



# **Small Business Economic Impact Analysis**

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By  
Shon Kraley, Ph.D.

For the  
**Water Quality Program**  
Washington State Department of Ecology  
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## Contact Information

### Water Quality Program

P.O. Box 47600

Olympia, WA 98504-7600

Phone: 360-407-6600

**Website:** [Washington State Department of Ecology](http://www.ecology.wa.gov)<sup>1</sup>

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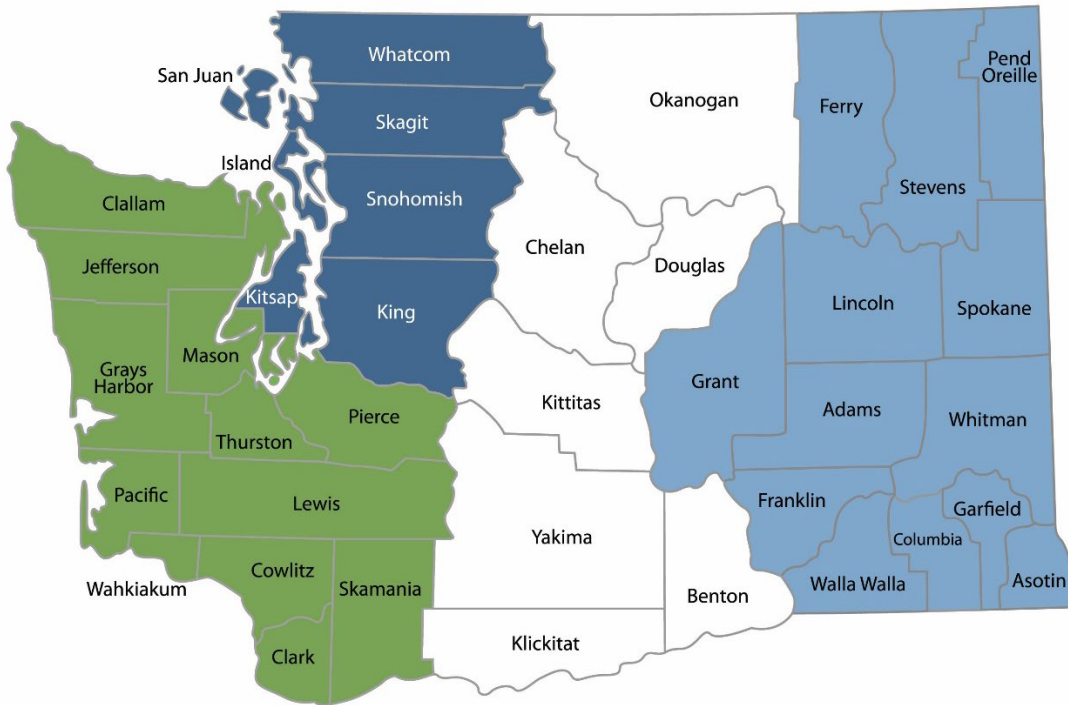
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# Small Business Economic Impact Analysis

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Zostera japonica Management on Commercial  
Clam Beds in Willapa Bay General Permit

Water Quality Program  
Washington State Department of Ecology

Olympia, WA

**October 2024 | Publication 24-10-061**



DEPARTMENT OF  
**ECOLOGY**  
State of Washington

# Table of Contents

<b>Acronyms</b> .....	<b>7</b>
<b>Executive Summary</b> .....	<b>8</b>
<b>Chapter 1: Introduction to the Small Business Economic Impact Analysis</b> .....	<b>12</b>
1.1 Scope.....	12
1.2 Definitions of small and large businesses .....	13
1.3 Permit Coverage .....	13
1.4 Excluded costs.....	14
1.5 Compliance costs included in the SBEIA .....	14
1.5.1 Permit coverage .....	14
1.5.2 Application for coverage .....	15
1.5.3 Discharge limits .....	15
1.5.4 Application of products.....	16
1.5.5 Notification and posting requirements.....	16
1.5.6 Monitoring requirements.....	17
1.5.7 Reporting and recordkeeping .....	17
1.5.8 Spill prevention and control.....	18
<b>Chapter 2: Costs of Compliance with the General Permit</b> .....	<b>19</b>
2.1 Compliance costs .....	19
2.1.1 Permit Coverage.....	19
2.1.2 Application of products.....	20
2.1.3 Notification and posting requirements.....	21
2.1.4 Monitoring requirements.....	21
2.2 Conclusion of the estimated costs .....	23
<b>Chapter 3: Relative Compliance Costs for Small and Large Businesses</b> .....	<b>24</b>
3.1 Analysis of facilities intended to be covered under the general permit .....	24
3.2 Business size data .....	24
3.3 Relative costs of compliance.....	25
<b>Chapter 4: Mitigation of Disproportional Impacts</b> .....	<b>26</b>
4.1 Mitigation options under WAC 173-226-120.....	26
4.2 Mitigation actions .....	26
4.3 Conclusion.....	27
<b>References</b> .....	<b>28</b>
<b>Appendix A: Commercial clams, geoducks, and oysters</b> .....	<b>30</b>
<b>Appendix B: Zostera marina and japonica</b> .....	<b>32</b>

## Tables

Table i: Summary of additional compliance costs by type of cost .....	9
Table ii: Expected permitted growers by number of employees .....	9
Table 1: Summary of additional compliance costs by type of cost .....	23
Table 2: Expected permitted growers by number of employees .....	24

# Acronyms

- CFR Code of Federal Regulations
- CWA Clean Water Act
- COD Chemical Oxygen Demand
- DMP Discharge Management Plan
- DNR Department of Natural Resources
- EPA Environmental Protection Agency
- NPDES National Pollutant Discharge Elimination System
- RCW Revised Code of Washington
- U.S.C. United States Code
- WAC Washington Administrative Code
- WFDF Washington of Fish and Wildlife
- WSESD Washington State Employment Security Department

# Executive Summary

This Small Business Economic Impact Analysis (SBEIA) estimates the costs of complying with the *Zoostera japonica* Management on Commercial Clam Beds in Willapa Bay General Permit (“permit”). It compares the costs of complying with the permit for small businesses (defined as having less than 50 employees) to the costs of compliance for the largest 10 percent of businesses, to determine whether the permit disproportionately impacts small businesses. This analysis is required by state rule in Washington Administrative Code (WAC) 173-226-120<sup>2</sup>, which directs Ecology to determine if the permit imposes disproportionate burden on small businesses, and if it does, to mitigate the disproportion to the extent that is legal and feasible.

This general permit regulates the discharge of the aquatic herbicide imazamox and marker dyes to manage *Zoostera japonica* (*Z. japonica*) on commercial clam beds (excluding geoduck culture) in Willapa Bay. *Z. japonica* is a non-native species of eelgrass listed as a Class C noxious weed on commercial clam beds only. Clam beds are most effected by *Z. japonica* because of the organisms’ preferred location higher on the intertidal zone. This general permit helps Ecology:

- Mitigate and condition the aquatic use of the herbicide imazamox.
- Monitor impacts of imazamox treatments to non-target organisms.
- Track imazamox use rates and locations.
- Ensure that notifications and postings occur in areas where the public or local residents may access the treated areas.

Costs associated with permit requirements include costs of complying with:

- Permit coverage
- Application of products
- Notification and posting requirements
- Monitoring to document impacts to *Zoostera* species within a buffer area

Estimated compliance costs of the permit appear below.

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<sup>2</sup> Chapter 173-226 WAC Waste Discharge General Permit Program  
<https://apps.leg.wa.gov/wac/default.aspx?cite=173-226>



Table i: Summary of additional compliance costs by type of cost

Permit requirements (per permittee)	Per year average (low)	Per year average (high)	5-year total, discounted <sup>3</sup> (low)	5-year total, discounted (high)
Posting signs	\$ 350	\$ 350	\$ 1,712	\$ 1,712
Public newspaper notice	\$ 60	\$ 60	\$ 300	\$ 300
Monitoring	\$ 1,732	\$ 1,925	\$ 8,475	\$ 9,417
<b>Total</b>	\$ 2,142	\$ 2,335	\$ 10,487	\$ 11,429

When comparing the costs of compliance for small businesses to the compliance cost at the largest ten percent of businesses covered by the permit, the governing rule (WAC 173-226-120) allows for this comparison to be made on one of the following bases:

- Cost per employee.
- Cost per hour of labor.
- Cost per one hundred dollars of sales.

We use cost per employee, because this data is readily and most comprehensively available for businesses operating in Washington State.

Table ii lists the average number of employees for the small businesses (less than 50 employees) and the largest 10% of industries in each of the representative industries.<sup>4</sup>

Table ii: Expected permitted growers by number of employees

Employees	Number of Growers	Average number of employees
Fewer than 50	8	7.7
Other 50 or more	1	99

The general permit may impose disproportionately larger costs on smaller permittees. The compliance costs we estimate do not vary by permittee size. Each grower expected to be covered by the general permit incurs the same constant compliance costs. If there are

<sup>3</sup> Ecology uses a discount rate based on interest that could be earned risk-free on today's dollars over the relevant time period. Ecology uses the twelve-year average rate of return offered on the US Treasury's T-Bills (inflation-indexed short-term bonds; US Treasury Department, 2024) as the discount rate, averaging 1.45 percent over the last twelve years.

<sup>4</sup> Employment data for potentially impacted entities comes from Ecology's third-party database of employers with locations in Washington State.

substantial compliance costs that are a function of tideland area, and larger businesses own larger tidelands in Willapa Bay, then it is less likely the general permit imposes disproportionately larger costs on smaller businesses.

There are currently no exemptions for businesses with fewer than 50 employees. There are included, however, mitigation opportunities for all businesses. We assume larger businesses will have larger total costs, and these cost savings will comprise a smaller relative percentage of those total costs. Therefore, these components will likely reduce small business costs by a larger percentage than for large business costs.

These mitigation opportunities include:

- Permittees who have contiguous clam beds that agree to combine treatment efforts are not required to maintain the ten-meter property line buffer on the connecting parcel boundaries.
- Permittees are allowed to use elements of the associated Environmental Impact Statement to substitute for applicable elements of their discharge management plans.

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# Chapter 1: Introduction to the Small Business Economic Impact Analysis

This Small Business Economic Impact Analysis (SBEIA) estimates the costs of complying with the Zoostera japonica Management on Commercial Clam Beds in Willapa Bay General Permit (“permit”). It compares the costs of complying with the permit for small businesses to the costs of compliance for the largest 10 percent of businesses, to determine whether the permit disproportionately impacts small businesses. This analysis is required by state rule in Washington Administrative Code (WAC) 173-226-120<sup>5</sup>, which directs Ecology to determine if the permit imposes disproportionate burden on small businesses, and if it does, to mitigate the disproportion to the extent that is legal and feasible.

## 1.1 Scope

WAC 173-226-120 requires the SBEIA to include:

- A brief description of the compliance requirements of the general permit.
- The estimated costs of complying with the permit, based on existing data for businesses intended to be covered under the general permit, including:
  - The minimum technology-based treatment requirements identified as necessary under WAC 173-226-070.
  - The monitoring requirements contained in the general permit.
  - The reporting and recordkeeping requirements.
  - Plan submittal requirements.
  - Equipment.
  - Supplies.
  - Labor.
  - Increased administrative costs.
- A comparison, to the greatest extent possible, of the cost of compliance for small businesses with the cost of compliance for the largest ten percent of businesses intended to be covered under the permit.
- A summary of how the permit provides mitigation to reduce the effect on small businesses (if a disproportionate impact is expected), without compromising the mandated intent of the permit.

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<sup>5</sup> Chapter 173-226 WAC Waste Discharge General Permit Program  
<https://apps.leg.wa.gov/wac/default.aspx?cite=173-226>

## 1.2 Definitions of small and large businesses

For the purposes of the SBEIA, a small business is an independent entity with 50 or fewer employees. Government enterprises are excluded. Employment is typically based on the highest available level of ownership data.

## 1.3 Permit Coverage

Since 2001, and based on *Headwaters v. Talent Irrigation District* (No. 99-35373, 2000), Ecology has managed the discharge of pesticides to waters of the state under National Pollutant Discharge Elimination System (NPDES) permits to comply with the Federal Clean Water Act (CWA) and with the Washington Water Pollution Act (Chapter 90.48.080 RCW). In 2009, the Sixth Circuit Court ruled in *National Cotton Council et al. v. The Environmental Protection Agency (EPA)* that the discharge of pesticides and their residues to waters of the state requires NPDES coverage. This decision means that NPDES permitting is required for all aquatic pesticide applications throughout the United States.

This general permit regulates the discharge of the aquatic herbicide imazamox and marker dyes to manage *Zostera japonica* (*Z. japonica*) on commercial clam beds (excluding geoduck culture) in Willapa Bay. *Z. japonica* is a non-native species of eelgrass listed as a Class C noxious weed on commercial clam beds only. Clam beds are most effected by *Z. japonica* because of the organisms' preferred location higher on the intertidal zone. This general permit helps Ecology:

- Mitigate and condition the aquatic use of the herbicide imazamox.
- Monitor impacts of imazamox treatments to non-target organisms.
- Track imazamox use rates and locations.
- Ensure that notifications and postings occur in areas where the public or local residents may access the treated areas.

Though a permit has been in place since 2014 for the use of imazamox in Willapa Bay, the baseline for this analysis is that there is no permit, and therefore no imazamox use on commercial clam beds in Willapa Bay. Without a permit, imazamox use is not allowed on any aquatic sites. From that baseline:

- The permit could have included more geographic area than only Willapa Bay. We therefore estimate no additional compliance costs as a result of this limitation. A discussion of geographic areas not covered under the general permit can be found in section 2.1.1.
- The permit restricts the use of imazamox to commercial clam beds only (no treatment on oyster or geoduck beds). This increases the area where imazamox may be used compared to the baseline of no treatment. We estimate no additional compliance costs as a result of 5 this limitation. You can find a discussion of geographic areas with additional species not covered under this general permit in section 2.1.1.

## 1.4 Excluded costs

This SBEIA does not include the costs of complying with existing laws and rules, as permittees would be required to comply with requirements regardless of whether the permit reiterated or referenced them, or if the permit did not exist. Costs excluded from all SBEIAs include the costs of complying with:

- Water Quality Standards for Surface Waters of the State of Washington (Chapter 173-201A WAC)
- Ground Water Quality Standards (Chapter 173-200 WAC)
- Sediment Management Standards (Chapter 173-204 WAC)
- Whole Effluent Toxicity Testing and Limits (Chapter 173-205 WAC)
- Human health based criteria in the National Toxics Rule (40 CFR 131.36)
- National Primary Drinking Water Regulations (40 CFR Chapter 1, Part 141)
- Group A Public Drinking Water Supplies Source Water Protection and Maximum Contaminant Levels (WACs 246-290-135 and 246-290-310)
- Federal Insecticide, Fungicide, and Rodenticide Act laws and labels (7 U.S.C. 136-136y)
- The Washington Pesticide Control Act (Chapter 15.58 RCW)
- The Washington Pesticide Application Act (Chapter 17.21 RCW)
- SEPA rules (State Environmental Policy Act) (Chapter 197-11 WAC)
- Federal laws and rules, including but not limited to the Clean Water Act and federal National Pollutant Discharge Elimination System (NPDES) regulations, if discharging to surface waters.

Discharges not in compliance with the above standards are not authorized, regardless of whether or not the proposed general permit exists. The above standards represent the baseline in the analysis, the state of the world if the permit did not exist. We consider the impacts of the permit on permittees in comparison to this baseline.

## 1.5 Compliance costs included in the SBEIA

While some of the requirements in the permit result in additional costs for permittees, others do not. The following subsections discuss each requirement and identify whether they cause additional cost to permittees.

### 1.5.1 Permit coverage

The discharge of aquatic herbicides is significantly different from a traditional pollutant discharge where the business owner must comply with permit requirements and implement discharge treatment or control methods at their own cost. Imazamox, on the other hand, will

be intentionally discharged for the specific purpose of managing *Z. japonica*, and permittees will not need to implement traditional discharge treatment and control methods to comply with the general permit. The permittee can discharge anywhere from zero to the permitted maximum quantity of imazamox, and costs of using imazamox (such as purchase price and labor spent on application) are not direct compliance costs resulting from the general permit. The permittee does not incur these costs as a result of complying with the general permit.

**Baseline:** No use of herbicides allowed for management of *Z. japonica* on commercial clam beds in Washington State.

**Change:** Allow the use of imazamox for the management of *Z. japonica* on commercial clam beds in Willapa Bay.

**Cost:** None.

## 1.5.2 Application for coverage

RCW 90.48.170 requires applicants to submit an application a minimum of 60 days before performing the activity covered by a permit. WAC 173-226-130(3)(b) provides that we must allow for a public comment period during the 30 days after publication of the second public notice (see Section 2.1.3 for costs associated with public notice). WAC 173-226-190 provides that the public has the right to appeal any permit coverage decision.

WAC 173-226-220 specifies general permits shall be issued for fixed terms not exceeding five years from the effective date, and WAC 173-224-040 specifies the permit fee schedule by category, in dollars per year.

**Baseline:** Existing rules require applicants submit their complete application a minimum of 60 days before applying the imazamox, a period of public comment, and expiration of the permit after 5 years. Existing rules also specify both the requirement and quantity of the annual permit fee.

**Change:** None.

**Cost:** None.

## 1.5.3 Discharge limits

The permittee must develop and implement a Discharge Management Plan (DMP). The application of imazamox must not cause or contribute to a violation of the:

- Water Quality Standards for Surface Waters of the State of Washington (Chapter 173-201A WAC).
- Ground Water Quality Standards (Chapter 173-200 WAC).
- Sediment Management Standards (Chapter 173-204 WAC).

- Human health based criteria in the National Toxics Rule (40 CR 131.36).
- Federal Insecticide, Fungicide, and Rodenticide Act laws and labels.
- The Washington Pesticide Control Act (Chapter 15.58 RCW).

Permittees must also comply with all other applicable federal and state laws. Only Washington-licensed applicators with a Washington State Department of Agriculture aquatic pesticide applicator license or applicators under direct supervision of a licensed applicator may apply herbicides to water. Requirements for discharge limits are mandated by existing federal and state regulations.

**Baseline:** The EPA requires the development of a DMP in its NPDES permit for aquatic pesticide application and state permits must not be less stringent than federal permits. Permittees must comply with applicable federal and state laws. Only Washington-licensed applicators with an aquatic endorsement or applicators under direct supervision of a licensed applicator may apply pesticides to water.

**Change:** None.

**Cost:** None.

### 1.5.4 Application of products

The general permit allows the use of the herbicide imazamox and marker dyes. The permittee must maintain a 10-meter buffer along the inside of the parcel boundary (property line) where treatment will not occur.

The goal of these buffers is to protect against chemical trespass off of the permittee's property.

**Baseline:** No use of herbicides and marker dyes is permitted. Only Washington-licensed applicators with an aquatic endorsement or applicators under direct supervision of a licensed applicator may apply herbicides to water.

**Change:** The use of the herbicide imazamox and marker dyes for the management of *Z. japonica* on commercial clam beds in Willapa Bay is permitted.

**Cost:** None.

### 1.5.5 Notification and posting requirements

There is a requirement of public posting in the proposed general permit. Permittees must post a sign at all corners of the treatment site, as well as at all public access areas on the waterbody that are within 400 feet of a treated area and at all public boat launches on the waterbody within one quarter mile of a treated area, and publish public notice in the local newspaper



when they first apply for permit coverage, twice, one week apart, for two consecutive weeks. This only occurs when they first apply for permit coverage, and would not be an annual cost.

The costs associated with these requirements are estimated below (see section 2.1.3).

**Baseline:** No requirement for public posting.

**Change:** Require public posting at all corners of the treatment site, and publishing a public notice in the local newspaper twice, one week apart, as part of the permit application process.

**Cost:** Cost of public notice in newspaper and public posting at corners of treatment site and nearby public access points.<sup>6</sup>

### 1.5.6 Monitoring requirements

Monitoring consists of recording the date treatment occurred, amount of active ingredient applied, and the number of acres and location(s) treated.

Permittees must:

- Measure the width of dead eelgrass in the buffer, and the number of measurements will depend on the size of the commercial clam bed treated.
- Take photographs at all measured locations, and label each photo by placing a card with the date, Global Positioning System (GPS) coordinates, sample site, and permit number within the photographed area.

**Baseline:** No requirement for monitoring.

**Change:** Require monitoring.

**Cost:** Cost of monitoring to document impacts to *Zostera* species plants.

### 1.5.7 Reporting and recordkeeping

WAC 173-226-090 requires periodic submission of reports. 40 CFR § 122.44(i)(2) requires reporting frequency to be at least once per year. For this general permit, the periodic report is an annual report. The annual report summarizes the amount of imazamox (in pounds of active ingredient) used during the course of each treatment season, location, and results of monitoring. Costs associated with recording the date treatment occurred, amount of active ingredient applied, and the number of acres and location(s) treated, as well as monitoring, are describe in section 2.1.4 (monitoring).

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<sup>6</sup> Estimated in section 2.

WAC 173-226-090(2)(c) requires applicators to keep all records and documents for five years.

**Baseline:** Permittees must meet part of their reporting requirements through periodic reporting. Permittees must keep all records and documents required by this permit for five years.

**Change:** None.

**Cost:** None.

### **1.5.8 Spill prevention and control**

WAC 173-226-070 allows Ecology to place permit conditions to prevent or control pollutant discharges from runoff, spillage or leaks, sludge or waste disposal, or handling or storage of materials. RCW 90.48.080 prohibits discharge of polluting matters in waters, such as unintentional discharge of aquatic pesticides.

**Baseline:** The permittee must be prepared to mitigate for any potential spills and in the event of a spill, perform the necessary cleanup and notify the Ecology regional office. The proposed general permit does not impose more specific requirements than what is already in existing statute.

**Change:** None.

**Cost:** None.

# Chapter 2: Costs of Compliance with the General Permit

This Small Business Economic Impact Analysis (SBEIA) estimates the costs of complying with the general permit for applying Imazamox on commercial clam beds in Willapa Bay. It also compares the costs of complying with the general permit for small businesses to the costs of compliance for large businesses, to determine whether the requirements of the general permit disproportionately impact small businesses.

The scope of the analysis includes only the direct compliance costs imposed by the general permit to the expected permittees. We are not required to evaluate benefits in an EIA and do not do so in this document.

## 2.1 Compliance costs

Costs associated with permit requirements include costs of complying with:

- Permit coverage
- Application of products
- Notification and posting requirements
- Monitoring to document impacts to *Zostera* species

### 2.1.1 Permit Coverage

The permit expands the universe of herbicides and areas permittees are allowed to apply. Although the general permit could have included other herbicides and areas, compared to the baseline of no herbicides and no areas permitted, the universe of allowable herbicides and areas permitted has strictly increased. We therefore estimate no additional compliance costs as a result of this limitation.

We discuss geographic areas and species not covered under this iteration of the general permit below for informational purposes. We note that *Z. japonica* generally resides on a higher intertidal as opposed to *Z. marina*. We also note that clam beds generally reside on a higher intertidal as opposed to oysters and geoducks. Appendix A and Appendix B include maps of the relative distribution of clam beds and oyster/geoducks, and *Zostera* species.

Appendix A and B reflect estimated distributions. The distribution of *Zostera* species changes significantly over time, and we have data limitations in assessing relative distributions. Accurate data of the distribution of *Z. japonica* as opposed to *Z. marina* is not common, especially outside of Willapa Bay. The two species are often intermixed, and listed together such that the data does not specify which eelgrass is being referred to. Areas with eelgrass also vary in density (such as patchy versus continuous).

The Washington State Department of Natural Resources (DNR) ShoreZone data used in the appendices does not distinguish between the two *Zostera* species, though both are included in the data. As a rough estimate, for informational purposes, approved commercial oyster and geoduck (as defined in Appendix A) areas intersect with either *Zostera* species on about 20,000 acres, in all of Washington State<sup>7</sup>.

We highlight again the inaccuracy in our data, and that *Z. japonica* and *Z. marina* are not distinguished separately in our data. Because *Z. marina* resides on a lower intertidal, along with oysters and geoducks, we suspect a significant portion of the acreage estimated above intersects with *Z. marina*, which is not listed as a noxious weed. Ecology does not currently have more accurate data to fully ascertain the area affected.

Clams (as defined in Appendix A) in approved commercial areas are in large part covered by the general permit, however. Clams in approved commercial areas that intersect with eelgrass of either species, outside of Willapa Bay, amount to approximately 167 acres (primarily in Gray's Harbor).

To the extent that the lands discussed above will not be used due to *Z. japonica*, we note Fisher, Bradley, and Patten estimate losses of \$4,000 per acre per year in areas affected by *Z. japonica*.<sup>8</sup> This is a result of a fewer number of clams, decreased clam weight, and decreased clam quality on beds with *Z. japonica*.

## 2.1.2 Application of products

WAC 16-228-1231 specifies that aquatic pesticides are restricted use in Washington, and only aquatic licensed applicators may purchase and apply them. The permit expands the universe of herbicides and areas permittees are allowed to apply. Although the general permit could have included other herbicides, compared to the baseline of no herbicides, the universe of allowable herbicides has strictly increased, and therefore we estimate no compliance costs.

The permit also requires creating a 10-meter buffer along property boundaries. The goal of buffer creation is to protect against chemicals moving into the property and the protection of off-site *Z. marina*. Although this decreases the available area to apply imazamox, the universe of permitted area has increased compared to the baseline of no area permitted for imazamox application.

Appendix B contains a map of relative distribution of *Z. marina* and *japonica*. If permittees created a 10-meter buffer around all property lines that intersect with clam beds in approved commercial areas, permittees would forgo approximately 307 acres as an approximate upper bound of foregone acreage due to buffer creation. This is likely an overestimate because where multiple permittees and sponsors who have contiguous clam beds agree to combine treatment

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<sup>7</sup> Ecology (2012).

<sup>8</sup> Fisher, Bradley, and Patten (2011).

efforts, a buffer is not required on the connecting parcel boundaries. Visually inspecting the distribution of *Z. japonica* in Appendix B, in comparison to the location of clam beds in Willapa Bay, permittees will likely forgo an area smaller than what we have estimated. However, we are unable to accurately determine the acreage foregone due to buffer requirements because of data limitations.

### **2.1.3 Notification and posting requirements**

To comply with the general permit, permittees must post a sign at all corners of the treatment site, as well as nearby public access points, and publish public notice in the local newspaper when they first apply for permit coverage, twice, one week apart, for two consecutive weeks.

In 2012, Ecology analyzed data in the Parcels Working Group Parcel Database<sup>9</sup> to find aquatic parcels that contain eelgrass (where application of Imazamox may occur) and commercial clam beds (where application of Imazamox may be permitted).<sup>10</sup> We overestimate the universe of potential parcels covered by the general permit, by assuming all parcels that contain eelgrass and commercial clam beds will apply; we then find the number of corners of all parcels estimated, and estimate the number of nearby public access points for the expected number of signs that will be required.

We assume each sign is 8.5 x 11 inches and costs \$1.35 each, and a 1 x 1 x 36 inch bundle of 50 grading stakes costs \$43 dollars a bundle. The cost of posting one sign at one corner is estimated to be \$2.50. Given an estimate of 130 corners per permittee (assuming all parcels identified will need signs, and all permittees own the same number of parcels)<sup>11</sup>, and 10 nearby public access points, the average cost per expected permittee is \$350 per year, and approximately \$1,712 over the 5-year period, discounted, assuming they post signs in all 5 years. If businesses with fewer employees own fewer parcels, compliance costs will be less burdensome for smaller businesses.

The permittee must also publish a public notice at the time of application for two consecutive weeks. This results in 2 total public notices over the 5-year period. Permittees need only publish a public notice at the time of application for the general permit. Using the sample public notice in Appendix B of the general permit, we obtained estimates for the cost of public notice from a local and regional newspaper,<sup>12</sup> of \$150 per notice. This implies an additional compliance cost of approximately \$300 over the five-year period, discounted.

### **2.1.4 Monitoring requirements**

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<sup>9</sup> See Works Cited section for a reference to the Parcels Working Group Parcel Database.

<sup>10</sup> Ecology (2012).

<sup>11</sup> We did not include parcels owned by the United States of America in our parcel data.

<sup>12</sup> The Chinook Observer and the Aberdeen Daily World, respectively.

In 2012, using Washington Department of Fish and Wildlife’s (WDFW’s) Shellfish Summary, and WDFW’s Commercial Shellfish Areas data, we find the parcels that intersect approved, commercial shellfish areas, and our definitions for clams (hardshell clams, manila clams, razor clams, subtidal hardshell clams).<sup>13</sup>

We overestimate the universe of potential parcels that will be covered by this permit, by assuming that growers will apply for all parcels that contain eelgrass and commercial clam beds; we then find the expected size of the parcels in question. 47 percent are up to 5 acres, 11 percent are 5.1 to 10 acres, 9 percent are 10.1 to 20 acres, and 33 percent are greater than 20 acres. Given the number of measurements required per parcel edge, we expect 5.98 measurements per parcel edge. We then find how many sides of each parcel where a ten-meter buffer will intersect both clams and eelgrass, to find the expected number of measurements. We find there are 1,090 parcel edges where a ten-meter buffer intersects both eelgrass and commercial clams. This is likely an overestimate. Where multiple permittees and sponsors who have contiguous clam beds agree to combine treatment efforts, a buffer is not required on the connecting parcel boundaries.

Monitoring consists of recording the date treatment occurred, amount of active ingredient applied, and the number of acres and location(s) treated, as well as

measuring the distance into the buffer that *Zostera species* plants are affected by treatment. Permittees must measure the width of dead eelgrass in the buffer, and the number of measurements will depend on the size of the commercial clam bed treated. Photographs must be taken at all measured location, and labeled by placing a card with the date, Global Positioning System (GPS) coordinates, sample site, and permit number within the photographed area.

We look at a report<sup>14</sup> from the University of Washington (UW) that summarizes the average time needed to determine percent cover and shoot density of *Z. marina* per quadrat, ranging from 3 minutes and 40 seconds to 4 minutes per quadrat (one square meter). We note that the requirements for monitoring under the permit are less intensive than the monitoring estimated for in the UW study, making these time estimates likely significantly higher than the actual permit requirements.

Given our estimate of 593 measurements per permittee, we assume based on program experience the permittee would need to hire the equivalent of an Environmental Specialist<sup>15</sup> for 36 to 40 hours per year at an hourly rate of \$48.12. We estimate an average per-year cost of \$1,304 to \$1,448, and a total cost of \$6,378 to \$7,086 over the five-year period, discounted.

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<sup>13</sup> Ecology (2012).

<sup>14</sup> “Evaluation of Sampling Design for Monitoring Impacts of the Control of Exotic Eelgrass on Native Eelgrass in Willapa Bay, Washington”

<sup>15</sup> US BLS (2024), [Environmental Engineers \(bls.gov\)](https://www.bls.gov) Accessed on 9/4/24.

## 2.2 Conclusion of the estimated costs

Estimated compliance costs of the permit appear below.

Table 3: Summary of additional compliance costs by type of cost

<b>Permit requirements (per permittee)</b>	<b>Per year average (low)</b>	<b>Per year average (high)</b>	<b>5-year total, discounted<sup>16</sup> (low)</b>	<b>5-year total, discounted (high)</b>
Posting signs	\$ 350	\$ 350	\$ 1,712	\$ 1,712
Public newspaper notice	\$ 60	\$ 60	\$ 300	\$ 300
Monitoring	\$ 1,732	\$ 1,925	\$ 8,475	\$ 9,417
<b>Total</b>	<b>\$ 2,142</b>	<b>\$ 2,335</b>	<b>\$ 10,487</b>	<b>\$ 11,429</b>

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<sup>16</sup> Ecology uses a discount rate based on interest that could be earned risk-free on today's dollars over the relevant time period. Ecology uses the twelve-year average rate of return offered on the US Treasury's T-Bills (inflation-indexed short-term bonds; US Treasury Department, 2024) as the discount rate, averaging 1.45 percent over the last twelve years.

# Chapter 3: Relative Compliance Costs for Small and Large Businesses

This chapter compares the costs of compliance per employee for small businesses to the compliance cost per employee at the largest ten percent of businesses covered by the permit. The governing rule (WAC 173-226-120) allows for this comparison to be made on one of the following bases:

- Cost per employee.
- Cost per hour of labor.
- Cost per one hundred dollars of sales.

We use cost per employee, because this data is readily and most comprehensively available for businesses operating in Washington State.

## 3.1 Analysis of facilities intended to be covered under the general permit

There are both small and large shellfish growers in Willapa Bay. The following table shows data on the expected number of permitted growers in Willapa Bay with fewer than fifty employees, and with fifty or more employees. Our sample is comprised by members of the Pacific Coast Shellfish Growers Association who operate in Willapa Bay. It is likely not a comprehensive sample, but attempts to estimate the distribution of small versus large growers in Willapa Bay that we expect to be permitted.

## 3.2 Business size data

Table 2 lists the average number of employees for the small businesses (less than 50 employees) and the largest 10% of industries in each of the representative industries.<sup>17</sup>

Table 4: Expected permitted growers by number of employees

Employees	Number of Growers	Average number of employees
Fewer than 50	8	7.7
Other 50 or more	1	99

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<sup>17</sup> Employment data for potentially impacted entities comes from Ecology’s third-party database of employers with locations in Washington State.



### **3.3 Relative costs of compliance**

This EIA compares the costs of compliance for small and large businesses to determine if the general permit disproportionately impacts small businesses. Ecology compares costs by looking at the cost per employee, where businesses with fewer than 50 employees are considered small businesses.

The general permit may impose disproportionately larger costs on smaller permittees. The compliance costs we estimate do not vary by permittee size. Each grower expected to be covered by the general permit incurs the same constant compliance costs. If there are substantial compliance costs that are a function of tideland area, and larger businesses own larger tidelands in Willapa Bay, then it is less likely the general permit imposes disproportionately larger costs on smaller businesses.

# Chapter 4: Mitigation of Disproportional Impacts

The general permit likely imposes disproportionate costs on small businesses, so Ecology took the legal and feasible actions described in this chapter to reduce small business compliance burden.

## 4.1 Mitigation options under WAC 173-226-120

The governing rule states the following options should be considered to reduce the impact of the permit on small businesses.

- Establishing differing compliance or reporting requirements or timetables for small businesses.
- Clarifying, consolidating, or simplifying the compliance and reporting requirements under the general permit for small businesses.
- Establishing performance rather than design standards.
- Exempting small businesses from parts of the general permit.

## 4.2 Mitigation actions

If a proposed mitigation measure violates federal or state regulations, it cannot be undertaken.

There are currently no exemptions for businesses with fewer than 50 employees. There are included, however, mitigation opportunities for all businesses. We assume larger businesses will have larger total costs, and these cost savings will comprise a smaller relative percentage of those total costs. Therefore, these components will likely reduce small business costs by a larger percentage than for large business costs.

These mitigation opportunities include:

- Permittees who have contiguous clam beds that agree to combine treatment efforts are not required to maintain the ten-meter property line buffer on the connecting parcel boundaries.
- Permittees are allowed to use elements of the associated Environmental Impact Statement to substitute for applicable elements of their discharge management plans.

### 4.2.1 Impact of mitigation on effectiveness of general permit

The general permit rule states mitigation only needs to be undertaken when it is legal and feasible in meeting the stated objectives of the Clean Water Act and Chapter 90.48 RCW, the State Water Pollution Control Act. Even if a proposed mitigation measure is legal, if it would limit the general permit's effectiveness in controlling water pollution too much, it should not be undertaken.

## 4.3 Conclusion

This analysis found that the *Zostera japonica* Management on Commercial Clam Beds in Willapa Bay General Permit likely imposes disproportionate costs on small versus large businesses complying with it. In compliance with WAC 173-226-120, Ecology included elements in the general permit that reduce compliance costs, and attempted to reduce disproportionate costs. Further cost reductions, or reductions to disproportion, were not possible due to limitations of federal and state laws and rules protecting the environment and regulating permittee behavior.

# References

RCW 34.05.272 requires Ecology to categorize sources of information used in significant agency actions made in the Water Quality Program.

## Independent peer review

**Review is overseen by an independent third party.**

n/a

Fisher, Bradley, and Patten. (2011). Invasion of Japanese eelgrass *Zostera japonica* in the Pacific Northwest: A preliminary analysis of recognized impacts, ecological functions, and risks.

Grue, Grassley, and Conquest. (2013). Evaluation of Sampling Design for Monitoring Impacts of the Control of Exotic Eelgrass on Native Eelgrass in Willapa Bay, Washington.

Mach, Wyllie-Echeverria, and Ward. (2010). Distribution and potential effects of a non-native seagrass in Washington State.

Merrill. (1995). The effect of *Zostera japonica* on the growth of *Zostera marina* in their shared transitional boundary.

Semmens. (2008). Acoustically derived fine-scale behaviors of juvenile Chinook salmon associated with intertidal benthic habitats in an estuary.

University of Washington. (n.d.). Professional Staff Program, Appendix B - Professional Staff Salaries. Retrieved from <http://www.washington.edu/admin/hr/polproc/prostaff/appB.html>.

WA State Department of Fish and Wildlife. (2013). Commercial Shellfish Areas GIS.

WA State Department of Fish and Wildlife. (2013). Shellfish Summary GIS.

WA State Department of Natural Resources. (2013). ShoreZone GIS Inventory.

US BLS (2024). Retrieved from [www.bls.gov](http://www.bls.gov)

## Internal peer review

**Review by staff internal to Ecology.**

WA State Department of Ecology. (2012). Economic Impact Analysis: *Zostera japonica* Management on Commercial Clam Beds in Willapa Bay General Permit (14-10-002).

WA State Department of Ecology. (2013). Washington State Coastal Atlas

## External peer review

**Review by persons that are external to and selected by Ecology.**

n/a

## Open review

**Documented open public review process that is not limited to invited organizations or individuals.**

n/a

## **Legal and policy documents**

**Documents related to the legal framework for the significant agency action, including but not limited to: federal and state statutes, court and hearings board decisions, federal and state administrative rules and regulations, and policy and regulatory documents adopted by local governments.**

Chapter 173-200 WAC: Water quality standards for groundwaters of the state of Washington.

Chapter 173-201A WAC: Water quality standards for surface waters of the state of Washington.

Chapter 173-204 WAC: Sediment management standards.

Chapter 173-224 WAC: Water quality permit fees.

Chapter 173-226 WAC: Waste discharge general permit program.

Chapter 90.48 RCW: Water Pollution Control.

## **Independent data**

**Data from primary research, monitoring activities, or other sources, but that has not been incorporated as part of documents reviewed under independent, internal, or external peer review.**

US Bureau of Labor Statistics (2023). May 2023 State Occupational Employment and Wage Estimates, Washington State. [https://www.bls.gov/oes/current/oes\\_wa.htm](https://www.bls.gov/oes/current/oes_wa.htm)

US Bureau of Labor Statistics (2023). Consumer Price Index.

## **Records of the best professional judgment of Ecology employees or other individuals.**

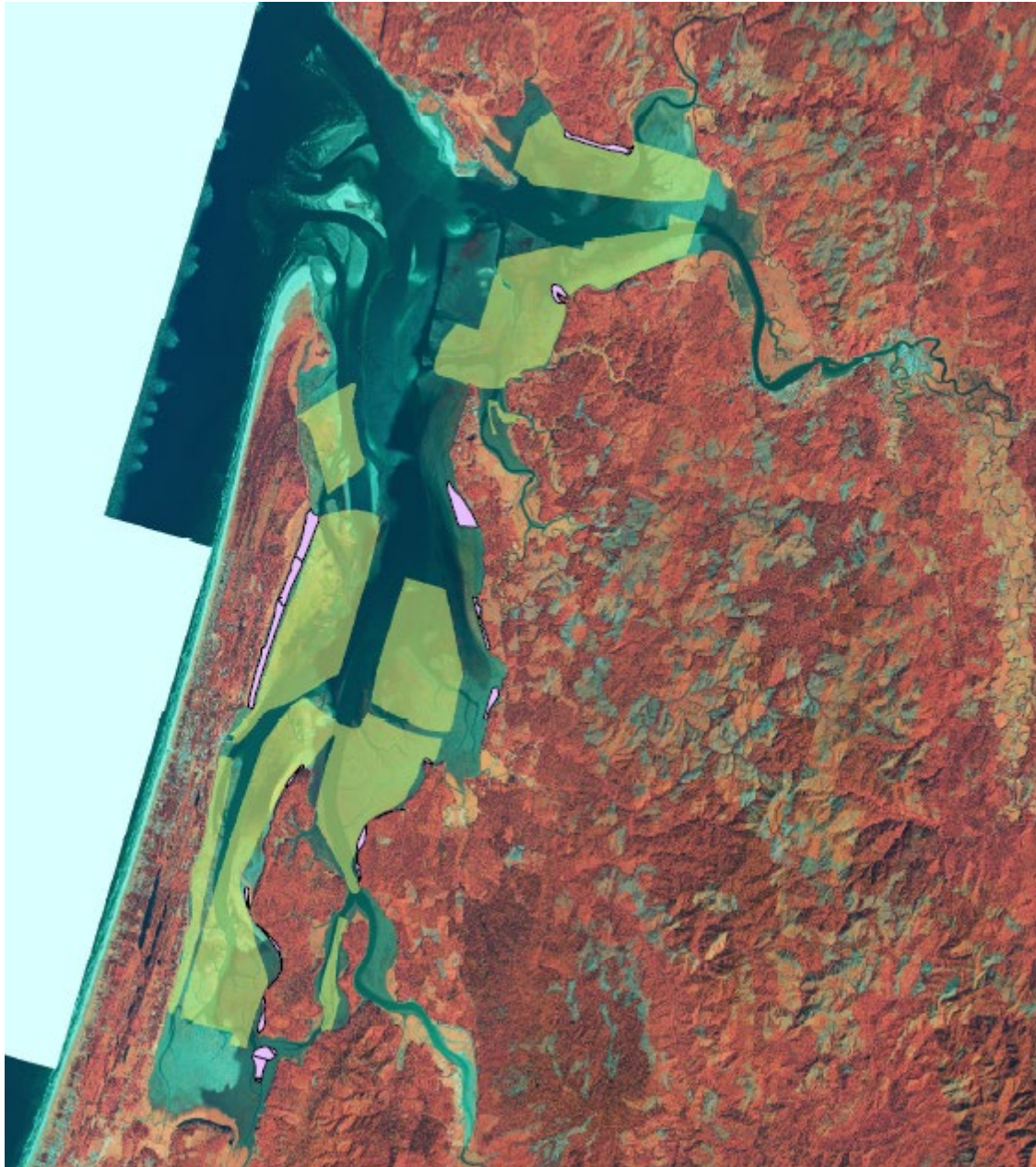
n/a

## **Other**

**Sources of information that do not fit into other categories.**

## Appendix A: Commercial clams, geoducks, and oysters

Figure 1. Coastline map of intersecting areas where approved, commercial shellfish areas, and our definitions for oysters and geoducks (geoducks, native oysters, oyster beds), and clams (hardshell clams, manila clams, razor clams, subtidal hardshell clams) overlap.



The yellow areas represent approved, commercial oysters and geoducks.  
The pink areas represent approved, commercial clams.  
The textured area represents land.

The map was created using Washington Department of Fish and Wildlife's (WDFW's) Shellfish Summary, and WDFW's Commercial Shellfish Areas data. The areas above are the intersection of approved, commercial shellfish areas, and our definitions for oysters and geoducks (geoducks, native oysters, oyster beds), and clams (hardshell clams, manila clams, razor clams, subtidal hardshell clams) (Ecology, 2012).

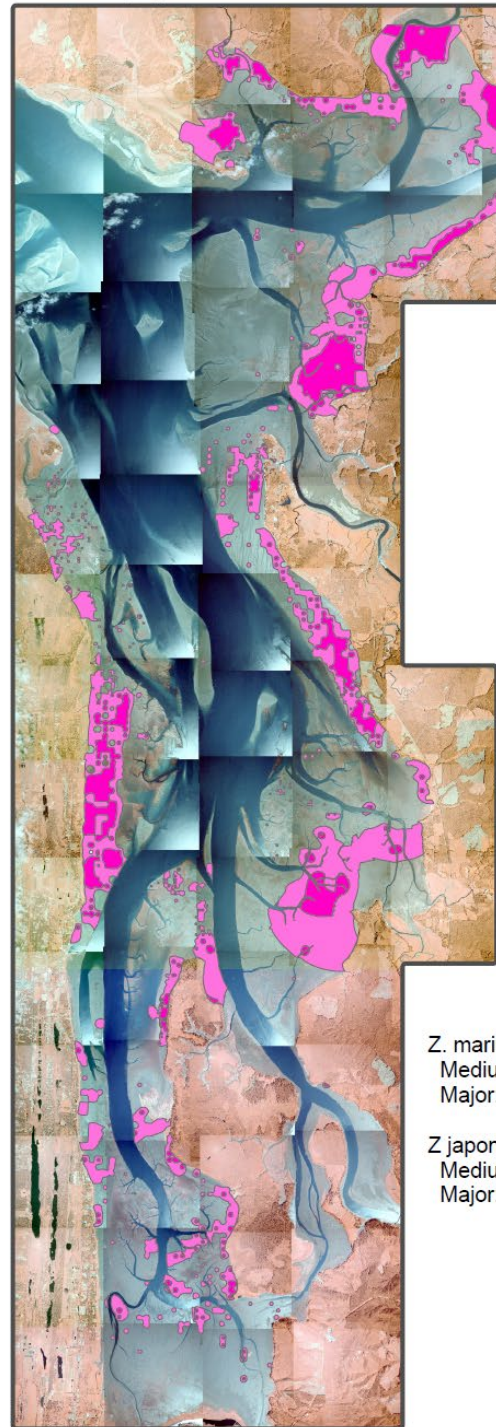
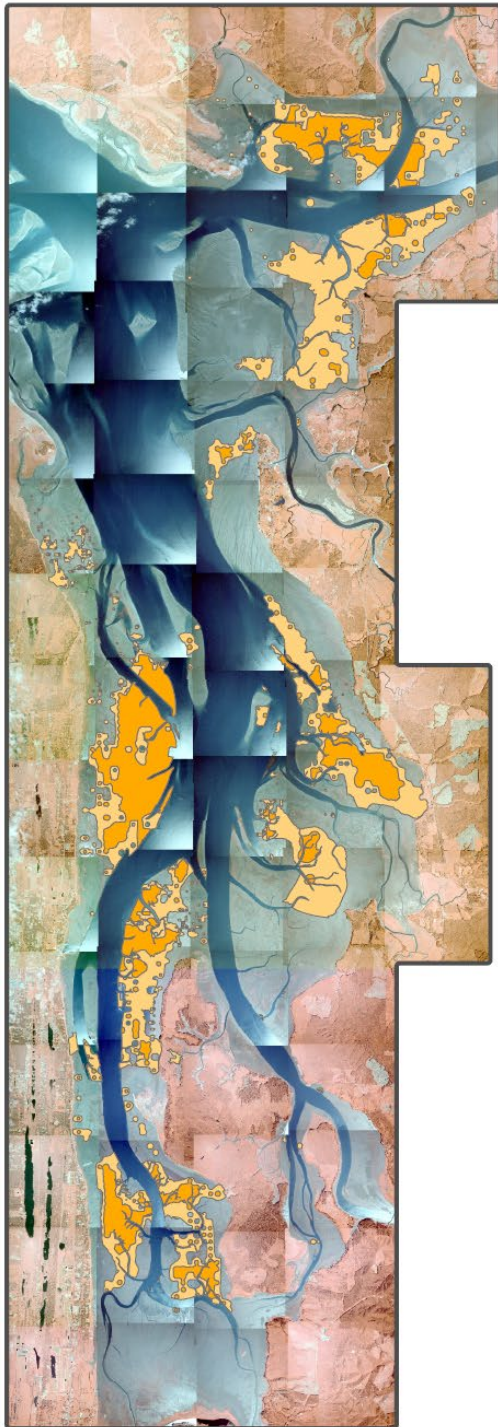


# Appendix B: *Zostera marina* and *Zostera japonica*

Figure 2. 2006/2007 grid survey by USDA-ARS, Newport, OR

***Zostera marina***

***Zostera japonica***



Present - Medium  
 Present - Major

Present - Medium  
 Present - Major

*Z. marina*  
 Medium: 8774 Acres  
 Major: 4988 Acres

*Z. japonica*  
 Medium: 8944 Acres  
 Major: 3239 Acres

Interpolated *Zostera marina* & *Zostera japonica* density and distribution from 2006/2007 grid survey by USDA of 4238 points throughout Willapa Bay, WA.