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Dear Kathy,

I am writing to offer comments in regard to the proposed issuance of a General NPDES permit to allow imazamox to be used to control invasive Zostera japonica, a class-C noxious weed, in Willapa Bay. I am submitting these in addition to my previous comments on this issue. I support the issuance of this permit, and encourage WDOE to expedite the permitting process to allow a control tool to be in place in time for the 2013 control season beginning in mid April. Based on all Best Available Science (BAS) developed by WSU, UW, USARS, etc, it's clear that japonica is having a large negative impact both on and off shellfish beds. While I believe it's detrimental to limit the control of this noxious weed to only clam beds, I very much appreciate DOE's support in working through this process so we can at least begin to protect this part of our farms. I support moving ahead in Willapa Bay to demonstrate the safety of this control program so that other responsible land Managers will have a tool available when the devastating effects of this plant are recognized and accepted by all those with aquatic land management responsibilities.

Zostera japonica is crippling our ability to farm in Willapa and is having large economic consequences for our farm. Field research has clearly shown the high level of economic impact japonica has had as it's spreads across our farmlands. The impacts range from reduced seed recruitment, to reduced shell growth, to reduced meat yield, to overall lower harvest levels. Japonica also acts to increase sedimentation where it inhabits so that massive amounts of sediment normally carried from the estuary through natural currents are instead deposited onto the tidelands. This not only destroys our cultivated shellfish beds, but also acts to completely alter the tideland substrate making it uninhabitable by many natural species. Since 1999 we have been working to develop mechanical methods for control of japonica. Using these methods we have been able to slow the expansion of japonica in select areas of our farms. However, we are quickly losing ground as this invasive aggressively spreads. Even with our attempt to provide control, I estimate we are seeing at least a 20% increase in overall infestation each year. In addition, to provide any realistic control as aligned with the need to cultivate our crops there are many control evevts required each year. These events result in damage to our crops, heavy

impact on the cultivated bed surface, high equipment acquisition and maintenance costs, dispersion of highly viable japonica root fragment and seed, high labor costs, etc. As we lose ground to japonica and our crop yields reduce, it's becoming more economically infeasible to be able to conduct control and still farm profitably. Without a reliable and economically feasible no touch control tool, it's clear that we will lose large portions of our farms as they become completely infested with japonica. Of course this will eliminate what little clear area is left for the various species that rely on our beds for habitat as the rest of the tide lands in Willapa are carpeted by this aggressive invasive plant.

With the reduced natural seed setting due to what appears to be degrading global environmental conditions, we would normally be able to rely on hatchery raised seed to supplement our crops and retain our annual harvest levels. However, areas infested with japonica provide opportune hiding areas for predators at much higher densities than would occur in the natural tideland state. When we have attempted to plant hatchery seed in or near japonica we found that it was entirely consumed by these predators. This has eliminated the long term option to supplement our crop densities using hatchery raised seed. We have already reduced our production from our clam beds by approximately 45% due directly to the negative impact of japonica, and this has had devastating consequences for our farm. This is in line with the field research conducted by WSU showing at least this level of reduced seed recruitment and survival where japonica exists. This 45% translates directly to the amount of employment we can offer and has resulted in about a 40% reduction in our crew so far. Left uncontrolled japonica will continue to degrade our beds, which in turn will result in lower and lower annual harvest levels. Eventually we will reach a point where it is no longer feasible to farm clams, and this will result in a current estimated loss of 5 million dollars to the shellfish farming community in Willapa Bay. This only includes beds we have been able to pursue some control on, and not ground that has become unusable due to japonica infestation. It also does not include the large investment made to cultivate beds. It also does not include impacts to oyster seed and grow out beds, which shellfish growers already see as being heavily impacted. The effect on oyster beds is the same in regard to reduced seed recruitment, reduced meat yield and quality, increased bed degradation, increased predation, etc. We've made large investments in infrastructure to support our clam and oyster crop propagation, and japonica has acted to put much of that investment at risk of total loss.

It's clear based on research and our long term experience in addressing invasive plants like this that the impact on the general ecology of Willapa has been devastating. We have seen literally thousands of acres of once sandy oxygen rich tide lands transformed into high sediment, increasingly anaerobic areas where the biota has been completely transformed. This transformation is having direct impacts on the basic food chain of Willapa Bay, and this is evident to shellfish growers who constantly monitor the health of indicator species like clams and oysters in the bay. The food production area relied upon by many species is being lost as japonica carpets much of Willapa. We are seeing bird species that rely on clear tide flats being displaced because they can't feed through the thick stem and root mass of japonica. I find it extremely irresponsible that some of those responsible to manage our public lands have resisted taking a proactive approach to this problem and instead have hidden behind vague assertions of too little science being completed. The fact is that there are years of science documenting the negative impacts of japonica in our estuary and in other states. This last summer field work by WSU and UW continued, and clarified further the bleak future of Willapa if control of this

invasive plant is not pursued. There is more data indicating that japonica is displacing endangered species by eliminating forage areas located away from shellfish beds. We know that the massive annual decomposition of japonica stem is affecting water chemistry and likely lowering Ph in and around shellfish beds and thereby contributing to localized acidification concerns. Given the large reduction in natural shellfish seed survival in areas where japonica infests, it's likely this increase in acidity is killing many species of shellfish larva in general.

Japonica has no significant stem coverage during the early spring so there is no realistic possibility that it could be used for any forage fish spawning. Stem density reduces about 90% from mid October until June when stems start to grow again and germination begins. Documented fish spawning events happen outside that time frame, so there is no spawning activity when japonica stem is present. On the other hand, dense japonica root mass remains year around so that any species requiring clear sand/gravel substrate for egg laying will clearly be prevented from spawning successfully. In my work on the DNR Habitat Conservation Plan, there has been much concern expressed in regard to assuring spawning area in the higher intertidal locations are protected. As I understand there are forage fish species that utilize substrate consisting of sand and/or gravel in order to lay eggs beneath the substrate surface. While not yet documented, it's clear that the dense root mass of japonica would prevent or at the very least greatly interfere with any spawning event. The obvious conclusion here is that japonica is reducing available habitat for species that require more clear substrate for spawning, and there are thousands of acres of infested area in Willapa Bay alone.

As with any invasive noxious weed, there must be an allowance for those supporting the program to pursue control in an efficent manner. In the aquatic situation, control must be timed so as to be conducted around tide and weather events. This is further complicated for shellfish growers by the ongoing farm work necessary to manage their lands and crops. The control of a noxious weed is viewed as a public service, so any permit should embrace this view throughout its content. I mention this because it's important that there be no acreage limitations associated with this permit. The amount of acreage that can be controlled will be self regulated due to tidal fluctuations, normally extreme coastal weather events, farm logistics, and the expense associated with treating. With shellfish growers taking on the responsibility to provide the public service of controlling a state listed noxious weed, they should be able to do as much control as possible on their property as aligned with any noxious weed control program. There has been discussion about limiting the permitted acreage, and this is not in the best interests of the State's goal to control this noxious weed. The control program will be self directed in regard to annual acres treated since it is very costly and time consuming to perform IPM activities. It would defy logic and any common sense to treat more ground than is necessary each year. Participants should be allowed to treat as much as necessary so they can implement a noxious weed management program that is aligned with need. Acreage limitations are not aligned with a normal approach to controlling a noxious weed, and act to cause participants to over control due to concern of not having enough acres year by year. Having an annual program driven by need will be a much more positive program, and should result many times in fewer acres requiring annual treatment.

Monitoring requirements included in the NPDES permit need to be aligned with any other noxious weed control programs. In this case, the closest program to use as a model is the Spartina eradication program. While there may be some extra monitoring built into the permit

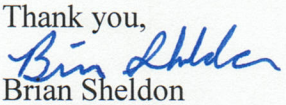
for the first year, if that monitoring shows no significant negative impact then monitoring requirements should automatically be reduced so as to be in line with those of the Spartina program. At this point I believe monitoring related to the Spartina program has been eliminated based on several years of monitoring that showed no impact. I assume monitoring associated with the japonica program would follow this model so that if its shown there is no effect then the requirements would be eliminated entirely given an adequate data set.

As a class-C noxious weed, the State has recognized japonica as a non-native species that is having significant negative impacts on the natural environment and economics of agriculture. Because shellfish growers spend so much time in the estuary environment, we are often the group who elevates the concern when we see such a destructive transformation occurring as is the case with the japonica infestation. This concern for the public interest is provided as a service by shellfish growers, and it's normal for there to be a short lag before other land Managers embrace the issue. However, in all cases these other stakeholders are recognizing the problem and will begin to consider control strategies. I mention this because based on history it will only be a matter of time until those with a charge to protect the public interests in the aquatic environment will take action to protect, preserve, and restore sensitive ecological habitat, recreation areas, etc. In addition, many private land owners are already exploring their option to pursue control to protect their shellfish gardens, preserve their tideland in a natural state, etc. Because history does show that the control of Zostera japonica will become a more urgent need for public and private land managers, any permit needs to be written such that it can be easily expanded to allow land managers to implement effective control strategies.

I request that the name Zostera japonica be used in all documents related to this permitting action. Use of other references such as Japanese eelgrass, Dwarf eel grass, etc. act to confuse the issue. It's important to differentiate Zostera japonica as an invasive class-C noxious weed as compared to other native Zostera species. Using the accepted scientific name Zostera japonica will help assure a common understanding across all functional boundaries, and this will help eliminate the confusion that exists in regard to this invasive plant.

I appreciate the opportunity to provide comment on this critical matter. I again ask that WDOE expedite the issuance of this NPDES permit so that shellfish growers can finally make some progress toward reducing the high crop losses we have been experiencing for the past several years directly due to japonica infestation. We have reached a point where the situation has become critical and so emergency action may be required if a permit is not in place in time to begin treatments when japonica begins to germinate in the mid April 2013 timeframe. I also ask that any permit be written such that oyster beds can also be treated. If this is not allowed in the initial permit then there needs to be an allowance for the permit to be expanded automatically if its demonstrated that there are no significant negative impacts from the first year pilot treatments.

Thank you,



Brian Sheldon
Northern Oyster Company