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September 20, 2024

Office of Pesticide Programs
Environmental Protection Agency, (28221T)
1200 Pennsylvania Ave., NW
Washington, DC 20460-0001

Re: Draft Insecticide Strategy to Reduce Exposure of Federally Listed Endangered and Threatened Species and Designated Critical Habitats from the Use of Conventional Agricultural Insecticides [EPA-HQ-OPP-2024-0299]

Dear Madam/Sir,

These comments are submitted on behalf of Beyond Pesticides. Founded in 1981 as a national, grassroots, membership organization that represents community-based organizations and a range of people seeking to bridge the interests of consumers, farmers and farmworkers, Beyond Pesticides advances improved protections from pesticides and alternative pest management strategies that eliminate a reliance on pesticides. Our membership and network span the 50 states and the world.

The Draft Insecticide Strategy released for public comment is intended to provide for early protections for the more than 850 federally listed (threatened and endangered) species and designated critical habitats from potential insecticide exposure. By "early protections," it is presumed the agency means requiring needed restrictions on insecticide applications to conserve listed species and their critical habitats prior to completion of the obligatory formal *Endangered Species Act* (ESA) section 7 consultations with the Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS) that can be protracted and resource-intensive over months or years. However, the agency should ensure such consultations and label restrictions are completed and instituted prior to approving a registration or renewing a pesticide product label during registration review as mandated under the *Federal Insecticide, Fungicide, and Rodenticide Act* (FIFRA) and ESA.

The primary goals of the Insecticide Strategy as stated include:

1. Identifying mitigations for listed species likely impacted at the population-level by the agricultural use of conventional insecticides;
2. Considering mitigations that would reduce major routes of insecticide exposure to listed species;

3. Improving the efficiency of future ESA consultations on conventional insecticides including, where appropriate, applying the final strategy to future registration and registration review actions; and
4. Increasing regulatory certainty for growers and other stakeholders regarding the use and availability of conventional insecticides.

We believe the strategy as presented fails to achieve these goals. Mitigations considered are primarily to reduce exposures by transport of applied product from target areas to nontarget areas via spray drift and runoff/erosion. Virtually no consideration is presented for reducing on-field (target area) exposures. In fact, by reducing the loss of insecticide applied to a treated field by spray drift and/or runoff/erosion, the proportion of insecticide applied and retained will be increased within the treated field. While nontarget wildlife and listed species in areas adjacent to treated fields may see reduced exposure with the exposure mitigations employed, nontarget wildlife and listed species in the target fields that utilize the fields for food, forage, etc. will be exposed to higher residue concentrations with the mitigations than without. Also, wildlife visiting and foraging in a treated field are exposed directly to treated food or prey and may pose a secondary hazard to other predatory or scavenging wildlife. Insects like honeybees can be exposed to residues and carry/transport residues back and contaminate their own hive/nest. The treated field is also a danger zone for wildlife and farmworkers for some time post-application. It is why a specified reentry interval is required on pesticide labels that pose a human health risk. Unfortunately, wildlife cannot adhere to such interval. With the enhanced efficiency of keeping applied insecticide on a target field with the imposed exposure mitigations, the agency could also consider lowering the application rate in concert with the improved residue retention.

The strategy as proposed is limited only to conventional insecticides and agricultural uses in the lower 48 states. In addition, EPA is releasing supporting documents including an Ecological Mitigation Support Document to Support Endangered Species Strategies Version 1.0 that contains relevant information on potential mitigation measures to be implemented. EPA is not seeking comments on the current version of the mitigation support document as it incorporates stakeholder feedback and information collected during the development of the Herbicide Strategy. EPA considers its mitigation options to be flexible and that these will evolve over time as more information and technologies become available on the effectiveness of different practices. Similar to the draft herbicide strategy, this draft insecticide strategy focuses mitigations almost entirely on exposure by reducing spray drift and runoff/erosion transport to nontarget areas. Both strategies focus on mitigating impacts only to species that are similar to the target pests of the pesticides (for insecticides, mitigations focus on nontarget invertebrates; for herbicides, mitigations focus on nontarget plants). This strategy as described is designed for reducing the potential for population-level impacts only to listed invertebrates and listed species that depend on invertebrates from spray drift and runoff/erosion from agricultural uses. This proposed strategy does not consider risks to the many listed vertebrate species that may be adversely affected or jeopardized by direct toxicity from insecticide exposures on a targeted field or off. Also, the many non-agricultural insecticide uses such as forestry, public health (e.g., mosquito control), and residential insect control are not part of the strategy as these are expected to be included in different strategies to be completed in the future. Therefore, the title for the strategy should be changed to "Draft Insecticide Strategy to Reduce Exposure of Federally Listed Endangered and Threatened **Invertebrate** Species and Designated Critical Habitats from the Use of Conventional Agricultural Insecticides". The intention of such limitations is to let EPA identify more mitigation for what it considers to be the "more sensitive" species and less mitigation for other "less sensitive" species. This allows EPA to protect listed species from potential population-level impacts while more importantly (for the agency) to minimize impacts of mitigation on growers in areas with less sensitive species. It is again assumed the agency is not shirking its responsibilities under FIFRA and ESA and considers mitigations (application restrictions) that reduce exposure to species similar to targeted pests (e.g., insects) that nontarget listed species dissimilar to the target pests (e.g., birds, fish, mammals, reptiles, amphibians, etc.) and their critical habitats will also be afforded reduced exposure and therefore avoid any possible may affect/jeopardy conditions.

Further, the strategy does not include consideration of listed marine/estuarine species under the auspices of the NMFS. Under the ESA, the EPA must consult with the Services (FWS and NMFS) to ensure that the registration of products under FIFRA complies with section 7 of the ESA. EPA has coordinated only with FWS on the development of this insecticide draft strategy. Once final, EPA and FWS expect to formalize their understanding of how this strategy can inform future biological evaluations and consultations. The draft Insecticide Strategy focuses on listed species under the jurisdiction of FWS as they have authority over approximately 95% of the listed species associated with agricultural uses in the contiguous U.S. Unfortunately, listed species under the authority of NMFS are not in the scope of the draft strategy because the agency is addressing these through a separate programmatic consultation between EPA and NMFS. Historically, there have been few consultations analyzing the impacts of agricultural insecticides on anadromous fish species (e.g., coho salmon) and marine invertebrates (e.g., black abalone). In July 2002, a federal court ordered EPA to consult with both the FWS and NMFS to ensure that the registration of 37 pesticide active ingredients under the FIFRA complies with section 7 of the ESA.[1] In January 2004, the EPA was enjoined from authorizing the application of a set of pesticides within certain distances from salmon-supporting waters.[2] EPA was required to consult with NMFS concerning possible adverse effects of pesticide applications on salmon and steelhead trout protected under the ESA. The court imposed two types of restrictions on application of pesticides covered in the lawsuit. For aerial applications, no pesticides can be applied within 100 yards of salmon-supporting waters; for ground applications, the distance is 20 yards. Although unknown at the present time, given the primarily marine environment inhabited by black abalone and the uncertainty regarding the concentration of pesticides that may be introduced to these habitats from agricultural applications, the protections for salmon-supporting waters would likely be adequately protective of black abalone critical habitat.[1] It is recommended that EPA also coordinate with NMFS in addition to FWS on the applicability of its proposed insecticide strategy as presented to listed species under its jurisdiction and existing court orders.

We find the focus on listed invertebrates and invertebrate populations that may pose indirect impacts to listed vertebrates to be insufficient to comply with the agency's obligations within FIFRA and the ESA. Phylogeny alone does not determine sensitivity: Two species of the same genus may show large differences in sensitivity,[3] while convergent evolution may lead to similar sensitivity among

[1] Region, S., 2011. Economic Impacts Associated with the Critical Habitat Designation for the Black Abalone. National Marine Fisheries Service Southwest Region 501 West Ocean Blvd. Long Beach, CA 90802
[2] Washington Toxics Coalition, et al. v. EPA, C01-0132 (W.D. WA), 22 January 2004.
[3] Buchwalter, D.B., Cain, D.J., Martin, C.A., Xie, L., Luoma, S.N. and Garland Jr, T., 2008. Aquatic insect ecophysiological traits reveal phylogenetically based differences in dissolved cadmium susceptibility. *Proceedings of the National Academy of Sciences*, *105*(24), pp.8321-8326.

taxonomically unrelated taxa.[4] In fact, evidence shows that taxonomy is not an inherently informative descriptor for differences in species sensitivity to toxins, but that phylogenetically related aggregations of certain species traits could better fit this purpose.[5,6,7,8] However, existing trait information without a relevant toxicokinetic and toxicodynamic connection has not yet been demonstrated to provide such an unambiguous relationship with laboratory sensitivity.[9]

The proposed strategy framework is intended to explain how mitigation measures are selected to decrease pesticide exposure and reduce the potential for population-level impacts to listed species. The first step in the effort is to identify potential for population-level impacts. This is done by calculating the Magnitude of Difference (MoD) for each of the insecticide uses considered. The MoD is defined as the ratio of the insecticide exposure, known as the estimated environmental concentration (EEC), to its corresponding toxicity threshold value. Although similar to the agency's risk quotient (RQ) used in its ecological risk assessment, MoDs represent a more refined approach that differ by the toxicity endpoint selected, less conservative estimated exposures, and how they are interpreted. The agency will need to determine multiple MoDs for a given product label for different types of exposures (spray drift, runoff/erosion), different environmental media (e.g., water or sediment concentrations for aquatic species, concentrations in the diet of terrestrial species), different types of habitats (e.g., small vernal pools, wetlands, ponds, terrestrial areas), and different groupings of species (referred to as "taxa", grouped based on taxonomic categories such as order or phylum) when they differ substantially in their sensitivity to an insecticide. This is expected to be not only resource-intensive for the agency but also to lack transparency and predictability by pesticide registrants and users.

Developing the toxicity thresholds for use in the MoDs are also problematic. The toxicity values considered within the strategy are only for invertebrate species. It is presumed the agency believes that mitigating exposures to susceptible invertebrate populations will also reduce or eliminate risks to listed vertebrate species. The agency disregards in the strategy direct risks from insecticides to vertebrate species or the possibility that a tested vertebrate species may be more or equally sensitive to an insecticide exposure than any of the tested invertebrates.

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[4] Rubach, M.N., Baird, D.J. and Van den Brink, P.J., 2010. A new method for ranking mode-specific sensitivity of freshwater arthropods to insecticides and its relationship to biological traits. *Environmental Toxicology and Chemistry*, *29*(2), pp.476-487.

[5] Barnett AJ, Finlay K, Beisner BE. 2007. Functional diversity of crustacean zooplankton communities: Towards a trait-based classification. Freshw Biol 52:796–813.

[6] Poff, N.L., Olden, J.D., Vieira, N.K., Finn, D.S., Simmons, M.P. and Kondratieff, B.C., 2006. Functional trait niches of North American lotic insects: traits-based ecological applications in light of phylogenetic relationships. *Journal of the North American Benthological Society*, *25*(4), pp.730-755.

[7] Usseglio-Polatera, P., Bournaud, M., Richoux, P. and Tachet, H., 2000. Biological and ecological traits of benthic freshwater macroinvertebrates: relationships and definition of groups with similar traits. *Freshwater Biology*, *43*(2), pp.175-205.

[8] Townsend CR, Hildrew AG. 1994. Species traits in relation to a habitat templet for river systems. Freshw Biol 31:265–275.

[9] Buchwalter, D.B., Cain, D.J., Martin, C.A., Xie, L., Luoma, S.N. and Garland Jr, T., 2008. Aquatic insect ecophysiological traits reveal phylogenetically based differences in dissolved cadmium susceptibility. *Proceedings of the National Academy of Sciences*, *105*(24), pp.8321-8326.

In selecting the toxicity threshold endpoints, the agency must first determine the differential sensitivity among applicable taxonomic groups of listed invertebrates. The agency considers the sensitivity of a species to an insecticide among different taxonomic groups is expected to vary by systematic differences at least due to varying physiological, genetic, and biological attributes which affect a species' susceptibility. Whether systematic differences in sensitivity to an insecticide exist among different taxonomic groups depends on the magnitude, consistency and quantity of data available to support such conclusions. As previously noted, phylogeny alone does not determine sensitivity. Large sensitivity differences as much as four orders of magnitude have been reported in 96hr median lethal concentrations (LC50) values in the fish taxonomic group alone.[10] Even in a single fish genus (*Oncorhynchus*), more than three orders of magnitude differences in LC50s have been reported for the chemical 6PPD-quinone. For example, LC50 for coho salmon (*Oncorhyncus kisutch*) is 0.041µg/L and rainbow trout (*Oncorhynchus mykiss*) is 1.0 µg/L whereas the closely related sockeye salmon (*Oncorhynchus nerka*) and chum salmon (*Oncorhynchus keta*) lack a response to the chemical up to maximum solubility (67 µg /L).[11,12] Moreover, there are indications that the toxicity of 6PPD-quinone can change substantially throughout development; the LC50 for coho alevins (3 weeks old) has been reported to be 0.041µg/L[13] whereas the LC50 for parr (>1 year) is more than double, at 0.095µg/L.[14]

Since vast differences in sensitivity can occur within and across taxonomic groups, the agency intends to use a species sensitivity distribution (SSD) tool and will decide case-by-case whether the available data are sufficient to support its use. SSDs are a statistical representation of sensitivity differences among species to a given chemical exposure and are used in setting acute toxicological thresholds that are putatively protective of certain percentages of tested species (e.g., the 5th percentile in an SSD would presumably be protective of 95% of species represented in the distribution). EPA develops SSDs for invertebrates using the acute terrestrial species LD50 and acute aquatic species LC50 values when sufficient data are available. To be valid, an SSD requires test data on multiple species representative of those in the taxa group or groups considered. For invertebrates, the agency may have insufficient data to confidently determine an appropriate SSD. The agency proposes to use either the 5th percentile (HC5) of the SSD to set the MoD toxicity endpoint for evaluating direct, population-level impacts to listed invertebrates and obligately dependent listed animals or plants or the 25th percentile (HC25) for evaluating indirect impacts to listed generalists that depend on invertebrates for survival. The HC5 is considered by the agency to be a reasonably protective concentration for evaluating direct effects to listed invertebrates since it assumes that this concentration is below the LD50/LC50 for 95% of the

[10] Mayer, F.L., Jr and Ellersieck M.R. 1986. Manual of acute toxicity: interpretation and data base for 410 chemicals and 66 species of freshwater animals. U.S. Fish and Wildlife Service, Resource Publication 160. 579 pp.
[11] Foldvik, A., Kryuchkov, F., Ulvan, E.M., Sandodden, R. and Kvingedal, E., 2024. Acute Toxicity Testing of Pink Salmon (Oncorhynchus gorbuscha) with the Tire Rubber–Derived Chemical 6PPD-Quinone. *Environmental Toxicology and Chemistry*, *43*(6), pp.1332-1338.
[12] Brinkmann, M., Montgomery, D., Selinger, S., Miller, J.G., Stock, E., Alcaraz, A.J., Challis, J.K., Weber, L., Janz, D., Hecker, M. and Wiseman, S., 2022. Acute toxicity of the tire rubber-derived chemical 6PPD-quinone to four fishes of commercial, cultural, and ecological importance. *Environmental Science & Technology Letters*, *9*(4), pp.333-338.
[13] Lo, B.P., Marlatt, V.L., Liao, X., Reger, S., Gallilee, C., Ross, A.R. and Brown, T.M., 2023. Acute toxicity of 6PPD-quinone to early life stage juvenile chinook (Oncorhynchus tshawytscha) and coho (Oncorhynchus kisutch) salmon. *Environmental Toxicology and Chemistry*, *42*(4), pp.815-822.
[14] Tian, Z., Gonzalez, M., Rideout, C.A., Zhao, H.N., Hu, X., Wetzel, J., Mudrock, E., James, C.A., McIntyre, J.K. and Kolodziej, E.P., 2022. 6PPD-quinone: Revised toxicity assessment and quantification with a commercial standard. *Environmental Science & Technology Letters*, *9*(2), pp.140-146.

tested species. The HC25 of the SSD is selected by the agency for listed generalist species because unacceptable mortalities at this concentration (below the LD50/LC50 for 75% of tested species) are presumed to occur at the community level, rather than for a population of a single species. Separate MoD toxicity endpoints are derived for different use circumstances. The use of toxicity data that relate to different taxonomic groups, endpoints, test durations, modes of action, or sensitivities will often result in multimodal SSDs.[15] Such multimodal SSDs can confound predictions and can also reduce confidence in the resulting toxicity threshold. The approach overall in the proposed strategy is less conservative and likely less protective of listed species than the traditional approach the agency used in setting a toxicity Level of Concern (LOC) that represents a toxicant concentration that will likely kill or impair sufficient individuals to be a serious population impact. Traditionally the agency used 1/10th the most sensitive LD50 for terrestrial species or 1/20th the most sensitive LC50 for aquatic species as the LOC for a listed species as populations of listed species are more vulnerable to loss of even a single individual.[16] In fact, the ESA prohibits the "take" of a single listed species. Take is defined in the ESA as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct." The likely "take," which includes unintentional harm or death, of even one individual of a listed species, is enough to constitute a may affect determination under the agency's own policy and trigger the need for formal consultation with the Services. In comparing the traditional LOCs with the proposed MoDs, this would generally equate to 1/10th or 1/20th the relevant HC5 (surrogate for most sensitive tested species LD50/LC50) from the SSD. Expressed in a different way, an HC5 toxicity threshold estimates that 5% of species and an HC25 estimates 25% of species listed or otherwise will be exposed to an insecticide concentration equal to or greater than a laboratory derived LD50/LC50. An individual exposed to a median lethal concentration would be at high risk of death and by extension a severe impact to a population of these individuals. The agency should consider using 1/10th or 1/20th the HC5 as appropriate for the selected toxicity threshold for direct population impacts of listed species and 1/5th the HC25 for indirect community level impacts.

For chronic toxicity thresholds for the population, the agency establishes toxicity thresholds used to support a chronic MoD on the Maximum Acceptable Toxicant Concentration (MATC) obtained from the most sensitive species for which reliable chronic toxicity data are available. The MATC is the geometric mean between the No Observed Adverse Effect Concentration (NOAEC) and the Lowest Observed Adverse Effect Concentration (LOAEC) from a chronic toxicity test. The NOAEC represents the highest concentration in a chronic toxicity test where statistically significant effects do not occur while the LOAEC represents the lowest concentration where statistically significant effects occurred in the test. Biological effects begin to occur between these two endpoints. Thus, the MATC is intended to reflect the onset of adverse effects from chronic exposure to a chemical. Previously the agency used the NOAEC of the most sensitive species as the chronic LOC but now uses the less conservative MATC value. Also, if the most sensitive chronic MATC is greater than the most sensitive acute toxicity threshold (e.g., 1/2 LC50) as may occur when the available MATC is on a less sensitive species, then the value needs to be adjusted by an acute-to-chronic ratio based on the difference in acute toxicities between the most sensitive species acute value and the acute value for the species used for the chronic MATC. It is irrational for the short-

[15] Fox, D.R., Van Dam, R.A., Fisher, R., Batley, G.E., Tillmanns, A.R., Thorley, J., Schwarz, C.J., Spry, D.J. and McTavish, K., 2021. Recent developments in species sensitivity distribution modeling. *Environmental Toxicology and Chemistry*, *40*(2), pp.293-308.
[16] Urban, D.J., and Cook, N.J., 1986. *Hazard evaluation division standard evaluation procedure: Ecological risk assessment* (No. 85). US Environmental Protection Agency, Office of Pesticide Programs.

term acute toxicity threshold to be less than the chronic long-term toxicity threshold value. The agency should be mindful that the most sensitive tested species with reliable chronic toxicity data available may in fact be a vertebrate species and should be dealt with accordingly.

Table 3 in the draft insecticide strategy provides the relationship between the MoD determined and the potential for population-level impacts that the agency uses to establish the degree of exposure mitigations to dictate. In addition to the MoD ranges, EPA considers other information such as the level of confidence and bias in exposure or toxicity threshold estimates when assigning the potential for population/community-level impact to a listed species. For example, EPA's EECs for the standard farm pond are used as a proxy to represent exposure of listed species in rivers and streams since EPA currently lacks a reliable exposure model for these flowing water systems. The agency contends that the pond-based EECs tend to overestimate exposures in rivers and streams by an order of magnitude or more based on its previous analyses. Similarly, the models used to estimate spray drift also tend to overestimate exposure for some habitats where substantial interception of spray droplets is expected (e.g., forests, shrubland). Therefore, for listed species that live in such habitats, the potential for population-level impact categories shown in Table 3 of the draft insecticide strategy are assigned higher MoD ranges by one category (i.e., an MoD range of 10 to <100 would equate to low potential for population-level impacts, representing the lower exposure and potential for population-level impacts in these habitats).

Table 3. Relationship Between the Magnitude of Difference and Potential for Population-Level Impacts.

Magnitude of Difference (MoD)	Potential for Population-Level Impacts
<1	Not Likely
1 to <10	Low
10 to <100	Medium
>100	High

We find the MoD and corresponding potential population impact levels in Table 3 to be rather arbitrary and capricious. The proposed MoD to be used is based on an acute toxicity threshold where the EEC exceeds the LC50/LD50 for 5% of species represented. Individuals exposed at this estimated exposure can be expected to suffer high mortality. If a listed species falls within the 5% of most sensitive species, then the potential impact to its population is clearly unacceptable. For invertebrate populations in general that a listed species may be dependent, the agency proposed MoD is where the EEC exceeds the LC50/LD50 for 25% of species represented. For the 95% or 75% of species, respectively, and their population where the EEC does not exceed their respective estimated LC50/LD50, substantial and widespread mortality and/or sublethal effects may still be expected. Such potential risks to nontarget species in general and listed species in particular are not acceptable. We propose more conservative and protective relationship levels based on the agency's traditional LOCs to be used to trigger the degree of exposure mitigation required to achieve listed species protection:

Recommended Alternate Relationship Between the Magnitude of Difference and Potential for Population-Level Impacts.

Magnitude of Difference (MoD)	Potential for Population-Level Impacts
<0.05	Not Likely
0.05 to <0.1	Low
0.1 to <1	Medium
>10	High

The agency has a suite of established standardized models to determine and EEC. Choice and application of an appropriate model depends on relevant application parameters, fate characteristics of the chemical, habitat of the species, and the extent a particular use scenario meets the selected model assumptions. It is unclear how the agency will factor multiple applications of an insecticide in developing the appropriate EEC for its MoD. Additionally, the strategy makes no reference for dealing with mixtures of insecticides, adjuvants, or other pesticides (e.g., herbicides, fungicides) that may be tank mixed or otherwise present on a treated field. Such complex exposures my enhance or attenuate the expressed toxicity of a subject insecticide use. The resources the agency will need to expend in selecting the most suitable model and calculating exposures for the many habitat and species scenarios used for a given MoD will be formidable.

For the majority of the insecticide agricultural uses considered in this strategy, the agency identifies spray drift and runoff/erosion as the dominant transport pathways leading to nontarget organism exposures. Other possible transport routes (i.e., leaching, wind erosion, volatilization) may be relevant to a specific insecticide, but are not commonly routes of concern by the agency. As such, these transport routes were not included in the agency's Ecological Mitigation Support Document. For a chemical/use circumstance that other routes are relevant to a chemical or species, the agency would still be expected to identify any needed mitigations as part of those actions (e.g., registration, registration review, development of a biological evaluation).

For spray drift mitigation, the agency plans to include them on the pesticide product label, whereas for run-off/erosion mitigation, the agency plans to direct applicators to an EPA website with a menu of those measures EPA's -- Bulletins Live! Two website (BLT). Using a website allows EPA to update the menu over time with additional mitigations, which allows applicators to use the most up to date mitigations without amending pesticide product labels. Further, the agency may determine that additional mitigations would be appropriate for some listed species beyond the mitigations on the general pesticide product label. It is important that products requiring such mitigations for listed species concerns receive a Restricted Use classification to only be used by certified pesticide applicators as adherence to such restrictions and need to navigate multiple websites of necessary mitigation measures are beyond the understanding and capability of an untrained general user.

For runoff/erosion mitigation, EPA developed a menu of measures that would apply whenever EPA identifies mitigations for nontarget species, including listed species. EPA elected to develop a mitigation menu to provide flexibility for grower/applicators to use mitigations that are best for their situation to reduce off site pesticide exposure via runoff and/or erosion. These measures are provided in more detail in the Ecological Mitigation Support Document Version 1.0. In order to include as many options as feasible across dozens of measures with varying degrees of efficacy, EPA is planning to utilize a point system for runoff/erosion mitigations to: (1) associate the number of points with each MoD category for runoff/erosion; and (2) assign lower or higher point values to mitigation practices that are less or more effective, respectively, in reducing runoff/erosion.

While a multitude of factors determine the fate and transport of a pesticide in the environment, one fundamental physio-chemical property is the sorption coefficient, otherwise known as the Koc. This property describes whether a chemical tends to adsorb to soil particles or remain in water. Chemicals with a higher Koc tend to adsorb to soil and are more likely to be transported by soil erosion, while chemicals with lower Koc tend to partition to water and are more likely to be present in runoff. Several of the runoff/erosion mitigation measures listed in the Ecological Mitigation Support Document function by removing soil, and therefore soil-sorbed pesticides, from runoff. This difference between chemicals results in runoff and erosion mitigations being inherently more effective for erosion-prone pesticides. Examples of this phenomena can be seen in the literature for various mitigation measures, including vegetative filter strips, sedimentation basins, and cover crops/mulching. Another important physio-chemical property to be considered is the Kow (octanol water partition coefficient) that is used to estimate bioconcentration of a chemical and potential for bioaccumulation. Combined with the estimated environmental persistence of an insecticide, the magnitude of the potential risk posed by a listed species exposure to bioaccumulative prone chemical would be enhanced.

For the draft Insecticide Strategy, EPA is proposing to apply mitigations, when appropriate, broadly across the full spatial extent of a use pattern (e.g., specific crops) within the contiguous U.S., specifying the mitigations on the general pesticide product label. In other cases, EPA plans to require mitigations in geographically specific areas only (referred to as Pesticide Use Limitation Areas or PULAs). A PULA is the specific geographic area associated with particular pesticide mitigations for a listed species, groups of listed species, or designated critical habitat. PULAs are used in BLT to provide pesticide applicators with specific locations where use restrictions may apply to their intended pesticide application to protect listed species or their designated critical habitat. Depending on the insecticide, EPA may use both label and website or one or the other option or a combination of both. EPA is proposing to implement mitigations on the general label when mitigations are identified for listed generalists, and using BLT (with PULAs) when additional mitigations are identified for listed invertebrates. The agency has made use of previous insecticide Biological Evaluations completed in consultation with the FWS and NMFS to inform the appropriate mitigations selected.

The agency is proposing to group terrestrial species by the following three taxa: butterflies, beetles, and bees to allow for cases where toxicity data are available for an insecticide that shows different sensitivities across these taxonomic groups. Since honey bee toxicity data are often the only available terrestrial insect data, the agency will use the honey bee as a surrogate for all insect orders. In those cases, the mitigations applied will be the same for all insect species regardless of order. However, it is uncertain if the honey bee is as sensitive as an insect group in the same order as an insecticide's target species. The agency should seek additional data on a range of insect taxa as may be found in efficacy data the proponent for registration likely possesses.

EPA is under immense litigation pressure from NGOs for not being compliant with the ESA. The proposed insecticide strategy along with the similar herbicide strategy recently proposed and the expected draft fungicide strategy soon to be released are the agency's response to relieve this pressure. The agency is also under pressure from growers/applicators due to conservative/protective mitigations that impose substantial costs and requirements. The draft insecticide strategy as proposed would fundamentally change the way insecticides will be registered by requiring general and specific mitigations to labels and a menu of detailed restrictions/measures with PULAs on its mitigation website. The agency should be mindful on how to ensure protection of listed species and balance its response to the competing pressures. A troubling aspect about the draft strategy is that it appears the agency deals with MoDs that present a risk of population-level impacts only by requiring some level of spray drift or runoff/erosion exposure mitigation. The draft strategy should be revised to include an explanation of how the agency plans to regulate (e.g., reject, suspend, cancel) under its FIFRA mandate those insecticides proposed for new registration or in registration review as to what level an MoD after imposed mitigations still pose an unreasonable risk of adverse effects to listed species and/or nontarget wildlife.

Respectfully,

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