I recently learned that the Washington Dept. of Ecology is soliciting comments on an update to permit for removing noxious weeds with a focus on controlling *Zostera japonica* on clam beds in Willapa Bay. Thank you for the opportunity to provide comments on this topic again. I continue to oppose the use of herbicides to control *Zostera japonica* in Willapa Bay, especially on clam beds. Back in 2012 I provided extensive comments against listing *Zostera japonica* as a noxious weed and against allowing herbicide control of *Zostera japonica* on clam beds (comments attached). After reviewing that document, most of those comments still have not been addressed by peer reviewed research and are as relevant today as they were 12 years ago.

In addition to those previous comments, I would like to point out new research that indicates the presence of seagrass in general provides a valuable and under appreciated service of reducing pathogenic bacteria in the water column and in shellfish (Lamb et al. 2017, Ascioti et al. 2022, Dawkins et al. 2024). Lamb et al. (2017) found that *Enterococcus* bacterial levels were 3-fold lower when seagrass were present. Ascioti et al. (2022) estimated that the seagrass sanitation effect resulted in about 8 million fewer gastrointestinal cases worldwide. The work of Lamb et al (2017) and Ascioti et al. (2022) was based on mixed species seagrass beds suggesting that the deactivation or removal of pathogens was not dependent on the type of seagrass present. In a German study, eelgrass (*Zostera marina*) the locally dominant seagrass in Washington and the Pacific Northwest was found to suppress pathogens in seawater (Tasdemir et al. 2024). The wieght of evidence is that the presence of seagrass, regardless of species is associated with lower pathogen loads in the environment and fewer cases of gastroenteritis. Work in Puget Sound (Dawkins et al. 2024) found that not only does the presence of seagrass reduce pathogens in the water column, but they also showed a 65% reduction in human bacterial pathogens in marine bivalves in locations with seagrass. Taken together, these publications suggest that seagrass presence, regardless of species, provides a beneficial service by removing pathogenic bacteria from the environment and from shellfish growing in seagrass beds. Unfortunately, none of these studies explain the mechanism of pathogen removal, and additional mechanistic work is required. Actively removing seagrass from clam beds may reduce or limit the efficacy of this important, under-recognized service and could have implications for human health.

I would be interested to learn about how the requirement that “prohibited in drainages that are flowing to areas containing the native eelgrass *Zostera marina*.” is evaluated and enforced? Are there records audits and fines associated with inappropriate applications? This seems to rely on the goodwill and self-regulation. Further, I wonder if the application on ~100 acres of clam beds actually justify the “need” for this chemical eradication tool? If this tool is only being used on a small fraction of clam beds in Willapa Bay, is it really needed and do the environmental impacts really justify its continued usage.

Ascioti et al. 2022. The sanitation service of seagrasses – dependencies and implications for the estimation of avoided costs. Ecosystem Services 54: 101418. Doi: 10.1016/j.ecoser.2022.101418

Dawkins et al. 2024. Seagrass ecosystems as green urban infrastructure to mediate human pathogens in seafood. Nature Sustainability. Doi: 10.1038/s41893-024-01408-5

Lamb et al. 2017. Seagrass ecosystems reduce exposure to bacterial pathogens of humans, fishes and invertebrates. Science 355: 731-733.

Tasdemir et al. 2024. Epiphytic and endophytic microbiome of the seagrass Zostera marina: Do the contribute to pathogen reduction in seawater? Science of Total Environment 908: 168422. Doi: 10.1016/j.scitotenv.2023.168422