From: Denise Garoutte
To: Rockett, Derek (ECY)
Subject: EIS SCOPING BUROWING SHRIMP WILLAPA BAY
Date: Saturday, February 15, 2014 3:51:03 PM

Dear Mr. Rockett:

I respectfully submit the following comments for your consideration in reviewing the application for a permit to use Imidacloprid on burrowing shrimp in the Willapa Bay by the Oyster Growers Association.

I read the risk assessment by Compliance Services International and found a number of scientific papers that question some of their conclusions. Also the EPA is reviewing their permitting process and this class of pesticides has been banned in Europe. There are serious concerns worldwide as to its bioaccumulation, persistence in soil and water and its harm to birds, bees, invertebrates of all kinds and even humans.

Some brief comments on the risk assessment:

-The half-life studies were done at 3 pHs. The 2 mentioned were 9 and 5-7 but the Willapa Bay is 7-9. Also the temperature used was 25d C. The Bay averages temperatures from 7d C to 26d C with 26 being limited to 1-2 months in summer. What is the half-life using actual Willapa Bay temperatures and pH?

-Tests were only done during July, August and October but application period is April 15 to December 15. What are the effects during months not studied when chemical likely to be used?

-Tide pushes water out into the ocean but there was no discussion about the water being pushed into the river, which it would on incoming tide. How is the river ecology affected?

-High Risk Human Subpopulations were listed as children who were most likely not to consume oysters. What about the effects on pregnant women and developing fetuses?

-The information about the inert object (surfactants and such) were proprietary but given as none or more toxic or potentially greater in toxicity than Imidacloprid alone. What are the cumulative effects with both toxicities??

-Bioaccumulation was from a 'estimation' by Tomlin (2006) and one source. What does other literature say about bioaccumulation?

-Hydrolysis was not tested in a salt water environment.

-Since there is a golf course upstream that presumably uses Imidacloprid, and farmland and homeowners, what is the current accumulation in the river and Bay waters? Since the effect is cumulative, what is the EPA doing to study the total amount of Imidacloprid in the Bay?

-"The extent of the potential effects on the total invertebrate food supply will depend on the numbers of acres of tidal mudflat treated each year, and sockeye salmon use of that area. It is anticipated that the potential effects on crustaceans and bottom dwelling invertebrates will be transient, at least on a yearly basis. So the questions that must be answered are: how much of a reduction in the crustacean and bottom dwelling invertebrate food supply will cause indirect effects?, and; How much (what proportion) of Willapa Bay or Grays Harbor would have to be treated to cause this reduction? Given the huge areas of both Willapa Bay and GraysHarbor, and the relatively small areas that have been treated with carbaryl in the past, it does not appear that there could be a reduction in the available crustaceans and bottom dwelling invertebrate food supply such that it would cause an indirect effect" This is an opinion unsubstantiated by study or fact. Also not considered are the other sources of Imidacloprid coming into the waters from the ocean, the golf course, local farmers and homeowners. Is it responsible to risk threatened endangered species like the salmon and eagles in the Bay without further research on the effects? Is it responsible to threaten one of the few remaining pristine bays in the lower United States without further study?Will these questions be answered before approval of the pesticide?

-Birds, mammals and reptiles could be exposed through dermal contact while in treated waters. At repeated exposure and cumulative effect, what will be done to limit exposure to Imidacloprid?

-The study concludes that no endangered species will be affected by Imidacloprid. However, there are studies showing that a tiny amount can cause illness and death in seabirds. Also butterflies feed on the nectar of plants and there is evidence that Imidacloprid can persist in plants for up to 7 years. What will be done to assure there is no harm to these endangered species? Studies of other escuataries where there is runoff of Imidacloprid show a profound effect on bird and insect life.

Other questions and concerns:

Birds:

The American Bird Conservancy has called for a ban on neonicotinoids pending independent review on birds. They have the potential to affect entire food chains. (http://abcbirds.org) . A report by world renounced environmental toxicologist Dr. Pierre Mineau (The Impact of the Nation's Most Widely Used Insecticides on Birds) reviewed 200 studies on neonicotinoids including industry research and concluded that neonicotinoids are lethal to birds and to the aquatic systems they depend upon. He also concluded that the EPA underestimated the toxicity of these compounds to birds due partly to risk assessment methods, which fail to account sufficiently for interspecies variation in toxicity.

Although ghost shrimp typically inhabit deep burrows, they are susceptible to predation because they sometimes venture outside their burrow entrances. Fishes and invertebrates are significant predators when the tide is high, whereas shorebirds and humans prey on ghost shrimp when the tide is low (Light, Carlton 2007: Posey, 1985; Posey, M.H. 1986; Stenzel, Huber and Page, 1976)

Bald Eagles are common in the Willapa Bay and can be seen feeding on carrion, shrimp, garter snakes. Since there is evidence birds are killed and that Imidacloprid is bioaccumulative and eagles could be eating shrimp, shore birds, garter snakes and other animals killed by Imidacloprid, what studies have been done to show Eagles won't be affected?

Salmon:

By aerating the surface sediment through burrowing, the ghost shrimp provide an environment attractive to other species including the blind goby, three species of pea crabs, two species of clams, a copepod, a shrimp, polynoid worms and isopods, all of which live in the burrows(Horning, et al, 1989; Pernet, Deconinck and Haneym 2010). It would be safe to assume that all of these species will be killed and eaten by predators. Among them are endangered salmon and steelhead. (http:k4u.ca/ghost-shrimps-steelhead-candy/) The young Chinook salmon prefers plankton (also killed or at minimum absorbed by this pesticide) off the river floor as well as terrestrial insects and small crustaceans. Young Coho salmon typically feed during the day and prefer aquatic insects at the surface such as mayflies, caddis flies and stoneflies. Adult chum also eat shrimp, smelt, sand lance, crab herring, amphipods and krill. (http://whatcomsalmon. Whatcomcounty.org) What will be done to protect the salmon which are already struggling?

Neonicotinoid insecticides have documented negative impacts on aquatic food webs, thereby raising concerns about loss of productivity in freshwater fisheries and aquaculture systems.

Persistence

Studies from Canada and Europe list major risk concerns about these pesticides being both persistent and mobile, likely to cause surface and ground water contamination. Imidacloprid is considered stable in water, not easily biodegradable and can accumulate in soil and sediments, where it persists for months to years. How will this persistence affect the birds, bees, fish and other species?

Bees and butterflies, frogs and reptiles

There is definitive evidence that Imidacloprid is toxic to bees by both direct contact and by sub lethal effects in contaminated pollen and nectar Measurable amounts of resides have been found in woody plants up to six years after application. Since the pesticide will be applied in the bay, it is argued that bees won't be present. However, one method of application is by helicopter and even on low wind days, drift will occur. Also the tidal flow will bring the pesticide up into the river and deposit it on riverbank plants which bees frequent. Minuscule amounts will kill bees. There is some evidence that the breakdown products of Imidacloprid are toxic to bees. Butterflies also feed on nectar and will be impacted.

Non-target plant-feeding insect groups (e.g., bees, certain moths and butterflies) exposed to these insecticides are at risk. Declines in these insect groups are well documented, while noting that these declines can be attributed to habitat loss and invasive species as well as to pollution from neonicotinoid insecticides and other agricultural chemicals. In many agricultural areas, populations of animals that rely on plant-feeding insects as food sources (e.g., birds, bats, amphibians, predatory insects) are also declining. Neonicotinoid insecticides also bind to vertebrate acetylcholine receptors, posing direct risks to vertebrate herbivores such as birds. Adverse impacts of these insecticides on insect predators (rove beetles, carabid beetles, lady beetles, spiders) and potential losses of natural pest control services have also been addressed in a number of studies.
Exposure to neonicotinoid insecticides stresses the immune systems of animals and increases their vulnerability to other drivers of biodiversity loss, such as invasive pests and diseases. It has been suggested that the introduction of these chemicals coincides with, and is linked to, the explosion of emerging infectious diseases of wildlife in a wide variety of taxa, including honeybees, fish, amphibians, bats and birds (Mason, R. et al. 2012. Immune suppression by neonicotinoid insecticides at the root of global wildlife declines. J. Environ. Immunol Toxicol 1(1): 3-12).

Adverse impacts of these insecticides on insect predators (rove beetles, carabid beetles, lady beetles, spiders) and potential losses of natural pest control services have also been addressed in a number of studies.

Frogs and toads are diminishing rapidly across the state. What effect will this pesticide have on those that live in the waters including the river and ponds affected by the tides?

Other Wildlife

Exposure to neonicotinoid insecticides stresses the immune systems of animals and increases their vulnerability to other drivers of biodiversity loss, such as invasive pests and diseases. It has been suggested that the introduction of these chemicals coincides with, and is linked to, the explosion of emerging infectious diseases of wildlife in a wide variety of taxa, including honeybees, fish, amphibians, bats and birds (Mason, R. et al. 2012. Immune suppression by neonicotinoid insecticides at the root of global wildlife declines. J. Environ. Immunol Toxicol 1(1): 3-12).

Humans

A recent study (Kimura-Kuroda, J. et al. 2012. Nicotine-like effects of the neonicotinoid insecticides acetamiprid and imidacloprid on cerebellar neurons from neonatal rats. PLoS ONE 7(2): e32432.) indicates that the neonicotinoid insecticides acetamiprid and imidacloprid exert excitatory effects on mammalian acetylcholine receptors similar to nicotine, a neurotoxin of brain development and a known risk factor for sudden infant death syndrome, low-birth-weight infants, and attention deficit/hyperactivity disorder. This raises concerns that neonicotinoid insecticides may adversely affect human health, especially the developing brain.

There are other alternatives for oyster growers to consider including mechanical means, suspension on ropes or platforms. I can put you in contact with a retired Oyster grower who grew oysters for years without the use of any chemicals. Also there is further information on Willapa Bay oyster history at this location:http://www.pacificcohistory.org/sw2005_3.htm

It is always the route of those who want approval of something controversial to tell you it must be done for their survival, it will impact jobs, decimate the industry and on and on. I have great sympathy for the oyster industry but am old enough to remember that similar arguments were used to gain approval of DDT and other pesticides later proved to be harmful. Wildlife and ecosystems like our pristine bay are under siege from many directions and we should not add to its struggles. It is likely that upon further review, the EPA will pull use of Imidacloprids either now or later when the impacts are fully felt.

The Willapa watershed is the most productive coastal ecosystem remaining in the continental United States(http://wwwtest2.rco.wa.gov).

I urge you to do a thorough review with other stakeholders such as all the people working on preserving the pristine nature of the bay and ensuring the survival of the shorebirds, eagles, sturgeons, salmon and all the diversity of the creatures who live here. There are also many beekeepers, my self included, who fear the effects of Imidacloprid on our bees. Using the Willapa Bay as an experiment for Imidacloprid will not end well. There needs to be more research and definitive answers to guarantee our Willapa Bay will remain pristine. I trust that you and the other folks at EPA will consider all research and long term impact of this decision.

Sincerely,

Denise Garoutte
1957 Fowler Road
Raymond, WA 98577

Credible sources of information, preferably from peer-reviewed articles:
Buglife –The Invertebrate Conservation Trust prepared a 2009 report on *The impact of neonicotinoid insecticides on bumblebees, honey bees and other nontarget invertebrates* with over 100 references **(**http://www.buglife.org.uk/Resources/Buglife/revised%20neonics%20report.pdf). In 2012, Buglife reviewed 41 articles that had appeared since their 2009 report. They concluded that 31 of the papers "contained evidence that neonicotinoids would or could have significant environmental impacts above and beyond what was previously known" - see (http://www.buglife.org.uk/Resources/Buglife/A%20review%20of%20recent%20research%20relating%20to%20the%20impact%20of%20neonicotinoids%20on%20the%20environment.pdf).

The Xerces Society for Invertebrate Conservation prepared a comprehensive review of the literature relating to neonicotinoid insecticides and pollinators in 2012, *Are Neonicotinoids Killing Bees? (*http://www.xerces.org/neonicotinoids-and-bees/)

The American Bird Conservancy prepared an analysis of the scientific literature on neonicotinoid insecticides and birds in 2013, *The Impact of the Nation's Most Widely Used Insecticides on Birds.*
(http://www.abcbirds.org/abcprograms/policy/toxins/Neonic_FINAL.pdf

- birds (e.g., Nebel, S. et al. 2010. Declines of aerial insectivores in North America follow a geographic gradient. *Avian Conserv. Ecol.* 5(2): 1. [online]);
- bats (e.g., Wickramasinghe, L.P. et al. 2004. Abundance and species richness of nocturnal insects on organic and conventional farms: effects of agricultural intensification on bat foraging. *Conserv. Biol.* 18: 1283–1292);
- amphibians (e.g., Blaustein, A.R. 2011. The complexity of amphibian population declines: understanding the role of cofactors in driving amphibian losses. *Ann. N. Y. Acad. Sci.* 1223: 108-119);
- bumblebees (e.g., Cameron, S.A. et al. 2011. Patterns of widespread decline in North American bumble bees. *Proc. Nat. Acad. Sci.* 108(2): 662-667);
- butterflies (e.g., Van Dyck, H. et al. 2009. Declines in common, widespread butterflies in a landscape under intense human use. *Conserv. Biol.* 23(4): 957-965);
- moths (e.g., Conrad, K.F. et al. 2006. Rapid declines of common, widespread British moths provide evidence of an insect biodiversity crisis. *Biol. Conserv.* 132(3): 271-291); and
- carabid beetles (Brooks, D. R. et al. 2012. Large carabid beetle declines in a United Kingdom monitoring network increases evidence for a widespread loss in insect biodiversity. *J. Appl. Ecol.* 49(5): 1009-1019).

There is an urgent need for greater understanding of the degree to which exposure to neonicotinoid insecticides may be contributing to these declines, and how exposure to these chemicals may be interacting with other negative pressures on biodiversity in agricultural areas.

Other sources:

http://www.groundwork.org.za/Resources/FactSheets/PAN%20AP/pesticides-factsheet-hhps-neonicotinoids.pdf

http://www.apvma.gov.au/news_media/docs/gw0673.pdf

http://www.foodnavigator.com/content/view/print/859309

http://www.bijensterfte.nl/sites/default/files/FinalThesisTvD.pdf

http://www.wired.com/wiredscience/2013/04/neonicotinoids-and-ecosystems/

http://www.pnas.org/content/early/2013/10/18/1314923110.abstract

http://oregonsustainablebeekeepers.org/2013/10/27/neonics-and-bees-political-inaction-persists-despite-mounting-evidence/

http://www.xerces.org/wp-content/uploads/2013/09/XercesSociety_CBCneonics_sep2013.pdf