From: Bayard, Trina
To: Rockett, Derek (ECY)
Subject: Comment letter DEIS – Control of Burrowing Shrimp using Imidacloprid
Date: Monday, December 08, 2014 4:44:12 PM
Attachments: Audubon WA Imidacloprid DEIS comments FINAL 12_8_14.pdf
Washington_coastal_estuaries_IBA_7_2013.png

Dear Mr. Rockett,

Please see the attached pdf for a copy of Audubon Washington's comments concerning the Draft Environmental Impact Statement – Control of Burrowing Shrimp using Imidacloprid on Commercial Oyster and Clam Beds in Willapa Bay and Grays Harbor, Washington. I've also attached a map showing the location of Important Bird Areas in Southwest Washington coastal areas.

Thank you for considering our concerns,

Trina Bayard

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Audubon WASHINGTON

December 8, 2014

Washington State Department of Ecology
Water Quality Program
ATTN: Derek Rockett
derek.rockett@ecy.wa.gov
Southwest Regional Office
PO Box 47775
Olympia, WA 98504

RE: Draft Environmental Impact Statement – Control of Burrowing Shrimp using Imidacloprid on Commercial Oyster and Clam Beds in Willapa Bay and Grays Harbor, Washington

Dear Mr. Rockett:

Thank you for the opportunity to comment on the *Draft Environmental Impact Statement – Control of Burrowing Shrimp using Imidacloprid on Commercial Oyster and Clam Beds in Willapa Bay and Grays Harbor, Washington* (DEIS)[1]. We have reviewed the DEIS, the 2013 *Risk Assessment for Use of Imidacloprid to Control Burrowing Shrimp in Shellfish Beds of Willapa Bay and Grays Harbor, WA*[2] (2013 Risk Assessment) as well as peer-reviewed studies on the potential effects of neonicotinoid exposure on aquatic invertebrates and their avian predators.

Although we wholeheartedly support the discontinued use of Carbaryl at these locations, we are very concerned about the potential unintended consequences of imidacloprid application on birds and their invertebrate prey community, and the estuarine ecosystems of Willapa Bay and Grays Harbor in general. Because we learned of this proposal relatively recently, we will keep our comments focused on two main issues of concern:

1. The potential effects of burrowing shrimp control and imidacloprid application on the Grays Harbor and Willapa Bay estuarine ecosystems; and
2. Uncertainties surrounding the fate of imidacloprid in the marine aquatic environment.

The potential effects of native burrowing shrimp suppression and imidacloprid application on the Grays Harbor and Willapa Bay estuarine ecosystems

As the DEIS correctly states, Willapa Bay supports several hundred bird species and is a site of critical importance for migrating aquatic birds. **The DEIS fails to note that Willapa Bay supports three Important Bird Areas (IBA), including one Global IBA (Sand and Gunpowder Islands), and two state-level IBAs (North Willapa Bay, and South Willapa Bay) (see attached figure).** Important Bird Areas are sites that provide

[1] Ecology (Washington State Department of Ecology). 2014. "Draft Environmental Impact Statement: Control of Burrowing Shrimp using Imidacloprid on Willapa Bay and Grays Harbor, Washington. Appendix A." Available at: http://www.ecy.wa.gov/programs/wq/pesticides/imidacloprid/docs/ImidaclopridDEIS.pdf. Accessed December 1, 2014.

[2] McGaughey, B. et al. 2013. Risk Assessment for Use of Imidacloprid to Control Burrowing Shrimp in Shellfish Beds of Willapa Bay and Grays Harbor, WA. Plauche & Carr. Compliance Service International. Available at: http://www.ecy.wa.gov/programs/wq/pesticides/imidacloprid/docs/ImidaclopridRiskAssessment.pdf. Accessed December 3, 2014.

essential habitat for one or more species of birds; sites are ranked as Global, Continental, or State level IBAs, depending on their significance.

The DEIS also fails to note that Grays Harbor Estuary was designated a hemispheric reserve by the Western Hemisphere Shorebird Reserve Network as a site of international significance. The estuary is visited by over 500,000 shorebirds annually during spring and fall and is used as roosting and foraging grounds by shorebirds (www.WHSRN.org), as well as many other marine bird species. **Grays Harbor Estuary also supports six state-level IBAs** (see attached figure). Grays Harbor is considered one of the top destinations nationwide to view birds.

The sheer number and diversity of birds found in these estuaries is a direct reflection of both the high productivity and the unique configuration of habitats found there. These estuaries are incredibly valuable landscapes, from both an economic and an environmental standpoint. As such, they should be managed using the precautionary principle and an abundance of caution.

Given the value of these estuaries, we think that the 2013 Risk Assessment provides inadequate evidence that the proposed application of imidacloprid "will not significantly impact the endemic species of the ecology of these waters." In fact, a growing body of evidence suggests that the **introduction of neonicotinoid insecticides such as imidacloprid poses a significant threat to biodiversity and ecosystem services in places where it is used.**

The Worldwide Integrated Assessment (WIA), a massive review of 800 peer-reviewed studies led by a team of 29 independent scientists, concluded that the threat to biodiversity posed by neonicotinoid insecticides was high enough to warrant regulatory action, and that aquatic invertebrates are vulnerable to both low and acute exposure levels[3]. The WIA also noted that contamination of estuarine and coastal marine systems has been detected, which is in direct contradiction to the contention of the DEIS that imidacloprid quickly degrades in the estuarine environment. Other recent peer-reviewed literature also supports the notion that neonicotinoid contamination is widespread in aquatic systems[4,5]. This research further suggests that imidacloprid may cause invertebrate prey base collapse, which in turn has been correlated with avian population declines.[6] Direct toxicity to bird populations has also been noted[7,8] .

We respectfully request that Ecology integrate recent advances in the published literature about both the short and long-term effects of imidacloprid into the EIS and any approved permit language. In addition, we have the following concerns:

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[3] Van der Sluijs J.P., et al. 2014. Conclusions of the Worldwide Integrated Assessment on the risks of neonicotinoids and fipronil to biodiversity and ecosystem functioning. *Environ Sci Pollut Res* doi:10.1007/s11356-014-3229-5

[4] Morrissey, C.A., et al. 2014. Neonicotinoid contamination of global surface waters and associated risk to aquatic invertebrates: A review. *Environment International* 74 (2015) 291–303

[5] Van Dijk et al. 2013. Macro-invertebrate decline in surface water polluted with imidacloprid. *Plos One* 8: e62374. doi:10.1371/journal.pone.0062374

[6] Hallmann et al. 2014. Declines in insectivorous birds are associated with high neonicotinoid concentrations. *Nature* doi:10.1038/nature13531

[7] Gibbons et al. 2014. A review of the direct and indirect effects of neonicotinoids and fipronil on vertebrate wildlife. Environ Sci Pollut Res: DOI 10.1007/s11356-014-3180-5

[8] Mineau, P. and C. Palmer. 2013. "The Impact of the Nation's Most Widely Used Insecticides on Birds." American Bird Conservancy. Available at: http://www.abcbirds.org/abcprograms/policy/toxins/Neonic_FINAL.pdf. Accessed December 1, 2014.

1. Although it appears from the evidence presented in the DEIS that imidacloprid uptake by eelgrass is minimal, there seems to be enough uncertainty about the transport and long-term accumulation of imidacloprid in the sediments of these two sites that a greater understand of the potential uptake by zooplankton and micro and macro-algae, both within and outside of the pesticide application area should be considered.
2. The timing of proposed imidacloprid application is between April 15 and December 15. **Because shorebird numbers peak from mid-April through early May during spring migration, and waterfowl return to the estuaries in October, we request that if alternative 3 is approved, the timeframe for imidacloprid application be limited to May 15-September 15**.

Despite the difficulty that the two native species of burrowing shrimp (ghost shrimp, *Neotrypaea californiensis* and mud shrimp, *Upogebia pugettensis*) pose to the shellfish industry, the species are, in fact, an integral component of the benthic environment. As the DEIS notes, "burrowing shrimp are considered ecosystem engineers because of their ability to control and structure the benthic community." Although the DEIS contends that imidacloprid will be used in just a small portion of these sites, this "tinkering" with the estuarine benthic environment when the ecosystem-level effects of this suppression are unknown, may have unintended consequences. This is clearly an issue under both alternative 2 and 3, and one that is not adequately addressed in the DEIS. As such, we would like to voice the following concerns:

1. The DEIS contends that burrowing shrimp are present at high densities at these sites, but no formal assessment of the burrowing shrimp population, including potential drivers for population growth, are given. If burrowing shrimp populations are indeed substantially higher than "normal," it is important to understand if other human pressures are driving this trend, or whether high densities of burrowing shrimp are the result of natural phenomena.
2. The DEIS contends that a reduction in burrowing shrimp will yield beneficial impacts for eelgrass and other aspects of invertebrate biodiversity. We find this purported benefit quite puzzling, since the Willapa/Grays Harbor Oyster Growers Association (WGHOGA) recently applied for and received a permit to control non-native eelgrass using the herbicide Imazamox.[9] Is there any information available on whether the suppression of burrowing shrimp will result in new areas of non-native eelgrass (*Zostera japonica)* growth? The idea that imidacloprid use to suppress burrowing shrimp populations will result in greater biodiversity is completely at odds with the biological outcomes observed in the published literature.[10]

Uncertainties surrounding the fate and effect of imidacloprid in the marine aquatic environment

A recent review of neonicotinoid contamination and the potential effects on aquatic invertebrates suggests that concerns about the potential risks to non-target organisms and aquatic ecosystems are justified.[11] This review drew from 29 studies from 9 countries and included 49 species of aquatic insects and 12 orders of crustaceans. Of particular concern and relevance to this DEIS is the evidence from this review that

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[9] Ecology. *Zostera Japonica* Management on Commercial Clam Beds in Willapa Bay General Permit. Issued: April 2, 2014.

[10] Van der Sluijs J.P., et al. 2014. Conclusions of the Worldwide Integrated Assessment on the risks of neonicotinoids and fipronil to biodiversity and ecosystem functioning. *Environ Sci Pollut Res* doi:10.1007/s11356-014-3229-5

[11] Morrissey et al. 2015. Neonicotinoid contamination of global surface waters and associated risk to aquatic invertebrates; A review. Environmental International 74:291-303.

neonicotinoids, including imidacloprid: 1) act synergistically or additively with other pesticides, fungicides, fertilizers, 2) are persistent in the aquatic environment, including fast-moving systems such as rivers, and 3) can have toxic effects at concentrations that are orders of magnitude apart on different invertebrate species. These empirical results raise the following questions and concerns:

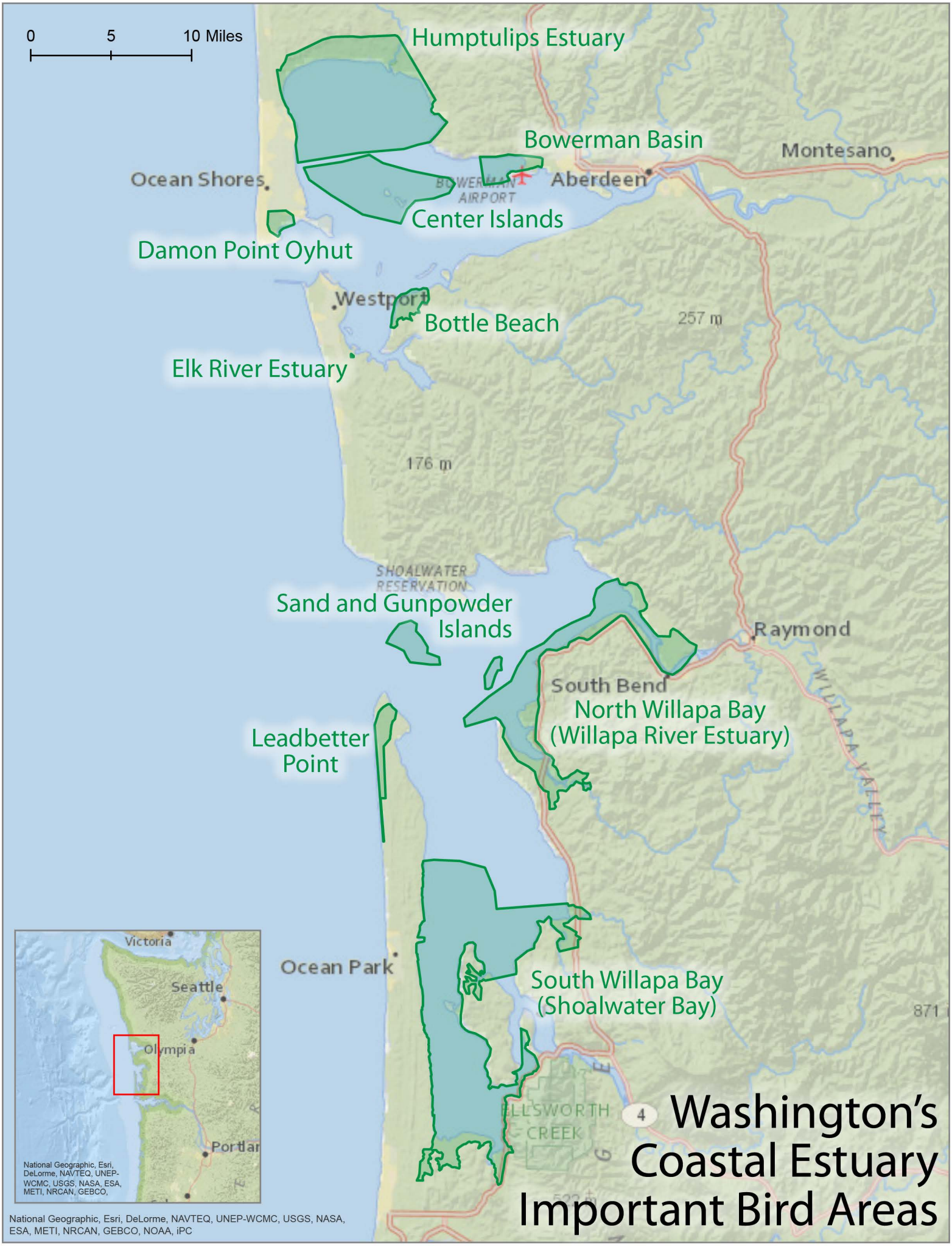
1. What is the current profile of fungicides, pesticides, and fertilizer contamination in Grays Harbor and Willapa Bay, and how does this vary over the course of the proposed imidacloprid application period? Have the analyses of the potential toxic effects of imidacloprid taken this information into account?
2. Application of imidacloprid in the estuarine environment appears to be a fairly unusual use of the insecticide. The DEIS states that WGHOGA 2011 field trials testing the efficacy, environmental fate and transport, and biological effects of imidacloprid did not have an Ecology-approved Sampling and Analysis plan, although 2012 field trials did. Nevertheless, one year of preliminary field data combined with one year of more rigorous data should not take precedence over peer-reviewed research. Until a rigorous assessment of imidacloprid in the estuarine environment is available, Ecology should use a precautionary approach and apply conservative estimates of imidacloprid toxic effect thresholds and transport rates, as are reported in the peer-reviewed literature [12,13,14]. This includes recommended ecological thresholds for imidacloprid at below 0.2 µg/L for acute exposure and 0.035 µg/L for long-term chronic exposure[15]. The imidacloprid levels reported in the 2013 Risk Assessment are considerably higher (acute 0.35 µg/L to 4,200 µg/L; chronic: 0.4 µg/L), which poses an unacceptable risk to the benthic environment of Willapa Bay and Grays Harbor.

The conservation of marine birds and their food and habitat resources are one of Audubon's top conservation priorities, both at the state level and throughout the Pacific Flyway. We are working across our network of 25 local chapters to ensure that state and federal policies concerning wildlife and habitat management use the best available science to safeguard these birds and their life history needs. While we recognize the complex challenge that WGHOGA and Ecology face in managing issues related to burrowing shrimp and shellfish production, we ask that Ecology consider our concerns about the potential unintended consequences of imidacloprid application and incorporate the latest peer-reviewed science on the subject into any EIS or permit language. Please don't hesitate to contact us if you have any questions.

Sincerely,

Trina Bayard, PhD
Director of Bird Conservation, Audubon Washington

[12] Morrissey et al. 2015. Neonicotinoid contamination of global surface waters and associated risk to aquatic invertebrates; A review. Environmental International 74:291-303.
[13] Gibbons et al. 2014. A review of the direct and indirect effects of neonicotinoids and fipronil on vertebrate wildlife. Environ Sci Pollut Res: DOI 10.1007/s11356-014-3180-5
[14] Van der Sluijs J.P., et al. 2014. Conclusions of the Worldwide Integrated Assessment on the risks of neonicotinoids and fipronil to biodiversity and ecosystem functioning. *Environ Sci Pollut Res* doi:10.1007/s11356-014-3229-5
[15] Morrissey et al. 2015. Neonicotinoid contamination of global surface waters and associated risk to aquatic invertebrates; A review. Environmental International 74:291-303.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Westport
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Elk River Estuary
176 m
SHOALWATER RESERVATION
Sand and Gunpowder Islands
Raymond
South Bend
North Willapa Bay (Willapa River Estuary)
WILLAPA VALLEY
Leadbetter Point
Ocean Park
South Willapa Bay (Shoalwater Bay)
871
ELLSWORTH CREEK
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Washington's Coastal Estuary Important Bird Areas
Victoria
Seattle
Olympia
Portland
National Geographic, Esri, DeLorme, NAVTEQ, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO,
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