Office of Pesticide Programs
Environmental Protection Agency Docket Center (EPA/DC)
1200 Pennsylvania Ave., NW
Washington, D.C. 20460-0001

April 19, 2018

On behalf of the Natural Resources Defense Council's (NRDC) more than three million members and activists, NRDC submits the following comments on the ecological non-pollinator risk assessment for the registration review of imidacloprid, and the draft non-pollinator ecological risk assessments for the registration review of clothianidin, thiamethoxam, acetamiprid, and dinotefuran. These comments also address EPA's assessment of the purported benefits of neonicotinoid insecticide use on cotton and citrus crops.

These comments are submitted to the following dockets:

• Benefits assessment	EPA–HQ–OPP–2014–0737	for corn, soybean, and cotton
• Imidacloprid	EPA–HQ–OPP–2008–0844	for terrestrial risks
• Dinotefuran	EPA–HQ–OPP–2011–0920	for ecological risks
• Clothianidin	EPA–HQ–OPP–2011–0865	for terrestrial and aquatic risks
• Thiamethoxam	EPA–HQ–OPP–2011–0581	for terrestrial and aquatic risks
• Acetamiprid	EPA–HQ–OPP–2012–0329	for ecological risks

NRDC has previously submitted comments on the preliminary pollinator-only ecological risk assessments for most of these chemicals when they were issued in May 2017. For imidacloprid, a preliminary pollinator-only risk assessment was issued for imidacloprid in January 2016, an aquatic species-only ecological risk assessment was issued in January 2017, and a human health risk assessment was issued in September 2017. EPA also issued its response to public comments on the Agency's 2014 assessment of the benefits of neonicotinoid seed treatments to soybean production. All our previous comments are incorporated by reference herein.

EPA is conducting its registration review pursuant to section 3(g) of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and 40 C.F.R. part 155, subpart C. Section 3(g) of FIFRA provides, among other things, that the registrations of pesticides are to be reviewed every 15 years.[1] Under FIFRA, a pesticide product may be registered or remain registered only if it meets the statutory standard for registration given in FIFRA section 3(c)(5).[2] When used in accordance with widespread and commonly

[1] 7 U.S.C. 136a(g)(1)(A).
[2] *Id*. § 136a(c)(5).

recognized practice, the pesticide product must perform its intended function without unreasonable adverse effects on the environment; that is, without any unreasonable risk to man or the environment.[3]

Background

Neonicotinoid or "neonic" pesticides are used to treat soil, seeds, and foliage to control sucking insects such as rice hoppers, aphids, thrips, whiteflies, turf insects, soil insects, and some beetles.[4] They kill insects by debilitating their central nervous system. They mimic nicotine and bind to nicotinic acetylcholine receptors, blocking the receptor, thereby preventing nerve cell transmission, and leading to paralysis and death in insects. In humans, these receptors are found in neuromuscular junctions and the central nervous system.[5] Neonicotinoid pesticides are systemic insecticides; this means that when plants take them up through soil or leaves, the pesticide spreads to other parts of the plant, such as its stems, fruits, and flowers. Insects that chew or suck on these plants ingest the insecticide, which attacks their nervous system and kills them.[6] Neonic pesticides also are absorbed into the plant tissue of milkweed – the sole food source for monarch butterfly larvae – which can result in lethal and sublethal effects for monarch butterflies.[7]

Neonics account for roughly 25 percent of the global agrochemical market and are the most widely used class of insecticides in the world today.[8] An international committee of 29 scientists has determined that neonicotinoid pesticides are contaminating land, soil, and water and pose toxic threats to earthworms, snails, butterflies, birds, mammals, and bees.[9]

Due to their pervasive nature, it is critical the EPA accurately evaluate the risks of neonic pesticides to the environment and implement all appropriate use restrictions before re-registering them. However, we believe the EPA has not yet fully evaluated or appropriately safeguarded against these risks. Based on the existing evidence regarding the significant risk neonics pose to wildlife, we believe that EPA should do the following:

- Cancel seed treatment uses of neonics;
- Restrict foliar spray and soil applications for which EPA identified potential excessive risks;
- Account for use over the maximum label rate when calculating upper lever/peak exposure scenarios;
- Use non-industry data and information quantitatively;
- Employ the most conservative assumptions and protective measures in the face of data gaps and uncertainties;
- Evaluate risks of neonics to all terrestrial invertebrates;
- Account for cumulative and synergistic effects of neonics; and

[3] *Id*.
[4] Extoxnet: Extension of Toxicology Network, *Imidacloprid* (last visited Apr. 13, 2018), https://bit.ly/2qw1Igw.
[5] National Pesticide Information Center, *Imidacloprid: General Fact Sheet* (May 2010), *available at* https://bit.ly/2EJoAgM.
[6] *Id.*
[7] Pecenka, J.R., and J.G. Lundgren, *Non-target Effects of Clothianidin on Monarch Butterflies*, Science of Nature, 102: 19 (2015) [hereinafter "Pecenka & Lundgren 2015"].
[8] Jeschke. P. et al., *Overview of the Status and Global Strategy for Neonicotinoids*, Journal of Agricultural and Food Chemistry 59: 2987 (2011).
[9] Task Force on Systemic Pesticides, *Worldwide Integrated Assessment* (2015), *available at* https://bit.ly/2vc86hV.

- Consult with the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act.

Further detail on these comments is provided below.

EPA should cancel seed treatment uses of neonics

NRDC opposes seed treatment uses of neonics.[10] The value to farmers of these environmentally-damaging seed treatments is increasingly shown to be nonexistent or marginal at best. A 2015 multi-state University Extension report sharply questioned both the economic and environmental justifications for using neonicotinoid-treated seed in soybeans: "To summarize: For typical field situations, independent research demonstrates that neonicotinoid seed treatments do not provide a consistent return on investment.[11, 12, 13] The current use of neonicotinoid seed treatments in soybean and other crops far exceeds pest pressures."[14] Reports by academics,[15] the Center for Food Safety (2017),[16] and EPA experts (2014)[17] have provided further evidence to support these conclusions. Worse, the toxic soil residues from neonic seeds can make pest control even more difficult by disrupting biological control systems.[18, 19] Indeed, a study by Douglas et al. (2015) reported that in slug-infested fields, soybean grown with neonic-treated seeds had *poorer* yields than counterparts grown without neonic seeds.[20]

Furthermore, EPA's analysis confirms that seed treatments lead to excessive acute and chronic risks to birds. Acute risks were elevated in both EPA's dose-basis and area-basis assessment approaches. EPA's findings of excess risk from its modeled assessments are supported by real-world incidents of bird kills reported by EPA in its assessment and by the American Bird Conservancy (ABC). The ABC issued a lengthy and well documented 100-page report in 2013 documenting harm to wild birds from neonicotinoid seed treatments. ABC expert, Cynthia Palmer is quoted as saying, "[a] single corn kernel coated with a neonicotinoid can kill a songbird. Even a tiny grain of wheat or canola treated with the

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[10] *See* NRDC, *Comments from the Natural Resources Defense Council on the Preliminary Aquatic Risk Assessment to Support the Registration Review of Imidacloprid*, EPA-HQ-OPP-2008-0844-1146 (July 2017), *available at* https://bit.ly/2H0fe2p.

[11] Bailey, W., et al., *The Effectiveness of Neonicotinoid Treatments in Soybean*, 4 (Dec. 2015), *available at* https://bit.ly/2wziyA4 [hereinafter "Bailey 2015"].

[12] Seagraves, M.P., and J.G. Lundgren, *Effects of Neonicotinoid Seed Treatments on Soybean Aphid and Its Natural Enemies*, Journal of Pest Science, 85: 125-132 (Mar. 2012) [hereinafter "Seagraves & Lundgren 2012"].

[13] McCarville, M.T., et al., *One Gene Versus Two: A Regional Study on the Efficacy of Single Gene Versus Pyramided Resistance for Soybean Aphid Management*, Journal of Economic Entomology, 107: 1680-1687 (Aug. 2014).

[14] Bailey 2015.

[15] Krupke, C.H., et al., *Planting of Neonicotinoid-Treated Maize Poses Risks for Honey Bees and Other Non-Target Organisms Over a Wide Area Without Consistent Crop Yield Benefit,* Journal of Applied Ecology, 54(5) (May 2017)

[16] Doug Gurian-Sherman, *Alternatives to Neonicotinoid Insecticide-Coated Corn Seed: Agroecological Methods Are Better for Farmers and the Environment* (May 2017), *available at* https://bit.ly/2qtbeQI.

[17] EPA, *Benefits of Neonicotinoid Seed Treatments to Soybean Production* (Oct. 2014), *available at* https://bit.ly/2jZ6kWI.

[18] Seagraves & Lundgren 2012.

[19] Douglas, M.R., et al.. Ne*onicotinoid Insecticide Travels Through a Soil Food Chain, Disrupting Biological Control of Non-Target Pests and Decreasing Soybean Yield*, Journal of Applied Ecology, 52(1) (Dec. 2014), *available at* https://bit.ly/2IRr4MF.

[20] Douglas, M.R., and J.F. Tooker, Large Scale Deployment of Seed Treatments Has Driven Rapid Increase in Use of Neonicotinoid Insecticides and Preemptive Pest Management in US Field Crops. Environmental Science and Technology, 49 (8), 5088–5097 (Mar. 2015).

oldest neonicotinoid — called imidacloprid — can fatally poison a bird. And as little as 1/10th of a neonicotinoid-coated corn seed per day during egg-laying season is all that is needed to affect reproduction."[21] EPA's recent analysis affirms the findings of ABC's experts. Although Risk Quotient (RQ) values presume that the bird or mammal is consuming treated seeds for 100% of its diet, this scenario can occur in the real world where treated seeds are spilled during planting. EPA also notes that acute risks of concern are triggered where treated seeds are *just 1-6%* of the diet for all crops except potato. EPA says that corn and soybean seeds are too large for many birds to eat, but in fact corn seeds are readily consumed by grouse, pheasants, turkeys, quails, cardinals, grosbeaks, crows, ravens, jays, doves, ducks, cranes, geese, and other bird species.[22] The Cornell Lab website on birds warns that corn intended for planting is highly toxic to humans, livestock, and all birds.[23]

RQ= exposure/toxicity RQ<1 is low or no risk RQ>1 is high risk

For mammals, EPA determined that depending on the size of the animal even one-third of the diet made up of treated seeds would be enough to cause harm.

In addition to direct ingestion of neonics from treated seeds, or direct exposures from foliar and other application methods, the pesticides are readily soluble in water and persistent in soil, with a half-life of hundreds of days (for example, for imidacloprid EPA estimates half-lives ranging from 172 to 608 days). This means that wildlife including mallard ducks, which EPA identified as the most sensitive bird species for acute toxicity (including adverse impacts on egg production, egg hatchability, and body weight), will continue to be exposed through food, water, and contact with contaminated soil.

Given the significant risks posed by seed treatments to wildlife and the environment and the limited benefits of this application, EPA should cancel all seed treatment uses for neonic pesticides.

<u>EPA should restrict foliar spray and soil applications that have potential excessive risks</u>

EPA should place appropriate restrictions on the use of all neonic foliar and soil applications identified as having the potential for "excessive risks." For example, for imidacloprid, EPA's modeled analysis demonstrates that foliar spray applications, whether for agriculture or non-agriculture uses, lead to significant risks to non-listed bird species for all uses modeled when evaluated on an acute, oral dose basis (Table 1-1). EPA's analysis also identified a potential for excessive chronic risks to non-listed mammals from these application methods, when evaluated on an oral dose basis. Similarly, for imidacloprid, soil use patterns for both agriculture and non-agriculture uses indicate a potential acute risk above the level of concern (LOC) for small and medium sized non-listed birds on an acute oral dose basis, and excessive chronic risks to mammals for approximately half the modeled uses.

[21] Dr. Pierre Mineau & Cynthia Palmer, *The Impact of the Nation's Most Widely Used Insecticides on Birds*, (Mar. 2013), *available at* https://bit.ly/2frF3dz.
[22] *See* Cornell Lab of Ornithology, *Feeding Birds: A Quick Guide to Seed Types* (Apr. 20, 2009), *available at* https://bit.ly/2bAoaOf.
[23] *Id.*

In all cases where potential excessive risks have been identified, EPA should restrict neonic spray and soil applications to prevent those risks. EPA should also consider appropriate restrictions in all instances where EPA's analysis indicated risks exceeding the relevant LOCs.

<u>EPA should account for use over maximum label rates when calculating upper level/peak exposure scenarios</u>

While we support the EPA modeling pesticide uses presuming the maximum single and annual application rates specified on the labels, we caution that this approach may underestimate the risks associated with misuse of the pesticides over the label rate. Maximum label rates are legally allowed, and are the most likely to contribute to potential harm to non-target species. Registrants, growers, and other lobbyists argue to keep label rates high, so they clearly believe that such rates are needed and used.

We note, however, that no one – not the registrant and not EPA – has presented significant data on the frequency of applications at the maximum legal rate in practice. To the contrary, registrants, EPA, and others argue that application rates necessarily vary by region, local weather, local pest pressures, seasonal production changes, and other highly variable factors. For example, comments and research papers by Dr. Adam Gaspar, an Agronomist at DuPont Pioneer and Farmer (according to his LinkedIn), on imidacloprid benefits to soybean growers specifically emphasizes localized factors that influence pesticide decisions as summarized by EPA (EPA-HQ-OPP-2014-0737-0948). Similarly, in its own analysis of benefits to cotton growers, EPA concludes that certain imidacloprid restrictions would lead to an average increase in grower costs ranging from $2.80/acre in the Southeast to over $7/acre in the Mid-South, and much lower impacts among growers in the West, thus emphasizing the regional and local differences in pesticide needs and uses (EPA-HQ-OPP-2008-0844-1258).

Accordingly, with such highly local and seasonal variability it is certain that there will be times and places where maximum label rates are applied, it is both reasonable and accurate to include them in EPA use models. However, we caution that use of maximum label rates does not account for the misuse of these pesticides including instances in which the label is not consulted or followed or when there are accidental spills or incidents of improper disposal. Therefore, when calculating upper level/peak exposure scenarios, the use of maximum label rates is likely to underestimate risks. EPA should therefore account for these types of scenarios in their analysis.

<u>Non-industry data and information should be included quantitatively</u>

We are pleased that EPA tried to obtain and review toxicity data from open literature sources, in addition to the registrant-submitted studies that EPA uses – almost exclusively – in its quantitative risk assessments. However, it is unclear how EPA plans to use this non-industry data and information – in particular, whether the agency will use it in a meaningful quantitative analysis, and not merely qualitatively.

We recommend that EPA use this data in its quantitative analyses. If EPA fails to do so, then it is functionally continuing the questionable practice of relying exclusively on agrochemical industry-sponsored data and information to regulate agrochemicals. EPA could use non-industry data quantitatively to calculate exposure limits (RfD, RfCs, etc), expand uncertainty factors, and drive requests for additional data and information using its data call-in authorities under FIFRA. We strongly encourage the agency to do so.

Data gaps and uncertainties support conservative assumptions and protective actions

The presence of data gaps and uncertainties calls for using the more conservative protective approach for assessing risk. For example, avian risk estimates for imidacloprid using acute oral-dose methods indicated excessive risks, whereas risk estimates from diet-based methods did not. The difference is that oral dose-based methods model a gavage toxicity study where imidacloprid is delivered directly to the animal's stomach, whereas in a diet-based method, intake is from a diet that includes the pesticide. Both the risk estimates from oral-dose basis methods and diet-based methods have strengths and limitations. Gavage methods provide a more accurate measure of the dose within the body of the test animal in a precise time, whereas diet-based exposures may involve longer exposure times, but less precise estimates of consumption. In addition, as EPA points out, a laboratory diet study presumes that the same animal in the wild will have the same consumption patterns (amount, time, etc), whereas, actual wild animals have much higher energy requirements, and less predictable eating schedules and patterns. Because of these uncertain variables, EPA should use whichever risk estimates provide the most conservative results, therefore supporting the greatest protection for wildlife species.

Regarding neonic seed treatments, EPA identifies seed planting depth as a major source of uncertainty in its risk assessments. That is, wildlife may be less likely to access and therefore ingest seeds that are planted deeper, but EPA admittedly has no data to inform this uncertainty. We note that EPA also has no data to inform the amount of spilled seed that is accessible to wildlife, as well as the amount of seed that is near enough to the soil surface to be ingested by at-risk wildlife. This uncertainty should support the use of conservative assumptions and/or uncertainty factors to provide adequate protection to non-target species including threatened and endangered species.

EPA must evaluate risks to other terrestrial invertebrates in addition to bees

EPA's risk assessments for neonicotinoid pesticides addresses risks to bees and risks to non-pollinator aquatic invertebrates. However, EPA has not evaluated the risk of neonicotinoid pesticides to monarch butterflies and other non-target terrestrial invertebrates. EPA must consider the risk of neonicotinoid pesticides to this group of insects, as they are likely to experience acute and chronic effects due to exposure to neonicotinoid pesticides.

Monarch butterflies experience lethal and sublethal effects when exposed to neonicotinoid pesticides.[24] Additionally, their populations have been in steep decline over the last 20 years which corresponds with the period in which there has been increasing use of neonicotinoid pesticides.[25]

The North American Monarch butterfly population is divided by the Rocky Mountains into two subpopulations – the western population that overwinters primarily in California and the eastern population that overwinters in the Oyamel forests of Michoacán, Mexico. These subpopulations have been measured for at least the past 20 years. In 1997, the western population numbered 1,200,000

[24] Pecenka & Lundgren 2015.

[25] Thogmartin, W. E., et al., *Monarch Butterfly Population Decline in North America: identifying the Threatening Processes*, The Royal Society, 4: 170760 (Aug. 2017), *available at* https://bit.ly/2veVbvE [hereinafter "Thogmartin et al. 2017"].

individuals, but this year the count was less than 200,000.[26] For the eastern monarch population, in 1997 it measured 20.97 hectares, but by 2014 it had dropped to its lowest number of 0.67 hectares. The most recent measurement (in 2017) of the population was 2.9 hectares which is considered precariously low.[27] Studies have predicted that the population is at a substantial risk (11-57%) of quasi-extinction (i.e. loss of a viable migratory population) within the next 20 years.[28] The monarch butterfly is currently being evaluated by the U.S. Fish and Wildlife Service for Endangered Species Act protections.

While several factors have contributed to the decline of monarch butterflies, the largest contributing factor has been attributed to the loss of milkweed in the agricultural Midwest.[29] Recently, however, several studies have begun to document a relationship between the use of neonicotinoid pesticides and the decline of monarch butterflies[30] as well as other species of butterflies.[31] These studies have documented the effect of direct exposure of neonicotinoids on monarch butterfly caterpillars as well as the presence of neonicotinoid in milkweed, the monarch caterpillars only food source.[32] Additionally, several studies have examined negative correlational effects between neonic use and declining butterflies in both the United States and the United Kingdom. [28, 33]

The only study to date to examine the direct effect of neonicotinoid exposure on monarch butterfly larvae was conducted by Pecenka and Lundgren (2015). In this study, the researchers fed monarch caterpillars aqueous clothianidin in laboratory conditions over a 36-hour period and recorded both lethal and sublethal effects. Lethal effects were detected with an LC_{50} of 15.63. Sublethal effects were observed at concentrations as low as 1 ppb and included shorter body length and smaller head capsules.[29]

Pecenka and Lundgren (2015) also conducted field studies that documented the presence of neonicotinoid pesticides in milkweed plants that occur outside of agricultural fields that have been treated with neonicotinoids. They found that greater than 50% of milkweed plants were contaminated with neonicotinoid pesticides on average across the sampling time with 36.6% contaminated in June and 64.5% of the milkweed plants contaminated in July, when monarch caterpillars are most abundant. Contaminated milkweed plants averaged a concentration of 1.14 ppb of neonicotinoids with a maximum of 4 ppb in a single plant indicating that monarch butterflies can be exposed to neonicotinoids in the field at levels that cause sublethal effects. The presence of neonicotinoids was detectable in both June and July indicating that monarch butterflies likely face prolonged exposure to neonicotinoids throughout

[26] Xerces Society, *Western Monarch Butterflies Continue to Decline* (Feb. 1, 2018), *available at* https://bit.ly/2BZoxwc.

[27] MonarchWatch.org, *Monarch Population Status* (Feb. 11, 2017), *available at* https://bit.ly/2JKgcRV.

[28] Semmens, B.X., et al., *Quasi-Extinction Risk and Population Targets for the Eastern, Migratory Population of Monarch Butterflies (Danaus plexippus*), Scientific Reports, 6: 23265 (Mar. 2016), https://go.nature.com/2IQLGVk.

[29] Pleasants, J. M. and K. S. Oberhauser, *Milkweed Loss in Agricultural Fields Because of Herbicide Use: Effect on the Monarch Butterfly Population*, Insect Conservation and Diversity, 6: 135-144 (Mar. 2012); Flockhart, D. T, et al., *Unravelling the Annual Cycle in a Migratory Animal: Breeding-Season Habitat Loss Drives Population Declines of Monarch Butterflies*, Journal of Animal Ecology 84: 155-165 (Jan. 2015); Thogmartin et al. 2017.

[30] Pecenka & Lundgren 2015; Thogmartin et al. 2017.

[31] Gilburn, A. S., et al. 2015, *Are Neonicotinoid Inscticides Driving Declines of Widespread Butterflies?*, PeerJ 3:e1402 (Nov. 2015) *available at* https://bit.ly/1lGvH0y; Forister, M. L., et al., *Increasing Neonicotinoid Use and the Declining Butterfly Fauna of Lowland California*, Biology Letters: 12: 20160475 (Aug. 2016), *available at* https://bit.ly/2vbFPIh [hereinafter "Forister et al. 2016"].

[32] Pecenka & Lundgren 2015.

[33] Thogmartin et al. 2017.

the summer (not just following planting). The prolonged presence of neonicotinoids in the field suggests that the researchers' 36-hour laboratory study likely represents an underestimate of actual exposure in the field.[29]

Although Pecenka and Lundgren (2015) is the only study to directly examine the effect of neonicotinoid pesticides on monarch butterflies, several other studies have documented negative associations between the use of neonicotinoid pesticides and monarch butterflies [30] as well as other butterfly species. [28]

Thogmartin et al. (2017) recently identified that neonicotinoid use was negatively associated with the monarch butterfly population meaning that as neonicotinoid application increased, the monarch butterfly population decreased. The authors examined many variables that may have contributed to the decline in monarch butterflies and found "strong negative relationships between population size and habitat loss variables, principally glyphosate use, but also weaker negative effects from the loss of overwinter forest and *breeding season use of neonicotinoids*" (emphasis added). The authors found that "(t)otal neonicotinoid usage increased 48-fold in the northern USA between 2003 and 2010" during part of the time period that the monarch population was declining.

Similar studies have found a negative correlation between the use of neonicotinoid pesticides and the quantity of butterflies in both the United Kingdom and California. [28] In England, the total abundance of butterfly species has declined by 58% on farmed land between 2000-2009 (Brereton et al. 2011). To better understand this decline, Gilburn et al. (2016) examined population indices for 17 common butterfly species typically found in farmland landscapes between 1985-2012. They found that indices for 15 of 17 species showed a negative correlation with neonicotinoid usage. The declines were greatest where neonic usage is at its highest (in England) and populations were stable where neonic usage is low (in Scotland).

Similarly, the butterfly fauna in Northern California has been declining over the last two decades after having remained stable for the prior two decades. While controlling for land use and climate factors, Forister et al. (2016) detected a negative association between the total number of butterfly species and increasing neonicotinoid pesticide application.[34] Notably, the butterfly fauna in this study has been surveyed for 40 years and remained stable until 1997 when it began a steep decline. Neonicotinoid use began in 1995 and increased over the next 20 years while other types of pesticide use remained stable or decreased.

There is both direct and indirect evidence that neonicotinoid pesticides are having a negative effect on monarch butterflies and other butterfly species. Although studies have not yet examined all routes of exposure, butterflies are likely to encounter neonicotinoid pesticides in host plants on which their caterpillar feed (as documented by Pecenka and Lundgren 2015), but also as adults in numerous nectar sources. The EPA must evaluate the risk to these butterflies as well as all non-target terrestrial invertebrate species.

<u>EPA must account for cumulative and synergistic effects</u>

As with all of EPA's risk assessments, the agency must evaluate the cumulative and synergistic effects of this set of pesticides. Given the pervasive and persistent nature of these pesticides, organisms are likely

[34] Forister et al. 2016.

to encounter multiple neonicotinoids throughout their life spans. EPA must evaluate the cumulative risks that accompany this. Similarly, neonics are often mixed with other active ingredients in patented products and the synergistic effect of this combination must be evaluated. The EPA's risk assessments are not complete until both cumulative and synergistic effects are accounted for.

EPA must consult with the U.S. Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS) under Section 7 of the Endangered Species Act (ESA)

EPA must consult with FWS and NMFS under Section 7 of the ESA on its registration review decisions on acetamiprid, clothianidin, dinotefuran, imidacloprid, and thiamethoxam. Under the ESA, all federal agencies must ensure that their actions do not jeopardize the existence of federally threatened or endangered (listed) species or adversely modify their critical habitat.[35] In practice, this requires agencies to consult with FWS and NMFS on actions that "may affect" such species.[36] EPA has long recognized that the neonic pesticides under review risk both direct and indirect harm to numerous listed species,[37] and the preliminary results of the registration review risk assessments confirm these potential hazards.[38]

Despite these known risks, there is no indication EPA has initiated consultation with FWS or NMFS—the first step toward meeting its ESA obligations. While EPA had indicated an intention to incorporate ESA consultation into its registration reviews for some of the neonic pesticides,[39] in January of this year, EPA declared the current pesticide consultation process "broken," effectively abandoning the methods it had proposed to use for the consultations, and providing no timeline for the development of new methods.[40] As EPA was required to consult on the initial registrations of these pesticides, ESA consultation is now well past-due. Accordingly, EPA must consult on the neonic pesticides under review before issuing its final registration review determinations.

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[35] 16 U.S.C. § 1536(a)(2).

[36] Id.; 50 C.F.R. § 402.14(a).

[37] *See, e.g.,* EPA, *Problem Formulation for the Environmental Fate and Ecological Risk, Endangered Species, and Drinking Water Assessments in Support of the Registration Review of Dinotefuran*, 34 (Dec. 13, 2011) (noting dinotefuran has "potential to reduce survival, reproduction, and/or growth in non-target terrestrial and aquatic organisms"), *available at* https://bit.ly/2HXriBu; EPA, *Ecological Risk Assessment for the Proposed Section 3 New Use of Acetamiprid on a Variety of Agricultural Crops and as Bait near Animal Areas and Enclosed Dumpsters*, 85–86 (Nov. 29, 2011) (finding risks to all threatened and endangered birds, fish, amphibians, and aquatic invertebrates), *available at* https://bit.ly/2vlXjNk; EPA, *EFED Section 3 and IR-4 Risk Assessment for Imidacloprid for Use on Soybeans, Peanuts, Kava, Millet, Oats, Artichoke, Wild Raspberry, and Caneberry Subgroup 13A*, 34 (May 1, 2007) (finding risks to threatened and endangered aquatic invertebrates and birds as well as species dependent on invertebrates), *available at* https://bit.ly/2FYJ9vn.

[38] *See, e.g.,* EPA, *Preliminary Environmental Fate and Ecological Risk Assessment in Support of the Registration Review of Acetamiprid* (Dec. 22, 2017) (finding acute and chronic risks to threatened and endangered birds, mammals, terrestrial invertebrates, and aquatic invertebrates from multiple acetamiprid application methods), *available at* https://bit.ly/2JGJ1Pg; EPA, *Preliminary Ecological Risk Assessment (excluding terrestrial invertebrates) for the Registration Review of Dinotefuran*, 65 (Nov. 28, 2017) (finding potential direct risks to threatened and endangered birds, amphibians, and aquatic insects, as well as indirect risks to fish), *available at* https://bit.ly/2IsXqNy; EPA, *Preliminary Aquatic Risk Assessment to Support the Registration Review of Imidacloprid*, 8 (Dec. 22, 2016) (finding potential acute and chronic risks to threatened and endangered aquatic invertebrates from all imidacloprid spray applications), *available at* https://bit.ly/2r3Uuyy [hereinafter "2017 Imidacloprid Risk Assessment"].

[39] *See, e.g.,* 2017 Imidacloprid Risk Assessment at 77.

[40] EPA, EPA Administrator Scott Pruitt Signs Endangered Species Act Memorandum with State Agriculture Commissioners (Jan. 31, 2018), available at http://bit.ly/2nwhx4C.

Conclusion

Due to neonics' pervasive, persistent, and toxic nature and their well-known and documented harms to wildlife, EPA should improve its risk analyses of these chemicals and impose the recommended use restrictions outlined above.

Respectfully,

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