SALISH SEA BIOLOGICAL

MEMO

DATE: October 23, 2012

TO: Kathy Hamel, WDOE, Olympia, WA

SUBJECT: Comment on "Japanese eelgrass control on commercial clam beds on Willapa Bay" permit scoping notice.

INTRODUCTION:

The following comments on the proposal to attempt to eradicate the so-called "Japanese eelgrass", Z*ostera japonica*, in certain areas of Willapa Bay Washington State 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, more general marine fish habitat investigations, and other field activities while with WDF/WDFW. My field activities often involved observations and habitat assessments directly within the zones of occurrence of Z*ostera japonica* targeted for herbicide treatment by the proposal.

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 provide a sizeable suite of ecological functions to the local marine ecosystems, including physical habitat context, larval settlement substrate, carbon fixation/ sequestration, organic detritus production, oxygen generation, and herring spawning substrate. 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, the later species, despite regulatory protections, is already being damaged by

on-going shellfish aquaculture practices both in Willapa Bay (by comparison of bed-coverage 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. As you may recall, 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 such a data package, but it would be available from myself or WDFW for use during the consideration on this proposal.

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 agency records currently indicate. WDF/WDFW herring spawn surveys commonly do not approach tideflat-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 were 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 purposeful damage to it. So far as I am aware, there have been no suggestions of consideration of full 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 small 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, rigorous studies should be undertaken to document the salmonid-food communities within the plant's beds, compared to adjacent barren middle intertidal mudflats. Note that these investigations should be undertaken by research institutions without fiscal or philosophical connections to the commercial shellfish industry. 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. Also, 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 it has become accepted that fish and wildlife habitat values will have been purposely eradicated.

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. The proposal to purposely eradicate a carbon-fixing estuarine plant species would seem to obviously run counter to any goal of alleviating 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 Z*ostera japonica* should not be permitted, at least at the present state of knowledge.

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 for the purpose of commodity extraction and profit should 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 has 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. 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, such as reported Humboldt Bay, CA, control studies using hot water and other non-herbicidal measures.

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 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.

Sincerely,

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