

Appendix C: Response to Comments

Reissuance of the *Z. japonica* Management on Commercial Clam Beds in Willapa Bay General Permit

Ecology received comments from 27 commenters regarding the *Z. japonica* Management on Commercial Clam Beds in Willapa Bay General Permit (*Z. japonica* permit).

Ecology assigned a reference key number to each commenter based on the date each comment was received. See Table 1 below. The number assigned to the commenter is used as a key to determine which comments the commenter submitted. Each comment/response pair has a list of the commenter numbers at the beginning. Due to the volume of comments received as form letters, those who submitted a form letter are included in under the organization that submitted the form letter. A separate table with the individuals who submitted the form letter is included at the end of the response to comments. See Table 2 and 3.

Ecology summarized comments during development of this Response to Comments (RTC). Thank you to all commenters for your input. Ecology considered each comment in its permitting decision.

The following links are provided for your reference:

- [Z. japonica permit web page:](https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Aquatic-pesticide-permits/Zostera-japonica-eelgrass-management)
<https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Aquatic-pesticide-permits/Zostera-japonica-eelgrass-management>
- [Z. japonica final permit document](https://fortress.wa.gov/ecy/ezshare/wq/permits/ZJ-FinalPermit.pdf) (requirements that must be followed):
<https://fortress.wa.gov/ecy/ezshare/wq/permits/ZJ-FinalPermit.pdf>
- [Z. japonica factsheet document](https://fortress.wa.gov/ecy/ezshare/wq/permits/ZJ-UpdatedFactsheet.pdf) – with corrections:
<https://fortress.wa.gov/ecy/ezshare/wq/permits/ZJ-UpdatedFactsheet.pdf>
- [Comments received on the draft Z. japonica permit:](http://ws.ecology.commentinput.com/?id=gAE9x)
<http://ws.ecology.commentinput.com/?id=gAE9x>
- Permit coverage documents (Applications, Pre-treatment Reports, Annual Reports, DMPs) are available by searching the [public PARIS portal](https://apps.ecology.wa.gov/paris/Default.aspx):
<https://apps.ecology.wa.gov/paris/Default.aspx>

Table 1: List of Commenters

Commenter Number	Commenter Name, Affiliation
1	Bob Triggs
2	Lee First, Twin Harbors Waterkeeper
3	Mike Nordin, Grays Harbor and Pacific Conservation Districts
4	Christine and Ross Barkhurst
5	Larry Warnberg
6	Laura Hendricks, Coalition to Protect Puget Sound Habitat
7	Fritzi Cohen
8	Ray Bailey
9	Friends of the Earth – 1187 Form Letters (Submitted by Hallie Templeton, see Table 2 for all individuals included)
10	Jeff Nesbit, Pacific County Noxious Weed Control Board
11	Brian Sheldon, Northern Oyster Company
12	Tim Hamilton, Twin Harbors Fish & Wildlife Advocacy
13	Kim Patten
14	Richard Wilson
15	Kathleen Moncy
16	Annie Herrold
17	Diantha Weilepp
18	Larry Philips, WDFW Region 6
19	Margaret Barrette, Pacific Coast Shellfish Growers Association
20	David Beugli, WGHOGA
21	Ken Wiegardt
22	Dick Sheldon
23	Center for Food Safety – 683 Form Letters (Submitted by Joey Lee, see Table 3 for all individuals included)
24	Amy van Saun, Center for Food Safety
25	Joe Breskin, Olympic Environmental Council
Comments Received After Close of Comment Period (November 4, 2019)	
26	Lisa Belleveau
27	George Tuttle, WSDA

Summarized Comments and Ecology Responses

Comment 1: 1, 3, 4, 5, 6, 9, 10, 11, 12, 13, 14, 15, 16, 19, 20, 21, 23, 24, 25

Commenters submitted comments asking Ecology to reissue the permit, or deny reissuing the permit.

Ecology Response:

Noxious weed is a regulatory term defined in [RCW 17.10.010\(1\)](#). Plants are designated to be a noxious weed because of the impact that the plant has. A noxious weed is “a plant that when established is highly destructive, competitive, or difficult to control by cultural or chemical practices.”

The [Washington State Noxious Weed Control Board \(WSNWCB\)](#) is provided authority in [RCW 17.10.080](#) to adopt, through rule making, a list of plants designated to be noxious weeds. The process for designating a plant to be a noxious weed is public (following the Administrative Procedures Act – [Chapter 34.05 RCW](#)), and set in [RCW 17.10.080](#) and [WAC 16-750-022](#). Ecology does not have authority to override the WSNWCB’s decision on whether a plant is designated as a noxious weed.

The State legislature created the noxious weed control boards “to limit economic loss and adverse effects to Washington’s agricultural, natural, and human resources due to the presence and spread of noxious weeds on all terrestrial and aquatic areas in the state ([RCW 17.10.007](#)).” Based on the purpose stated by the legislature in [RCW 17.10.007](#), part of the consideration for determining if a plant should be a noxious weed is the economic impact of the plant on agriculture, natural areas, and human resources.

The WSNWCB determined it appropriate to designate *Z. japonica* to be a noxious weed starting in 2012, in part because of the economic impacts to commercial clam culture (see [WSNWCB written findings for the listing](#)). The commercial shellfish grower community approached Ecology for a permit to use imazamox to control *Z. japonica* the same year.

[RCW 90.48.445](#) directs Ecology to issue permits for the aquatic use of herbicides and surfactants registered under state or federal pesticide control laws for the control of aquatic noxious weeds.

Under [RCW 90.48.445](#), Ecology must issue a permit for the use of registered herbicides for any aquatic noxious weed control where a permit is requested. Ecology’s options for denying a permit request for aquatic noxious weed control using herbicides are limited by this statute. This means that the basic questions facing Ecology when such a permit is requested are not, should a permit be issued, but generally:

- Should Ecology issue an individual or general permit?
- Which EPA or WSDA registered herbicides and adjuvants should Ecology conditionally authorize for use in the permit for control of an aquatic noxious weed?

- What geographic area should be included in the permit for conditional authorization to use the registered herbicides and adjuvants?
- How does Ecology balance all competing designated uses of a waterbody (for example: habitat, industrial use, recreation, agriculture) while allowing herbicides to be used to control an aquatic noxious weed?

Comment 2: 2, 3

Commenters provided the following comments about the process for proposing to reissue this general permit:

- Why is Ecology going through the public process to reissue the permit when only minimal changes are proposed?
- What compliance review of current permittees did Ecology perform as part of developing the proposed draft permit? What was the outcome of the compliance review?
- Why did Ecology propose a draft permit that did not include any changes from the previous 2014-2019 version of the general permit?

Ecology Response:

The *Z. japonica* permit was issued in 2014, and expired in 2019 at the end of its 5 year cycle. The major modification to finalize the treatment area buffers in 2017 did not affect the expiration date of the general permit. State and Federal rules (RCW 90.48.180, WAC 173-226-220, 40 CFR §122.46(a)) require that a general permit have a maximum active period of 5 years. After that 5-year period, the general permit expires. To make any changes to the conditions in an expired general permit, the changes must go through a public process (the reissuance process). Additionally, new coverages may not be issued under an expired general permit, and existing coverages (though extended due to re-application), may not be expanded to include new areas where discharge is conditionally authorized. The way we get to a new, active, general permit which has updated conditions and that allows changes to coverages is through the public reissuance process.

Ecology staff reviewed the communications related to the permit, permit reports, and compliance data when beginning the process of updating this permit. Only one complaint was received during the 2014-2019 permit cycle. This complaint was determined to be related to *Spartina spp.* control activity, not *Z. japonica* control. Based on lack of complaints and no communication suggesting that permit conditions were not achievable (though some difficulty with timing Pre-treatment reports was noted), no major changes to the permit were proposed. See Comment 18 responding to comments about the Pre-treatment report timing.

Data from the pre-treatment and annual treatment reports was summarized in a chart presented at the public hearing in October 2019. Data presented was only for years that had complete data (2014 to 2018). See Comment 28 for an updated chart that includes 2019 data.

Comment 3: 3, 10, 11, 15, 20, 24

Commenters suggested that Ecology should expand the area that the permit applies to so that Puget Sound is included, or so that this permit mimics the Aquatic Noxious Weed Control General Permit where aquatic noxious weeds may be treated anywhere they are present.

Ecology Response:

Ecology did not receive a request to expand the geographic area of this permit at a time when it would be possible to consider such an expansion. Additionally, the 2014 environmental impact statement which assessed probable significant environmental impacts from imazamox use is only valid for Willapa Bay. No EIS has been developed for Puget Sound. Limiting the permit to only Willapa Bay, where clam growers claimed the biggest impacts to manila clam culture take place, allows Ecology to issue a permit as directed by RCW 90.48.445 and at the same time limit impacts to Puget Sound restoration efforts.

Comment 4: 23, 24, 25

Comments were submitted about the appropriateness of the Washington State Noxious Weed Control Board (NWCB) designating *Z. japonica* to be a noxious weed including:

- Commercially grown clams and oysters are invasive species the same as *Z. japonica*.
- The NWCB should not have listed *Z. japonica* as a noxious weed just so that commercial clam growers could grow more clams.
- Eelgrass removal on commercial clam beds is not in the public interest. Ecology relies on self-serving statements by WSU scientists and industry that removing eelgrass is necessary for clam production. The NWCB only listed *Z. japonica* as "invasive" because of the economic impacts to shellfish growers. Ecology should not be allowing herbicide use by shellfish growers so that they can fix a problem of their own making.
- Ecology should protect all eelgrass because other state and federal agencies are not. Other agencies claim that their regulations exempt eelgrass management under the Hydraulic Project Approval (HPA) permit program, or fail to analyze cumulative impacts of all activities on eelgrass.

Ecology Response:

The Washington State Noxious Weed Control Board (WSNWCB) is provided authority in RCW 17.10.080 to adopt, through rule making, a list of plants designated to be noxious weeds. The process for designating a plant to be a noxious weed is public (following the Administrative Procedures Act – Chapter 34.05 RCW), and set in RCW 17.10.080 and WAC 16-750-022. Economic impacts are one of the criteria that the WSNWCB uses to determine if a plant species should be categorized as a noxious weed. Ecology does not have authority to override the WSNWCB's decision on whether a plant is designated as a noxious weed.

Comment 5: 10, 11, 12, 14, 15, 19, 20, 21, 22, 23, 24, 25, 26

Comments related to the management decisions made by the land manager that lead to treatment of a commercial clam bed with imazamox to control *Z. japonica*:

- This permit does not describe how IPM is a technology based approach to limiting discharges, and fails to describe how IPM principles will be required and adhered to as part of the permit.
- The State has mismanaged *Z. japonica*. If managed correctly, these invasive noxious weed would be eradicated as *Spartina* has been.
- Ecology should treat *Z. japonica* the same as any other aquatic noxious weed and issue a permit that allows control wherever this species is present.
- *Z. japonica* and *Z. marina* are critical salmon habitat.
- Discharge Management Plans not available for public review, even though they describe how permittees be following IPM.
- No clear explanation of how the 2014 EIS may substitute for portions of the Discharge Management Plan.
- Human intervention is necessary to keep invasive species like *Spartina* and *Z. japonica* in check so that they do not outcompete native species. Often the most effective method is the use of chemicals. Without their availability and use, there is a high risk of valuable ecosystems being lost to monocultures of invasive plants.
- WSDA should be in charge of managing *Z. japonica* like they are for the Aquatic Noxious Weed Control General Permit to reduce duplication of regulatory effort by Ecology and WSDA.
- *Z. japonica* has destroyed thousands of acres of agricultural lands (aquaculture beds). The permit needs to be changed so that it is like the Aquatic Noxious Weed Control General Permit that allows removal of any and all aquatic noxious weeds.
- Ecology should be protecting all the natural resources in Willapa, not allowing treatment for commercial aquaculture.
- *Z. japonica* is a threat to natural habitat and biodiversity in Willapa Bay.
- Imazamox has been demonstrated to be a low risk and effective management tool. It has negligible impacts on other species, and results in a good level of efficacy.
- Imazamox has been a valuable tool for clam farming in Willapa Bay, and has allowed many acres of valuable commercial clam beds to be reclaimed. Without a permit to use imazamox, much of the progress that has was made reclaiming shellfish beds since the permit was issued will be reversed.
- The presence of *Z. japonica* is increasing rapidly, particularly along the Washington Coast. The presence of *Z. japonica* is negatively affecting natural tidelands, natural setting and recruitment of (shellfish) seed.
- The presence of *Z. japonica* is known to alter benthic invertebrates, affect water and sediment temperatures, and reduce shellfish meat yield and increases predation of clam crops.
- *Z. japonica* is being treated on a rotation across commercial clam beds, and native eelgrass beds are still thriving. This indicates that permit conditions are working as they are.
- The ability to use a chemical (imazamox) to help manage *Z. japonica* is an important tool in the IPM toolbox. Mechanical methods alone do not keep up with the spread of *Z. japonica*.

- The State should be taking action to manage *Z. japonica* so that it does not take over further, like *Spartina* did. *Z. japonica* forms a monoculture over the sand which affects use by native species (for example, smolts and sandlance trapped in the *Z. japonica* at low tide) and aquaculture.
- Sometimes a chemical is a necessary tool for land management.
- The State should not be encouraging *Z. japonica* in Puget Sound, and should follow California's policy of removing *Z. japonica* completely.
- The shellfish industry should stop their misguided attempts to control nature and treat shellfish beds at upland wheat farms.
- Shellfish growers need to stop trying to control the natural environment and force it into an unstable system.
- There is no known process by which *Z. japonica* can be removed without harming *Z. marina*. *Z. japonica* is too well established to eradicate, and its distribution is spreading.
- Eelgrass effectively controls the range of burrowing shrimp on tide flats. It should be left in place to prevent the need to use insecticides to control burrowing shrimp on shellfish beds.
- Spraying should be a last resort, but it should be a tool in the toolbox.
- There is no reason to allow direct spraying of any native eelgrass, even on commercial clam beds. Ecology failed to evaluate any alternatives that are more environmentally protective than spraying herbicides to kill eelgrass.
- The reason burrowing shrimp are a problem is that eelgrass has been removed from shellfish beds.
- Willapa Bay should be managed holistically by the State, not in a piecemeal fashion.
- Permit allows harm to native eelgrass, not just *Z. japonica* because there are mixed stands of eelgrass on commercial clam beds and there is no data to demonstrate that there are not off-site impacts from treatment. The Puget Sound Partnership and SROTF do not distinguish between eelgrass species in their restoration plans. Ecology should assess impacts from treatment in conjunction with all the other stressors from human activity.
- Long residence time and lack of surfactant have led to lots of off-site impacts long distances away from treatment and replacement of eelgrass with lug worms and burrowing shrimp.
- The NWCB should not have listed *Z. japonica* as a noxious weed just so that commercial clam growers could grow more clams.
- Eelgrass removal on commercial clam beds is not in the public interest. Ecology relies on self-serving statements by WSU scientists and industry that removing eelgrass is necessary for clam production. The State Noxious Weed Control Board only listed *Z. japonica* as "invasive" because of the economic impacts to shellfish growers. Ecology should not be allowing herbicide use by shellfish growers so that they can "fix"/manage a problem of their own making.
- Ecology must protect the environment and public health over promoting an industry.
- Removal of eelgrass from commercial clam beds is contrary to many regulations.

Ecology Response:

There are many beneficial uses of State waters, such as drinking, habitat, irrigation, industrial, agricultural, recreational, and aesthetics. As a State resource, beneficial uses of water bodies are protected by implementation of water quality standards through permits issued by Ecology for discharges. This permit places restrictions on what, when, where, and how imazamox may be applied to protect all the designated beneficial uses of the water in Willapa Bay.

We consider all designated beneficial uses for a waterbody equally when developing a permit. Ecology is directed in chapter 90.48.445 of the Revised Code of Washington to issue permits for noxious weed control. Permits that allow the aquatic use of herbicides require balancing often-competing water uses, and compliance with legislative mandates.

The permit conditions restrict how imazamox use may take place in Willapa Bay, to protect all designated uses of the water in the Bay. Ecology does not make management decisions for individual projects or arbitrate between dissenting groups about which management actions are taken.

The use of chemical methods of aquatic plant control and the existence of a permit coverage does not prevent the use of physical or mechanical management techniques. The alternative to controlling *Z. japonica* with imazamox is mechanical – such as harrowing or chain dragging. These practices can be done without regulatory oversight by Ecology, and can cause impacts to all benthic organisms. These physical/mechanical control methods may be used in place of, or in conjunction with chemical methods. The decision of which management method to use is made by the individuals or groups with authority to manage the project area (i.e. commercial clam bed) and within the constraints of the permit issued by Ecology.

See also responses to comments: 4, 12, 16, 17, 22, 24, 25.

Comment 6: 2, 18

Commenters suggested the following about the actual application methods used to put imazamox onto *Z. japonica*:

- Ecology should consider requiring the use of food grade marker dye or temporary flagging to mark the boundaries of treatment areas so that permittees know where application on the clam bed must stop to maintain parcel edge boundaries.
- Ecology should specify what imazamox application methods are allowed to be used under permit.
- We suggest limiting the total quantity of Imazamox allowed on-site to the quantity needed to cover the acreage that can be sprayed for the day in order to limit the risk of spills and unacceptable impacts from excess imazamox being held and mixed at the treatment site prior to use.

Ecology Response:

Food-grade marker dyes are allowed for use in the permit to mark where treatment has occurred. See special condition S1.

Application methods are specified by the product label, including handling instructions to avoid spills into surface water. However, Ecology does not allow aerial (i.e. helicopter, airplane) broadcast spraying to help prevent off-target impacts due to drift of aerially applied product. See special condition S4.A.2.h.

The current product label listing control of *Z. japonica* (Clearcast) lists the following conditions for cleaning up a spill (based on WSDA label interpretation, for concentrated Clearcast product):

“Steps to take if material is released or spilled:

- Dike and contain the spill with inert material (sand, earth, etc.) and transfer liquid and solid diking material to separate containers for disposal.
- Remove contaminated clothing, and wash affected skin areas with soap and water.
- Wash clothing before reuse.
- Keep the spill out of all sewers and open bodies of water”

<http://cru66.cahe.wsu.edu/~picol/pdf/WA/54905.pdf>

In responding to a spill, Permittees must comply with product label requirements as part of implementing AKART and permit requirements. The permit addresses the potential for spills of both pesticides and oil/gas in Special Conditions S4.E-G by means of spill prevention, spill notification, and spill cleanup.

Where concentrated Clearcast product is being mixed for application, if a spill of the concentrate occurs, Permittees must follow label requirements on steps to take (listed above from the current Clearcast product label). If a spill of tank mix solution occurs, the response would be different depending on where the spill occurred. At the location where mixing occurred, spill response would be the same as if concentrated Clearcast product were spilled. Response to spills of tank mix on tidelands are more complex. WSDA pesticide compliance staff were consulted to determine how a spill of tank mix may be handled on a clam bed where treatment is underway. If a spill occurs on a clam bed while treatment is underway, then in order to comply with maximum label rates, permit limits of 1.4 oz a.i./per acre, and have first-flush dilution align with EIS assumptions, all or a portion of the clam bed being treated would need to be considered treated to account for how much tank mix was spilled. Even though a spill occurred, the clam bed (or portion of the clam bed acreage matching how much tank mix was spilled) would be considered treated for the treatment season in order to comply with Special Condition S4.A.2.f.

Comment 7: 2, 12, 18

In regards to timing of the application of imazamox, that is the time of year during which treatment of *Z. japonica* with imazamox is conditionally authorized, summarized comments included:

- Ecology should increase the amount of dry time required after application of imazamox.

- Ecology should only allow application of imazamox April through early July when treatment is most effective. See Patten, K. 2015. Imazamox Control of invasive Japanese eelgrass (*Z. japonica*): Efficacy and non-target impacts. Journal of Aquatic Plant Management. Vol 53, pgs 185-190. <http://www.apms.org/wp/wp-content/uploads/japm-53-02-185.pdf>
- Timing of treatment to does not prevent impacts on herring because of the loss of habitat (eelgrass) used by herring for spawning.
- Application of Imazamox is conditionally authorized from April 1 through June 30. This work window falls outside of the observed herring spawning timing for Willapa Bay, thus, should prevent unacceptable reductions in spawning substrate for herring.

Ecology Response:

The amount of dry time included in the permit is the minimum necessary for imazamox to be effective at controlling *Z. japonica* before tidal inundation occurs. See the 2014 EIS for discussion of necessary dry time and plant uptake of imazamox. See also Comment 24 for response to comments related to the 2014 EIS.

The 2014 EIS discusses the timing of herring spawning in relation to the proposed treatment as well as the suitability of *Z. japonica* as a substrate for herring spawn.

Ecology decided to keep the current treatment window. See response to Comment 18 for Pre-treatment plan report timing.

Comment 8: 2, 4, 19

Comments made about the actual treatment locations on commercial clam beds:

- Ecology should require that permittees avoid harm to *Z. marina* by not allowing treatment near or over pools, or drainages/swales, containing *Z. marina*. When treatment is occurring, who is responsible for determining where such areas are located on the commercial clam bed and how do they make this determination?
- A permittee can kill eelgrass outside of their commercial clam bed if they find a cooperating land owner.
- Demonstrating success of the intent of the issuance of the original permit in 2014, less than 40% of the 1,200 acres currently under permit coverage is in need of annual treatment.

Ecology Response:

The permit requires that treatment avoid swales and drainages on a commercial clam bed that are transporting water off-site. See special condition S4.A.2.i.

The Permittee is responsible for compliance with permit conditions, including determination of where swales and drainages occur during treatment.

A permittee may only treat *Z. japonica* on their commercial clam beds. No treatment off of commercial clam beds is allowed. Where two or more parties commercial clam beds share boundaries, the parties may cooperate on treatment and only use buffers on the outside of the treated commercial clam beds. See special condition S4.B.

Comment 9: 24

One commenter submitted remarks on whether the permit complies with the Clean Water Act, water quality standards, or sediments management standards:

- This permit does not comply with state and federal water quality standards.
- The permit violates water quality standards criteria for habitat protection (WAC 173-201A-612 and 173-201A-020). Ecology may not issue a permit that is not protective of water quality. There is no analysis in the factsheet about how the proposed draft permit protects water quality. It is unclear how this permit protects the beneficial uses (i.e. habitat) of Willapa Bay.
- To determine if sediment impacts are likely from treatment with imazamox, Ecology appears to rely on studies associated with the denied permit for imidacloprid use for burrowing shrimp control on oyster beds in Willapa Bay. Ecology should re-evaluate any conclusions based on the same information used to deny the use of imidacloprid.
- Ecology has a duty to protect the environment and water quality under state and federal law. It must not cave to the shellfish industry and allow industry to kill valuable species just because it wants to grow more commercial shellfish.

Ecology Response:

As discussed in the response to Comment 1, Ecology is required to issue a permit to allow the use of one or more registered herbicides for the control of aquatic noxious weeds. Conditionally authorizing the use of herbicides for the control of aquatic noxious weeds is a balancing act for Ecology. Ecology must balance the requirement to allow herbicide use with the impacts to the often competing designated uses of a waterbody (for example: habitat, recreation, industrial use). Ecology balances these priorities by developing an environmental impact statement (EIS) for each active ingredient conditionally authorized for use in a permit. The EIS then informs Ecology as to which active ingredients are acceptable for use because the impacts to designated uses can be mitigated. Ecology also relies on the short-term modification of surface water quality standards (see draft factsheet page 42 for a discussion). This acknowledges that in the short term, a designated use will be degraded, but over the long term, the designated use will not be degraded.

Review of the 2014 EIS did not indicate potential for buildup of imazamox in tideland sediments. However, because of ongoing concerns from other potential treatment types (imidacloprid for burrowing shrimp for which no discharge permit is available) in Willapa Bay, Water Quality Program staff requested a review by the Toxics Cleanup Program (TCP), which would oversee any potential sediment impact zones. Based on TCP review, no potential for sediment impacts was noted. TCP did note an area of uncertainty related to impacts to sediment bacteria. As part of developing the draft *Z. japonica* permit, Water Quality Program staff investigated available scientific literature about potential impacts of

imazamox on bacteria. This investigation was documented in the 2019 draft fact sheet on pages 43 to 47 (which includes references). The summary of conclusions in the factsheets states:

“Based on the limited information available, the fact that the information is related to terrestrial and/or laboratory environments, extrapolation to effects on bacteria in a marine sediment environment is challenging. Literature is unclear on actual effects, with some bacteria species being affected by one ALS/ASHS inhibiting herbicide, but not another. Some bacteria species appear to be affected negatively, other positively. No information directly addressed rebound of bacteria population diversity or density, though some literature noted inhibition in growth, and shifts in population. Additionally, some bacteria are known to breakdown pesticides (Nayak et al, 2018)(Lui et al, 2016). Bacteria have generation times (growth and cell fission) ranging from minutes to hours, depending on species and environmental characteristics (e.g. temperature, nutrient sources) (Brock, 1970)(Rheinheimer, 1985). It is unclear if short-term growth inhibition or shifts in bacteria population could occur in the marine sediment environment or how fast populations may rebound.

Current information does not appear to support a reasonable potential for unacceptable impacts to marine sediment bacteria. The permit limits the number of imazamox applications to a commercial clam bed to one time per year in Willapa Bay. Literature indicates short chemical half-life, short bacteria generation periods, uncertainty if bacteria will actually be effected by imazamox, and the likelihood that some bacteria will contribute to the breakdown of imazamox. Therefore, at this time, the information does not support the requirement for a SIZ.”

Comment 10: 4, 24, 25

Three commenters were concerned with how Ecology is dealing with off-site (tideland that is not a commercial clam bed) impacts:

- It is unclear how Ecology would know about off-site impacts because of the lack of monitoring and oversight.
- The permit lacks any meaningful monitoring of off-site impacts or oversight by Ecology. Eelgrass has been lost on a much larger area than characterized by permit reports.
- Long residence time and lack of surfactant have led to lots of off-site impacts long distances away from treatment and replacement of eelgrass with lug worms and burrowing shrimp.
- Eelgrass has disappeared from my oyster bed due to spraying further out in the bay, so that it no longer supports oyster culture. Use of my oyster bed by waterfowl that feed on eelgrass has also decreased. Removal of eelgrass also allows lugworms and burrowing shrimp to flourish. My oyster bed has seen an increase in worm and shrimp use now due to spraying.
- The information Ecology relied on for dilution of imazamox residue during tidal exchange is inaccurate. New science says that tide water exchange is much less than

previously thought. Residues will stick around longer at higher concentrations causing off-site impacts.

- Ecology can't perform a valid anti-degradation analysis on the draft permit because there is not enough information from permit reports or information on off-site impacts.

Ecology Response:

See responses to the following comments: 20, 24, 15, 20, 23, 12, 20, 27

Comment 11: 5, 9, 17, 23, 24

Some commenters thought that Ecology should require use of other methods of controlling *Z. japonica*, either in place of, or before treatment with imazamox occurred.

Ecology Response:

Chapter 90.48 RCW provides Ecology authority to regulate discharges of polluting matter to State waterbodies (RCW 90.48.080, RCW 90.48.260). Ecology does so through the discharge permit program (RCW 90.48.160). However, chapter 90.48 RCW does not provide Ecology the authority to regulate activities which do not result in a discharge, or authorize Ecology to require a different activity take place instead of a discharge under a discharge permit.

Ecology does not make waterbody or project specific determinations about which aquatic noxious weed management methods are appropriate. Permits are Ecology's decision about balancing competing needs when a discharge permit is requested. See also the response to Comment 5 about management decisions.

Comment 12: 4, 9, 17, 23, 24

Wheat, Banas, and Ruesink (2019) published an article with their findings about tidewater movement within Willapa Bay. Several commenters referenced this publication in the following comments:

- Eelgrass has disappeared from my oyster bed due to spraying further out in the bay, so that it no longer supports oyster culture. Use of my oyster bed by waterfowl that feed on eelgrass has also decreased. Removal of eelgrass also allows lugworms and burrowing shrimp to flourish. My oyster bed has seen an increase in worm and shrimp use now due to spraying.
- Ecology should check the tidal water movement vectors at treatment locations. Cross vectors can move imazamox in directions other than directly towards the shoreline and contribute to eelgrass loss in other locations. The permit ignores these types of water movement vectors and their impacts.
- Wheat, Banas, and Ruesink (2019) showed that tide waters can have a residence time of 5 or 6 tidal cycles (tides over 2-3 days). This means that tidal dispersion does not have as great an effect on imazamox dilution as theorized in the 2014 EIS, which the permit is based upon. Less dispersion means greater impacts to off-site eelgrass because imazamox remains at high concentrations in tide water for longer than anticipated.

- New science shows that tidal flushing does not cause as much water exchange in Willapa Bay as previously thought. This means that imazamox will be present longer in the Bay causing off-site impacts.
- Tidal flushing not even across the bay.
- New science shows that tidal flushing does not cause as much water exchange in Willapa Bay as previously thought. This means that imazamox will be present longer in the Bay causing off-site impacts.
- The information Ecology relied on for dilution of imazamox residue during tidal exchange is inaccurate. New science says that tide water exchange is much less than previously thought. Residues will stick around longer at higher concentrations causing off-site impacts.

Ecology Response:

Review of the Wheat et al 2019 paper does not lead to different conclusions than discussed in the 2014 EIS or the appeal of the 2014 permit (PCHB 14-047 Findings of Fact, Conclusions of Law, and Order). The determination that treatment would not lead to off-site impacts in 2014 was based upon dilution, use of buffers, short chemical half-life, and only allowing one treatment per clam bed per season (multiple application times/days may be used to cover one clam bed with one treatment). Though Wheat et al does conclude that mixing of the tidal water takes longer than may have initially been estimated, longer tidal mixing cycles do not change the initial dilution of imazamox after treatment to a level that is not herbicidal.

Concentration calculations discussed in the 2014 permit appeal (PCHB 14-047 Findings of Fact, Conclusions of Law, and Order) were based upon the 3000 acres of commercial clam beds and static water (no tidal exchange). The concentration of imazamox active ingredient was calculated as 0.5 ppb. Extrapolation to 6,000 acres of treatment would result in a 1 ppb imazamox active ingredient concentration.

We developed three worst case scenarios using the same calculations as those used in the 2014 appeal for a concentration of imazamox after treatment based on the past 5 years of permit reports. For the three worst case scenarios we assume:

- No photodegradation (which is actually a primary degradation pathway for imazamox)
- Static water - no tidal mixing at all (not just slower tidal mixing as predicted by Wheat et. al)
- Static water volume from 2014 PCHB appeal information: 90×10^9 liters
- No 10 meter buffer requirement
- Maximum application rate allowed by permit (1.4 oz/acre imazamox active ingredient, not acid equivalent)
- All imazamox from treatment is contained in the water column
- All imazamox treatments are occurring simultaneously so that there is no degradation of imazamox between treatments

Scenario 1:

All parcel acreage (clam bed acreage under coverage on parcel, plus all parcel acreage not included in the commercial clam bed) – **Note: such a treatment is not allowed by the permit, only commercial clam bed acreage on a parcel may be treated under permit coverage.**

- Acreage: 4,256.61
- Total ounces of imazamox applied: 5,959.3 oz
- Concentration of imazamox active ingredient after first tidal flush: 1.88 ppb

Scenario 2:

Maximum proposed treatment amount of commercial clam bed acreage based on permit Pre-treatment reports. **Note: Based upon maximum proposed treatment acreage, which is the proposed treatment of 1,942 acres in 2015.**

- Acreage: 1,942
- Total ounces of imazamox applied: 2,718 oz
- Concentration of imazamox active ingredient after first tidal flush: 0.86 ppb

Scenario 3:

Maximum treated amount of commercial clam bed acreage based on permit annual reports. **Note: Based upon maximum actual treatment acreage, which is treatment of 315.5 acres in 2018.**

- Acreage: 315.5
- Total ounces of imazamox applied: 441.7 oz
- Concentration of imazamox active ingredient after first tidal flush: 0.14 ppb

When we take into consideration that imazamox has a photolytic half-life of approximately 7 hours, some amount of imazamox will be temporarily retained in the plant material and surface sediments, all treatments are not occurring on the same date, and that Willapa Bay is not a static water system; the concentration of imazamox expected in the water column after treatment should not result in off-site impacts to vegetation. We expect that actual water column concentrations will be less than those estimated in scenario 2 and 3.

Comment 13: 6, 12, 25

Three commenters submitted comments regarding *Z. japonica* as critical habitat for salmon (Southern Resident Orca prey species):

- The permit allows the conversion of critical habitat to commercial clam beds, preventing any eelgrass from growing on the clam beds.
- Since the first year of this permit all species of salmon in Willapa Bay are failing to meet management (egg take) requirements, herring spawning mass is no longer present, and waterfowl numbers have dropped significantly. This permit would continue to allow unmeasured and unmonitored habitat (eelgrass) removal.

- Renewal of this permit to further increase shellfish production will likely present greater obstacles for the recovery of salmon runs in Willapa Bay due to lack of nutrients for juvenile salmon.
- Shellfish farming is over-grazing the nutrients in the bay. This is causing juvenile salmon mortality.
- Reissuing this permit will impact Orcas and salmon, and is disrespectful to the taxpaying public that is funding investment in Orca and salmon recovery.
- Allowing removal of eelgrass under permit conflicts with the Governor's Orca Task Force policy goals.
- Reissuing this permit will undermine salmon and Southern Resident Orca recovery efforts.
- Allowing treatment of *Z. japonica* is contrary to Gov. Inslee's goals of increasing habitat for salmon and Orcas.
- WDFW Policy C-3012 requires that WDFW document and protect spawning habitat of forage fish such as herring. Some of the known herring spawning areas are also commercial clam beds that may be treated under permit. Allowing removal of *Z. japonica* is contrary to this WDFW policy.
- *Z. japonica* and *Z. marina* are critical salmon habitat.

Ecology Response:

See response to Comment 22 about *Z. japonica* control conflicting with the Governor's Task Force policies on recovery of the Southern Resident Orca.

See response to Comment 20 about the most up-to-date eelgrass mapping information Ecology was able to obtain from DNR.

See response to Comment 16 about overlapping regulations. It must be noted, however, that aquaculture is exempt from many regulations, such as hydraulic code rules. So while WAC 220-660-320 lists seagrasses as a saltwater habitat of special concern for herring spawning, aquaculture is exempted in WAC 220-660-040(l) from being require to follow protections for this habitat.

Comment 14: 4, 12, 24, 25

A recent federal court case surrounding the Army Corps Nationwide Permit 48 (NWP 48) was brought up by some commenters:

- The Coalition to Protect Puget Sound Habitat v. U.S. Army Corps of Eng'rs, et al. makes it clear that no net loss cannot be accomplished merely by assessing eelgrass, which is what Ecology is proposing to do.
- "The US Army Corps Nationwide Permit 48 (NWP 48) that allows aquaculture activities in navigable waters was recently set aside by the Western District Court in Washington (The Coal. to Protect Puget Sound Habitat v. U.S. Army Corps of Eng'rs, et al., No. 17-1209RSL, 2019 WL 5103309 (W.D. Wash. Oct. 10, 2019)). This is because the Environmental Assessment did not provide enough evidence supporting the US Army

Corps decision that the NWP 48 permit would have no significant impact from commercial aquaculture, partially because the Corps did not consider removal of eelgrass from imazamox treatment.”

- US Army Corps of Engineers recently had the Nationwide 48 permit for aquaculture revoked by the Western District Court (federal) of Washington. Without a permit, shellfish growers will not be able to frost commercial clam beds (add gravel to improve habitat suitability for clams). Without being able to frost the commercial clam beds reissuing this permit will result in conversion of critical habitat (eelgrass) to barren mud flats.
- The federal judge in CASE determined that in relying upon Dumbauld and McCoy's findings, that the US Army Corps made an arbitrary decision about the landscape level impacts of shellfish culture.
- Ecology should protect all eelgrass because other state and federal agencies are not. Other agencies claim that their regulations exempt eelgrass management under the Hydraulic Project Approval (HPA) permit program, or fail to analyze cumulative impacts of all activities on eelgrass. See Center for Food Safety v. U.S. Army Corps of Engineers: 17-1209RSL, 2019 M'1_, 5103309, at *6 (W D. Wash. Oct. 10, 2019).

Ecology Response:

There are many overlapping regulatory requirements that affect what actions a manager may take to manage their property. The permit does not remove the requirements for the land manager to also comply with other regulations, or obtain other required permits. In a situation where a permit allows an activity, and another regulation does not, the more restrictive regulation would take precedence (the activity may not take place).

See also response to Comment 16 about overlapping regulations and how a permit interacts with other regulations.

Comment 15: 9, 12, 24, 25, 26

Some commenters felt that Ecology should be exercising more oversight on treatment of *Z. japonica* on commercial clam beds in Willapa Bay, or conduct routine inspections during treatment:

- Ecology should be evaluating the overall condition of eelgrass in Willapa Bay due to the years of disturbance from commercial aquaculture activities.
- Ecology should account for accumulative effects of all activities in Willapa Bay when developing the permit, not just effects from treatment with imazamox.
- Ecology and other agencies should be evaluating the impacts to eelgrass from all aquaculture activities, not just *Z. japonica* treatment with imazamox on commercial clam beds.
- Ecology has allowed the unmonitored spraying of eelgrass because the buffers are only required around parcel boundaries, not around the clam beds, and often the clam bed does not extend to the parcel boundary. Off-site impacts are not required to be monitored.

- It is unclear how Ecology would know about off-site impacts because of the lack of monitoring and oversight.
- There is not enough data for Ecology to make the determination that there is no net loss of eelgrass.
- The permit lacks any meaningful monitoring of off-site impacts or oversight by Ecology. Eelgrass has been lost on a much larger area than characterized by permit reports.
- Ecology should have more oversight of actual treatment and know exactly what is going to be treated before it is treated.
- Ecology should be more active in its oversight on this permit. Permittees self-monitoring their compliance with permit requirements is not appropriate.
- Ecology should have more oversight on permittees and require more details about what is actually going to be treated each year prior to treatment occurring.
- Ecology needs to inspect treatments as they are occurring.
- Ecology should have more oversight of actual treatment and know exactly what is going to be treated before it is treated.
- Ecology should be more active in its oversight on this permit. Permittees self-monitoring their compliance with permit requirements is not appropriate.

Ecology Response:

There are two agencies that have regulatory authority over aquatic herbicide applications. One is Washington State Department of Agriculture under state and federal pesticide laws, and the other is Ecology through discharge permits under state and federal clean water laws. A central component of both state and federal clean water laws is the requirement for self-monitoring and reporting. Though monitoring and reporting varies by type of discharge, these components are included in every discharge permit that Ecology issued. Self-monitoring and reporting is necessary because Ecology has limited resources to apply to over 6000 different dischargers in Washington. Due to limited resources, Ecology oversight of *Z. japonica* permit coverages is limited to complaint response. Ecology staff only responded to one complaint during the 2014-2019 permit cycle. The complaint was determined to be related to Spartina control activities.

When Ecology becomes aware, or is made aware, of potential permit violations, the situation and potential enforcement actions are treated seriously and considered on a case-by-case basis to determine potential actions to bring a permittee back into compliance.

See also Comment 23 about the buffer validation study which lead to the final buffers included in the 2014-2019 permit during the 2017 major modification. The use of buffers is meant to prevent statistically significant off-site impacts to non-target plants. See Comment 20 for a summary of DNR eelgrass survey data and Comment 16 on no net loss.

Comment 16: 4, 12, 24, 25

No net loss of eelgrass was a large concern for some commenters, as well as compliance with the Shoreline Management Act which has protections for some eelgrass, the Growth Management Act, or Critical Areas Ordinance:

- Removal of eelgrass from commercial clam beds is contrary to the Growth Management Act.
- It is not legal to cause net loss of habitat functions.
- Ecology did not make clear at the public workshop that the permit allows removal of all eelgrass from a commercial clam bed. *Z. marina* is a protected species and any loss contributes to net loss, which is illegal.
- The current Pacific County Shoreline Master Plan states that *Z. marina* is protected unless it is on an aquaculture bed. This is inappropriate and should not be allowed in order to protect wildlife habitat and no net loss.
- The Shoreline Management Act (RCW 90.58) requires no net loss of ecological function.
- It is unacceptable that once eelgrass is removed from a site that it no longer contributes to no net loss regulations if the eelgrass does come back to the site.
- During the public workshop, Ecology pointed to HPAs as controlling the loss of ecological function, however aquaculture is exempt from HPA requirements. Ecology cannot rely on HPAs to regulate no net loss of eelgrass.
- The permit allows the conversion of critical habitat to commercial clam beds, preventing any eelgrass from growing on the clam beds.
- This permit does not comply with no net loss requirements. There have been drastic reductions in species populations following treatment with imazamox.
- WAC 173-26-186(8) requires that shoreline master programs include policies and regulations designed to achieve no net loss of those ecological functions. Pacific Counties SMP does not comply with this regulation even though Ecology approved the plan.
- All eelgrass is critical habitat.
- Removal of eelgrass from commercial clam beds is contrary to the Shoreline Management Act requirements (WAC 173-26-221(2)(c)(iii and iv).
- Removal of eelgrass from commercial clam beds is contrary to the Growth Management Act.

Ecology Response:

There are many regulations that constrain what a land manager (for example: owner, lessee) may do when managing their land. These regulations may overlap. However, unless the regulation specifically states that another regulation does not apply, the land manager must comply with all applicable regulations when they manage their lands. Complying with one regulation does not absolve the land manager from failing to comply with other applicable regulations.

In the case of *Z. japonica* control there are some exceptions to the overlapping laws which would regulate management of this plant. However, in general, overlapping laws include:

- Title 33 USC 1251 et seq Federal Clean Water Act.

- Title 33 USC 401 et seq, 1344, 1413: Navigation and Navigable Waters (Regulation of Navigable Water by the US Army Corps)
- RCW 90.58: Shoreline Management Act
- RCW 90.48: Water Pollution Control Act
- RCW 36.70A: Growth Management Act
- RCW 77.55: Construction Projects in State Waters

These laws are implemented through regulations such as:

- 33 CFR 122: NPDES Permit Program
- WAC 173-226: General Permit Program
- WAC 173-201A: Surface Water Quality Standards
- WAC 173-204: Sediment Management Standards
- WAC 222-660: Hydraulic Project Code
- WAC 173-26: State master Program Approval/Amendment Procedures and Master Program Guidelines

While this general permit may conditionally authorize a discharge of imazamox, the permit does not remove the responsibility of the land manager from complying with other applicable regulations. Notifying the permittee and sponsor of this fact is the purpose of General Condition G9 (largely from 40 CFR 122.5(b and c)) which states: *“Nothing in this permit excuses a Permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations.”* If there is a conflict between regulations, with this permit allowing use of imazamox, but another regulation not allowing use, then the permittee and sponsor would not be able to use imazamox under this permit without violating the other regulation. Doing so would most likely be a violation of the permit.

It must be noted that aquaculture is exempt from many regulations, such as hydraulic code rules (chapter 220-660 WAC). So while WAC 220-660-320 lists seagrasses as a saltwater habitat of special concern for herring spawning, aquaculture is exempt from being required to obtain a HPA under WAC 220-660-040(l).

Comment 17: 24

One commenter questioned whether Ecology had complied with the State Environmental Policy Act (SEPA) for various reasons:

- Ecology should not reissue this permit based on the environmental impacts noted in the 2014 EIS.
- Ecology did not comply with SEPA to develop a supplemental Environmental Impact Statement for this permit to incorporate the past 5 years of data.
- Use of imazamox is not an existing discharge that is exempted from SEPA requirements under RCW 43.21C.0383 because the use started after this RCW was enacted in 1996.
- See 24g summary.
- EPA has not set any effluent limitations for imazamox use on commercial clam beds, therefore there is no way to compare if the proposed draft permit is more or less stringent than EPA effluent limits as required by 43.21C.0383.

- Ecology must develop a supplemental EIS to incorporate any new studies or data collected in the past 5 years about the impacts of imazamox on Willapa Bay, and assess alternative methods of *Z. japonica* control on commercial clam beds.

Ecology Response:

Ecology interprets RCW 43.21C.0383 (1) as applicable to the reissuance of the *Z. japonica* permit. Though there are no federal effluent guidelines published in the Code of Federal Regulations for imazamox use on tidelands, EPA does issue the federal Pesticides General Permit. In the absence of published effluent limit guidelines, we have used federal permits as a baseline in the past on other aquatic pesticide permits. Based on review of the federal Pesticides General Permit, this permit is at least as stringent as the federal equivalent.

Additionally, Ecology staff performed a search for new credible data (for example: scientific journal articles) that contain information about the effects of imazamox on marine ecosystems (for example: benthic organisms, off-site movement). No documents were located which would cause Ecology to update the 2014 EIS. One new journal article addressing tidal water exchange within Willapa Bay was noted in the public comments. It is addressed in the response to Comment 12. However, this article does not change Ecology's assessment of potential impacts from imazamox use on commercial clam beds.

See Comment 27 for Ecology's response addressing antidegradation requirements and incorporating permit data into the development of a draft general permit.

Comment 18: 18, 20, 27

Three commenters suggested changes to the reporting conditions in the permit (special condition S7):

- Pre-treatment plans being due to Ecology prior to the spring tides makes it difficult to visit some sites to determine if treatment will be necessary that year. Moving the pre-treatment plan due dates to later in the spring should result in more accurate information and better management decisions.
- The Permit relies on self-reporting by the Permittee. This includes the events in which the Permittee is unable to comply with terms and conditions of the Permit that may endanger health of the environment. The Permit states that when a Permittee finds themselves out of compliance, they must stop activity and take actions necessary to return to compliance. While it may or may not be appropriate for a Permittee to make the call on noncompliance, we feel that it is inappropriate for the Permittee themselves to determine they have returned to compliance.

Ecology Response:

Ecology has changed the Pre-treatment reporting conditions based on comments received. See response to Comment 18.

The permit requires that the Permittee submit a report to Ecology within 5 days of noncompliance detailing the situation causing noncompliance as well as actions the

Permittee is taking to return to compliance. Based on review of this report (special condition S7.C), as well as likely communication with the Permittee, and potentially site inspection, Ecology would decide whether the actions taken have returned the Permittee to compliance.

Comment 19: 20

Comments were submitted on the record keeping conditions in the permit:

- The proposed changes to the permit are consistent with how record keeping and reporting is currently taking place and will not cause any confusion.
- Pre-treatment plans being due to Ecology prior to the spring tides makes it difficult to visit some sites to determine if treatment will be necessary that year. Moving the pre-treatment plan due dates to later in the spring should result in more accurate information and better management decisions.

Ecology Response:

Ecology prefers that permittees use the most accurate information they have available for making management decisions. More accurate information should lead to better estimates of proposed treatments each year. In order to facilitate using more accurate information to determine where treatment may occur (as submitted on Pre-Treatment Plans) Ecology is changing the permit requirement as stated in the draft permit special condition S4.C, S7, S7.A to reference April 15 as the deadline for submitting annual pre-treatment reports. Ecology has also removed the statement in special condition S4.C that Ecology will post Pre-treatment reports to the permit web page as announced at the October 2019 public hearings. All permit coverage documents are available in the PARIS permitting database through the [public PARIS portal](https://apps.ecology.wa.gov/paris/Default.aspx): <https://apps.ecology.wa.gov/paris/Default.aspx>.

Special condition S7.A language was modified further:

The draft language stated: *“Permittees must submit an annual Pre-Treatment Plan to Ecology by March 1, even if no treatment is planned.”*

The final permit language states: *“Permittees must submit an annual Pre-Treatment Plan to Ecology by April 15, even if no treatment is planned. To meet this deadline, the Permittee may submit their plan via email. However, the email copy must be followed up with a mailed hardcopy of the plan containing the Permittee’s ink signature. The hardcopy must be mailed to Ecology within one week (seven days) of the email submittal.”*

Special condition S4.C was also modified to reflect this change, with the due date for Pre-Treatment reports being changed to April 15. The text stating that Ecology would post Pre-Treatment reports on the *Z. japonica* permit web page was also removed. All permit reports will now be posted to PARIS.

Comment 20: 2, 6, 9, 12, 18, 20, 23, 24, 25, 26, 27

The monitoring conditions (special condition S5) in the proposed permit were of interest to many parties:

- Ecology can't perform a valid anti-degradation analysis on the draft permit because there is not enough information from permit reports or information on off-site impacts.
- Ecology should be evaluating the overall condition of eelgrass in Willapa Bay due to the years of disturbance from commercial aquaculture activities.
- "Ecology should account for accumulative effects of all activities in Willapa Bay when developing the permit, not just effects from treatment with imazamox."
- Ecology and other agencies should be evaluating the impacts to eelgrass from all aquaculture activities, not just *Z. japonica* treatment with imazamox on commercial clam beds.
- Ecology and other agencies should be evaluating the damage to eelgrass and other native species from commercial shellfish aquaculture in Willapa Bay and monitoring the treatment the industry does carry out.
- Ecology should require monitoring after treatment, and off-site, to determine impacts to eelgrass not targeted for treatment.
- Ecology has allowed the unmonitored spraying of eelgrass with the herbicide imazamox for five years. This must stop.
- Ecology should include buffer monitoring requirements using vegetation plots, one week after treatment, every 250 of buffer distance to measure whether there is any *Zostera* species kill. Require reporting of this monitoring in the annual report.
- The treatment buffers and current monitoring efforts are effective at protecting native seagrass beds that are located much lower in tidal elevation.
- Because of the permit buffer requirements, no monitoring of off-site impacts was conducted. Ecology should require off-site monitoring to determine the impacts to eelgrass.
- The buffer study in the 2014 version of the permit was fatally flawed. It showed negative impacts to native eelgrass and should not have been used to support extending the permit for the full 5 years. There are still significant data gaps around the effectiveness of the buffers in the permit.
- On page 12, special condition S5.a (of the second a., b., c., . . . series) under Documentation of monitoring activities and results must include (if applicable), it states that the "exact place" of sampling should be documented under. It would be clearer to specify the GPS coordinates or lat/long instead of "exact place".
- Ecology has allowed the unmonitored spraying of eelgrass because the buffer are only required around parcel boundaries, not around the clam beds, and often the clam bed does not extend to the parcel boundary. Off-site impacts are not required to be monitored.
- It is unclear how Ecology would know about off-site impacts because of the lack of monitoring and oversight.
- Permit allows harm to native eelgrass, not just *Z. japonica*, because there are mixed stands of eelgrass on commercial clam beds and there is no data to demonstrate that there is not off-site impacts from treatment. The Puget Sound Partnership and SROTF do not distinguish between eelgrass species in their restoration plans. Ecology should

assess impacts from treatment in conjunction with all the other stressors from human activity.

- There is not enough data for Ecology to make the determination that there is no net loss of eelgrass.
- The permit lacks any meaningful monitoring of off-site impacts or oversight by Ecology. Eelgrass has been lost on a much larger area than characterized by permit reports.
- Ecology should have more oversight on permittees and require more details about what is actually going to be treated each year prior to treatment occurring.
- Ecology needs to inspect treatments as they are occurring.
- Long residence time and lack of surfactant have led to lots of off-site impacts long distances away from treatment and replacement of eelgrass with lug worms and burrowing shrimp.
- Ecology should have more oversight of actual treatment and know exactly what is going to be treated before it is treated.
- Ecology should be more active in its oversight on this permit. Permittees self-monitoring their compliance with permit requirements is not appropriate.
- Under special condition S5 on page 11 and 12, the permit describes which types of monitoring samples required to be analyzed by an accredited laboratory. Reading this section would make more sense, and be clearer, if there were two lists. Separate out the parameter that need to be analyzed by an accredited lab and those that do not.
- The Permit states that Permittees must conduct routine monitoring on all treated clam beds. WDFW recommends that monitoring frequency should be explicitly stated in the Permit, i.e., after every treatment, or some other frequency. Also, the Permit focuses on self-monitoring by the applicant with no indication that neutral party studies are planned to either independently monitor treatment or compile data to help determine the effectiveness of the application or in the buffer intended to protect native eelgrass and other species. WDFW recommends developing a third-party independent review program to verify effectiveness and to ensure that the conditions of the Permit are followed."

Ecology Response:

WAC 173-226-090 and 40 CFR 122.41(j and l) require that a discharge conditionally authorized by a general permit be monitored to ensure that the discharge is in compliance with the permit. The monitoring required by this permit (reporting amount of imazamox discharged and visual monitoring in some circumstances) is intended to measure whether a permittee is in compliance with permit conditions. The permit cannot authorize a Permittee to go onto another's property to conduct permit related monitoring activity. In addition to protecting off-parcel eelgrass, this is the reason that buffers are measured from the parcel boundary inward.

Monitoring is dependent on where treatment occurs in relation to parcel boundaries as clam bed boundaries on a parcel do not always match parcel boundaries. Monitoring must take place 30 days after treatment (special condition S5.A). Buffers are intended to keep

imazamox on the treated site during treatment in order to prevent unacceptable off-site impacts.

See response to Comment 23 for a discussion of the buffer validation study. No credible data sources were presented to Ecology that these buffers are not working as intended. Ecology is required to use credible data in its decision making which the state legislature defined in RCW 34.05.272. Credible data requires quality assurance measures were followed and documented during the collection and analysis of samples. Assurance must be provided that samples are representative, that a sufficient number of samples and parameters were analyzed to meet the stated objectives, and that sampling and laboratory analysis conform to methods and protocols generally accepted by the scientific community as appropriate for use in assessing conditions.

Washington DNR and USDA-ARS conducted an updated eelgrass survey in Willapa Bay in 2013. At the time of writing this response to comments, no formal publication of the data was available. However, from the white paper provided to Ecology by DNR in 2019, the results of the survey were summarized as:

“Zostera japonica: status and change

Z. japonica change analysis was performed. Of the nearly 1000 sites surveyed, 45% showed no change in Zj abundance 36% of the sites showed an increase in Zj abundance and 19% showed a decrease in Zj abundance

Z. japonica was significantly more abundant in 2013 than in 2006/2007 (t=5.6507, df = 1,349, p-value < 0.001), though the magnitude of difference was small (0.19 units on a scale of 0=absent, 1=minor, 2=medium, 3=major).”

See response to Comment 15 for a statement about Ecology’s oversight on permit holders and actual treatment of *Z. japonica*.

See response to Comment 23 for a discussion of the buffer validation study conducted during the 2014-2019 permit cycle.

Comment 21: 4, 12, 24

Some comments were submitted concerning the off-site movement of imazamox after treatment and the potential for effects of this movement on neighboring properties:

- I don't want any chemicals on my shellfish beds from other shellfish growers or the eelgrass on my shellfish beds killed. Tidal water movement vectors will move imazamox to my shellfish beds when treatment occurs elsewhere.
- Imazamox moves offsite on to other's property after treatment/during the first flush tide. This violates their property rights.
- Ecology can't perform a valid anti-degradation analysis on the draft permit because there is not enough information from permit reports or information on off-site impacts.

Ecology Response:

Based on the information Ecology currently has available such as the 2014 EIS, complaints related to the 2014-2019 *Z. japonica* permit, buffer validation study, and Toxics Cleanup Program sediment review, off-site and sediment impacts are not expected from treatment of commercial clam beds in compliance with the permit. After first flush dilution of any imazamox or residues present on the treated commercial clam bed, the concentration of imazamox on the water column is expected to be below a level where herbicidal activity is seen in any plants that come into contact with the water.

Comment 22: 6, 12, 25

Some comments concerned what the commenters saw as a conflict between issuing the proposed permit and the Governor's policy on Southern Resident Orca recovery and Puget Sound restoration:

- Eelgrass is a valuable resource for improving water quality in Puget Sound. A Puget Sound Recovery action agenda item is to increase eelgrass extent by 20%.
- Reissuing this permit will undermine salmon and Southern Resident Orca recovery efforts.
- Allowing treatment of *Z. japonica* is contrary to Gov. Inslee's goals of increasing habitat for salmon and Orcas.

Ecology Response:

The Governor's policy directives for recovery of the Southern Resident Orca must be carried out within the constraints of existing statutes. One of those statutes is RCW 90.48.445, which requires Ecology to issue a permit for the use of herbicides to control aquatic noxious weeds. Ecology must balance these priorities and does this by limiting the active ingredients that may be used to control *Z. japonica*, limiting the geographic area where the permit applies (only Willapa Bay), limiting the work window (April 15 – June 30), and by limiting the category of commercial clam beds where treatment may be conditionally authorized (commercial clam beds only, excluding geoduck).

See response to Comment 1 for a discussion of noxious weeds and RCW 90.48.445.

Comment 23: 2, 4, 18, 20, 21, 23, 24, 25, 27

Several commenters included comments about the adequacy of the buffer validation study conducted as part of the 2014 version of the permit, and finalized through a major modification in 2017:

- Ecology can't perform a valid anti-degradation analysis on the draft permit because there is not enough information from permit reports or information on off-site impacts.
- The buffer validation study that Ecology required as part of the 2014 version of the permit failed and report results were not released until after the appeal of the 2014 permit to the PCHB. Acceptance criteria for the study were exceeded and criteria changed to make it pass. The independent scientists meant to carry out the study instead of WDFW were not allowed back on the study site after finding determining that they needed to inspect damage outside the buffer. The study was finished by a WSU

extension scientist. DNR said that the buffer was not good enough, but WDFW and Ecology did.

- Treatment does not go offsite. The results of treatment can be seen as a straight line on a clam bed where treatment has occurred (no eelgrass) and where treatment has not (eelgrass present).
- The buffer validation study did not look at actual imazamox application rates (lower rate than allowed by label was used). Two of three study plots showed significant impacts (greater than 20% change) to eelgrass beyond the 10 meter buffer zone. Ecology did not consider this a significant impact under no net loss policy.
- Ecology should include buffer monitoring requirements using vegetation plots, one week after treatment, every 250 of buffer distance to measure whether there is any *Zostera* species kill and require reporting of this monitoring in the annual report.
- The treatment buffers and current monitoring efforts are effective at protecting native seagrass beds that are located much lower in tidal elevation.
- Because of the permit buffer requirements, no monitoring of off-site impacts was conducted. Ecology should require off-site monitoring to determine the impacts to eelgrass.
- The buffer study in the 2014 version of the permit was fatally flawed. It showed negative impacts to native eelgrass and should not have been used to support extending the permit for the full 5 years. There are still significant data gaps around the effectiveness of the buffers in the permit.
- On page 12, special condition S5.a (of the second a., b., c., . . . series) under Documentation of monitoring activities and results must include (if applicable), it states that the "exact place" of sampling should be documented under. It would be clearer to specify the GPS coordinates or lat/long instead of "exact place".
- Ecology has allowed the unmonitored spraying of eelgrass because the buffer are only required around parcel boundaries, not around the clam beds, and often the clam bed does not extend to the parcel boundary. Off-site impacts are not required to be monitored.
- It is unclear how Ecology would know about off-site impacts because of the lack of monitoring and oversight.
- There is not enough data for Ecology to make the determination that there is no net loss of eelgrass.
- The permit lacks any meaningful monitoring of off-site impacts or oversight by Ecology. Eelgrass has been lost on a much larger area than characterized by permit reports.
- The buffer validation study did not look at actual imazamox application rates (lower rate than allowed by label was used). Two of three study plots showed significant impacts (greater than 20% change) to eelgrass beyond the 10 meter buffer zone. Ecology did not consider this a significant impact under no net loss policy.
- One application requirement mandates a 10m buffer on each parcel property boundary to protect resources outside of the treatment area. While this buffer has been supported by previous studies to protect resources outside the parcel boundaries, the requirement does not address adjacent Z marina within the parcels themselves. As

indicated by Imazamox control of invasive Japanese eelgrass (*Zostera japonica*): Efficacy and nontarget impacts: The greatest ecological risk to native eelgrass from imazamox is from short-term, unintentional in-water exposure at locations where it is naturally found. This could occur when the concentration and exposure time (CET) to imazamox in on-site static pools and swales became high enough to cause damage "" The Permit requires the Permittee to not directly apply imazamox into any drainages that contain *Z. marina* and is moving water off the treatment site. It would be beneficial to require the same 10m buffer around any on-site native *Z. marina* patches to aid in the protection of this native species.

- Permit allows harm to native eelgrass, not just *Z. japonica* because there are mixed stands of eelgrass on commercial clam beds and there is no data to demonstrate that there is not off-site impacts from treatment. The Puget Sound Partnership and Southern Resident Orca Task Force do not distinguish between eelgrass species in their restoration plans. Ecology should assess impacts from treatment in conjunction with all the other stressors from human activity.

Ecology Response:

The buffer validation study conducted during the 2014-2019 permit cycle. The study requirements were included in the 2014 version of the permit. Ecology finalized the buffers in the permit during the 2017 major modification. The major modification had a public comment period and was an appealable action. Ecology notified all interested parties about the major modification. No appeal of the finalized buffer conditions based upon the buffer validation study occurred.

Though DNR staff did have some disagreement over the study design, no agency disagreed with the results of the study, as designed. DNR was included in the buffer validation study scoping and design process prior to permit issuance in 2014. Ecology maintains that the interpretation of the buffer validation study results are valid, and the existing buffers are appropriate.

As part of the permit modification in 2017 the maximum allowable rate for imazamox was reduced to match the application rate used in the buffer validation study. The maximum application rate allowed by the permit is less than the maximum application rate allowed on the product (Clearcast) label. Permittees may not use more imazamox than the maximum application rate allowed by the permit, even though the label allows a higher application rate.

The final report on the buffer validation study initially listed an application rate of 11.5 – 11.7 oz. active ingredient per acre. However, later communication with the report author (Dr. Christian Grue, UW School of Aquatic and Fisheries Sciences) confirmed that this amount of active ingredient was stated in error. The amount reported was actually the amount of product (Clearcast) applied. Based on the amount of active ingredient stated on the Clearcast label (12.1%) 11.5 – 11.7 oz of Clearcast product is equivalent to 1.39 – 1.41 oz imazamox active ingredient. The 2014-2019 permit, after modification in 2017, lists 1.4 oz

per acre imazamox active ingredient as the maximum application rate allowed by the permit.

Ecology addressed critical habitat and no net loss of eelgrass in the 2014 issuance and 2017 modification of this permit. No net loss off of the commercial clam bed parcel is one of the goals of the permit conditions in order to align with other agencies regulations and policies. It does not prevent Ecology from issuing permits as required by a state law (RCW 90.48.445).

2014 Response to Comments

- Comment 53 on page 20:

“WDFW defines no net loss as : No-net-loss = (a) Avoidance or mitigation of adverse impacts to fish life; or (b) Avoidance or mitigation of net loss of habitat functions necessary to sustain fish life; or (c) Avoidance or mitigation of loss of area by habitat type. Mitigation to achieve no-net-loss should benefit those organisms being impacted (WAC 220-110-020(56)). The conditions of the permit set out the mitigation and avoidance requirements to achieve the goal of no net loss to Z. marina off of the treatment site due to direct effects from imazamox. Ecology agrees that there may be a reduction of off-site Z. marina due to indirect effects of imazamox treatment. The phrase “no net loss” is not used in the permit and is not part of the conditions set forth in the permit.”

2017 Response to Comments

- Comment 7 on page 8, partial Ecology response:

“Please see the EIS sections 2.6.2 and 2.6.3 for a discussion on how WDFW’s Priority Habitat and Species designation and Hydraulic Project Approval (HPA) permitting interacts with this activity.”

- Comment 28 on page 13, Ecology response:

“There are not regulations in place that require commercial clam growers to protect or mitigate for non-target vegetation within commercial clam beds in Willapa Bay. Further, Ecology feels that this permit will provide the appropriate herbicide application restrictions to protect offsite vegetation. Please see the EIS, sections 2.6.2 and 2.6.3, for a discussion on how WDFW’s Priority Habitat and Species designation and Hydraulic Project Approval (HPA) permitting interacts with this activity.”

- Comment 41 on page 16, partial Ecology response:

“Though the goal is no net loss of native eelgrass off of the treatment site, the permit and buffer validation study are not designed ensure zero impacts off of the treatment site. The study was designed to look at measureable impacts to native eelgrass at the 10 m buffer distance. Based upon WDFW Hydraulic Project Approval Permit monitoring guidance and the validation of the study design (see response to comment # 26), Ecology determined that measurement of a 20% reduction in native

eelgrass stem density allows standard survey methods a chance of detecting a change at a level of effort that is not prohibitively expensive."

See also response to Comment 22 for are response to comments about the Governor's Orca Task Force, and Comment 5 for management decision responses.

Comment 24: 4, 7, 9, 11, 12, 15, 17, 18, 19, 20, 21, 22, 23, 24, 25

The Environmental Impact Statement (EIS) completed in 2014 when this permit was originally issued was the subject of many comments:

- There is no reason to allow direct spraying of any native eelgrass, even on commercial clam beds. Ecology failed to evaluate any alternatives that are more environmentally protective than spraying herbicides to kill eelgrass.
- Calculations in the 2014 EIS about the acres of eelgrass that could potentially be treated are off by orders of magnitude. Ecology could not tell us during the public meeting how many acres of eelgrass were actually treated each year.
- The EIS from 2014 claims that imazamox is not a concern for sediment build-up because the chemicals does not bind tightly to the sediment (there is not enough organic carbon) and will break down quickly (short half-life). However, the documentation for the burrowing shrimp control permit when it was first issued (DATE), limited the areas treated because of the high amount of organic carbon.
- The permit and explanation treat eelgrass as if it were an established hayfield, finding that 50 ppb of imazamox in the water will not harm off-site plants. However, primary propagation of eelgrass is through seed, not re-growing rhizomes. The label states that water should not be used for irrigating golf courses when imazamox concentrations are 1ppb or higher. This means that 1ppb or higher imazamox concentration will harm off-site plants.
- Eelgrass serves as an "ecosystem engineer" by slowing water flow, binding and stabilizing sediments, and mitigating the impacts of ocean acidification by absorbing CO₂ and increasing oxygen in the water.
- Imazamox has been demonstrated to be a low risk and effective management tool. It has negligible impacts on other species, and results in a good level of efficacy.
- *Z. japonica* displaces native eelgrass (*Zostera marina*) and other native species such as sturgeon, migratory birds, and benthic organisms in addition to the problems it causes commercial shellfish aquaculture.
- *Z. japonica* displaces native eelgrass (*Zostera marina*) and other native species such as sturgeon, migratory birds, and benthic organisms in addition to the problems it causes commercial shellfish aquaculture.
- Chemicals should be tested more before being allowed to be used under permit. What are the long term effects on people?
- How much does imazamox (Clearcast cost per gallon)
- What are the offsite impacts to other plants?

- When used as described in the permit, Imazamox is unlikely to have significant negative impacts to fish or shellfish species in Willapa Bay. Some indirect impacts may occur to fish and shellfish that occupy eelgrass beds at the time of treatment.
- Native eelgrass provides valuable habitat for salmon and other marine organism. The benefits provided by healthy native eelgrass beds include protection from predators, improved water quality and increased insect production. Pacific Herring (*Clupea pallasii*) spawn in the estuaries of Washington State, including Willapa Bay, and eelgrass is commonly utilized by spawning herring as a substrate to deposit eggs.
- Herring eggs have been observed more commonly on *Z. marina* than on *Z. japonica* due to the greater prevalence of *Z. marina* and its tendency to grow at greater depths than *Z. japonica*.
- The potential negative impacts to Green sturgeon (*Acipenser medirostris*) are less understood but one food source is Ghost shrimp (*Neotrypaea californiensis*). Ghost shrimp densities appear to be less abundant in an area with established *Z. japonica* therefore removing *Z. japonica* could increase forage for Green sturgeon.
- In review of this Permit, and current available information and data, we anticipate no significant direct impacts to fish and wildlife resources in Willapa Bay associated with treatment of *japonica* as described in the permit.
- While some indirect impacts to invertebrates, waterfowl, and shorebirds, is possible if the species is occupying the commercial clam bed at the time of treatment, it does not appear that *Z. japonica*, as a non-native species, is a critical food source for native or migratory species.
- Native eelgrass (*Z. marina*) appears to be at or near historical abundance in Willapa Bay, in the low intertidal and sub-tidal areas, which are generally below the preferred tidal zone for commercial clam culture. *Z. japonica* appears to be expanding its range in the mid to upper tidal areas where there are documented impacts to commercial clam culture.
- There have been multiple studies that demonstrate imazamox to be a targeted chemical and as authorized under the NPDES permit, it impacts the invasive *Z. japonica* without effecting water quality or harming other aquatic organisms.
- On tidelands *Z. japonica* increases sedimentation, increases water surface and sediment temperatures, alters benthic invertebrate assemblages and creates anoxic sediment conditions. These conditions create unsuitable habitat for many benthic organisms especially cultivated clams. When large mats of *Z. japonica* form it has devastating effects on clam populations, including a marked decrease in juvenile clam recruitment, slowed growth, reduced meat weight and increased predation.
- *Z. japonica* is gone by August/September, and herring in Willapa Bay spawn in mid-winter, so *Z. japonica* does not provide a substrate for herring spawning.
- *Z. japonica* provides the same habitat function as *Z. marina*, however Ecology is still allowing removal of *Z. japonica* and is not providing oversight when treatments occur.
- Populations of many species began declining once the Spartina eradication project started and then further once eelgrass management started.

- Treatment areas overlap with critical herring spawning habitat. Herring spawning has decreased since the *Spartina* eradication project started.
- Imazamox kills both *Z. japonica* and *Z. marina*.
- The few scientists that work for the industry, that Ecology listened to, contradict all the history and literature on the subject.
- Demonstrating success of the intent of the issuance of the original permit in 2014, less than 40% of the 1,200 acres currently under permit coverage is in need of annual treatment.
- The buffer validation study that Ecology required as part of the 2014 version of the permit failed and report results were not released until after the appeal of the 2014 permit to the PCHB. Acceptance criteria for the study were exceeded and criteria changed to make it pass. The independent scientists meant to carry out the study instead of WDFW were not allowed back on the study site after finding determining that they needed to inspect damage outside the buffer. The study was finished by a WSU extension scientist. DNR said that the buffer was not good enough, but WDFW and Ecology did.
- Treatment does not go offsite. The results of treatment can be see as a straight line on a clam bed where treatment has occurred (no eelgrass) and where treatment has not (eelgrass present).
- The buffer validation study did not look at actual imazamox application rates (lower rate than allowed by label was used). Two of three study plots showed significant impacts (greater than 20% change) to eelgrass beyond the 10 meter buffer zone. Ecology did not consider this a significant impact under no net loss policy.
- Ecology should be evaluating the overall condition of eelgrass in Willapa Bay due to the years of disturbance from commercial aquaculture activities.
- Ecology should account for accumulative effects of all activities in Willapa Bay when developing the permit, not just effects from treatment with imazamox.
- Ecology and other agencies should be evaluating the impacts to eelgrass from all aquaculture activities, not just *Z. japonica* treatment with imazamox on commercial clam beds.
- Ecology failed to evaluate any alternatives that are more environmentally protective than spraying herbicides to kill eelgrass or conduct any review of the impacts on the ground after five years of spraying.
- This permit does not comply with state and federal water quality standards.
- There is no reason to allow direct spraying of any native eelgrass, even on commercial clam beds. Ecology failed to evaluate any alternatives that are more environmentally protective than spraying herbicides to kill eelgrass.
- The reason burrowing shrimp are a problem is that eelgrass has been removed from shellfish beds.
- There is not enough data for Ecology to make the determination that there is no net loss of eelgrass.
- The permit lacks any meaningful monitoring of off-site impacts or oversight by Ecology. Eelgrass has been lost on a much larger area than characterized by permit reports.

- The federal judge in CASE determined that in relying upon Dumbauld and McCoy's findings, that the US Army Corps made an arbitrary decision about the landscape level impacts of shellfish culture.
- Ecology should not reissue this permit based on the environmental impacts noted in the 2014 EIS.
- Ecology did not comply with SEPA to develop a supplemental Environmental Impact Statement for this permit to incorporate the past 5 years of data. Use of imazamox is not an existing discharge that is exempted from SEPA requirements under RCW 43.21C.0383 because the use started after this RCW was enacted in 1996.
- EPA has not set any effluent limitations for imazamox use on commercial clam beds, therefore there is no way to compare if the proposed draft permit is more or less stringent than EPA effluent limits as required by 43.21C.0383.
- Ecology must develop a supplemental EIS to incorporate any new studies or data collected in the past 5 years about the impacts of imazamox on Willapa Bay, and assess alternative methods of *Z. japonica* control on commercial clam beds.
- This permit allows wide ranging impacts on many different threatened and endangered species.

Ecology Response:

Ecology staff performed a search for new scientific documents (for example: journal articles) that contain information about the effects of imazamox on marine ecosystems (for example: benthic organisms, off-site movement). No documents were located which would cause Ecology to update the 2014 EIS.

One new journal article addressing tidal water exchange within Willapa Bay was noted in the public comments. It is addressed in the response to Comment 12. However, this article does not change Ecology's assessment of potential impacts from imazamox use on commercial clam beds.

See also response to the following comments: 4, 5, 9, 14, 16, 17, 22, 23

Comment 25: 4, 6, 12, 22, 25

Comments received about other agency (state or local), historical, or industry actions:

- Willapa Bay should be managed holistically by the State, not in a piecemeal fashion.
- Ecology staff at the public workshop stated that they had discussed the draft permit with WDFW, and that WDFW did not express concerns. It is troubling that WDFW does not have concerns about eelgrass removal using imazamox considering the current degraded state of the Willapa Bay ecosystem.
- DOE staff stated that they had discussed the draft with WDFW. At the time of discussion no concerns were noted. DOE staff also stated that at the time of the public workshop and hearing, WDFW had not submitted comments on the proposed draft permit."
- WDFW staff is unwilling to discuss habitat at the Salmon Management Advisory Group Meetings for Willapa Bay.

- Removal of eelgrass from commercial clam beds is contrary to many regulations.
- It is not an honest narrative for the shellfish industry to eradicate eelgrass of any kind and at the same time complain about ocean acidification which science proves is reduced by aquatic vegetation like eelgrass. For Ecology or Fish and Wildlife to even attempt to act like wildlife in Willapa Bay/Grays Harbor is important is a completely false narrative that is sad, but true.
- Years of treatment with carbaryl, glyphosate, imazapyr, imidacloprid, and imazamox are the reason that salmon runs, herring, marbled murrelet, migratory bird populations and other marine species have virtually disappeared in Willapa Bay.
- The reason burrowing shrimp are a problem is that eelgrass has been removed from shellfish beds.
- During the public workshop, Ecology pointed to HPAs as controlling the loss of ecological function, however aquaculture is exempt from HPA requirements. Ecology cannot rely on HPAs to regulate no net loss of eelgrass.
- Ecology should protect all eelgrass because other state and federal agencies are not. Other agencies claim that their regulations exempt eelgrass management under the Hydraulic Project Approval (HPA) permit program, or fail to analyze cumulative impacts of all activities on eelgrass. See Center for Food Safety v. U.S. Army Corps of Engineers: 17-1209RSL, 2019 M'l, 5103309, at *6 (W D. Wash. Oct. 10, 2019).
- WDFW Policy C-3012 requires that WDFW document and protect spawning habitat of forage fish such as herring. Some of the known herring spawning areas are also commercial clam beds that may be treated under permit. Allowing removal of *Z. japonica* is contrary to this WDFW policy.
- Removal of eelgrass from commercial clam beds is contrary to many regulations.

Ecology Response:

Several state agencies, as well as local government agencies, have regulatory oversight of various aspects of the environment in Willapa Bay. Each agency has their authorities set in statute. For example, some generalized authorities include: Ecology has authority over water quality, WSDA has authority over pesticides, WDFW has authority over habitat, DNR has authority through contracts on state managed tidelands, and the WSNWCB has authority over noxious weeds. Each agency does not have the ability to override the decisions made by another agency under that agency's regulatory authorities. The agencies work together to align statutory and policy directives that may appear to be competing.

See also responses to the following comments: 5, 13, 14, 16

Comment 26: 24

Comment about All Known, Available, and Reasonable Technologies (AKART) in the permit: This permit does not include AKART, unclear how Ecology believes AKART is implemented in this permit. Does not describe how IPM is a technology based approach to limiting discharges, and fails to describe how IPM principles will be required and adhered to as part of the permit.

Ecology Response:

The permit defines what actions are considered AKART for the discharge of imazamox to control *Z. japonica* on commercial clam beds in Willapa Bay. Permit special condition S3.A.2 states: “Permittees must use All Known, Available, and Reasonable methods of prevention, control, and Treatment (AKART) when applying imazamox. Compliance with this permit, the Washington Pesticide Control Act, the Washington Pesticide Application Act, the requirements of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) label constitute AKART.”

Comment 27: 24

Comment about anti-degradation related to the permit:

- Ecology can't perform a valid anti-degradation analysis on the draft permit because there is not enough information from permit reports or information on off-site impacts.

Ecology Response:

Ecology incorporates the data from the previous permit cycle into review while developing the draft permit to determine if changes are necessary. Anti-degradation analysis is based on the information available during draft permit development, and is on pages 40-42 of the draft factsheet. WAC 173-201A-320(6) describes how Ecology should conduct an antidegradation Tier II analysis when it issues NPDES general permits, but does not provide any thresholds for how much data is required.

Ecology staff reviewed the available information, and looked for new information. However, no new credible data was available, or provided during the public comment period, that would change the antidegradation plan in the draft permit factsheet.

Washington DNR and USDA-ARS conducted an updated eelgrass survey in Willapa Bay in 2013. At the time of writing this response to comments, no formal publication of the data was available. However, from the white paper provided to Ecology by DNR in 2019, the results of the survey were summarized as:

“Zostera japonica: status and change

Z. japonica change analysis was performed. Of the nearly 1000 sites surveyed, 45% showed no change in Zj abundance 36% of the sites showed an increase in Zj abundance and 19% showed a decrease in Zj abundance

Z. japonica was significantly more abundant in 2013 than in 2006/2007 (t=5.6507, df = 1,349, p-value < 0.001), though the magnitude of difference was small (0.19 units on a scale of 0=absent, 1=minor, 2=medium, 3=major).”

Comment 28: 2, 4, 24

Comments about the public availability of required permit submittals and documents such as Discharge Management Plans (DMP):

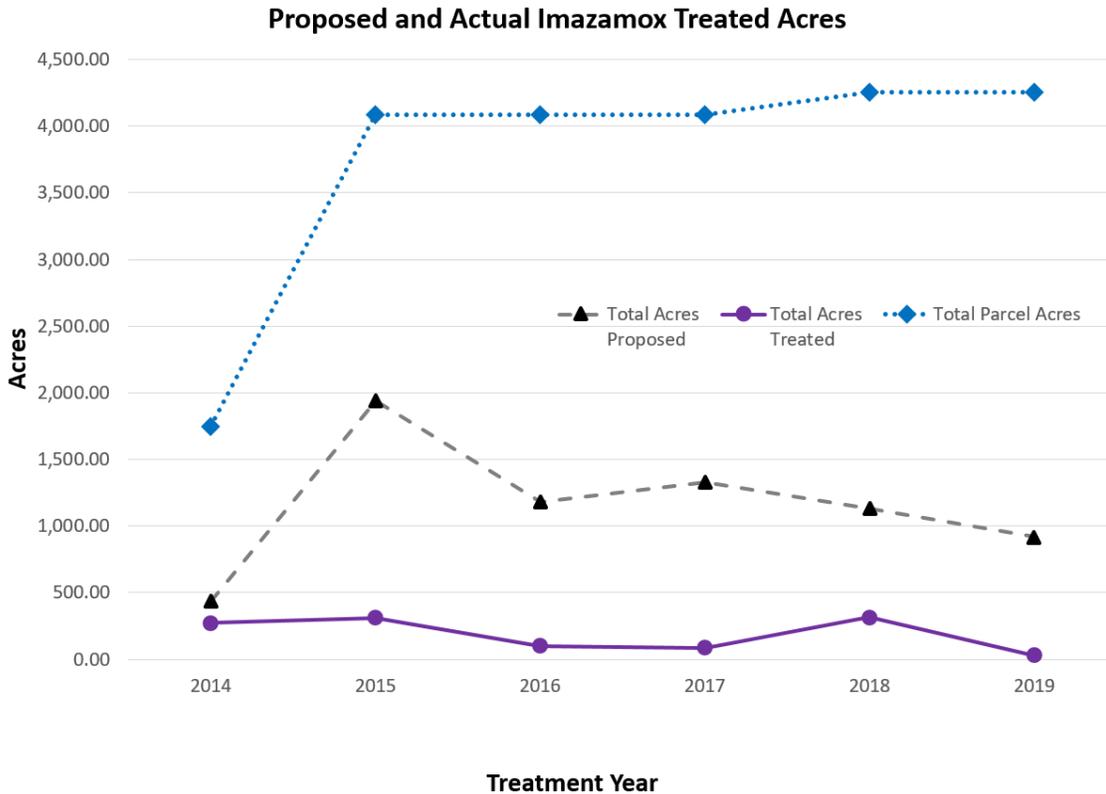
- Does not describe how IPM is a technology based approach to limiting discharges, and fails to describe how IPM principles will be required and adhered to as part of the permit.

- Discharge Management Plans not available for public review, even though they describe how permittees are following IPM.
- No clear explanation of how the 2014 EIS may substitute for portions of the Discharge Management Plan.
- Ecology only showed 5 years of treatment data (2014 to 2018) during the public workshop, even though, under an expired general permit, treatment still occurred in 2019. If Ecology had 2019 data it should have also been presented.
- DMPs should be made available to the public as well as the action thresholds for the *Z. japonica* population density that commercial growers determine impacts clam culture.

Ecology Response:

All reports and other documents required to be submitted for permit compliance, or in support of permit compliance are available to the public. Due to interests stated in the past, only Pre-treatment Plans and Annual Treatment Reports were posted on the permit website during the 2014-2019 permit cycle. Other documents were available through public disclosure request. Ecology is moving the permit compliance information into the PARIS database. PARIS is the database Ecology is using to manage all water quality discharge permit information. The [public PARIS portal](https://apps.ecology.wa.gov/paris/PermitLookup.aspx) is at: <https://apps.ecology.wa.gov/paris/PermitLookup.aspx>. All submittals required by the permit are now available through the public PARIS portal which may be accessed by the public at any time online, without a public disclosure request.

Treatment data presented at the public hearings in October 2019 included only data for which pre- and post-treatment data sets were available. Only 2019 pre-treatment data was available at the time of the public hearing. An updated chart with the complete 2019 pre and post treatment data is included below.



Comment 29: 27

Three comments were made about correcting information in the draft permit factsheet:

- Under AQUATIC PESTICIDE LEGAL HISTORY on page 9 it states that, “States have primary authority under FIFRA to enforce”. A more appropriate term/explanation is that EPA has delegated authority to the States.
- Under AQUATIC PESTICIDE LEGAL HISTORY on page 10 the web link: http://www.epa.gov/oppsrrd1/registration_review/ is to a page that no longer exists. A replacement page is: <https://www.epa.gov/pesticidereevaluation/registration-review-process>
- Under AQUATIC PESTICIDE LEGAL HISTORY on page 10 the web link: www.agr.wa.gov/PestFert/LicensingEd/Licensing.htm is to a page that no longer exists. A replacement page: <https://agr.wa.gov/services/licenses-permits-andcertificates/pesticide-license-and-recertification/pesticide-and-spi-licensing>

Ecology Response:

Ecology only makes changes to draft factsheets where information is factually incorrect. In this case, Ecology made the suggested changes to the draft factsheet to ensure readers are pointed to correct, up-to-date information and web pages. EPA and WSDA web pages have changed since this comment was received, so the web links for EPA and WSDA in the comment above are no longer correct. We have attempted to find corresponding pages to add to the draft factsheet.

Table 2: Friends of the Earth Form Letter Commenters

A. Bailor	Deborah Kaye	Jill Friedman	Lynne Roberson	Robert Seaman
A. Rosenthal	Deborah Parker	Jill Walton	Lynne Roberson	Robert Whitbeck
Aaren Thompson	Deborah Schulte	Jim Berka	M. Crowley	Roberta Hutton
Abbie Carrasco	Debra Campbell	Jim Sasser	M. Lee	Roberta Klein
Abby Wagman	Debra Clapp	Ji-Young Kim	M.C.	Roberta Moody
Abigail Ann Fanestil	Dee Grady	Jj-Young Kim	Madalyn Chevallier	Roberta R. Czarnecki
Adam Levine	Del E. Domke	Jo Harvey	Manny Jackson	Robin Hordon
Addison Barrett	Denee Scribner	Joan Kurtz	Marc Ladd	Robin Starzman
Adeline Parker	Denese Burrell	Joanie Merritt	Marcia Culver	Robin Wolfe-Jess
Adina Parsley	Denise Di Santo	Joanna Redman-Smith	Marcia Homer	Roger Clark
Aida Bound	Denise McGregor	Joanne Parrent	Marcia Pauley	Roger Nystrom
Aileen Taylor	Denise Sparks	Joel Carlson	Marco Di Marzio	Roger Waid
Aisha Farhoud	Dennie Carcelli	Johanna Dagget	Maren Culter	Ron Digiacomio
Alan Jennings	Dennis Merz	John Burns	Margaret Caron	Ron Knoll
Alan Lish	Dennis Rice	John Burrows	Margaret Graham	Ronalf Mazza
Alessandra Paolini	Dennis Smith	John DuBois	Margaret Hazard	Ronda Snider
Alex and Sandy McDougall	Derek Benedict	John Dunn	Margaret MacKenzie	Roni Jo Pattterson
Alex Berger	Desiree Nagyfy	John Earhart	Margaret Rinaldi	Ronlyn Schwartz
Alexa Munoz	Diahn Stetner	John Endres	Margaret Singh	Rose Fanger
Alfred Ferraris	Diana Balsam	John Espe	Margaret Woll	Rose Thygesen
Alison Eckels	Diana Flannery	John Gieser	Margaret Woll	Roseann Day
Alive Flegel	Diana Hice	John Guros	Margery Barlow	Roseanne Rohrer
Allen Elliott	Diana Meyers	John Kenny	Margie Meis	Rosemary Meert
Alyce Riddle	Diana Nielsen	John Leaver	Marguerite Winkel	Roy Conner
Alycia Staats	Diana Rutter	John Miller	Mari Decléments	Ruben Press
Amy Mower	Diane Bisset	John Primrose	Maria Magana	Russ Bradford
Andrea Fisher	Diane Boteler	John Rose	Maria Mata	Russ Thomas
Angela Kalm	Diane Brown	John Springer	Maria Santana	Russell Watson
Angela Swanson	Diane Carlson	John Steenson	Mariana Haynes	Ruth Darden

Anita Scheunemann	Diane Dishion	John Weeks	Marianna Clark	Ruth Hooper
Anita Stovall	Diane Rose	John Zey	Marianne Jacobs	Ruth King
Ann Bates	Diane Smith	Jollie Carlson	Maribeth Harper	Ruth Neuwald Falcon
Ann Becherer	Diane Sullivan	Jonathan Melusky	Marie Colvin	Ruth Zulas
Ann Bradshaw	Diane Sullivan	Jonathan Seil	Marilee Meyer	Ryan Sleight
Ann Brock	Diane Weinstein	Jonny Hahn	Marilyn Heuser	S. Almskaar
Ann Glynn	Dianna Macleod	Joseph Mabel	Marilyn Lowry	S. Breyfogle
Ann Michaud	Dianna Smith	Joseph Piercuch	Marilyn Overton	S. Jacky
Anna Hall	Dianne Sheldon	Joshua Weichman	Marilyn Thomas-Penney	Sada Showell
Anna Maletich	Dina Pearl-Thomas	Joyce Grajczyk	Marilynn Westerbeck	Sallie Shippen
Anne Almgren	Don Adair	Joyce Lewis	Maris Fravel	Sally Radford
Anne Cross	Don Thomsen	Judah Joy Easley	Marjorie Ostle	Sally Thrall
Anne Kahle	Donald Agnelli	Judith Bluhm	Mark Canright	Samantha Ngy
Anne Mosness	Donna Davis	Judith Brockmann	Mark Frey	Sammy Low
Anne Wells	Donna Leavitt	Judith Dobkevich	Mark Myers	Sandi Hogben
Annette F.	Donna Mason	Judith Hewitt	Mark Olson	Sandra Adams
Annette Smith	Donna Rowland	Judith Oswood	Mark Porter	Sandra Bush
Anonymous	Donna Shannon	Judith Ryan	Mark Proa	Sandra Diamond
Anthony Buch	Dore Richman	Judith Schwab	Mark Simpson	Sandra Gehri-Bergman
Arlene Bell	Doreen Harwood	Judy Knold	Mark Wirth	Sandra Maloff
Arlene Roth	Dori Bailey	Judy Mayo-Velasco	Marlene Clark	Sandra Russell
Ashley Fowler	Doris Raspa	Judy Palmer	Marlene Hayden	Sandra Smith
Audrey Meade	Dorothy Jones	Juie Taylor	Marsha Robbins	Sandra Wilson
Barabara Davidson	Dorothy Jordan	Julia Buck	Marta Newberry	Sandy Braden
Barb Drake	Dorothy Lipsky	Julia Holtzman	Martin Forster	Sandy Gese
Barb Kuchno	Dorothy Weiss	Julia Larsen	Martin Pittman	Sanford Leffler
Barbara Busby	Dorothy Wendler	Julia McLaughlin	Mary DeVany	Sanja Futterman
Barbara Daligcon	Doug Brown	Julia Russell	Mary Guard	Sara Bhakti
Barbara DelGuidice	Douglas Bolton	Julie Glover	Mary Jeffrey	Sara Eldridge
Barbara Gulbran	Douglas Taylor	Julie Pariseau	Mary Jo Wilkins	Sara Montgomery

Barbara Irgens	Duane Uusitalo	June MacArthur	Mary Kay Ganttmeier	Sara Wallick
Barbara Lamb	Dwight Rousu	K Cook	Mary Kennedy	Sarah Bauman
Barbara Powers	Edards Connor	K. Eggers	Mary L. Kennedy	Sarah Collmer
Barbara Rosenkotter	Edith Gish	Karen Byrd	Mary Magnano	Sarah Cooke
Barbara Scavezze	Edith Lackland	Karen Curry	Mary Masters	Sarah Dallosto
Barbara Stevenson	Edward Kaeufer	Karen Dahmer	Mary Menninga	Sarah Fletcher
Barbara Tountas	Edwyna Spiegel	Karen Fisher	Mary Parmenter	Sarah Habel
Barbara Vigars	Eileen Perfremment	Karen Leifker	Mary Riley	Sarah Hanson
Barbara We	Eleanor Dowson	Karen Loeser	Mary Solum	Sarah Lamberson
Barbara Wight	Eleanor Israel	Karen Scherwood	MaryAnn Seward	Scott Bishop
Becky Hage	Eleanor Klauminzer	Karl Scholze	MaryJo Fontenot	Scott Bohart
Becky Johnson	Eleanor Morris	Karla Bouvette	Matt Buckmaster	Scott Species
Ben Moore	Elizabeth Fleming	Karla Everett	Matt Connolly	Sean Edmison
Benjamin Lamey	Elizabeth Johnson	Karla Taylor	Matt Shaffer	Selim Uzuner
Beth Call	Elizabeth Nedeff	Karol Morphew	Matthew Boguske	Serena Mccullough
Beth Eisenbeis	Elizabeth Scott	Karris Shia	Matthew Cloner	Shannon Markley
Bethany Eldred	Elizabeth Sokol	Kate Blessing	Maureen Parriott	Share Jolliffe
Betsy Pendergast	Elizabeth Taylor	Kate Hunter	Maxi Backhouse	Sharmayne Busher
Beverly Gilyeart	Ellen Boyle	Katherine Masotti	Maxine Clark	Sharon Fasnacht
Beverly Vonfeld	Ellen Cupp	Katherine Nelson	Mayellen Henry	Sharon Kaylen
Bill Beers	Ellen Lyons	Katherine Wright	Mechthild Rast	Sharon Levine
Bill Bowman	Ellen Zarter	Kathie West	Meg Casey	Sharon Parshall
Billie Mann	Emily Raymond	Kathleen Bruner	Meghan McCutcheon	Sharon Vander Pool
Blake Koehn	Emily Trinkaus	Kathleen Hall	Melanie Lee	Shawn Tuthill
Bob Aegerter	Enid Cox	Kathleen Harris	Melinda Parke	Shelley Burns
Bob Gillespie	Eric Zimdars	Kathleen Hiatt	Melinda Powers	Shelley Mortinson
Bob Varden	Erik LaRue	Kathleen Lee	Melissa Betts	Shelley Simcox
Bobette Jones	Erika Davis	Kathleen Rooney	Melissa Rees	Shelley Young
Bonnie Benard	Ernest Bennett	Kathlene Croasdale	Melissa Schmidt	Shemayim Elohim
Bonnie Bledsoe	Ernetta Skerlec	Kathryn Bromley	Melissa Thirloway	Sheryl Sparling

Bonnie Roemer	Esther Kronenberg	Kathryn Cooper	Meredith Baker	Shirley Graves
Boris Bruton	Esther Rodriguez	Kathryn DeWees	Meryle A. Korn	Sidney Cohen
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Brandie Deal	F. Carroll	Kathryn Lambros	Micael Lucero	Simone Jarvis
Brandon Juhl	F. Steven Trevallee	Kathryn Townsend	Michael and Barbara Hill	Somsaron Pheth
Brenda Calloway	F.T.	Kathy Goldstein	Michael Betz	Sonia Thompson
Brenda Lewis	Farnoush Katouzian	Kathy Golic	Michael Boykin	Stacia Haley
Brenda McLaren	Fay Payton	Kathy Mallalieu	Michael McGinnis	Stacie Hartman
Brenda Michaels	Felicia Dale	Kathy Wilson	Michael McKinnon	Stan Lindskog
Brenda Michaels	Felix Lee	Kathryn Oliver	Michael Rosen	Stefanie Durbin
Brian Baltin	Fran Holme	Katie Berkowitz	Michael Saunders	Stella Allen
Brian Gunn	Frances Marcolli	Katie Scherrer	Michael Smith	Steph Page
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Brian Morrison	Frank Shuri	Katrina Clark	Michelle Fedore	Stephen Craig Rolston
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Bruce Gerhard	Gail Atkins	Kaye Adkins	Michelle Skylstad	Stephen Wunderlich
Bruce White	Gail Barton	Kayleigh Somers	Micky Shirley	Stephen Wunderlich
C. David Cook	Gail Hapeman	Kayleigh Somers	Mike Conlan	Stephen Zettel
C. Lenihan	Gary Albright	Keith Harlow	Mike Lyman	Steve Biggio
Camille von Eberstein	Gary Bennett	Keith Horton	Millie Magner	Steve Hamlin
Candace Davis	Gary Brill	Keith Kumnick	Miriam Danu	Steve Shapiro
Candice Cassato	Gary Meacham	Kelley Coleman-Slack	Miriam Israel	Steve Uyenishi
Candy Caldwell	Gary Petersen	Kelly and Ralph Hochendoner	Mitch Miller	Steve Williams
Carey Durgin	Gary Thomasson	Kelly Keefer	Molly Swan-Sheeran	Steven Duke
Carl Bryden	Gay Thompson	Ken Loehlein	Monica Dunn	Steven Knoll
Carla Fisher	Gayle Booker	Ken Tacke	Monica Hill	Steven Lovelace
Carol deLima	Gayle Janzen	Kenlee Ducoing	Monica Miklova	Steven Monahan
Carol Ellis	Gena Dilabio	Kenneth Apostol	Monica Robbins	Steven Newport
Carol Hedlin	George Morgan	Kergan Street	Mont Livermore	Stuart Mork

Carol Houston	George Summers	Kerry Knight	Mr. Shelley Dahlgren, PhD	Sue Herbrand
Carol Kaufman	Gerald Hetmes	Kerry McCool	Myrna Eden	Sue Jarrard
Carol Papworth	Gerlad Thompson	Kerry Whitsitt	Myrna Eden	Sue Nickerson
Carol Royer	Gina Abernsthy	Kevin Chiu	Myrna Lipman	Sue Paro
Carol Scott	Gina Landino	Kevin Davis	Nadine Wallace	Sue Stoeckel
Carol Stevens	Gine Imboden	Kevin Hughes	Nancy Anvari	Summer Sage-Sorley
Carol Verga	Ginelle Walker-Ward	Kevin Milam	Nancy Blackadder	Summer Stevens
Carol Whitehurst	Gisela Loeffler	Kim James	Nancy Bradbee	Suong Huynh
Carole Henry	Glen Anderson	Kim McDonald	Nancy Dahlberg	Susan Barron
Carolina Bowdish	Glenn Maneman	Kim Nelson	Nancy Ellingham	Susan Betourne
Carolyn Treadway	Glenna Johnson	Kim Olson	Nancy Enz Lill	Susan Froeschner
Carolyn Vaughan	Gloria McClintock	Kim Seater	Nancy Gilbert	Susan Janelle
Carrie Heron	Gloria Schmidt	Kimberly Spiegel	Nancy H. Wagner	Susan Kilgore
Cary Given	Goldie Silverman	Kindy Kemp	Nancy Hathaway	Susan MacDonald
Casaundra Robinson	Goldie Silverman	Kira Derhgawen	Nancy Hayden	Susan MacGregor
Catherine Adams	Gordon Corkum	Kiran Gill	Nancy Hoffman	Susan Morgan
Catherine Barashkoff	Grace Padelford	Kjersten Gmeiner	Nancy Kilgore	Susan Olson
Catherine Caron	Graham Lang	Klaudia Nowak	Nancy Little	Susan Palmen
Catherine Lowell	Greg Goodwin	Konstan Stewart	Nancy McMahan	Susan Putaansuu
Catherine Muller	Greg Weber	Kris Krupicka	Nando Ab	Susan Shouse
Cathleen Burns	Gregg Orr	Kristen Klooster	Neal Hallmark	Susan Thiel
Cathleen Burns	Gregory Williams Peter	Kristin Felix	Neal Umphred	Susan Vossler
Cathy Lindsay	Gretchen Van Meter	Kristin Otto	Nicholas Heyer	Susan Wollett
Cecilia Alvarez	Gunda Vesque	Kristina Rohder	Nicholas Jurus	Susana Serna
Chad Evans	Guy Chan	Kristy Kriner	Nick Barcott	Susanne Weil
Chad Upshaw	Guy Foley	Kyle Kennedy	Nick Szumlas	Suska Davis
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Charlie Wallblom	Harrie Kessler	Larry Karns	Noel Orr	Sylvia Lawrence
Chasity Hungerford	Heather Campbell	Larry Lawton	Norm Conrad	T.H.
Cherie Erwin	Heather Haverfield	Larry Mahlist	Norman Baker	Taen Scherer
Cheryl Peterson	Helen Gilchrist	Lars Henrikson	Norman Husser	Tallia Fierro
Cheryl Speer	Helen Meeker	Iassie Webster	Oleg Varanitsa	Tamara Saarinen
Cheryl Zoe Dailey	Helen Steinhardt	Laura Delmas	P. Willis	Tammy Colenaty
Chloe Key	Holger Mathews	Laura Goldberg	Paige Garberding	Tanya Atkinson
Chris Gammon	Holly G. Graham	Laura Huddlestone	Pam IVES	Tara Sparkman
Chris Guillory	Holly Gadbow	Laura Reigel	Pamela Bendix	Teresa Allen
Chris Nolasco	Holly Hewitt	Laura Weiss	Pamela Benjamin	Teri Rivera
Chris Zakharoff	Holly Taylor	Laura Zerr	Pamela Rains	Terri Inge
Christie Fairchild	Howard Donaghy	Lauren Barnhart	Pat Siggs	Terri Stromberg
Christine Mustelier	Howard Mizuta	Lauren Sewell	Patricia Burton	Terry Sullivan
Christine Psyk	Howard Steeley	Lawrence Johnson	Patricia Ayers	Theresa Pomeroy
Christine Rossen	Hunter Reed	Lawrence Magliola	Patricia Cackowski	Thom Lufkin
Christopher Bain	IM Hightower	Leah Anderson	Patricia Fuller	Thomas Cox
Christopher Lawrence	J. Eggers	Lee Johnston	Patricia Levan	Thomas Johnson
Cindy Ambrosius	Jack Jensen	Lee Musgrave	Patricia Scott	Thomas Robinette
Cindy Hart	Jack Locker	Leon Robert	Patricia Shore	Thomas Swoffer
Cindy Rose	Jack Stansfield	Leonard Elliott	Patricia Wilson	Tiffany Welton
Cj Joyce	Jackied Critser	Leonard Obert	Patrick Conn	Tika Bordelon
Claire & Hilka Egtvedt	Jacque Son	Leslie Martin	Patrick Townsend	Tim Durnell
Claire Berkwitz	James Adams	Leslie Pfost	Patti Harter	Tim Shannon
Claire Morency	James Bartley	Leslie Sherman	Patty Aylen	Timothy Roehl
Clayton Jones	James Bates	Leslie White	Paul Fellows	TJ Thompson
Cole Grabow	James Clark	Leslye Stewart	Paul Gorski	TJ Thompson
Cole Mumper	James Giles	Lin Meadow	Paul Sarvasy	Todd Gray
Cole Mumper	James Loppnow	Lin Provost	Paul Swindells	Tom Borst
Colleen Curtis	James Mulcare	Lin Sunseri	Paul Weiss	Tom Cashman

Colleen Lynch	James Mynar	Linda Avinger	Paula Hartsell	Tom Harding
Connie Campbell	James R. Whitefield	Linda Bassett	Paula Sjunneson	Tom Hughes
Constance Knudsen	James Reeder	Linda Carroll	Pawiter Parhar	Tom Kemken
Consuelo Larrabee	James Rueckel	Linda Chu	Peggy Page	Tom Martin
Corinne Salcedo	James Tootell	Linda Dodson	Penelope Johansen	Tom McCulloh
Cornelia Shearer	James Wayrynen	Linda Ellingboe	Penny Eskenazi	Tom McNeely
Cristina Wenzl	Jamie Critcher	Linda Ellsworth	Penny McGinty	Tom Rarey
Crystal Schaffer	Jan Aszman	Linda Engelbrecht	Percy Hilo	Tom Wiitala
Cynthia Lachance	Jan Ellis	Linda Erickson	Perry Wong	Toni Lugar
Cynthia Simms	Jan Thorne	Linda Feletar	Peta Lamb	Toni Schwellinger
Cynthia Zheutlin	Jan Tyler	Linda Golley	Peter Rimbos	Tony Lyttle
D. Hubenthal	Jana Balliet	Linda Graham	Peter Seidman	Tor Svanoe
D. Munro	Jane Larson	Linda Hammer	Phil Pennock	Tracy Oulette
D. Robinson	Jane Metcalfe	Linda Hoff	Philip Condit	Trudy Cordes
D. Smith	Janelle Church	Linda Howard	Phoebe Bachleda	Ursula Mass
DA Lean	Janet Hurd	Linda Leighton	Phyllis Oshikawa	V. Magnum
Dan Schneider	Janet Hurt	Linda Linqvist	PR	Valentina Mazza
Dana Ashton	Janet Way	Linda Maki	Priscilla Martinez	Valerie Emery
Daniel Brant	Janet Wynne	Linda Reynolds	Quentin Kreuter	Valerie Mehring
Daniel Grimley	Janice Brookshier	Linda Sanders	Rachel Nostrom	Van A. Maxwell
Daniel Henling	Janice Campbell	Linda Schuyler	Rae Pearson	Vana Spear
Daniel McClure	Janice Holkup	Linda Shirley	Randal Jeter	Vanessa Jamison
Daniel Sandvig	Janice Jack	Linda Standow	Randall Potts	Verna Legaspi
Daniele Rubcic	Janis Swalwell	Linda Story	Randi Fitch	Veronique de la Poterie
Darece Swindler	Janis Whitcomb	Linda Thompsen	Randy Shoemaker	Vicky Forsberg
Darin Jones	Jared Leavitt	Linda Wasserman	Rcihard Weiss	Vicky Matsui
Darius Mitchell	Jay White	Lindy A Von Dohlen	Rebecca Bartlett	Victoria Castle
Darla Klein	Jean Carman	Lisa Boisvert	Rebecca Brooks	Victoria Holman
Darlene St. Martin	Jean Mattke	Lisa Crum-Freund	Rebecca Deardorff	Victoria Macduff
Dave Baine	Jean Perry	Lisa Ehle	Rebecca Rose	Victoria Urias

Dave Pierot	Jean Slocum	Lisa Halpern	Rebecca Tucker	Victoria Vernon
Dave Popoff	Jean Stolle	Lisa Harris	Rebecca Westlake	Virgene Link-New
David and Ann Cordero	Jean Vavrek	Lisa Messinger	Rebekah Elowyn	Vonda Vandaveer
David Arntson	Jeanene Lorey	Lisa Sturzen	Reed Glesne	Wanda Unger
David Bailey	Jeanene Lorey	Liz Kestner	Rich Lague	Wayne Attwood
David Benson	Jeff Freels	Liza Martin	Richard Bergner	Wayne Ellis
David Blair	Jeffery McConaughy	Lloyd Hedger	Richard Bruskrud	Wendy Blair
David Estep	Jeffrey Cook	Lois Fenstemaker	Richard Good	Wendy Bowman
David Hand	Jeffrey Kaufman	Lois Strand	Richard Grassl	Wendy Howard
David Hirst	Jeffrey Watson	Lorelette Knowles	Richard Hernandez	Wendy Jones
David Ramsey	Jen Haley	Lori Bellamy	Richard Johnson	Wesley Banks
David Randall	Jeni Miller	Lori Gudmundson	Richard Morgan	Wesley Cherry
David Rice	Jennifer Gindt	Lori McKole	Richard Nelson	William Conable
David Shively	Jennifer Mazuca	Lori Stark	Richard Yust	William Custis
David Szilagyi	Jennifer Nelson	Lorie Stoneberger	Rick Caldwell	William Davison
David Walseth	Jennifer Stone	Lorraine DeGloria	Rick Hatten	William Dudley
Dawn Wojciechowski	Jennifer Wyatt	Lorraine Johnson	Ricki McMahon	William Justis
Dayna Yalowicki	Jens Hansen	Lorraine Monprode	Ricki Walsh	William Kildall
Dean Webb	Jeri Ichikawa	Lorraine Thompson	Rita Boone	William O'Grady
Debbie Leeding	Jerry Golden	Lou Merzario	Rita Haselman	William O'Neal
Debbie Thorn	Jerry Kessinger	Lou Orr	Robert Blumenthal	William Osmer
Debbit Pratt	Jesse Mallory	Luan Pinson	Robert Boy	William Persky
Debi Grotzinger	Jessi Berkelhammer	Luarette Culbert	Robert Burns	William Shanks
Deborah Baird	Jessica Ostfeld	Lucy Johnson	Robert Cuthbertson	Willow Wren Shigetani
Deborah Ellman	Jessica Scalzo	Luke Tuxedo	Robert James	Yeshi Dolma
Deborah Engelmeyer	Jessica Zickefoose	Lyn Lukich	Robert Kaminski	Ying Cooper
Deborah Francis	Jessie Dameron	Lynn Offutt	Robert Sager	Yonit Yogev
Deborah Gandolfo	Jill Blaisdell	Lynne Oulman	Robert Sanford	Yvonne Leach
				Zach Luschen

Table 3: Center For Food Safety Form Letter Commenters

A L	Debra Chang	Jennifer Gindt	Maradel Gale	Robert Meyer
A Michael Dianich	Debra Ellers	Jennifer Purcell	Marc Laliberte	Robert Rice
Adam McDuff	Dee Packard	Jennifer Svenson	Marcel Liberge	Robert Sanford
Adele Dawson	Denee Scribner	Jennifer Weaver-Neist	Margaret Keene	Robert Thomson
Adina Parsley	Denny Duncan	Jennifer Wyatt	Margaret M	Robin Esterkin
Adrienne Wolf-Lockett	Diana Dahlman	Jeremy Henry	Margery Barlow	Robin Gotfrid
Aimee Sanders	Diana Nielsen	Jeri Silfies	Margery Winter	Robin Jenkins
Alan Liechty	Diana Williams	Jesse Mallory	Mari Jose Rábago Sanabrais	Rod Wolf
Alex Games	Diane Black	Jim Roberts	Marian Roh	Roderic Stephens
Alex Samarin	Diane Diprete	Jim Young	Marianne McClure	Roger Hardi
Alexandria Falcon	Diane Luck	Joan Allen	Marion Hadden	Roger K Nystrom
Allen Elliott	Diane Marks	Joanna Chesnut	Marius Brisán	Ron Cavin
Amanda Caster	Diane Ramage	Joanna Lee	Marjorie Nafziger	Rosemary Janz
Amy Christenson	Diane Sullivan	Joanne Chenoweth	Mark Bradley	Roy Treadway
Amy Hansen	Diane Weinstein	Joanne Watchie	Mark Canright	Ruby Matthews
Amy Roberts	Disne Millican	Johan Luchisnger	Mark Scott	Ruth Handewith
Amy Valdez	Donna Grubbs	John Altshuler	Mark Volmut	Ruth W. Shearer
Amy Whitworth	Donna Harlan	John Ardner	Mark Wirth	Ruth Weedman
Andrea Gruszecki	Donna Harris	John Barger	Marsha Hanchrow	Ryland Helt
Andrea Speed	Donna Leavitt	John Bremer	Marsha Wilson	S Cook
Andrea Vos	Donna Redemer	John Burrows	Martin Robbins	S S
Andrew Libonati	Donna Roddvik	John Colman-Pinning	Mary Baker	Sabolch Horvat
Andrew Stanger	Donna Sharp	John Dubois	Mary Jo Wilkins	Sada Showell
Angie Dixon	Dorinda Kelley	John Easterday	Mary Johnson	Saliha Abrams
Ann Cobban	Doug Gemmell	John Goldthwait	Mary Keeler	Sally Goodson
Ann Waugh	Doug Gibson	John Kenyon	Mary Lynn Willis Parodi	Sally Maish
Anna Cowen	Douglas Frye	John Sailer	Mary Powell	Sally Stroud
Annabelle Herbert	Dr. David D. Markwardt	John Scholten	Mary Pritchard	Sam Garbi
Annapoorne Colangelo	Dwight Long	John Sirutis	Mary Riley	Samantha Morris
Anne Mitchell	Earlene Benefield	Joseph Hasegawa	Mary Sprute	Sammy Low

Anne Mosness	Ed Leach	Joseph Wolf	Mary Stock	Sandi Cornez
Anne Ryland	Eileen Correia	Jovy Jergens	Mary Young	Sandra Dudley
Annette Fails	Eileene Gillson	Jr McGowen	Matt Freedman	Sandra Joos
Arthur Noble	Elan Morin	Juanita Rinas	Matt Lucas	Sandra L. Herndon
Atiah Azhar	Eleanor Morris	Judi Stratton	Matt Shaffer	Sara Eldridge
Audrey Collins	Elena Rumiantseva	Judith Cohen	Matthew Anderson	Sara Kaul
Audrey Farrelly	Elisabeth Wright	Judith Dobkevich	Maureen O'Neal	Sarah Pruett
B Barbara Parliman	Elizabeth Char	Judith Hance	Max Denise	Saralyn Brown
Baker Smith	Elizabeth Darby	Judith Schwab	Meghan McCutcheon	Satya Vayu
Barbara Bonfield	Elizabeth Erfurth	Judy Lee	Melinda McRostie	Scott Species
Barbara Comnes	Elizabeth Grant	Judy Wilcox	Melinda Thayne	Scott Washburn
Barbara Gregory	Elizabeth Schwartz	Jules Moritz	Merriann Bell	Sean Edmison
Barbara Gross	Elizabeth Surton	Julie Glover	Meryle A. Korn	Seth Snapp
Barbara Ierulli	Ella Elman	Julie Moore	Mia Heavyrunner	Shane Hoefsloot
Barbara Kolby	Emlyn Stenger	Julie O'Donnell	Michael And Barbara Hill	Shannon Markley
Barbara Tountas	Eric Lambart	June Kempthorne	Michael Burmester	Sharon Holford
Barbara Wight	Erica St. John	June MacArthur	Michael Czuczak	Sharon Parshall
Barbara Wilhite	Erik Larue	Justice Boyd	Michael Halloran	Shary B
Bc Shelby	Esther Friedman	Kacey A Donston	Michael Kalafut	Sheila McDonnal
Ben Basin	Ethel Birnbach	Kaija Jones	Michael Lampi	Shemayim Elohim
Ben Rall	Eugene Kiver	Kara Harms	Michael Parker	Sherry Petersen
Beth Hall	Faye Bartlett	Karen And Daniel Erlander	Michael Price	Sheryl Sparling
Beth Marshall	Faye Nieuwendorp	Karen Black	Michael Siptroth	Shirley Collins
Betsy Pendergast	Felicia Dale	Karen Deora	Michaelle Robardey	Shirley Gazori
Betty Barbee	First Last	Karen Fisher	Michele Walters	Sierra Ansley
Betty Shelley	Florie Rothenberg	Karen Fletcher	Michelle Jordan	Silvia De Los Santos
Bill Burk	Forest Shomer	Karen Genest	Michelle Rossee	Stacy Parr
Bill Driscoll	Forster Freeman	Karen Hooper	Mike Kiser	Stephanie Peron
Bill O'Brien	Frances Elder	Karen Horton	Mike Zotter	Stephanie Prima
Bill Witherspoon	Frances Marquart	Kate Blessing	Miriam Reed	Stephanie West
Billie Abbott	Francisco Gadea	Kate O'Brien	Mulysa Melco	Stephen Hirsch

Bob Hannigan	Frank Kroger	Katherine Nelson	Nancy Goodwin	Stephen Oder
Bobby Morrison	Fred Arkel	Kathryn Alexandra	Nancy Hh	Stephen Wilson
Bonnie Mitchell	Fred Ingman	Kathryn M Tominey	Nancy Kilgore	Stephen Zettel
Bonnie Roemer	G D Abbott	Kay Jenson	Nancy McDonald	Steve Sheehy
Brad Kalita	G Joan Jarvis	Keith Baldwin	Nancy Nelson	Steve Uyenishi
Brandie Deal	Gary Ivey	Kelly McConnell	Nancy Sosnove	Steve V.
Brenda Michaels	Gary Millhollen	Ken Mincin	Nancy White	Steven Gregory
Brent Rocks	Gary Webb	Kenneth Loehlein	Nannette Taylor	Steven Tichenor
Bridget O'Brien	George Fairfax Md	Kerrie Nasman	Neal Devine	Sue Despotopulos
Bruce Gilbertson	George Snipes	Kevin Gallagher	Nena Cook	Sue Stoeckel
Bruce Gundersen	George Summers	Kevin Hughes	Nick Barcott	Susan Betourne
Bruce Schacht	Georgeanne Samuelson	Kevin Milam	Nina French	Susan Coulter
Bruce Von Borstel	Glen Anderson	Kevin O'Halloran	Noel Barnes	Susan Delles
C G	Glenda Goldwater	Kevin Schmidt	Nora Polk	Susan G Rives-Denight
Caley Eller	Glenn Eklund	Kevin Sicard	Norah Renken	Susan Heath
Carol Carlson	Grace Neff	Kevin Wildermuth	Norm Conrad	Susan Ishaya
Carol Coons	Greeley Wells	Kim Osborne	Owen MacAlvey	Susan MacGregor
Carol Hoon	Gregory Penchoen	Kim Stein	P Perron	Susan Muckle
Carol Stanley	Gret Rowe	Kim Wick	Pamela Collord	Susan Narizny
Carol Verga	Guy Chan	Kimberlee Ireton	Pamela Yates	Susan Rohder
Carol Wagner	Gwen Nolte	Kindy Kemp	Patricia Jorgensen	Susan Shouse
Carol Whitehurst	Hal Anthony	Klaudia Englund	Patricia Kolstad	Susan Smith
Carolann Davidson	Hannah Harrison	Klemke Ken	Patricia Rodgers	Susan Wilson
Carrie Lyons	Harrie Kessler	Kris York	Patricia Starr	Susi Hulbert
Catherine Martin	Heather Murawski	Kristin Felix	Patrick Hook	Suzanne Guest
Cathleen Burns	Heidi Hartman	Kristina Gravette	Patty Bonney	Suzanne Hamer
Celeste Howard	Helen Jones	Kyle Rolnick	Paul Cesmat	Suzi Hokonson
Chad Evans	Helen Moissant	L I	Paul Krippner	T Jeffries
Charlene Lauzon	Holger Mathews	Lane King	Paul Latimer	T Reading
Charles And Eugenia Haggin	Homer R. Reese Jr.	Larry Karns	Paul Leib	Tabitha Donaghue
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Chris Guillory	J Heasley	Laurie Slater	Per Zeeberg	Tara Felder
Chris Mack	J Jordan	Lawren Pulse	Pete Compton	Tara Spires
Christine Klunder	J Michael Pinc	Lawrence Magliola	Peter Brazitis	Tatiana Zolotareva
Christine Landon	J S	Lawrence Yox	Peter Martynowych	Teresa Allen
Christine Meyers	J. Eggers	Leana Citar	Phil Goldsmith	Terry Jess
Christopher Marrs	J. Woodworth	Lemoine Radford	Phil Hanson	Thom Lufkin
Clifford Spencer	Jack Stansfield	Leon Werdinger	Philip Chanen	Thomas Libbey
Clyde Williams II	Jackie Critser	Leonard Elliott	Phyllis Rapport	Thomas Scarpinatto
Colleen Ozora	Jacqueline Halter	Leonard Hearne	Phyllis Reynolds	Tika Bordelon
Collin K Fleming	James Bates	Lesli Dalaba	Phyllis Villeneuve	Tim Durnell
Constance Miner	James Clark	Leslie Chester	Priscilla Martinez	Timothy Stinson
Cornelia Teed	James Feit	Leslie Langdon	R. S. McClain	Tina Bissett
Courtenay Smith	James Meyer	Leslie McClure	Rafael Robles	Tina Gardner
Craig Emerick	James Morgante	Leslie Smith	Randal Bonney	Tj Thompson
Craig Weakley	James Mulcare	Leslie Spurling	Randall Esperas	Tod Barnett
Craig Zimmerman	James Murphy	Linda Alstad	Randall Potts	Tod Jones
Crystal Hultberg	James Ploger	Linda Ballantine	Randy Harrison	Tom Denison
Curt Clay	James Strickler	Linda Cornell	Ray West	Tom Gilbrough
Cynthia Dalton	Jamie Fillmore	Linda Donnelly	Rebecca Baker	Torunn Sivesind
Cynthia Laughery	Jan Bird	Linda Graham	Rebecca Canright	Tracy Ouellette
Cynthia Marrs	Jan Meredith	Linda Lindsay	Rebecca Crowder	Tracy Richards
D Stirpe	Jana Doak	Linda Reilly	Rebecca McDonough	Trisha Ten Broeke
D. Deloff	Jane Barron	Linda Sears	Rebecca Picton	Uli Baab
Daisy Sweetland	Jane Lant	Linda Voci	Rebekah Baldwin	Usha Honeyman
Dale Sturdavant	Janet Doerr	Lisa Brienen	Ren Rowe	Valerie Guinan
Dan Schneider	Janet H.	Lisa Halpern	Rene Ray	Valerie Holland
Dan Sherwood	Janet Pinneo	Lisa Henniger	Renee Wick	Victoria Urias

Dana Bleckinger	Janice McLaughlin	Lisa Messinger	Rhett Gambol	Vincent Alvarez
Dana Petre-Miller	Janice Wilfing	Lisette West	Richard Grassl	Virginia Davis
Danny Dyche	Janiece Staton	Lori Erbs	Richard Johnson	Virginie Calme
Darlene Schanfald	Janna Piper	Lori Stark	Richard Knablin	Vivian Sovran
David Arntson	Jean Fee	Lorie Lucky	Richard Martin	Wally Bubelis
David Cunningham	Jean Mendoza	Lorraine Hartmann	Richard McCombs	Wayne Carpenter
David Grant	Jean Vavrek	Lorraine Kristoferson	Richard Musser	Wayne Kelly
David Houlton	Jeannine Gilmer	Louise Gilman	Richard Payne	William Hoffer
David Jessup	Jeff Carter	Luwana Wanaisie	Rita Hogan	William Insley
David Laws	Jeff Freeman	Lyn Meyerding	Robby Robinson	William M. Musser IV
David Stan	Jen Eiffert	Lyn Z Page	Robert Godwin	Yonit Yogev
David Todnem	Jenet Johnsen	Lynn And Roger Stapes	Robert Helm	Zina Losey
Debbie Thorn	Jennifer Bonar	Lynn Englehart	Robert Jensen	
Deborah Johnson	Jennifer Bruner	Lynne Oulman	Robert Jones	