From:	Hamel, Kathy (ECY)
To:	John McCabe
Cc:	Lubliner, Nathan (ECY)
Subject:	RE: Public Comment Period for the proposed development of a General Permit for the Management of Japanese Eelgrass on Commercial Clam Beds in Willapa Bay
Date:	Monday, October 29, 2012 10:17:54 AM

Thank you. Ecology will be posting all comments to the proposal on the Japanese eelgrass permit website after the comment period closes.

Kathy

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From: John McCabe [john@oysters.us]
Sent: Sunday, October 28, 2012 5:38 PM
To: Hamel, Kathy (ECY)
Subject: Re: Public Comment Period for the proposed development of a General Permit for the Management of Japanese Eelgrass on Commercial Clam Beds in Willapa Bay

<mailto:Kathy.Hamel@ecy.wa.gov>Dear Ms. Kathy Hamel,

As already noted in my communication to DOE on March 5, 2012, I oppose any usage of Imazamox for the eradication of dwarf eelgrass, aka Japanese eelgrass, Zostera japonica, on any tideland, private or public in Washington State. Similarly, many other Washington State citizens have already voiced their opposition. As such, I find it curious that public input is again requested regarding Willapa Bay. Nonetheless, I welcome the opportunity to again go on record as naturally also opposing any usage of Imazamox on any Willapa Bay tideland, private or public.

In the course of more than a decade, my private studies of bivalves in Washington State have mandated regular field studies of Willapa Bay. Some friendships and acquaintances with people directly or indirectly involved with Willapa Bay's shellfish industry were formed in these studies. This has helped me gain access to tideland generally restricted to the public. Time and again, I am amazed by evidence of considerable sturgeon feeding activity, green and white sturgeon I presume, both on tideland with and without eelgrass. By proxy, my studies have also helped me better understand a powerful lobby of shellfish growers on Willapa Bay. Historically, this lobby has supported usage of pesticides (e.g. Rodeo, Carbaryl). I'm also familiar with the consequences that some shellfish growers on Willapa Bay have faced when opposing usage of pesticides, especially Carbaryl. For the sake of brevity, I will only state that I deeply admire the courage of the few Willapa shellfish growers who have dared to challenge this lobby on pesticide usage on tideland.

It should not come as a surprise to anyone that usage of the pesticide Imazamox on eelgrass finds numerous proponents on Willapa Bay. The destruction of two native crustacean species, the ghost shrimp, Callianassa sp., and the mud shrimp, Upogebia sp., with the pesticide Carbaryl, for the sake of facilitating the production of the invasive species Crassostrea gigas (Japanese or Pacific oyster), has long been practiced on Willapa Bay:

"[...] Willapa Bay is the cleanest estuary in the U.S., and we've been using Carbaryl for 40 years," Brian Sheldon says. "I mean, where's the beef?"
(Taken from article titled Shell Games: With old ways and new ideas, Willapa Bay's oystermen face a shifting future in The Seattle Times, Sunday, May 15, 2005)

Well, part of "the beef" is that these ecologically important native shrimp inhibit the range of eelgrass meadows. Simply put, if the native shrimp are killed, then eelgrass will likely start growing where they once lived. Or scientifically put:

"The treatment of intertidal oysterbeds with carbaryl clearly reduces abundance of shrimp in this zone and we documented the same pattern of seagrass colonization on a commercial oyster bed and lack of seagrass in an adjacent unsprayed area. Density of native seagrass Z. marina shoots was also enhanced in plots treated with carbaryl, but only at lower tidal elevations or in intertidal pools where it could

survive. We believe the removal of shrimp will continue to broaden the distribution of Z. japonica in Washington coastal estuaries where carbaryl use is permitted and add an interesting perspective to this controversial management issue."
(Taken from The influence of burrowing thalassinid shrimps on the distribution of intertidal seagrasses in Willapa Bay, Washington, USA by
B.R. Dumbauld, S. Wyllie-Echeverria / Aquatic Botany 77 (2003) p. 27

It appears that Dumbauld's and Wyllie-Echeverria's findings in this regard may have been known and published in some form as early as 2001 - and were certainly well known by 2003. Nonetheless, the destruction of native shrimp with Carbaryl continued until 2012. Hence, the range of eelgrass was knowingly enhanced for nearly a decade. Now it is the dwarf eelgrass' turn to be vilified and killed with the pesticide Imazamox for the sake of facilitating the production of the invasive species Venerupis philippinarum (Japanese littleneck or Manila clam). In time, the native shrimp that managed to survive would likely try to return to areas where eelgrass was eradicated. Since usage of Carbaryl has been outlawed on Willapa Bay effective 2012, there is much talk of replacing this pesticide with yet another pesticide, Imidacloprid. As such, a disturbing pattern appears evident. The outcome could result in vast stretches of Willapa Bay's intertidal zone being routinely soaked with possibly as many as three pesticides (Rodeo, Imazamox, Imidacloprid).

Attempts by some shellfish companies to frame dwarf eelgrass, aka Japanese eelgrass, Zostera japonica, as detrimental to Willapa Bay'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 meadows with Imazamox is akin to a monstrous scorched earth policy, whereby critical habitat is denied to countless organisms for the sake of profit from conveniently expanded production of invasive Manila clams.

I further believe that the eradication dwarf eelgrass with Imazamox will also render much native eelgrass "collateral damage" due to its proximity in the intertidal zone.

The great ecological importance of eelgrass, be it dwarf eelgrass or native eelgrass, has been explained by many authorities. A few examples:

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.

4. William D. Pinnix et al (2004) on eelgrass in general:
"A limited number of studies have documented specific habitats, particularly eelgrass, that are used by juvenile salmonids rearing in estuaries. Murphy et al. (2000) documented higher beach seine catches of juvenile pink salmon O. gorbuscha in eelgrass beds than in open bay environments in Alaska. Bayer (1981) also documented the use of eelgrass beds by immature salmonids in the Yaquina estuary in Oregon, again based on beach seine catches. Dumbauld (Washington Department of Fish and Wildlife, Nahcotta Field Station, Nahcotta, Washington, personal communication) found juvenile salmonids residing in eelgrass beds in Willapa Bay, Washington using fyke nets equipped with 19.7 m leads. Various marine fish species within the taxonomic families Clupeidae (herring and relatives), Scorpaenidae (rockfish), and Pleuronectidae/Paralichthyidae (flatfish) have also been shown to depend on eelgrass as nursery habitat."
Taken from Fish Communities in Eelgrass, Oyster Culture, and Mud Flat Habitats of North Humboldt Bay, California (2004), U.S. Fish and Wildlife Service, by William D. Pinnix, Thomas A. Shaw, and Nicholas J. Hetrick

In closing, a grim historical reminder of what happens when eelgrass meadows disappear:

"[...] The vital importance of eelgrass was first noted by Danish biologists in 1890, but it was revealed dramatically in 1931 when a serious fungal disease and a change in ocean currents that brought warmer waters to the extensive Atlantic Zostera meadows teamed up to kill this species. With this catastrophic decline, which killed over 90 percent of the North Atlantic eelgrass population, many species of ducks and geese vanished. In addition, lobster, crabs, scallops, clams, and other invertebrates declined. A vital part of the food chain in coastal areas had been removed, and the decline in Zostera also caused significant problems with coastal erosion."
Taken from Eelgrass (Zostera marina); Flowering plants of the sea by Prentice K. Stout,
found online at http://seagrant.gso.uri.edu/factsheets/eelgrass.html

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