From:	John McCabe
To:	Hamel, Kathy (ECY)
Subject:	Ecology Proposal to Issue General Permit to Spray Imazamox on Commercial Shellfish Beds in Willapa Bay and Puget Sound
Date:	Monday, March 05, 2012 1:17:29 PM

Dear Ms. Kathy Hamel,

As inconsequential as I believe public input to be on the DOE decision process in marine matters, I nonetheless wish to go on record as opposing any usage of Imazamox for the eradication of dwarf eelgrass, aka Japanese eelgrass, *Zostera japonica*, on any tideland, private or public.
Please allow me to briefly explain why I believe, perhaps erroneously, that DOE public input is inconsequential:

In the later part of the 19th century, Karl Möbius, a German scientist who specialized in marine sciences (notably oysters), first defined what he called *Biozönose*. Biozönose describes the study of interdependence of many organisms ("Lebensgemeinde", i.e. "life community"), commonly known today as ecology. The name "Dept. of Ecology" fosters the understanding among many citizens of this state that this agency is dedicated to prudent stewardship of eco-systems. With this rather naïve understanding, I formally expressed to DOE at length some years ago (2006), as did other citizens, grave concerns about the application of the pesticide Carbaryl on the tidelands of Willapa Bay/Grays Harbor.
In my comments I furnished the results of my privately funded, personal survey, including pictures, of the supposed native "ghost shrimp problem", this vilified indigenous "pest", earmarked for eradication by a Willapa Bay shellfish grower lobby for the commercial benefit of facilitating the production of the invasive species *Crassostrea gigas*, originally well known as the Japanese oyster, since the 1930s better known under the more marketable common name Pacific oyster:
http://www.ecy.wa.gov/Programs/wq/pesticides/final_pesticide_permits/oyster/fs_051702_wbghoyst.pdf

It appears to me that the application of Carbaryl has essentially been rubberstamped by your agency for a long time. I fear similar DOE handling of Imazamox in marine environments, and possibly later, Imadicloprid in marine environments. Regrettably, I can no longer believe that public input on DOE's decision process pertaining to marine environments has any influence, especially when commercial interests are in play. Instead, I've grown to believe that public input at DOE on marine matters serves little more than simply giving concerned citizens the opportunity to go on record as opposing pesticide applications in marine environments. DOE's past marine related Carbaryl handling has led me to believe that DOE's invitation for public input was a formality, the "victory" of some shellfish growers at DOE being a foregone conclusion. From what I've learned, it is owed to a few citizens and the wisdom of a judge that Carbaryl spraying on Willapa Bay is to be stopped. Now there is talk of introducing the insecticide Imadicloprid as a replacement.

Some science notes regarding dwarf eelgrass, aka Japanese eelgrass, *Zostera japonica*:

1. J. R. Baldwin, J. R. Loworn (1994) on Zostera japonica:
"[...] This introduced species provides an important feeding habitat for many migratory waterfowl. Percent dry mass of *Z. japonica* in esophagus contents of birds collected in
Boundary Bay was 57.2 % (n = 62) in brant *Branta bernicla*, 84.8 % (n = 45) in American wigeon *Anas americana*, 72.3 % (n = 20) in mallard *A. platyrhynchos*, 48.3 % (n = 54) in northern pintail *A. acuta*, and 1.7 % (n = 14) in green-winged teal *A. crecca*. Percent dry mass of the native *Z. marina* was 41.2% in esophagi of brant but only 0.1 to 4.6% in the other species. Grazing by brant and dabbling ducks, with peak numbers of about 80 000 in early December, removed 50% (262 t) of the above-ground biomass and 43 % (100 t) of the below-ground biomass of *Z. japonica*. This exotic seagrass thereby supported
almost 4.6 million use days by these birds."
"[...] Although *Zostera japonica* was introduced inadvertently, it may be an unusual example of an exotic species being generally beneficial to major components of an ecosystem."

Taken from report titled *Expansion of seagrass habitat by the exotic Zostera japonica, and its use by dabbling ducks and brant in Boundary Bay, British Columbia*

2. S. Y. Lee *et al* (2001) on *Zostera japonica*:
"[...] Both the abundance and species richness of the epi- and infauna were significantly positively correlated with the belowground biomass of the seagrass and detritus standing crop. Macrofaunal species richness was higher (118) in the seagrass bed than the adjacent unvegetated areas (70), with

a higher degree of similarity between the infauna than the epifauna of the two habitats. While all species recorded from the unvegetated areas were found in the seagrass bed, 48 species occurred only in the seagrass-covered areas. Species richness of epifauna was significantly higher in the seagrass bed, but there was no difference between infaunal species of the two habitats. On the contrary, faunal (epi- and infauna) abundance was significantly higher in seagrass areas."

Taken from report titled *The effects of seagrass (Zostera japonica) canopy structure on associated fauna: a study using artificial seagrass units and sampling of natural beds*.

3, G. Snively (2008) on eelgrass in general:
"[...] The root structures and tangled blades provide shelter and sites of attachment for large communities of amphipods, isopods, snails, nudibranchs, crabs, and fish....At low tide, where protective eelgrass beds or depressions in sand hold a little water, a variety of small fish – Sand Soles, Staghorn Sculpins, and the juveniles of a large assortment of flatfish – dart off in all directions."
Taken from pages 245/246 of *Beach Explorations, A Curriculum for Grades 5 – 10*.

Any attempts by shellfish companies to frame dwarf eelgrass, aka Japanese eelgrass, Zostera japonica, as detrimental to Washington State's marine environment would, in my opinion, (again) be rooted in a self-serving agenda of profit and greed, certainly not ecology. The wholesale destruction of eelgrass with Imazamox is akin to a scorched earth policy, whereby a vast habitat is denied to countless organisms for the sake of profit from conveniently expanded production of invasive Manila clams and geoduck (e.g. convenient elimination of "biofouling" on "anti-predator netting" on thousands of pieces of "cultivation" plastic sewer pipe...).

Please note that I do not condone usage of all-inclusive descriptions like "the shellfish industry". Many shellfish growers I have met do not condone pesticide use on our tidelands. To avoid public confusion in this regard, perhaps DOE should list the names of shellfish companies that use or seek usage of any pesticide on tideland rather than just providing rather obscure organizational names (e.g. "growers associations"). In closing, I suggest that some of the decision makers on marine matters at DOE might just done a cheap pair of rubber boots, catch a low tide and just go look at all the beautiful life that abounds in and around eelgrass beds on Willapa Bay and in Puget Sound, perhaps also see the plate sized impressions commonly found on Willapa Bay tideland, left by grazing sturgeon.

Kind regards,

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