THE DEFEND THEM ALL FOUNDATION

Environmental Protection Agency
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Coastal Coordination Program

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Comments regarding EPA's Draft Biological Evaluation, Effects Determinations, and Mitigation Strategy for Federally Listed and Proposed Endangered and Threatened Species and Designated and Proposed Critical Habitats (Docket EPA-HQ-OPP-2023-0567).

The Defend Them All Foundation (DTA) submits the following comment for the EPA's Draft Endangered Species Act Biological Evaluation for the Registration Review of 11 Rodenticides ("BE"), docket number EPA-HQ-OPP-2023-0567. DTA is an Oregon based 501(c)(3) nonprofit dedicated to securing a better future for animals and their habitats. As an organization focused on issues at the intersection of animal and environmental law and policy, DTA is part of the growing movement to reduce the harm caused to animals and the environment as a result of chemical contamination. Given this mission, we are concerned about the impacts of rodenticides on species threatened by extinction. We appreciate the opportunity to provide feedback and additional information.

The Endangered Species Act (ESA) requires all federal action agencies, in consultation with the Services (U.S. Fish and Wildlife Service (FWS) and/or the NOAA Fisheries Service (NOAA)), to "insure that any action authorized, funded, or carried out ... is not likely to jeopardize the continued existence of any endangered species or threatened species or result in [their habitats'] destruction." 16 U.S.C. § 1536(a)(2). Consultation is required if an action agency determines that its proposed action "may affect" listed species or critical habitat. 50 C.F.R. § 402.14(a). To fulfill this requirement, "...each agency shall use the best scientific and commercial data available." Id.

The term "may affect" is broadly construed to include "[a]ny possible effect, whether beneficial, benign, adverse, or of an undetermined character," and is easily triggered. 51 Fed. Reg. 19,926, 19,949 (June 3, 1986). "[A]ctions that have any chance of affecting listed species or critical habitat—even if it is later determined that the actions are 'not likely' to do so—require at least some consultation under the ESA." Karuk Tribe v. EPA, 681 F.3d at 1027 (emphasis added). Any Agency "mitigation measures that merely 'reduce,' but cannot scientifically 'eliminate' an 'effect'

probably compel a 'may effect' finding." (National Fam. Farm Coal. v. EPA (Dow), 966 F.3d at 924 (quoting Karuk Tribe at 1028)).

Unfortunately, the BE severely understates the harm rodenticides pose to ESA listed species; as such, we encourage the EPA to amend the BE and Proposed Mitigation Strategy to account for the real danger rodenticides pose, including secondary poisoning, sublethal effects and risks to aquatic ecosystems.

EPA's categorical "no effect" determination for all aquatic species disregards documented harm and reasonably foreseeable consequences.

The EPA wrongly concludes that aquatic species (freshwater and marine fish, aquatic mammals, aquatic amphibians, aquatic reptiles, and aquatic invertebrates) and species reliant on aquatic food webs are not reasonably certain to be exposed to rodenticides, on the basis that intended application sites, target species, and label requirements preclude exposure of aquatic organisms (BE 3.1.1.2). Thus, categorical NE determinations were made for all aquatic vertebrates including those under the jurisdiction of NMFS.

In actuality, exposure through aquatic pathways is known to occur, and residues have been detected in fish, mussels, and limpets up to three years after application.[1] Such accumulations pose risks to species across the food web as well as to human health.[2] Furthermore, scientists have repeatedly raised concerns regarding the inadequacy of detection methods used for aquatic species (See Boesch, 2023).

Disregarding the possible adverse effects on aquatic species is arbitrary and inconsistent with the ESA.

EPA Severely Underestimated Risks Of Sublethal Effects And Secondary Exposure.

Rodenticides (both "first" and "second generation") are inherently dangerous poisons designed to kill. Animals that ingest these products and/or poisoned prey experience pain and suffering

[1] Julia Regnery et al., "Rating the risks of anticoagulant rodenticides in the aquatic environment: a review," *Environmental Chemistry Letter* (2019) Switzerland Springer Nature; "Heavy rainfall provokes anticoagulant rodenticides' release from baited sewer systems and outdoor surfaces into receiving streams," *Science of the Total Environment* (2020) Elsevier B.V.; Matthias Kotthoff et al., "First evidence of anticoagulant rodenticides in fish and suspended particulate matter: spatial and temporal distribution in German freshwater aquatic systems," *Environmental Science and Pollution Research* (2019) Switzerland Springer Nature.

[2] Lin Zhu et al., "Determination of bromadiolone and brodifacoum in human hair by liquid chromatography/tandem mass spectrometry and its application to poisoning cases," *Rapid Communications in Mass Spectrometry* (2013) Wiley Analytical Science.

over a period of days or weeks, most often leading to death. During this time, rodents and other primary consumers can continue to feed on the baits, thus accumulating a significant level of rodenticides in their livers before they finally die.[3] Rodent populations that have developed resistance can consume even greater amounts of bait with reduced adverse effects, thereby posing even greater risks to subsequent consumers.[4]

Furthermore, behavioral symptoms[5] of poisoned rodents make them more available for consumption by predators.[6] Rats suffering from rodenticide toxicity have been found to spend more time outside of their dens during all hours of the day.[7] Since rodents will disperse away from buildings and into surrounding natural habitats, often seeking water to quench thirst symptomatic of rodenticide poisoning, the secondary-exposure risk for predators is not acceptably mitigated by requiring the use of bait boxes. At least four listed species (alligator snapping turtle, bull trout, Atlantic salmon, and steelhead trout) have been known to consume poisoned rats and experience secondary exposure via this pathway. [8]

EPA admits that secondary exposure through consumption of burrow dwelling animals is a possibility for all 11 rodenticides from all types of uses, including bait stations, but asserts that such exposure "is limited by the tendency of burrow dwelling pest species to die in their burrows rather than on the surface (BE pg. 23)." Effect determinations for listed species based on these erroneous assumptions must be revisited and revised.

Relatedly, numerous studies have documented sub-lethal effects[9] of rodenticide exposure in wildlife, including lethargy, shortness of breath, anorexia,[10] bloody diarrhea, changes in behavior,

[3] Cox, P. and Smith, R.H. 1992. "Rodenticide Ecotoxicology: Pre-Lethal Effects of Anticoagulants on Rat Behaviour." Proc. 15th Veterbr. Pest Conf. (J.E. Borrecco and R.E. Marsh, Eds.) Univ. of Calif., Davis, 165- 170.
[4] Hindmarch, S. and Elliott, J.E. 2018. "Ecological Factors Driving Uptake of Anticoagulant Rodenticides in Predators." In N.W. van den Brink, J.E. Elliott, R.F. Shore, and B.A. Rattner (Eds.), *Anticoagulant Rodenticides and Wildlife* (1st ed., pp. 229-258). Springer.
[5] Littin, K. E., C. E. O'Connor, C.E. and Eason, C.T. (2000). Comparative Effects of Brodifacoum on Rats and Possums, New Zealand Plant Protection Society
[6] Cox & Smith, *supra* note 3.
[7] Howald, G. R., Mineau, P., Elliott, J. E., & Cheng, K. M. 1999. Brodifacoum poisoning of avian scavengers during rat control on a seabird colony. *Ecotoxicology*, 8(6), 431-447.
[8] Pritchard, P.C.H., 1979. *Encyclopedia of turtles* (p. 876). New Jersey: TFH; Stewart, D.B., Mochnacz, N.J., Sawatzky, C.D., Carmichael, T.J. and Reist, J.D., 2007. Fish diets and food webs in the Northwest Territories: bull trout (Salvelinus confluentus). *Canadian Manuscript Report of Fisheries and Aquatic Sciences, 2800*; Purnell, R. 2011. Mastering the Morrish Mouse. *Fly Fisherman* June 30.
[9] Salim, Hasber, et al. "Secondary poisoning of captive barn owls, Tyto alba javanica, through feeding with rats poisoned with chlorophacinone and bromadiolone." J Oil Palm Res 26.1 (2014): 62-72 [Salim, Secondary poisoning of barn owls]
[10] Cox & Smith, *supra* note 3.

tenderness of the joints and mange,[11] demonstrating that, even at sub-lethal levels, rodenticide products are known to reduce the biological fitness of wildlife (See California Department of Pesticide Regulation, pg. 31). Rodenticides also interfere with reproduction, reduce hunting success, and are associated with an increased likelihood of trauma. For example, even if owls are not directly killed by internal hemorrhaging, those that have ingested rodenticides are more likely to hunt unsuccessfully, become ill, or collide with vehicles or windows.

An analysis of necropsies for birds of prey in British Columbia raised serious concerns regarding the application of criteria used to diagnose avian species. Even if the presence of rodenticide(s) is confirmed, trauma, hemorrhage, emaciation, or a combination thereof are often listed in the report with no mention of toxicants. Additionally, many birds that exhibit classic signs and symptoms of rodenticide poisoning with no other identifiable cause are never tested for the presence of rodenticides. Results described in Wiens et. al., 2019 suggest that similarly problematic data collection and analysis procedures may exist in the United States.[12] If this is the case, the effects of rodenticides on ESA Listed Species may be grossly underestimated.

By diminishing risks of secondary ingestion and sublethal effects, the BE significantly underestimates the impact of rodenticides on ESA Listed Species. The BE must be revised to reflect these important considerations.

The inadequacies of EPA's Draft BE are magnified in the context of island eradication projects considering amplified application rates and quantity of baits systematically sought for these projects.

Island Conservation projects involve smothering sensitive island ecosystems with rodenticides in a multitude of bait boxes, or by aerial broadcast application (helicopter) for "conservation" or the "protection" of seabird colonies. The efficacy and consequences of such projects are difficult to predict and subject to ongoing scientific debate, but mass animal casualties in the aftermath of these projects have been reported around the globe (Video: Brodifacoum drops on Rangitoto and Motutapu Islands, 2009).

For example, in 2009, an eradication project on Alaska's Rat Island led to the reported deaths of more than 420 birds, including 46 bald eagles (Ornithological Council Report, 2009). During the Alaska Rat Island project, Island Conservation—the same organization working in partnership with the U.S. Fish and Wildlife Service (FWS) on the proposed house mouse eradication project

[11] Serieys, Laurel E.K. et al. 2015. "Anticoagulant rodenticides in urban bobcats: exposure, risk factors and potential effects based on a 16-year study." *Ecotoxicology*, 24(4).
[12] Wiens, J. David et al. 2019. "Anticoagulant rodenticides in *Strix* owls indicate widespread exposure in west coast forests." *Biological Conservation*, 238.

at the Farallon Islands — dropped an amount of poison that was "in excess of that recommended by an advisory panel and probably above the legal limit approved by the US Environmental Protection Agency (EPA)," according to a 2011 Nature article.

Impacts on non-target species were similarly underestimated on Lehua Island, Hawaii, where invasive rodents were not eradicated after an initial aerial application necessitating "mop-up" efforts of additional poison to effectively complete the project, resulting in the death of over 400 birds. Massive fish kill and widespread humpback whale deaths were also observed, with postmortem evaluations revealing that these aquatic species showed classic signs of rodenticide poisoning.[13]

Despite the unintended by-kill, the Rat Island and Lehua Island projects were declared to be "success" stories as rodent eradication and rebounded population of the targeted island birds was accomplished. Still, proponents of "Island Conservation" projects promote a standard of "success" that permits/accepts the death of hundreds of individuals within multiple species targeted for protection including many migratory and/or ESA listed species.

Importantly, scientists[14] intimately familiar with current detection methods and reporting standards have raised serious concerns regarding monitoring efforts conducted before, during, and after rodenticide applications, the fate of anticoagulant residues in the oceans, and adverse effects in marine mammals, further suggesting that collateral kills associated with island eradication projects have been severely underestimated.[15]

The EPA maintains authority to approve or reject the registration of pesticides under 7 U.S. Code § 136a of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), which empowers the agency to regulate the contents and directions for use outlined on pesticide product labeling. Likewise, under 7 U.S. Code § 136d, the EPA possesses authority to cancel or suspend the registration of a pesticide when necessary to prevent unreasonable adverse effects on the

[13] Parkes, J. and Fisher, P. (2017). Review of the Lehua Island rat eradication project 2009. Pacific Cooperative Studies Unit Technical Report 195. University of Hawai'i at Mānoa, Department of Botany. Honolulu, HI. (PDF)

[14] Robert Boesch is a retired pesticide regulator for the EPA and the Hawaii Department of Agriculture. Presently, he is Visiting Colleague at University of Hawaii at Manoa. See Appendix A.

[15] No diphacinone was detected in liver samples of a Humpback Whale stranded after rodenticide application on Mokapu by USDA and NOAA scientists as methods with high limits of detection were used (77 ppb and 15 ppb respectively) rather than a published alternative that can detect 0.3 nanograms, considered 256 more precise than the USDA method. Additionally, only fish filets were tested, i.e., muscle as opposed to entrails including the liver, kidneys and stomach content which is where anticoagulants would appear (Boesch, Robert (2023). "Eradication Programs Eliminating Invasives and their Predators and Scavengers" University of Hawai'i at Mānoa, Department of Botany. Honolulu, HI. (PDF)

environment. This statutory power equips the agency with the capacity to revoke authorization or halt the sale of registered pesticides found to pose harmful risks not adequately addressed through labeling requirements.

As the EPA maintains final authority to approve special use rodenticide labels for island eradication projects the agency is not immune to ESA obligations in this context.

The Draft BE predicts that island eradication projects demanding special use rodenticide labels will be conducted on 28 island complexes in U.S. waters within the next 5-7 years (BE p. 15-16). Nonetheless, EPA chose not to include this use in its analysis, instead relying on expected APHIS ESA consultations.

One such project involves a proposed plan to disperse approximately 3,500 lbs (1.45 tons) of Brodifacoum-infused bait (rat poison) at the Farallon Islands - a globally significant and extraordinarily diverse marine ecosystem designated as both a Marine Protected Area and National Marine Sanctuary. If permitted to proceed, bioaccumulation and the death of hundreds of animals, from birds and mammals to invertebrates, is anticipated to occur even if the project goes exactly as planned.

The Greater Farallones National Marine Sanctuary hosts a quarter-million breeding seabirds and is a popular stop for migrating birds traveling along the Pacific Flyway from Central and South America to as far north as Alaska. Sustained by lush marine biota, the Farallones are home to the largest breeding colony of seabirds in the Continental U.S. While the duration and pathway of exposure to the poisoned bait varies by each species' feeding habits, all birds present during and after the drop will be at a high risk of exposure for at least 30 days (FEIS p.167). The poison's harmful effects are likely through both direct and indirect methods of exposure, and will only be reduced by the passing days. However, chronic exposure to brodifacoum may occur over the long term, as this product is known to persist for approximately 101 days (FEIS Section 2.8.10). Brodifacoum research showed a plasma elimination half-life of 91.7 days and liver elimination half-life of 307.4 days, indicating the longevity of indirect harm.[16] As the poison circulates through the food chain, long-term risk of exposure will remain for raptors, scavengers and other birds that consume rodents, small birds, reptiles, insects, and amphibians that have been inadvertently exposed to the poison.

Hosting steep inclines of up to 109 meters, and a name that literally means "the cliffs," the Farallon Islands' geography virtually guarantees that any drop of the pellet-shaped rodenticide baits onto the island is bound to cause significant runoff into the water as these baits will

[16] Vandenbroucke, V. et al. 2008. "Pharmacokinetics of Eight Anticoagulant Rodenticides in Mice after Single Oral Administration." *Journal of Veterinary Pharmacology and Therapeutics*, 31(5), 437–445.

simply roll down the cliffs where applied and into the water from there. As such, collateral ecosystemic consequences should be expected to occur.

CONCLUSION

The BE severely underestimates the impact of rodenticides on ESA listed species and must be revised to more realistically account for the impact on aquatic species, as well as the risks of secondary poisoning and sublethal effects.

The District Court of Arizona recently examined the EPA's reliance on "the premise that…control measures would preclude offsite movement of dicamba during the 2020 growing season," in reaching a "no effects" determinations and decision not to consult FWS to evaluate the effects of OTT dicamba on protected species and critical habitats.[17] The Court criticized "EPA's circular approach to assessing risk, hinging on its high confidence that control measures will all but eliminate offsite movement" where more than 3,000 incident reports demonstrated that dicamba did in fact move offsite and adversely impact non-targets.[18] Thus, the Court determined that the EPA's "no effects" determination was problematic, contrary to the mission of the ESA.[19]

This same problematic reasoning is on display in the current Draft BE. The EPA claims that since the reviewed rodenticides' labels generally prohibit use in or near water, and that target species are terrestrial, the rodenticides are "unlikely used near aquatic habitats," and based on these assumptions issued NE determinations for all aquatic listed species (BE 36). The EPA is, again, relying on the efficacy of control measures like product label warnings, assuming that such precautions effectively eliminate adverse effects on listed species, where in reality countless studies have demonstrated rodenticides do get into the water and do poison listed aquatic species. Additionally, the EPA claims that rodents tend to "die in their burrows rather than on the surface," and that the risk of secondary poisoning is thus "limited" (BE 22). The EPA's reliance on mitigation here is similarly contradicted by clear signs of secondary poisoning in listed species across the board. The EPA cannot continue making the same flawed judgments based on misfounded faith in mitigation that will inevitably prove ineffective, jeopardizing listed species in violation of the ESA.[20]

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[17] Ctr. for Biological Diversity v. EPA, No. CV-20-00555-TUC-DCB, 2024 WL 455047, at *22 (Dist. Ct. Ariz. Feb. 6, 2024).
[18] *Id*. at *22.
[19] *Id*. at *20.
[20] *See id*. ("Mitigation measures can cut against a 'no effect' finding if they reduce but cannot eliminate the impact to threatened species. When a failure to consult stretches over years, it is a substantial procedural violation; it is not a violation that is merely technical or de minimis.")

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Risks posed by rodenticides are expansive and well known to be playing an outsized role in perpetuating extinction. It is vital for the federal government to take a stronger stance against these products to pave the way for comprehensive change. There is overwhelming evidence that the EPA has taken the wrong approach to managing pest populations. Extensive science demonstrates that mere restrictions are not enough. Rodenticides are an obsolete tool no longer acceptable or appropriate given the triple crises of biodiversity loss, climate change, and pollution.

As a final note, we applaud the EPA's recent commitment to reducing the use of animals in chemical testing. To that end, our comments are in no way suggesting that additional resources or funding be directed towards rodenticide toxicology testing on animals. Volumes of existing studies have already documented short and long term effects of toxicity, environmental persistence, biomagnification, secondary poisoning effects, and sublethal impacts in species ranging from birds to aquatic invertebrates. Continued animal testing is neither scientifically or ethically warranted given plentiful conclusive evidence regarding ecosystem damage as well as unnecessary animal cruelty entailed. Synthesizing existent rodenticide research via meta-analyses and modeling for risk assessments can sufficiently inform mitigation strategies and policy without sacrificing additional animal lives. The preponderance of data on health effects, environmental accumulation, and the availability of alternative assessment methods obviate any arguable rationale for ongoing animal testing.

Sincerely,

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