at 43 percent, although it should be noted that Geoducks were also perceived as producing the highest return on investment. Twenty-nine (29) percent of the firms interviewed grew at least one other species of oyster, 14 percent grew mussels, and 7 percent grew at least one other species of shellfish in addition to those previously mentioned. These results are presented in Figure 7.

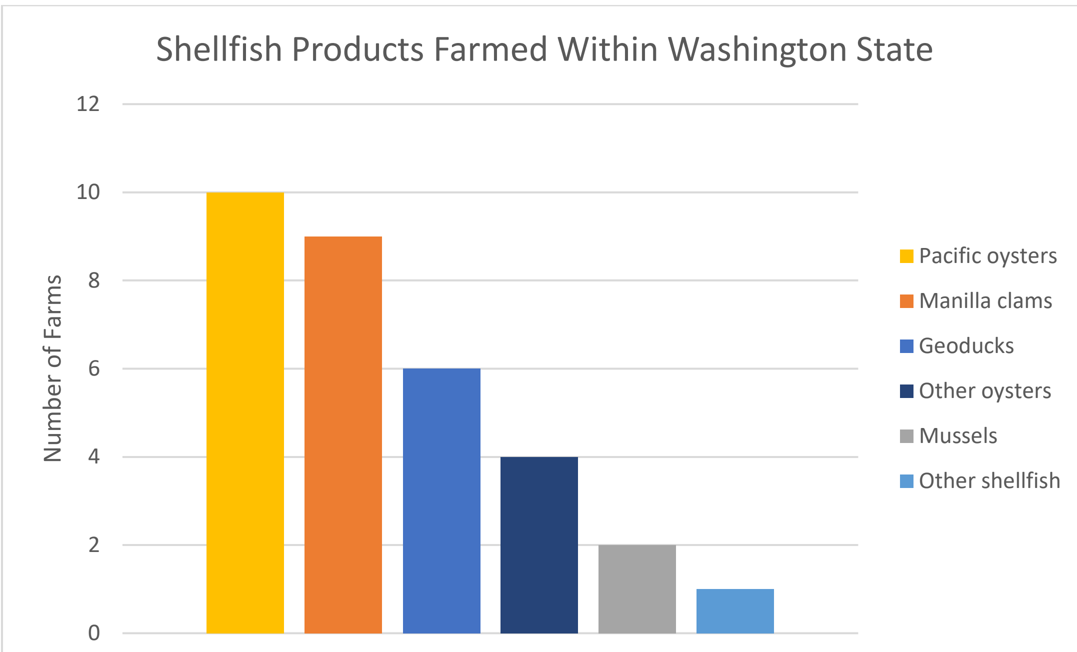

Figure 7. Shellfish Products Farmed in Washington State

One trend expressed by nearly all of those interviewed was a pattern of **shrinking margins within the shellfish industry**. While production costs have continued to increase, as discussed in section 4.1, market prices have not kept pace. One individual remarked that they had formerly sold their geoduck at a rate of $13 per pound, but that they now receive as little as $5 per pound from the same purchasers. Prices for Manilla clams have remained relatively consistent over the past ten years, at a rate of approximately $2 per pound to growers, despite cost inflation. Revenue has dropped by a matter of hundreds of thousands of dollars for some farms, reducing profits to nearly zero.

It was mentioned by several individuals that the shellfish market experiences **high amounts of variability**, with fluctuations in sale price being just one of many factors placing a burden on growers. Many of the smaller operations interviewed expressed that maintaining regular profits on an annual basis was challenging for them, whereas larger operations claimed that they were able to sidestep this issue by diversifying their products and growing in multiple different areas. This idea is supported by the rising industry belief that increased production is the only method for achieving regular profitability, yet this approach is sacrificing the long history of family farms and leads to industry concentration.

These factors have resulted in a trend of **slowed industry growth**. There has been a reported consolidation among processing facilities, with more processors choosing to farm their own products rather than purchasing from smaller growers. It has also been suggested that increased startup costs and challenges associated with permitting new sites, combined with long investment times for the most valuable of shellfish products, such as geoducks, have made it extremely difficult for new growers to enter the industry. This trend is evidenced in declining coastal property sales and by the disappearance of more niche and costly forms of processing, such as shucker-packer operations.

Several recent world events have also contributed to uncertainties within the shellfish market. The economic impacts of the **COVID-19 pandemic** are still being felt, driving increased inflation rates and producing a highly competitive labor market. Demand for shellfish reached an all-time low during the pandemic and resulted in increased prices for shipping and packaging materials like Styrofoam and cardboard. Since then, industry transactions have been much less consistent for some farms, leading to economic losses stemming from last-minute order cancellations or unpredictable work schedules for employees. The shellfish market is also highly subject to **trade shocks.** Much of the shellfish produced in the United States is exported to other countries including China, Canada and several in Europe and Asia. The Washington State market is primarily competing with shellfish from Canada, Mexico, the East Coast, and the Gulf of Mexico.[34]

4.3. Regulatory Factors

DOH and the commercial shellfish industry share a common goal, assurance that Washington State shellfish are as safe as possible for consumption by the general public. Many individuals expressed that they had an **overall positive opinion of DOH**, and that the backlash to the proposed fee changes represented a small disturbance in a long and otherwise prosperous relationship. It was common to hear clear statements of trust, respect, and appreciation for DOH and the responsibilities with which they are entrusted to carry out on a daily basis. Any issues presented during the interview process were primarily centered around **communication**. Some farmers felt that as though the recent proposed fee changes were made without adequate industry consideration, others stated that the termination of regular meeting with one of the industry association groups had resulted in a disconnect between growers and DOH staff.

Many individuals made **suggestions** for how processes could be streamlined in order to help support farmers at the state level. Among these suggestions were discussions of a central point of contact for growers, a reevaluation of how fee criteria scales with the size of an operation, a greater emphasis on digital tools to assist with inspections, annual licensing and certification processes, and a reduction in the amount of duplicate work required from the industry each year by a number of government agencies, such as DOH, the Department of Natural Resources, and the Army Corps of Engineers.

One of the most notable topics discussed by growers was the state's handling of **biotoxin testing fees**. The majority of those interviewed believed that testing for PSP and other harmful toxins in shellfish was classified under the realm of public good and should therefore be fiscally supported by GFS. Some growers made the point that the state already covers the cost of testing for areas where recreational shellfish activity occurs, and that essentially all aspects of the marine ecosystem, from commercial

[34] Washington State Department of Agriculture. Aquaculture in Washington. Available here.

fisheries to recreation and tourism, benefit from the testing that the industry currently funds. A more detailed discussion of the structure and function of the biotoxin testing program is provided in Chapter 8.

Many individuals expressed that the methods by which DOH has carried out handling marine biotoxin events in the past were more than sufficient, with an appropriate level of communication and responsiveness. Operations located in more remote locations stated that they had no issue with assisting DOH in the collection of biotoxin samples, and other members of the industry communicated that they would be eager to help develop a more collaborative relationship regarding these activities in the future.

4.4. Environmental Factors

Several environmental issues have also resulted in recent issues for the commercial shellfish industry, including the overabundance of several **invasive species**. Burrowing shrimp have been found to cause oysters to sink and suffocate during the growing process, and European green crabs appear to have some correlation with declines in clam yields. **Extreme weather events**, which are occurring at increased frequencies as a result of changing climate conditions, have resulted in high mortality rates, with some farmers losing as much as 40 percent of their harvest to intense heat or cold. Heat extremes also leave farmers more vulnerable to large mortality events caused by summer heat waves or **harmful algal blooms**. Additionally, **biotoxin events,** such as the Willapa Bay biotoxin closure in 2024,[35] can lead to significant economic losses. Larger operations are not as intensely affected by these events, as they often grow and harvest across a variety of different areas and can adapt to shutdowns by reallocating resources. Smaller operations, however, are not as well equipped to respond to these kinds of events and have reported significant losses in terms of compromised product, wasted labor costs, and terminated business arrangements.

4.5. Summary

The major points and topics discussed across both waves of interviews are summarized in Table 15. Cross-cutting themes across the four topics are threefold. First, there is **increasing uncertainty** in the industry between markets, labor challenges, environmental and regulatory factors. Second there are greater **pressures on the smaller operators** and a trend toward greater concentration in the industry. And curiously a number of the smaller operators commented that they receive a lot of support from the larger operators—leading us to believe that concentration is not desired by any participants in the industry, small or large.

A third, and important theme relates to the historic and **cultural relevance of the industry**. During the grower interviews, the vast majority if not all growers responded to the opening question, “Can you tell us about your operations?” by telling the research team about the history of the operation, often dating back to the early 20th century or even late 19th. There is tremendous pride among all operators related to the sustained industry tradition and importance within the state.

[35] Assessing Paralytic Shellfish Poisoning Risk in Southern Washington. February 2025. National Centers for Coastal Ocean Science. Available here.

Table 15. Summary of Interview Findings

Cost Factors	Market Factors	Regulatory Factors	Environmental Factors
• **Labor** expenses comprise the largest category of costs for the majority of shellfish farms • Shellfish **seed costs** are also significant, and are critical to a successful harvest • Other notable costs for shellfish operations include **fuel, materials, maintenance, utilities, and shipping and packaging** • The costs required to start a shellfish farm are extensive, and are heavily impacted by **legal challenges** associated with obtaining proper licensing and permitting • There is a strong dichotomy between the largest and smallest of shellfish operations within the state that makes **smaller farms vulnerable to shifting industry trends**	• Washington shellfish farms primarily grow **pacific oysters, manilla clams, and geoducks** • Many shellfish operations have **thin margins as a result of high costs and variable pricing**, which has led to uncertain profitability and a lack of consistent revenue • Industry growth is slowing, due in part to **regulatory challenges** associated with establishing **new growing sites** • The **COVID-19** pandemic has had long-lasting negative impacts on the industry • **Trade disputes** are currently having significant effects on market prices due to the international nature of commercial shellfish business	• The industry has an overall positive relationship with DOH • Recent communication issues have soured this relationship somewhat • There are many opportunities to streamline the regulatory process for farmers at the state level • A majority of industry members believe that biotoxin testing should be covered under general funds as a benefit to public good • There are issues with how biotoxin testing is carried out that could be improved to help both the industry and DOH better achieve their goal of securing public health	• **Invasive species** have caused difficulties for shellfish farmers in recent years • **Heat events and changing climate** conditions will continue to lead to high shellfish mortality events • **Biotoxin events** have resulted in significant economic losses for shellfish farmers

5. LEAN Assessment

The primary goal of a LEAN assessment is to identify opportunities to streamline processes, reduce waste, and improve customer experience. Customer focus is one of the hallmarks of this type of assessment.

The Department is a proponent of LEAN and applies LEAN principles to everyday tasks. Prior to 2020, DOH went through in-depth LEAN analyses for many of their processes. When the COVID-19 pandemic hit, DOH had to change many of their processes quickly using the existing tools they had. DOH has used LEAN principles while developing these new processes and has been open to going through the LEAN process further.

Improvements made as a result of a 2016 LEAN assessment process resulted in a 53 percent reduction in license renewal processing time, reducing it from an average of 13 to 6 days. In 2017 the Department conducted a Customer Service Satisfaction Survey[36] that resulted in additional improvements to the Harvest Site Certification procedures and the License Renewal process.

As part of the initial analysis supporting the new fee structure proposal the Department also conducted an internal evaluation of their processes and as a result removed some costs from their calculations.

In February 2025, Greene Economics performed a LEAN assessment of the Shellfish Licensing and Certification program to identify improvements and consider methods to offer data transparency and potentially reduce program administration costs. Specifically, the team was asked to review current processes and procedures associated with four focus areas:

- licensing/permitting,
- inspecting operations,
- biotoxin management, and
- issuing export certificates.

Building on work that had already been done, the team initially received and reviewed DOH standard operating procedures and process documents associated with the four focus areas. In addition to document review, prior to the workshop the team reviewed public comments that were submitted during the comment periods associated with the rulemaking process. The team used industry and Tribal feedback gathered from a survey, as noted in Chapter 1, as well as information gathered during the first round of producer interviews to design a four-day workshop series to conduct value stream mapping exercises with key staff involved in the license, inspection, biotoxin testing and export certification processes.

As noted in Chapter 2, Washington is a member of the Interstate Shellfish Sanitation Conference, enforcing the requirements set forth in FDA’s National Shellfish Sanitation Program Model Ordinance Guide for the Control of Molluscan Shellfish. Participation in this program not only ensures the highest standards for public health and safety, it also facilitates producers’ ability to ship and sell Washington shellfish products across the United States and internationally. From a LEAN assessment perspective, these factors influence the LEAN process because many of the processes, procedures, intervals and

[36] Shellfish Licensing and Certification Section. 2017 Customer Satisfaction Survey Results. Available here.

testing requirements of the program are in place to comply with ISSC standards and thus are not open to modification.

While the steps and requirements themselves cannot be modified, there are opportunities to streamline the intake and review processes associated with those requirements as well as improve communication between staff managing review, approval, and with applicants regarding application status.

Of the four processes reviewed (licensing/permitting, inspecting operations, biotoxin management, and issuing export certificates) no opportunities for process improvement were identified for the export certificate process, which is fully automated and on-line. In fact, the structure and functionality of this process illustrates the types of efficiencies that are needed across other aspects of the program and demonstrates that they can be achieved.

The LEAN assessment identified instances of process, people, and flow waste that were common to the other three of the processes reviewed (licensing/permitting, inspection and biotoxin management). These included multiple channels and tools for receiving information, incompatible information systems, redundant input and output of data, re-entering of data and converting of formats, incompatible information systems (leading to workarounds), and overprocessing. Additional opportunities observed that are not directly aligned with office and flow waste concepts include the inability to produce forms in multiple languages and difficulty accessing, submitting or updating forms from the field.

Staff and leadership participating in the LEAN assessment were not unaware of these issues and in many cases, have implemented steps to address them. Many of these issues can be resolved by updating the data platforms used to manage and track information, but that comes with a price.

The Shellfish Programs at DOH currently utilizes multiple platforms to manage data. The Shellfish program and the DOH IT department are aware of the shortcomings of the current version of HealthSpace (the software used for facility inspections), and the team is also aware of opportunities for further streamlining the application processes. The IT and program staff are currently working with a team at HS Govtech, the developer of the HealthSpace application, to transition to a cloud-based version of HealthSpace. This newer version of HealthSpace should be better able to integrate with the other existing systems used DOH, and may allow data to be shared between the systems in both directions. However, the most significant improvements promised by this software upgrade are pitched to address the first two major friction points we identified.

As part of the upgrade, HS Govtech has agreed to create data entry forms for most of the existing Shellfish applications. DOH would be able to host these forms online, and in much the same way that a checkout page would provide an error if you entered your card information incorrectly, these forms will provide basic error handling for issues like incorrect formatting or required fields being left unfilled. The data from these online forms would then be input directly into the Shellfish program's systems, without an individual needing to transcribe paper applications into a computer. This will go a very long way to reducing the repetitious and redundant work currently being done in the form of data entry and basic error correction by individual team members.

These new forms provided via HealthSpace can be set up as decision-tree style questionnaires, making the forms easy to follow for those less accustomed to working with interactive documents, like a form-fillable PDF.

HS Govtech has estimated that the new product will be rolled out to the Shellfish program in Q3 of 2025, though there is always uncertainty with these types of improvements.

Technology itself is not the complete solution, however. We observed that during the rollout of the online renewal and payment system that the analogue nature of the industry will likely make it resistant to these new processes, and that the decrease in direct human contact between the shellfish companies and their counterpart team members in the DOH Shellfish program could lead to harmful degradation in those critically important relationships.

To avoid creating a sense of depersonalization and disregard for growers, their needs, and to facilitate the transition to a more fully online system, the program should designate a transition window and establish a well-publicized single point of contact to serve as a “help desk” during the transition from paper applications and phone calls to online forms and automated systems. This help desk should be an easily accessible point of contact that allows shellfish companies to get direct support either by email, by phone, by video call, or possibly even by in-person workshops or site visits, where department staff can walk them through the use of the online systems and answer any questions they have. During this phase, program staff should be encouraged to direct all questions and troubleshooting to this resource. Workshops may be an especially useful tool for helping guide non-English-speaking shellfish company members, as it would condense the cost of translation services.

It is unlikely that the whole industry will get on board with this in the first year, but if this “help desk” program is well executed and helps maintain that sense of support and connection with the industry, then word of mouth could improve attendance in future years. As more companies, groups, and individuals become accustomed to the process, they will require less and less support, and the need for this program will diminish until either an acceptable medium is reached and the program can be ended, or the burden on DOH is so minimal that it no longer requires additional resources, and instead takes the form of a small number of phone calls per year to new users of the system.

While these improvements will not radically alter DOH’s cost to operate the program, they will streamline and improve efficiency and customer services.

6. Cost and Fee Review

As the basis for developing a proposed fee structure, the Department conducted an historic review of program and operating costs across all facets of program operations. Between October 2022 and January 2023, the Department gathered and evaluated financial data from FY 2016- FY 2022 including salaries, wages and benefits, contracts, goods and services, legal, software, travel, capital outlays, enterprise software, telecommunications, building cost allocations, adjudicative services, and program expenses associated with each of the activities subject to the proviso. These actual costs were used to develop cost projections for FY 2023- FY 2030. Greene Economics evaluated these results, as discussed in Section 6.1 and 6.2.

In Washington State, the policy for licensing fees, including full cost recovery, is governed by RCW 43.70.250.[37] This statute mandates that the costs of professional, occupational, and business licensing programs be fully borne by the members of those professions, occupations, or businesses. In order to determine what portions of the total costs associated with program operations should be subject to this construct, the Department evaluated seven different allocation methods, which are discussed in Section 6.3. This analysis and projections were used to develop a PFCR proposal.

As noted in the introduction, and in Figure 4, the development of the cost analysis went through multiple iterations. The first version supported full cost recovery. Based on feedback received, the department PFCR fee schedule with a 3-year phased approach. Due to additional feedback, the program reviewed costs and identified $435,203 in costs (primarily related to allocations of staff time) that could be removed and reviewed for further analysis. These removals are referred to in Department documents and spreadsheets as "LEAN" and should not be confused with the results of the Greene Economics LEAN assessment discussed in Chapter 5 of this report. This version was also not supported. The Department's final proposal was to implement a subsidized increase for two years, while a LEAN analysis was completed and then the fees would be evaluated again. This version of the fee structure was also met with concern. As described in Chapter 1, a legislative proviso was passed to have a third-party consultant (ultimately Greene Economics) conduct a fee analysis and LEAN analysis. With this, the department halted the rulemaking process and the 2022 fee structure remains in place until the results of this analysis have been completed.

For this portion of the analysis, Greene Economics reviewed the data sources, assumptions and methods that were used by DOH to develop the full cost estimates, PFCR fee plan shown in Figure 4 in Chapter 1.

6.1. Review Process

The Department provided a wide array of documents to the Greene Economics team that support how they developed cost estimates for program operations, as well as alternatives for proposed increases in fees for the commercial shellfish regulatory program including licensing, inspecting, permitting, and testing. Spreadsheets, administrative documents, reports, public comments, and power point presentations were provided for review.

Over 170 documents were provided for review. The Greene Economics team began by reviewing the documents at a very high level to assess which needed a greater, in-depth review of the details. Eight

[37] RCW 43.24.086 here.

documents were considered essential to provide an understanding of the costs required for the fee analysis. These are listed in Table 16. For each document, Table 16 also provides a brief description of the document, which costs are provided within each, and how it was used in the development of the PFCR fee plan.

Table 16. Description of DOH Documents Providing Cost Data for Fee Analysis[38]

Document	Type	Description	Cost Data Included
License Cost Allocation Methods Final	PPT	This is the document that provides a clear overview of process and final method used.	Summary of the cost allocation methods reviewed that identifies the chosen method and the reasoning behind that decision.
Shellfish Workbook Summary Final	XLS	Compilation of values calculated and/or presented in other related spreadsheets summarizing the Full Time Equivalents (FTE), Expenditures and Revenues relating to Commercial Shellfish program and fees. Historical 2016-2023; projected 2024-2031.	Summary (sum) of all the costs associated with the program related to: licensing, testing, and export certificates.
Annual License Cost Allocation Final Inspection	XLS	Information for calculating inspection fee portion of the total fee (inspection times, cost of staff time, operation counts, calculation of fees, 50% increase implementation subsidy rates).	All inspection costs allocated by share of inspection time for each operation type and size; used to calculate the fees required to cover the cost of inspections by operation type and size.
Shellfish License Fee Analysis Workbook Final	XLS	Historical number of licensees and fees, and licensing fee revenues; various “fee scenarios” for all fees. The costs include FTEs and salaries, benefits, travel, cost allocations for IT and other administrative costs, inspection and registration costs, HTS annual license, Harvest sites, HTS Harvest sites, GFS Permitting, and GFS Tribal, LEAN, and Other. Revenue Tab includes number of licenses by classification and new fees. Some tabs have broken calculations.	All historical and projected program costs for Annual License- inspections/registration, HTS Annual Licensing, Harvest Sites GFS, HTS Harvest Sites GFS, GFS Permitting, GFS Tribal / LEAN / Other; these include FTE costs for salaries, wages, benefits, good and services, software and IT costs and building cost allocations attributable to providing inspections and licensing services through the program

[38] Copies of DOH provided cost data referenced in this table, and throughout the report, may be obtained by contacting the Department of Health, Shellfish Program here, or through a public records request here.

Document	Type	Description	Cost Data Included
Shellfish Export Fee Analysis Workbook Final	XLS	Historical number and fees for export certificates and revenues; various “fee scenarios” for all fees	All historical and projected program administration costs; HTS export costs; HTS licensing and certification costs and all indirect costs; these include FTE costs for salaries, wages, benefits, good and services, software and IT costs and building cost allocations attributable to providing export certificates through the program.
Shellfish Biotoxin Fee Analysis Workbook Final	XLS	Provides the historical Biotoxin fees by number and type of operation, the total cost for service by test types - DSP, DA, and PSP - number of tests times the cost per test. Then these are projected through time along with the revenues from biotoxin fees and geoduck.	All historical and projected program administration costs for biotoxin testing and PSP geoduck testing; these include FTE costs for salaries, wages, benefits, good and services, software, communications, and IT costs and building cost allocations attributable to providing testing services through the program; also includes the costs per test for DSP, DA, PSP and PSP geoduck
PHL Test Cost Recovery Worksheets	XLS	Provides the detailed cost assessment for each type of test (Vibrio qPCR, PSP, DSP, DA)	Outlines the costs incurred to provide testing services for each of the testing types, including lab labor costs (hours by job classification), supplies and equipment costs, service contracts and IT costs (if any), and agency and division indirect costs. These costs are rolled up into the Shellfish Biotoxin Fee Analysis Workbook Final workbook
Fee Allocation Methods	XLS	Presents the current fee information for a variety of different permits and tests.	Counts and estimated additional counts for relays, wet storage, and bait permits, harvest site certs, and biotoxin tests
Fee Cost Workbook Final	XLS	Presents staffing costs and shows the calculation method of total annual costs.	Summary of historical staffing costs by fee type; non-direct staffing costs by fee type, including fee-specific costs (e.g. testing costs, EHAPPS and PHD allocation of costs) and travel costs

The analysis done by the Greene Economics team provides an understanding of how the eight relevant Excel documents presented in Table 16 function together in the calculation of Shellfish fees. Figure 8 presents a summary of how the documents used in the fee analysis, all of which are identified in Table 16 in the first rows, were included in the process used by the DOH staff to calculate shellfish program fees and associated expenditures and revenues.

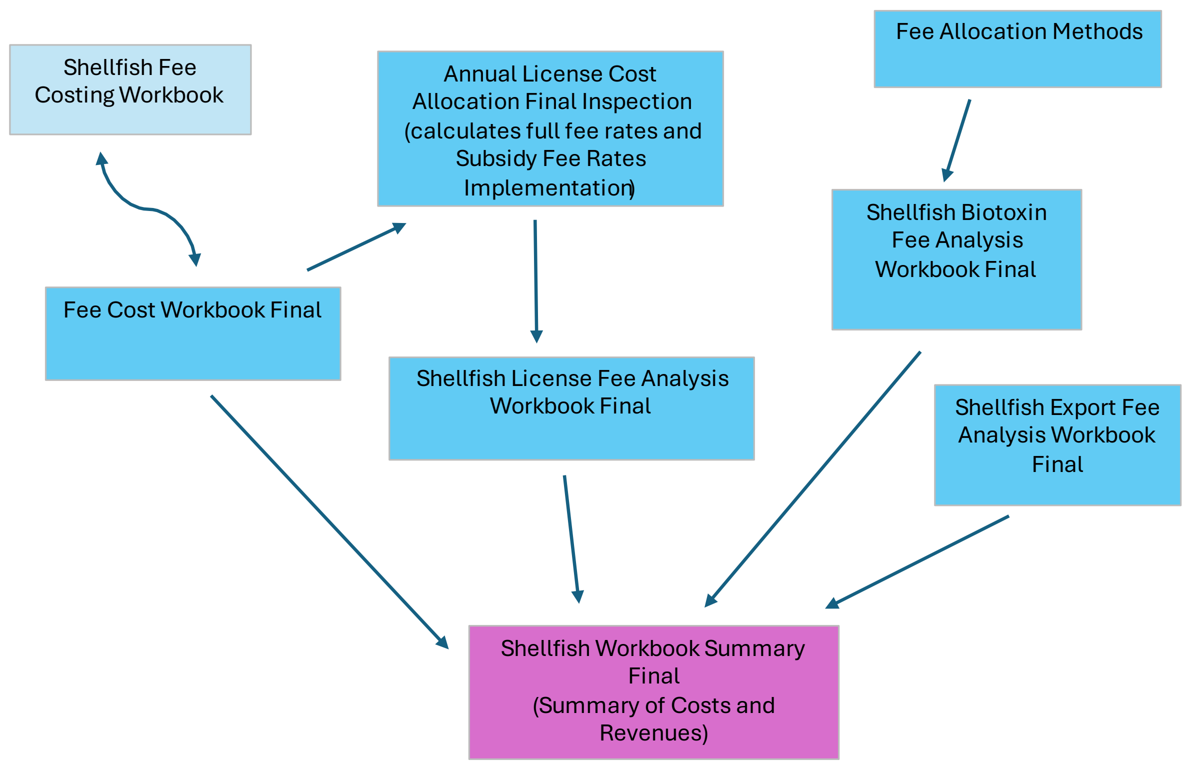

Figure 8. Shellfish Fee Process Flow

The process depicted in Figure 8 is clearly not simple and possesses several complexities in pathways. Working backwards is the most straightforward way to move through this process. The end point is a summary of total expenses and revenues for the program through the revised fees. These are found in the "Shellfish Workbook Summary Final" excel workbook. The information on revenue and expenditures are tied to several other documents, which are summed in the original document and connected to the summary document. These include the following four direct connections:

1) The "Shellfish Export Fee Analysis Workbook Final" excel workbook calculates the total program administrative costs, broken down by type, plus total export certificate Health Technology Solutions (HTS) costs, broken down by type.

2) The "Shellfish License Fee Analysis Workbook Final" calculates and provides expenditures for staff salaries and benefits, travel, cost allocations for technology costs and other administrative costs. It also calculated inspection and licensing costs, HTS annual license, Harvest sites, HTS Harvest sites, GFS Permitting, and GFS Tribal, LEAN, and other expenditures, with projected revenues calculated by multiplying the number of licenses per category by the associated new fees.

3) The “Shellfish Biotoxin Fee Analysis Workbook Final” excel workbook calculates the total cost for biotoxin test types (Diarrhetic Shellfish Poisoning, Amnesic Shellfish Poisoning, and Paralytic Shellfish Poisoning), the number of tests multiplied by the cost per test, and the associated revenue, each projected through time.
4) The “Fee Cost Workbook Final” excel workbook calculates the total annual license costs.

Some of those direct connections to the summary documents require input from other documents, which provide input indirectly to the summary document. The first is the excel workbook “Fee Allocation Methods”, which provides the historical revenue, the full fee revenue, and the 50 percent increase implementation fee, meaning the full fee is partially subsidized, but not as much as current, by the GFS, for biotoxin fees. This workbook connects to “Shellfish Biotoxin Fee Analysis Workbook Final.” The connection of the other two indirectly associated documents is a little more complicated. The first one is “Annual License Cost Allocation Final Inspection” excel spreadsheet, which calculates the full fee rates and subsidy fee rates implementation. This is connected to the “Shellfish License Fee Analysis Workbook Final” workbook. However, it needs to be noted that while “Fee Cost Workbook Final” connects directly to “Shellfish Workbook Summary Final,” it also connects directly to “Annual License Cost Allocation Final Inspection” through the calculated rates by category (facility type and billing type). The remaining document to be discussed in this analysis is “Shellfish Fee Costing Workbook.” This document does not provide numbers directly to the analysis, but it is somewhat related to, and an older version of, “Fee Cost Workbook Final.” Its importance is in the calculation of the annual license costs calculation of $668,095 that shows up in “Fee Cost Workbook Final”, the basis from which other costs are allocated. It shows the process of calculating the previously used annual license costs, using an older version of direct and indirect staffing costs. While the upward adjustment of these license costs is not shown directly and was calculated in the background, the general process and initial (previous) result is provided.

6.2. Program Cost Review

The next steps for this analysis include examining the costs to administer testing, inspecting/certifying operations, issuing licenses, and issuing export certificates. The program cost components include costs to provide biotoxin testing services, costs to provide facility inspections and licensing services, and costs to provide export certificates to commercial shellfish producers. DOH developed detailed cost worksheets in 2022, projecting costs for FY2024-FY2030. These cost estimates were used to develop a proposed new fee structure. These worksheets assume the implementation of the new structure in FY 2024. For clarity in this section, these will be presented as Projected Fiscal Years (PFY), for example PFY 2024 and PFY2030. A detailed discussion of the specific costs associated with each of these components is presented in this section. A summary of these projected costs by program component is provided in Table 17. Note that the total annual program costs in the table include Tribal and Other Costs ($542,881) and Permit costs ($81,364), both of which are currently paid by GFS. So, if those two costs are subtracted from the total of $2,198,982, the total annual PFCR costs that would be paid by the industry totals $1,574,737. This value is similar to what is estimated by the Greene researchers to be the total projected revenue under PFCR discussed later, in Chapter 9.

Table 17. Summary of Projected Annual Commercial Shellfish Program Costs for FY24 under PFCR

Program Component	Primary Cost Component	Revenue under PFCR Plan
Testing	PHL Biotoxin Testing Costs	$277,161
	EPH Biotoxin Testing Costs	$171,635
	PHL PSP geoduck	$63,997
	EPH PSP geoduck	$33,341
	Total Testing	**$546,134**
Operational Inspections and Licensure	License Costs	$644,184
	Harvest Sites Costs	$214,820
	Permit Costs	$81,364
	Tribal and other costs	$542,881
	Total Licensing	**$1,483,249**
Export Certificates	Program Administration Costs	$143,702
	HTS – Export Costs	$25,897
	Total Export Certificates	**$169,599**
Total		**$2,198,982**

Biotoxin Testing Costs

The costs associated with biotoxin testing were provided to Greene in a workbook called "Shellfish Biotoxin Fee Analysis Workbook Final." These costs are provided with historical actual data for fiscal years (FY) 2016 through FY2022, estimated data for FY2023, and projected data for FY2024 through FY2030. The primary components of testing costs are Public Health Lab (PHL) Biotoxin Testing cost, which is based on a price per biotoxin test for each type including Diarrhetic Shellfish Poisoning, Amnesic Shellfish Poisoning, and Paralytic Shellfish Poisoning multiplied by the estimated number of tests; EPH Biotoxin Testing Costs, which is based on FTE costs and associated allocated costs; PHL PSP geoduck, which is calculated on a price per test basis multiplied by the estimated number of tests; and EPH PSP geoduck, which is based on FTE costs and associated allocated costs. These costs sum to a projected total of $546,134 for FY2024. This section presents the specific costs included in each of these cost categories as well as their total costs. The summary of all costs is included in Table 17.

PHL Biotoxin Testing cost

The total for all PHL biotoxin testing costs for FY2024 is $277,161. Costs per test are rounded to the nearest dollar, so totals many not sum due to rounding. The costs by type are:

1. Diarrhetic Shellfish Poisoning; $190 per test for 330 tests, totaling $62,676
2. Amnesic Shellfish Poisoning; $163 per test for 428 tests, totaling $69,650
3. Paralytic Shellfish Poisoning; $211 per test for 688 tests, totaling $144,834

EPH Biotoxin Testing Costs

EPH biotoxin testing costs sum to $171,635 for PFY2024 and include:

1. Average salaries and wages for 1.1 FTE
2. Employee benefits for 1.1 FTE
3. Good and services
4. Travel

Additional costs are allocated by FTE and include:

1. Enterprise software
2. Telecommunications
3. Campus Reallocation - Help Desk
4. Building Cost Allocations
5. Indirect costs

PHL PSP Geoduck

The total for all PHL PSP geoduck testing costs for PFY2024 is $63,997. As this is calculated on a per test basis, the cost per test is $211 (rounded) for a total of 304 tests (total may not sum due to rounding).

EPH PSP Geoduck

EPH PSP geoduck testing costs sum to $33,341 for PFY2024 and include:

1. Average salaries and wages for 0.21 FTE
2. Employee benefits for 0.21 FTE
3. Good and services

Additional costs are allocated by FTE and include:

1. Enterprise software
2. Telecommunications
3. Campus Reallocation - Help Desk
4. Building Cost Allocations
5. Indirect costs

Costs for Operational Inspections and Licensure

The workbook provided to Greene titled “Shellfish License Fee Analysis Workbook Final” presents the costs associated with inspections and licensing. These costs are provided with historical actual data for FY2016 through FY 2022, estimated data for FY2023, and projected data for PFY2024 through PFY2031. The primary components of operational inspections and licensure costs are License Costs, which include the subset of Annual License, HTS Annual License, and GFS Tribal License Costs; Harvest Sites Costs, which include GFS Harvest Sites and GFS Harvest Sites HTS; GFS Permit Costs; and GFS Tribal/LEAN/Other Costs. The costs designated as “LEAN” in these worksheets are costs that were identified by DOH for further review and were removed from the cost estimates pending the results of LEAN analysis. These costs sum to a total of $1.48 million for PFY2024. This section presents the specific costs included in each of these cost categories as well as their total costs.

License Costs

The total for all license costs for PFY2024 is $664,184. The costs specific to annual license fees, which include the inspections and annual registration costs, sum to $603,028 for PFY2024, Net of Tribal license costs, the total is $569,302 for PFY2024 and includes:

1. Average salaries and wages of 3.39 FTE, which includes inspection staff
2. The employee benefits for 3.39 FTE
3. Any associated contracts
4. Good and services
5. Travel

Additional costs are allocated by FTE and include:

1. Enterprise software
2. Telecommunications
3. Campus Reallocation - Help Desk
4. Building Cost Allocations

Costs specific to Health Technology Solutions (HTS) sum to $41,156 for PFY2024 and include:

1. Average salaries and wages for 0.75 FTE
2. Employee benefits for 0.75 FTE
3. Capital outlays for enterprise software, telecommunications, and others “not specified”
4. Campus Reallocation - Help Desk
5. Building Cost Allocations
6. EHAPPS Online Payments (1 time cost)
7. Indirect costs

GFS Tribal license costs sum to $33,726 for PFY2024 and include:

1. Annual License GFS Tribal
2. New/Expired GFS Tribal
3. Non-Compliance Tribal

Harvest Sites Costs

The total cost for harvest sites in PFY2024 is $214,820.

Harvest site costs currently offset with GFS and regularly covered by GFS sum to $134,317 for PFY2024 and include:

1. Average salaries and wages for 0.92 FTE
2. Employee benefits for 0.92 FTE
3. Good and services

Additional costs are allocated by FTE and include:

1. Enterprise software
2. Telecommunications
3. Campus Reallocation - Help Desk
4. Building Cost Allocations

GFS Harvest Sites HTS costs sum to $80,503 for PFY2024 and includes:

1. Average salaries and wages
2. Employee benefits
3. Enterprise software
4. Telecommunications
5. Campus Reallocation - Help Desk
6. Building Cost Allocations
7. Indirect costs

GFS Permit Costs

GFS Permits costs sum to $81,364 for PFY2024 and include:

1. Average salaries and wages for 0.57 FTE
2. Employee benefits for 0.57 FTE
3. Good and services

Additional costs are allocated by FTE and include:

1. Enterprise software
2. Telecommunications
3. Campus Reallocation - Help Desk
4. Building Cost Allocations
5. Indirect costs

GFS Tribal/LEAN/Other Costs

GFS Tribal/LEAN/Other costs sum to $542,881 for PFY2024 and include:

1. Average salaries and wages for 3.07 FTE
2. Employee benefits for 3.07 FTE
3. Good and services
4. Travel

Additional costs are allocated by FTE and include:

1. Enterprise software
2. Telecommunications
3. Campus Reallocation - Help Desk
4. Building Cost Allocations
5. Indirect costs

Costs Related to Export Certificates

The workbook "Shellfish Export Fee Analysis Workbook Final" presents the costs associated with Export Certificates. These costs are provided with historical actual data for FY2016 through FY2022, estimated data for FY2023, and projected data for PFY2024 through PFY2030. The primary components of export certificate costs are program administration and HTS for the export certificate system. These costs sum to a total of $169,599 for PFY2024. This section presents the specific costs included in each of these cost categories as well as their total costs.

Program Administration Costs

Program administration costs sum to $143,702 for PFY2024 and include:

1. Average salaries and wages for 1.04 FTE
2. Employee benefits for 1.04 FTE
3. Good and services

Additional costs are allocated by FTE and include:

1. Enterprise software
2. Telecommunications
3. Campus Reallocation - Help Desk
4. Building Cost Allocations
5. Indirect costs
6. Vacancy savings

HTS – Export Costs

HTS costs for the export certificate system sum to $25,897 for PFY2024 and include:

1. Average salaries and wages for 0.25 FTE
2. Employee benefits for 0.25 FTE

Additional costs are allocated by FTE and include:

1. Enterprise software
2. Telecommunications
3. Campus Reallocation - Help Desk
4. Building Cost Allocations
5. Indirect costs

Understanding Tribal License Fee Cost

In 1974, the landmark Boldt Decision (***United States v. Washington***, 384 F. Supp. 312 (W.D. Wash. 1974) reaffirmed the fishing rights for treaty tribes and established co-management of the fishery with the state. In 1993, those rights were expanded to shellfish, through the Rafeedie Decision. Judge Rafeedie ruled that the tribes had reserved harvest rights to half of all shellfish from all of the usual and accustomed areas, except for those cultivated by citizens.[39] Following the Rafeedie Decision, the tribes agreed to abide by the NSSP Model Ordinance and allow the Department to complete sanitary shellfish inspections for them through the Shellfish Sanitation Consent Decree in 1994.[40] Within this agreement, section II D states, "*The state shall not charge a fee for licensing any Tribal treaty or individual treaty shellfishing operation*[...]."

Per this agreement, the department does not charge tribes for licensing fees. The licensing costs are covered under GFS and were therefore not incorporated into the full cost recovery calculation. Tribes do pay for biotoxin testing and those costs/fees are included in the full cost recovery calculations evaluated in Chapter 7.

Cost Review Conclusions

Our team reviewed the costs that were included in the spreadsheet analysis- including the assumptions regarding staff allocations, labor requirements for inspections, application processing, indirect costs and allowances for inflation. We confirmed our understanding of program operations and workflows during the LEAN assessment and through a site visit to the Public Health Lab in Shoreline. Based on these reviews, it is our opinion that the cost estimates used as the basis for developing the alternative fee structures accurately reflect the current understanding of operating costs for the program and are reasonable and accurate.

6.3. Cost Allocation Methods Reviewed

The review of the documents presented in Table 16 indicated that the Department considered several cost allocation methods for license fee setting purposes. For this portion of our analysis, we reviewed all methods that were considered by the Department, including ones not recommended. Seven cost allocation methods were calculated and presented, six of which were not selected. This section

[39] Northwest Indian Fisheries Commission. Radfeedie Decision Available here.
[40] Shellfish Sanitation Consent Decree. 1994. Available here.

identifies and briefly describes each of these. The application of the selected method to develop a proposed fee structure is discussed in more detail in the following section.

Method 1 – Based on Inspections

The first method presented is the "Original" method, which was calculated in March of 2023. This method calculates the fee using the equation:

% of annual inspection time * total cost / number of operations = annual fee

This method was not chosen as it was too simplified, in favor of adding in different sizes of operations to the equation and supports a greater level of detail to be added to the fee schedule, as presented in the second option.

Method 2 – Updated Version of Method 1

The second method is the "Updated" method, referred to throughout the report as the PFCR fee, which is the method chosen by the Department and further discussed in section 6.4.

Method 3 – Across the Board Increase

The third option considered was the "across the board increase and postpone fee schedule update" method, in which the allocation method is not changed with an across the board increase until the next fee analysis, when better data is anticipated to be available. This option was prepared for review as the program did not think it was fitting to use the inspection time percentage method. However, this method would need justification on why inspection time would not be suitable for cost allocation, and none was provided. Further, this method allocates more costs to smaller operations which generates concerns within the industry.

Method 4 – Based on Inspection and Annual Registration

The fourth option presented was the "Operation annual registration fee + Inspection fee" method. Using this method, the cost per inspection was calculated to determine the annual inspection fee. The remaining cost is then split between operations through the annual registration fee by facility type and billing type categories to calculate the total annual fee. The program feedback on this option included the argument that it is not fair to have an across-the-board annual registration fee because operation cost impact mirrors the inspection time pattern, signifying that inspection time was a better predictor of associated cost per operation type. Further, if this method was used it can be argued that a more comprehensive study on costs would need to be completed to finalize the fee schedule.

Method 5 – Based on Acreage

The fifth method is called the "Acres" method. This method would require that the DOH acreage data be updated for consistency to use for this purpose. It could be based on either total or harvestable acres, but it would need to be consistent. Industry concerns include that setting fees on productive acres is not fair as they would then be based on potential profit instead of costs of regulatory services (inspections). Upon review of existing data, the Department concludes that the fees would be more appropriately applied by operation type. It is also argued that not using the onsite inspection time would need to be justified as it is the primary annual action and can be considered a strong predictor of other regulation costs of facilities.

Method 6 – Based on Oyster/Production and Profits

The next option considered is the "Oyster/Production" method, which is also related to profits. However, as discussed in Method 5, productivity or profitability does not affect inspection costs. Inspections occur by type (i.e. HA1, SS2, SP4). Onsite inspection time appears to be a better measure of regulation costs than production of operations. Additionally, this program is based on cost recovery and should not be a taxing program. The cost should be allocated based on cost driver, which in this case is onsite inspection time.

Method 7 – Based on Hourly Rates for Onsite Inspection Time

The final method reviewed but not selected is "Hourly Rate for onsite inspection time." Under this method, each operation would not be charged by the hour, but the hourly charge is used to develop the annual cost per operation. This method was requested by program leadership to assess if it might result in a lower rate. The exercise demonstrated that although the method included a different calculation, the outcome resulted in the same fee as the "percent of inspection time" calculation. This is not surprising, as the base for both calculations is total program cost.

6.4. PFCR Fee Estimate and Fee Allocation

The Department chose the "Updated" method, or Method 2, to be used in the fee setting process. This one is similar to the original process described above (Method 1), with the exception that it uses the inspection type by facility type and billing type group to allocate licensing inspection and registration costs to determine the associated annual fee. This was determined to be a more objective and reasonable way to allocate licensing costs and set fees, as it applies the costs of the program based on the operation type and size and its associated share of inspection time, which is the largest cost component of the licensing program. The fees calculated when this method is applied to the full cost estimates vary by facility type and billing group. These results are presented in Table 1 in Chapter 1 of this report. The fee structure developed by applying this allocation method is referred to as Proposed Full Cost Recovery or PFCR fee plan.

In addition to license and biotoxin testing—which make up the bulk of the program costs, the Department also performs additional inspections, issues permits, conducts Geoduck testing, issues export certificates, and responds to complaints. Between 2016-2022 the Department collected fees to cover the cost of Geoduck testing and the issuing of export certificates. As part of the PFCR the Department is proposing to adjust these fees to achieve full cost recovery and to add additional fees for some specific services. These are summarized in Table 2 in the Introduction chapter. These fees are paid by subsets of producers based on the activities they would like to participate in and are referred to as "use fees." These costs are the same whether a producer is Tribal or not. However, they are industry costs, and they will have impacts on some producers and so are included in the overall analysis presented in Chapter 7 as an additional consideration.

While the proposed fee increases associated with full cost recovery are significant, it is important to note that the Department has not increased PSP geoduck fees since 2002, license fees since 2007, and biotoxin testing fees and export certificate fees since 2015.

Recalling Figure 4, the PFCR fee plan serves as the basis for the analysis in Chapter 7 of industry capacity to absorb the cost increases associated with this fee structure. The analysis in Chapter 7 will also explore what the fee structure would have looked like if the 2022 fee structure had been increased to keep pace with inflation. The analysis in Chapter 8 examines whether additional elements could be removed from the cost estimations and how that would impact the capacity of the industry to bear an increase.

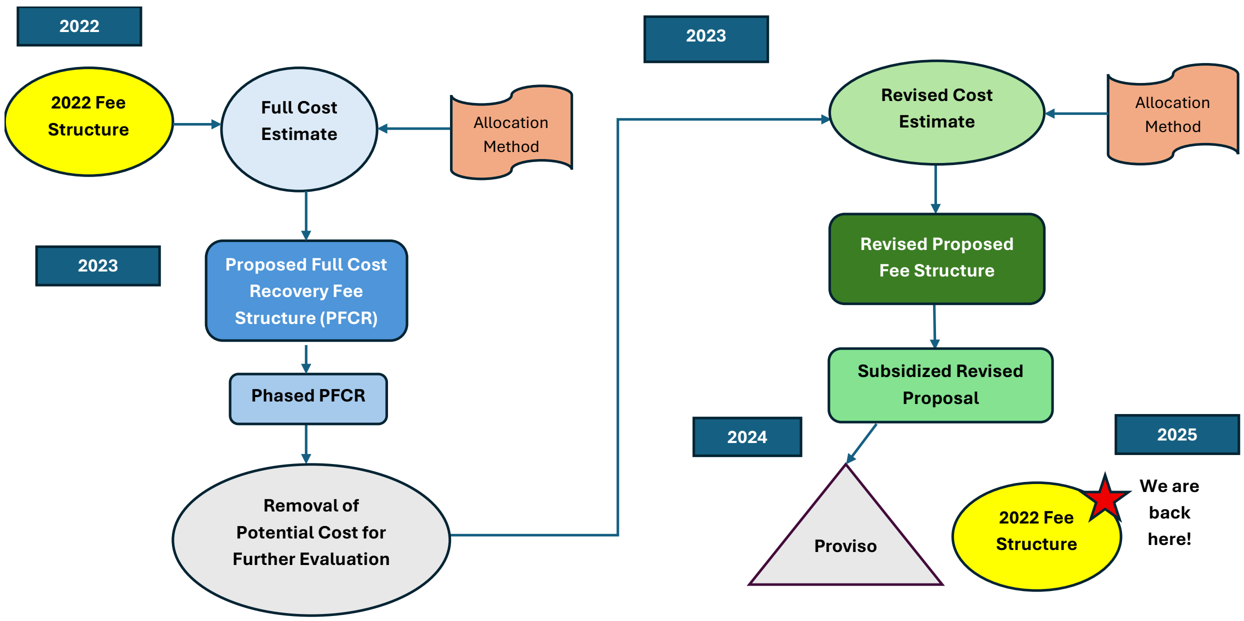

Figure 9. Full Cost Recovery Fee Structure Process

7. Industry Capacity to Bear Fees

As a result of the background research (Chapters 2 and 3), DOH fee analysis (Chapter 6), and the interview information (Chapter 4), the research team then analyzed the PFCR based fees to determine the viability of the industry to support these costs. A discussion of alternative strategies to address any shortfalls in the industry capacity to bear the fee increases completes this chapter.

7.1. Background and Previous Research

Previous research regarding the impact of governmental regulatory structures on shellfish aquaculture dates back to 1994[41] and has primarily focused on estimating the total annual cost of regulatory compliance to businesses within the industry. A 2020 study by van Senten et al.[42] split these estimations into three primary categories. The first of these categories is ‘regulatory burden,’ or the increase in farm costs due to regulatory program requirements or fees. The major cost factors considered for this category include the acquisition of permits and licenses, costs associated with testing, costs of equipment and supplies purchased as a result of regulatory action, and the value of labor associated with monitoring, record-keeping, or reporting. This category of analysis directly correlates to the subject of the current research effort for DOH. The researchers also cover a second category called ‘lost sales revenue’, covering costs stemming from regulatory actions or trade barriers that restricted access to additional markets. A third category analyzed consists of ‘lost opportunities,’ where regulations have imposed limits on the expansion or diversification of aquaculture operations and have thus reduced their potential earnings. The van Senten et al. study conducted a survey to gather information surrounding these costs which captured 74 percent of the value of Pacific coast shellfish production within its respondents; the study also incorporated farm records that documented sales prior to regulation in order to calculate lost sales revenue.[43]

At a national level, Engle et al.[44] found that in 2023, the annual regulatory burden on aquaculture farms in the United States totaled $196 million. The most significant of these costs included direct regulatory compliance costs (other than permits and licenses) at 28 percent of the total, management and labor at 25 percent, taxes at 14 percent, insurance at 12 percent, capital costs at 10, changes due to regulations at 6 percent, legal, accounting and professional services at 3 percent, and permits and licenses at 2 percent.[45] Lost sales revenue and lost opportunities combined to generate a total of $807 million.[46]

[41] Thunberg, E. M., C. M. Adams, & C. E. Cichra. 1994. Economic, regulatory, and technological barriers to entry into the Florida aquaculture industry. Available here.

[42] van Senten, J., C. R. Engle, B. Hudson, & F. S. Conte. 2020. Regulatory costs on Pacific coast shellfish farms. Available here.

[43] van Senten, J., C. R. Engle, B. Hudson, & F. S. Conte. 2020. Regulatory costs on Pacific coast shellfish farms. Available here

[44] Engle, C. R., J. van Senten, S. Hegde, G. Kumar, C. Clark, N. Boldt, G. Fornshell, B. Hudson, E. J. Cassiano, & M. A. DiMaggio. 2025. The National Regulatory Cost Burden on US aquaculture farms. Available here.

[45] Ibid.

[46] Ibid.

The Pacific coast (Washington, Oregon, and California) represents only 22 percent of the total number of aquaculture farms within the United States, and yet makes up 54 percent of the country's total shellfish value.[47] When isolating annual impacts specifically to shellfish farms along the Pacific coast, Engle et al. estimated the total regulatory burden cost to be approximately $20.8 million, with a mean regulatory burden cost value of $320,519 per farm; by comparison, the categories of lost sales revenue and lost opportunities accounted for $360 million combined.[48] Within the same region, van Senten et al.[49] estimated regulatory burden to be $15.6 million annually, lost sales revenue to be $110 million, and lost opportunities to be $169.9 million. Per farm, these costs resulted in an annual average of $240,621[50] in 2019 dollars, which would be approximately $300,776 in 2024 (see Table 18). This suggests a similar cost level was found in both studies. Assuming that the share of regulatory burden was the same now as in the 2020 van Senten et al. study, the current share of regulatory costs per farm along the Pacific Coast would be about $16,921.

Table 18. Annual Regulatory Cost Estimates from Literature

Item	Engle et al. 2025 *(millions)*	van Senten 2019 *(millions)*	Updated to 2024 *(millions)*	Share	Mean Farm Estimate*
Regulatory Cost	$20.8	$15.6	$19.5	5.3%	$16,921
Lost Sales	$360	$110	$137.5	37.2%	$119,313
Lost Opportunities		$169	$213.7	57.5%	$184,285
Total	**$380.8**	**$296**	**$370.7**	**100%**	**$320,519**
Mean Farm*	$320,519	$240,621	$300,776		

*Items starred are reported in dollars and not millions of dollars.

The 2020 van Senten et al. study contained several estimated values specific to Washington State. Of the $15.6 million associated with regulatory burden in the Pacific coast region, $5.1 million came from Washington, with the average costs estimated at $171,481 per farm and $55,662 per acre in 2019 dollars.[51] Washington also possessed the greatest value for annual lost sales revenue and lost opportunities, at $78,024,400 and $97,358,518, respectively.[52] Notably, the average annual **costs associated with all permits and licenses were highest in Washington, at $12,129 per farm (or about $15,400 in current year dollars), nearly double those found in Oregon and California.** And the Washington industry reportedly lost significantly more sales revenue specifically due to delays in all

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47 United States Department of Agriculture. 2014. Census of aquaculture (2012). Available here.

48 Engle, C. R., J. van Senten, S. Hegde, G. Kumar, C. Clark, N. Boldt, G. Fornshell, B. Hudson, E. J. Cassiano, & M. A. DiMaggio. 2025. The National Regulatory Cost Burden on US aquaculture farms. Available here.

49 van Senten, J., C. R. Engle, B. Hudson, & F. S. Conte. 2020. Regulatory costs on Pacific coast shellfish farms. Available here.

50 Ibid.

51 Ibid.

52 Ibid.

types of licenses and permits or obtaining those permits (**those permits have more to do with permits from organizations other than those from DOH**), at $2.6 million and $3.2 million, respectively.[53]

It's important to realize that these industry averages cover a very heterogeneous group of industry participants from large operations with over 10,000 acres and shipping and distribution systems to many small farms growing shellfish on one or two acres. Several studies have found that the cost of regulatory compliance disproportionately impacts small businesses. Engle et al. calculated an average rate of $69,936 in regulatory costs per hectare of farmed land; this rate had an inverse correlation with the size of the studied operation.[54] For Pacific Coast shellfish in particular, the study found that the average rate for farms with more than four hectares was less than $10,000 per hectare, but that value rose to greater than $90,000 per hectare for farms with less than four hectares.[55]

A common theme within the literature involves the negative relationship between the complexity or redundancy of regulatory actions and the health of the domestic aquaculture industry. These kinds of regulations have been shown to contribute to slower economic growth generally,[56] and there is also evidence to support the idea that over time they are increasing in abundance with regard to aquaculture specifically.[57] [58] [59] [60] Complex or redundant regulation has been linked with reduced technical efficiency on farms resulting from pulling manpower and resources away from production and marketing in order to service record-keeping and reporting activities.[61] Ultimately, it is believed that these patterns may result in an overall decrease in aquaculture farm productivity[62] [63] and growth.[64] [65]

The United States aquaculture industry experiences elastic demand and operates within a highly competitive market. Therefore, businesses within that market may be unable to consistently pass on

53 Ibid.

54 Engle, C. R., J. van Senten, S. Hegde, G. Kumar, C. Clark, N. Boldt, G. Fornshell, B. Hudson, E. J. Cassiano, & M. A. DiMaggio. 2025. The National Regulatory Cost Burden on US aquaculture farms. Available here.

55 Ibid.

56 Dawson, J. W., & J. J. Seater. 2013. Federal regulation and aggregate economic growth. Available here.

57 Engle, C. R., & N. M. Stone. 2013. Competitiveness of US aquaculture within the current US regulatory framework. Available here.

58 Knapp, G., & M. C. Rubino. 2016. The political economics of marine aquaculture in the United States. Available here.

59 Rubino, M. 2022. Policy considerations for marine aquaculture in the United States. Available here.

60 Wirth, F. F., & E. J. Luzar. 2001. Regulatory climate toward finfish aquaculture: The impacts of state institutional structure. Available here.

61 van Senten, J., C. R. Engle, K. Hartman, K. K. Johnson, & L. L. Gustafson. 2018. Is there an economic incentive for farmer participation in a uniform health standard for aquaculture farms? An empirical case study. Available here.

62 Duff, J. A., T. S. Getchis, & P. Hoagland. 2003. A review of legal and policy constraints to aquaculture in the US northeast. Available here.

63 Lockwood, G. S. 2017. Aquaculture: Will it rise to its potential to feed the world.

64 Farquhar, S. D., S. Sims, S. Wang, & K. Morrill. 2017. A brief answer: Why is China's aquaculture industry so successful? Available here.

65 Kite-Powell, H., M. C. Rubino, & B. Morehead. 2013. The future of US seafood supply. Available here.

increased regulatory costs to consumers, resulting in operations with reduced access to funds and resources exiting the industry in greater numbers than those that can withstand these financial losses.[66]

Of the three major cost categories analyzed for this literature review, regulatory burden is of the most pertinence with respect to the analysis of the DOH commercial shellfish licensing and testing fee program. Nonetheless, it is clear that the categories of lost sales revenue and lost opportunities both represent important economic mechanisms within the industry and should be taken into consideration when engaging in regulatory decision-making, despite the lack of detailed information present in the literature regarding their delineation.

7.2. Current Fees, Proposed Fees, and DOH Revenue

The current base license fees are presented in Table 19. Table 20 shows the numbers of operators who have obtained the various license types over the years in each category. Tribal operators are issued licenses, but as discussed in Chapter 6, they do not pay licenses fees. The costs to issue Tribal licenses are not recoverable through a fee structure and will need to remain covered with revenue from the state general fund (GFS).

Noticeable from both tables is that total fee revenue and the total number of licenses sold have varied from year to year, without a clear trend upward like that seen in the NASS revenue table above (Tables 3 and 4 in Chapter 2) that showed a 10-year increase in sales.

In addition to the fees paid by the industry for licenses, each operator must also pay an annual biotoxin testing fee, again based on the category of operations (see Table 21). Tribal operations pay the same base biotoxin testing fees as non-Tribal operations. The current and proposed fees are presented in Table 1 in Chapter 1. Table 21 shows that under the PFCR, fees range from $1,200 to $8,201 and would have generated over $562,000 in 2024.

[66] Bailey, J., & D. W. Thomas. 2017. Regulating away competition: The effect of regulation on entrepreneurship and employment. Available here.

Table 19. Annual Non-Tribal License Fee Amounts and Revenue Received 2018 - 2023

		FY18	FY19	FY20	FY21	FY22	FY23
Harvester non-Tribal	2 or less	$263	$263	$263	$263	$263	$263
Harvester non-Tribal	3 or more	$263	$263	$263	$263	$263	$263
Shellstock shipper non-Tribal	0 - 49 acres 2 or less	$297	$297	$297	$297	$297	$297
	0 - 49 acres 3 or more	$297	$297	$297	$297	$297	$297
	50 or greater acres	$476	$476	$476	$476	$476	$476
Shellstock shipper wholesale only	SS wholesale	$297	$297	$297	$297	$297	$297
	SS wholesale- DNR tracts only	$297	$297	$297	$297	$297	$297
Shucker-packer non-Tribal	(plants < 2000 sq ft) 2 or less	$542	$542	$542	$542	$542	$542
	(plants < 2000 sq ft) 3 or more	$542	$542	$542	$542	$542	$542
	(plants 2000 -5000 sq ft) 2 or less	$656	$656	$656	$656	$656	$656
	Plants > 5000 sq ft n/a	$1,210	$1,210	$1,210	$1,210	$1,210	$1,210
	(plants 2000-5000 sq ft) 3 or more	$1,210	$1,210	$1,210	$1,210	$1,210	$1,210
Total Fee Revenue		$113,535	$105,076	$62,266	$146,202	$96,756	$103,232

Table 20. Number of Annual Licenses Issued 2018 - 2023

		FY18	FY19	FY20	FY21	FY22	FY23
Harvester non-Tribal	2 or less	63	60	61	61	36	33
Harvester Tribal	2 or less					-	15
Harvester non-Tribal	3 or more					24	26
Harvester Tribal	3 or more					10	9
Harvester Tribal -	certified Tribal only tracks					13	13
Shellstock Shipper non-Tribal	0 - 49 acres 2 or less	187	203	192	194	63	59
	0 - 49 acres 3 or more					43	41
	50 or greater acres	23	26	24	26	24	24
Shellstock Shipper Tribal	0 - 49 acres 2 or less					4	4
	0 - 49 acres 3 or more					1	1
	50 or greater acres					6	7
Shellstock Shipper wholesale only	Non SS DNR tracts					88	82
	Non SS DNR tracts Tribal					6	6
	SS DNR tracts only					5	11
Shucker-Packer non-Tribal	(plants < 2000 sq ft) 2 or less	8	8	7	7	3	3
	(plants < 2000 sq ft) 3 or more	7	7	7	7	4	4
	(plants 2000 -5000 sq ft) 2 or less					1	1
	Plants > 5000 sq ft n/a					6	6
	(plants 2000-5000 sq ft) 3 or more	6	5	5	5	6	6
Shucker-Packer Tribal	(plants < 2000 sq ft) 2 or less						
	(plants < 2000 sq ft) 3 or more						
	(plants 2000 -5000 sq ft) 2 or less						
	Plants > 5000 sq ft n/a					1	1
	(plants 2000-5000 sq ft) 3 or more					1	1
Total Licenses Issued		294	309	296	300	345	338

Table 21. PFCR Biotoxin Fees and Revenue Estimated for FY2024

Operator		Number of Operators FY24	Per Operator Fee	Total Revenue
Harvester	2 acres or less	35	$1,200	$42,000
Harvester Tribal	2 acres or less		$1,200	$0
Harvester	3 acres or more	25	$1,819	$45,475
Harvester Tribal	3 acres or more	10	$1,819	$18,190
Shellstock shipper	0 - 49 acres 2 or less sites	61	$1,336	$81,496
	0 - 49 acres 3 or more sites	42	$2,047	$85,974
	50 or greater acres	24	$3,267	$78,408
Shellstock shipper	wholesale only	93	$673	$62,589
Tribal shellstock shipper	wholesale only	6	$673	$4,038
Tribal shellstock shipper	0 - 49 acres 2 or less sites	4	$1,336	$5,344
	0 - 49 acres 3 or more sites	1	$2,047	$2,047
	50 or greater acres	7	$3,267	$22,869
Shucker-packer	< 2000 sq ft, 2 or less sites	3	$2,557	$7,671
	< 2000 sq ft, 3 or more sites	4	$3,658	$14,632
	2000 -5000 sq ft, 2 or less sites	1	$2,999	$2,999
	> 5000 sq ft n/a	6	$8,201	$49,206
	2000-5000 sq ft, 3 or more sites	6	$4,410	$26,460
Tribal shucker-packer	< 2000 sq ft, 2 or less sites	0	$2,557	$0
	< 2000 sq ft, 3 or more sites	0	$3,658	$0
	2000 -5000 sq ft, 2 or less sites		$2,999	$0
	> 5000 sq ft n/a	1	$8,201	$8,201
	2000-5000 sq ft, 3 or more sites	1	$4,410	$4,410
Total		**330**		**$562,009**

7.3. Additional Use Fees

Export certificates also generate revenue for DOH and support the industry. An export certificate is requested by an operation who would like to export shellstock to a different country. The export certificate is signed by Department staff certifying the shellstock was harvested from an Open and Approved Growing Area. In 2023, export certificates (1,744) generated $95,920 in revenue at a rate of $55.00 each.

Operations harvesting Geoduck must also test for PSP in addition to the biotoxin testing fee that is part of the general fee structure. The gut of Geoducks must be tested because that is where the toxins are concentrated. When toxin levels are very elevated in the gut, the meat is also tested. Due to the fact that Geoducks require more PSP testing than other commercial species and result in the majority of commercial closures each year there is a special fee to manage this species. Producers who require those tests pay a fee that is charged on a per test basis. The per sample test fee is determined by dividing $58,000 by the number of tests performed. In 2023, 366 tests were performed, therefore costing $158.47 each. The total numbers of tests and fees paid by each of the 13 different entities are shown in Table 22 below. below.

Table 22. PSP Geoduck Annual Biotoxin Testing Fees and Revenue 2023

Entity	Number of Samples	Fee
1	104	$16,481
2	20	$3,169
3	21	$3,328
4	2	$317
5	1	$158
6	27	$4,279
7	37	$5,863
8	1	$158
9	38	$6,022
10	5	$792
11	63	$9,984
12	1	$158
13	46	$7,290
Total	**366**	$58,000

DOH currently charges per test fees for Geoduck testing and per certificate fees for export certificates. These fees would be increased under the proposed new fee structure. In addition, the Department would start to charge, on a per use basis, for services in eight other categories. These additional fees, the anticipated number, and the projected revenue are presented in Table 23 below.

Table 23. Current and PFCR Annual Fee Rates and Projected Revenue for Use Fees

Fee Type	Current (2022) Fee	PFCR Fee	Projected Number of Items	2022 Projected Revenue	PFCR Projected Revenue
Export Certificate	$55	$75	1,740	$95,920	$130,000
PSP Geoduck Testing	$158	$305	366	$58,000	$111,630
Harvest Site Permit	None	$31	6,083		$188,573
Wet Storage Permit (recirculating)	None	$904	20		$18,080
Wet Storage Permit (flow-through)	None	$582	16		$9,312
Relay Permit	None	$700	17		$11,900
Bait Permit	None	$204	18		$3,672
Non-Compliance Inspection (virtual)	None	$56	240		$13,272
Non-Compliance Inspection (in-person)	None	$252	1		$252
New/Expired License Inspection Fee	None	$279	55		$15,345
Total			**8,577**	**$153,920**	**$502,836**

7.4. Inflation Adjusted Fees

As previously noted, the Department has not increased PSP Geoduck fees (the $58,000) since 2002, license fees since 2007, and biotoxin testing fees and export certificate fees since 2015. Cost allocation method 3 which was reviewed in Chapter 6 proposed keeping the 2022 fee structure in place and simply adjusting those costs for inflation. The inflation adjusted rates were developed using the Bureau of Labor Statistics Inflation Calculator which is based on the Consumer Price Index, or CPI for the 2022 fee structure. (Table 24). Non-Tribal commercial producers would pay a base fee that consists of the license fee and a biotoxin fee. Tribal producers would only pay the inflation adjusted biotoxin fee.

Table 24. Total Fees Charged in 2022 and Inflation Adjusted (IA) Based on First Year of Fee

	Non-Tribal Commercial License Fees		Biotoxin Fees		Total	
	2022	IA	2022	IA	2022	IA
Harvester 2 or less	$263	$416	$353	$484	$616	$899
Harvester 3 or more	$263	$416	$535	$733	$798	$1,148
SS 0-49 acres, 2 or less	$297	$469	$393	$538	$690	$1,008
SS 0-49 acres, 3 or more	$297	$469	$610	$836	$907	$1,305
SS 50 acres or more	$476	$752	$961	$1,317	$1,437	$2,069
SS Wholesale	$297	$469	$198	$271	$495	$741
SP <2000 sq ft, 2 or less	$542	$856	$752	$1,030	$1,294	$1,887
SP <2000 sq ft, 3 or more	$542	$856	$1,076	$1,474	$1,618	$2,330
SP>5000 sq feet	$1,210	$1,912	$2,412	$3,304	$3,622	$5,216
SP (2000-5000 sq feet) 2 or less	$656	$1,036	$882	$1,208	$1,538	$2,245
SP (2000-5000 sq feet) 3 or more	$656	$1,036	$1,297	$1,777	$1,953	$2,813

Based on the projected numbers of licenses issued in each category, the projected potential annual revenue associated with this fee structure is estimated at $386,623 as shown in Table 25 below.

Table 25. Inflation Adjusted Annual License and Biotoxin Fee Revenue Estimate by Category

Category	Inflation Adjusted Base Fee Structure
Harvester 2 or less	$31,470
Harvester 3 or more	$36,042
SS 0-49 acres, 2 or less	$63,622
SS 0-49 acres, 3 or more	$55,644
SS 50 acres or more	$58,864
SS wholesale	$64,572
SS wholesale-DNR tracts	$5,924
SP <2000 sq ft, 2 or less	$5,660
SP <2000 sq ft, 3 or more	$9,322
SP>5000 sq feet	$34,602
SP (2000-5000 sq feet) 2 or less	$2,245
SP (2000-5000 sq feet) 3 or more	$18,657
	$386,623

These results are presented as a point of reference for the analysis of alternative fee structures presented in Chapter 9.

7.5. Summary

Key summary themes from this background section set the stage for the subsequent viability analysis.

- Current annual base fees (also being referred to as "2022 Fees") range from $0 to $1,210 for the license fees and $353 to $2,412 for the biotoxin fees. The PFCR fees range from **$0 to $6,775** for the license fees and **$673 to $8,201** for the biotoxin fees depending on the license type (Table 1).
- Under the PFCR structure, producers who require additional **per-use services** such as Geoduck testing and export certificates will pay **increased fees**, and **new fees** for some additional services such as a bait permit, fee for a new or expired license, and a recirculating wet storage permit will be applied to those producers who need those services permitted.
- Regulatory costs for aquaculture have been studied for some time, and the research notes that **often smaller producers are more impacted by regulatory costs than larger producers**.
- van Seten et al. (2020) found the **average annual costs of all permits and licenses**, not just those from DOH, in Washington was $12,129 per farm in 2019 ($15,400 in current year dollars), **nearly double those found in Oregon and California.**

- van Seten also estimated the industry reportedly lost significantly more sales revenue specifically due to delays in licenses and permits or obtaining a license or permit **(though these are mostly associated with permits from agencies other than DOH),** than California or Oregon.
- The Washington commercial **shellfish industry has grown i**n terms of the numbers of operators, and the total sales between 2013 and 2023 increasing 18 and 23 percent respectively.
- The industry employs about **1,700 workers** and generates over **$252 million in annual sales** following statistics from USDA.
- In addition, the industry generates a total of over **$416 million per year in the local economy** when the indirect and induced impacts of the industry are counted, accounting for nearly **2,400** jobs.
- The industry accounts for **over $12 million annually** in state, county, and municipal **tax revenues**, with $3 million in direct impacts, plus another $9 million in indirect and induced economic impacts.
- While **licensing fees** have not changed in 23 years, they have actually been **getting less expensive** through time when **adjusted for inflation**. License fees are essentially **63 percent of what they were in 2007 when initiated**, and biotoxin fees are **72 percent of the cost in 2015 when initiated.**

8. Alternative Fee Structures

In addition to evaluating the capacity of industry to bear the imposition of a full cost recovery fee structure, the proviso directs the research to explore alternative fee structures that might be developed and to assess the impact of those alternatives on industry.

The team did not pursue cost allocations methods already reviewed and ultimately rejected by the Department (see Section 6.3 Cost Allocation Methods Reviewed). Rather, the team built on the findings from Chapters 6 and 7 to identify costs that could be removed from the full cost recovery calculations. The team also used the findings from Chapter 5 (Other State Programs) as well as comments submitted by commercial shellfish growers during the comment periods and public hearings associated with the initial rulemaking.

Based on this review and analysis it is the conclusion that the testing and monitoring costs associated with the biotoxin program meet the criteria for classification as a public good and could be removed from the cost estimates. This conclusion is based on four findings:

- Sampling and testing that supports the biotoxin program meets the criteria for classification as a public good,
- of the six shellfish producing states interviewed, though none are as complex as Washington, none recover costs for biotoxin testing through a fee recovery structure imposed on industry, instead covering the costs to administer programs through grants or other revenue sources,
- apart from the current proposed fees, the commercial shellfish industry already collaborates with and supports the program at direct cost to the industry, which contributes to broader public health,

and finally,

- the analysis of industry viability to support full cost recovery (as detailed elsewhere) indicates that there are significant vulnerabilities associated with substantial fee increases. Our review of relevant state law suggests that the secretary has discretion to adjust fees that “would be to the financial disadvantage of the state.”[67]

The next chapter begins with a brief overview of the structure and function and cost associated with the biotoxin testing program. This is followed by a more detailed discussion of the four points above. The chapter concludes with an assessment of the implications and risks associated with shifting the cost of biotoxin testing to the general fund in the current fiscal environment and offers some alternatives for consideration.

8.1. Biotoxin Testing in Washington

Algae, which produces biotoxins, is naturally present in marine water, but usually not at levels of concentration that are harmful to people. However, when they become more abundant in the water, typically from May to October, biotoxins can accumulate in shellfish and become harmful to people.

[67] RCW § 43.70.110 Available here.

Biotoxin testing occurs consistently throughout the year at two-week intervals and increases in frequency when a biotoxin event occurs. The number of sentinel sites is expanded between April and October.

The Marine Biotoxin Program (MBP) aims to protect the public from instances of illness and death following the consumption of shellfish. Paralytic Shellfish Poisoning (PSP), Amnesic Shellfish Poisoning (ASP), and Diarrhetic Shellfish Poisoning (DSP) events can occur year-round, with little indication as to when toxicity levels might rise or fall. These events can result in severe negative public health impacts if not monitored closely and responded to swiftly, making efficiency and communication paramount to the program's success.

There are two prongs to the testing program: phytoplankton monitoring and Sentinel mussel testing. DOH collaborates with two networks, Sound Toxins and the Olympic Region Harmful Algal Bloom Partnership (ORHAB), to regularly monitor phytoplankton in Puget Sound and on the coast. ORHAB collects and analyzes water samples from coastal beaches and bays typically weekly during the winter and two times per week March to November and HAB events. Sound Toxins collects water samples throughout Puget Sound every other week during the winter and weekly between March and October.

Surveillance testing for PSP, DSP, and ASP occurs at consistent two-week intervals via the Sentinel mussel Program. Mussels are used because they will pick up evidence of toxins earlier than any other marine organism. Samples are collected from mussels stationed at over 120 sites in Washington's marine areas. In 2024, a total of 2,229 surveillance samples were collected and tested. Figure 10 shows eight percent of the routine monitoring samples were collected by the commercial shellfish industry while the other 92 percent were collected by local health jurisdictions, volunteers, tribes, and state agencies.

In 2024 over 3,400 samples total were collected (both surveillance and follow up testing) and submitted to PHL (see figure 11). These samples include not just routine monitoring, but also PSP Geoduck testing, recreational testing, tribal testing, and more. A variety of shellstock are tested including geoduck, razor clams, Manila clams, butter clams, oysters, crab, scallops, and mussels. Tribes and local health jurisdictions provide the majority of samples collected (51 percent), with state agencies, volunteers, and commercial shellfish industry collecting the remaining 49 percent.

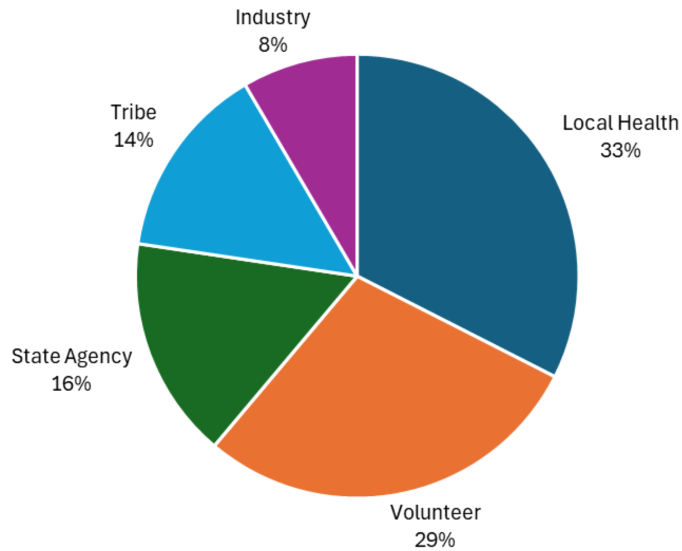

Figure 10. Routine Surveillance Samples Submitted

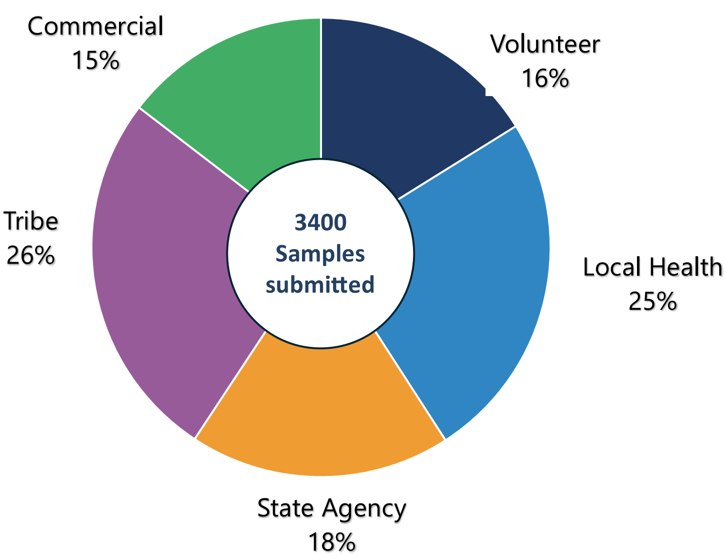

Figure 11. Profile of Total Samples Submitted by Entity

In addition to supporting testing for the commercial shellfish industry, the lab provides testing services that support recreational, illness, sport, research and contract activities. The lab also currently supports Alaska and Oregon by providing DSP testing for their programs because their funding is not sufficient at this time to add needed toxin testing programs. PHL has also supported Oregon by testing PSP outbreak samples because they did not have the capacity at their lab to perform the testing in an emergency situation.[68]

[68] Shelly Lankford, DOH, internal communication April 2025.

8.2. Sampling, Testing and Monitoring Meet Public Good Criteria

Clams, oysters, Geoducks, and mussels are filter-feeding organisms that can accumulate harmful marine biotoxins, including those responsible for Paralytic Shellfish Poisoning (PSP), Amnesic Shellfish Poisoning (ASP) and Diarrhetic Shellfish Poisoning (DSP), and when consumed can pose significant risks to human health. Monitoring and testing programs that detect these biotoxins serve not just shellfish harvesters or seafood consumers, but the entire public. These commercial regulatory tests are non-excludable and non-rivalrous, prevent market failure, protect public health and industry stability, and promote environmental justice and equity.

Defining a Public Good

A public good is both non-excludable—people cannot be easily prevented from benefiting from it—and non-rivalrous—one person's benefit doesn't reduce the benefit available to others.[69] Shellfish biotoxin testing fits this definition. No one can be excluded from using publicly available health alerts or being protected as a result of shellfish beach harvest closures issued by Washington's DOH. Likewise, the dissemination of results does not reduce their value to others. This public data prevents illness and builds trust in the safety of local food systems, clearly qualifying it as a public good. Any asymmetry of information places the public at risk, as consumers cannot visually detect contaminated shellfish, nor can they feasibly conduct their own toxin analysis.[70]

Protecting Public Health

Biotoxin events pose a significant public health risk associated not only with eating contaminated products but also respiratory irritation and failure as a result of airborne exposure. These health risks also come with costs associated with hospital and doctor visits, hospitalization and related health care as well as lost earnings for individuals who are unable to work as a result of exposure. A 2000 report estimated the economic value of public health impacts of HABs nationwide at $22,202,597 annually.[71] Much of the analysis of economic impacts of HAB events in Washington is focused on impacts to recreational Dungeness crab and Razor clam sectors. Using real data from the 2007-2008 season, a 2024 study estimated that a hypothetical season long closure of the recreational Razor clam industry would result in $29 million in sales impact and an additional $10.6 million in labor impacts in two counties.[72] Indigenous communities and populations that rely on subsistence harvesting are often disproportionally affected by these health impacts.

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[69] Samuelson, P. A. (1954). The pure theory of public expenditure. Review of Economics and Statistics, 36 (4), 387–389. Available here.

[70] Akerlof, G. A. (1970). The market for "lemons": Quality uncertainty and the market mechanism. Quarterly Journal of Economics, 84 (3), 488–500. Available here.

[71] D. Anderson, P. Hoagland, Y. Kaoru, A. White (2002). Estimated Economic Impacts form Harmful Algal Blooms (HABS) in the United States. Woods Hole Oceanographic Institution. Available here.

[72] Di Jin, M. Kourantidou, M. Weir, I. Horstmann (2024). Assessing the value of harmful algal bloom forecasts in the Pacific Northwest. ICES Journal of Marine Science. Vol 81. Issue 9. Available

There are also indirect costs associated with a public health event. Washington's shellfish industry contributes over $416 million annually to the state's economy and supports thousands of jobs.[73] Ensuring the safety of these products through reliable testing is essential not just for public health but for the long-term stability of the industry. A single outbreak linked to contaminated shellfish could cripple consumer trust and export markets. Therefore, government-funded biotoxin monitoring serves not only as a public good but as an essential economic safeguard. This conclusion is reinforced by the results of a 2023 shellfish survey conducted by Ocean Strategies in partnership with David Binder Research which found that 48 percent of the respondents considered food safety was the most important factor they considered when purchasing shellfish for consumption. [74]

Equity and Environmental Justice

Routine testing also advances environmental justice. Indigenous tribes, coastal communities, and low-income populations in Washington disproportionately rely on shellfish harvesting for food security, cultural practices, and income.[75] These communities are particularly vulnerable to gaps in monitoring. Without equitable access to timely and accurate testing data, they bear an unfair share of the health and economic risks posed by biotoxins. State-funded testing ensures that all residents—regardless of geography or income—are protected equally under public health laws.

Furthermore, biotoxin presence is linked to climate change and pollution, both of which are beyond the control of individual harvesters or shellfish companies. As oceans warm the window for increased testing frequency has already been expanded to May through October. DOH is also finding toxins in areas where they had not previously been found. For these reasons the government is best positioned to coordinate the long-term, large-scale monitoring needed to respond to these systemic environmental shifts.[76]

As such, shellfish and biotoxin testing represents a public good, and its continued funding should be a core responsibility of government. Portions of the routine biotoxin monitoring and testing programs are already currently funded with GFS. In addition, lab testing costs during a closure event or public health emergency are already fully funded through the GFS because the lab does not generate enough fees to pay for the extra surveillance and commercial shellfish tests required during a closure.

8.3. Approaches in Other Compact Member States

Greene Economics conducted interviews with program staff from six state programs (Alaska, Maryland, Massachusetts, New Jersey, Oregon, Virginia, and California) that were referenced during the public

[73] Greene Economics, LLC. 2025. Technical Memorandum: "Viability of the Industry to Support Full Cost Recovery**".** Pg.7. Submitted to the Washington Department of Health Shellfish License Certification. April 17, 2025.

[74] Ocean Strategies. 2023. Shellfish Survey. Provided by Brett Veerhusen, principal, Ocean Strategies, via email on June 5, 2025.

[75] Brown, C. L., Harris, S. G., & Powell, M. S. (2017). Tribal shellfish management: A case study in the Pacific Northwest. Marine Policy, 85, 140–146.Avaliable here.

[76] Trainer, V. L., Moore, S. K., Hallegraeff, G. M., et al. (2020). Pelagic harmful algal blooms and climate change: Lessons from nature's experiments with extremes. Harmful Algae, 91, 101591. Available here.

comment period. None have testing and monitoring programs as robust as Washington. None were found to use license or biotoxin fee revenues to support their biotoxin testing and monitoring programs.

The three shellfish producing states closest to Washington, in terms of geography, Oregon, California and Alaska, all use combinations of state funds and grants to fund their biotoxin testing programs. It is worth noting that none of these states are able to fully meet the demand for biotoxin testing within their state and frequently rely on Washington's Public Health Lab for testing support in emergency situations.[77]

The California Department of Public Health has the longest-standing biotoxin monitoring program in the US, conducting year-round coastal bivalve monitoring as well as coastal phytoplankton monitoring. The program is entirely supported by state funds.

Biotoxin testing in Alaska is overseen by the Department of Environmental Conservation. Funding for testing comes from the GFS and from the Commercial Passenger Vessel Environmental Fund. Costs for sample collection and shipping are paid by individual operators in the commercial shellfish industry.[78]

The Department of Agriculture in Oregon (ODA) receives funding from the Department of Fish and Wildlife (ODFW) to oversee shellfish biotoxin testing in Oregon, as part of a broader effort to monitor harmful algal blooms. Samples are collected twice a month by ODA and ODFW staff and tested at an ODA lab. The ODA website states that 'ultimately this partnership between *agencies* (emphasis added) allows fishermen and the seafood industry to have access to markets throughout the US while protecting public health.[79]

These states, and others who are part of the ISSC, consider biotoxin monitoring and testing to be in the broader public interest as noted in Chapter 3.

8.4. Existing Industry Contributions

As noted above, the program in Alaska is a partnership between state agencies and the commercial industry—with the agencies covering the costs of testing and industry absorbing the cost of collecting and submitting samples. This model works well in Alaska because the miles of coastline make it impractical for the state to engage in continuous monitoring across all areas making it more cost effective for growers to harvest and submit samples from specific areas where they operate.

There is a similar partnership in Washington, DOH provides sentinel mussels that can be harvested for testing as well as providing materials for collecting and shipping samples to the lab. In addition to citizen monitors, a number of commercial growers are part of the routine sampling monitoring program, contributing staff time and resources to collection and shipping. As noted in Figures 10 and 11, commercial growers contributed eight percent of the surveillance samples submitted as part of this voluntary collaborative effort in 2024, and 15 percent of the total samples taken.

[77] Lankford, Shelly, DOH personal communication.

[78] Alaska Department of Environmental Conservation. FY 2018 Governor's Operating Budget Department of Environmental Conservation Laboratory Services Component Budget. Pg 3. Available here.

[79] Oregon Department of Agriculture. Shellfish. Available here.

Based on information collected from growers during the interviews, Greene Economics was able to construct a simple chart that considers labor effort, vehicle miles, and communication time that growers absorb to support these efforts. For example, for some different smaller harvesters, costs range from about $150 per sample to about $600 per sample, and the totals assume testing twice per year for between $300 and $1,200 per year depending on location and driving time.[80]

When there is a threat of an outbreak and additional samples or species-specific samples are required, growers submit samples from their own stock and often hand transport samples from collection areas either directly to the lab in Shoreline or to the DOH Offices in Tumwater where they can be sent to Shoreline for testing. For samples submitted in Tumwater, DOH staff repackage samples, update paperwork, and DOH covers the cost of transportation or shipping to the PHL.

In interviews it was clear that industry does not see these efforts as overburdensome because they recognize that everyone benefits from confidence in shellfish safety and, in the event of an outbreak, from timely detection and restoration of the ability to harvest. Growers recognize that as water temperatures increase the probability for outbreaks also increases, making the need for a robust timely testing and monitoring network all the more critical.

It is important, however, to acknowledge that the industry is making a tangible contribution, at an economic cost, to the greater public benefit over and above and apart from the portion of the fees allocated to offset testing and monitoring.

8.5. Biotoxin Testing Costs Represent Potential Financial Harm to the State

The most significant factor influencing the recommendation that fees associated with the biotoxin testing and monitoring program be removed from the fee assessment calculations is the direct cost to the industry. As noted in Chapter 4, the shellfish industry is highly diverse and for many producers, margins are thin, and in some cases almost nonexistent. Labor supplies are uncertain as is weather. In addition, market conditions are highly variable. These uncertainties create conditions where even small increases in costs and fees can have disproportionate impacts to economic viability.

When the fee structure (and the proposed fee increases) is examined in detail, biotoxin fees make up a significant portion of the fee structure both as a discrete cost and as a percentage of the total base fee structure (in part due to having been updated in 2015) as well as the proposed fee increases.

In 2023, biotoxin testing fees made up more than half of the total base fees for all types of operators (except Wholesale Shellstock Shippers) averaging 61 percent of the FY 2023 fees (in part due to having been updated in 2015). Under the proposed new fee structure, the adjustments to the other components brings that average percentage down to 42 percent under the proposed new base fee structure, as shown in the tables below from the Full Cost Recovery Memorandum (Table 26).[81] Note

[80] Greene Economics, LLC. 2025. Technical Memorandum: "Viability of the Industry to Support Full Cost Recovery". Pg. 27. Submitted to the Washington Department of Health Shellfish License Certification. April 17, 2025.

[81] Greene Economics, LLC. 2025. Technical Memorandum: "Viability of the Industry to Support Full Cost Recovery". Pg. 12 & 13 Submitted to the Washington Department of Health Shellfish License Certification. April 17, 2025.

that the Tribal biotoxin fees are not listed, since in each case these are the only base fees paid by the Tribal entities.

Table 26. Annual Non-Tribal Operator Fees in 2022 and Biotoxin Fee Share of Total

Operator		License Fee Per Operation	Biotoxin Fee per Operation	Total Fee per Operation	Biotoxin % of Total
Harvester non-Tribal	2 acres or less	$263	$353	$616	57%
Harvester non-Tribal	3 acres or more	$263	$535	$798	67%
Shellstock shipper non-Tribal	0 - 49 acres 2 or less sites	$297	$393	$690	57%
	0 - 49 acres 3 or more sites	$297	$610	$907	67%
	50 or greater acres	$476	$961	$1,437	67%
Shellstock shipper	wholesale only	$297	$198	$495	40%
Shucker-packer non-Tribal	< 2000 sq ft, 2 or less sites	$297	$752	$1,049	72%
	< 2000 sq ft, 3 or more sites	$542	$1,076	$1,618	67%
	2000 -5000 sq ft, 2 or less sites	$656	$882	$1,538	57%
	> 5000 sq ft n/a	$1,210	$2,412	$3,622	67%
	2000-5000 sq ft, 3 or more sites	$1,210	$1,297	$2,507	52%
AVERAGE % OF TOTAL					**61%**

Under the proposed fee increase structure (PFCR) depending on the size and type of operator biotoxins as a percentage of the total fees varies significantly, ranging from 22 to 63 percent, with an average of 42 percent (see Table 27).

Table 27. Proposed Annual Non-Tribal Operator Fees Under PFCR and Biotoxin Share

Operator		License Fee Per Operation	Biotoxin Fee Per Operation	Total Fee Per Operation	Biotoxin % of Total
Harvester non-Tribal	2 acres or less	$1,037	$1,200	$2,237	54%
Harvester non-Tribal	3 acres or more	$1,046	$1,819	$2,865	63%
Shellstock shipper non-Tribal	0 - 49 acres 2 or less sites	$2,382	$1,336	$3,718	36%
	0 - 49 acres 3 or more sites	$2,561	$2,047	$4,608	44%
	50 or greater acres	$2,560	$3,267	$5,827	56%
Shellstock shipper	wholesale only	$2,396	$673	$3,069	22%
Shucker-packer non-Tribal	< 2000 sq ft, 2 or less sites	$2,178	$673	$2,851	24%
	< 2000 sq ft, 3 or more sites	$5,397	$2,557	$7,954	32%
	2000 -5000 sq ft, 2 or less sites	$6,709	$3,658	$10,367	35%
	> 5000 sq ft n/a	$5,737	$8,201	$13,938	59%
	2000-5000 sq ft, 3 or more sites	$5,737	$2,999	$8,736	34%
AVERAGE % OF TOTAL					**42%**

Tribal operators, who only pay biotoxin fees, would also see an increase in those fees as shown in Table 28.

Table 28. Annual Tribal Biotoxin Fees Per Operation under Current and PFCR

Facility Type	Billing Type Group	Current Biotoxin Base Fee Rates	PFCR Biotoxin Base Fee Rates	% increase
Harvester	Tribal harvester 2 or less	$353	$1,200	340%
	Tribal harvester 3 or more	$535	$1,819	340%
Shellstock shipper	Tribal (0-49 acres) 2 or less	$393	$1,336	336%
	Tribal (0-49 acres) 3 or more	$610	$2,047	340%
	Tribal (50 or greater acres) N/A	$961	$3,267	340%
	Tribal (0-49 acres) WC	$198	$673	340%
	Tribal SS - DNR tracts only	$198	$673	340%
Shellstock shipper (wholesale only)	Tribal (plants < 2000 sq ft) 2 or less	$752	$2,557	340%
	Tribal (plants < 2000 sq ft) 3 or more	$1,076	$3,658	340%
	Tribal (plants > 5000 sq ft) N/A	$2,412	$8,201	340%
Shucker-packer	Tribal (plants 2000-5000 sq ft) 2 or less	$882	$2,999	340%
	Tribal (plants 2000-5000 sq ft) 3 or more	$1,297	$4,410	340%
Average % Increase				**340%**

In addition to increases in the base fees, as part of the PFCR proposal, the Department has proposed an increase in the per test Geoduck testing fee from $158 to $305 per test (see Tables 1 and Table 23). In 2023 the department conducted 366 tests. However, based on ocean warming and other climate related trends, this projection is likely an underestimation of the need and demand for Geoduck testing. Because these costs are borne by individual producers on a case-by-case basis, this increase has the potential to result in significant unanticipated cost increases for certain producers.

As discussed extensively in Chapter 3, the commercial shellfish industry is a vital component of the Washington economy and identity. Shellfish are "an iconic part of Washington's heritage and identity stated 90 percent of the respondents to the Shellfish Survey." Shellfish farms are beneficial to

Washington's economy stated 84 percent and 74 percent said they were beneficial to the environment.[82]

Increasing base license fees to support full cost recovery is necessary, however, when combined with the introduction of new use fees and the new increases in biotoxin testing fees and geoduck testing fees the combined effect may be the proverbial straw that breaks the back, particularly for smaller operations.

8.6. Other Industry Examples and Secretary Discretion

RCW § 43.70.110 opens with a simple statement: "*The secretary shall charge fees to the licensee for obtaining a license." Later in the same paragraph, "[t]he secretary may waive the fee when, in the discretion of the secretary, the fees would not be in the best interest of public health and safety, or when the fees would be to the financial disadvantage of the state." In addition, "fees charged shall be based on, but shall not exceed, the cost to the department for the licensure of the activity or class of activities and may include costs of necessary inspection." (emphasis supplied*).[83]

In evaluating whether including biotoxin costs in the fee recovery analysis is appropriate, it is useful to explore how other industries that are subject to RCW 43.70 implement fee recovery and what they consider. RCW 43.70 and 43.23 apply to all licensing programs where DOH or WSDA directly regulate professional practice or public health oversight. Broadly, these fall into three key groups:

A. Healthcare (DOH-regulated):

- Individual professionals: physicians, nurses, psychologists, dentists, counselors, therapists, technicians, etc.
- Health facilities: hospitals, nursing homes, ambulatory surgery centers, home health agencies, hospices, clinical labs.

B. Agriculture (WSDA-regulated):

- Pesticide applicators: private, commercial, public, structural pest inspectors.
- Fertilizer distributors, feed manufacturers.
- Weighmasters (commodity scale operators).

C. Food Processing & Aquaculture (WSDA & DOH-regulated):

- Food processors: packaged foods, bakeries, beverage plants, dairy processors, frozen food plants, warehouses.
- Shellfish operations (oyster, clam, mussel farming and processing), highly specialized due to marine water monitoring.

Fees vary substantially across sectors depending on industry size, complexity of regulation, and program costs. Nearly all fees are paid annually, although certain WSDA licenses allow multi-year licenses. Fees

[82] Shellfish Survey- ibid.
[83] Washington State Legislature. "RCW 43.70." Revised Code of Washington. Accessed June 2025. [here.]

may also include upfront application fees, examination fees, and occasional inspection or testing charges tied to compliance as shown in Table 29 below.

Table 29. Representative Full Cost Recovery Fee Structures by Sector

Sector	Fee Examples (per year, unless noted)	Primary Fee Structure
Healthcare (DOH)	nurses: ~$138; psychologists: ~$226; denturists: ~$1,700; mental health counselors: ~$125; hospitals (per facility): ~$20K–$46K (via certificate of need & facility licensing)[84]	Individual license + annual renewal + facility fees
Feed/Fertilizer (WSDA)	feed distributors: $50 + tonnage reporting; fertilizer distributors: $50 + ~$0.30/ton	Annual license + volume-based fees
Weighmasters (WSDA)	$80/year + $20 per employee; $60 seal[85]	Annual license
Food Processors (WSDA)	$92–$862/year depending on gross sales[86]	Annual license tiered by sales volume
Shellfish (DOH)	harvester: $263; biotoxin testing: $353–$961 depending on farm size; shucker-packers: up to ~$3,600 total[87]	Annual license + biotoxin program fees

It is also useful to look at how full cost recovery impacts other industries that are subject to the law.

Healthcare (DOH):

- Large professions like registered nurses (~100,000 licensees statewide) pay ~$130/year.
- Niche professions (e.g., acupuncturists, ~1,500 licensees) pay ~$205/year.
- High-cost small pools: e.g., Nursing Home Administrators pay ~$975/year.
- Facilities pay the highest absolute fees: hospitals average ~$50K/year, scaled by bed count.

Food Processing (WSDA):

- Food processors pay $92–$862/year depending on sales.
- Dairy plants pay ~$250/year.
- ~1,200 licensed firms statewide.
- Small businesses often pay under $100/year; large processors pay higher but sustainable fees.

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[84] Washington State Department of Health. "Health Professions Fee Change Information." Licenses, Permits and Certificates (A-Z). Accessed June 2025 https://doh.wa.gov/licenses-permits-and-certificates/professions-new-renew-or-update/health-professions-fee-change-information

[85] Washington State Department of Agriculture. "Weighmaster/Weigher License." Licensing, Permits and Certificates. Accessed June 2025. https://agr.wa.gov/services/licenses-permits-and-certificates/summary-descriptions/weighmaster-license

[86] Washington State Department of Agriculture. "Food Processors." Food Safety. Accessed June 2025. https://agr.wa.gov/services/licenses-permits-and-certificates/summary-descriptions/food-processing-plant-license

[87] Washington State Department of Health. "Commercial Shellfish Licenses." Commercial Shellfish. Accessed June 2025. https://doh.wa.gov/community-and-environment/shellfish/commercial-shellfish/apply-license/harvester-license

Shellfish & Aquaculture (DOH):

- ~350 licensed shellfish companies statewide.
- Small farms: ~$600/year; large shucking plants: ~$3,600/year.
- Higher per-firm cost due to intensive water quality testing, sampling, and public health risk.

Clearly bigger pools result in smaller fees, distributing costs broadly over a wider pool of license holders. For smaller industries, like shellfish, the per firm costs are higher. In addition, higher costs are driven by regulatory complexity, making commercial shellfish one of the more costly industries to regulate, relative to its size.

8.7. Risks and Uncertainties with Removing Biotoxin Costs

Annual operating costs for the PHL have grown significantly in recent years, both because of testing costs and increasing numbers of tests that need to be done as shown in Figure 12 below.

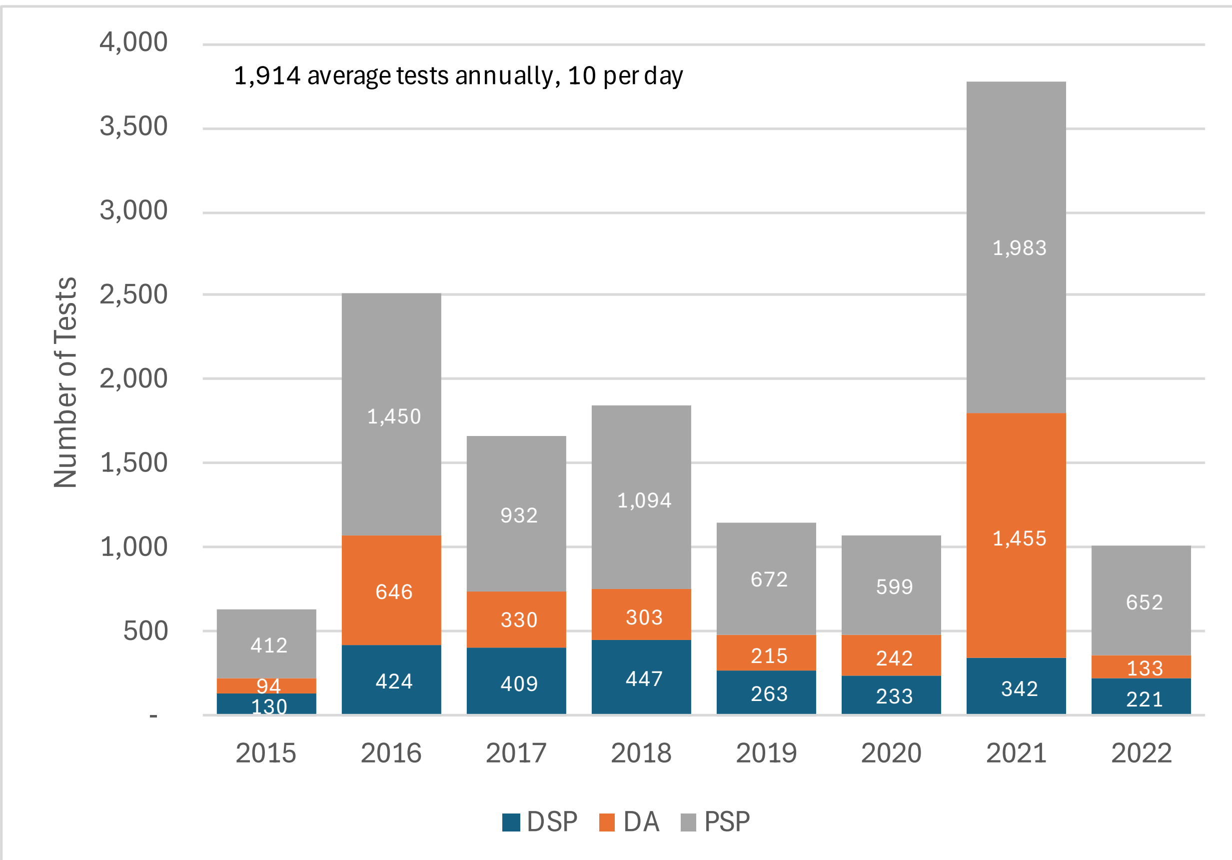

Figure 12. Annual Commercial Testing by DSP, DA, and PSP tests[88]

Projections developed by DOH in 2022 estimated that operating costs for the PHL would be around $948,775 in 2024, increasing to over $1 million by FY 2030, with roughly half of that cost associated with biotoxin testing. As with the overall program, these costs have been and will continue to be supported

[88] Program Data Power Point

with revenue from commercial and recreational fees as well as general funds. In addition, the lab has historically received federal government grants from agencies including NOAA and FDA.

The biotoxin portion of the PFCR base fee structure would generate $562,009 to offset the costs of biotoxin testing (as noted in Table 21, Ch 7). An additional $111,630 in revenue to support geoduck testing would also need to be replaced if these fees were removed from the fee recovery proposal, for a total of $673,639 annually. While not insignificant, the real dollar amount of that replacement would represent a small fraction (about one sixth of one percent, or 0.16 percent) of the total overall annual economic contribution of the commercial shellfish industry ($416 million).

While it is philosophically consistent with the definition of public goods and in alignment with how other states treat the costs associated with biotoxin testing, in the current fiscal climate this decision may expose the industry to an unacceptable level of risk and vulnerability. Annual state budget cycles could **reduce the availability of biotoxin monitoring with reduced GFS leading to much longer commercial shellfish closures** over multiple growing areas. This would have a detrimental impact on the commercial shellfish industry which would also have a ripple impact.

Robust, timely, accurate and trustworthy biotoxin testing is critical to the industry's ability to sell and export shellfish and state's ability to capitalize on direct and indirect revenue generated in association with recreational harvesting activity- as well as maintaining Tribal customs and traditions. In 2025 the Washington State Economic and Revenue Forecast Council predicted a $845 million drop in revenue through 2029,[89] forcing legislators to significantly reduce expenditures to balance the 2025 biennium budget. In such a dismal revenue climate, it is uncertain whether or not even this proportionally modest increase in GFS allocations would be accepted. Practically speaking, removing these funds from the fee revenue stream leaves the program and the industry vulnerable.

It is also important to consider that while sections of RCW 43.70 speak to full cost recovery for licensing fees in general for the Department, the commercial shellfish industry is also governed by the State Board of Health's RCW 69.30 "Sanitary Control of Shellfish" and WAC 246-282[90] which outlines the requirements for regulating commercial shellfish under the ISSC and outlines fees specifically in WAC 246-282-990. Ultimately remaining in compliance with both the ISSC requirements and state regulations is necessary for the survival and sustainability of the industry.

Another option that could be explored would be to keep the current fee structure in place, with some level of fee being paid while continuing to subsidize commercial and Tribal biotoxin fees and PSP geoduck fees with GFS. DOH last raised its PSP geoduck fee in 2002 and commercial biotoxin fee in 2015. Current revenue associated with these fees contributes to biotoxin testing done at the Public Health Lab. The Shellfish Program in Environmental Public Health (EPH) currently does not receive any funds from commercial biotoxin fees or PSP geoduck fees. The amount of revenue from fees and GFS does not fully fund the work done at the Public Health Lab and EPH, so continuation of additional GFS funds would be requested in this option, but not at the level anticipated with fully removing biotoxin testing costs from the fee structure.

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[89] Carter, Simone "Clouds in State Forecast: Projected Collections Through 2029 Drop $845 Million". The Olympian. March 23, 202. Available here.
[90] RCW 246-282-990

A third option to support removing biotoxin fees would be a hybrid approach. The bulk of the biotoxin testing cost increases are associated with the use of a mouse bioassay to test for PSP. The Department is moving towards reducing the use of mice, which will lead to some cost savings, however this reduction will not be as significant as originally anticipated. This is due to changes in the economy and uncertainties at the federal level. The laboratory has relied heavily on Foundational Public Health Services (FPHS), GFS revenue, and grant funding for the last several years to offset the high costs associated with purchasing and maintaining equipment. The economic forecast in Washington has led to a dramatic reduction in FPHS funding (a form of GFS), which will reduce the laboratories' ability to offset the equipment costs using money from FPHS. At the federal level, communication and partnerships with FDA and NOAA staff has made it uncertain if current grant projects to implement the new assay could be completed in 2025. A hybrid approach might be to allocate GFS revenue to cover investments in and upgrades to equipment and maintain a fee structure that included biotoxin testing, so that the Department can replace ageing equipment and maintain the current equipment necessary to make the change until such time as the new systems can be certified and then dropping biotoxin testing costs from the fee structure. Further analysis needs to be done to fully explore the cost implications of this alternative.

9. Conclusions and Recommendations

The Department has the responsibility to preserve public health and the power to inspect and, if necessary, close or limit shellfish harvesting. The department derives such duty and power from the executive branch of government, as spelled out in chapter 43.70 RCW and 69.30 RCW. The department, therefore, may rightly see the duty and power to preserve public health by inspecting and restricting shellfish harvest as superior to all other shellfish-related public policy, duties or powers, by which it may be tasked (such as license fee setting).

The legislation makes license fee setting and revenue optimizing secondary to the secretary's concerns for public biological health and even, as the statute expressly states, to the state's financial health. To be sure, the legislature envisioned the department's oversight of commercial shellfish licensure as an attribute of public health preservation.

However, the secretary has to set fees in accordance with the Administrative Procedures Act and the Regulatory Fairness Act, each of which requires the secretary to attend as needed, for economic reasons, whatever fee setting powers or duties otherwise at the disposal of his or her office.

Implementing a licensure cost policy expresses a statutory ideal, which nonetheless must be harmonized with other passages, such as the prerogative to base fees on financial concerns, and requisite adherence to Administrative Procedures and Regulatory Fairness Acts. A sound policy, therefore, would be to strive for a fee revenue price that satisfies all regulatory costs, reduced as needed by the likely sustainability of local business at that price. This approach comports, also, with the express purposes of the Administrative Procedures and Regulatory Fairness Acts.

If local business cannot withstand such a price, then it cannot be in the best financial interest of the state, which seeks a thriving shellfish industry.

Fee increases are inevitable and cannot be avoided. For this analysis, Greene Economics considered licensing fees and biotoxin fees paid by commercial shellfish operations as well as fees associated with additional services.

Greene Economics evaluated two fee structure options:

Option A: The first option is to implement the PFCR fee allocation as proposed by the Department for both license and biotoxin fees.

Option B: The second is to implement the PFCR fee allocation for only the license fees and eliminate the PSP Geoduck biotoxin fee and base biotoxin fee costs.

The department also explored other fee structure options (see Section 6.3 Cost Allocation Methods Reviewed) that were ultimately rejected and therefore not further researched for this study.

Greene Economics also looked at what the impacts to producers would have had on producers and the amount of revenue that would be generated if the current fee structure had kept pace with inflation. Inflation Adjusted (IA) Comparison: this means that biotoxin fees are updated from 2015 (the last time these were assessed), the license fees are updated from 2007, and the PSP geoduck fee updated from 2002. The resulting comparison of fees is shown in Table 30. The table shows the fees for each type of operation, combining the license fees and the biotoxin fees (except for Option B, which does not include a biotoxin fee).

Table 30. Comparison of Projected Options for Commercial Shellfish Fees

Facility Type	Billing Type Group	Number of Facilities	2022	2022 IA	Option A PFCR	Option B No Biotoxin
Harvester	2 or less	35	$21,560	$31,470	$78,295	$36,295
	Tribal Harvester 2 or less	0	$0	$0	$0	$0
	3 or more	25	$19,950	$28,712	$71,625	$26,150
	Tribal Harvester 3 or more	10	$5,350	$7,330	$18,190	$0
Shellstock shipper	(0-49 acres) 2 or less	61	$42,090	$61,468	$226,798	$145,302
	Tribal (0-49 acres) 2 or less	4	$1,572	$2,154	$5,344	$0
	(0-49 acres) 3 or more	42	$38,094	$54,808	$193,536	$107,562
	Tribal (0-49 acres) 3 or more	1	$610	$836	$2,047	$0
	(50 or more acres)	24	$34,488	$49,648	$139,848	$61,440
	Tribal (50 or more acres)	7	$6,727	$9,216	$22,869	$0
Shellstock shipper (wholesale only)	(0-49 acres) WC	85	$42,075	$62,944	$260,865	$203,660
	Tribal (0-49 acres) WC	6	$1,188	$1,628	$4,038	$0
	SS - DNR tracts only	8	$3,960	$5,924	$22,808	$17,424
	Tribal SS - DNR tracts only	0	$0	$0	$0	$0
Shucker-packer	(plants < 2000 sf) 2 or less	3	$3,882	$5,660	$23,862	$16,191
	Tribal (plants < 2000 sf) 2 or less	0	$0	$0	$0	$0
	(plants < 2000 sf) 3 or more	4	$6,472	$9,322	$41,468	$26,836
	Tribal (plants < 2000 sf) 3 or more	0	$0	$0	$0	$0
	(plants > 5000 sf)	6	$21,732	$31,297	$83,628	$34,422
	Tribal (plants > 5000 sf)	1	$2,412	$3,304	$8,201	$0
	(plants 2000-5000 sf) 2 or less	1	$1,538	$2,245	$8,736	$5,737
	Tribal (plants 2000-5000 sf) 2 or less	0	$0	$0	$0	$0
	(plants 2000-5000 sf) 3 or more	6	$11,718	$16,880	$67,110	$40,650
	Tribal (plants 2000-5000 sf) 3 or more	1	$1,297	$1,777	$4,410	$0
Total base fee revenue		**330**	**$266,715**	**$386,623**	**$1,283,678**	**$721,669**
Total per use fees			$153,920	$236,657	$502,836	$391,206
Industry totals			**$420,635**	**$623,280**	**$1,786,514**	**$1,112,875**
Shortfall			***-$1,365,879***	***-$1,163,234***	***$0***	***-$673,639***

If the fee structure that has been in place since 2007 had been increased to account for inflation, the program would be **$1,163,234 short of full cost recovery, so some adjustment above inflation is needed.**

Greene was asked to evaluate whether or not the industry could bear the “proposed full cost recovery” (PFCR) based on the analysis and feedback from grower interviews, larger operations likely can bear the proposed fee increases, both to the base fees and the per service items. However, this full cost recovery proposal nearly doubles the costs for smaller operations, and they are most vulnerable to economic and environmental uncertainties. If the full cost recovery option is adopted, the industry as a whole will likely continue to function, but its character and composition may be irrevocably changed. **For these reasons adopting the PFCR fee structure (Option “A”) is not recommended.**

It is also important to note that the PFCR fees used in this analysis were projected before the SFY25-27 biennial operating budget (SB5167) was adopted on May 20, 2025. The two-year budget funds, amongst other core services, a new collective bargaining agreement which has implications on projected staffing costs due to a 5 percent cost of living increase (3 percent in SFY25 and 2 percent in SFY26) as well as job class specific salary range increases which will increase overall the cost of administering the program.

Looking at **Option B** (implementing PFCR for license fees and removing biotoxin fees) – this would require a $673,639 additional subsidy from GFS. The benefit to this approach is that costs are more evenly distributed across all the licensing size categories and industry would retain diversity, keeping small farmers farming. It must be noted that if GFS funds were not available for this deficit then reduced biotoxin testing would likely lead to longer and more frequent commercial shellfish closures across all species. This could have a negative impact on the shellfish operations.

A permutation of Option B would be to cover the cost of biotoxin testing with GFS on an interim basis until improved, lower cost test methods could be adopted and implemented. GFS funds could also be used to purchase equipment and supplies needed to facilitate this transition. Once cheaper testing methods are in place, and there is a more accurate picture of the need and demand for testing in light of changing environmental conditions, it might be possible to implement a full cost fee recovery approach for biotoxin testing. In the short run, GFS could be used to secure the biotoxin testing program, setting the stage for full cost recovery for biotoxin testing in the future.

It is worth noting that under Option A, the 31 percent of operator licenses that are small (counting all small harvester licenses, small shellstock shippers, and small shucker-packers) bear 26 percent of the PFCR fees, compared to Option B where the small operators bear just 11 percent of the PFCR total.

Based on this analysis, **it is the recommendation of Greene Economics that Option B should be implemented**. Meaning, DOH should move forward with PFCR for licensing fees and the legislature should secure and allocate additional general fund revenue to offset the annual cost of biotoxin testing for all (currently estimated at $673,639 annually). Future license fees should continue to be adjusted for inflation. It is also recommended that the legislature appropriate additional funds to the Public Health lab to expedite the transition away from mouse-bioassay testing to a testing protocol that is less costly. This will need to be quantified in a separate analysis.

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Appendix A

Worksheets