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TO: Kathy Hamel, Water Quality Program

FROM: Padilla Bay National Estuarine Research Reserve,  
Douglas Bulthuis, Research Coordinator 

SUBJECT: Scoping notice for an Environmental Impact Statement on Japanese  
eelgrass management on commercial clam beds in Willapa Bay:  
General permit

Thank you for the opportunity to comment on the scoping notice for an EIS on a general permit for Japanese eelgrass management on commercial clam beds in Willapa Bay.

As a National Estuarine Research Reserve (NERR), Padilla Bay NERR has conducted studies on *Z. japonica* and supported and encouraged studies by graduate students and other scientists to better understand its role in the ecosystem and its interaction with the native eelgrass, *Zostera marina*. The non-native eelgrass, *Zostera japonica* is widespread in Padilla Bay, probably having been introduced through shellfish culture when Pacific Oysters, *Crassostrea gigas*, were brought to Padilla Bay for aquaculture in the 1930s. Since the 1930s *Z. japonica* has increased its distribution in Padilla Bay, generally over intertidal flats that had been bare of large vegetation.

The studies in Padilla Bay and elsewhere in Washington State have indicated the important role that Japanese eelgrass plays in the ecosystem and the ways in which this non-native eelgrass plays a role similar to that of the native eelgrass, *Z. marina*, albeit at a higher intertidal elevation and usually to a lesser extent. *Z. japonica* provides food and foraging habitat for juvenile salmon, food for waterfowl such as Black Brant, Widgeon and other dabbling ducks, habitat for bivalves, polychaetes and a whole range of marine invertebrates in the sediment. *Z. japonica* contributes to the productivity of the bays in Puget Sound and the outer coast as the leaves and rhizomes decay and become part of the detritus at the base of the food web. Many studies in Padilla Bay were conducted to examine the differences between the two species in regard to productivity, temperature tolerance, infauna, sediment bacteria, epiphytes on the leaves, juvenile salmon prey, and



other factors. In most cases *Z. japonica* supported native species and the differences between the roles of the two eelgrass species were usually ones of degree and magnitude. Generally, *Z. japonica* tended to support fewer species per unit area than the native eelgrass. On the other hand, *Z. japonica* expanded the intertidal range and amount of area providing these roles in the ecosystem.

In Padilla Bay the area covered by *Z. japonica* fluctuates from year to year, particularly in the upper intertidal. Total coverage in Padilla Bay has been estimated from about 750 acres to more than 2000 acres out of a total coverage of about 8000 acres of eelgrass in the bay. The two species of eelgrass grow intermixed in Padilla Bay sometimes covering extensive area. One study reported about 500 acres of intermixed eelgrass in Padilla Bay. Similarly, along a series of monitoring transects perpendicular to the shoreline in Padilla Bay the two species grow intermixed for more than 2/3 of a mile.

The two *Zostera* species can be distinguished quite clearly when the *Z. marina* has long wide leaves. However, we have found in Padilla Bay where the two species are growing intermixed, that young smaller *Z. marina* is difficult to distinguish from *Z. japonica*. This is particularly true in spring and early summer when control of *Z. japonica* might be attempted.

In the context of the studies on *Z. japonica* in Padilla Bay and elsewhere in the state, we would recommend that the following issues be considered in the EIS analysis:

Because imazamox is a non-selective herbicide particular emphasis should be placed on protecting native eelgrass, *Z. marina* from deleterious effects whether immediate death or long term sublethal effects.

When *Z. marina* is intermixed with *Z. japonica* on the commercial clam beds, appropriate criteria should be identified to protect the native eelgrass and to identify when application of imazamox would be allowed.

Adequate buffers should be designated around the area to be treated to protect native *Z. marina* that is near the clam beds.

Because of the intermixture of the two eelgrass species, greater emphasis should be placed on integrated pest management. Differing conditions may make use of non-chemical control of *Z. japonica* a better alternative and more protective of *Z. marina*, whether intermixed on the commercial clam bed or adjacent to the clam bed. It seems to us that an integrated pest management approach should also be strongly evaluated.

A permit to allow application of an herbicide on marine vegetation is introducing a new class of contaminant to the marine environment. Monitoring should be rigorous and include the efficacy of the treatment, lethal and sublethal effects on *Z. marina* and effects on other vegetation. We suggest a committee with representation from clam growers, natural resource agencies, and academia to

develop appropriate guidelines for monitoring, review monitoring data, and report to Ecology. The committee should be authorized to recommend modifications to treatment methods, buffers, the required monitoring, etc. based on monitoring results or other relevant studies.

Because of our current understanding of the beneficial role of *Z. japonica* in the ecosystem, *Z. japonica* off-site should be protected from deleterious effects of the application on commercial clam beds.

If monitoring indicates significant lethal or sub lethal effects on *Z. marina* off-site, mechanisms should be in place for possible revocation of the permit in specific situations, changes in the permit requirements, or revocation of the permit overall.

Imazamox should be applied only when the conditions are most efficacious and when the potential for off-site effects is least likely.

Consideration should be given to the possibility and effects of erosion of the sediments where *Z. japonica* is successfully controlled.

Thank you for this opportunity to provide further input on the scoping process for the EIS on Japanese eelgrass management on commercial clam beds in Willapa Bay.