

**From:** [Daniel E. Penttila](#)  
**To:** [Lubliner, Nathan \(ECY\)](#)  
**Subject:** Willapa Z. japonica spray permit comments  
**Date:** Sunday, January 26, 2014 3:19:05 PM  
**Attachments:** [1.26.14.docx](#)  
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Nathan Lubliner, WDOE:

Attached is my comment letter regarding the proposed General Permit for herbicide control of Japanese eelgrass in Willapa Bay.

Dan Penttila  
Anacortes

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## SALISH SEA BIOLOGICAL

### MEMO

**DATE:** January 26, 2014

**TO:** Nathan Lubliner, WDOE, Olympia, WA

**SUBJECT:** Comments on proposed General Permit for *Zostera japonica* control on commercial clam beds on Willapa Bay.

#### **INTRODUCTION:**

The following comments on the proposal to attempt to eradicate the so-called “Japanese eelgrass”, *Zostera japonica*, in certain areas of Willapa Bay are based on a 39-year career as a marine fish habitat biologist for the Washington Department of Fisheries (WDF) and, after agency merger, the Washington Department of Fish and Wildlife (WDFW), all spent involved in matters of marine forage fish habitat investigations, critical spawning habitat mapping, and contribution of the formulation of regulatory protection measures for such habitats, 1971-2010. My career immediately followed upon the awarding of degrees in zoology from the University of Washington (BS, 1970) and biology from the University of Oregon (MS, 1971), both with a marine near-shore biology emphasis. During the course of my career, I became quite familiar with the marine environment of Willapa Bay, during the course of many herring spawning habitat surveys, other marine fish habitat investigations, and other field activities while with WDF/WDFW. My field activities often involved observations and habitat assessments within the zones of occurrence of *Zostera japonica* targeted for herbicide treatment by the proposal. The southern Willapa Bay-Naselle area has also been the ancestral home region of both sides of my family for several generations.

While I am currently self-employed as a sole-proprietorship consultant specializing in marine forage fish conservation matters, registered and licensed as “Salish Sea Biological”, I am producing and distributing this comment letter as a concerned private citizen without any consideration of monetary compensation.

#### **ECOLOGICAL FUNCTIONS OF EELGRASS:**

Seagrasses of all species in this region, including *Z. japonica*, provide a very significant suite of ecological functions to the local marine ecosystems, including physical habitat/shelter, larval settlement substrate, carbon fixation/ sequestration, organic detritus production, oxygen generation, and herring spawning substrate, and waterfowl food. These functions can clearly be ascribed to the Japanese eelgrass as well as the native eelgrass, *Zostera marina*, the latter of which is afforded, at least on paper, “no-net-loss”

regulatory protection by local, state, and federal agencies. In fact, however, the latter species, despite regulatory protections, has already been damaged by 100+ years of shellfish aquaculture practices both in Willapa Bay, as evidenced by both direct observations in the field, and by comparison of bed-coverages in old versus recent low-tide aerial photographs) and elsewhere in Washington State and southern British Columbia.

I can comment in detail on the usage of *Zostera japonica* as spawning substrate for the Willapa Bay stock of Pacific herring (*Clupea pallasii*), an important forage fish within the local marine food web. I have inspected the written records of WDFW/WDFW herring spawn surveys undertaken over the last 30+ years in Willapa Bay and adjacent Grays Harbor, and found a number of instances where *Zostera japonica* beds were found to have supported herring spawn deposition, as evidenced by observation of herring eggs attached directly to the plants in-situ. I was lead-worker on most if not all of these surveys and observations. This relatively new evidence of *Zostera japonica*'s ecological importance was assembled and distributed to WDFW, Sierra Club and a number of other interested parties in the spring of 2012. I am not aware whether WDOE requested or received this data package, but it would be available from myself or WDFW for use during the consideration on this proposal.

This regulatorily-protected critical-habitat data pertaining to *Z. japonica* apparently had no impact on the State Weed Board's recent listing of the species as a noxious weed. Nor did it seem to prevent the recent removal by WDFW of *Z. japonica* for their lists of protected habitats and species. If these recent actions were done at the behest of the commercial shellfish industry, they should be reviewed for natural resource management propriety.

Since this initial documentation of herring spawning usage of *Zostera japonica* in Willapa Bay, evidence of herring usage of this plant has also been found at several sites in the Puget Sound basin, clearly indicating a region-wide phenomenon. Based on my long personal experience with WDF/WDFW herring spawning survey protocols, I consider it very likely that the usage of *Zoster japonica* by spawning herring is much more widely-occurring throughout the region than WDFW records currently indicate. WDF/WDFW herring spawn surveys commonly do not approach tidelflat-fronted shorelines to depths shallower than about +0' in tidal elevation, as they concentrate on native eelgrass and marine algae beds in search of herring spawn deposits. In so doing, they tend not to sample the main zone of occurrence of *Zostera japonica* in-shore of that depth and thus tend not to have sampled that plant for herring spawning usage. With the advent of *Zostera japonica* eradication proposals in the spring of 2012, after the main herring spawn survey season, WDFW staff have been urged to sample that species' microhabitat more frequently in the future, which should increase the frequency of spawning-usage documentation. Meanwhile, past published statements of the lack of evidence of herring spawning usage of *Zostera japonica* in Puget Sound should be considered incorrect and superceded by more current information.

The management significance of the now-widespread observations of herring eggs on *Zostera japonica* within Washington State is that the plant should now be added to the list of near-shore marine plants that comprise "documented herring spawning habitat" and, by that measure, be afforded no-net-loss protection by the WAC Hydraulic Code Rules, the state Growth Management Act, and the state

Shoreline Management Act, all of which have herring spawning habitat conservation language within them. This would seem to legally preclude *Zostera japonica* from being purposely eradicated by any party, at least without complete mitigation for the purposeful damage to it. So far as I am aware, there have been no suggestions of consideration of full and previously -proven mitigation for proposed damage to *Zostera japonica* beds by this proposal, let alone mitigation for past damages to *Zostera* beds by the parties involved in this proposal.

Another field of inquiry and concern, pertaining to the positive ecological functions of *Zostera japonica*, for which there seems to be little or data at present, is the degree to which the plant promotes the establishment and propagation of communities of those epibenthic invertebrates which serve as seasonal food for out-migrating juvenile salmonids along the shores of Willapa Bay and elsewhere in the region. *Zostera japonica* occupies a growth zone astride a major migratory pathway of out-migrating salmonids. Before eradication of this species is contemplated under the auspices of this permit, peer-reviewed studies, by impartial researchers not associated with the shellfish industry, should be undertaken to document the salmonid-food communities within the plant's beds, compared to adjacent unvegetated-control middle intertidal mudflats. It may well be that the presence of beds of *Zostera japonica* promotes a greater abundance of both salmonid food items and protective cover for the fish themselves, thus promoting the survival of a suite of economically important species during a period when the restoration and maintenance of salmon populations is and will be into the foreseeable future a major regional undertaking. Certain stocks of Willapa Bay salmonids are reported to be in poor condition at present. The net value of the conserved salmonids may outweigh the economic value of the exotic cultured shellfish being promoted by this proposal, adding justification to the concept of NOT treating the region's marine near-shore as one would a typical terrestrial, mono-culture, commodity-producing farm plot, where, as in terrestrial agriculture, it is typically accepted that fish and wildlife habitat values will have been purposely eradicated for profit. A call for a more rational management of *Z. japonica* in Washington State, based on more than just the desires of the commercial shellfish industry, was recently reviewed in Shafer et al (2013)

Yet another emerging ecological function fulfilled by seagrasses like *Zostera japonica* now beginning to be recognized as important in the coastal estuaries of the region presently experiencing "ocean acidification" to the alleged detriment of the commercial shellfish industry, is those plant species' enhanced ability to sequester carbon, removing excess carbon dioxide from the atmosphere, and thus possibly reducing localized acidification in the process. It is ironic that the shellfish industry now pleads for acidification control measures, while it itself has had a long history of destroying the very seagrass beds that might have a hand in alleviating that very problem, if managed instead for conservation/restoration. The proposal to purposely eradicate a carbon-fixing estuarine marine plant species would seem to obviously run counter to any goal of alleviating ocean acidification.

## **CONCLUSIONS:**

It is evident by a number of factors that the broad-scale application of herbicides to the estuarine tideflats of Willapa Bay for the eradication of *Zostera japonica* should not be permitted, at least at the present state of knowledge (Shafer et al, 2013).

The target plant is often intermixed with the regulatorily-protected native eelgrass, *Zostera marina*, with no practical method to avoid eradication of both species under such circumstances, even if herbicides were to be applied however carefully. Commercial/ industrial eradication of the native eelgrass, *Z. marina*, for the purpose of commodity extraction and profit, should also be unacceptable, considering the significant net losses of native eelgrass beds that have occurred already in Washington State during the past 150 years.

The target plant is documented to be used by spawning herring as egg-deposition substrate, and therefore should have state and federal regulatory “no net loss” protections. No eradication measures should be permitted until there have been more- adequate herring spawn surveys undertaken to document the spawning-usage of the target plant more fully in the areas in and around the proposed herbicide application sites. If eradication permits are eventually issued, they must also include suitable mitigation measures to compensate for those losses of ecological functions brought about by the purposeful eradication. These mitigation measures must be proven and functioning before localized eradication can proceed. Alternatives to eradication by broad-cast herbicide applications must be investigated before permitting, including those regions of the world where eradication of *Z. japonica* is not considered necessary nor appropriate.

The target plant is of probable and presently-undocumented juvenile salmonid habitat quality value in its possible enhanced production of food items during a critical life history stage for salmon stock maintenance. No eradication measures should be permitted until adequate salmonid diet/ plant-bed usage data have been gathered, analyzed, peer-reviewed, and suitably published.

The plant may fulfill an important role in estuarine carbon sequestration in the effort to control local ocean acidification. Its wholesale eradication would appear to run counter to the long-term interests of the very industry proposing that eradication.

Any consideration of permitting eradication measures triggered by this permit must include a cost/benefit/risk analysis to determine whether or not the economic value of the exotic shellfish commodity produced thereby is of sufficient value to justify the conversion of wide areas of estuarine tideflat habitat, of ecological value to a wide range of native species, to a chemically-supported monoculture for a single industry, as opposed to those estuarine habitats being of more societal value when left in their existing condition.

Thank you for this opportunity to comment on this important matter.

Citation:

Shafer, D.J., J.E. Kaldy, and J.L. Gaeckle, 2013. Science and management of the introduced seagrass, *Zostera japonica*, in North America. Environmental Management, DOI 10.1007/s00267-013-0172-z, 18 p.

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