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To: [Rockett, Derek \(ECY\)](#); [Doenges, Rich \(ECY\)](#); [Rogowski, Barry \(ECY\)](#)
Cc: [McReynolds, Ryan](#)
Subject: NMFS comment letter on draft NPDES Permit and DEIS on use of Imidacloprid
Date: Monday, December 08, 2014 3:59:45 PM
Attachments: [2014_12-08_Imidicloprid Letter \(1\).pdf](#)

Mr. Rockett, Please accept as our agency's comments the attached letter responding to Ecology's draft NPDES permit and DEIS covering the proposed use of imidacloprid to control burrowing shrimp in Willapa Bay and Grays Harbor.

Sincerely,

Thom Hooper

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UNITED STATES DEPARTMENT OF COMMERCE
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December 8, 2014

Mr. Derek Rockett
State of Washington Department of Ecology
Water Quality Program
P.O. Box 47775
Olympia, Washington 98504

Re: Comments on draft NPDES Permit allowing use of imidacloprid to control burrowing shrimp in Willapa Bay and Grays Harbor

Dear Mr. Rockett:

Thank you for the opportunity to comment on the Washington State Department of Ecology's (Ecology's) draft National Pollution Discharge Elimination System (NPDES) Permit (Permit) to the Willapa/Grays Harbor Oyster Growers Association (Association) and Draft Environmental Impact Statement (DEIS) provided October 24, 2014. The National Marine Fisheries Service (NMFS) recognizes the importance of the final decision Ecology must make regarding the use of imidacloprid for oyster growing operations in Washington State's coastal estuaries. NMFS also recognizes the important economic role chemical control of burrowing shrimp has played for oyster growers over the past several decades. The NMFS appreciates the continued open communication, sharing of information, and opportunity to meet with Ecology personnel in October to discuss permit details, and appreciates the time spent in an earlier July meeting to discuss details of the preliminary DEIS.

The NMFS is providing these comments based on our responsibilities under the Endangered Species Act (ESA), the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the Marine Mammal Protection Act, and the Department of Commerce and NOAA Aquaculture Policies.

The draft Permit indicates that Ecology would allow the application of imidacloprid, as an alternative to carbaryl, in limited areas of Willapa Bay and Grays Harbor to kill burrowing shrimp (*Neotrypaea californiensis* and *Upogebia pugettensis*) on mudflats desired for commercial shellfish operations and create for the first time a sediment impact zone (SIZ). Below we provide general comments on the use of imidacloprid for this purpose, and offer the Association assistance in finding alternative approaches to chemical use. Permit-specific comments are attached to this letter. The draft Permit allows significant increases in acreages for shrimp control over previous levels. Specifically, treatment in Grays Harbor would increase from 200 acres treated per calendar year to 500 acres, and treatment in Willapa Bay would increase from 600 to 1500 acres per calendar year for a total of 2000 acres treated annually. This more than doubles the amount of area previously permitted for treatment with the carbamate insecticide, carbaryl.



If Ecology determines to go ahead with issuing this permit, NMFS strongly encourages a more cautious approach. As described below, there are far too many unknowns with imidacloprid's use; and issues to be worked out regarding impacts to other aquatic and terrestrial biota. We believe measured increases in acreage treated up to the proposed amount would allow for more effects information to be obtained. Ecology should begin by keeping the acreage as before, 600 acres treated in Willapa Bay and 200 acres in Grays Harbor. This we believe would be far more prudent than the proposed initial approval of 1,500 acres in Willapa Bay, and 500 acres in Grays Harbor. In addition, this approach would maintain the existing quality of the untreated acreage in Willapa Bay and Grays Harbor.

During meetings with Ecology staff in July and in October of this year, NMFS questioned the rationale for these increases. We were told by Ecology staff two reasons drove the increase: (1) the growers were concerned with the efficacy of imidacloprid; and (2) growers believed the number of burrowing shrimp have been increasing. We understand and agree these would be significant concerns to growers.

However, the NMFS is not convinced these points are well supported. Previous smaller pilot plot applications have shown imidacloprid is highly effective at killing shrimp. Trials conducted from 2010 to 2012 generally indicated that granular and liquid forms of imidacloprid were moderately to highly effective in reducing densities of shrimp. To get at this question further, a much larger 500+ acre application area and study occurred in summer 2014. This amount of acreage treated and corresponding study was approved by Ecology and was meant to build on previous work; to better define efficacy, rate of transport, persistence, and impacts to non-target organisms. This past summer's 500+ acres were treated at the prescribed 0.5 lb imidacloprid (active ingredient) per acre application rate. We understand that the results of this application have not been made available to Ecology or to other interested parties. The NMFS is interested in the data regarding the efficacy, water quality, sediment, and benthic ascertained (as described requirements of the draft permit) from this 500 plus acre treatment so we can better understand effects to ESA and MSA species. This information should be made available for review and comment before Ecology makes its final determination.

Indeed, Ecology's issuance of this draft permit for review without first obtaining the efficacy and the benthic and water chemistry study results from last summer's 500-plus acre treatment does not seem prudent. The data from this more representative treatment event could have reshaped the conditions of the draft permit, resulted in a better informed DEIS, and the public, and increased confidence that important public aquatic resources, including ESA-listed threatened and endangered species were being sufficiently protected.

Regarding the suggestion that numbers of burrowing shrimp are increasing, NMFS was told by Mr. Rockett of Ecology, during a meeting referenced above, that data to support this claim was available. Although we requested this data, it was not provided, leading the validity of this assertion in question.

The NMFS also requested the sampling results from the water chemistry studies that were conducted during the test treatments of recent years. Again, the data were not provided.

It is important to note that both varieties of burrowing shrimp found in Willapa Bay and Grays Harbor, Washington are native to these waters and thus play a role in the natural ecosystem. As their name implies, burrowing shrimp rework intertidal and shallow subtidal bottom sediments during the normal course of their feeding, sheltering, and other activities. Burrowing shrimp play an important role in ecosystem processes. Burrowing and deposit-feeding by ghost shrimps affect the geochemical properties of the sediments, including grain size, nutrient exchange, and organic deposition. Biological implications of these habitat modifications include both beneficial and adverse effects for associated flora and fauna. The functional ecologic importance of burrowing ghost shrimps has been highlighted in several studies (Suchanek, 1983; Posey, 1986; Dittmann, 1996; Berkenbusch et al., 2000; Dumbauld and Wyllie-Echeverria, 2003). Shrimp are prey for a number of species and, as such, are an important link in estuarine trophic pathways (Feldman et al. 2000, pp. 145, 153, 166). Dungeness crab (*Cancer magister*), a commercially important species, and native coastal cutthroat trout (*Salmo clarkii*) feed on shrimp (Posey 1985, 1986b in Feldman et al. 2000, p. 154). As stated in our previous letter to Ecology (NMFS 2014, p. 2), control of burrowing shrimp may reduce habitat quality (i.e., food resources) for ESA-listed North American green sturgeon (*Acipenser medirostris*). In Willapa Bay, burrowing shrimp are the preferred prey item for green sturgeon, comprising approximately 50 percent of their diet (Dumbauld et al. 2008). In addition to prey removal, green sturgeon may suffer direct effects by ingesting imidacloprid bound to sediments that are ingested while feeding on burrowing shrimp. Control of burrowing shrimp is also likely to reduce the quality of essential fish habitat for Federally-managed fish species, including Pacific salmon, groundfish, and coastal pelagic species, by reducing prey availability. Further, we want to emphasize that the prey resource is a primary constituent element of designated critical habitat for listed green sturgeon.

Along with direct effects and reductions in food resources for ESA-listed green sturgeon, other direct and indirect reductions in prey for other species have been identified in numerous studies with regards to aquatic applications of imidacloprid. For example, experiments in imidacloprid-treated rice fields by Hayasaka et al. (2012) showed direct negative effects on the species abundance of the zooplankton community, leading to the indirect suppression of growth in fishes feeding on the zooplankton species. Sanchez-Bayo and Goka (2006) found indirect effects on algae growth in rice fields after changes of the arthropod communities induced by imidacloprid.

The fact a SIZ is being allowed/established and monitored for the recovery of benthic sediments and taxa after application of imidacloprid is telling. Based on conversations with staff during the referenced meetings, Ecology is clearly aware that imidacloprid is a persistent broad spectrum pesticide that will kill nearly all benthic organisms on the acreage directly treated. The NMFS believes impacts to benthic prey species will be affected beyond the area to be treated, including areas where the spray has drifted, or carried off-site by tidal currents. These benthic organisms are prey for many species of fishes that are listed under the ESA, managed under the MSA, and others, including Pacific salmon, groundfish, coastal pelagic species, herring, sandlance, and smelt. The ESA-listed Pacific salmon from the Columbia River use the coastal estuaries to rear. Activities reducing available prey directly affect their growth, and hence their survival (NMFS 2009). Salmon and forage fish are intrinsically important, and also are important economic resources. Millions of dollars are spent each year on salmon recovery efforts. The NMFS encourages Ecology to take the impacts to these fishes into greater consideration when considering your final action.

The NMFS is also concerned with delayed, lingering, and latent effects resulting from imidacloprid's persistence in sediments. Studies have found significant effects from persistent, low concentrations of imidacloprid following application. While most pesticides do not have toxic effects below a certain level (no observable effects concentration, or no observable effects level), the cumulative effects of neonicotinoids imply that even the lowest concentrations have toxic effects if sustained over a long period, which is especially relevant for species with a long life span such as sturgeon (Van Dijk, et al. 2012). In addition to the existing experimental evidence on the negative effects of imidacloprid on invertebrate life, the Van Dijk, et al. (2012) study showed that serious concern about the far-reaching consequences of the abundant use of imidacloprid (as proposed by this permit) for aquatic ecosystems is justified.

With regard to the SIZ, NMFS is concerned that the Puget Sound toxic site recovery standard used by Ecology to determine maximum biological effects is not sufficiently protective of aquatic resources and their habitats. By this standard, when a site recovers up to 50% biotic richness and abundance, it can meet the "recovered" standard. Applying this standard to the total acres sprayed (2000) and the off-site areas affected could represent a huge and continuing loss in biotic production for several other ecologically important and economically valuable species. We do not agree the Puget Sound toxic site "clean-up" standard should be used for this purpose. We believe a return abundance and biotic richness of 80% would indicate a site is recovering. Without long-term data associated with this proposed action, it is impossible to say that at 50% abundance and richness, what direction (recovering or not recovering) the population of the benthic community is heading. Nor is it possible to say that at 50%, the benthic communities' population is sufficient to support the ecological role demanded by listed species and other vital fisheries resources.

NMFS appreciates that aquaculture is an important aspect of the Washington State economy. It is a component of our agency's efforts to maintain healthy and productive marine and coastal ecosystems, protect special marine areas, rebuild overfished wild stocks, restore populations of endangered species, restore and conserve marine and coastal habitat, balance competing uses of the marine environment, create employment and business opportunities in coastal communities, and enables the production of safe and sustainable seafood. While NMFS is concerned about the unintended biological effects of controlling burrowing shrimp as described above, we also share the Association's concern regarding the economic impacts of burrowing shrimp on their industry. NMFS offers a number of funding opportunities that the Association might use to investigate alternative types of oyster culture that do not require the chemical control of burrowing shrimp, but maintain oyster production. We recommend the Association work directly with the NMFS Office of Aquaculture staff and the West Coast Region Aquaculture Coordinator to develop proposals for such investigations. The NMFS also encourages Ecology to seek funding sources that could help with alternative practices. Sources of funding NMFS can assist with include:

- **Saltonstall-Kennedy Grant Program** - The Saltonstall-Kennedy Grant Program includes aquaculture as a priority to fund projects that encourage the development of environmentally- and economically-sound aquaculture as well as relieve fishing pressure and improve market availability of U.S. seafood products. (OPEN NOW, closes Dec 15, 2014)

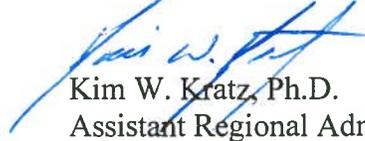
- **Sea Grant Marine Aquaculture Grant Program** - Informally referred to as the "National Marine Aquaculture Initiative (NMAI)," this national competitive grant program encourages demonstration projects and research targeted to the development of sustainable marine aquaculture in the United States. The competition is designed to foster dynamic partnerships that channel resources toward the development of sustainable aquaculture technologies. Projects often involve partnerships among commercial companies, research institutions, universities, state governments, and coastal communities. The competition also supports the work of state Sea Grant extension programs.
- **NOAA Fisheries Finance Program** - The Fisheries Finance Program provides long-term financing (up to 25 years) in the form of direct loans for up to 80 percent of the cost of construction, reconstruction, expansion, and purchase of aquaculture facilities. The program also may refinance existing loans. There are no early repayment penalties and the fees for a new loan are 0.5 percent. Aquaculture is considered a high priority in this program.

To summarize NMFS does not believe Ecology should issue the permit without first obtaining the efficacy and the benthic and water chemistry study results from last summer's 500-plus acre treatment and making this information available for a second round of public review. We also believe the amount of acreage allowed for treatment should initially remain the same at 800 acres per year in total (600 Willapa Bay and 200 Grays Harbor). Further, all required sampling should be conducted every year over the duration of the permit. This requirement would be informative. For example, if the data supported it, yearly sampling results could justify measured increases in acreage treated (up to the proposed limit) in subsequent issuances of the NPDES permit. Finally, the Puget Sound site clean-up standard for benthic recovery is too low, a higher target of 80% benthic recovery would be more appropriate.

The NMFS is the lead federal agencies in Washington State involved in protecting, improving, and restoring marine species, habitats, and ecosystems. We look forward to continued dialogue with Ecology as the agency moves toward its final determination. We look forward to a resolution that will allow continued shellfish culture in a manner consistent with the protection of other very important resources. Regarding the contents of this letter, and/or for future meetings concerning funding opportunities described, please contact our Regional Aquaculture Coordinator, Laura Hoberecht by phone, 206-526-4453, or email, laura.hoberecht@noaa.gov.

All other questions or inquiry for meetings should be directed to Fisheries Biologist's Scott Anderson by phone, 360-753-5828, or email, scott.anderson@noaa.gov; or Thom Hooper by phone, 360-753-9453, or email, thomas.hooper@noaa.gov.

Sincerely,



Kim W. Kratz, Ph.D.
Assistant Regional Administrator
Oregon – Washington Coastal Area Office

cc: Rich Doenges
Jason Landskron
Barry Rogowski
Cathy Tortorici

Attachment: Specific comments on the NPDES permit

References

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Appendix – Specific Comments on Ecology’s Draft NPDES Permit for the use of Imidacloprid to Control Burrowing Shrimp in Willapa Bay and Grays Harbor

The permit requires (Section S1C) the permittee to ensure that treatment does not cause or contribute to further impairment of Willapa Bay and/or Grays Harbor for any parameter that is impaired in these estuaries. Yet there is no list of the existing impairments provided to determine how the permittee (or the public) can ensure this requirement is attained.

In section S2 (the “Permittee may” section:) item number 2 is concerning. This stipulates the Permittee may apply pesticides, other than imidacloprid, for experimental use. Section S2H goes on to prescribe specific conditions of the experimental use of other chemicals. Specifically that experimental use must be conducted under a Washington State Experimental Use Permit issued by the Washington State Department of Agriculture (WSDA) and that the use can only be for 1 acre or less. The NMFS is not familiar with the procedures the WSDA goes through prior to issuance of these experimental permits. For example, what outcomes are monitored, and does issuance of an experimental permit go through a public process? If so, NMFS requests notification and an opportunity to comment. If it does not go through a public process, what provisions are in place to ensure protection of people and of the environment?

Section S3A states 1) that “the SIZ boundaries coincide with the boundaries of the treated grounds identified in the Annual Operation Plan, and 2) that impacts to sediment quality outside the treatment plot boundaries as a result of imidacloprid application will violate the terms and conditions of the permit.” However, other than water sampling required on the ensuing tide (S4A), there does not appear to be a requirement to sample sediments or the benthic community off-site. Given this short-coming, how will Ecology make this compliance determination?

In section S4B, the Sediment Monitoring Schedule raises concerns. We do not agree that years should be skipped to determine chemical persistence and benthic impacts within the designated areas described in the table. Persistence of imidacloprid in the sediment and the potential for lasting affects is a significant concern. Given that the data from last summer’s 500 acre treatment are not available, and the proposal to expand application to 2000 acres, skipping years and hence opportunities to gather more information about potential effects, does not seem prudent. What is Ecology’s purpose to allow years to be skipped?

Section S4F requires monitoring of the persistence of imidacloprid in sediments, but the monitoring plan leaves troubling uncertainties. The treatment plots to be sampled must be identified in the annual Sediment Sampling and Analysis Plan. Four sediment samples, representative of the treatment plot, must be collected post treatment for whole sediment and extraction of porewater at low tide on days 1, 14, 28, and monthly thereafter (per the sampling schedule identified in S4B). The term “representative” is problematic because it is not clearly defined and does not require that they be randomly chosen. Does Ecology have criteria for selecting the samples? This is important to arrive at statistically valid sample results.

In section S4G on Sediment Benthic Invertebrate Monitoring, there is a discussion of sub-plots no smaller than 10 acres. “The 10 acre sub-plot must encompass as many of the overall treatment plot’s ecological features as possible to ensure it is representative of the overall

treatment plot.” NMFS has the same concerns described above for how the sample site is selected to be representative of the entire acreage treated. Criteria should be in place and well understood. Random selection of sites is critical in study design to arrive at statistically valid sample results.

Section S6A. contains the Annual Operations Plan requirement. Should this permit be issued, NMFS agrees that unless an Operations Plan is provided for Ecology’s review and approval each year, the Permittee should not be allowed to apply the product.

In section S6A1a: there is a provision for Permittee’s to treat grounds that have burrowing shrimp densities below the “action threshold.” NMFS is wondering what criteria will Ecology use to approve or disapprove treatment with imidacloprid on grounds that have less than the action threshold of ten burrows per square meter? It is not possible to comment on this item without first knowing how Ecology will proceed in these instances, and what variables Ecology will be taking into consideration.

This section also lacks a requirement for the Permittee to provide the elevations of the proposed treatment area or control. This is important information that is essential when considering suitability of controls (equivalency) with treatment grounds and for interpreting benthic data. Regarding section S6C Noncompliance Notification, NMFS is wondering what administrative steps Ecology will follow when it receives a non-compliance notification (or not receive in time, or not received at all). This is not described in the permit. NMFS recommends that this process be clearly stated.

Finally, there are other aspects of the permit that are impossible to comment on because they reference documents not yet produced. These include details in the sampling and analysis plan and the Annual Operations Plan (for which these are a component of). Will there be a public review process on these components of the proposed action?