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Re: Comments on EPA's Proposed Revisions to the Proposed Interim Decisions for 11 Rodenticides (87 Fed. Reg. 73297)

Please accept the following comments from the Center for Biological Diversity ("Center") in response to the Environmental Protection Agency's ("EPA") proposed revisions to the proposed interim decision for the following 11 rodenticides:

First Generation Anticoagulant Rodenticides

Chlorophacinone	Case Number 2100	EPA-HQ-OPP-2015-0778
Diphacinone (and its sodium salt)	Case Number 2205	EPA-HQ-OPP-2015-0777
Warfarin (and its sodium salt)	Case Number 0011	EPA-HQ-OPP-2015-0481

Second Generation Anticoagulant Rodenticides

Brodifacoum	Case Number 2755	EPA-HQ-OPP-2015-0767
Bromadiolone	Case Number 2760	EPA-HQ-OPP-2015-0768
Difenacoum	Case Number 7630	EPA-HQ-OPP-2015-0769
Difethialone	Case Number 7603	EPA-HQ-OPP-2015-0770

Non Anticoagulant Rodenticides

Bromethalin	Case Number 2765	EPA-HQ-OPP-2016-0077
Cholecalciferol	Case Number 7600	EPA-HQ-OPP-2016-0139
Strychnine	Case Number 3133	EPA-HQ-OPP-2015-0754
Zinc Phosphide	Case Number 0026	EPA-HQ-OPP-2016-0140

The Center is a non-profit environmental organization dedicated to the protection of native species and their habitats through science, policy, and environmental law. The Center has over 1.7 million members and online activists dedicated to the protection and restoration of endangered species and wild places. The Center has worked for thirty three years to protect

imperiled plants and wildlife, open space, air and water quality, and overall quality of life. The Center's Environmental Health Program aims to secure programmatic changes in the pesticide registration process including securing the completion and implementation of ESA consultations for all pesticides in order to ensure that the nation's most imperiled species have a fighting chance in their battle against extinction.

We appreciate EPA's attempt at label changes and a pilot project meant to establish minimum mitigation requirements to prevent jeopardy to three at-risk Endangered Species Act ("ESA") listed species from rodenticides. While a significant step in the right direction, we remain concerned that label language and proposed mitigations remain insufficiently protective and are not targeted enough to make the *Bulletins Live II* ("BLT") approach meaningful on the ground. Importantly, more explicit geographic prohibitions are needed in the geographic range of ESA listed species.

It is absolutely essential that EPA put in place mitigations that are effective, simple, likely to be followed and enforceable as part of its ongoing consultation with the U.S. Fish and Wildlife Service and National Marine Fisheries Service ("Wildlife Services") and to reduce the unreasonable effects to all non-target wildlife.

I. Concerns with General Label Changes and Mitigation Measures

While these three pilot species are clearly vulnerable to rodenticides, we would like to note that many other ESA listed species that may or may not be less highly-exposed or at risk than these three pilot species are still likely to be jeopardized by EPA's action. EPA recognizes that at least 91 ESA listed species are harmed by rodenticides, but are not addressed in this decision.[1] It is equally clear that many more species deserve similar protections from harm by this dangerous pesticide. This exercise does not excuse EPA from its duties to these other species.

Of utmost importance when designing label mitigations is that they are effective, simple, likely to be followed and enforceable. The proposed mitigations are unlikely to achieve these four requirements. Requirements for carcass removal and restricted use status have proven ineffective at reducing non-target exposure. Carcass removal and geographic restrictions are vague in application. Label mitigations should be simple, clear, and enforceable. Mitigations that have a clear potential to be violated will not achieve their intended purpose and do not meet the legal standards required by the Endangered Species Act or the Federal Insecticide Fungicide and Rodenticide Act ("FIFRA"). Below are concerns and improved mitigations that are strong and simple in an effort to strengthen compliance and protect wildlife.

We will also note that California is the only state that has robust and accurate usage data. EPA should not attempt to use usage data from other states in a similar manner because they are simply not reliable or transparent. Usage data are not the best available science for determining a pesticide use footprint because they are not transparent, reliable or accurately predictive of

[1] Rodenticides: Draft Effects Determinations and Evaluation of Proposed Mitigations Intended to Avoid Jeopardizing Three Federally Listed Endangered and Threatened Species and Avoid Adversely Modifying One Designated Critical Habitat, EPA-HQ-OPP-2015-0778-0096 at App. C.

future use. Reliance on usage data limits the accuracy of the EPA's conclusions regarding likely harm to listed species from these rodenticides.

A) Carcass Removal

We question the feasibility and breadth of the proposed carcass removal mitigations. EPA cites to the 2012 Rozol Biological Opinion for the justification on the feasibility and effectiveness of carcass removal to reduce non-target secondary exposure.[2] However, FWS concludes that "the comparatively complex nature of the Rozol label renders it particularly vulnerable to noncompliance, and reports from users indicate that failure to pick up prairie dogs is a 'widespread and commonly recognized practice'".[3] FWS emphasizes that carcass removal is "inadequate to consistently locate poisoned prairie dogs above ground and thus unlikely to prevent non-target exposure."[4] FWS goes into a detailed analysis of the lack of feasibility and effectiveness in the 2012 Rozol Biological Opinion, which EPA disregards. Far from being support for the effectiveness of carcass removal mitigations, the 2012 Rozol Biological Opinion specifically demonstrates why substantial evidence to support such mitigations as effective is lacking.

The same limitations and difficulty with label compliance occur in the carcass removal mitigations for the 11 rodenticides. EPA's Benefits Assessment for 11 Rodenticides repeatedly references the inadequate labor, cultural, and monetary capabilities to properly implement and oversee label compliance for carcass removal.[5]

Also troubling is that EPA does not require or only make carcass removal mandatory for the same toxic "baits prepackaged in a single-use plastic bait stations", structural use, or even more toxic Second Generation Anticoagulant Rodenticides ("SGARs"). The secondary effects on non-target organisms that predate on the target organisms would be the same whether the products were the target organisms consumed them in the field or in bait boxes leading to widespread harm to species, especially for the more toxic SGARs. This type of arbitrary decision making is not supported by scientific data or substantial evidence.

B) Critical Habitat Must be Fully Protected from Pesticides

All pesticide use should cease in designated critical habitat of all listed species throughout the entire year, excepting any use that directly benefits a listed species, such as removing invasive species or treating disease.

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[2] FWS 2012, Final Biological Opinion For Rozol Use on Black-tailed Prairie Dogs Registered Under Section 3 of the Federal Insecticide, Fungicide and Rodenticide Act, https://www3.epa.gov/pesticides/endanger/2012/borozol-final.pdf

[3] *Id*. at 20.

[4] *Id*. at 21.

[5] EPA 2022, Use and Benefits Assessment for 11 Rodenticides and Impacts of Potential Risk Mitigation, EPA-HQ-OPP-2015-0778-0095 ("there may not be sufficient labor available in the short run to provide needed services"; "users do not frequently search for carcasses, as the application areas are often extremely large and treated pests usually die within their underground burrows"; "Such requirements are expected to be highly burdensome and in some cases economically unsustainable.").

Critical habitat is essential to the survival and recovery of ESA listed species. Critical habitat is often the only source of remnant, high-quality habitat left for many species and pesticides have no place in these designated areas. As EPA proposes mitigations for listed species, critical habitat must be fully protected. We support restricting pesticide use in all critical habitat, with the exception for when there is a need for a pesticide that directly benefits a listed species, for example to remove invasive species or treat disease. Restricting pesticide use in critical habitat is an easy, efficient mitigation that EPA can and should implement for all listed species that will go a long way towards protecting species.

In order to avoid jeopardy to ESA listed species, adverse modification of critical habitat, and to minimize take the use of rodenticides should be prohibited within the range of ESA protected species, with limited exceptions for public health emergencies, or species conservation.

C) EPA Must Account for the Cumulative and Synergistic Effects of Rodenticides in Organisms

EPA must account for the cumulative and synergistic effects of rodenticides in wildlife. The increased sensitivity of exposed wildlife following a re-exposure is expected given the cumulative mode of action demonstrated with all the anticoagulant rodenticides. SGARs are more persistent than First Generation Anticoagulant Rodenticide ("FGARs") in the livers of animals that have been exposed.[6] For example, warfarin has a hepatic (liver) half-life of 26.2 days, whereas brodifacoum has a hepatic half-life of up to 350 days.[7] The significantly extended hepatic half-lives for SGARs means that an animal that ingested the anticoagulant can potentially carry that compound for years, as compared to days or months for an FGAR.[8] These rodenticides will continue to bioaccumulate as the predators consume more rodenticides leading to health impacts and death.

The majority of some raptor species like red tailed hawks and great horned owls in proximity to the human population now carry multiple rodenticide residues, primarily SGARs.[9] A 2022 study by the California Department of Fish and Wildlife ("CDFW") found that almost half of the tested animals had exposure to three or more anticoagulant rodenticides.[10]

This extensive pre-exposure in wildlife populations can lead to a general increase in susceptibility to anticoagulation and hemorrhaging resulting from consumption of anticoagulant rodenticides. Current rodenticide assessments are carried out on individual compounds and fail to acknowledge that the second-generation anticoagulants (as well as some of the first generation anticoagulants) act on the same receptors as they bioaccumulate in the animal making their impact additive.

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[6] California Department of Pesticide Regulation 2018, An Investigation of Anticoagulant Rodenticide Data Submitted to the Department of Pesticide Regulation (Nov. 16, 2018).
[7] *Id*.
[8] *Id*.
[9] Thomas et al. 2011, Second-generation anticoagulant rodenticides in predatory birds: Probabilistic characterisation of toxic liver concentrations and implications for predatory bird populations in Canada. Environment International 37:914–920.
[10] CDFW 2022, Pesticide Exposures & Mortalities in Non-Target Wildlife, 2021 Annual Report.

Exposure to rodenticides can also lead to negative immune system effects, such as increased mange in bobcats and mountain lions.[11] Increased disease can contribute to decreased health and hunting ability, which can lead to a vicious cycle of greater susceptibility to disease.[12] These cumulative and combined impacts must be evaluated and mitigated.

D) Clarification to Bulletins Live Language

We request that the EPA require that all ESA *Bulletins Live II* language be placed at the *beginning* of the "Directions for Use" section or in a highly prominent location on any and all labels. This was requested by the NMFS in its biological opinion for malathion, chlorpyrifos and diazinon, and should be uniformly adopted across all labels for all pesticides. It is very important that this language is prominent and upfront to avoid pesticide users missing it altogether.

E) Restricted Use Classification is Ineffective Due to Bioaccumulation in Predators

Substantial evidence does not support EPA's proposed classification of restricted use pesticide ("RUP") status in order to mitigate effects on secondary non-target organisms. California categorized SGARs as restricted use in 2014. Despite restrictions placed on SGARs, "reported rates of non-target wildlife exposure to SGARs have not decreased" since the restricted use regulations on SGARs went into effect in California.[13] Making anticoagulant rodenticides restricted use pesticides would also not avoid exposures and deaths of non-target organisms, including ESA protected and rare wildlife. As evidenced in California after SGARs were made Restricted Use Pesticides ("RUPs"), there was still a significant level of SGAR exposure and poisoning of wildlife.[14] As noted in these comments the long-term persistence of rodenticides in the environment, long half-life of SGARs in wildlife, bioaccumulation and cumulative exposures of all rodenticides, but especially SGARs, make restricted use classification an ineffective mitigation.

II. Concerns with Species-specific Mitigation

The proposed mitigations for the three pilot species seek to decrease the rodenticide footprint within their range by restricting certain rodenticides and certain application methods. The EPA is right to define specific "Pesticide Sensitive Areas" and limit rodenticide use in those areas. However, the EPA continues to rely on vague definitions of habitat and propose unenforceable wind-buffers. The Ninth Circuit Court of Appeals has found that the EPA's failure to address label language that is so confusing or difficult such that a pesticide user cannot reasonably comply with such requirements runs contrary to law.[15] Instead of subjective and confusing

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[11] Riley SPD, et al. 2007. Anticoagulant exposure and notoedric mange in bobcats and mountain lions in urban southern California. J. Wildl. Manag. 71, 1874–1884. (doi:10.2193/2005-615).
[12] Beldomenico PM, et al. 2010. Disease spread, susceptibility and infection intensity: vicious circles? Trends Ecol. Evol. 25, 21–27. (doi:10.1016/j.tree.2009.06.015).
[13] CDPR 2019, California Notice 2019-03: Notice of Final Decision to Begin Reevaluation of Second-Generation Anticoagulant Rodenticides (March 12, 2019).
[14] California Department of Pesticide Regulation 2018, An Investigation of Anticoagulant Rodenticide Data Submitted to the Department of Pesticide Regulation (Nov. 16, 2018).
[15] *Nat'l Family Farm Coal. v. United States EPA*, 960 F.3d 1120, 1139-42 (9th Cir. 2020)

measures that still allow for rodenticide use in occupied habitat, the EPA should endeavor for far greater specificity and stronger, enforceable mitigations that take known, occupied habitat off the table.

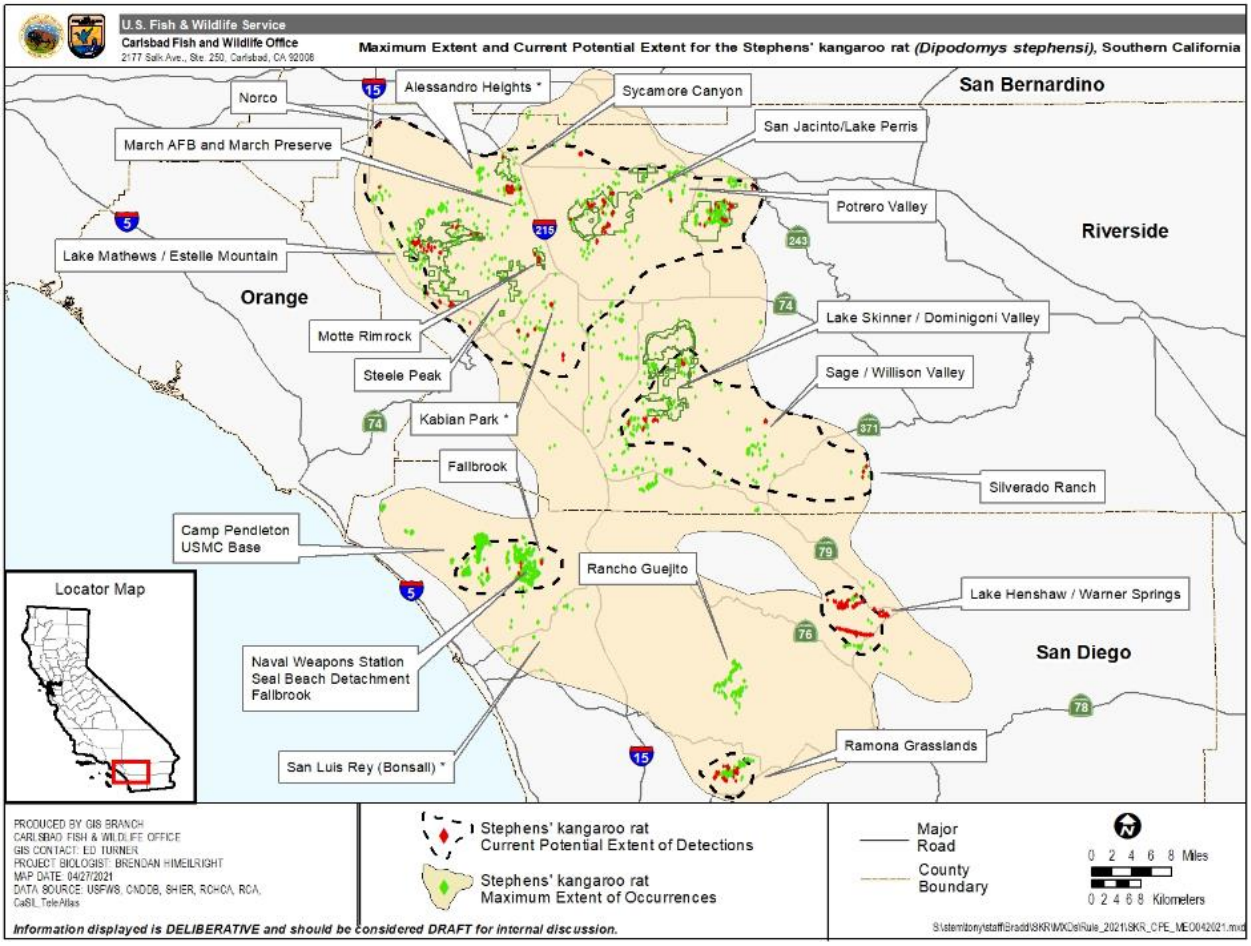
The best available geographic data on species occurrence will vary depending on the species, which will require the EPA and Services to do a meaningful assessment of each species' life history, current conservation status and available scientific data. In developing conservation measures, EPA should draw from available FWS data sources including Species Status Assessments ("SSA"), 5-year Reviews, Recovery Plans, listing decisions, and other consultations to identify known occupied sites and fully protect them from rodenticide use.

Below are specific recommendations and concerns for each of the species in the species pilot:

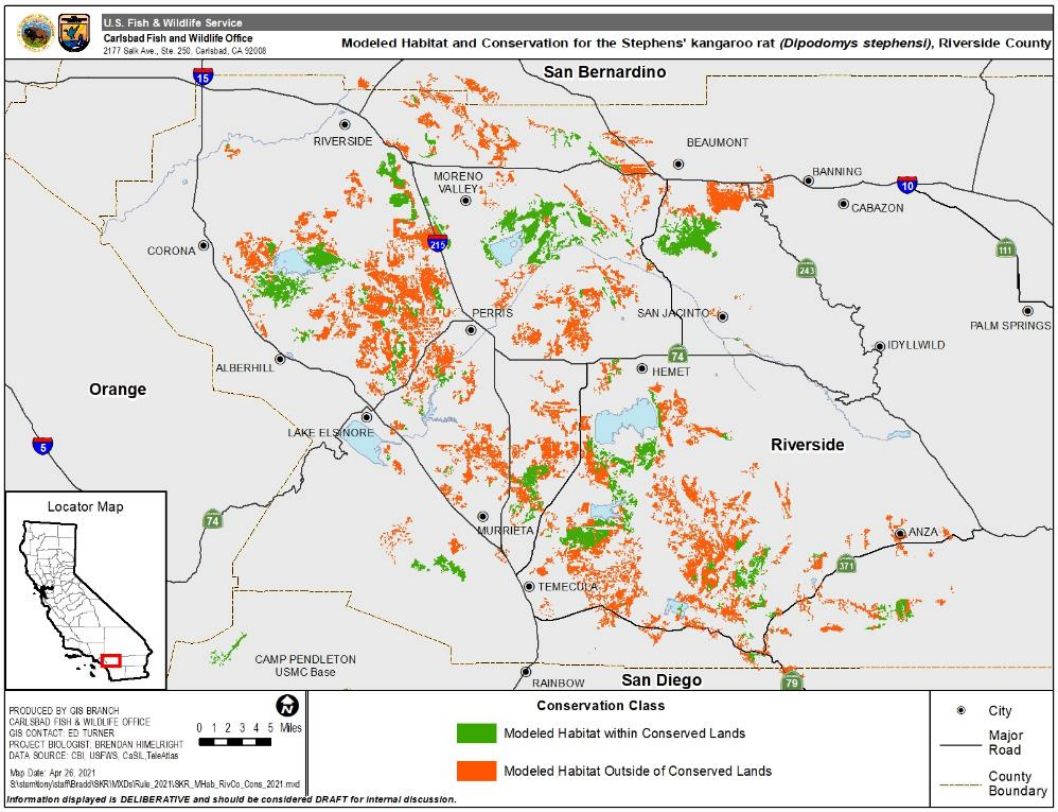
A. Stephens' Kangaroo Rat (*Dipodomys stephensi* (*incl. D. cascus*))

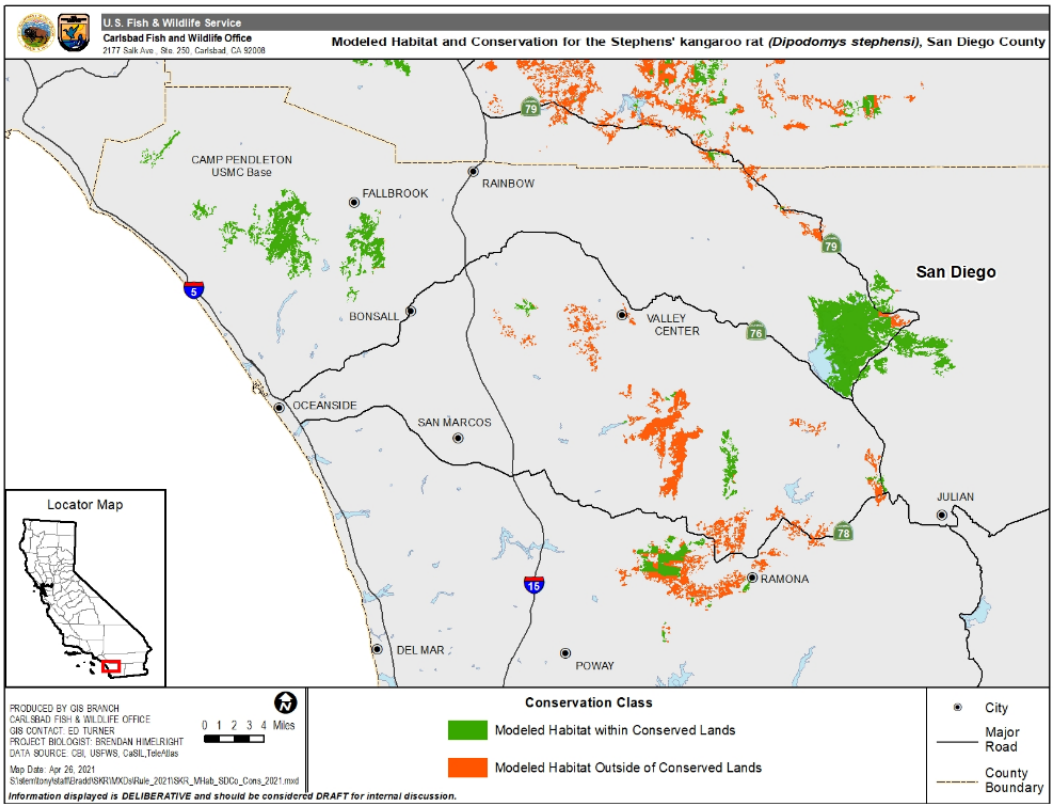
1. <u>The EPA Should Draw from All FWS Data Sources to Develop Conservation Measures</u>

In developing conservation measures, EPA should draw from available FWS data sources including SSA, 5-year Reviews, Recovery Plans, listing decisions, and other consultations to identify known occupied sites and fully protect them for pesticide use. Limiting conservation measures to mechanistic retrievals of range data from ECOS may not be appropriate for each listed species. The Stephens' kangaroo rat ("SKR") is one of those species where a retrieval of range data from ECOS is inappropriate, especially given that the SSA contains a detailed map identifying species locations based on occurrence records from survey reports, government databases, and other literature instead of a "general outline" of the SKR's range:



The map offers a much more robust and refined data set than what the EPA is currently referencing in its pilot project. In addition, the FWS has modelled habitat as it overlaps with conservation lands, highlighting areas where rodenticide use should be completely restricted except in cases of a necessary conservation protect to protect ESA listed or rare species or public health emergencies after consultation with the FWS:


U.S. Fish & Wildlife Service
Carlsbad Fish and Wildlife Office
2177 Salk Ave., Ste. 250, Carlsbad, CA 92008
Modeled Habitat and Conservation for the Stephens' kangaroo rat (Dipodomys stephensi), Riverside County
San Bernardino
RIVERSIDE
BEAUMONT
MORENO VALLEY
BANNING
CABAZON
CORONA
PERRIS
SAN JACINTO
PALM SPRINGS
IDYLLWILD
ALBERHILL
HEMET
Orange
LAKE ELSINORE
Riverside
Locator Map
MURRIETA
ANZA
TEMECULA
CAMP PENDLETON USMC Base
RAINBOW
San Diego
PRODUCED BY GIS BRANCH
CARLSBAD FISH & WILDLIFE OFFICE
GIS CONTACT: ED TURNER
PROJECT BIOLOGIST: BRENDAN HIMELRIGHT
DATA SOURCE: CBI, USFWS, CaSIL,TeleAtlas
Map Date: Apr 26, 2021
0 1 2 3 4 5 Miles
Information displayed is DELIBERATIVE and should be considered DRAFT for internal discussion.
Conservation Class
Modeled Habitat within Conserved Lands
Modeled Habitat Outside of Conserved Lands
City
Major Road
County Boundary


U.S. Fish & Wildlife Service
Carlsbad Fish and Wildlife Office
2177 Salk Ave., Ste. 250, Carlsbad, CA 92008
Modeled Habitat and Conservation for the Stephens' kangaroo rat (Dipodomys stephensi), San Diego County
CAMP PENDLETON USMC Base
FALLBROOK
RAINBOW
San Diego
BONSALL
VALLEY CENTER
OCEANSIDE
SAN MARCOS
Locator Map
JULIAN
RAMONA
DEL MAR
POWAY
PRODUCED BY GIS BRANCH
CARLSBAD FISH & WILDLIFE OFFICE
GIS CONTACT: ED TURNER
PROJECT BIOLOGIST: BRENDAN HIMELRIGHT
DATA SOURCE: CBI, USFWS, CaSIL,TeleAtlas
Map Date: Apr 26, 2021
0 1 2 3 4 Miles
Information displayed is DELIBERATIVE and should be considered DRAFT for internal discussion.
Conservation Class
Modeled Habitat within Conserved Lands
Modeled Habitat Outside of Conserved Lands
City
Major Road
County Boundary

By targeting conservations measures based on robust FWS data, the EPA can target conservation measures to known occupied sites and ensure maximum compliance instead of referencing protective measures to general habitat.

2. The EPA's Proposed Measures Greatly Reduce the Rodenticide Footprint, But Do Not Fully Protect Known Occupied Habitat.

The EPA is proposing to prohibit burrow and broadcast uses of all rodenticides except cholecalciferol, which is still allowed for use in burrows. Given the high magnitude of harm and overlap, this proposed conservation measure is appropriate to greatly reduce the footprint of harmful rodenticides within the habitat of SKR. However, these measures do not eliminate the risk to known occupied sites. Utilizing the specific location information provided above, the EPA should propose specific areas where rodenticide use is prohibited except for a necessary conservation protect to protect ESA listed or rare species or public health emergencies after consultation with the FWS.

These restrictions are necessary given that bait station use is still permitted range wide. Though the requirement of elevated bait stations or PVC pipes with upturned corners should reduce exposure, the EPA noted that poison bait may still fall to the ground or be cached at ground level by targeted species.[16] As the EPA acknowledges, it is also unclear whether tamper-resistant bait stations are currently designed to exclude kangaroo rats. There is also no clear design requirements to prevent rodenticides that target mice, rats, or voles from harming SKR. While the FWS has previously recommended additional measures such as requiring that traps are baited during daylight hours when kangaroo rats are inactive, the EPA should endeavor to prohibit rodenticide use in certain areas where SKR is known to occur.[17]

These targeted conservation measures are further justified by the risk of secondary exposure. The risk of secondary exposure to rodenticides is not negligible, as SKR consumes ants and darkling beetles common to the area and are known to consume rodenticide coated seeds.[18] Invertebrates have different blood-clotting mechanisms and are less susceptible to rodenticides, but they can keep rodenticides within their body for up to four weeks.[19] Even with bait stations specifically designed to exclude SKR, secondary exposure via insect consumption is a possibility. There are clearly targeted areas where the SKR is known to occur where rodenticide use could be completely prohibited except for a necessary conservation protect to protect ESA listed or rare species or public health emergencies after consultation with the FWS. This is not a completely novel concept, as Lake Perris State Recreation Area no longer uses rodenticides for rodent control given in part the risk to SKR.[20]

B. Attwater's Prairie Chicken (*Tympanuchus cupido attwateri*)

[16] U.S. FWS, Species Report for Stephens' Kangaroo Rat at 63 (2021) https://ecos.fws.gov/ecp/species/3495
[17] *Id.*
[18] Michele S. Deisch, *The Effects of Three Rodenticides on Nontarget Small Mammals and Invertebrates* Electronic Thesis and Dissertations at 64 (1986)
[19] Claire V. Dowding, *Accumulation of Anticoagulant Rodenticides in a Non-target Insectivore, the European hedgehog (Erinaceus europaeus).* 158 Evntl. Pollution 161, at 14 (2010) https://core.ac.uk/reader/60079?utm_source=linkout
[20] Species Report for Stephens' Kangaroo Rat at 63.

1. Rodenticide Use Must Be Restricted Within the Pesticide Sensitive Area

While conservation measures based on a spatially explicit pesticide sensitive area incorporated into BLT works to target conservation, the EPA should not rely on vague definitions of habitat to target rodenticide use within the area. Given that many rodenticide uses are still allowed area-wide, rodenticides that are likely to jeopardize the species should be prohibited within the area.

The EPA has focused on restricting rodenticide use within the a "Pesticide Sensitive Area" that was first delineated by FWS in 2004. The Attwater's prairie chicken is mainly found in its namesake national wildlife refuge, but since the chicken is known to travel several miles a day and is often spotted on adjacent farmland, restricting rodenticide use in general within this area is appropriate.[21] These areas are "spatially explicit" and thus simple to incorporate into BLT. Restricting uses within a designated area and incorporating those measures into BLT is the appropriate solution for Attwater's prairie chicken, so long as those restrictions are meaningful. The EPA could apply this strategy of restricting pesticide uses within pesticide sensitive areas to other threatened and endangered species – 28 of which already have defined pesticide sensitive areas.[22]

The EPA is proposing a prohibition on broadcast use of chlorophacinone and zinc phosphide, the latter of which is predicted likely to jeopardize the Attwater's prairie chicken. Of course, restricting rodenticide access within the habitat of the chicken is welcome, but it makes little sense to delineate a pesticide sensitive area and then prohibit rodenticide use only in certain narratively defined habitat types within that area. Zinc phosphide and chlorophacinone are only restricted in grasslands, pasture, and rights-of-ways within the pesticide sensitive area. The prohibition also excludes "rangeland" and "agricultural areas" which the EPA notes represent habitat of this species and areas that may be visited by the species.[23] There is no guidance on how to differentiate "rangeland" from "pastureland" or how to classify habitats, making it difficult for the average person to comply with the label. EPA's failure to address label language that is so confusing or difficult such that a pesticide user cannot reasonably comply with such requirements runs contrary to law.[24]

There have been previous efforts to restrict zinc phosphide in the past that take a far more aggressive posture in protecting endangered species. Since 1993, ZP Rodent Bait AG has carried a precautionary statement that forbids its use within the occupied range of the chicken, which

[21] Attwater's Prairie Chicken: Recovery Plan at 24-25 (2010) https://ecos.fws.gov/docs/recovery_plan/100426.pdf
[22] U.S. EPA, Recommended Protection Measures for Pesticide Applications in Region 2 of The U.S. Fish and Wildlife Service at 22 (2004) https://azdot.gov/sites/default/files/media/2022/10/USFWS-2007-Recommended-Protections-for-Pesticide-Applications-in-Region-2.pdf
[23] U.S. EPA. Draft Effects Determinations and Evaluation of Proposed Mitigations Intended to Avoid Jeopardizing Three Federally Listed Endangered and Threatened Species and Avoid Adversely Modifying One Designated Critical Habitat at 27 (2022).
[24] *Nat'l Family Farm Coal. v. United States EPA*, 960 F.3d 1120, 1139-42 (9th Cir. 2020)

includes a list of 13 Texas counties.[25] This precautionary statement is still on the label as of 2014.[26]

Given that diphacinone is still allowed to be used in broadcast application area-wide, and that zinc phosphide, chlorophacinone, and many other rodenticides are still able to be used in burrow and bait stations, it is unclear why broadcast use of these two chemicals of concern should not be restricted area-wide. In fact, it is unclear why zinc phosphide is not prohibited completely within this small area given its high magnitude of harm and high overlap.

Insects are also the primary food source for baby chicks, meaning there is still a concern for secondary exposure from bait station use in general, as ground-dwelling insects can access bait stations and contain rodenticides for weeks.[27]

As previously stated, we believe that the strategy of delineating and protecting pesticide sensitive areas is the appropriate solution for some species. However, we believe that there should be a general presumption against the use of pesticides – especially pesticides that could potentially harm a listed species – within a pesticide sensitive area. The EPA's Regional Pesticide Recommendations that the pesticide sensitive area is derived from even recommend that these spaces prioritize Integrated Pest Management strategies that include cultural, biological, and mechanical controls.[28] The pesticide sensitive area is a very small area that is of great importance to the survival of the Attwater's prairie chicken, and it should not be presumed that all manner of rodenticide use is authorized until the EPA takes affirmative action to restrict it.

Of course, we agree that the use of rodenticides for legitimate conservation purposes or for recognized public health emergencies is permissible, so long as it is done in consultation with the FWS.

2. <u>The EPA Must Address Bait Station Spillage</u>

Notwithstanding our concerns about broadcast use of rodenticides within the pesticide sensitive area, we remained concerned that highly toxic rodenticides can still be used within bait stations with seemingly no restrictions and without addressing the issue of spillage.

The EPA states that rodenticides that are only used in bait stations are supposedly not a concern (i.e., brodifacoum, bromadiolone, bromethalin, cholecalciferol, difenacoum, difethialone, strychnine, and warfarin). However, the EPA's narrative does not properly address the issue of spillage from bait stations, which is a common problem and can occur with any bait formulation or bait station due to rodent activity.[29]

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[25] ZP Rodent Bait AG (1993)
[26] Label Amendment (Agency Initiated) – Minor Amendment to Precautionary Statements (2014) https://www3.epa.gov/pesticides/chem_search/ppls/012455-00017-20140806.pdf
[27] Alejandro A. Calixto et al, *Final Report: Impact of Red Imported Fire Ants on Insect Abundance as a Food Source for Broods of the Critically Endangered Attwater's Prairie Chicken* at 3 (2009) https://tpwd.texas.gov/huntwild/wild/research/highlights/taxa/publications/Calixto_etal_2009_FireAntsAPC.pdf
[28] U.S. EPA, Recommended Protection Measures at 29 (2004)
[29] Mt. Dept. of Agriculture, Managing Agricultural Rodent Pests with Bait Stations (Sept. 22, 2022) https://agr.mt.gov/_docs/vertebratepests-docs/ManagingAgriculturalRodentPestswithBaitStations.pdf

The EPA acknowledges the issue of spillage but claims that "bait that is kicked or spilled out of the bait station can be cleaned up to reduce risk of exposure," though no further elaboration is given as to how those stations should be monitored to ensure no exposure. The Attwater's prairie chicken is a seedeater, and consumption of spilled seeds coated with a rodenticide is a concern that should be addressed in this pilot, especially if bait station use will still be permitted within the pesticide sensitive area, though use should be generally restricted.

While spillage is a common concern with all formulations, there is generally less concern about nontarget exposure from wax block baits when they are securely housed within bait stations.[30] While loose grains may be more effective, without design modifications to bait stations – like a substantial, spill-proof internal lip – the risk of spillage from rodents kicking grains out onto the ground increases.[31]

The EPA has determined in the past that the use of inadequate bait protections in sensitive areas constitutes a misuse of a pesticide.[32] If the EPA is going to allow highly toxic rodenticides to be freely used within bait stations, they must offer label instructions that specify how certain baits must be protected within the bait station. The EPA is already recommending specific bait-station designs for the Stephen's kangaroo rat. It should do the same for the Attwater's prairie chicken.

3. <u>The EPA Should Not Incorporate "Usage Data" to Refine Conservation Measures</u>

Actual usage data that is detailed, refined, and site-specific does not exist in Texas, and the FWS's heavy reliance on it in its malathion Biological Opinion is fundamentally flawed. It is therefore inappropriate for the EPA to consider refining protections for the Attwater's prairie chicken through usage data and deviate away from the scientifically appropriate and legally required step of assessing impacts to endangered species based on the pesticide use authorized by the pesticide label. As noted by the National Marine Fisheries Service, actual use data cannot be relied upon to make assumptions about exposure potential given the degree of uncertainty and speculation associated with it.[33] Put simply, "this data may be useful for marketing decisions, but [it is] not designed for the purpose of assessing risk to threatened or endangered species."[34] This process must analyze impacts to endangered species according to what is legally sanctioned on the label instead of relying on spurious claims of actual use. Doing otherwise would eviscerate Congress' clear command to "give the benefit of the doubt to the species."[35]

C. California Condor (*Gymnogyps californianus*)

1. <u>The EPA Should Identify Occupied Areas Where Rodenticide Use Should Be Prohibited</u>

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[30] Roger A. Baldwin, *Effectiveness of Rodenticides for Managing Invasive Roof Rats and Native Deer Mice in Orchards* 21 Envtl. Sci. & Pollution Research 5795, 5800 (2014).
[31] *Id.*
[32] Rodenticide Bait Station; Hearings 28 Fed. Reg. 48711 (Oct. 20, 1983) https://www.govinfo.gov/content/pkg/FR-1983-10-20/pdf/FR-1983-10-20.pdf
[33] NMFS, *Draft Revised Biological Opinion on Chlorpyrifos, Malathion, and Diazinon* at 2829 (Feb. 25, 2022)
[34] *Id.* at 2820.
[35] *Connor v. Burford*, 848 F. 2d, 1411, 1454 (9th Cir. 1988).

While the EPA is proposing restrictions to applications "within set distances of occupied condor range or designated critical habitat" to reduce likelihood of exposure, the EPA can use more refined information to identify the obvious areas where California condor is reliably found, and target rodenticide use restrictions. The current range-wide prohibition is likely unenforceable, though some areas within the range of the condor are clearly high-use and could be explicitly identified and protected.

The range map cited by the EPA in the pilot is a decade old, and is even less refined than current ECOS range maps. While the designated critical habitat cited is current, there are clear "physical and biological features" (i.e., foraging grounds) within critical habitat where rodenticide use will occur. Given that highly refined, precise location data for the California condor exists, it makes little sense to implement half-measures in the entirety of the range instead of prohibiting uses in known occupied areas where it would have the greatest impact.

There has been an enormous investment in intense monitoring and management of adults, sub-adults, and nestlings.[36] Nearly all released condors are fitted with radiotelemetry monitors, and there are more radiotagged condors now than in free-living populations in the past.[37] Some condors are even fitted with GPS satellite reporting transmitters that provide hourly position fixes with an accuracy of 50 meters.[38] The FWS has also intensively monitored and managed nest in southern California since 2007.[39] The EPA could use this data to identify specific occupied areas within the range and critical habitat of the California condor where rodenticide use should not be occurring under any circumstances.

2. <u>Wind-direction Contingent Buffers are not Effective or Enforceable.</u>

The EPA's current proposal prohibits broadcast rodenticide application upwind from range and critical habitat "when air currents are moving towards those areas" to presumably eliminate drift or volatilization from rodenticides likely to jeopardize condors. Bait drift is a possibility for broadcast application of rodenticides,[40] and buffers of 200 yards by air or 40 yards by ground may be minimally appropriate, however wind-direction contingent buffers are not effective, not enforceable, and allow any person to claim the wind was not blowing when they sprayed, making the mitigation essentially useless. If the EPA continues to recommend wind buffers, such a measure must be omnidirectional to protect condor habitat.

3. <u>In Known Occupied Habitat and Critical Habitat, All Rodenticide Use Should be Prohibited.</u>

Even though five rodenticides where predicted likely to jeopardize the condor, bait stations, burrows, bait paste, floating bait stations, and tracking powders are still permitted within occupied habitat. As discussed above, there are clear and obvious areas where condors are reliably located and where all rodenticide use should be prohibited. Critical habitat and foraging

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[36] Jeffrey R. Walters et al *Status of the California Condor (Gymnogyps Californianus) and Efforts to Achieve its Recovery* 4 THE AUK 969, 972 (2010).
[37] *Id.* at 990.
[38] *Id.* at 989.
[39] *Id.* at 982.
[40] Richard M. Engemann *Assessing Spatial Variation and Overall Density of Aerially Broadcast Toxic Bait During a Rat Eradication on Palmyra Atoll* 20 ENVTL. POLLUTION RESEARCH 480, 486 (2013)

areas within critical habitat should also be off limits to rodenticide use given their importance to the survival of the condor.

The EPA states that the prohibitions "would then focus the mitigations on rodenticide bait station and burrow uses" without elaborating on what this means or what measures would be implemented.[41] If the EPA is to expand on restrictions for other rodenticide formulations, they should elaborate further.

4. Prohibiting Feral Hog Rodenticide Use Will Greatly Reduce Rodenticide Footprint

The EPA's proposal to prohibit rodenticide use for feral hog control within the range and designated critical habitat of the condor would greatly reduce the rodenticide footprint and opportunity for secondary consumption while restricting uses in occupied habitat. Rodenticides can still be used if the applicator coordinates with the local FWS office.

We agree with the EPA that alternative methods of controlling feral hogs could be used within the range of the California condor. If control of feral hogs is done in conjunction with FWS, non-chemical controls should be preferred over chemical rodenticides. If natural methods are not possible, applications of rodenticides that have no effect on the condor are preferred. These applications must be time-limited so as not to permanently authorize new uses in the habitat of the condor.

5. Carcass Search and Removal is Unlikely to Reduce Secondary Consumption

We remain skeptical of carcass search and removal as a way to justify increased use of rodenticides throughout the range of the California condor. Historically, these programs have not achieved their stated goals. Requiring carcass searches as a means to justify increased rodenticide use is inappropriate and likely to increase secondary consumption.

The EPA recognizes that carcass survey and disposal only eliminates a portion of affected carcasses, but it claims that RUP classification means the applicator would be better at finding carcasses. In a perfect world, strict adherence to these standards combined with diligent search protocols could eliminate secondary exposure routes. However, there is little evidence that these search and survey protocols are followed, and even less evidence that classifying a rodenticide as an RUP would perfect the carcass search.

The rodenticide Rozol contained a carcass search provision that failed to reduce secondary consumption.[42] Applicators were required to return to sites twice to dispose of prairie dog carcasses, though relevant information on applicator behavior implied that few, if any, dead prairie dogs were collected and disposed of in a manner that reduces secondary exposure. In fact, during a stakeholder meeting where the EPA proposed increasing visits after application, one participant indicated that no one adhered to the two-visit requirement, and that adding additional visits would meet a similar fate.

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[41] Draft Effects Determination at 39

[42] *See* U.S. FWS, Final Biological Opinion for Rozol Use on Black-tailed Prairie Dogs Registered Under Section 3 of the Federal Insecticide, Fungicide and Rodenticide Act at 19-22 (2012).

While the EPA similarly proposes visit requirements, the current proposal lacks specific protocols on how to conduct the search. The FWS previously noted that the lack on specific protocols for Rozol contributed to the ineffectiveness of carcass search in general. Random search protocols would decrease efficacy, though requiring systematic searches may increase detection rate.

In a perfect world, a carcass search and removal program like the EPA has proposed would result in a 100% detection rate that completely halted secondary consumption. However, these programs do not work as intended, and should not be touted as a justification for increased authorization of rodenticides. The EPA should focus efforts on restricting rodenticide use where possible within the critical habitat and known occupied sites of the condor.

III. EPA Must Ensure Compliance with the ESA and Plan for Additional Label Changes Associated with ESA Compliance

EPA recognizes that it failed to consider the risks to from rodenticides for ESA-protected species that are threatened with extinction.[43] This serious omission not only violates the ESA's congressional mandate, but is also a fatal flaw under FIFRA because EPA does not have substantial evidence to support that it registered inpyrfluxam without unreasonable adverse effects on the environment.[44]

"'Congress has spoken in the plainest of words, making it abundantly clear that the balance has been struck in favor of affording endangered species the highest of priorities, thereby adopting a policy which it described as 'institutionalized caution.'"[45] Agencies must "give endangered species priority" to halt and reverse the trend toward species extinction.[46] Yet, EPA intentionally and knowingly stopped short of undertaking the congressionally mandated analysis of risks to endangered and threatened species when it proposed mitigations and conducted the analysis in the proposed interim decision. Without the analysis of risks to endangered species, EPA does not have substantial evidence to assert there aren't any unreasonable adverse effects on the environment.

EPA has recognized that its FIFRA Risk Assessment cannot cure this evidentiary gap because the ESA has a heightened statutory standard to protect species from extinction and scientific deficiencies in EPA's FIFRA analysis result in "insufficient protections" for ESA-protected species.[47] EPA's reliance on flawed and limited data in analyzing the effects of pesticides on "precarious" populations of wildlife does not meet FIFRA's substantial evidence standard.[48]

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[43] Rodenticides: Draft Effects Determinations and Evaluation of Proposed Mitigations Intended to Avoid Jeopardizing Three Federally Listed Endangered and Threatened Species and Avoid Adversely Modifying One Designated Critical Habitat, EPA-HQ-OPP-2015-0778-0096 at App. C.
[44] 7 U.S.C. § 136a(c)(5).
[45] *Cottonwood Envtl. Law Ctr. v. United States Forest Serv*., 789 F.3d 1075, 1091 (9th Cir. 2015).
[46] *Tennessee Valley Authority v. Hill*, 437 U.S. 153, 185 (1978).
[47] EPA Announces Endangered Species Act Protection Policy for New Pesticides, https://www.epa.gov/newsreleases/epa-announces-endangered-species-act-protection-policy-new-pesticides
[48] *Pollinator Stewardship Council v. United States EPA*, 806 F.3d 520, 529-32 (9th Cir. 2015).

IV. Second Generation Anticoagulant Rodenticides: Brodifacoum, Bromadiolone, Difenacoum, Difethialone

While all of the rodenticides under review pose grave risks to non-target organisms, because Second Generation Anticoagulant Rodenticides ("SGARs") pose an unreasonable adverse effect on the environment and public health, EPA should cancel all existing registrations allowing SGARs only for use as a last resort during demonstrated public health or environmental emergencies for a period not longer than 30 days. In opening the registration review docket for SGARs, the Center submitted comments from over 24,000 individuals, and 29 groups urging the EPA to cancel SGARs.[49] SGARs should only be allowed when there is a recognized emergency condition such as an urgent, non-routine situation that requires the use of a pesticide to address public health threat or significant risk to endangered or threatened species, beneficial organisms, or the environment.

Despite a declining long term trend, SGARs continue to present an unreasonable adverse risk to public health given the range of alternative Integrative Pest Management strategies[50] and alternative rodenticide products. The most recent report from the American Association of Poison Control Centers found that annual poisonings resulting from SGARs continues to result in an unreasonable number of public health incidents with over 3,000 exposures in 2021 and at least 73% (3,377) of those involving children under 6 years old.[51]

A. Anticoagulant Rodenticides

Rodenticides are designed to kill mammals through the interference with blood clotting mechanisms and their effects on humans and non-target mammals are qualitatively the same as their effects on target pests. Poisoning occurs by ingestion of bait, or via consumption of poisoned animals. Rodenticides can be divided into three broad classes in terms of their effects: first generation anticoagulants, second generation anticoagulants, and nonanticoagulants. SGARs pose the greatest ongoing threat to wildlife.

The first- and second generation anticoagulants interfere with blood clotting and death results from hemorrhage. For both first generation and second generation anticoagulants, primary manifestations include nosebleeds, bleeding gums, hematuria, melena, and extensive ecchymoses (bruises). Animals may also have symptoms of anemia, including fatigue and difficulty breathing on exertion. If the poisoning is severe, the animal may progress to shock and death.

SGARs, which include brodifacoum, bromadiolone, difenacoum, and difethialone, are acutely toxic and have a high risk of severe unintended poisoning for children, pets, and other non-target wildlife. This is due to the fact that second-generation anticoagulants remain in the body longer

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[49] *E.g.* Regulations.gov docket # EPA-HQ-OPP-2015-0767-0044.

[50] Safe Rodent Control Resource Center. Rodent Control Strategies. Available at: http://saferodentcontrol.org/site/rodent-control/

[51] : David D. Gummin, et al (2022) 2021 Annual Report of the National Poison Data System© (NPDS) from America's Poison Centers: 39th Annual Report, Clinical Toxicology, 60:12, 1381-1643, DOI: 10.1080/15563650.2022.2132768 at 1589 (Long-Acting Anticoagulant Rodenticides incidents).

than first generation anticoagulants, with half-lives of up to 350 days, and may also accumulate in an animal's body when consumed during multiple feedings. As a result, predatory birds and mammals that feed on dead poisoned rodents or live rodents that have received a sub lethal dose are especially vulnerable to secondary poisoning from SGARs.

B. Second Generation Anticoagulants Lead to Direct Mortality of Non Target Wildlife

SGARs contribute to deaths of significant numbers of non target wildlife because the physiological effects of anticoagulants are not limited to the target animal or the animal that originally ingests the anticoagulant. SGAR's greater acute toxicity increases the potential for primary poisoning amongst non-target species, meaning that the non-target species may be killed after only one feeding of rodenticide bait.[52] In addition, the longer tissue half-lives of SGARs enhance the potential for bioaccumulation in non-target predators in particular and increase the risk of secondary poisoning.[53]

Non target wildlife deaths due to the exposure to SGARs are well documented in the scientific literature.[54] Studies of upper level predators have shown anticoagulant rodenticide toxicosis in raptors.[55] A study conducted on bobcats and mountain lions discovered a highly significant correlation between anticoagulant rodenticides and death from notoedric mange.[56] In the study, 31/39 bobcats had detectable levels of brodifacoum.[57] One bobcat died directly due to brodifacoum toxicity, and 4/4 mountain lions had detectable levels of brodifacoum – with two of the lions dying from direct exposure to anticoagulant rodenticides.[58]

Wildlife mortality incident poisoning reports and necropsies have also indicated the persistent problem of mortality to non target organisms from anticoagulant rodenticides. Recent studies in California by the California Department of Pesticide Regulation ("CDPR") found that brodifacoum was likely involved in 13% of reported animal mortalities and bromadiolone was likely involved in approximately 3% of reported animal mortalities.[59] Nationwide wildlife mortality incident reports compiled by the U.S. Environmental Protection Agency ("EPA") demonstrate poisoning and deaths to non-target wildlife for several decades.[60]

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[52] Thomas et al. 2011, Second generation anticoagulant rodenticides in predatory birds: probabilistic characterization of toxic liver concentrations and implications for predatory bird populations in Canada. Environment International 37:914–920.
[53] *Id*.
[54] Eason et al 2002. Assessment of Risks of Brodifacoum to Non-target Birds and Mammals in New Zealand, Ecotoxicology, 11, 35-48 2002.
[55] Murray 2011. Anticoagulant rodenticide exposure and toxicosis in four species of birds of prey presented to a wildlife clinic in Massachusetts, 2006-2010. J Zoo Wildl Med. 2011 Mar;42(1):88-97.
[56] Riley S.P.D. et al. (2007) Anticoagulant Exposure and Notoedric Mange in Bobcats and Mountain Lions in Urban Southern California. J. Wildlife Management 71(6) 1874–1884.
[57] *Id*.
[58] *Id*.
[59] CDPR 2013, Memorandum: Second Generation Anticoagulant Rodenticide Assessment, Deborah Daniels, DVM, Senior Environmental Scientist (June 27, 2013).
[60] EPA 2013, Compilation of Rodenticide Wildlife Mortality Incident Reports Between 1971-2012 (January 29, 2013).

In July 2004, EPA published a report that concluded second-generation anticoagulants – and brodifacoum in particular – present the highest potential overall primary and secondary risks to birds and nontarget mammals.[61] Two years later EPA confirmed that "several monitoring programs have found that a major portion of some animal populations are being exposed to second-generation anticoagulant rodenticides."[62]

C. Sublethal Effects of Second Generation Anticoagulants Contribute to Wildlife Deaths

Even if exposed wildlife survive after anticoagulant rodenticide intoxication, the animal still may suffer possible disruptions in vital physiological processes. Analysis by the California Department of Pesticide Regulation of SGAR exposure to non-target wildlife "found evidence of possible population-level impacts among non-target wildlife in California due to statistically significant associations with SGAR exposure and sublethal impacts."[63] Damage to the heart muscle has been shown in both birds and mammals following brodifacoum exposure.[64] Liver damage, disruptions of physiological processes leading to osteoporosis, or calcium remobilization and deposition in the circulatory system are all possible because of the impact upon vitamin K biochemistry.[65] Unusual ranging behavior in bobcats was positively associated with increased levels of anticoagulant rodenticides. The presence of anticoagulants is also associated with other diseases and may act synergistically with natural environmental stressors to increase susceptibility to naturally occurring lethal diseases.[66] Multiple studies have shown that even sub-lethal doses can impact blood clotting, and result in biochemical abnormalities (including glucose and liver function markers), and physiological abnormalities (including statistically significant decreased body weight, increased liver size, increased heart size, and increased kidney size), which could or did cause mortality in the laboratory setting.[67]

Exposure to rodenticides can also lead to negative immune system effects, such as increased mange in bobcats and mountain lions.[68] Increased disease can contribute to decreased health and hunting ability, which can lead to a vicious cycle of greater susceptibility to disease.[69]

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[61] EPA 2004, Potential Risks of Nine Rodenticides to Birds and Nontarget Mammals: a Comparative Approach, (July 2004).
[62] EPA 2006, Memorandum: Rodenticide Incidents Update (November 15, 2006).
[63] CDPR 2019, California Notice 2019-03: Notice of Final Decision to Begin Reevaluation of Second-Generation Anticoagulant Rodenticides (March 12, 2019).
[64] Rahmy 1993, Myocardial alterations in animals intoxicated with an anticoagulant rodenticide. J. Egypt. Ger. Soc. Zool. 12C: 87-98.
[65] Knopper et al 2007, Bone Density and breaking strength in UK raptors exposed to second generation anticoagulant rodenticides. Bull Environ Contam Toxicol 78:249–251.
[66] Riley et al. 2007, Anticoagulant Exposure and Notoedric Mange in Bobcats and Mountain Lions in Urban Southern California, J. Wildlife Management 71(6) 1874–1884.
[67] CDPR 2013, Memorandum: Second Generation Anticoagulant Rodenticide Assessment, Deborah Daniels, DVM, Senior Environmental Scientist (June 27, 2013).
[68] Riley SPD, et al. 2007. Anticoagulant exposure and notoedric mange in bobcats and mountain lions in urban southern California. J. Wildl. Manag. 71, 1874–1884. (doi:10.2193/2005-615).
[69] Beldomenico PM, et al. 2010. Disease spread, susceptibility and infection intensity: vicious circles? Trends Ecol. Evol. 25, 21–27. (doi:10.1016/j.tree.2009.06.015).

Other sub lethal effects at dose levels orders of magnitude below lethal levels have been reported.[70] Sub-lethal doses of brodifacoum caused abortions and reduced lambing rates in sheep.[71] Several studies also indicate that sub-lethal concentrations of second generation anticoagulants may cause mortality to embryos.[72]

A particularly worrisome research finding has been the report of brodifacoum toxicosis in neo-natal dogs following a past sub-lethal exposure in the mother.[73] The risk of trans-placental transfer is of obvious concern given the high proportion of mammals found carrying residues, including endangered species such as the San Joaquin kit fox.

D. Wildlife is Broadly Exposed to Second Generation Anticoagulants

Second-generation anticoagulant rodenticides have long been of concern for wildlife.[74] In 1999, the CDFW was sufficiently concerned about one of the second-generation anticoagulants – brodifacoum – that it requested CDPR to reevaluate all rodenticides containing that active ingredient.[75] Between 1994 and 2000 in California, second-generation anticoagulants were detected in 70% of mammals and 68% of birds examined; signs of intoxication were seen in 43% of exposed wildlife.[76] Between 2014 and 2018 in California, over 87% of animals tested had been exposed to SGARs.[77] Despite restrictions placed on SGARs, "reported rates of non-target wildlife exposure to SGARs" did not decrease when the restricted use regulations on SGARs went into effect.[78] In 2000, the list of potentially affected mammals was already extensive including coyote, red and gray fox, raccoon, bobcat, mountain lion as well as the endangered San Joaquin kit fox. As for raptors, golden eagles and barn owls were showing the highest exposure levels.

EPA found that incident reports have identified many taxa of non-target animals exposed to rodenticides, including strict carnivores such as mountain lions, bobcats, hawks and owls; omnivores such as coyotes, foxes, skunks and raccoons; and granivores and herbivores such as

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[70] USEPA 1998, Reregistration Eligibility Decision (RED) Rodenticide Cluster, EPA738-R-98-007; USEPA 2004, Potential Risks of Nine Rodenticides to Birds and Nontarget Mammals: a Comparative Approach (July 2004).
[71] Godfrey 1985, Non-target and secondary poisoning hazards of "second generation" anticoagulants. Acta zoologica fennica 173: 209-212.
[72] Laas et al. 1985, Retention of brodifacoum in sheep tissues and excretion in faeces, New Zealand J. Agric. Res. 28:357-359; Godfrey et al. 1980, Preliminary dosing trials of a new anticoagulant, brodifacoum, as a toxicant for the rabbit, *Oryctolagus cimiculus* (L.). New Zealand J. Exper.Agric. 8:1-5; Munday et al 2003, Brodifacoum toxicosis in two neonatal puppies. Vet Pathol. 40:216.
[73] Munday et al. 2003, Brodifacoum toxicosis in two neonatal puppies. Veterinary Pathology 40:216.
[74] Alterio 1996, Secondary poisoning of stoats (*Mustela erminea*), feral ferrets (*Mustela furo*), and feral house cats (*Felis catus*) by the anticoagulant poison, brodifacoum, New Zealand Journal of Zoology, 1996, Vol. 23: 331-338.
[75] CDPR 1999, Notice of proposed reevaluation of pesticide products, California Notice 99-7 (December 30, 1999).
[76] Hosea 2000, Exposure of non-target wildlife to anticoagulant rodenticides in California. In: Salmon, T.P. and A.C. Crabb, (eds.) Proceedings of the Nineteenth Vertebrate Pest Conference. University of California, Davis, CA. 236-244.
[77] CDPR 2018, An Investigation of Anticoagulant Rodenticide Data Submitted to the Department of Pesticide Regulation (Nov. 16, 2018)
[78] CDPR 2019, California Notice 2019-03: Notice of Final Decision to Begin Reevaluation of Second-Generation Anticoagulant Rodenticides (March 12, 2019).

squirrels and deer. EPA's ecological incident report documents anticoagulant residues in 27 avian species and 17 mammalian species.[79]

In May 2008, EPA published its risk-mitigation decision for rodenticide bait products containing the second-generation anticoagulants brodifacoum, bromadiolone, difenacoum, and difethialone. Therein, EPA described in detail the evidence that second-generation anticoagulants are having a significant adverse impact on non-target wildlife, and the agency concluded that "widespread exposures to second-generation anticoagulants are occurring wherever those rodenticides are being used."[80] The U.S. Fish & Wildlife Service determined that "second-generation rodenticides have proven to be a greater threat to nontarget wildlife due to their high toxicity and ability to bioaccumulate in tissue."[81]

Between 1995 and 2011, approximately 73% of animals tested in California had residues of at least one SGAR.[82] Difethialone residues were found in approximately 8% of the animals analyzed.[83] Bromadiolone residues were found in approximately 37% of the animals analyzed, and bromadiolone was likely involved in approximately 3% of animal mortalities.[84]

Brodifacoum was the most widespread and lethal SGAR. Brodifacoum residues were found in approximately 69% of the 492 animals tested by CDPR, and brodifacoum was likely involved in 13% of animal mortalities.[85] The 2011 Scientific Advisory Panel convened by the United States Environmental Protection Agency also concluded that terrestrial food chains were widely contaminated with brodifacoum, the most studied SGAR to date.

Birds of prey are especially subject to secondary poisoning from brodifacoum via ingestion of contaminated animals.[86] Data from Canada indicates that it is becoming difficult to find uncontaminated great horned owls or red tailed hawks, and that the majority of birds in proximity to the human population now carry multiple rodenticide residues, primarily second generation anticoagulants.[87] Similarly, in California the exposure of numerous species of wildlife to anticoagulant rodenticides is widespread.[88] Even after increased restrictions on SGARs, such as those that went into effect in 2021 in California, wildlife is still broadly exposed to SGARs.[89]

California's large percentage of wildlife within close proximity of the wildlife-urban interface create similarly negative correlations between populated centers and rodenticide poisonings. A

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[79] EPA 2008, Risk Mitigation Decision for Ten Rodenticides (May 28, 2008).
[80] *Id*.
[81] US Fish and Wildlife Service 2005, Comments on EPA's Potential Risks of Nine Rodenticides to Birds and Nontarget Mammals: A Comparative Approach (February 28, 2005).
[82] CDPR 2013, Memorandum: Second Generation Anticoagulant Rodenticide Assessment, Deborah Daniels, DVM, Senior Environmental Scientist (June 27, 2013).
[83] *Id*.
[84] *Id*.
[85] *Id*.
86 Thomas 2011, Second generation anticoagulant rodenticides in predatory birds: probabilistic characterization of toxic liver concentrations and implications for predatory bird populations in Canada. Environment International 37:914–920.
[87] *Id*.
[88] CDFW 2021, Pesticide Exposures & Mortalities in Non-Target Wildlife, 2020 Annual Report.
[89] CDFW 2022, Pesticide Exposures & Mortalities in Non-Target Wildlife, 2021 Annual Report.

spatial analysis of raptor incidents in San Diego, Fresno, Kern and Madera counties in California suggested a higher number of rodenticide detections in urban areas with higher population density.[90] Similarly, a study of bobcats and mountain lions in the Santa Monica area showed exposure rates to SGARs near urbanized areas of southern California pervasive.[91] The prevalence of rodenticide poisoning and exposure is also indicated in wildlife mortality incident reports compiled by the EPA demonstrating poisoning and deaths to non target wildlife for several decades.[92]

E. ESA Listed Species Are Frequently Poisoned and Killed by SGARs

The pervasive nature of SGARs in the environment and food chain lead to lethal and sub-lethal harm to endangered species. As noted by state and federal wildlife officials SGARs "can cause take, including mortality, which could have 'substantial population level effects' on an endangered species that is 'in danger of extinction.'"[93]

Comprehensive data from EPA, CDPR, and scientific literature document poisonings and deaths of ESA listed species.[94] The EPA has determined that the use of rodenticides containing brodifacoum,[95] bromadiolone,[96] difethialone,[97] and difenacoum[98] are likely to adversely affect several ESA listed species in California, including the Alameda whipsnake (*Masticophis lateralis euryxanthus*), salt marsh harvest mouse (*Reithrodontomys raviventris*), San Joaquin kit fox (*Vulpes macrotis mutica*), Giant kangaroo rat (*Dipodomys ingens*), Stephen's kangaroo rat (*Dipodomys stephensi*), Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*), Fresno kangaroo rat (*Dipodomys nitratoides exilis*), and Point Arena mountain beaver (*Aplodontia rufa nigra*).[99]

EPA has further determined that brodifacoum, difethialone, and bromadialone are likely to jeopardize the continued existence of at least four ESA listed species--the Morro Bay kangaroo

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[90] Lima et al. 2010. Assessing some potential environmental impacts from agricultural anticoagulant uses. Proc. 24th Vertebr. Pest Conf. (R.M. Timm and K.A. Fagerstone, Eds.) University of California; Earthjustice 2012, Comments on Notice of Proposed Decision to Renew Pesticide Product Registrations for 2013, Director's Findings and Public Report, California Notice 2012-14 (December 7, 2012).
[91] Riley 2007, Anticoagulant Exposure and Notoedric Mange in Bobcats and Mountain Lions in Urban Southern California. J. Wildlife Management 71(6) 1874–1884.
[92] EPA 2013, Compilation of Rodenticide Wildlife Mortality Incident Reports Between 1971-2012 (January 29, 2013).
[93] CDPR 2013, Memorandum: Second Generation Anticoagulant Rodenticide Assessment, Deborah Daniels, DVM, Senior Environmental Scientist (June 27, 2013).
[94] *Id*.; CDPR 2013, Memorandum: Second Generation Anticoagulant Rodenticide Assessment, Deborah Daniels, DVM, Senior Environmental Scientist (June 27, 2013).
[95] EPA 2012, Letter from S. Bradbury (EPA) to G. Frazier (FWS) regarding Endangered Species Act consultation for brodifacoum (March 30, 2012).
[96] EPA 2011, Letter from A. Pease (EPA) to G. Frazier (FWS) regarding Endangered Species Act consultation for bromadiolone (September 30, 2011).
[97] EPA 2011, Letter from A. Pease (EPA) to G. Frazier (FWS) regarding Endangered Species Act consultation for difethialone (September 30, 2011).
[98] EPA 2012, Letter from S. Bradbury (EPA) to G. Frazier (FWS) regarding Endangered Species Act consultation for difenacoum (March 30, 2012).
[99] EPA 2004, Potential Risks of Nine Rodenticides to Birds and Nontarget Mammals: a Comparative Approach, Attachment E (July 2004).

rat (*Dipodomys heermanni morroensis*), Salt marsh harvest mouse (*Reithrodontomys raviventris*), Fresno kangaroo rat (*Dipodomys nitratoides exilis*), and San Clemente loggerhead shrike (*Lanius ludovicianus mearnsi*).[100] The EPA and wildlife experts have also noted incidents of SGAR exposure, poisoning, and death of the federally listed northern spotted owl (*Strix occidentalis caurina*)[101] and Pacific fisher (*Pekania pennant*)[102], including incidents in California. There have also been reported deaths of California condors associated with SGARs.[103]

While data and analysis from government agencies and scientific literature demonstrate harm to numerous species the data regarding harm to certain wildlife species is overwhelming. In one study 87% of kit foxes in Bakersfield had been exposed to anticoagulant rodenticides from commensal rodents.[104] Data through 2011 from the CDFW reports approximately 50 kit fox individuals in Kern County alone with detectible levels of brodifacoum, ranging from 0.007 to 11 ppm.[105] This level of exposure to SGARs poses a high risk of sublethal and lethal impacts on endangered kit foxes.[106]

EPA reported in an endangered species assessment that exposure of the endangered kit fox to the second generation anticoagulant brodifacoum is extensive.[107] EPA further determined that the use of rodenticides containing the second generation anticoagulants brodifacoum,[108] bromadiolone,[109] difethialone,[110] and difenacoum[111] are likely to adversely affect several ESA

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[100] *Id*.

[101] EPA 2008, Risk Mitigation Decision for Ten Rodenticides (May 28, 2008); Gabriel 2017, Exposure to rodenticides in Northern Spotted and Barred Owls on remote forest lands in northwestern California: evidence of food web contamination, Avian Conservation and Ecology 13(1):2. https://doi.org/10.5751/ACE-01134-130102; Weins 2019, Anticoagulant rodenticides in *Strix* owls indicate widespread exposure in west coast forests, Biological Conservation 238 (2019) 108238.

[102] Gabriel 2012, Anticoagulant Rodenticides on our Public and Community Lands: Spatial Distribution of Exposure and Poisoning of a Rare Forest Carnivore. PLoS ONE 7(7): e40163. doi:10.1371/journal.pone.0040163

[103] FWS 2017, Critically endangered California condor death in Fresno County related to trespass marijuana cultivation (Oct. 27, 2017) https://www.fws.gov/news/ShowNews.cfm?ref=critically-endangered-california-condor-death-in-fresno-county-related-to-&_ID=36177; NPS, Condor Memorial (Updated Sept. 24, 2019) https://www.nps.gov/pinn/learn/nature/condormemorial.htm

[104] McMillan 2008, Anticoagulant Rodenticide Exposure in an Urban Population of the Joaquin Kit Fox. Proc. 23rd Vertebr. Pest Conf.

[105] CDPR 2013, Memorandum: Second Generation Anticoagulant Rodenticide Assessment, Deborah Daniels, DVM, Senior Environmental Scientist (June 27, 2013); McMillan et al. (2008) Anticoagulant Rodenticide Exposure in an Urban Population of the Joaquin Kit Fox. Proc. 23rd Vertebr. Pest Conf.

106 EPA (2012) Risks of brodifacoum use to the federally threatened Alameda whipsnake (*Masticophis lateralis euryxanthus*) and the federally endangered salt marsh harvest mouse (*Reithrodontomys raviventris*) and San Joaquin kit fox (*Vulpes macrotis mutica*). March 30 2012.

[107] EPA 2012, Risks of brodifacoum use to the federally threatened Alameda whipsnake (*Masticophis lateralis euryxanthus*) and the federally endangered salt marsh harvest mouse (*Reithrodontomys raviventris*) and San Joaquin kit fox (*Vulpes macrotis mutica*). March 30 2012. Appendix D.

[108] EPA. (March 30, 2012) Letter from S. Bradbury (EPA) to G. Frazier (FWS) regarding Endangered Species Act consultation for brodifacoum.

[109] EPA. (September 30, 2011) Letter from A. Pease (EPA) to G. Frazier (FWS) regarding Endangered Species Act consultation for bromadiolone.

[110] EPA. (September 30, 2011) Letter from A. Pease (EPA) to G. Frazier (FWS) regarding Endangered Species Act consultation for difethialone.

[111] EPA. (March 30, 2012) Letter from S. Bradbury (EPA) to G. Frazier (FWS) regarding Endangered Species Act consultation for difenacoum.

listed species species including the kit fox. The EPA has determined that there is such a high risk of kit foxes consuming poisoned rodents that use of rodenticides in the range of the kit fox will almost certainly lead to mortality.[112] Pesticide laboratory reports conducted by the CDFW have validated this analysis. Necropsy reports demonstrate high levels of brodifacoum coupled with internal hemorrhaging indicating that kit foxes were killed in California due to lethal doses of second generation anticoagulants.[113] Take and population level impacts on endangered species is particularly concerning for the San Joaquin kit fox because at least five San Joaquin kit fox deaths have been attributed to SGARs by official necropsy reports from the CDFW.[114]

V. General Concerns with EPA Predictive Jeopardy Approach to Endangered Species Act Compliance.

It is important to recognize several critical limitations with the EPA's approach in assessing the likely harms to listed species. First and foremost, the EPA does not possess the statutory authority or scientific expertise to correctly assess or make "predictive" determinations regarding jeopardy to any listed species, as such determinations can only be made by the U.S. Fish and Wildlife Service and National Marine Fisheries Service during formal consultations under the Endangered Species Act. Jeopardy can only be assessed in context of the full suite of threats to any given species, after considerations of the environmental baseline, cumulative effects and the real-world conservation status of any given species. However, we recognize that the EPA is making efforts to make strides in protecting species from pesticides and commend its efforts.

We do agree that the EPA can, somewhat accurately, assess the relative likelihood of severe harm to listed species from pesticides, but its methodologies continue to overlook key information including, for example, the relative extinction risk within taxonomic groups of similar species.

Second, it is vital for the EPA to recognize that the consultation process contains two, mandatory statutory goals: (1) avoiding jeopardy or adverse modification of critical habitat, and (2) *minimization* of unavoidable take in situations where jeopardy will not occur.[115] To the extent

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112 EPA (2012) Risks of brodifacoum use to the federally threatened Alameda whipsnake (*Masticophis lateralis euryxanthus*) and the federally endangered salt marsh harvest mouse (*Reithrodontomys raviventris*) and San Joaquin kit fox (*Vulpes macrotis mutica*). March 30 2012.

113 Department of Fish and Game 2007, Pesticide Laboratory Report, Lab. No: P-2386, E.P. No: L-200-04; Department of Fish and Wildlife 2013, Lab. No. P-2721, Necropsy No. N13-210; Department of Fish and Wildlife 2014, Lab. No. P-2740, Necropsy No. N13-241; Department of Fish and Wildlife 2014, Lab. No. P-2736, CAHFS D1315042; Department of Fish and Wildlife 2017, Lab. No. P-3165, Necropsy No. Z16-1082.; CDFW 2017, Endangered Foxes Poisoned By Rodenticides (November 17, 2017) https://cdfgnews.worCDPRess.com/2017/11/17/endangered-foxes-poisoned-by-rodenticides/

114 Department of Fish and Game 2007, Pesticide Laboratory Report, Lab. No: P-2386, E.P. No: L-200-04; Department of Fish and Wildlife 2013, Lab. No. P-2721, Necropsy No. N13-210; Department of Fish and Wildlife 2014, Lab. No. P-2740, Necropsy No. N13-241; Department of Fish and Wildlife 2014, Lab. No. P-2736, CAHFS D1315042; Department of Fish and Wildlife 2017, Lab. No. P-3165, Necropsy No. Z16-1082; CDFW 2017, Endangered Foxes Poisoned By Rodenticides (November 17, 2017) https://cdfgnews.worCDPRess.com/2017/11/17/endangered-foxes-poisoned-by-rodenticides/.

115 16 U.S.C. 1536(b)(4) (The Secretaries shall provide: "a written statement that (i) specifies the impact of such incidental taking on the species, (ii) specifies those reasonable and prudent measures that the Secretary considers necessary or appropriate to minimize such impact."

that EPA's Proposed Interim Decision might mean that the re-registration of the 11 rodenticides here could avoid jeopardy for a subset of listed species, that is a positive step. However, reducing take to a level that possibly avoids jeopardy for three species does not mean that EPA has satisfied the requirements of the ESA, *all* unavoidable take must be minimized in order to receive an Incidental Take Statement. The Center supports the EPA's efforts to reduce take to listed species at the front-end of consultation and at every opportunity during EPA's registration review processes, but it should not, and may not legally, create the expectation that these initial mitigation measures are sufficient for full compliance with the Endangered Species Act.

EPA has identified at least three species that are highly vulnerable to methomyl and that have habitats and lifecycles that make them appropriate for a pilot such as this. Based on the review of these data, a logical conclusion would be that rodenticide use jeopardizes the continued existence of these species and that mitigations are required for these species under both the legal requirements of the Federal Insecticide, Rodenticide and Fungicide Act and the Endangered Species Act.

Finally, we would also like to emphasize that EPA's reliance on the approach within the FWS's malathion BiOp is extraordinarily problematic. The BiOp remains has a range of legal and factual flaws, in part because it failed to fully assess the full range of harms from insecticides for many listed species, and both its draft and final conclusions regarding jeopardy are highly problematic. Excessive reliance by the EPA on the FWS malathion BiOp could cause the EPA problems down the road.

VI. Cost-Benefit Balancing for The Proposed Pilot Mitigations is Unlawful

We fully understand the complexities involved in implementing ESA-specific mitigations in the context of a preliminary interim decision, which is a FIFRA action. The EPA typically conducts a cost-benefit balancing for its FIFRA actions, while the ESA specifically forbids it.
In EPA's recent ESA workplan update,[116] it appears that EPA intends to do a cost-benefit balancing when it proposes broad label mitigations. The agency views these actions as furthering its FIFRA obligations because these mitigations have broad ecological benefits, not just to listed species.[117] However, EPA also believes that targeted mitigations to protect certain listed species, in the form of Bulletins or certain geographies, do not require a cost-benefit balancing because that action is governed by the ESA standard.[118] Importantly, EPA states that this is also the case when the targeted mitigation is included through registration review.

Given that EPA has stated that targeted mitigations to protect listed species are not subject to a cost-benefit analysis the inclusion of a cost benefit analysis related to ESA mitigation in the benefits document[119] is inappropriate. Conducting a cost-benefit analysis in this pilot undermines

[116] EPA. ESA WORKPLAN UPDATE: Nontarget Species Mitigation for Registration Review and Other FIFRA Actions. Nov. 2022, https://www.epa.gov/system/files/documents/2022-11/esa-workplan-update.pdf
[117] *Id.* at 5.
[118] *Id.*
[119] Use and Benefits Assessment for 11 Rodenticides and Impacts of Potential Risk Mitigation, EPA-HQ-OPP-2015-0778-0095 at 41-43

the ESA and is in direct violation of EPA's recent workplan update.[120] We request that the EPA clarify its benefits document for these proposed revisions in order to clear up any confusion as to how EPA developed its mitigation plan.

VII. Conclusion

Thank you for your consideration of these comments,

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[120] EPA. ESA WORKPLAN UPDATE: Nontarget Species Mitigation for Registration Review and Other FIFRA Actions. Nov. 2022, https://www.epa.gov/system/files/documents/2022-11/esa-workplan-update.pdf