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THE UNITED STATES DISTRICT COURT
OF ARIZONA

Center for Biological Diversity, et al., *Plaintiffs*, v. United States Environmental Protection Agency, et al., *Defendants*, and Bayer CropScience LP, et al., *Defendant-Intervenors.*	Case No. CV-20-00555-DCB **PLAINTIFFS' MOTION FOR SUMMARY JUDGMENT** Oral Argument Requested

NOTICE OF MOTION

Pursuant to Local Rule of Civil Procedure 56.1 and Rule 56 of the Federal Rules of Civil Procedure, Plaintiffs Center for Biological Diversity, National Family Farm Coalition, Pesticide Action Network, and Center for Food Safety (Plaintiffs) hereby move for summary judgment on all claims of their Third Amended Complaint for Declaratory and Equitable Relief on the grounds that the Environmental Protection Agency's (EPA) approval violated the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), the Endangered Species Act (ESA), and the Administrative Procedure Act (APA). This motion is based on the pleadings and Administrative Record on file in this case and the Statement of Facts based on that Record, the points and authorities herein, and the declarations submitted herewith.

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GLOSSARY

APA	Administrative Procedure Act
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FIFRA	Federal Insecticide, Fungicide, Rodenticide Act
FWS	Fish and Wildlife Service
LOC	Level of Concern
NAS	National Academy of Sciences
NMFS	National Marine Fisheries Service
NOAEC	No Observed Adverse Effect Concentration
OTT	Over-the-Top
PCE	Primary Constituent Elements
RQ	Risk Quotient
VRA	Volatility Reduction Adjuvant
VSI	Visual Sign of Injury

INTRODUCTION AND SUMMARY OF ARGUMENT

Today's summary judgment filing has been some time coming, for multiple reasons beyond Plaintiffs' control. And it is comprehensive, as Plaintiffs have endeavored to provide the Court with the clearest picture possible, marshaling all the evidence and setting forth the lengthy background. But stepping back, this case is also quite straightforward. Less than three years ago, the Ninth Circuit held unlawful EPA's controversial dicamba approval for multiple reasons and vacated its registration. The court's factual findings cataloged the damning, unprecedented record of widespread harm from dicamba drift to farmers and the environment. The court gave a long laundry list of errors for EPA to fix, if it were to try and re-register the same dicamba use. Most importantly, EPA had to actually analyze and *weigh* the costs of drift damage to farmers, and could not rely on an unrealistic, impossible label to conclude dicamba use does not cause unreasonable adverse effects, when all the evidence screams that it does. Instead, EPA, under the prior administration, rushed to re-approval in a matter of months, fixing *none* of it, thumbing its nose at the court.

EPA also found new, different ways to violate FIFRA, ignoring additional costs and adverse impacts, like harm to trees and orchards, and harm from dicamba runoff and contaminated rainwater. This time EPA mysteriously registered dicamba use under the harder unconditional standard, but without meeting any of the prerequisites for it. And in its rush, EPA skipped no less than *three* separate required public notice-and-comment processes (any of which would have put the case back right before the Ninth Circuit on direct review). And last, but definitely not least, EPA continued to flout its ESA responsibilities, refusing to seek the guidance of the expert wildlife agencies to protect endangered species from dicamba harm, despite putting literally hundreds of species at risk.

Any of those violations, let alone all of them, are more than enough. But there's still

more: the new administration's EPA put out an absolutely damning 2021 report basically admitting its mitigation in the 2020 Decision had failed, showing drift harm continuing or worsening and admitting harm to endangered species, and consequently admitting that even EPA—the responsible defendant agency—was not sure the registration complied with FIFRA and the ESA. And then did… essentially nothing about it.

And so it's left to this Court. This is an important case with a lengthy record, but in terms of outcome it is crystal clear: Plaintiffs are entitled to summary judgment, and the Court should vacate the 2020 Decision.

PROCEDURAL HISTORY[1]

This case is the latest chapter in a series. In this case's direct precursor, the Ninth Circuit struck down Defendant EPA's registration of the same over-the-top use of dicamba at issue in this case. *Nat'l Fam. Farm Coal. v. EPA*, 960 F.3d 1120, 1124, 1144–45 (9th Cir. 2020) (*NFFC*). The Court held EPA violated FIFRA six separate ways, *id.* at 1124, 1144 (summarizing holdings), separated into two parts: EPA "substantially understated three risks it acknowledged" and "also entirely failed to acknowledge three other risks." *Id.* at 1124. As that case was heard on direct appellate review, the court's detailed decision was also filled with factual record findings recounting the catastrophic result for farmers and the environment from EPA's novel registration: millions of acres of off-field dicamba drift, as well as damage to crops, wild plants, and native ecosystems each growing season since EPA first approved over-the-top spraying in 2016. *Id.*; *see* Pls.' Stmt. Facts (SOF) ¶¶ 17–53 (filed concurrently).

The first group of holdings all related to costs to farmers from dicamba drift. The Ninth Circuit held that EPA understated the dicamba amount sprayed (and thus the drift harm from it), *id.* at 1124, 1136, improperly minimized the amount of under-reporting of

[1] The Statement of Facts is submitted separately per the Court's rules and covers the procedural history in more detail.

drift damage, *id.* at 1137–38, and, despite the copious record evidence of drift harm, in its registration decision "refused to quantify or estimate the amount of damage caused" by drift as an economic cost. *Id.* at 1138.

As to the second group of violations, the Ninth Circuit first held that EPA had predicated its registration on unrealistic and unanalyzed mitigation, entirely failing to account for the substantial non-compliance with the dicamba use instructions or grapple with the near impossibility of following the label in real-world farming conditions, and what that would mean for increased drift damage. *Id.* at 1144. That is, the Court held that EPA improperly based its approval on the premise that the label's mitigation would be followed and thus limit off-field drift, when the record evidence showed that label instructions were "difficult if not impossible" to follow. *Id.* at 1124. Second, EPA similarly failed to recognize and factor in another, separate "clear" economic cost: drift damage coercing farmers to defensively adopt dicamba-resistant crops, and its anti-competitive, monopolistic ramifications. *Id.* at 1142. Finally, EPA entirely failed to consider the social costs to farming communities: dicamba drift had "torn apart" their "social fabric," pitting neighbor against neighbor, causing damage to crops and also trees and gardens. *Id.* at 1143. For these reasons, the Ninth Circuit held EPA's decision was contrary to the record and the agency had "failed to perform a proper analysis of the risks and the resulting costs of the uses." *Id.* at 1144.

As to remedy, the Ninth Circuit vacated EPA's decision, finding it "exceedingly unlikely" EPA could (lawfully) issue the same registration again and that EPA failed to overcome its burden of showing why vacatur is not warranted. *Id.* at 1145. EPA subsequently issued its own "final cancellation order" for the dicamba uses. SOF ¶ 54.

Yet four months later, in late October 2020, EPA re-approved over-the-top dicamba

spraying,[2] and Plaintiffs filed this corresponding case. Compl., ECF 1. In December 2021, with a year's worth of evidence under the new registration, EPA issued a damning report (the Report) revealing significant drift damage continuing despite the 2020 Decision's mitigation measures and openly admitting that the agency was no longer sure if the registration could be sustained under FIFRA or the ESA. EPA subsequently minorly revised the 2020 Decision with superseding amendments for a handful of states but otherwise decided to largely leave it as is, twice, in March 2022 and in February 2023. Notices, ECFs 73 & 137. Each time, Plaintiffs supplemented their Complaint to encompass the most recent EPA decisions. Am. Compls., ECFs 84 & 149.

STANDARDS OF REVIEW

Summary judgment is appropriate if there is no genuine issue of material fact, and the moving party is entitled to judgment as a matter of law. Fed. R. Civ. P. 56(c); *Celotex Corp. v. Catrett*, 477 U.S. 317, 322–23 (1986).

Under the APA, a court must "hold unlawful and set aside" agency decisions that are "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law," or adopted "without observance of procedure required by law." 5 U.S.C. § 706(2). In determining if an action is "arbitrary and capricious," courts evaluate whether the agency "examine[d] the relevant data and articulate[d] a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.'" *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983). An action is "arbitrary and capricious if the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of

[2] Plaintiffs refer to EPA's continued approval of over-the-top dicamba use collectively as the Decision or the Registration Decision, and specify agency decisions by year (2020 Decision, 2022 Decision, or 2023 Decision) where appropriate.

agency expertise." *Id.*

In APA review, the Court must conduct a "searching and careful inquiry, the keystone of which is to ensure that the [agency] engaged in reasoned decision making." *Nw. Coal. for Alts. to Pesticides v. EPA*, 544 F.3d 1043, 1052 n.7 (9th Cir. 2008) (internal quotation omitted). The APA standards apply here. *See, e.g.*, *Ctr. for Food Safety v. Regan*, 56 F.4th 648, 656 (9th Cir. 2022) (explaining that "because the ESA does not specify a standard of review, we review EPA's compliance under the [APA]"); *Ellis v. Housenger*, 252 F. Supp. 3d 800, 808 (N.D. Cal. 2017) (reviewing FIFRA challenge under 7 U.S.C. § 136n(a) under APA standards); *Friends of Animals v. EPA*, 383 F. Supp. 3d 1112, 1120 (D. Or. 2019) (holding APA standards for "other final actions" of EPA under § 136n(a)).[3]

SELECT STATUTORY BACKGROUND[4]

FIFRA: In registering pesticides, the core standard is the "unreasonable adverse effects" standard. That is, EPA applies a cost-benefit analysis "to ensure that there is no unreasonable risk created for people or the environment from a pesticide." *Pollinator Stewardship Council v. EPA*, 806 F.3d 520, 522–23 (9th Cir. 2015). That cost-benefit analysis "is the *critical determination* that the pesticide complies with FIFRA's safety standard." *NRDC*, 38 F.4th at 53 (emphasis added). Congress anticipated that EPA's balancing of costs and benefits would "take every relevant factor [the agency] can conceive into

[3] FIFRA also provides its own standard of review for direct appellate review: EPA must support registrations with "substantial evidence." 7 U.S.C. § 136n(b). Like APA review, the agency's reasoning "must also be coherent and internally consistent." *Nat. Res. Def. Council v. EPA (NRDC)*, 38 F.4th 34, 44 (9th Cir. 2022). Given that this case was previously heard via that provision, and the difference is EPA's (unlawful) failure to hold notice-and-comment, *see supra*, there is some question if it should also apply. Regardless, the standards are similar, and any difference between them is irrelevant, as EPA's 2020 Decision does not pass muster under either. *See, e.g., Ass'n of Data Processing Serv. Orgs. v. Bd. of Governors of the Fed. Reserve Sys.*, 745 F.2d 677, 683–84 (D.C. Cir. 1984) (Scalia, J.) (holding "there is no *substantive* difference between" arbitrary and capricious and substantial evidence tests).

[4] For more detail, *see* ECF 149 ¶¶ 43–97 (pp. 17–32).

account," S. Rep. 838, 92d Cong. 2d Sess., reprinted in 1972 U.S.C.C.A.N. 3993, 4032–33, and thus defined "unreasonable adverse effects on the environment" to mean "any unreasonable risk to man or the environment, taking into account the economic, social, and environmental costs and benefits of the use of any pesticide." 7 U.S.C. § 136(bb).

The challenged 2020 Decision is an "unconditional" registration, which EPA can only grant if it concludes that the pesticide (1) "will perform its intended function without unreasonable adverse effects on the environment," *id.* § 136a(c)(5)(C), and (2) "when used in accordance with widespread and commonly recognized practice [the pesticide] will not generally cause unreasonable adverse effects on the environment." *Id.* § 136a(c)(5)(D); *see also* 40 C.F.R. § 152.112(e).

FIFRA also requires that EPA hold notice-and-comment for pesticide registrations that create, *inter alia*, a "changed use pattern," 7 U.S.C. § 136a(c)(4), which EPA interprets to include, *inter alia*, "any additional use pattern that would result in a significant increase in the level of exposure, or a change in the route of exposure, to the active ingredient of man or other organisms." 40 C.F.R. § 152.102; *id.* at § 152.3 ("new use"). Finally, after a pesticide cancellation, EPA's regulations impose even more procedural requirements and a heightened standard for un-canceling and re-approval. *See* 40 C.F.R § 164.

ESA: Congress enacted the ESA to ensure the survival and recovery of endangered species. 16 U.S.C. § 1531(b), (c). Unlike FIFRA's cost-benefit analysis, Congress made a "conscious decision" to give endangered species priority over the "'primary missions' of federal agencies." *Tennessee Valley Auth. v. Hill*, 437 U.S. 153, 185 (1978).

Section 7 is the ESA's "heart," crucial to the recovery of ESA-protected species. *Karuk Tribe v. U.S. Forest Serv.*, 681 F.3d 1006, 1019 (9th Cir. 2012) (en banc). Through it, EPA has a substantive duty to "insure" authorizations of pesticides are not likely to jeopardize any species or adversely modify any critical habitat. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.02. To satisfy its substantive duties, EPA has a procedural duty: evaluating the registration's effects "in consultation with and with the assistance of" the agencies that—

unlike EPA—Congress designated as having endangered species expertise any time EPA determines its actions "may affect" protected species or critical habitat. 16 U.S.C. § 1536(a)(2); 50 C.F.R. §§ 402.14(a), 402.01(b). "[T]he strict substantive provisions of the ESA justify *more* stringent enforcement of its procedural requirements, because [they] are designed to ensure compliance with the substantive provisions." *Thomas v. Peterson*, 753 F.2d 754, 764 (9th Cir. 1985) (emphasis in original), *abrogated on other grounds by Cottonwood Env't Law Ctr. v. U.S. Forest Serv.*, 789 F.3d 1075, 1088–89 (9th Cir. 2015).

APA: Under the APA, agency actions that qualify as rules must go through notice-and-comment. 5 U.S.C. §§ 553(b), (c). The APA defines "rule" as "the whole or a part of an agency statement of general or particular applicability and future effect designed to implement, interpret, or prescribe law or policy." *Id.* § 551(4). Legislative rules are agency decisions that "create rights, impose obligations, or effect a change in existing law pursuant to authority delegated by Congress." *Hemp Indus. Ass'n v. Drug Enforcement Admin.*, 333 F.3d 1082, 1087 (9th Cir. 2003).

ARGUMENT[5]

I. The Registration Is Arbitrary and Capricious, Contrary to FIFRA and the APA.

EPA has been sitting on dynamite since rushing to re-issue the challenged dicamba use approval in late 2020 (the 2020 Decision). And by December 2021—then with a year under the new registration—EPA had compiled the dicamba drift evidence, *see* U.1 (the Report), and the results were *devastating*: the registration measures that registrants and EPA assured stakeholders would, this time, finally halt the problem had utterly failed.

The evidence left EPA little choice but to admit that "despite the control measures

[5] Plaintiffs have standing because the Decision injures Plaintiffs' professional, economic, environmental, aesthetic, and recreational interests. *Hunt v. Wash. State Apple Advert. Comm'n*, 432 U.S. 333, 342–43 (1977). *See* Clauser Decl.; Bradley Decl.; Newman Decl.; Hess Decl.; Limberg Decl.; Faux Decl.; Mormann Decl.; Smith Decl.; Buse Decl.; Trimble Decl.; Nelms Decl.; Suckling Decl.

... 2021 incident reports *show little change* in number, severity, or geographic extent of dicamba-related incidents" compared to prior years. Ex-R.9 at 2 (emphasis added); U.1 at 43. [redacted], U.1 at 9, 30 & 43, and drift hit between 65,000 to over a quarter-million soybean fields, indicating damage to as many as *15.6 million* farmland acres. A.6 at 31, tbl.8. [redacted], U.1 at 18, tbl.3, fn.1, [redacted]. *Id.* at 18 tbl.3, fn.5; *see also id.* at 17.

[redacted], *id.* at 17, [redacted] *Id.* at 24. [redacted] *Id.* at 5.

These are all reasons why EPA said in its official release accompanying the Report that it was no longer sure "whether over-the-top dicamba can be used in a *manner that does not pose unreasonable risks* to non-target crops and other plants, or to listed species and their designated critical habitats." Ex-R.10 at 2;[6] *see also* Pls.' Mot. Complete, ECF 108; Ex-R.9 at 2–3. Thus, the agency was "evaluating all of its options for addressing future dicamba-related incidents." Ex-R.10 at 3 (EPA repeated this verbatim to the Court later, *see* EPA's Opp'n, ECF 67 at 3). Even more bluntly, EPA admitted to reporters that the agency was not even sure it could "continue to defend the 2020 dicamba registration" as it was in this lawsuit. Ex-R.11 at 2 ("[W]e [EPA] do have significant concerns about the ability for us to continue to make arguments in the ongoing litigation. ...[W]e are examining our ability to continue to defend it.").

[6] For the Court's convenience, Plaintiffs concurrently reattach the extra-record materials cited to in Plaintiffs' pending Motion to Complete/Supplement the Administrative Record, ECF 108, and distinguish them from the record citations by "Ex-R."

Yet in March 2022, four months later, when EPA did finally act, it was a whimper, not a roar: it only made minor registration amendments for two of 34 states (Minnesota and Iowa), including a June 20th cutoff in Iowa, and a June 12th cutoff and 85-degree temperature restriction for part of Minnesota. *See* ECF 73-1. Beyond that, EPA declared that the 2022 Decision "does not affect any conditions that were previously imposed on this registration," Q.9 at 1, and that the agency did not prepare a "new ecological risk assessment" beyond what it had done in 2020. *Id.* at 2.[7] *In other words: everything we said in 2020 in terms of the Decision and risk assessment, still goes.*

Given the minor 2022 amendment, and for only two states, it was perhaps no surprise that the 2022 season turned out to be just as disastrous. *See* SOF ¶ 157 ("EPA has reason to believe dicamba-related incidents continued through the 2022 growing season as well."). Yet now faced with a *second* chance to fix the 2020 Decision, instead EPA again largely just doubled down on it, this time making minor changes to further restrict over-the-top dicamba use in three more states (Iowa again, plus Illinois, Indiana, and South Dakota), merely tightening the application dates in those states. *See* SOF ¶ 158. EPA's actions are classic arbitrary and capricious agency action, contrary to the record before the agency at the time and failing to make a "rational connection between the facts found and the choice made." *State Farm*, 463 U.S. at 43.

First, the scope of EPA's 2022 & 2023 Decisions is arbitrary and capricious. There are multiple aspects of the 2020 Decision that the Report and the Record exposed as wholly inadequate, yet EPA did not even attempt to address them, in either 2022 or 2023. The 2022 Decision only covered two states, when the Report showed drift harm continuing in 29 of 34 states; the 2023 Decision made changes in three more states, when the Record showed that multiple states sought further use restrictions. SOF ¶¶ 159–160,

[7] EPA used the same language for the other product registration amendments. *See also* ECFs 73-1 & 73-2 & 73-3; S.1; R.9.

168, 171. EPA "entirely failed to consider" these myriad problems. *Id.*

Unrealistic reliance on an impossible label: For example, [redacted]. *NFFC*, 960 F.3d at 1139–41 (detailing "extensive evidence" of the real-world difficulty in complying and citing numerous examples of how few hours the extensive restrictions left available for legal spraying). [redacted], U.1 at 33–34, [redacted] *Id.*; SOF ¶¶ 117–125.

Yet EPA's 2022-2023 Decisions did nothing to address the problem. *State Farm*, 463 U.S. at 43. [redacted]. U.1 at 38.

Volatility: And lack of feasibility aside, [redacted]. U.1 at 6, 21; SOF ¶ 122–124. [redacted] *Id.* at 37; *see* SOF ¶ 125.

The same can be said for all the other critical failings the Ninth Circuit found, *NFFC*, 960 F.3d at 1124, 1144, and that EPA claimed to have assessed and remedied, including: buffers' inadequacy; under-reporting of drift incidents; social costs to farming communities; and economic costs, including monopolistic effects.[8] The Report revealed

[8] *See* SOF ¶¶ 55–82; Mot. Lift Stay, ECF 66 at 10–13 (and citations therein).

that all continued and in some cases *worsened*. Yet EPA in its 2022-2023 Decisions arbitrarily and capriciously failed to address *any* of them. *State Farm*, 463 U.S. at 43.

Second, there is also a major "failure to explain" APA violation. In light of the new evidence summarized in the Report, EPA said it was re-reviewing "*whether* over-the-top dicamba can be used in a manner that *does not pose* unreasonable risks to non-target crops and other plants, or to listed species and their designated critical habitats." Ex-R.10 at 3 (emphases added). In other words, EPA admitted it was not sure whether the Decision might be posing unreasonable risks. This makes sense, considering widespread damage in the Report and potential jeopardy to endangered species from incidents in ESA counties.

Yet under FIFRA and the ESA, EPA *must* be sure of the opposite: first that the Decision will "*not* generally cause unreasonable adverse effects on the environment," 7 U.S.C. § 136a(c)(5)(D) (emphasis added); 40 C.F.R. § 152.112(e); and second that the Decision is not likely to jeopardize any federally listed species or adversely modify any designated "critical" habitat. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.02.

It follows then that EPA needed to explain how its 2022-2023 Decisions cleared up its own admitted uncertainties, yet EPA failed to explain: (1) how the amendments address the many problems with the Decision that the Report revealed; and (2) how the amendments meet EPA's FIFRA and ESA statutory duties in light of the Report (and its own prior statements about its import). *A Community Voice v. EPA*, 997 F.3d 983, 986 (9th Cir. 2021) (holding that a "failure to explain" how addressing a harm by an agency in the "face of mounting evidence" of that danger is arbitrary and capricious).

Instead, EPA's sparse rationale[9] for the 2022-2023 Decisions raises more questions than answers. In March 2022, [redacted]

[9] Any explanation the agency provides now is *post hoc* litigation positioning that cannot sustain the Decision. *Nat. Res. Def. Council v. EPA*, 735 F.3d 873, 877 (9th Cir. 2013) ("'It is well-established that an agency's action must be upheld, if at all, on the basis articulated by the agency itself.'") (quoting *State Farm*, 463 U.S. at 50).

[redacted] U.1 at 38, EPA suddenly found it "likely" that more restrictions would *help* the situation without any explanation of their feasibility in real-world farming conditions. Q.9 at 1–2; R.9 at 1–2; S.1 at 1–2. EPA then based its 2022 Decision (a June 20th cutoff date for Iowa and June 12th/85-degree temperature restriction for southern Minnesota) solely on the 2020 ecological risk assessment's general conclusion that volatility is reduced in lower temperatures, without explaining why then the 2020 assessment would not also support such restrictions in the 27 other states that also experienced significant damage. *Id.*

And after another season of widespread damage in 2022, *see* SOF ¶¶ 157–165, EPA again found it "likely" that the 2023 Decision would reduce volatility based again on the 2020 assessment and alleged success in Minnesota. SOF ¶ 170. But according to states and academics, the 2022 growing season in Minnesota did not provide a reliable metric for whether the June 12th cutoff date reduced damage (due to an unusually wet spring preventing many growers from using dicamba before the cutoff date as well as underreporting following five years of growing dicamba fatigue). Stevenson Decl., Ex. I at 1; Ex. H at 5; Ex. K at 26 (filed concurrently). And Bayer admitted that its amendment rationale (adopted by EPA) was not based on peer-reviewed studies. Z.41 at 4.

Nevertheless, EPA moved forward with the 2023 Decision in four states because they accounted for a "significant" percentage of off-target movement in the last three years. [redacted] U.1 at 18, tbl.3. [redacted] Nowhere did EPA explain how its 2023 Decision will mitigate damage in those states.

Finally, nowhere did EPA explain how the 2023 Decision will protect federally

protected species. Even if the additional restrictions do protect species in Indiana, Illinois, Iowa, Minnesota, and South Dakota, [redacted] U.1 at 18.

II. EPA Failed to Fix the Violations the Ninth Circuit Held.

Even without the Report confirming the hard truth—that the 2020 Decision failed to prevent unreasonable adverse effects and risks to endangered species—there was plenty of evidence this would be the result. In the frantic months—SOF ¶¶ 55–60—between the vacatur of the prior approval and the 2020 Decision, EPA tried to paper over the violations the Ninth Circuit had held, but it could not fix them.

A. Unreasonable Reliance on Infeasible Use Instructions

The Ninth Circuit held that EPA failed to study and account for the fact that, under the 2018 label measures approved, farmers could not both follow directions and control weeds. *NFFC*, 960 F.3d at 1139–42, 44. But just months later EPA again relied on many of the *exact same* mitigation use instructions, despite the fact that in prior seasons they had proved "difficult if not impossible to follow." *Id.* at 1124, 1140–41; *see* SOF ¶ 70 (listing measures). Indeed, the 2020 Decision not only included but *added to* the complex directions the court previously found deficient, producing a myriad of evidence that in the real world of farming they cannot be followed in most cases. *See* SOF ¶¶ 117–125. EPA relied on these measures' effectiveness to support its no "unreasonable adverse effects" determination in 2018 and has done so again. Yet EPA has again improperly failed to account for the risk of users' inability to follow these instructions despite their best efforts.

Importantly, EPA wrongly presents the crux of this issue as applicators' inability to properly understand a complex label, E.3 at 4 ("[redacted]"); E.17 at 4 ("[redacted]

[redacted]"), when the real issue is that the weather-related usage instructions are so numerous and restrictive as to make it impossible, on a consistent basis in the real world, to successfully use the products for their intended purpose of weed control while still complying with the label. *See* SOF ¶¶ 117–125, 42–47, 72.

B. Drift and Its Economic Costs

The Ninth Circuit also held that EPA violated FIFRA multiple ways with regards to drift's economic costs: EPA understated the amount sprayed, improperly minimized under-reporting of incidents, and overall for its cost-benefit analysis "refused to quantify or estimate the amount of damage caused." *NFFC*, 960 F.3d at 1124, 1136–38.

And just as in 2018, the Record before EPA in 2020 was replete with evidence of crop damage, as well as injury to beekeepers, orchards, vineyards, and non-agricultural trees and plants ensuing from dicamba drift.[10] *See* SOF ¶¶ 77–79.[11] Such damages resulted in significant yield losses, and in the case of perennial plants like fruit and ornamental trees, recultivation of the damaged trees to maturity meant economic losses for multiple years. *See id.*

Yet despite the Ninth Circuit's unambiguous instruction, *nowhere* in the 2020 Decision documents did EPA assess, quantify (or even provide rough estimates) and weigh the costs of farmers' losses, or economic impacts to seed companies and other stakeholders as a result of off-target drift. (EPA did not do so in the Report *either*.) Instead, the best EPA could muster was vaguely acknowledging that "non-users may experience impacts from crop

[10] EPA also again made the same unfounded claim that "there may have been issues of overreporting," A.4 at 8, despite the Ninth Circuit finding no evidence to support this. *See NFFC*, 960 F.3d at 1137.

[11] In fact, the 2020 Decision Record is even *stronger* than before because of market harm evidence from class action damages litigation over dicamba drift since, evidence EPA had. *See, e.g.*, *Bader Farms, Inc. v. BASF Corp.*, 39 F.4th 954 (8th Cir. 2022). *See* SOF ¶ 78.

injury or increased costs resulting from offsite movement of dicamba." A.6 at 7. This does not come close to complying with the Ninth Circuit's directive.

C. Economic Costs: Anti-Competitive, Monopolistic Effects

The Ninth Circuit also held EPA failed to consider another separate but equally "clear" economic cost that is "virtually certain" to stem from the Decision: the coercive effect of drift forcing farmers to defensively buy dicamba-resistant seeds and its anticompetitive, monopolistic ramifications. *NFFC*, 960 F.3d at 1142. Again, if anything, the 2020 record evidence of this cost was even stronger than previously. *See* SOF ¶¶ 78; A.6 at 43–44 (EPA's data analysis indicating "large proportion" of dicamba seeds remain untreated relative to other herbicide tolerant soybean, indicating growers plant defensively since only half of dicamba-resistant soybean and 60 percent of dicamba-resistant cotton acreages receive over-the-top spraying).

Yet in the 2020 Decision EPA *still* meaningfully never "took into account this cost." *NFFC*, 960 F.3d at 1142. While EPA concedes that defensive planting could entail "increased cost and/or reduced yields," A.6 at 45, it provides no *assessment* of these costs to either farmers or seed dealers. Nor did EPA attempt to actually *weigh* these costs against the purported benefits, as FIFRA requires. *Pollinator*, 806 F.3d at 522–23; 7 U.S.C. § 136(bb).[12]

D. Social Costs

The Ninth Circuit also held EPA failed to consider the "clear social cost," *NFFC*, 960 F.3d at 1142 (citing 7 U.S.C. §136(bb)), caused by the 2018 registration: the "severe strain on social relations in farming communities" that has "torn apart the[ir] social fabric"

[12] The "costs" EPA considered refer almost exclusively to putative costs on growers from compliance with use measures or costs of alternatives, not costs externalized on other farmers. *See* A.6 at 43–45.

and was "likely to increase." *NFFC*, 960 F.3d at 1143 (describing evidence of harm to off-field crops as well as old-growth trees and gardens).

Yet the 2020 Decision again failed to abide by this requirement, despite a robust record that such social strife has continued. *See, e.g.*, SOF ¶¶ 81–82. Instead, EPA justified its refusal by speculating that such social costs would continue even without the 2020 Decision, due to illegal dicamba use. A.6 at 46. This excuse fails because the Ninth Circuit has already held, as a matter of law, that this is a cognizable cost of the *over-the-top use registration*. *NFFC*, 960 F.3d at 1143. [redacted] U.1 at 5, 28; *see also* Ex-R.4 at 6. EPA's nonresponsive response is wholly insufficient to meet its duties under FIFRA to assess, consider, and weigh social costs, 7 U.S.C. § 136(bb), a duty the Ninth Circuit has already held EPA must meet for this specific cost, for this registration. *Id.*

III. EPA Failed to Address Other Risks from the 2020 Decision.

In addition to failing on remand to abide by the Ninth Circuit's commands, EPA also made other legal errors, failing to consider and weigh other problems from dicamba's continued registration, rendering the Decision arbitrary and capricious. *State Farm*, 463 U.S. at 43 (arbitrary and capricious if agency fails to consider important aspect of the problem).

A. EPA's Disregard of Dicamba Runoff Violated FIFRA

As with volatility, EPA has always known that dicamba runoff is another major cause of damage: in the 2018 registration, EPA required as a condition of registration that registrants study off-field effects including runoff. SOF ¶ 14. That study revealed dicamba concentrations in runoff—seven days after spraying—*still* exceeded EPA's own plant harm threshold. A.9 at 61. Other record studies similarly showed significant damage from runoff up to ten days after spraying. SOF ¶¶ 84–85. [redacted]

[redacted] E.15 at 1, and that [redacted] E.13 at 2; SOF ¶¶ 84–85.

Yet EPA still *failed to mitigate* the unreasonable adverse effects of dicamba runoff. In its rush to re-approval, all EPA did was extend the limitation on spraying when rainfall is forecasted from the previous 24 hours to 48 hours, as well as noting generally "best management practices for minimizing runoff should be employed." A.9 at 8. However, EPA already acknowledged with the 2018 registration that identifying the conditions likely to cause dicamba runoff "currently exceed the capabilities of most applicators and most regulatory compliance officials." M.37ag at 8. Nor does EPA have any explanation as to why it prohibited spraying only *within 48 hours* of rainfall when the data before the agency found runoff damage *up to ten days* after spraying. *See supra.* EPA's conclusion that dicamba runoff would not have unreasonable adverse effects was arbitrary and capricious and unsupported by the Record.

B. EPA Failed to Consider Harm from Dicamba-Contaminated Rainfall

EPA also failed to consider harm from dicamba in rainfall. Intensive dicamba use leads to "atmospheric loading," the accumulation of dicamba vapor in the air. M37o at 15; M.64 at 4; M.32; M.16. Rainfall then results in "extremely high amounts of dicamba in rainwater" at levels injurious to sensitive plants, as was found in Missouri in 2019-2020. SOF ¶¶ 87–88.

EPA was well-aware of this threat prior to the Decision. Missouri provided EPA with a report recording over one hundred dicamba detections in rainfall and streams in 2019. M.95 at 4; *see* SOF ¶ 87. [redacted] E.12 at 4. Instead, EPA's subsequent 2020 ecological risk assessment *entirely*

failed to address the issue of dicamba-contaminated rainfall injuring crops or plants; any rainfall mentions concerned only dicamba runoff from fields. *See, e.g.*, A.9 at 8, 17, 24.

C. EPA Failed to Account for "Wide Area Effects" of Dicamba Spraying

Dicamba drift is not merely a nearby problem, it also results in "wide-area effects": dicamba damage episodes caused by vapor drift that occur well beyond buffer zones established to protect against near-field effects. A.9 at 309–10; E.12 at 1. Indeed, the Record shows that EPA was well-aware that injury from dicamba drift has been reported from sites as far away as [redacted] feet from the original potential sources of dicamba spraying.[13] Even field studies have been damaged by incursions of dicamba drift from external sources traveling over 1400 feet, "far greater distances than the labeled in-field setbacks." A.9 at 261; *see* SOF ¶¶ 89–90.

Yet despite evidence of extensive, long-distance drift damage, EPA's dicamba drift mitigations are based on 10- to 20- acre field studies and modeling, and are only designed to address "near field" effects, A.9 at 9, meaning those "adjacent to the treatment site," *id.*, at most 400 feet from a treated field, *id.* at 309. [redacted] *See* E.12 at 3 ([redacted]); SOF ¶ 91. EPA again failed to address this important part of the problem. *State Farm*, 463 U.S. at 43.

D. EPA Failed to Consider Dicamba Harm to Trees

Like runoff, another 2018 conditional registration requirement was studies on effects of dicamba on "trees, shrubs, and perennials" in light of reports of damage to tree species and orchards. M.168 at 19; SOF ¶ 93. EPA reviewed only one such preliminary

[13] This figure is based on 2017–2019 data reported by BASF, *see* I.2; I.3, and Bayer, I.4; I.6, [redacted], U.1 at 31.

(Tier 1) study submitted by Bayer (Bayer Tree Study), but that study—which contained numerous deficiencies[14]—actually showed that EPA lacked sufficient data to rule out unreasonable harm to trees. *See* SOF ¶¶ 93–95.

EPA categorized the Bayer Tree Study as a preliminary (Tier 1) study because it only tested one dicamba concentration and its effects on five different tree species, and therefore could not be used to determine—*nor prevent*—harm to the most sensitive tree species. *See* G.31 at 14–15 ("This test was conducted with a single test concentration (Tier 1); therefore, the most sensitive species could not be determined."). In it, Bayer researchers studied dicamba at an extremely low concentration (0.000153 lb/acre)—the concentration that EPA found to have inhibited growth in soybeans by 25%, A.9 at 49—and its effects on trees. [redacted] F.80 at 9, 21, 32. In other words, [redacted]. A.9 at 31. And, EPA has no idea just how little dicamba it would take to stunt growth in American red oak (or other similar trees) because all that the study concluded was that the harm threshold (the NOAEC) for American red oak and apple saplings is less than the concentration EPA found significantly injurious to soybeans. *See* G.31 at 2 ("NOAEC: <0.000513 lb ae/A (apple and American red oak height)"). Yet, EPA did not call for another study nor examine any other data. EPA's cavalier disregard of the significant harm to trees and orchards from dicamba drift violated FIFRA.

[14] In addition to being a preliminary study, the Bayer Tree Study is also deficient [redacted], F.80 at 1, and the testing ended after just 90 days, leading the EPA reviewer to conclude that the Study was "*not scientifically sound*." G.31 at 15 (emphasis in original).

IV. EPA Failed to Meet the Unconditional Registration Standard.

EPA also violated FIFRA by failing to meet the rigorous preconditions for an "unconditional" registration.[15] The past registrations were conditional, *see NFFC*, 960 F.3d at 1133, an easier standard to meet. *Nat'l Fam. Farm Coal. v. EPA*, 966 F.3d 893, 915–16 (9th Cir. 2020) (*Enlist*) (unconditional standard is "higher" and "more burdensome" than conditional); *cf.* 7 U.S.C. § 136a(c)(7) (conditional) *with id.* § 136a(c)(5) (unconditional). Unconditional registrations have several prerequisites, all of which EPA failed to meet.

A. No Additional Data Necessary

While mere "satisfactory data" are required for conditional registration, *id.* § 136a(c)(7)(B), for unconditional, EPA must determine that "*no* additional data are necessary," 40 C.F.R. § 152.112(c) (setting forth registration requirements under FIFRA Section 3(c)(5)). Even under the *lesser* conditional standard, EPA previously lacked the required support. *NFFC*, 960 F.3d at 1124 (data had "several flaws"), *id.* at 1133–36 (discussing data's flaws). EPA again fails here under this tougher standard.

First, the nearest EPA comes to affirming the "no additional data" requirement is vaguely saying that "EPA received studies and other information, necessary to comply with the data requirements for the uses of these products." A.4 at 19. Then there is the issue of the studies, data, and monitoring that EPA conditioned registration upon in 2018 and what became of them, M.168 at 23; EPA does not say, nor give any rationale as to why the agency did not continue to require similar data and monitoring in this Decision. EPA's failure to explain and support the significant registration change is arbitrary and capricious. *State Farm*, 463 U.S. at 43.

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[15] FIFRA Section 3(c)(7)(B) authorizes EPA to conditionally register some pesticides while missing data is prepared. Despite eliminating the conditionality of prior approvals, EPA is silent about the approval now being unconditional other than stating that the approval, like all unconditional registrations, is pursuant to FIFRA section 3(c)(5) (as opposed to conditional registrations under section 3(c)(7)). *See* A.4 at 3, 18 (quoting section 3(c)(5)).

Second, and speaking of this Decision's continued reliance on pre-2020 data, EPA admitted that much of the 2018 assessments were irreparably *tainted* with politic interference. *See* SOF ¶¶ 61–64. The 2020 Decision was overseen by the same administration and same political EPA officials. And the 2020 Decision refers back, incorporates, and relies on the admittedly tainted 2018 studies. *See* SOF ¶¶ 63–64. EPA's continued and unexplained reliance on admittedly tainted data is arbitrary and capricious.

Finally, even if the politically tainted assessments EPA re-used are somehow magically absolved, the Record is replete with evidence that—in the frenzied few months between the Ninth Circuit's vacatur of the registration and the 2020 Decision, SOF ¶¶ 55–61—EPA did *not* have all the data it needed to determine risks unconditionally. For example, even though EPA relied heavily on the use requirement that farmers mix volatility reducing agents (VRAs or pH buffering agents) into spraying tanks, [redacted], P.481, despite [redacted] E.7 at 3; *id.* at 1 ([redacted]) (emphasis added); *see also* SOF ¶ 74.[16] [redacted] E.12 at 3; *see also* E.5; SOF ¶¶ 89–91; *supra* at 18. Other issues for which EPA lacked data include: dicamba in rain; dicamba in runoff; and dicamba's effects on trees, shrubs, and other woody perennial species seedlings. *See supra* Section III; SOF ¶¶ 83–95.

[16] And, even assuming the agents work, in its rush to re-register dicamba, EPA failed to ensure [redacted]. E.1; E.2; *see also* Ex-R.22 at 154 ("If we had more time…"); SOF ¶ 60.

B. Performing Intended Function Without Causing Unreasonable Adverse Effects

The unconditional registration standard also requires EPA to find and support with the Record that the dicamba uses can perform their "*intended function without* [causing] unreasonable adverse effects on the environment." 7 U.S.C. § 136a(c)(5)(C). Yet the record evidence strongly belies any such conclusion. Over and over again, experts—scientists, state regulators, and commercial applicators—told EPA that, due to the byzantine, unprecedented use directions that set forth near impossible conditions for lawful use, farmers are *not* able to use the products lawfully (1) for their "intended function" of suppressing weeds, and (2) *without* actually causing unreasonable adverse effects through off-field drift and runoff. *See supra* at 10; SOF ¶¶ 42–47, 70–72, 117–125.

Even before EPA added additional use restrictions in its 2020 Decision, experts described the prior label as "probably the most complex label I have ever seen in my 40-year career." *NFFC*, 960 F.3d at 1140 (estimating only 44 hours of application time allowed under the label during 2017); *id.* at 1140 ("There doesn't appear to be any way for an applicator to be 100% legal in their application."); A.1 at 6 ("Label requirements essentially make it impossible to do an on-label application"). Unsurprisingly, then state regulators described the even *more* restrictive 2020 label as the "biggest, gnarliest label ever seen," Ex-R.5 at 10, requiring conditions "so rare that it is impossible to follow." Ex-R.5 at 2; *see also* U.1 at 33 [redacted]. And even when farmers *did* have the rare conditions making the 2020 use directions feasible, vapor drift *still* occurred. Ex-R.1 at 2–3; SOF ¶¶ 121–123.

C. No Unreasonable Adverse Effects When Used in Widespread and Common Ways

Finally, EPA must find and support with the Record that the over-the-top dicamba spraying will not cause unreasonable adverse effects when used in "widespread and commonly recognized practice." 7 U.S.C. § 136a(c)(5)(D). Congress underscored its intent that "[i]f a pesticide is such that when used in accordance with its *label or common practice* it is injurious to man, other vertebrates, or useful plants, *it cannot be registered* under the Act

and cannot be sold or distributed in interstate commerce." S. Rep. 838, 92d Cong. 2d Sess., 1972 U.S.C.C.A.N. 3993, 3996 (emphases added). Registration under any possible contrived, hypothetical, laboratory scenario—no matter how difficult to follow, or how much of a weather/wind "fairy tale," *NFFC*, 960 F.3d at 1140, it is in the real world of farming—is *not* what Congress meant.

Indeed, "widespread and commonly recognized practice" is the *antithesis* of the practices EPA approved safety under here: what EPA approved requires use instructions unlike any other farmers have ever seen. *See* Ex-R.5 at 10; *NFFC*, 960 F.3d at 1140; SOF ¶¶ 42–47, 72, 119–121. Approval under such "complex and onerous" requirements—both putting farmers in a no-win situation and making the "restrictions" illusory—is not what Congress intended. EPA violated FIFRA's registration mandates.

V. EPA Violated the Endangered Species Act.

EPA's 2020 "no effect" determination is arbitrary and capricious, flies in the face of documented damage, lacks analysis, and risks harm to hundreds of ESA-protected plants and animals and their habitat. And despite the Report's admission of [redacted], EPA's 2022-2023 Decisions *still* failed to protect species.

A. <u>EPA Arbitrarily Applied Its FIFRA Approach to ESA Effects Determinations</u>

For the third time, EPA circumvented ESA Section 7 consultation with expert wildlife agencies regarding dicamba's use registration. Despite documented damage, including potential harm to *hundreds* of endangered plants and animals and their critical habitats, EPA made the unprecedented finding, again, that dicamba's novel over-the-top uses could nonetheless have "no effect" on all but one species and its designated critical habitat. *See* SOF ¶¶ 15-16, 101-110. EPA's "no effect" determination also violates its substantive duty to ensure against jeopardy and destruction or adverse modification of designated critical habitat.

As in 2016 and 2018, in the 2020 Decision EPA arrived at this conclusion by substituting the less protective FIFRA standards for the ESA's standards in its Ecological Assessment. *See generally* A.9; SOF ¶¶ 101-104. Namely, instead of determining whether the 2020 Decision met the low ESA "may affect" threshold, EPA's flawed methodology only evaluated whether exposing species or their habitat to dicamba exceeds EPA's self-determined "level of concern" under the FIFRA standard. SOF ¶¶ 102-104.

EPA must complete interagency consultation whenever it proposes an action that "may affect" a listed species or critical habitat. 50 C.F.R. § 402.14(a). The "may affect" threshold is extremely low—intentionally—to ensure the expert agencies are consulted to implement congressional intent of "institutionalized caution." *Hill*, 437 U.S. at 194; 51 Fed. Reg. 19,926, 19,949 (June 3, 1986) ("Any possible effect, whether beneficial, benign, adverse, or of an undetermined character, triggers the formal consultation requirement."); "[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*, 681 F.3d at 1027 (emphasis added).

To arrive at "no effect" for hundreds of ESA species, EPA in 2020, and as re-affirmed unchanged in 2022 and 2023, applied its Risk Quotient (RQ)/Level of Concern (LOC) assessment, designed to address FIFRA's registration standard of no "unreasonable adverse effects," just as it did in 2016 and 2018. SOF ¶¶ 15-16, 102-104. These are fundamentally different: the FIFRA standard includes a risk-benefit consideration, in contrast to the ESA's low bar of "may affect" that cannot allow *any* chance of impacts on protected species without consultation. A.9 at 33–34; 7 U.S.C. § 136(bb); *Wash. Toxics Coal. v. U.S. Dep't of Interior, Fish & Wildlife Serv.*, 457 F. Supp. 2d 1158, 1184 (W.D. Wash. 2006) ("The risk framework of FIFRA (no unreasonable adverse effects) does not equate to the survival and recovery framework of the ESA.").

Whatever its merit in the FIFRA context, in the ESA context, this approach is "*not scientifically defensible*" for judging risks to endangered species from pesticides, as no less a

source than the expert National Academy of Sciences (NAS) told EPA in a sharply critical 2013 report.[17] SOF ¶ 104; *Enlist*, 966 F.3d at 925; *id.* at 932–33 (Watford, J., dissenting). In *Enlist*, faced with the identical approach, the majority gave it a one-time pass for that registration, but cautioned it did not expect use of the FIFRA methodology "to reoccur given EPA's commitment to gather the data necessary to implement NAS's new methodology going forward." *Id.* at 926. That was *prior* to the 2020 Decision and years before the 2022-23 Decisions. It has been *a decade* since NAS leveled its critique, and EPA had no deadline to register dicamba again four months after the Ninth Circuit vacated it. *NFFC*, 960 F.3d at 1145. EPA cannot legally persist in applying an unsound method, and its reliance on it here once again, despite the Ninth Circuit's admonition, was arbitrary and capricious.

Further, after the 2017 *Enlist* registration, EPA has *not* relied solely on the FIFRA RQ/LOC to eliminate species for ESA "may affect" determinations and instead *has* initiated consultation based on newer methodologies resulting in "may affect" determinations for many pesticides, including chlorpyrifos (2018),[18] diazinon (2018), malathion (2018), carbaryl (2021), methomyl (2021), atrazine (2021) and glyphosate (2021). *See* ADD47-50 (Donley Decl. ¶¶ 7–14); SOF ¶ 105. The results are strikingly different. EPA determined there were *zero* "no effect" determinations for the pesticide glyphosate. ADD50 (Donley Decl. ¶ 13). Thus, EPA has not only had the time to

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[17] National Research Council, Nat'l Academies, *Assessing Risks to Endangered and Threatened Species From Pesticides* (2013), https://nap.nationalacademies.org/catalog/18344/assessing-risks-to-endangered-and-threatened-species-from-pesticides.

[18] *See* Donley Decl., Ex. 1; *see also* EPA, *Biological Evaluation Chapters for Chlorpyrifos ESA Assessment*, https://www.epa.gov/endangered-species/biological-evaluation-chapters-chlorpyrifos-esa-assessment (last visited Apr. 11, 2023) (EPA based its Biological Evaluation on methods developed with FWS and NMFS "in response to the National Academy of Science report.").

implement better ESA assessment methods; it has *already done so repeatedly*; the scientific data to do so is necessarily available. As such, EPA's failure also violates the ESA's mandate that every agency "shall" use the "best scientific and commercial data available." 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14(g)(8).

Finally, applying the correct "may affect" standard is crucial to the survival of species on the brink of extinction, as compared to effects on non-listed species. 16 U.S.C. § 1532(6) ("endangered" species are "in danger of extinction"); *id.* § 1532(20) ("threatened" species are likely to become endangered). Yet in another fatal flaw, EPA used the *exact same* LOC for both listed and non-listed plants.[19] SOF ¶ 103. In other words, EPA applied the same LOC to soybeans as it does to endangered plants. For example, FWS listed the whorled sunflower (*Helianthus verticillatus*) as endangered due to threats to its survival that include agricultural "chemical vegetation management" (herbicides) and "limited distribution and small population sizes." SOF ¶ 103. EPA's reliance on the outdated and flawed RQ/LOC "could underestimate risk and EPA would never know it." *Enlist*, 966 F.3d at 932–33 (Watford, J., dissenting). Not only did EPA unlawfully fail to consult with the wildlife agencies, it could be jeopardizing the continued existence of species like the sunflower in violation of its substantive ESA duty to avoid this. 50 C.F.R. § 402.02 (defining "jeopardize").

B. EPA's "Action Area" Is Unsupported

The ESA "action area" is broadly defined as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." 50 C.F.R. § 402.02. The potential "effects" an agency must consider are similarly broad, including both the "direct" and "indirect" effects of the action. *Id.*

[19] To determine acute effects to animals, EPA used the "lethality-based" endpoint of the median lethal dose or concentration (LD50 or LC50), which is the amount of a chemical that *kills 50% of the exposed animals*. A.9 at 30.

Vaper Drift Buffer Belied by the Evidence: Here, the most significant flaw is EPA's continued reliance on a 57-foot buffer to assume any volatility effects are limited to the sprayed field, despite contrary evidence. Faced with evidence of off-field damage, *supra* at 18, in the 2018 registration, EPA added a 57-foot buffer only in certain counties where listed plant species survive near cotton and soybean fields. A.4 at 24. The buffer's size contradicted EPA scientists' 2018 recommendation to expand the action area to *443 feet* (135 meters) after a study revealed injury to dicamba-sensitive soybeans 135 meters away. M.37o at 72–74. EPA has now admitted these studies were ignored due to improper political influence, which "compromised the integrity of [EPA's] science." *See* SOF ¶¶ 62-66. Nonetheless, EPA *again* relied on the same unsound ESA buffer distance in the 2020 Decision, even though damage continued much farther off field in 2019 and 2020 with the buffer in place. *See supra* at 18.

In 2021, [redacted], *see* SOF ¶¶ 137–140, [redacted] U.1 at 5.[21] Because of this, EPA admitted that it is "no longer certain whether over-the-top dicamba can be used in a manner that is protective of listed endangered species, critical habitats and non-target plants." Ex-R.11 at 2; Ex-R.8 at 3.

Even Bayer urged EPA to enact ESA protections prior to the 2022 season. Ex-R.12 at 3. Yet, in its 2022 Decision, EPA re-affirmed use of the 57-foot buffer by only amending the registration for Minnesota and Iowa, and then only to address cut-off dates, not the 57-foot ESA buffer. "[M]itigation measures that merely 'reduce,' but cannot scientifically

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[20] [redacted] U.1 at 5.

[21] Harm to individual species is considered "take." 50 C.F.R. § 402.02. It is unlawful for any person to take any species, unless such "incidental" take is allowed by the expert agency biological opinion, upon completion of consultation. 16 U.S.C. § 1538(a)(1)(B); 16 U.S.C. § 1536(b)(4).

'eliminate' an 'effect' probably compel a 'may affect' finding." *Enlist*, 966 F.3d at 924. EPA's decision not to alter its buffer in the 2022 Decision—in the face of the damning evidence of its failure—was arbitrary and capricious and contrary to law.

Ignored Evidence for Larger Drift Buffer: An additional scientific flaw is EPA's reliance on a threshold of 10% visual sign of injury (VSI) as a threshold to require the 310-foot drift buffer to limit the action area and arrive at its "no effect" conclusions. A.9 at 51.

[redacted] E.9 at 1–2; E.15 at 3–4 ([redacted] E.16 at 3 (emphasis added); E.13 at 2–3 ([redacted]). [redacted] E.9 at 3, 5; E.10 at 2.

Within a few weeks, something changed: [redacted] E.2 at 1. [redacted] E.1 at 1. [redacted] This appears to be another political taint that permeated the 2020 Decision.

Indirect Effects: Finally, in setting the action area, EPA failed to include the 310- and 57-foot ESA buffers in counties with species that rely on plants (obligate relationship). A.9 at 72. For example, the Poweshiek skipperling requires grasses and flowering plants, such as non-listed black-eyed Susan and purple coneflower. 17 C.F.R. § 17.95(i) (insects).[22] The skipperling has critical habitat in eleven counties where EPA does not require any ESA

[22] *Available at* https://www.ecfr.gov/current/title-50/chapter-I/subchapter-B/part-17/subpart-I/section-17.95 (searchable by species name).

buffers. Donley Decl. ¶ 15. Likewise, the Dakota skipper requires grasses and flowering plants within small, scattered critical habitat units. 17 C.F.R. § 17.95(i). The skipper has critical habitat in eight countries where EPA does not require any ESA buffers. Donley Decl. ¶ 15. EPA's failure to determine effects on species that rely on plants is arbitrary and not in accordance with the ESA.

Enlist Duo: The arbitrary dicamba action area is legally and factually distinct from *Enlist*. *Compare* 966 F.3d at 928. Here, Plaintiffs point to EPA scientists and studies that undermine EPA's politically tainted decision to limit the ESA volatility buffer to 57 feet and the drift buffer to 310 feet. *See supra.* Here, the damage reported every year since EPA approved these new dicamba uses very much shows that "mitigation measures are not working." *Id.* at 928; *Sierra Club v. Marsh*, 816 F.2d 1376, 1386–89 (9th Cir. 1987) (consultation should occur if mitigation ineffective), *abrogated on other grounds as recognized in Cottonwood Env't Law Ctr.*, 789 F.3d at 1075. And here, the mitigation measures are not "reasonably certain to occur" due to their complexity on the labels, *see supra* at 10, contributing to the fact that damage from dicamba volatility has "materialized in the real world." *Enlist*, 966 F.3d at 921.

C. EPA Violated the ESA's Critical Habitat Mandates

Critical habitat is "critical" because it is imperative to allow species to recover so that they no longer need ESA protection.[23] EPA's conclusion that there would be no effect (destruction or adverse modification) of critical habitat is likewise arbitrary. Rather than

[23] 50 C.F.R. § 402.02 (definition); 16 U.S.C. § 1532(5)(A) ("critical habitat" contains the "physical or biological features … essential to the conservation of the species" and "which may require special management considerations or protection"); *id.* § 1532(3) ("conservation" means using all methods to bring species to the point that they no longer need protection under the ESA); 50 C.F.R. § 402.02 (adverse modification is "a direct or indirect alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species").

evaluating whether the 2020 Decision may affect critical habitat that overlaps with dicamba uses, EPA limited its analysis to just the sprayed field, based on its assumption that dicamba will not drift off it: an assumption that the Record conclusively shows is faulty. EPA then added more hurdles—that the species itself must use the agricultural field and have a "direct toxic effect concern," and the action area must include dicamba effects on plants that are characteristic of the critical habitat. A.9 at 111. EPA's miserly framework does not satisfy its robust ESA duty to insure no destruction or adverse modification of critical habitats in the path of dicamba drifting and volatizing miles from the fields. 16 U.S.C. § 1536(a)(2). EPA's arbitrary approach resulted in a "no effect" determination for hundreds of critical habitats overlapping with the approved dicamba uses.

Using these tactics, EPA concluded that only critical habitat for the whooping crane met its criteria. A.9 at 111. However, even there EPA concluded that whooping crane critical habitat would not be modified based on residues of dicamba that "are not reasonably expected to be at a level raising concern for direct effects to the whooping crane." *Id.* But ensuring against destruction or adverse modification of critical habitat is a *separate* inquiry from EPA's duty to ensure against jeopardy. *Gifford Pinchot Task Force v. Fish & Wildlife Servs.*, 378 F.3d 1059, 1069–70 (9th Cir. 2004) (to meet ESA critical habitat mandates, agencies must ensure not only species survival but recovery).

The "no effect" determination for dicamba, which is known to volatilize and drift, is again factually distinguishable from *Enlist*. The *Enlist* majority again relied on the lack of evidence of damage from Enlist drift or volatilization off fields, affirming appropriateness of limiting EPA's critical habitat assessment to the fields themselves and species whose critical habitat contained Primary Constituent Elements (PCEs) related to agriculture on those fields. *Enlist*, 966 F.3d at 928–29; *id.* at 922–23 (explaining critical habitat and PCEs). But, for dicamba, damage far off the fields has been reported *every year* since 2016 "in the real world," and EPA's inadequate ESA buffers are not supported by science in the Record.

The *Enlist* majority also pointed to the whooping crane and Virginia bat as species with critical habitat designations without PCEs.[24] *Id.* at 929 (citing 50 C.F.R. § 17.95(a) (mammals) and *id.* § 17.95(b) (birds)). But other species' critical habitats that overlap with cotton and/or soy, *see* Bradley Decl. & Clauser Decl., *do* have PCEs within harm's way from dicamba drift. For example, the Southwestern willow flycatcher and yellow-billed cuckoo PCEs in their critical habitats include vegetation required for nesting and breeding (trees and shrubs) and low vegetation habitat for insects and small vertebrates on which the birds feed. 50 C.F.R. § 17.95(b); Suckling Decl. ¶¶ 8, 11. Likewise, the Chiricahua leopard frog critical habitat PCEs require vegetation as habitat for its food and to provide cover from predators. 50 § C.F.R. 17.95(d) (amphibians); Suckling Decl. ¶ 16. These species' critical habitats are unlawfully at risk from dicamba drift far off fields.

VI. EPA Violated the Procedural Mandates of FIFRA and the APA.

EPA also made a series of procedural violations. First, EPA flouted its own regulations requiring a different process, including notice-and-comment, because it cancelled the prior dicamba registration. Second, EPA violated its regulations for its failure to have notice-and-comment in re-registering the new over-the-top dicamba uses. And finally, EPA violated the APA by amending its regulations under FIFRA 24(c) without notice-and-comment.

A. EPA Violated FIFRA's Post-Cancellation Regulations

After the Ninth Circuit vacated the 2018 registration, EPA issued a "final cancellation order."[25] Unlike a new or renewed pesticide, if a registration is canceled, FIFRA regulations require EPA to go through a special process to "un-cancel" it, to explain

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[24] Even if not explicitly set forth in the critical habitat designation, by definition, designated critical habitat contains the "physical or biological features' essential to conservation of the species … ." 16 U.S.C. § 1532(5); 16 U.S.C. § 1533(a)(3).

[25] Stevenson Decl., Ex. J (EPA, *Final Cancellation of Three Dicamba Products* (June 8, 2020), https://www.epa.gov/sites/default/files/2020-06/documents/final_cancellation_order_for_three_dicamba_products.pdf).

what has so substantially changed. *Compare* 40 C.F.R. §152.100(a) (registration process for all pesticides "except" those that were the "subject of a previous Agency cancellation or suspension notice") *with id.* § 152.100(b) (EPA must use "subpart D of part 164" when evaluating "registration of a pesticide involving use of the pesticide in a manner that is prohibited by a suspension or cancellation order"). Subpart D requires EPA to "determine whether reconsideration of the Administrator's prior cancellation or suspension order is warranted." *Id.* § 164.131(a). Among other things, EPA must assess whether there is "substantial new evidence" affecting the prior cancellation decision. *Id.* If EPA finds reconsideration is warranted, EPA must publish notice in the Federal Register and hold a "public hearing" to decide the matter. *Id.* § 164.131(c). (This means hold notice-and-comment: the courts have equated "public hearing" in FIFRA with notice-and-comment, including in cancellation proceedings). *See United Farm Workers of Am., AFL-CIO v. EPA*, 592 F.3d 1080, 1083 (9th Cir. 2010); *Nw. Food Processors v. Reilly*, 886 F.2d 1075, 1077 (9th Cir. 1989).

Nevertheless, in October 2020 EPA again re-registered dicamba products for over-the-top use, proceeding as if *the agency had never issued a cancellation order*. The agency made zero effort to comply with the procedures of 40 C.F.R. Part 164 and the "substantial new evidence" findings required of the agency to reverse its previous cancellation order. *See id.* § 164.131(a). Had EPA followed the correct procedures, it would have had to consider whether the registrants had presented substantial evidence that materially altered the prior cancellation order; at a minimum, EPA had to justify that re-registration was warranted. Instead, EPA re-registered without evaluating whether the reconsideration was warranted, rendering its decision arbitrary and capricious and contrary to procedures required by law.

B. EPA Violated FIFRA's "New Use" Notice-and-Comment Requirements

In *Center for Food Safety v. Regan*, 56 F.4th 648 (9th Cir. 2022), the Ninth Circuit confirmed that EPA violates FIFRA if it fails to provide notice-and-comment before *re-*

approving the same pesticide uses that the court *previously vacated*. *Id.* at 661 ("FIFRA requires EPA to 'promptly' publish in the Federal Register 'a notice of each application for any pesticide if it contains any new active ingredient or if it would entail a changed use pattern.'") (quoting 7 U.S.C. § 136a(c)(4)). EPA made the same violation here.

EPA received new applications for the three dicamba pesticides in July 2020, B.1 (Xtendimax); C.6 (Engenia); D.4 (Tavium), and had to hold notice-and-comment if they posed a "changed use pattern." FIFRA does not define "changed use pattern," but its regulations explain it is "a new use," 40 C.F.R. § 152.102, which is defined in relevant part as "(2) any … use pattern, if no product containing the active ingredient is currently registered for that use pattern, *or* (3) [a]ny *additional use pattern that would result in a significant increase in the level of exposure* … to the active ingredient of man or other organisms." 40 C.F.R. § 152.3 (emphases added). Prior to the 2016 registration, never before had dicamba been sprayed over-the-top of genetically engineered crops resistant to it; EPA's approval was undeniably (and very controversially) a "changed use patten" for dicamba. EPA acknowledged this and held notice-and-comment. SOF ¶¶ 5, 17, 65; *NFFC*, 960 F.3d at 1132.

This time, in its rush to re-approve dicamba, EPA bypassed notice-and-comment despite the obvious controversy of dicamba's continued over-the-top use. EPA claims that notice-and-comment was not required because, even though the prior uses were vacated, there was still one such later approved "me too" over-the-top dicamba product active.[26] A.4 at 3 n.1, n.2. EPA's reliance is incorrect as a matter of law and contradicted by the Record.

[26] EPA's 2018 Decision and the scope of the Ninth Circuit's review included the over-the-top dicamba use approval and three dicamba products, two of which—XtendiMax and Engenia—were renewed and re-approved in EPA's 2020 Decision. Another product, Tavium, was registered in April 2019, five months after EPA had issued the October 2018 decision, and was not at issue in the case.

First, even though the Ninth Circuit did not directly reach the later "me too" product registration, the court vacated as unlawful the underlying use registration on which it was based: EPA had conditionally registered Tavium under "FIFRA section 3(c)(7)(A),"[27] 7 U.S.C. § 136a(c)(7)(A), which authorizes registration of pesticide uses "identical or substantially similar to any currently registered pesticide and use thereof" under a fast-track process (known as "me too" registrations) where EPA does not conduct new analyses, instead relying on the data and analyses for the prior registration.[28] *Id.* It makes no sense that over-the-top spraying of Tavium would remain legal when the Ninth Circuit struck down the *underlying* use registration (and identical products) upon which it was based.

Second, EPA's reliance is belied by the definition of "new use," which includes not just "any … use pattern, if no product containing the active ingredient is currently registered for that use pattern," but also "[a]ny additional use pattern that would result in a *significant increase in the level of exposure* … to the active ingredient of man or other organisms." 40 C.F.R. § 152.3 (emphasis added). For the 2020 Decision, the *prior* Tavium registration would have expired in December 2020. A.4 at 3 n.1.[29] The current/active Tavium application specifically *extended* over-the-top Tavium use beyond 2020: an "additional use" that significantly increased the level of exposure to dicamba. *See* SOF ¶ 59.

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[27] EPA, *Notice of Pesticide Registration: A21472 PLUS VAPORGRIP TECHNOLOGY* (Apr. 5, 2019), https://www3.epa.gov/pesticides/chem_search/ppls/000100-01623-20190405.pdf.

[28] EPA, *Identical/Substantially Similar (Formerly "Me-Too") Product*, https://www.epa.gov/pesticide-registration/pesticide-registration-manual-chapter-2-registering-pesticide-product#meetoo (last visited Apr. 11, 2023).

[29] EPA itself previously recognized over-the-top dicamba spraying as a "new use." Back in 2018, EPA explained that because the "[dicamba] use will expire before the end of 2018 unless these amendment requests are granted … EPA believes it appropriate to consider the extension of these uses *as a 'new use'*… ." M.168 at 17 (emphasis added). Nothing changed in 2020, except this time, EPA had to justify its use extension after the Ninth Circuit's ruling, so EPA conveniently decided not to refer to the 2020 Decision as a new use approval to avoid going back directly before the same Ninth Circuit panel.

The Ninth Circuit squarely rejected EPA's similar reliance on previous and ongoing uses of the pesticide to avoid its notice duties. *Regan*, 56 F.4th at 662 (rejecting EPA's claim that the uses were not new because they had been previously registered and emphasizing that "EPA documents repeatedly refer[red] to the 2019 amendment[] as 'new uses'"). [30] The 2020 Decision was for "changed use" within the definition of that term, requiring EPA to hold notice-and-comment under FIFRA.

C. The APA Required Notice-and-Comment for the FIFRA 24(c) Rulemaking

Nor did EPA hold notice-and-comment on its sweeping 24(c) rule change for not just dicamba but all pesticides. For decades, FIFRA 24(c) provided a critical tool for states to install their own "special local needs labels" to address agricultural, environmental, or public health needs. This was particularly important for mitigating dicamba damage: states relied on 24(c) to step into the breach left by EPA and address the rampant drift. SOF ¶ 96. But EPA reversed this decades-old policy in its 2020 Decision, for the first time prohibiting states from "impos[ing] further restrictions on the dicamba products, or any other federally registered pesticides" through 24(c), in a footnote no less. A.4 at 20 n.19. That decision violated the APA for three reasons.

First, the 24(c) change is a legislative rule: an agency decision that "create[s] rights, impose[s] obligations, or effect[s] a change in existing law pursuant to authority delegated by Congress." *Hemp Indus. Ass'n*, 333 F.3d at 1088; *Ctr. for Env't Health v. Vilsack*, 2016 WL 3383954, *4 (N.D. Cal. 2016) (applying and quoting). EPA did not just one but *all* of these: it amended a longstanding interpretation allowing states to restrict pesticide uses through 24(c);[31] imposed an obligation for states to undergo the time-intensive 24(a)

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[30] *See also* Ex.R-22 at 48 (EPA stating that it "expects to announce for public comment its decisions on whether to register/renew the products by the end of October.").

[31] Stevenson Decl., Ex. B at 10 ("[S]tates may issue §24(c) registrations to implement more restrictive labeling under certain circumstances."); *id.* at 2 (explaining the prior

process, resulting in many states' inability to adapt effectively; and altered rights for farmers, conservationists, and state regulators that relied on the flexible 24(c) process for protection. SOF ¶¶ 96–99.

Second, none of the rulemaking exceptions apply here. *Ctr. for Env't Health*, 2016 WL 33833954, at *4 (exceptions must be "narrowly construed and only reluctantly countenanced."). The 24(c) rule change is not an interpretive rule, 5 U.S.C. § 553(b)(A), which do "not itself purport *to impose new obligations or prohibitions* or requirements on regulated parties." *Nat'l Min. Ass'n v. McCarthy*, 758 F.3d 243, 251 (D.C. Cir. 2014) (emphasis added); *Kollasoft Inc. v. Cuccinelli*, 2020 WL 263618, at *6 (D. Ariz. Jan. 17, 2020) (interpretive rules "merely explain, but do not add to, the substantive law that already exists."). Rather, it creates a "strict and specific set of obligations," binding states to the new formal legislative process and prohibiting restrictions under 24(c). *Elec. Priv. Info. Ctr. v. U.S. Dep't of Homeland Sec.*, 653 F.3d 1, 7 (D.D.C. 2011) (finding the decision to screen airline passengers with advanced imaging technology legislative because it "substantially change[d] the experience of airline passengers and [was] therefore not merely 'interpretative' either of the statute directing the TSA to detect weapons likely to be used by terrorists or of the general regulation requiring that passengers comply with all TSA screening procedures.").

Nor is the 24(c) rule change a "general statement of policy," 5 U.S.C. § 553(b)(A), a directive that cannot "establish a 'binding norm,' … but must instead leave [agency] officials 'free to consider the individual facts in the various cases that arise.'" *Mada-Luna v. Fitzpatrick*, 813 F.2d 1006, 1014 (9th Cir. 1987). The registration decision absolutely establishes a "binding norm": it flatly prohibits states from restricting uses under 24(c). A.4 at 20 n.19. Additionally, the rule change is not a "procedural," internal agency

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interpretation culminates the efforts of the 1992 24(c) Center for Excellence); *NFFC*, 960 F.3d at 1128–29 (describing 24(c) rules in Minnesota and Arkansas).

"housekeeping" rule governing "organization, procedure, and practice," *Chrysler Corp. v. Brown*, 441 U.S. 281, 283 (1979); 5 U.S.C. § 553(b)(A), because here, "the agency action trenches on substantial private rights and interests." *Batterton v. Marshall*, 648 F.2d 694, 708 (D.C. Cir. 1980). *See supra.*

And third, EPA cannot demonstrate that "good cause" supported issuing the 24(c) rule change—for all pesticides, in a surprise, buried footnote—without going through notice-and-comment. 5 U.S.C. § 553(b)(B). This standard imposes a "high bar," applying "only in those narrow circumstances in which 'delay would do real harm.'" *United States v. Valverde*, 628 F.3d 1159, 1164–65 (9th Cir. 2010). EPA knew how critical 24(c) was, knew it was controversially contemplating a major rule change requiring notice-and-comment. In fact, *EPA repeatedly reassured stakeholders it would hold notice-and-comment*, and even prepared two draft 2019 Notices for public comment but never issued them. SOF ¶ 98 This was rulemaking, plain and simple, and it required notice-and-comment.

REMEDY

The Court should declare that EPA has violated FIFRA, the ESA, and the APA and set aside, or vacate, the Decision.

Under the APA, a reviewing court "*shall … hold unlawful and set aside* agency action, findings, and conclusions found to be … arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." 5 U.S.C. § 706(2) (emphasis added).[32] As such, vacatur is the default, presumptive remedy for invalid agency action. *All. for the Wild Rockies v. U.S. Forest Serv.*, 907 F.3d 1105, 1121–22 (9th Cir. 2018) ("Presumption of vacatur" unless *defendants* meet burden showing otherwise); *NRDC*, 38 F.4th at 51 ("[v]acatur is the traditional remedy for erroneous administrative decisions."). Just as in the prior dicamba case, *NFFC*, 960 F.3d at 1144–45 (vacating registration), this default goes for unlawful pesticide registrations. *E.g., Pollinator*, 806 F.3d at 532–33 (vacating sulfoxaflor registration);

[32] FIFRA includes similar "set aside" language. 7 U.S.C. § 136n(b).

NRDC, 38 F.4th at 52 (vacating glyphosate registration); *Farmworker Ass'n of Fla. v. EPA*, 2021 U.S. App. LEXIS 16882 (D.C. Cir. June 7, 2021) (vacating aldicarb registration); *NRDC v. EPA*, 676 F. Supp. 2d 307, 311–17 (S.D.N.Y. 2009) (vacating spirotetramat registration).

As such, the Ninth Circuit authorizes remand without vacatur only in "limited circumstances," *Pollinator*, 806 F.3d at 532; *Ctr. for Food Safety*, 56 F. 4th at 668 ("unique facts"), and only when "*equity demands*" that result, *Pollinator*, 806 F.3d at 532 (quoting *Idaho Farm Bureau Fed'n v. Babbitt*, 58 F.3d 1392, 1405 (9th Cir. 1995)) (emphasis added).

To determine if these "rare" circumstances are present, courts "weigh the seriousness of the agency's errors against the disruptive consequences of an interim change that may itself be changed." *NFFC*, 960 F.3d at 1144 (quoting *Pollinator*, 806 F.3d at 532). Within this framework, in environmental cases courts consider "the extent to which either vacating or leaving the decision in place would risk environmental harm." *NRDC*, 38 F.4th at 51–52. Finally, courts have also considered whether an agency "could adopt the same rule on remand," or, on the other hand, whether there are "fundamental flaws" in the decision that make it "unlikely the same rule would be adopted on remand." *Id.*; *see also NFFC*, 960 F.3d at 1144–45.

Seriousness of Violations: First, the seriousness of the agency's violations weighs heavily in favor of vacatur. The very same types of FIFRA violations the Ninth Circuit held in the prior dicamba litigation—understating some risks, failing to assess other costs—were plenty serious enough to vacate then, and they are again. *NFFC*, 960 F.3d at 1125, 1145. Despite rushed efforts to paper over them, EPA again understated, failed to acknowledge, and/or failed to assess important costs and risks. *See supra* Section II. EPA also made new errors, failing to assess other ecological risks, and failing to meet the unconditional registration requirements. *Supra* Sections III & IV. And, just as in 2018, when EPA continued the registration in the face of the damaging 2017 summer evidence, in 2021 EPA had one better still: its own confirmatory Report, compiling that damage while openly

questioning whether the registration met the required ESA and FIFRA mandates. But in EPA's 2022-23 amendments, the agency *still* failed to meaningfully address the damage.

Similarly, a violation of Section 7 is a violation of the "heart" of the ESA's scheme, *Kraayenbrink*, 632 F.3d at 495, warranting vacatur. *E.g., Nat'l Parks Conservation Ass'n v. Jewell*, 62 F. Supp. 3d 7, 20–22 (D. D.C. 2014) (holding a failure to consult violation to be a serious error for purposes of vacatur and vacating the agency action); *Defs. of Wildlife v. EPA*, 420 F.3d 946, 978 (9th Cir. 2005) ("Typically, when an agency violates the Administrative Procedure Act and the Endangered Species Act, we vacate the agency's action and remand to the agency to act in compliance with its statutory obligations."), *rev'd and remanded sub nom. Nat'l Ass'n of Home Builders v. Defs. of Wildlife*, 551 U.S. 644 (2007).

ESA violations risk the "incalculable" loss of endangered species, *Hill*, 437 U.S. at 187, and the consultation process EPA violated is how agencies carry out the ESA's substantive mandate to protect endangered species from jeopardy. 50 C.F.R. §§ 402.12–402.16; *Thomas*, 753 F.2d at 764 ("[T]he strict substantive provisions of the ESA justify *more* stringent enforcement of its procedural requirements, because the procedural requirements are designed to ensure compliance with the substantive provisions.") (emphasis in original), *abrogated on other grounds by Cottonwood Env't Law Ctr.*, 789 F.3d at 1075.

Finally, as to the *thrice* ways EPA unlawfully failed to hold public notice-and-comment procedures, such procedural violations raise significant doubts about the correctness of EPA's decision and thus even a *single* such violation qualifies as a "fundamental flaw" that "almost always requires vacatur." *Allina Health Servs. v. Sebelius*, 746 F.3d 1102, 1110 (D.C. Cir. 2014); *NRDC v. Wheeler*, 955 F.3d 68, 85 (D.C. Cir. 2020) (vacating and explaining notice-and-comment violation is a "fundamental flaw that normally requires vacatur"); *AFL–CIO v. Chao*, 496 F.Supp.2d 76, 90–91 (D.D.C. 2007) (compiling cases) (failure to comply with notice-and-comment requirements is "unquestionably a 'serious' deficiency" for purposes of vacatur); *NRDC*, 676 F. Supp.2d at

312–17 (vacating pesticide for failure to hold FIFRA notice-and-comment).

Consequences of Vacatur: Second, this is not one of those "limited" or "unique" instances, *see supra*, where the Court should remand without vacatur.[33] Whatever alleged "disruptive" consequences Intervenors spin, the Ninth Circuit *already rejected* those *same* arguments just a few years ago, *NFFC*, 960 F.3d at 1144–45, and the drastic consequences they claimed did not occur.

As to any reliance on the registration and whether the "*same* rule would be adopted on remand," *Pollinator*, 806 F.3d at 532 (emphasis added), the Ninth Circuit held it was "*exceedingly unlikely*" EPA could lawfully re-approve the same or substantially similar registration. *NFFC*, 960 F.3d at 1145 (emphasis added). The same is true again: any future EPA dicamba decision will differ procedurally and substantively because EPA will need to incorporate any number of changes including the substantive results of ESA consultation, FIFRA notice-and-comment, and the lawful re-assessment of risks and costs. Even without vacatur, any reliance on past EPA dicamba approvals is misplaced, as the parameters have shifted nearly every year. Under vacatur law, when "a different result *may* be reached" after remand, it undermines any "disruptive consequences of an interim change that may itself be changed" and supports vacatur. *Id.* (emphasis added). That is the case here.

Finally, the "consequences" inquiry in environmental cases should be guided towards the result that is the most environmentally protective. *All. for the Wild Rockies*, 907 F.3d at 1122 (vacatur "appropriate when leaving in place an agency action risks more environmental harm than vacating it"); *Pollinator*, 806 F.3d at 532 ("given the precariousness of bee populations, leaving EPA's registration of sulfoxaflor in place risks more potential environmental harm than vacating it."). And here the answer to that inquiry is plain: vacate.

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[33] It should *not*, but if it does remand without vacatur, the Court should require compliance by a court-ordered deadline of at most 180 days. *Ctr. for Food Safety*, 2022 WL 17826872, *17 (requiring same).

CONCLUSION

For the foregoing reasons, Plaintiffs ask that the Court **grant** their Motion for Summary Judgment and **vacate** the 2020 Decision, as amended in 2022 and 2023.

Respectfully submitted this 12th day of April, 2023.

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ADDENDUM OF DECLARATIONS IN SUPPORT OF MOTION FOR SUMMARY JUDGEMENT

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THE UNITED STATES DISTRICT COURT
OF ARIZONA

Center for Biological Diversity, et al., *Plaintiffs,* v. United States Environmental Protection Agency, et al. *Defendants,* and Bayer CropScience LP, et al., *Defendant-Intervenors.*	Case No. CV-20-00555-DCB **DECLARATION OF GEORGE KIMBRELL IN SUPPORT OF PLAINTIFFS' MOTION FOR SUMMARY JUDGMENT**

DECLARATION OF GEORGE KIMBRELL

I, GEORGE KIMBRELL, declare that if called as a witness in this action I would competently testify of my own personal knowledge as follows:

1. I am the Legal Director of the Center for Food Safety (CFS) and counsel in this case. CFS is a tax-exempt, nonprofit membership organization with offices in San Francisco, California; Portland, Oregon; and Washington, D.C. CFS represents more than one million farmer and consumer members, covering every state throughout the country, including hundreds of thousands of members in the 34 states covered by the over-the-top dicamba approval challenged in this case. CFS and its members are being, and will be, adversely affected by EPA's 2020 decision to register dicamba for uses on dicamba-resistant cotton and soybean, as amended in 2022 and 2023.

2. CFS was founded in 1997. In the 25 years since its inception, CFS's mission has been to empower people, support farmers, and protect the environment from the harmful impacts of industrial agriculture. CFS's varied program areas cover everything in agriculture from "farm to fork," including the environmental, public health, and economic impacts of the industrial food system. A cornerstone of this mission is to advocate for thorough, science-based safety testing of new agricultural products and technologies. This includes flagship programs on both pesticides as well as genetically engineered crops.

3. CFS combines multiple tools and strategies in pursuing its mission, including public and policymaker education, outreach, and campaigning. For example, CFS disseminates a wide array of informational materials to government agencies, lawmakers, nonprofits, and the general public regarding the effects of industrial food production, agricultural products, and pesticides, on human health and the environment. These educational and informational materials include, but are not limited to, news articles, policy reports, white papers, legal briefs, press releases, newsletters, product guides, action alerts, and fact sheets. CFS often has provided expert testimony to policymakers on

the potentially harmful agrichemical impacts associated with industrial monoculture cropping systems, including the increased use of pesticides and chemical fertilizers.

4. Staff members regularly monitor the Federal Register and submit comments to the U.S. Environmental Protection Agency and other regulatory agencies via the public notice-and-comment process. CFS also regularly sends out action alerts to its members, encouraging them to participate in the notice-and-comment process, or to submit letters to government officials related to the oversight of industrial agriculture, pesticide use, genetically engineered crops, and other issues affecting CFS's mission to build a sustainable food system.

5. When necessary, and as here, CFS also engages in public interest litigation to address the impacts of industrial food production and pesticides on its members, the environment, and the public interest.

6. CFS submitted organizational comments in 2010, 2012, and 2016 to the EPA docket on the registration of over-the-top dicamba, for use on dicamba-resistant cotton and soybean. CFS also submitted comments to EPA prior to EPA's 2018 decision to continue the initial 2016 registration. CFS was one of the petitioners in *National Family Farm Coalition v. Environmental Protection Agency*, No. 17-70196, ECF No. 1-5 (9th Cir., Jan. 20, 2017) (*Dicamba I*), which challenged EPA's 2016 registration of dicamba for over-the-top uses.

7. Following EPA's amended registration in 2018, CFS, along with other petitioners, amended the petition for review and challenged the 2018 amendments. In June 2020, the Ninth Circuit vacated the 2018 dicamba registrations due to numerous violations of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), holding that EPA "substantially understated three risks it acknowledged" and "entirely failed to acknowledge three other risks." *Nat'l Fam. Farm Coal. v. EPA*, 960 F.3d 1120, 1135 (9th Cir. 2020). Among other flaws in the 2018 registrations, the Court found that EPA failed to consider, analyze, and weigh the social and economic costs imposed on farming

communities, *id.* at 1142-43, as well as the infeasibility of use mitigations on which the registration's safety hinged, *id.* at 1139-40, and underreporting of damage. *Id.* at 1137.

8. In August 2020, when it became clear EPA was considering whether to re-approve dicamba despite the Court's decision, CFS submitted several hundred documents for EPA's consideration. CFS then submitted additional documents to EPA in October 2020.

9. As a party to this proceeding, CFS and its members are injured by EPA's 2020 approval of over-the-top uses of dicamba on dicamba-resistant cotton and soybean specifically engineered to withstand its application, as well as EPA's 2022 and 2023 amendments to the registration. CFS and its members are concerned about the harmful impacts on farmers, the environment, and endangered species that have resulted and will continue to result from EPA's 2020 approval of over-the-top dicamba, as amended.

10. CFS and its members are being, and will be, adversely affected by the challenged 2020 decision, as amended in 2022 and 2023. Many members of CFS are heavily involved with maintaining a healthy environment for many species of animals for recreational, aesthetic, and personal reasons. The use of over-the-top dicamba will negatively harm non-target organisms, injuring CFS members' recreational and aesthetic interests.

11. Many of CFS's members are farmers and/or live in rural areas where excessive amounts of pesticides are being applied to cotton and soybean crops genetically engineered with resistance to dicamba. These members are especially susceptible to the environmental risks associated with EPA's ongoing approval of over-the-top dicamba for use on cotton and soybean fields. Moreover, the intensive use of over-the-top dicamba on crops compromises our members' enjoyment of their local environment and injures the aesthetic and recreational interests of our members in maintaining biodiversity and protecting sensitive species.

12. CFS members' interests are also injured by EPA's 2020 decision to approve over-the-top dicamba use, and its 2022 and 2023 amended approvals, without consulting with the expert U.S. Fish and Wildlife Service (FWS) on the risks to federally endangered and threatened species and their critical habitats, as required under the Endangered Species Act. Many of CFS's members have significant recreational interests in observing sensitive species, including the Indiana bat and whooping crane, and preserving their habitats. CFS's members' aesthetic interests in biodiversity and protection of these sensitive species are injured by EPA's 2020 decision to register over-the-top dicamba without consulting with FWS, as well as EPA's decision to amend in 2022 and 2023 without consulting again, as required under the Endangered Species Act.

13. Similarly, members of CFS include farmers and gardeners who live and grow crops that have already been damaged or are likely to be damaged by drift, vaporization, and runoff of over-the-top dicamba. EPA's registration of over-the-top dicamba use has already caused unprecedented damage to farmers' and gardeners' crops and plants across millions of acres. Its 2020 decision, as amended in 2022 and 2023, will allow continued use, making it more likely that CFS's farmer and gardener members who cultivate crops near areas of over-the-top dicamba application will suffer crop or land use damage. Such members may have to adjust their planting season, or impose costly measures such as buffer strips, or forego the planting of certain crops, in order to try to reduce the negative impacts of over-the-top dicamba use near their crops. The livelihood and economic interests of CFS members who cultivate and farm such crops are injured by the EPA 2020 approval, as amended in 2022 and 2023.

14. CFS and its members are also harmed by EPA's failure to hold formal notice-and-comment on the controversial 2020 decision and its failure to follow the proper procedures, including notice-and-comment, after its dicamba cancellation order. CFS and many of its members regularly comment on EPA's pesticide decisions and would have welcomed the opportunity to provide input to EPA on the 2020 decision. And had EPA

allowed for public comment, it may have chosen not to register dicamba again after reading comments from farmers and conservationists that have been experiencing ongoing damage and harm to their economic and recreational interests. Furthermore, had EPA followed its own post-cancellation procedures, it may have determined that insufficient evidence existed to re-register dicamba and allow for the ongoing damage to CFS and its members.

15. Similarly, CFS and its members were harmed by EPA's failure to hold notice-and-comment on the FIFRA 24(c) rule change in the 2020 decision. Many CFS members reside and recreate in states that used FIFRA 24(c) to add protections from dicamba drift damage prior to 2020 but could not during the 2021 growing season, spurring widespread damage, such as Arkansas, Minnesota, and Iowa. Again, CFS members frequently participate in public comment periods and would have taken advantage of an opportunity to comment on an EPA proposal to remove states' regulatory flexibility in adding restrictions to pesticide uses under FIFRA 24(c). Had EPA allowed for public comment, it may have allowed states to continue using FIFRA 24(c) to protect CFS members from dicamba damage, and from any other pesticide that requires a restrictive Special Local Needs label.

16. In sum, EPA's 2020 decision to register over-the-top dicamba for use on cotton and soybean, as amended, injures CFS's organizational interests in protecting agriculture and the environment, as well as the aesthetic, recreational, and economic interests of CFS's over one million members. CFS's injuries and its members' injuries will be redressed if and when this Court vacates the registrations.

Respectfully submitted this 12th day of April, 2023.

George Kimbrell

George Kimbrell

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Counsel for Plaintiffs

THE UNITED STATES DISTRICT COURT
OF ARIZONA

Center for Biological Diversity, et al., *Plaintiffs,* v. United States Environmental Protection Agency, et al. *Defendants,* and Bayer CropScience LP, et al., *Defendant-Intervenors.*	Case No. CV-20-00555-DCB **DECLARATION OF MARCIA ISHII-EITEMAN IN SUPPORT OF PLAINTIFFS' MOTION FOR SUMMARY JUDGMENT**

DECLARATION OF MARCIA ISHII-EITEMAN

I, MARCIA ISHII-EITEMAN, declare that if called as a witness in this action I would competently testify of my own personal knowledge as follows:

1. I am a Senior Scientist of Pesticide Action Network North America (PANNA).

2. PANNA is a Berkeley, California-based, nonprofit corporation that serves as an independent regional center of Pesticide Action Network International, a coalition of public interest organizations in more than ninety countries. PANNA has more than 125,000 members across the United States. Many of our members are farmers or residents of rural communities. PANNA also has offices and/or staff members in Minneapolis, Minnesota, Iowa, Texas, Florida, and Tennessee: states directly affected by the U.S. Environmental Protection Agency regulatory approval of the use of the herbicide over-the-top dicamba.

3. PANNA was founded in 1982 to combat the proliferation of chemical intensive, mono-crop agriculture. PANNA's mission is to advance a post-industrial vision of agriculture that replaces the use of hazardous pesticides with healthier, ecologically-sound pest management. The costs of industrial food production and the increased use of pesticides now touch every aspect of our lives, from residues on our produce, to increased chronic disease, to biodiversity loss. In order to meet its objectives, PANNA links local and international consumer, labor, health, environment, and agriculture groups into an international citizens' action network. Through this network, PANNA challenges the global expansion of pesticides, defends basic rights to health and environmental quality, and works to ensure the transition to a just and viable food system.

4. To protect our health and restore our ecosystems, PANNA shares information and builds alliances with numerous partners and coalitions across the United States and globe. PANNA works together with these groups to reduce reliance on toxic chemicals, promote food democracy, and move toward a healthy, resilient system of food and farming for all. PANNA's partners include the California Climate and Agricultural

Network, Californians for Pesticide Reform, National Coalition for Pesticide-Free Lawns, National Family Farm Coalition, National Pesticide Reform Coalition, Rural Coalition, and many more. We also work closely with food and farming groups to reduce the negative health and livelihood impacts of pesticide drift in the states where over-the-top dicamba has been approved for use, including the Iowa Farmers Union, Iowa Organic Association, and Practical Farmers of Iowa.

5. In addition to coalition building, we bring our strength in grassroots science and strategic communications to tackle a multitude of pesticide-related problems. PANNA provides scientific expertise, public education and access to pesticide data and analysis, policy development, and coalition support to more than 100 affiliated organizations in North America.

6. PANNA previously submitted organizational comments in 2016 to EPA regarding the agency's initial proposal to register over-the-top dicamba, the pesticide product and uses at issue in the present petition for review. However, EPA's failure to provide for notice and comment on the 2020 decision and the FIFRA 24(c) rule change deprived PANNA of that opportunity to submit comments. PANNA was one of the petitioners in *National Family Farm Coalition v. Environmental Protection Agency*, No. 17-70196, ECF No. 1-5 (9th Cir., Jan. 20, 2017) (*Dicamba I*) and *National Family Farm Coalition v. Environmental Protection Agency*, No. 19-70115 (9th Cir.) (*Dicamba II*), which challenged EPA's earlier registration decisions of the same pesticide product and proposed uses.

7. Dicamba is a highly volatile chemical that easily turns to vapor, especially in warm summer temperatures, enabling it to drift for miles. In 2017 alone, weed scientists reported over 3.6 million acres of soybeans damaged by dicamba drift, in 23 states, representing over 2,700 individual reports of injury. Due to lack of reporting mechanisms, these figures do not include likely damage to other vulnerable crops (e.g., any broadleaf plants such as cotton, fruits, vegetables, vineyards, trees, or plants found in home gardens),

plant habitat critical to pollinators and other wildlife, and organic farm businesses that may lose organic certification as a result of dicamba contamination.

8. Dicamba drift has harmed farmers and the environment every summer since EPA approved it for "over the top" spraying on genetically engineered crops engineered with resistance to it. I know that EPA was aware of that harm before the 2020 approval, and even issued a report in 2021 admitting that its 2020 measures had failed to lessen harm from drift. But when EPA amended the registration in 2022 and 2023, it still failed to address the harms.

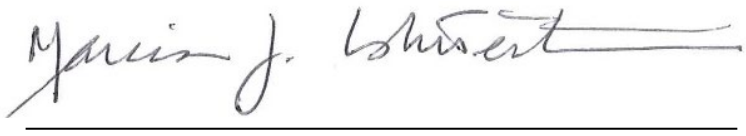
9. PANNA and its members are being, and will be, adversely affected by EPA's decision in 2020 to again register dicamba for over-the-top uses on cotton and soybeans, as amended in 2022 and 2023. PANNA's members live, farm, and recreate in many locations where over-the-top dicamba has been sprayed or will be sprayed. PANNA's farmer members who grow vulnerable crops, residents who have home gardens, and community members who enjoy the benefits of pollinators, birds, and other wildlife that rely on vulnerable plants for food, nesting, or breeding, are at risk of dicamba damage to their crops, hedgerows, gardens, and surrounding ecologically important flora. PANNA's farmer members may have to adjust their planting season and choice of seed or crop, or impose costly measures such as buffer zones, in an attempt to avoid crop damage by over-the-top dicamba.

10. PANNA's members are deeply concerned that EPA's registration of over-the-top dicamba will harm their farm productivity, livelihoods, and environment, to the detriment of their economic and recreational interests.

11. PANNA's members are heavily involved with reducing the use of pesticides to protect various species of plants and animals and enhance biodiversity. Biodiversity is essential to a healthy and thriving ecosystem and successful agriculture. The registration of over-the-top dicamba will harm sensitive, threatened, and endangered species, which will injure PANNA's members' aesthetic interest in protecting natural ecosystems and wildlife and maintaining biodiversity.

12. EPA's 2020 decision to register over-the-top dicamba for use genetically engineered cotton and soybeans, as amended in 2022 and 2023, without addressing the harms occurring from dicamba spraying, and without providing for public comment, adversely injures PANNA's organizational interests, as well as the aesthetic, recreational, economic, and personal health interests of our members.

Respectfully submitted this 9th day of March, 2023.



Marcia Ishii-Eiteman

George A. Kimbrell (WSB 36050) (*Pro Hac Vice*)
Sylvia Shih-Yau Wu (CSB 273549) (*Pro Hac Vice*)
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THE UNITED STATES DISTRICT COURT
OF ARIZONA

Center for Biological Diversity, et al., *Plaintiffs,* v. United States Environmental Protection Agency, et al. *Defendants,* and Bayer CropScience LP, et al., *Defendant-Intervenors.*	Case No. CV-20-00555-DCB **DECLARATION OF LISA GRIFFITH IN SUPPORT OF PLAINTIFFS' MOTION FOR SUMMARY JUDGMENT**

DECLARATION OF LISA GRIFFITH

I, LISA GRIFFITH, declare that if called as a witness in this action I would competently testify of my own personal knowledge as follows:

1. I am the National Outreach and Communications Coordinator of Plaintiff National Family Farm Coalition (NFFC). NFFC is a Washington, D.C.-based, nonprofit corporation that serves as a national link for a coalition of family farm and rural groups on the challenges facing family farms and rural communities. Founded in 1986, NFFC today represents farmers and ranchers from 31 grassroots member organizations in 42 states, including farmers and ranchers from Georgia, Mississippi, Missouri, North Carolina, North Dakota, Ohio, South Dakota, Texas, and Wisconsin, where the U.S. Environmental Protection Agency (EPA) has again approved the use of over-the-top dicamba on dicamba-resistant cotton and soybean, the challenged new uses at issue in this case. The combination of our member groups' grassroots strength and NFFC's experience, working on the national level, enables us to play a unique role in securing a sustainable, economically just, healthy, safe, and secure food and farm system.

2. NFFC chooses its projects based on the potential to empower family farmers by reducing the corporate control of agriculture while promoting a more socially just farm and food policy. NFFC's member organizations contribute to NFFC financially, participate in NFFC's executive decision-making, and help NFFC set its priorities. NFFC staff collaborate with NFFC members — family farmers and ranchers, community-based fishermen, and rural advocates — who help to determine NFFC's campaigns. Working with organizational, rather than individual, members offers a broader base of support and outreach for implementing national organizing strategies.

3. NFFC and its members are being, and will be, adversely affected by EPA's 2020 decision to re-register dicamba for over-the-top spraying on dicamba-resistant cotton and soybeans, and its decision to amend that approval in 2022 and 2023.

4. Since the mid-1990s, NFFC has devoted significant resources to addressing the harms stemming from the use of pesticides on genetically engineered, pesticide-resistant

crops. NFFC's Farmer to Farmer Campaign on Genetic Engineering sought to build a nationwide campaign focused on the risks of genetic engineering to agriculture. As part of the campaign, NFFC published educational materials on the liabilities of genetic engineering and conducted trainings to develop farmer leaders on various genetic engineering issues, including the agronomic, human health, and environmental harms of pesticide use on such crops. Farmer to Farmer also published "Out of Hand," a report on the problems farmers face through seed/pesticide industry concentration and anticompetitive effects, including diminished options, higher costs, and the increased use of toxic herbicides.

5. On behalf of the farmers and ranchers NFFC represents, NFFC submitted organizational comments in May 2016 to EPA regarding the agency's initial proposal to register the new uses of over-the-top dicamba on dicamba-resistant cotton and soybean. EPA's failure to allow for notice and comment on the 2020 decision and FIFRA 24(c) rule change, however, did not allow for NFFC to comment on this decision. NFFC was also one of the petitioners in *National Family Farm Coalition v. Environmental Protection Agency*, No. 17-70196 (9th Cir.) (*Dicamba I*) and *National Family Farm Coalition v. Environmental Protection Agency*, No. 19-70115 (9th Cir.) (*Dicamba II*), which challenged EPA's earlier registration decisions of the same pesticide products and proposed uses.

6. The approved uses of over-the-top dicamba injure NFFC members' farm productivity, livelihoods, and environment, to the detriment of their economic and personal interests. NFFC's members live, farm, and recreate in many locations where over-the-top dicamba has been sprayed or will be sprayed. NFFC farmer members who grow vulnerable crops, such as tomatoes, grapes, and non-dicamba-resistant soybeans, are at risk of dicamba damage. Because EPA's approval authorizes over-the-top dicamba use in cotton and soybean states for in-season use, NFFC's farmer members may have to adjust their planting season and choice of seed or crop, or impose costly measures such as buffer zones, in an attempt to avoid crop damage by over-the-top dicamba.

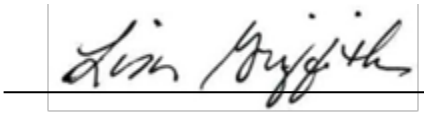
7. Many of NFFC's members are heavily involved with reducing the use of pesticides and preserving the use of non-patented seed crops. They see the use of conventional, non-genetically engineered seeds and the ability to save their seeds as vital components of rural life and their way of farming. Because EPA's approved new uses of over-the-top dicamba on dicamba-resistant cotton and soybean creates a longer period of time whereby farmers may suffer drift damage from over-the-top dicamba, many farmers in localities where NFFC farmers reside have no choice but to switch to planting dicamba-resistant soybean and cotton "defensively" in order to avoid economic losses due to drift damage to their crops. This, in turn, reduces the local availability of non-genetically engineered seeds as local seed banks have no incentive to sell such varieties due to reduced demand. Thus, the registration of over-the-top dicamba has, and will continue to, injure NFFC's members' interests and ability to obtain and plant non-genetically engineered seeds, costing them additional time and money in order to locate such seeds.

8. Every year since dicamba's initial over-the-top spraying approval in 2016, farmers including our members have suffered devastating drift damage. Yet EPA still keeps approving the use. The evidence was clear before the 2020 re-approval, but in addition to that, EPA itself in 2021 issued a report documenting continued damage and admitting that its 2020 measures had failed to work. Yet in March 2022 and February 2023, EPA only made minor changes to the registration and otherwise re-affirmed it.

9. In sum, EPA's 2020 decision to again register over-the-top dicamba for use on dicamba-resistant cotton and soybean, as amended in 2022 and 2023, adversely injure NFFC's organizational interests, as well as the economic and personal interests of our members.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Respectfully submitted this 1st day of March, 2023.



Lisa Griffith

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THE UNITED STATES DISTRICT COURT
OF ARIZONA

Center for Biological Diversity, et al., *Plaintiffs,* v. United States Environmental Protection Agency, et al. *Defendants,* and Bayer CropScience LP, et al., *Defendant-Intervenors.*	Case No. CV-20-00555-DCB **DECLARATION OF KIERÁN SUCKLING IN SUPPORT OF PLAINTIFFS' MOTION FOR SUMMARY JUDGMENT**

I, KIERÁN SUCKLING, declare that if called as a witness in this action I would competently testify of my own personal knowledge as follows:

1. I have been a member of the Center for Biological Diversity since 1989. I am a co-founder and the Executive Director.

2. I live in Tucson, Arizona. Arizona is one of the states where the Environmental Protection Agency (EPA) registered dicamba for use on genetically engineered cotton that has been engineered to resist dicamba. Cotton is one of Arizona's major agricultural commodities. Along with cattle, copper, and citrus, cotton makes up the "Four Cs" dominating Arizona's resource economy. Cotton is grown primarily in Graham, Maricopa, Pima, Pinal, Cochise, Greenlee, La Paz, Mohave, and Yuma counties.

3. The Center for Biological Diversity (the Center) is a tax-exempt, nonprofit membership organization headquartered in Arizona with offices and staff across the country. In 1989, I helped found the Center (formerly as the Greater Gila Biodiversity Project, then formerly incorporated as the Southwest Center for Biological Diversity) to fight the growing number of threats to biodiversity. Our mission is to secure a future for all species, great and small, hovering on the brink of extinction through science, policy, education, and environmental law. As a result of groundbreaking petitions, lawsuits, policy advocacy, and outreach to media, hundreds of species have gained protection. The Center has a full-time staff of scientists, lawyers, and other professionals who work exclusively on campaigns to save species and their habitat. Our members rely on the Center to represent their interests in protecting biodiversity and conserving threatened and endangered species and their habitats.

4. I have dedicated my life to protecting rare and imperiled wildlife, fish, and plants. I believe all of nature's living organisms, from beetles to polar bears, are equal, have inherent value, and are necessary for a healthy environment, including for humans. I have long been concerned about the widespread toxic contamination in our environment and the impacts these chemicals are having on biodiversity and human health. We developed

the Environmental Health Program within the Center to address the adverse effects of pesticides and other toxic substances.

5. I am very concerned about the effects of pesticides on species and their habitats, including federally designated critical habitat areas. I know that EPA approved dicamba pesticide products for use over the top of soybeans and cotton that are genetically engineered to resist dicamba. I also know that the Center was a petitioner in the case where, in 2020, the Ninth Circuit Court of Appeals held that EPA's 2018 registration of these products violated the Federal Insecticide, Fungicide, and Rodenticide Act and vacated the dicamba registration. I know EPA re-registered these uses of dicamba four months later in 2020, and that EPA confirmed these uses of dicamba in 2022 and 2023. I am aware of the extensive damage that over-the-top use of these dicamba products has caused and continues to cause to vegetation, including trees miles from the application locations.

6. I enjoy viewing wildlife in the wild that I have worked to protect and plants and other wildlife important to biodiversity. I regularly enjoy looking for species in their natural habitats wherever I am during my travels, and especially in my home state of Arizona. I have definite plans to continue to look for and enjoy these species and other plants and wildlife. In Arizona, I am specifically concerned about the potential effects of the use of dicamba on the Southwestern willow flycatcher, the yellow-billed cuckoo, the Chiricahua leopard frog, and habitats—especially critical habitats—they depend on.

7. The Southwestern willow flycatcher (*Empidonax traillii extimus*) is a small migratory bird that was formerly common along desert rivers from Texas to California. It is now very rare, but maintains a few important stronghold populations in Arizona. The flycatcher is listed as endangered and is supposed to be protected under the Endangered Species Act. 60 Fed. Reg. 10694 (Feb. 27, 1995). The flycatcher has designated critical habitat in Arizona. 78 Fed. Reg. 344 (Jan. 3, 2013). I was the lead author of the 1992 citizen petition to list it as a federally endangered species and to designate critical habitat

for it. The Center had to file numerous lawsuits from 1995 through 2010 to protect the flycatcher: first, to get the U.S. Fish and Wildlife Service to list it as endangered, then to designate critical habitat, including numerous lawsuits over the adequacy of the critical habitat.[1]

8. The flycatcher requires habitat for nesting (breeding) and feeding, generally including trees and shrubs that have vegetation near ground level. *Id.* at 346. The flycatcher's primary constituent elements (PCEs), which are the specific biological or physical features for a species' life-history processes and are essential to conservation of the species, *id.* at 350, include an abundance of riparian vegetation for breeding, non-breeding, territorial, dispersing, and migrating, including foliage from the ground level up to 98 feet. *Id.* at 351, 352, 355-56. The flycatcher generally eats insects such as bees, butterflies, caterpillars, and spittlebugs, including ground- and vegetation-dwelling species. *Id.* at 353, 356. Availability of flycatcher food is influenced by the density and species of vegetation, among other factors. *Id.* Flycatchers forage in tree canopy as well as open areas within their territory. Therefore, an essential PCE for flycatcher habitat is the presence of a wide range of insect prey, including vegetation-dwelling species. *Id.* at 353, 356.

9. I regularly hike and recreate along Arizona's rivers and have seen the Southwestern willow flycatcher on the San Pedro River, Santa Cruz River, Gila River, Bill Williams River, and Colorado River, including designated critical habitat areas. I have seen cotton fields in the uplands adjacent to each of these rivers. If dicamba is sprayed on these or new fields and reaches the trees or other vegetation in the riparian areas through direct spraying, run off, volatilization, drift, or a combination of these, the flycatcher directly could be harmed, killed, or even locally extirpated or indirectly harmed through habitat

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[1] The Center also sued U.S. Animal and Plant Health Inspection Service (APHIS) and the U.S. Department of Agriculture (USDA) for violating the Endangered Species Act when it allowed the release of the tamarisk-defoliating leaf beetle within Southwestern willow flycatcher nesting areas and critical habitat.

degradation and loss and diminishment of insect prey for food because the plants the prey rely upon are damaged. This would dramatically harm my professional, recreational, and aesthetic interests. I intend to continue to look for and hope to see flycatchers in these and other places in southern Arizona.

10. The yellow-billed cuckoo (*Coccyzus americanus*) was formerly common along rivers from Arizona to Washington State. Today, the cuckoo is found in a mere handful of locations, including several critically important strongholds in southern and western Arizona. The western population of the cuckoo is listed as threatened and is supposed to be protected under the Endangered Species Act. 79 Fed. Reg. 59992 (Oct. 3, 2014). The cuckoo has designated critical habitat in Arizona. 86 Fed. Reg. 20798 (April 21, 2021). In 1998, the Center submitted a citizen petition, primarily written by me, to list the yellow-billed cuckoo as a federally endangered species and to designate critical habitat for it. Again, the Center had to file lawsuits before the U.S. Fish and Wildlife Service listed the western populations as threatened in 2014.

11. The cuckoo requires habitat for nesting (breeding) and feeding. *Id.* at 20835. For breeding, the cuckoo needs riparian vegetation, trees, and shrubs, interspersed with openings, and has been found nesting in orchards, therefore, riparian vegetation is a PCE essential to the conservation of the cuckoo. *Id.* at 20835-36, 20845. The cuckoo eats insects, such as cicadas, caterpillars, katydids, and grasshoppers, and small vertebrates, such as frogs and lizards. *Id.* at 20840. The cuckoo must have access to abundant food sources to successfully rear their young, therefore presence of abundant large insects and small vertebrates is a PCE essential to the conservation of the cuckoo. *Id.* at 20841, 20845.

12. I regularly hike and recreate in southern Arizona and have seen the yellow-billed cuckoo in its designated critical habitat and on the San Pedro River, Bill Williams River, Gila River, Verde River, Sonoita Creek, and Cienega Creek.

13. On the Lower Colorado River in La Paz County, Arizona, I have seen yellow-billed cuckoos between the Cibola National Wildlife Refuge and the unincorporated town

of Blue Water to the north. There are substantial cotton fields adjacent to the river and yellow-billed cuckoo habitat, especially on the west side of the river in the southern segment and the east side in the northern segment. On the Lower Gila River in Yuma County, Arizona, I have seen yellow-billed cuckoos between the town of Ligurta and the Quigley Wildlife Management Area to the east. There are substantial cotton fields adjacent to the river and yellow-billed cuckoo habitat, especially on the south side of the river in the western segment and the north side in the eastern segment. On the Gila River in Maricopa County, Arizona, I have seen yellow-billed cuckoos between the river's confluences with the Agua Fria and Hassayampa rivers. There are substantial cotton fields adjacent to the river and yellow-billed cuckoo habitat on the north side of the Gila River in this area.

14. If dicamba is sprayed on these or new fields and reaches the trees or other vegetation in the riparian areas through direct spraying, run off, volatilization, drift, or a combination of these, the yellow-billed cuckoo could directly be harmed, killed, or even locally extirpated or indirectly harmed through habitat degradation and loss and diminishment of insect prey for food because the plants the prey rely upon are damaged. This would dramatically harm my professional, recreational, and aesthetic interests. I intend to continue to look for and hope to see the cuckoo in these and other places in southern and western Arizona.

15. The Chiricahua leopard frog (*Rana chiricahuensis*) was once found at more than 400 sites along rivers in Arizona and New Mexico, but it is now found at fewer than 80. In southeast Arizona, it has declined more than any other leopard frog. The Chiricahua leopard frog is listed as threatened and is supposed to be protected under the Endangered Species Act. 67 Fed. Reg. 40790 (June 13, 2002). It has designated critical habitat in Arizona. 77 Fed. Reg. 16342 (Mar. 20, 2012). In 1998, the Center submitted a citizen petition, primarily written by me, to list it as a federally endangered species and to designate critical habitat for it. Again, the Center had to file lawsuits before the U.S. Fish

and Wildlife Service listed the frog as threatened in 2002. In 2007, the Center became part of the stakeholders' group that developed the federal plan to recover the frog.

16. The Chiricahua leopard frog requires a combination of riparian vegetation for feeding and open areas for basking. *Id.* at 16341. The vegetation provides habitat for prey species and protection (cover) from predators, and the frog uses upland areas out to the edge of the vegetation, especially during the summer. *Id.* The frog eats primarily invertebrates, such as beetles, and has been documented eating a hummingbird in Arizona. *Id.* at 16335. According to the U.S. Fish and Wildlife Service, the importance of available cover, such as emergent vegetation, "cannot be overstated" because it is fundamental to the frog's defensive behavior and important to maintaining an invertebrate prey base. *Id.* at 16330.

17. I regularly hike and recreate in southeast Arizona and have seen the Chiricahua leopard frog and its designated critical habitat at isolated ponds and watering holes in the San Pedro, Santa Cruz, Brawley, and Cienega creek river basins.

18. If dicamba is sprayed on these or new fields and reaches the trees or other vegetation through direct spraying, run off, volatilization, drift, or a combination of these, the Chiricahua leopard frog could be directly harmed, killed, or even locally extirpated or indirectly harmed through habitat degradation and loss and loss and diminishment of prey for food because the plants the prey rely upon are damaged. This would dramatically harm my professional, recreational, and aesthetic interests. I intend to continue to look for and hope to see the frog in these and other places in southern Arizona.

19. I am concerned that dicamba will be routinely applied over the top on cotton in Arizona in and around habitat for the Southwestern willow flycatcher, the yellow-billed cuckoo, and the Chiricahua leopard frog and have negative impacts on them and their habitat. I am concerned and fear that these species will be harmed by use of dicamba and other agricultural chemicals. If these species are further impacted and their populations

reduced or extirpated, my enjoyment of Arizona's unique natural environment would be diminished.

20. I am also concerned about the biodiversity of all plants and species that rely on them that could be unreasonably harmed in an environment with over-the-top use of dicamba on cotton. For example, there are about 1,300 native species of bees in Arizona, the highest diversity of bees in the United States.[2] They need flowering plants to survive in spring, summer, and fall. While these and other species may not be at risk of extinction now, the harm to plants and native bees and other wildlife that rely on plants are at risk of declining from over-the-top use of dicamba, impacting biodiversity. I am concerned and fear that native bees and other species will be harmed by use of dicamba and other agricultural chemicals. If these species are further impacted and their populations reduced or extirpated, my enjoyment of Arizona's unique natural environment would be diminished.

21. I have professional, aesthetic, and recreational interests in the preservation of the Southwestern willow flycatcher, the yellow-billed cuckoo, and the Chiricahua leopard frog and their habitats, especially critical habitat, as well as the biodiversity of other plants and wildlife, such as native bees, in Arizona. My interests are being harmed by the EPA's failure to ensure that these species and critical habitat areas I enjoy will not be unreasonably adversely affected or be put in jeopardy of extinction. The EPA's failure to comply with the Federal Insecticide, Fungicide, and Rodenticide Act and the Endangered Species Act makes it more likely these species will further decline or become extinct. If that should happen, I will be deprived of my enjoyment of these species, habitats, and critical habitats in the wild. Further analysis under the Federal Insecticide, Fungicide, and

[2] *See* https://acis.cals.arizona.edu/pest-identification/pest-diagnostics/arizona-bee-identification-guide. *See also* https://www.pinalcentral.com/farm_and_ranch/native-bees-important-to-arizona-farmers/article_4065d53b-84c6-5e6a-b788-51d9cc8e554f.html#:~:text=Habitat%20loss%2C%20climate%20change%20and,also%20affect%20the%20native%20bees.

Rodenticide Act and Endangered Species Act consultation with the U.S. Fish and Wildlife Service could result in protective measures aimed at reducing impacts of this pesticide on these species and their habitats, which is important to ensure that my interests in them are preserved and remain free from injury.

I declare under penalty of perjury that the foregoing is true and correct.

Executed in Tucson, Arizona on this 9th day of March, 2023.

KIERÁN SUCKLING

George A. Kimbrell (WSB 36050) (*Pro Hac Vice*)
Sylvia Shih-Yau Wu (CSB 273549) (*Pro Hac Vice*)
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Counsel for Plaintiffs

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Center for Biological Diversity, et al., *Plaintiffs,* v. United States Environmental Protection Agency, et al. *Defendants,* and Bayer CropScience LP, et al., *Defendant-Intervenors.*	Case No. CV-20-00555-DCB **DECLARATION OF KARA CLAUSER IN SUPPORT OF PLAINTIFFS' MOTION FOR SUMMARY JUDGMENT**

I, KARA CLAUSER, declare that if called as a witness in this action I would competently testify of my own personal knowledge as follows:

1. I am a Geographic Information System ("GIS") specialist at the Center for Biological Diversity ("Center"), where I have worked in this capacity for over 6 years. I hold a Master of Science in geographic information systems technology and a Bachelor of Science in ecology and evolutionary biology, both from the University of Arizona.

2. I prepared the maps, attached as Exhibits A through F to this Declaration, concerning the Environmental Protection Agency's registration of over-the-top use of products containing dicamba on soybean and cotton that has been genetically engineered to withstand it and U.S Fish and Wildlife Service ("FWS") data concerning ESA-protected species, as provided in more detail below.

3. To prepare the maps, I used ArcGIS Pro version 3.0.2 from Environmental Systems Research Institute (ESRI), and, in my professional opinion, it is accurate with respect to the data it represents. To map the soybean and cotton crops in this Declaration, I downloaded the GIS data describing their locations in the continental United States for the years 2017-2021 from the United States Department of Agriculture's National Croplands Data Layer ("CDS") website at https://www.nass.usda.gov/Research_and_Science/Cropland/Release/index.php.

4. Attached to this Declaration as Exhibit A is a true and correct copy of a map I created showing where soybeans have been grown in proximity to critical habitat for Hine's emerald dragonfly (*Somatochlora hineana*). I downloaded the GIS data describing critical habitat from the FWS website at https://ecos.fws.gov/ecp/report/table/critical-habitat.html.

5. Attached to this Declaration as Exhibit B is a true and correct copy of a map I created showing where soybeans have been grown in proximity to critical habitat for the Indiana bat (*Myotis sodalist*). I downloaded the GIS data describing the critical habitat

from the U.S. Fish and wildlife's website at https://ecos.fws.gov/ecp/report/table/critical-habitat.html.

6. Attached to this Declaration as Exhibit C is a true and correct copy of a map I created showing where soybeans have been grown in proximity to FWS range of the Karner blue butterfly (*Lycaeides melissa samuelis*). I downloaded the USFWS data for the range from https://ecos.fws.gov/docs/species/shapefiles/usfws_complete_species_current_range.zip. This range was edited to exclude areas in Lake Michigan.

7. Attached to this Declaration as Exhibit D is a true and correct copy of a map I created showing where soybeans have been grown in proximity to FWS range of the Mitchell's satyr butterfly (*Neonympha mitchellii*). I downloaded the USFWS data for the range from https://ecos.fws.gov/docs/species/shapefiles/usfws_complete_species_current_range.zip. This range was edited to exclude areas in Lake Michigan.

8. Attached to this Declaration as Exhibit E is a true and correct copy of a map I created showing where soybeans have been grown in proximity to rusty patched bumble bee "High Potential Zones," and "Primary Dispersal Zones" from FWS data. I downloaded the GIS data for these areas from the FWS website at https://www.fws.gov/midwest/endangered/insects/rpbb/rpbbmap.html.

9. Attached to this Declaration as Exhibit F is a true and correct copy of a map I created showing where cotton has been grown in proximity to critical habitat for the western yellow-billed cuckoo (*Coccyzus americanus*) and Southwestern willow flycatcher (*Empidonax traillii extimus*). I downloaded GIS data representing these critical habitat designations for these species from the FWS website at https://ecos.fws.gov/ecp/report/table/critical-habitat.html.

I declare under penalty of perjury that the foregoing is true and correct.

Executed in Tucson, Arizona this 29th day of December, 2022.

KARA CLAUSER

Exhibit A

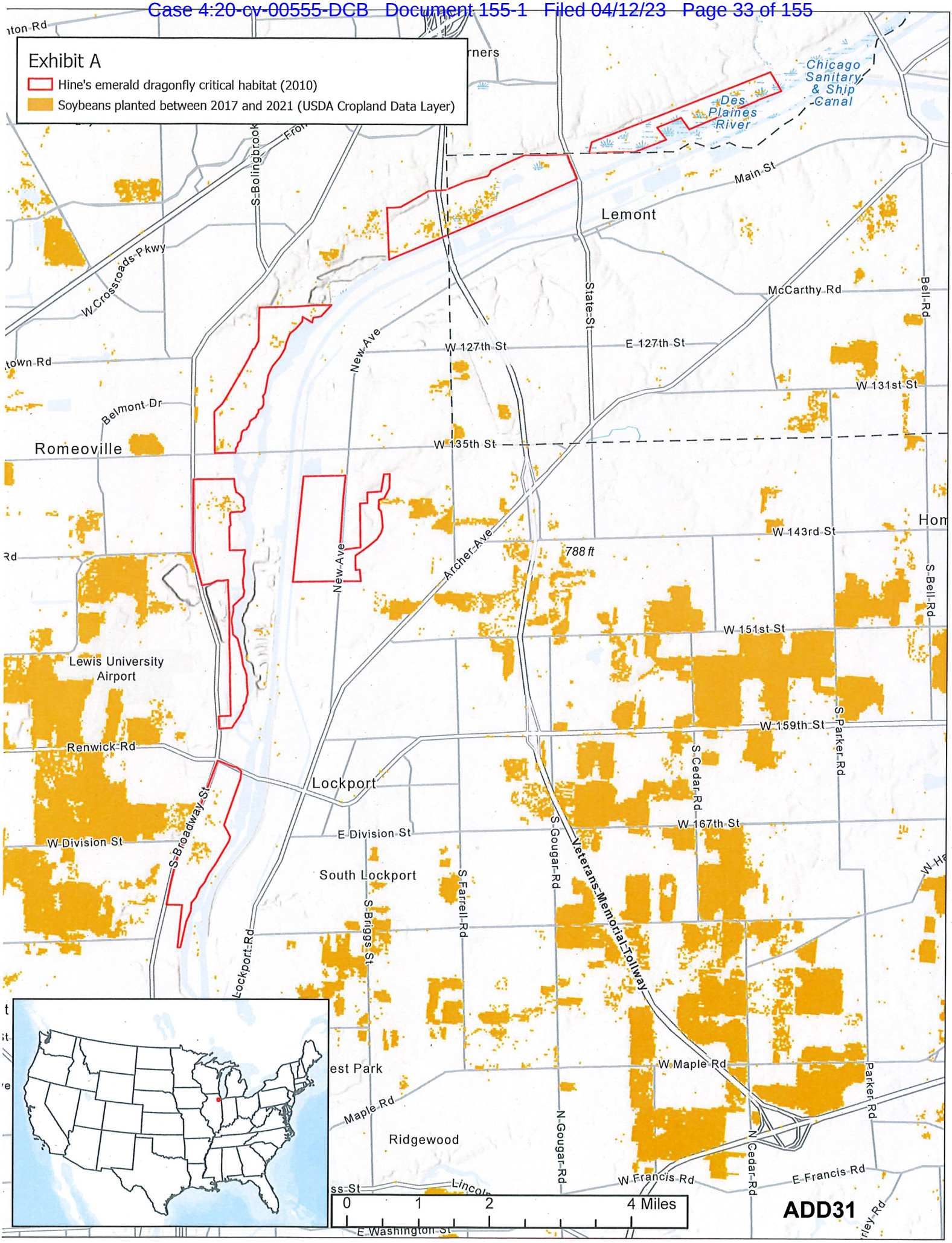
Exhibit A
Hine's emerald dragonfly critical habitat (2010)
Soybeans planted between 2017 and 2021 (USDA Cropland Data Layer)
Chicago Sanitary & Ship Canal
Des Plaines River
Main St
Lemont
S Bolingbrook
W Crossroads Pkwy
State St
McCarthy Rd
Bell Rd
New Ave
W 127th St
E 127th St
W 131st St
Belmont Dr
Romeoville
W 135th St
W 143rd St
Archer Ave
788 ft
S Bell Rd
W 151st St
Lewis University Airport
W 159th St
S Parker Rd
Renwick Rd
S Cedar Rd
Lockport
W 167th St
E Division St
W Division St
S Broadway St
South Lockport
S Gougar Rd
Veterans Memorial Tollway
S Farrell Rd
S Briggs St
Lockport Rd
W Maple Rd
Maple Rd
Ridgewood
N Gougar Rd
N Cedar Rd
Parker Rd
W Francis Rd
E Francis Rd
E Washington St
0 1 2 4 Miles
ADD31

Exhibit B

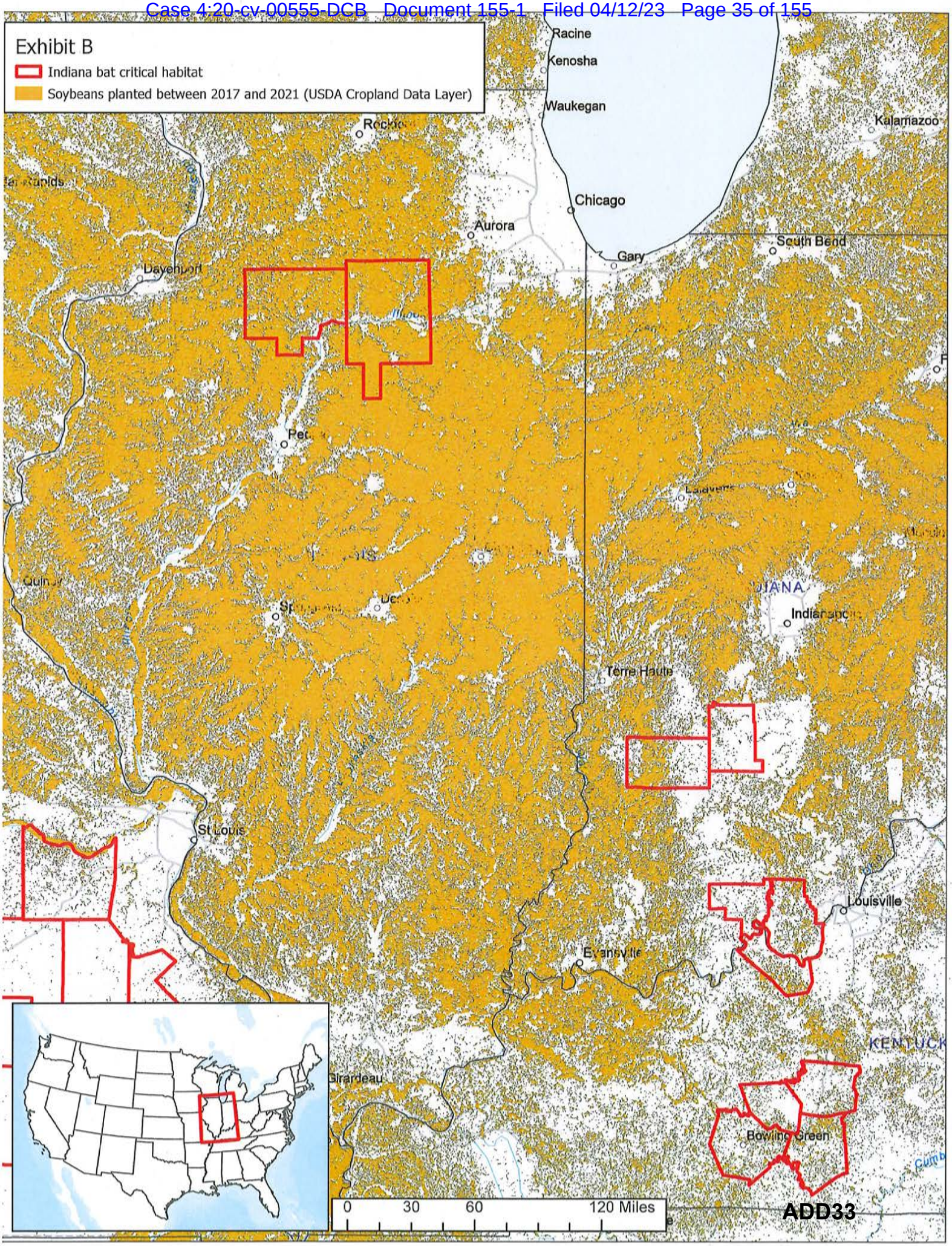
Exhibit B
Indiana bat critical habitat
Soybeans planted between 2017 and 2021 (USDA Cropland Data Layer)
Racine
Kenosha
Waukegan
Kalamazoo
Chicago
Aurora
South Bend
Gary
Davenport
Peo
Quincy
St
Terre Haute
St Louis
Louisville
Evansville
Bowling Green
Girardeau
0
30
60
120 Miles

Exhibit C

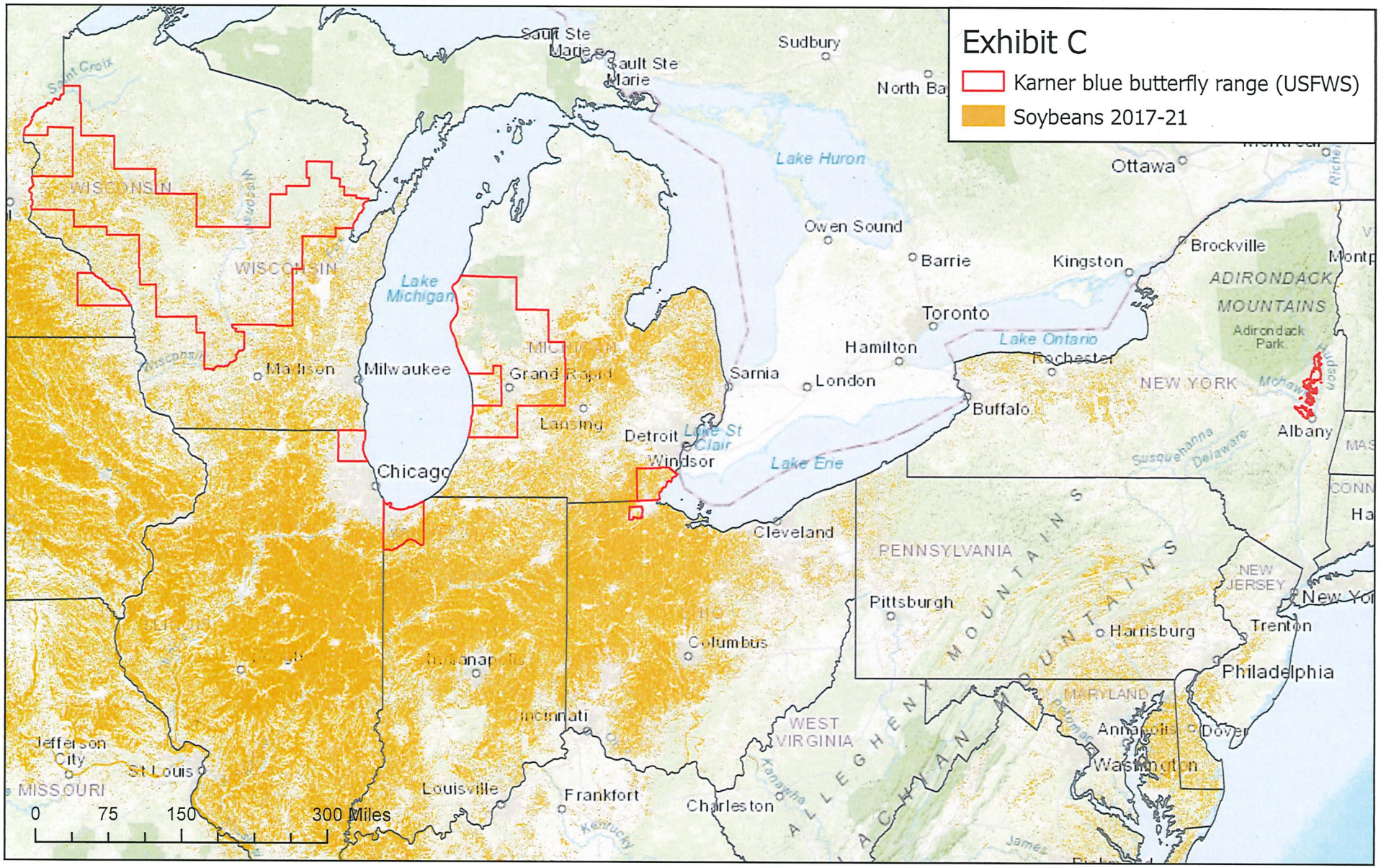
Exhibit C
Karner blue butterfly range (USFWS)
Soybeans 2017-21
Sault Ste Marie
Sault Ste Marie
Sudbury
North Bay
Lake Huron
Ottawa
Owen Sound
Barrie
Kingston
Brockville
ADIRONDACK MOUNTAINS
Adirondack Park
Toronto
Hamilton
Lake Ontario
Rochester
NEW YORK
Buffalo
Albany
Lake Michigan
WISCONSIN
Madison
Milwaukee
Grand Rapids
Lansing
Sarnia
London
Detroit
Lake St Clair
Windsor
Lake Erie
Chicago
Cleveland
PENNSYLVANIA
Pittsburgh
Harrisburg
Trenton
NEW JERSEY
Philadelphia
Columbus
Indianapolis
Cincinnati
WEST VIRGINIA
MARYLAND
Annapolis
Dover
Washington
Jefferson City
St Louis
MISSOURI
Louisville
Frankfort
Charleston
0 75 150 300 Miles

ADD35

Exhibit D

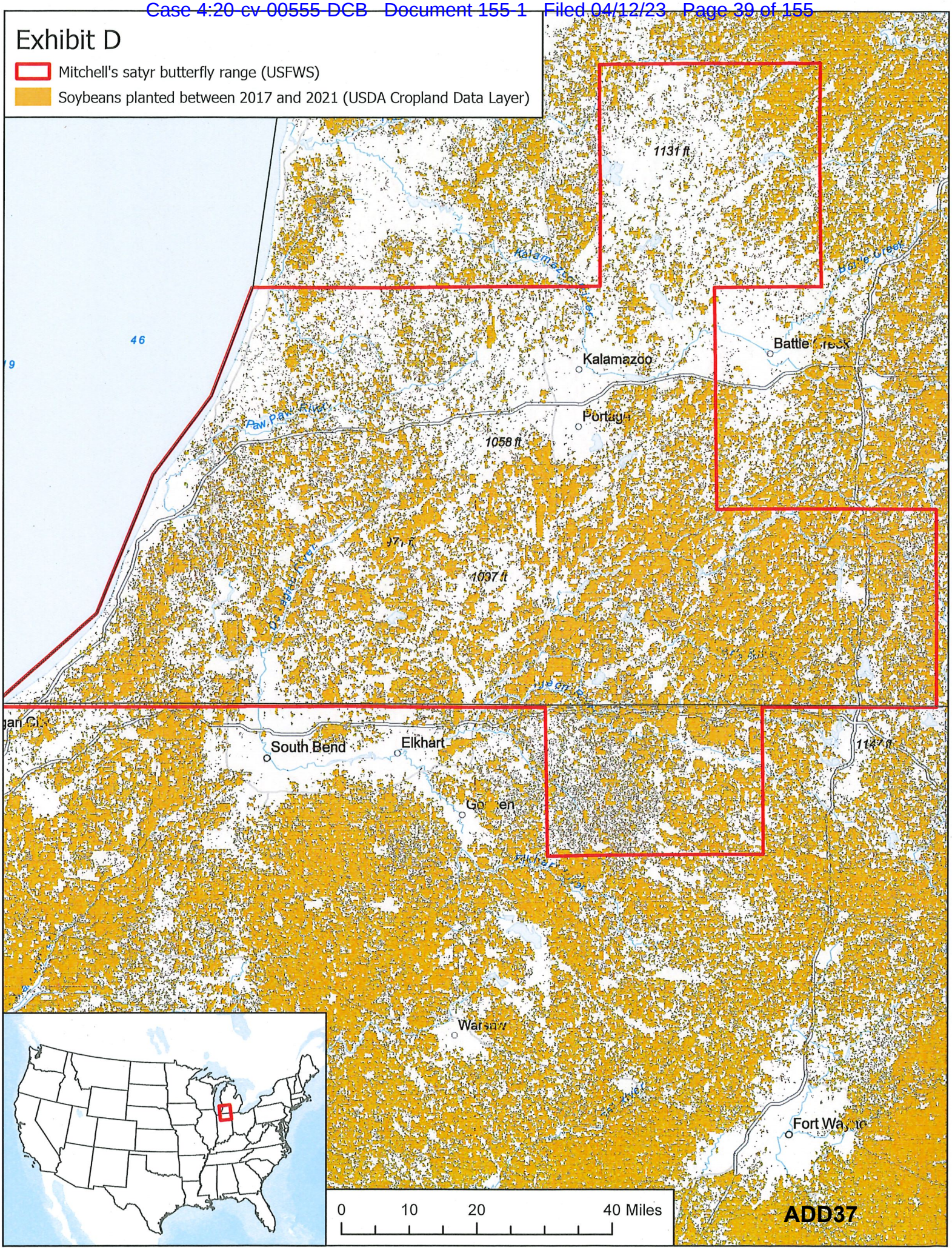
Exhibit D
Mitchell's satyr butterfly range (USFWS)
Soybeans planted between 2017 and 2021 (USDA Cropland Data Layer)
1131 ft
Kalamazoo
Battle Creek
Portage
1058 ft
1097 ft
South Bend
Elkhart
Warsaw
Fort Wayne
0 10 20 40 Miles
ADD37

Exhibit E

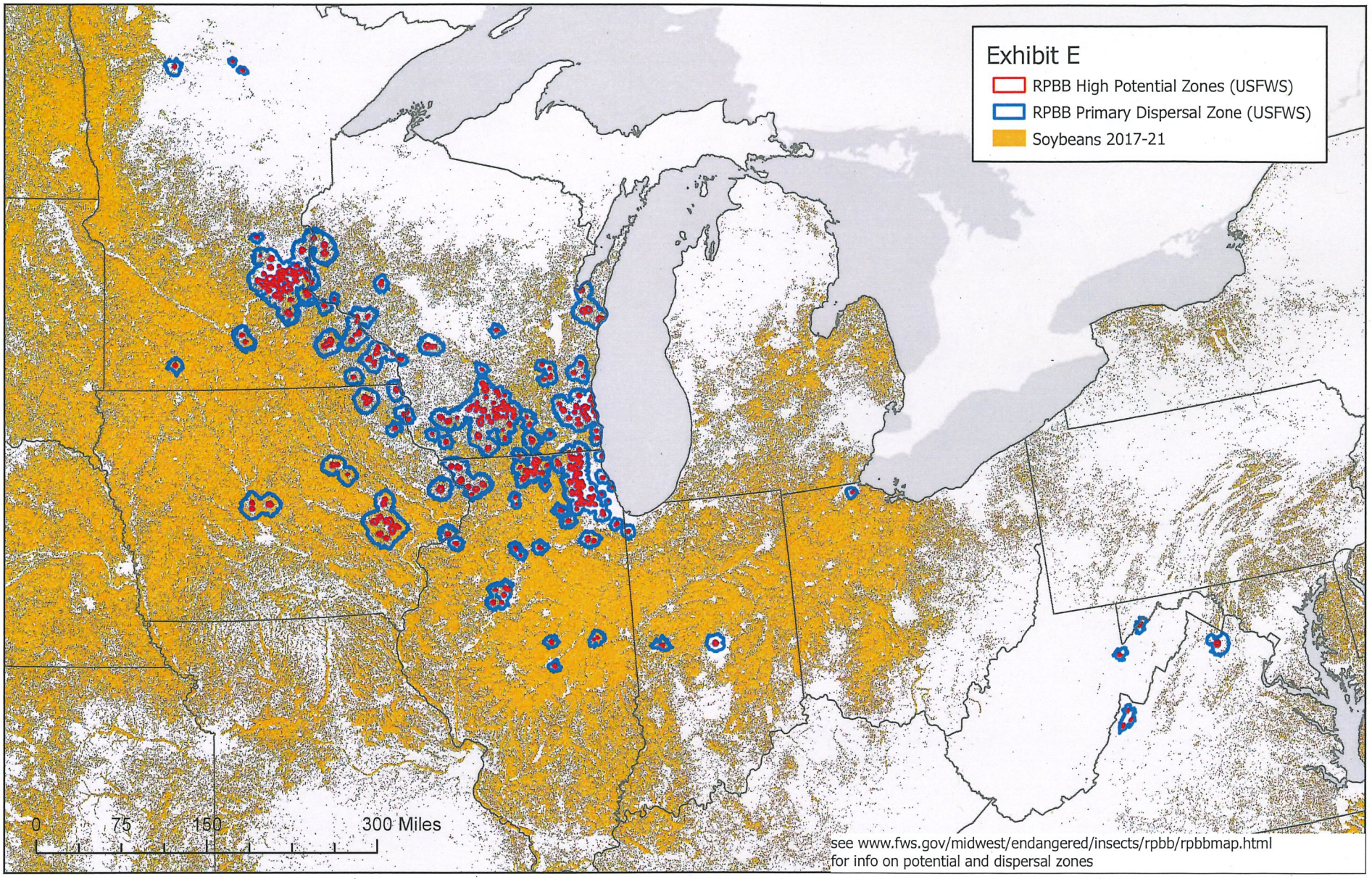
Exhibit E
RPBB High Potential Zones (USFWS)
RPBB Primary Dispersal Zone (USFWS)
Soybeans 2017-21
0
75
150
300 Miles
see www.fws.gov/midwest/endangered/insects/rpbb/rpbbmap.html
for info on potential and dispersal zones

Exhibit F

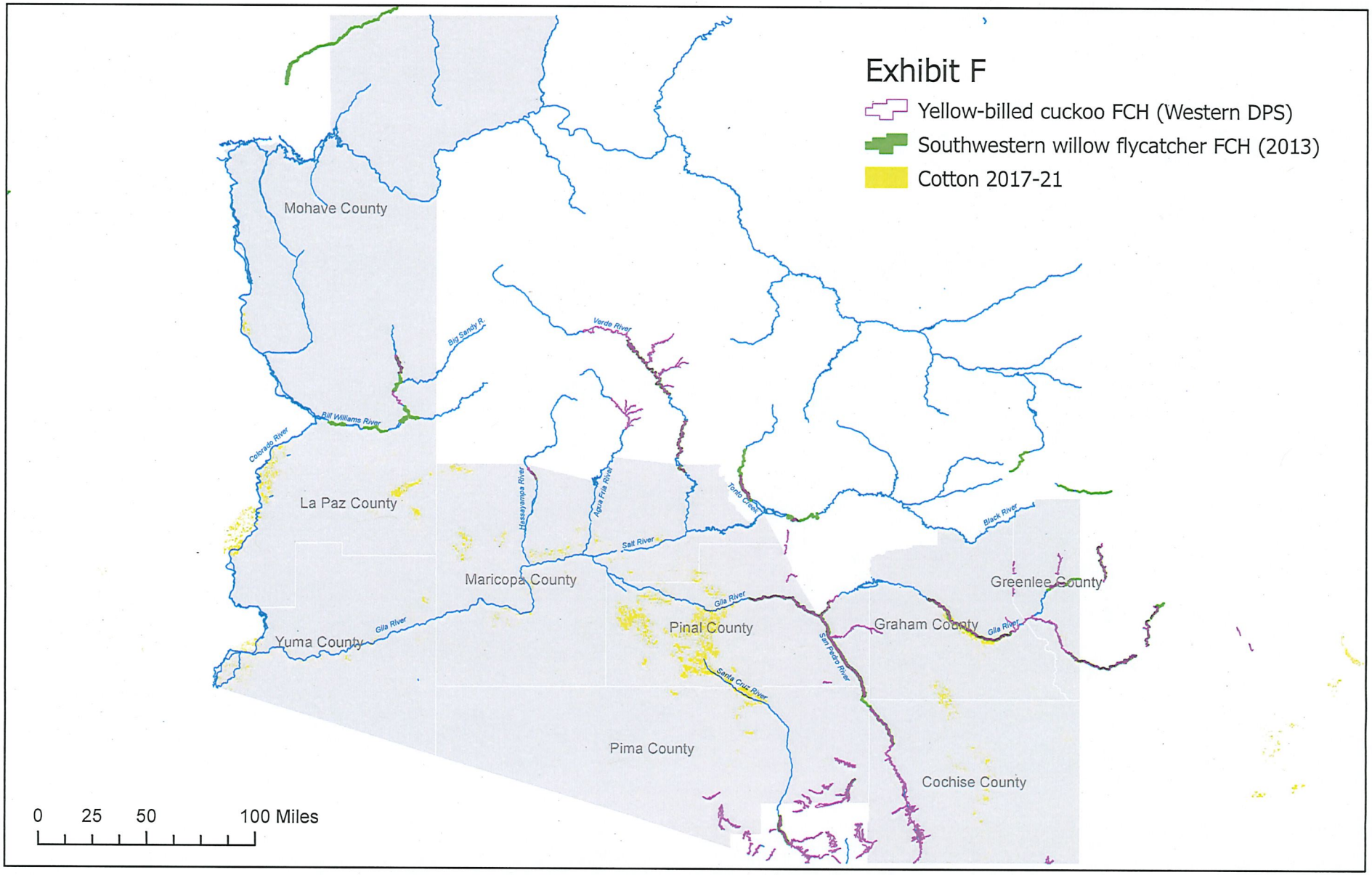
Exhibit F
Yellow-billed cuckoo FCH (Western DPS)
Southwestern willow flycatcher FCH (2013)
Cotton 2017-21
Mohave County
La Paz County
Maricopa County
Pinal County
Yuma County
Greenlee County
Graham County
Pima County
Cochise County
Big Sandy R.
Verde River
Bill Williams River
Colorado River
Hassayampa River
Agua Fria River
Tonto Creek
Salt River
Black River
Gila River
San Pedro River
Santa Cruz River
0 25 50 100 Miles

ADD41

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Counsel for Plaintiffs

THE UNITED STATES DISTRICT COURT
OF ARIZONA

Center for Biological Diversity, et al., *Plaintiffs,* v. United States Environmental Protection Agency, et al., *Defendants,* and Bayer Cropsciences LP, et al., *Defendant-Intervenors.*	Case No. CV-20-00555-DCB **DECLARATION OF CURTIS BRADLEY IN SUPPORT OF PLAINTIFFS' MOTION FOR SUMMARY JUDGMENT**

I, CURTIS BRADLEY, declare that if called as a witness in this action I would competently testify of my own personal knowledge as follows:

1. I am a Geographic Information System ("GIS") specialist at the Center for Biological Diversity ("Center"), where I have worked in this capacity for 22 years. I hold a Bachelor of Sciences in mechanical engineering and a Master of Sciences in watershed management, both from the University of Arizona. I have training in several GIS software applications and over 23 years of experience in GIS analysis and cartography.

2. I analyzed the overlap of cotton and soybean crop fields and selected species that have designated critical habitat protected under the Endangered Species Act in February 2019.

3. To do so, I used ArcGIS Pro version 2.5 GIS software from ESRI, and in my professional opinion it is accurate with respect to the data it represents.

4. To obtain the cotton and soybean crop field data, I downloaded the locations and classifications of the crop field layers for years 2013 to 2017 (the most recent layers available at the time) from the United States Department of Agriculture's National Croplands Data Layer website at https://www.nass.usda.gov/Research_and_Science/Cropland/Release/index.php. I converted these raster layers to polygons.

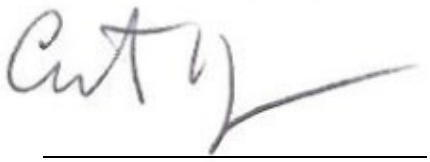
5. I then performed an intersect operation in my GIS program to determine the crops layers that intersected each selected species' designated critical habitat using GIS data downloaded from the U.S. Fish and Wildlife's critical habitat website at https://ecos.fws.gov/ecp/report/table/critical-habitat.html.

6. The analysis shows overlap of designated critical habitat for selected species with fields of cotton, soybean, or both. The number "1" indicates critical habitat overlap with a crop, and the number "0" indicates no overlap, as follows:

Common Name	Scientific Name	Listed Status	Type	Soy	Cotton
Chiricahua leopard frog	*Rana chiricahuensis*	Threatened	Herp	1	1
Dakota skipper	*Hesperia dacotae*	Threatened	Invertebrate	1	0
Hine's emerald dragonfly	*Somatochlora hineana*	Endangered	Invertebrate	1	0
Indiana bat	*Myotis sodalis*	Endangered	Mammal	1	0
Southwestern willow flycatcher	*Empidonax traillii extimus*	Endangered	Bird	0	1
Yellow-billed cuckoo (Western DPS)	*Coccyzus americanus* (Western DPS)	Threatened	Bird	0	1
Common Name	*Scientific Name*	Listed Status	Type	Soy	Cotton
Chiricahua leopard frog	*Rana chiricahuensis*	Threatened	Herp	1	1
Dakota skipper	*Hesperia dacotae*	Threatened	Invertebrate	1	0
Hine's emerald dragonfly	*Somatochlora hineana*	Endangered	Invertebrate	1	0
Indiana bat	*Myotis sodalis*	Endangered	Mammal	1	0
Poweshiek skipperling	*Oarisma poweshiek*	Endangered	Invertebrate	1	
Southwestern willow flycatcher	*Empidonax traillii extimus*	Endangered	Bird	0	1
Whorled sunflower	*Helianthus verticillatus*	Endangered	Flowering plant	1	
Yellow-billed cuckoo (Western DPS)	*Coccyzus americanus (Western DPS)*	Threatened	Bird	0	1

I declare under penalty of perjury that the foregoing is true and correct.

Executed in Tucson, Arizona on this 12th day of January, 2023.



CURTIS BRADLEY

George A. Kimbrell (WSB 36050) (*Pro Hac Vice*)
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Counsel for Plaintiffs

THE UNITED STATES DISTRICT COURT
OF ARIZONA

Center for Biological Diversity, et al., *Plaintiffs,* v. United States Environmental Protection Agency, et al., *Defendants,* and Bayer CropScience LP, et al., *Defendant-Intervenors.*	Case No. CV-20-00555-DCB **DECLARATION OF NATHAN DONLEY, PH.D IN SUPPORT OF PLAINTIFFS' MOTION FOR SUMMARY JUDGMENT**

I, NATHAN DONLEY, declare that if called as a witness in this action I would competently testify of my own personal knowledge as follows:

1. I have a Bachelor of Science degree in Molecular Biology from The Evergreen State College and a Ph.D in Cell and Developmental Biology from Oregon Health and Science University.

2. From 2013 to 2015, I worked as a post-doctoral fellow in the Oregon Center for Research on Occupational and Environmental Toxicology. In that position, I studied how exogenous toxins interact with a cell's genetics and how this can lead to chronic disease.

3. I have worked at the Center for Biological Diversity (Center) since 2015. From 2015 to 2016, I was a scientist in the Center's Environmental Health Program. In 2016, I was promoted to Senior Scientist, and in 2021 I was promoted to Environmental Health Science Director.

4. I have authored 14 peer-reviewed publications, most recently a comprehensive literature review on how pesticides affect soil life[1], a comparison of pesticide regulatory actions between the U.S and other countries around the world[2], and an analysis of how pesticides disproportionately impact people of color and low-income communities in the USA.[3] I have also authored five technical reports documenting pesticide regulatory failures at the U.S. Environmental Protection Agency (EPA).

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[1] Donley, N., et al., *Pesticides and soil invertebrates: A hazard assessment*, 9 Frontiers in Environmental Science (May 4, 2021), https://www.frontiersin.org/articles/10.3389/fenvs.2021.643847/full.

[2] Donley, N., *The USA lags behind other agricultural nations in banning harmful pesticides*, 18(1) Environmental Health (June 7, 2019), https://ehjournal.biomedcentral.com/articles/10.1186/s12940-019-0488-0.

[3] Donley, N., et al., *Pesticides and environmental injustice in the USA: Root causes, current regulatory reinforcement and a path forward*, 22(1) BMC Public Health (2022), https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-022-13057-4.

5. One of my ongoing responsibilities at the Center is studying the effects of pesticide use on human health and the environment, including species protected by the Endangered Species Act (ESA). I have written over 100 technical comments to EPA regarding new pesticide approvals, pesticide re-registrations, and ecological and human health risk assessments of pesticides subject to EPA's registration process, as well as other pesticide-related decisions and documents.

6. I have also reviewed and drafted comments on numerous EPA biological evaluations on the effects of certain pesticides on endangered and threatened species and their critical habitats that are supposed to be protected under the ESA. In these biological evaluations, EPA did not rely only on its Risk Quotient and Level of Concern to determine whether the pesticides may affect ESA-protected species and their critical habitats.

7. For example, in EPA's 2018 biological evaluation of the insecticide chlorpyrifos, EPA stated that its biological evaluation was based on "scientific methods developed in response to recommendations of the 2013 National Research Council,"[4] referring to an arm of the National Academies of Sciences (NAS) report, "Assessing Risks to Endangered and Threatened Species from Pesticides."[5] The NAS criticized EPA's outdated approach that EPA used to arrive at its ESA "no effect" determinations to approve over-the-top use of dicamba, as "not scientifically defensible."

8. As compared to EPA's determination that over-the-top use of dicamba would have "no effect" on any species or critical habitat, the newer approach that EPA used in other, more recent biological evaluations results in far different determinations. For example, EPA determined that only 16 of 1,835 ESA-protected species assessed would have

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[4] EPA stated this in its Chlorpyrifos Executive Summary for ESA Assessment at 1, attached as Exhibit 1. This document and EPA's entire chlorpyrifos biological evaluation can be found here: https://www.epa.gov/endangered-species/biological-evaluation-chapters-chlorpyrifos-esa-assessment.

[5] *See* https://nap.nationalacademies.org/catalog/18344/assessing-risks-to-endangered-and-threatened-species-from-pesticides.

"no effect" from use of chlorpyrifos, while the other 1,819 had "may affect" determinations, requiring consultation. Exhibit 1 at iv (Table 1). And EPA determined that zero of 794 designated critical habitats would have "no effect" from use of chlorpyrifos, meaning 794 critical habitats had "may affect" determinations, requiring consultation. *Id.* (Table 2).

9. The same is true for other EPA pesticide biological evaluations. In its 2018 biological evaluation for the insecticide malathion, EPA again stated that its evaluation is based on methods developed in response to NAS recommendations.[6] EPA determined that only 16 of 1,835 ESA-protected species assessed would have "no effect" from use of malathion, while the other 1,819 had "may affect" determinations, requiring consultation. Exhibit 2 at iv (Table 1). And EPA determined that zero of 794 designated critical habitats would have "no effect" from use of malathion, meaning all 794 critical habitats had "may affect" determinations, requiring consultation. *Id.* (Table 2).

10. In its 2018 biological evaluation for the insecticide diazinon, EPA again stated that its evaluation is based on methods developed in response to NAS recommendations.[7] EPA determined that only 114 of 1,834 ESA-protected species assessed would have "no effect" from use of diazinon, while the other 1,720 had "may affect" determinations, requiring consultation. Exhibit 3 at iv (Table 1). And EPA determined that 83 of 794 designated critical habitats would have "no effect" from use of diazinon, meaning 711 critical habitats had "may affect" determinations, requiring consultation. *Id.* (Table 2).

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[6] EPA, Executive Summary for Malathion ESA Assessment, at 1, attached as Exhibit 2. This document and EPA's entire malathion biological evaluation can be found here: https://www.epa.gov/endangered-species/biological-evaluation-chapters-malathion-esa-assessment.

[7] EPA, Executive Summary for Diazinon ESA Assessment, at 1, attached as Exhibit 3. This document and EPA's entire diazinon biological evaluation can be found here: https://www.epa.gov/endangered-species/biological-evaluation-chapters-diazinon-esa-assessment.

11. A few years later, in its 2021 biological evaluation for the insecticide carbaryl, EPA stated that its evaluation is based on a revised method that it released in March 2020, that had input from the ESA consulting agencies: the U.S. Fish and Wildlife Service and the National Marine Fisheries Service.[8] EPA determined that only 3 of 1,805 ESA-protected species assessed would have "no effect" from use of carbaryl, while the other 1,802 had "may affect" determinations, requiring consultation. Exhibit 4 at 4 (Table 1). And EPA determined that 3 of 791 designated critical habitats would have "no effect" from use of carbaryl, meaning 788 critical habitats had "may affect" determinations, requiring consultation. *Id.* at 5 (Table 2).

12. EPA also used its revised method in its 2021 biological evaluation for the insecticide methomyl.[9] EPA determined that 218 of 1,805 ESA-protected species assessed would have "no effect" from use of methomyl, while the other 1,587 had "may affect" determinations, requiring consultation. Exhibit 5 at 4 (Table 1). And EPA determined that 236 of 791 designated critical habitats would have "no effect" from use of methomyl, meaning 555 critical habitats had "may affect" determinations, requiring consultation. *Id.* at 5 (Table 2).

13. EPA again used its revised method in its 2021 biological evaluation for the herbicide glyphosate.[10] EPA determined that zero of 1,795 ESA-protected species assessed

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[8] EPA, Carbaryl Executive Summary for Final Biological Evaluation, at 1 & n.1, attached as Exhibit 4. This document and EPA's entire carbaryl biological evaluation can be found here: https://www.epa.gov/endangered-species/final-national-level-listed-species-biological-evaluation-carbaryl.

[9] EPA, Methomyl Executive Summary for Final Biological Evaluation, at 1 & n.1, attached as Exhibit 5. This document and EPA's entire methomyl biological evaluation can be found here: https://www.epa.gov/endangered-species/final-national-level-listed-species-biological-evaluation-methomyl.

[10] EPA, Glyphosate Executive Summary for Biological Evaluation, at 1 & n.1, attached as Exhibit 6. This document and EPA's entire glyphosate biological evaluation can be found here:https://www.epa.gov/endangered-species/final-national-level-listed-species-biological-evaluation-glyphosate.

would have "no effect" from use of glyphosate, while all 1,795 had "may affect" determinations, requiring consultation. Exhibit 6 at 5 (Table 1). And EPA determined that zero of 792 designated critical habitats would have "no effect" from use of glyphosate, meaning all 792 critical habitats had "may affect" determinations, requiring consultation. *Id.* at 6 (Table 2).

14. EPA again used its revised method in its 2021 biological evaluation for the herbicide atrazine.[11] EPA determined that 676 of 1,795 ESA-protected species assessed would have "no effect" from use of atrazine, while the other 1,119 had "may affect" determinations, requiring consultation. Exhibit 7 at 5 (Table 1). And EPA determined that 412 of 792 designated critical habitats would have "no effect" from use of atrazine, meaning 380 critical habitats had "may affect" determinations, requiring consultation. *Id.* (Table 2). The *sole* reason atrazine had so many "no effect" calls for species and critical habitat is that the atrazine registrant voluntarily committed to prohibit use of the herbicide in Hawaii, Alaska, and the U.S. territories (Puerto Rico, Guam, American Samoa, the U.S. Virgin Islands, and the North Mariana Islands), prohibit "Roadside" use, and prohibit all forestry uses.[12]

15. I am providing two examples of endangered species that rely on plants that are not "listed" under the ESA. The Poweshiek skipperling requires grasses and flowering plants, such as non-listed black-eyed Susan and purple coneflower, for larval and adult food and shelter. 17 C.F.R. § 17.95. [13] The skipperling has habitat in Hillsdale, Lenawee,

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[11] EPA, Atrazine Executive Summary for Biological Evaluation, at 1 & n.1, attached as Exhibit 7. This document and EPA's entire atrazine biological evaluation can be found here: https://www.epa.gov/endangered-species/final-national-level-listed-species-biological-evaluation-atrazine.

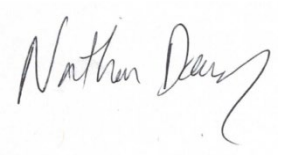
[12] Atrazine Interim Registration Review Decision Case Number 0062, at 6-7 (Sept. 2020), https://www.epa.gov/sites/default/files/2020-09/documents/atrazine-id-signed-final.pdf.

[13] https://www.ecfr.gov/current/title-50/chapter-I/subchapter-B/part-17/subpart-I/section-17.95 (searchable by species name)

Livingston, and Oakland in Michigan; Lac Qui Parle, Lyon, Norman, Swift, and Wilkin in Minnesota; Moody in South Dakota; and Waukesha in Wisconsin. *Id.* However, EPA does not require any ESA buffers in any of these counties. *See* A.9 at 68-69 (listing counties with ESA buffers). Likewise, the Dakota skipper requires grasses and flowering plants and has small, scattered critical habitat units in three states. 17 C.F.R. 17.95. The counties where the skipper has critical habitat include: Chipewa, Kittsin, Norman, and Swift in Minnesota; McKenzie, Ransom, and Rolette in North Dakota; and Deuel in South Dakota. 17 C.F.R. § 17.95. EPA does not require any ESA buffers in these counties. *See* A.9 at 68-69 (listing counties with ESA buffers).

I declare under penalty of perjury that the foregoing is true and correct to the best of my ability.

Executed in Olympia, WA this 11th day of April, 2023.



_____
NATHAN DONLEY, PH.D

Exhibit 1

Chlorpyrifos Executive Summary for ESA Assessment

This Biological Evaluation (BE) assesses whether the registered uses of chlorpyrifos (PC code 059101), based on the U.S. Environmental Protection Agency's (EPA) proposed federal action, will result in a potential effect to an individual of an endangered and threatened (listed) species and/or designated critical habitats. The evaluation also includes analysis of impacts to candidate species as well as species and critical habitats proposed for listing for conferencing purposes under section 7 of the Endangered Species Act (ESA). This evaluation, conducted as part of the registration review process (EPA's action under consultation), is based on interim scientific methods developed in response to recommendations of the National Research Council (NRC, 2013) and uses a three-step consultation process.

Step 1 consists of two parts: 1) establishing the action area for the proposed action, and 2) overlaying the listed, proposed, and candidate species (hereafter, "listed species" ranges and proposed and final critical habitat designations (hereafter, "critical habitat(s)" onto the action area (**Section 1.4.1**). This step identifies which species and critical habitats have the potential to be affected by the proposed action. A "no effect" determination is made for species and critical habitats whose ranges do not overlap with the action area and listed species that are presumed extinct as identified in the species reports. Any listed species and/or critical habitat that warrants a "may affect" determination in Step 1 (*i.e.,* its range and/or critical habitat overlaps spatially with the action area and it is not presumed extinct) continues for further analysis in Step 2. Step 2 determines whether effects to individuals of listed species and/or Primary Constituent Elements (PCEs)/physical and biological features (PBFs) of critical habitat result in a "may affect, not likely to adversely affect (NLAA) determination, or a "may affect, likely to adversely affect" (LAA) determination. In Step 2, toxicity (indirect and direct effects data) and exposure information are analyzed using a weight-of-evidence (WoE) approach. These data are organized into lines of evidence that inform risk hypotheses and ultimately the effect determinations for listed species and their critical habitats. The NLAA determinations are submitted to the US Fish and Wildlife Service and the National Marine Fisheries Services (the Services) for concurrence, while the listed resources with a LAA determination are considered by the Services in their Biological Opinions (Step 3). This Biological Evaluation represents Steps 1 and 2 in the ESA pesticide consultation process for chlorpyrifos.

General Information

Chlorpyrifos is an insecticide used on a wide variety of terrestrial food and feed crops, terrestrial non-food crops, greenhouse food/non-food, and non-agricultural indoor and outdoor sites. There are currently 31 active registrants of chlorpyrifos with 135 active product labels (86 Section 3s, 48 Special Local Needs, and 1 Section 18), which include formulated products and technical grade chlorpyrifos (see **APPENDIX 1-2**). Currently, there are 13 multi-active ingredient products registered that contain chlorpyrifos (i.e., products containing active ingredients in addition to chlorpyrifos). Chlorpyrifos can be applied in a liquid, granular, or encapsulated form or as a cattle ear tag or seed treatment. Aerial and ground application methods (including broadcast, soil incorporation, orchard airblast, and chemigation) are allowed. (See **APPENDIX 1-3** for details).

Chlorpyrifos enters the environment via direct application to use sites. It may move off-site via spray drift, volatilization (primarily following foliar applications), and runoff (generally by soil erosion rather than dissolution in runoff water). Major routes of chlorpyrifos transformation in the environment include alkaline hydrolysis, photolysis in air, and soil and aquatic metabolism (both aerobic and anaerobic). Chlorpyrifos is known to form chlorpyrifos-oxon, 3,5,6-trichloro-2-pyridinol (TCP), and 3,5,6-

trichloro-2-methoxypyridine (TMP). TCP and TMP are not considered residues of toxicological concern (see **APPENDIX 1-9**).

Chlorpyrifos is an organophosphate insecticide used to kill insects systemically and on contact. Organophosphate toxicity in animals is based on the inhibition of the enzyme acetylcholinesterase (AChE). Inhibition of AChE interferes with proper neurotransmission in cholinergic synapses and neuromuscular junctions which can lead to sublethal effects and mortality. The effects of chlorpyrifos have been studied extensively in many taxa, particularly in fish and aquatic and terrestrial invertebrates (see **Chapter 2**). The BE considered more than 1,400 ecotoxicity studies for chlorpyrifos (including ~180 fish studies, 26 amphibian studies, ~ 330 aquatic invertebrate studies, 32 aquatic plant studies, 58 bird studies, 1 reptile study, ~160 mammalian studies, ~500 terrestrial invertebrate studies, and ~125 terrestrial plant studies). Studies include acute and chronic laboratory and field studies with either technical or formulated chlorpyrifos, and include both registrant-submitted and open literature studies (search of relevant open literature data conducted up through May 2013). Toxicity to taxa from exposure to other chemical stressors of concern (*i.e.*, chlorpyrifos oxon, mixtures [*e.g.*, tank mixtures, formulated products, and environmental mixtures]) and non-chemical stressors (*e.g.*, temperature) are also considered.

Exposure Methods

Exposure values are based primarily on fate and transport model results. For aquatic exposures, the Pesticide in Water Calculator (PWC, v. 1.52, May, 2016)[a graphical user interface used to run Pesticide Root Zone Model (PRZM)/Variable Volume Water Body Model (VVWM)], AgDRIFT and AGricultural DISPersal (AGDISP) models are used to predict aquatic exposure in generic habitats, referred to as bins (see **Section 1.4.2.2.a.1.**). Aquatic exposure results for the bin(s) most appropriate for the species and/or critical habitat being assessed are used. For terrestrial exposures, existing models [*e.g.*, TerrPlant, AgDRIFT, AGDISP, earthworm fugacity model, Terrestrial Herpetofaunal Exposure Residue Program Simulation (T-HERPS), Terrestrial Residue Exposure model (T-REX) and portions of the Terrestrial Investigation Model (TIM)] were combined into a single tool that is referred to as the Terrestrial Effects Determination tool (TED)(see **Section 1.4.2.2.a.2.** and **ATTACHMENT 1-7**). A more detailed analysis using TIM and the Markov Chain Nest Productivity Model (MCnest) is also conducted for a subset of listed bird species. The models used in this BE can be found at https://www.epa.gov/endangered-species/provisional-models-endangered-species-pesticide-assessments.

Overlap Analyses

Both the mosquito adulticide and wide area uses are presumed to overlap with all of the listed species ranges and critical habitats because they have no specific geographic footprint. Other use layers (as identified in **ATTACHMENTS 1-2** and **1-3**) that overlap with a large percentage of listed species ranges and critical habitats (*i.e.*, these use sites overlap with ~50 – 90% of the species and critical habitats, by number) include: right of way, developed and managed forests, open space developed, rangeland, pasture, other grains, golf courses, vegetables and ground fruit, other row crops, orchards and vineyards, wheat, and corn. The actual degree of overlap of specific uses with a particular species range varies widely and will be impacted by off-site transport distances (*e.g.*, spray drift and downstream transport).

Effects Determinations

To help determine the potential for risk, effects thresholds are established (see Interim agreement[1]). For mortality to animals, the one-in-a-million chance of mortality [based either on the 5th percentile of the Species Sensitivity Distribution (SSD) or a surrogate LD_{50}, LC_{50}, or EC_x] is used to assess direct effects to a listed species (for details, see **ATTACHMENT 1-4**). For potential indirect effects based on prey lethality for those species without obligate relationships, the exposure that results in a 10% effect for the 5th percentile species on an SSD for the prey species or the 10% effect level for the most sensitive prey species tested (if not enough data are available for a SSD) is used. For sublethal effects, the direct effects threshold for animals and plants is the lowest available NOAEC/NOAEL or other scientifically defensible effect threshold (EC_x) that can be linked to survival or reproduction. For animals, the indirect effects threshold is the LOAEC/LOAEL for growth or reproduction for relevant taxa. For plants and indirect effects, the threshold is the lowest available LOAEC or EC_{50} value (aquatic plants) and the lowest LOAEC or EC_{25} value (terrestrial and wetland plants). These thresholds are used with other available data in a weight-of-evidence (WoE) approach which integrates the body of evidence that is available for making an effects determination. For the exposure assessment, the overlap of species range and action area, the relevance of predictive models to simulate EECs, the quality of fate data for exposure modeling and monitoring data that may be available are considered. For the effects analysis, the number of studies and/or species tested in the available toxicity data, taxonomic surrogacy, the magnitude and/or types of effects observed, and incident data are considered. An overall risk finding (high, medium, low) and a finding on the overall confidence (high, medium, low) in the available exposure and effects data is made for each line of evidence to inform the effect determinations for listed species and critical habitats (see **ATTACHMENT 1-9**).

Effects Determinations Summary

Because of the multitude of uses and use patterns for chlorpyrifos (including mosquito adulticide use), the action area for chlorpyrifos covers the entire US, including its territories. Therefore, all of the listed species ranges and critical habitats overlap with the action area and the "no effect" determinations largely involve species that are believed to be extinct (or extirpated from specific geographic areas) in USFWS documents and referenced in EPA species reports, but have not yet been delisted.

For chlorpyrifos, the results of the Step 1 ('**No Effect**' (NE) or '**May Affect**' determinations) and Step 2 ('**Not Likely to Adversely Affect**' (NLAA) or '**Likely to Adversely Affect**' (LAA) determinations) for species and designated critical habitats are presented in **Tables 1** and **2**, respectively. For species/critical habitats with a NE determination in Step 1, no additional analyses are conducted (they do not proceed to Step 2). For chlorpyrifos, all of the uses and use patterns modeled, result in threshold exceedances for most taxa. For species/critical habitats with NLAA determinations, they will be sent to the Services for concurrence. For species/critical habitats with a LAA determination, additional analyses will be conducted (*i.e.*, they proceed to Step 3).

[1] Interim approaches and agreement: https://www.epa.gov/endangered-species/interim-approaches-pesticide-endangered-species-act-assessments-based-nas-report

TABLE 1. Summary of Species Effects Determinations for Chlorpyrifos (Counts by Taxon).

TAXON	STEP 1 EFFECTS DETERMINATIONS		STEP 2 EFFECTS DETERMINATIONS		Totals
	NO EFFECT[1]	MAY EFFECT[2]	NOT LIKELY TO ADVERSLY AFFECT[3]	LIKELY TO ADVERSELY AFFECT[4]	
Amphibians	0	40	1	39	40
Aquatic Invertebrates	0	220	1	219	220
Birds	5	103	12	91	108
Fish	0	193	5	188	193
Mammals	2	107	20	87	109
Plants	0	961	2	959	961
Reptiles	0	48	0	48	48
Terrestrial Invertebrates	9	147	0	147	156
Total	16	1819	41	1778	1835

[1] No further analysis is conducted for these species/critical habitats
[2] These species/critical habitats proceed to Step 2
[3] These species/critical habitat determinations go to the Services for concurrence
[4] These species/critical habitats proceed to Step 3

TABLE 2. Summary of Critical Habitat Effects Determinations for Chlorpyrifos (Counts by Taxon).

TAXON	STEP 1 EFFECTS DETERMINATIONS		STEP 2 EFFECTS DETERMINATIONS		Totals
	NO EFFECT[1]	MAY EFFECT[2]	NOT LIKELY TO ADVERSLY AFFECT[3]	LIKELY TO ADVERSELY AFFECT[4]	
Amphibians	0	25	1	24	25
Aquatic Invertebrates	0	75	0	75	75
Birds	0	31	0	31	31
Fish	0	106	0	106	106
Mammals	0	32	4	28	32
Plants	0	462	3	459	462
Reptiles	0	17	4	13	17
Terrestrial Invertebrates	0	46	2	44	46
Total	0	794	14	780	794

[1] No further analysis is conducted for these species/critical habitats
[2] These species/critical habitats proceed to Step 2
[3] These species/critical habitat determinations go to the Services for concurrence
[4] These species/critical habitats proceed to Step 3

Exhibit 2

Executive Summary for Malathion ESA Assessment

This Biological Evaluation (BE) assesses whether the registered uses of malathion (PC code 057701), based on the U.S. Environmental Protection Agency's (EPA) proposed federal action, will result in a potential effect to an individual of an endangered and threatened (listed) species and/or its designated critical habitats. The evaluation also includes analysis of impacts to candidate species as well as species and critical habitat proposed for listing for conferencing purposes under section 7 of the Endangered Species Act (ESA). This evaluation, conducted as part of the registration review process (EPA's action under consultation), is based on interim scientific methods developed in response to recommendations of the National Research Council (NRC, 2013) and uses a three-step consultation process.

Step 1 consists of two parts: 1) establishing the action area for the proposed action, and 2) overlaying the listed, proposed, and candidate species (hereafter, "listed species" ranges and proposed and final critical habitat designations (hereafter, "critical habitat(s)" onto the action area (**Section 1.4.1**). This step identifies which species and critical habitats have the potential to be affected by the proposed action. A "no effect" determination is made for species and critical habitats whose ranges do not overlap with the action area and listed species that are presumed extinct as identified in the species reports. The categorization of "presumed extinct" are often difficult to ascertain and will be reviewed through outreach with FWS headquarters and field offices, as needed. Any listed species and/or critical habitat that warrants a "may affect" determination in Step 1 (*i.e.,* its range and/or critical habitat overlaps spatially with the action area and it is not presumed extinct) continues for further analysis in Step 2. Step 2 determines whether effects to individuals of listed species and/or Primary Constituent Elements (PCEs)/physical and biological features (PBFs) of critical habitat result in a "may affect, not likely to adversely affect (NLAA) determination, or a "may affect, likely to adversely affect" (LAA) determination. In Step 2, toxicity (indirect and direct effects data) and exposure information are analyzed using a weight-of-evidence (WoE) approach. These data are organized into lines of evidence that inform risk hypotheses and ultimately the effect determinations for listed species and their critical habitats. The NLAA determinations are submitted to the US Fish and Wildlife Service and the National Marine Fisheries Services (the Services) for concurrence, while the listed resources with a LAA determination are considered by the Services in their Biological Opinions (Step 3). This Biological Evaluation represents Steps 1 and 2 in the ESA pesticide consultation process for malathion.

General Information

Malathion is an organophosphate insecticide used on a wide variety of terrestrial food and feed crops, terrestrial non-food crops, aquatic food, non-agricultural indoor, outdoor sites, and for wide area public health uses. There is currently one active technical registrant for malathion and 96 active registrations (43 Section 3s, 53 Section 24c Special Local Needs, and no Section 18 Emergency Exemptions) which include formulated end-use products and technical grade malathion (see **APPENDIX 1-2**). Currently, there are 4 malathion products that are co-formulated with other active-ingredients. Malathion can be applied in a dust, liquid or encapsulated form. Aerial and ground application methods (including broadcast, fogger, and chemigation) are allowed (see **APPENDIX 1-3** for details).

Malathion will enter the environment via spray directly onto soil, foliage, or impervious surfaces. Spray drift and runoff are primary routes of offsite transport with volatilization and leaching occurring under certain conditions. Rainfall transports malathion off-field through runoff, soil erosion, and leaching. The primary route for malathion dissipation is microbial metabolism to malathion dicarboxylic and monocarboxylic acids (malathion DCA and malathion MCA, respectively). However, if malathion is in

contact with metabolically inactive surfaces such as dry soils or impervious surfaces common in non-agricultural settings, photo-oxidation to the degradate malaoxon can occur. Malaoxon dissipates and degrades similarly to malathion. Malathion DCA and MCA are not considered residues of toxicological concern (see **APPENDIX 1-9**).

Malathion is an organophosphate insecticide used to kill insects systemically and on contact. Organophosphate toxicity in animals is based on the inhibition of the enzyme acetylcholinesterase (AChE). Inhibition of AChE interferes with proper neurotransmission in cholinergic synapses and neuromuscular junctions which can lead to sublethal effects and mortality. The effects of malathion have been studied extensively in many taxa, particularly in fish and aquatic and terrestrial invertebrates (see **Chapter 2**). The BE considered more than 900 ecotoxicity studies for malathion (including (approximates) 225 fish and aquatic-phase amphibian studies, 260 aquatic invertebrate studies, 25 aquatic plant studies, 47 bird studies, 7 reptile and terrestrial-phase amphibian studies, 150 mammalian studies, 140 terrestrial invertebrate studies, and 49 terrestrial plant studies). Studies include acute and chronic laboratory studies with either technical or formulated malathion, and include both registrant-submitted and open literature studies (search of relevant open literature data conducted up through August 2013). Toxicity to taxa from exposure to other chemical stressors of concern (*i.e.*, malathion oxon, mixtures [*e.g.*, tank mixtures, formulated products, and environmental mixtures]) and non-chemical stressors (*e.g.*, temperature) are also considered.

Exposure Methods

Exposure values are based primarily on fate and transport model results. For aquatic exposures, the Pesticide in Water Calculator (PWC, v. 1.52, May 2016)[a new graphical user interface used to run Pesticide Root Zone Model (PRZM)/Variable Volume Water Body Model (VVWM)], AgDRIFT and AGricultural DISPersal (AGDISP) models are used to predict aquatic exposure in generic habitats, referred to as bins (see **Section 1.4.2.2.a.1.**). Aquatic exposure results for the bin(s) most appropriate for the species and/or critical habitat being assessed are used. For terrestrial exposures, existing models [*e.g.*, TerrPlant, AgDRIFT, AGDISP, earthworm fugacity model, Terrestrial Herpetofaunal Exposure Residue Program Simulation (T-HERPS), Terrestrial Residue Exposure model (T-REX) and portions of the Terrestrial Investigation Model (TIM)] were combined into a single tool that is referred to as the Terrestrial Effects Determination tool (TED)(see **Section 1.4.2.2.a.2.** and **ATTACHMENT 1-7**). A more detailed analysis using TIM and the Markov Chain Nest Productivity Model (MCnest) is also conducted for a subset of listed bird species. The models used in this BE can be found at https://www.epa.gov/endangered-species/provisional-models-endangered-species-pesticide-assessments.

Overlap Analyses

The mosquito adulticide is presumed to overlap with all of the listed species ranges and critical habitats because it has no specific geographic footprint. Other use layers (as identified in **ATTACHMENTS 1-2** and **1-3**) that overlap with a large percentage of listed species ranges and critical habitats (*i.e.*, these use sites overlap with ~50 – 90% of the species and critical habitats, by number) include: developed land, open space developed, pasture, other grains, vegetables and ground fruit, other row crops, orchards and vineyards, wheat, and corn. The actual degree of overlap of specific uses with a particular species range varies widely and will be impacted by off-site transport distances (*e.g.*, spray drift and downstream transport).

Effects Determinations

To help determine the potential for risk, effects thresholds are established (see Interim agreement[1]). For mortality to animals, the one-in-a-million chance of mortality [based either on the 5th percentile of the Species Sensitivity Distribution (SSD) or a surrogate LD_{50}, LC_{50}, or EC_x] is used to assess direct effects to a listed species (for details, see **ATTACHMENT 1-4**). For potential indirect effects based on prey lethality for those species without obligate relationships, the exposure that results in a 10% effect for the 5th percentile species on an SSD for the prey species or the 10% effect level for the most sensitive prey species tested (if not enough data are available for a SSD) is used. For sublethal effects, the direct effects threshold for animals and plants is the lowest available NOAEC/NOAEL or other scientifically defensible effect threshold (EC_x) that can be linked to survival or reproduction. For animals, the indirect effects threshold is the LOAEC/LOAEL for growth or reproduction for relevant taxa. For plants and indirect effects, the threshold is the lowest available LOAEC or EC_{50} value (aquatic plants) and the lowest LOAEC or EC_{25} value (terrestrial and wetland plants). These thresholds are used with other available data in a weight-of-evidence (WoE) approach which integrates the body of evidence that is available for making an effects determination. For the exposure assessment, the overlap of species range and action area, the relevance of predictive models to simulate EECs, the quality of fate data for exposure modeling and monitoring data that may be available are considered. For the effects analysis, the number of studies and/or species tested in the available toxicity data, taxonomic surrogacy, the magnitude and/or types of effects observed, and incident data are considered. An overall risk finding (high, medium, low) and a finding on the overall confidence (high, medium, low) in the available exposure and effects data is made for each line of evidence to inform the effect determinations for listed species and critical habitats (see **ATTACHMENT 1-9**).

Effects Determinations Summary

Because of the multitude of uses and use patterns for malathion (including the mosquito adulticide use), the action area for malathion covers the entire US, including its territories. Therefore, all of the listed species ranges and critical habitats overlap with the action area and the "no effect" determinations largely involve species that are believed to be extinct (or extirpated from specific geographic areas) in USFWS documents and referenced in EPA species reports, but have not yet been delisted.

For malathion, the results of the Step 1 ('**No Effect**' (NE) or '**May Affect**' determinations) and Step 2 ('**Not Likely to Adversely Affect**' (NLAA) or '**Likely to Adversely Affect**' (LAA) determinations) for species and designated critical habitats are presented in **Tables 1** and **2,** respectively. For species/critical habitats with a NE determination in Step 1, no additional analyses are conducted (they do not proceed to Step 2). For malathion, all of the uses and use patterns modeled, result in threshold exceedances for most taxa. For species/critical habitats with NLAA determinations, they will be sent to the Services for concurrence. For species/critical habitats with a LAA determination, additional analyses will be conducted (*i.e.*, they proceed to Step 3).

[1] Interim approaches and agreement: https://www.epa.gov/endangered-species/interim-approaches-pesticide-endangered-species-act-assessments-based-nas-report

TABLE 1. Summary of Species Effects Determinations for Malathion (Counts by Taxon).

TAXON	STEP 1 EFFECTS DETERMINATION		STEP 2 EFFECTS DETERMINATIONS		Totals
	NO EFFECT	MAY AFFECT	NOT LIKELY TO ADVERSLY AFFECT	LIKELY TO ADVERSELY AFFECT	
Amphibians	0	40	1	39	40
Aquatic Invertebrates	0	220	1	219	220
Birds	5	103	12	91	108
Fish	0	193	5	188	193
Mammals	2	107	20	87	109
Plants	0	961	2	959	961
Reptiles	0	48	0	48	48
Terrestrial Invertebrates	9	147	0	147	156
Total	16	1819	41	1778	1835
Percent of Total Number of Species (%)	1	99	2	97	

TABLE 2. Summary of Critical Habitat Effects Determinations for Malathion (Counts by Taxon).

DESIGNATED CRITICAL HABITAT TAXON	STEP 1 EFFECTS DETERMINATION		STEP 2 EFFECTS DETERMINATIONS		Totals
	NO EFFECT	MAY AFFECT	NOT LIKELY TO ADVERSLY AFFECT	LIKELY TO ADVERSELY AFFECT	
Amphibians	0	25	0	25	25
Aquatic Invertebrates	0	75	0	75	75
Birds	0	31	0	31	31
Fish	0	106	0	106	106
Mammals	0	32	5	27	32
Plants	0	462	3	459	462
Reptiles	0	17	0	17	17
Terrestrial Invertebrates	0	46	2	44	46
Total	0	794	10	784	794
Percent of Total Number of Critical Habitats (%)	0	100	2	98	

Exhibit 3

Executive Summary for Diazinon ESA Assessment

This Biological Evaluation (BE) assesses whether the registered uses of diazinon (PC code 057801), based on the U.S. Environmental Protection Agency's (EPA) proposed federal action, will result in a potential effect to an individual of an endangered and threatened (listed) species and/or designated critical habitats. The evaluation also includes analysis of impacts to candidate species as well as species and critical habitat proposed for listing for conferencing purposes under section 7 of the Endangered Species Act (ESA). This evaluation, conducted as part of the registration review process (EPA's action under consultation), is based on interim scientific methods developed in response to recommendations of the National Research Council (NRC, 2013) and uses a three-step consultation process.

Step 1 consists of two parts: 1) establishing the action area for the proposed action, and 2) overlaying the listed, proposed, and candidate species (hereafter, "listed species" ranges and proposed and final critical habitat designations (hereafter, "critical habitat(s)" onto the action area (**Section 1.4.1**). This step identifies which species and critical habitats have the potential to be affected by the proposed action. A "no effect" determination is made for species and critical habitats whose ranges do not overlap with the action area and listed species that are presumed extinct (or extirpated from specific geographic areas). Any listed species and/or critical habitat that warrants a "may affect" determination in Step 1 (*i.e.,* its range and/or critical habitat overlaps spatially with the action area and it is not presumed extinct or extirpated from the US) continues for further analysis in Step 2. Step 2 determines whether effects to individuals of listed species and/or Primary Constituent Elements (PCEs)/physical and biological features (PBFs) of critical habitat result in a "may affect, not likely to adversely affect (NLAA) determination, or a "may affect, likely to adversely affect" (LAA) determination. In Step 2, toxicity (indirect and direct effects data) and exposure information are analyzed using a weight-of-evidence (WoE) approach. These data are organized into lines of evidence that inform risk hypotheses and ultimately the effect determinations for listed species and their critical habitats. The NLAA determinations are submitted to the US Fish and Wildlife Service and the National Marine Fisheries Services (the Services) for concurrence, while the listed resources with a LAA determination are considered by the Services in their Biological Opinions (Step 3). This Biological Evaluation represents Steps 1 and 2 in the ESA pesticide consultation process for diazinon.

General Information

Diazinon is an insecticide used on orchards (almonds, stone fruit and pome fruit), ground fruit and vegetable crops (e.g., lettuce, tomatoes), outdoor nurseries and cattle ear tags. While most of the uses are allowed across the United States, many of the labeled uses are on Special Local Needs (SLN) labels and are only allowed in one state. Based on an Office of Pesticide Programs Information Network (OPPIN) query (conducted December 2014) there are five registrants with diazinon products with three technical labels, six Section 3 labels for agricultural products applied to crops, ten 24C or SLN Labels that are supplements to the six Section 3 labels, six cattle ear tag labels, and one Section 18 label for control of the fruit fly in the *Tephritidae* family in Florida. (see **APPENDIX 1-2**). All agricultural products (except the cattle ear tag) are applied in liquid form. Aerial applications are allowed for use on lettuce only. For all other uses, ground application methods (including broadcast, soil incorporation, orchard airblast, and chemigation) are allowed (see **APPENDIX 1-3** for details).

Diazinon enters the environment via direct application to use sites. It may move off-site via spray drift, volatilization (primarily following foliar applications), and runoff. Major routes of diazinon

transformation in the environment are through metabolism in soil and aquatic environments. In air, diazinon transforms to diazoxon, which is a degradate of concern. In soil and water, diazinon transforms to oxypyrimidine, which is not of toxicological concern (the toxicity is orders of magnitude lower than diazinon; see **APPENDIX 1-9**).

Diazinon is an organophosphate insecticide used to kill insects systemically and on contact. Organophosphate toxicity in animals is based on the inhibition of the enzyme acetylcholinesterase (AChE). Inhibition of AChE interferes with proper neurotransmission in cholinergic synapses and neuromuscular junctions which can lead to sublethal effects and mortality. The effects of diazinon have been studied extensively in many taxa, particularly in fish and invertebrates (see **Chapter 2**). The BE considered more than 500 ecotoxicity studies for diazinon (including approximately 130 fish studies, 10 amphibian studies, 130 aquatic invertebrate studies, 10 aquatic plant studies, 80 bird studies, 1 reptile study, 70 mammalian studies, 170 terrestrial invertebrate studies, and 60 terrestrial plant studies). Studies include acute and chronic laboratory studies with either technical or formulated diazinon, and include both registrant-submitted and open literature studies (search of relevant open literature data conducted up through June 2013). Toxicity to taxa from exposure to other chemical stressors of concern (*i.e.*, diazoxon, mixtures [*e.g.*, tank mixtures, formulated products, and environmental mixtures]) and non-chemical stressors (*e.g.*, temperature) are also considered.

Exposure Methods

Exposure values are based primarily on fate and transport model results. For aquatic exposures, the Pesticide in Water Calculator (PWC, v. 1.52, May 2016) [a new graphical user interface used to run Pesticide Root Zone Model (PRZM)/Variable Volume Water Body Model (VVWM)], and AgDRIFT models are used to predict aquatic exposure in generic habitats, referred to as bins (see **Section 1.4.2.2.a.1.**). Aquatic exposure results for the bin(s) most appropriate for the species and/or critical habitat being assessed are used. For terrestrial exposures, existing models [*i.e.,* Terrestrial Residue Exposure model (T-REX), Terrestrial Herpetofaunal Exposure Residue Program Simulation (T-HERPS), portions of the Terrestrial Investigation Model (TIM), TerrPlant, and AgDRIFT] were combined into a single tool that is referred to as the Terrestrial Effects Determination tool (TED) (see **Section 1.4.2.2.a.2.** and **ATTACHMENT 1-7**). A more detailed analysis using TIM and the Markov Chain Nest Productivity Model (MCnest) is also conducted for a subset of listed bird species. The models used in this BE can be found at https://www.epa.gov/endangered-species/provisional-models-endangered-species-pesticide-assessments.

Overlap Analyses

For diazinon, potential use sites were represented by 4 different types of landcover: orchards, ground fruit and vegetables, nurseries and areas where cattle graze. Of these landcovers, nurseries has the smallest overlap with species ranges. The majority of listed species ranges overlap with landcovers representing agricultural uses of diazinon (i.e., orchards, ground fruit and vegetables).

Effects Determinations

To help determine the potential for risk, effects thresholds are established (see Interim agreement[1]). For mortality to animals, the one-in-a-million chance of mortality [based either on the 5th percentile of the Species Sensitivity Distribution (SSD) or a surrogate LD_{50}, LC_{50}, or EC_x] is used to assess direct effects to a listed species (for details, see **ATTACHMENT 1-4**). For potential indirect effects based on prey lethality for those species without obligate relationships, the exposure that results in a 10% effect for the 5th percentile species on an SSD for the prey species or the 10% effect level for the most sensitive prey species tested (if not enough data are available for a SSD) is used. For sublethal effects, the direct effects threshold for animals and plants is the lowest available NOAEC/NOAEL or other scientifically defensible effect threshold (EC_x) that can be linked to survival or reproduction. For animals, the indirect effects threshold is the LOAEC/LOAEL for growth or reproduction for relevant taxa. For plants and indirect effects, the threshold is the lowest available LOAEC or EC_{50} value (aquatic plants) and the lowest LOAEC or EC_{25} value (terrestrial and wetland plants). These thresholds are used with other available data in a weight-of-evidence (WoE) approach which integrates the body of evidence that is available for making an effects determination. For the exposure assessment, the overlap of species range and action area, the relevance of predictive models to simulate EECs, the quality of fate data for exposure modeling and monitoring data that may be available are considered. For the effects analysis, the number of studies and/or species tested in the available toxicity data, taxonomic surrogacy, the magnitude and/or types of effects observed, and incident data are considered. An overall risk finding (high, medium, low) and a finding on the overall confidence (high, medium, low) in the available exposure and effects data is made for each line of evidence to inform the effect determinations for listed species and critical habitats (see **ATTACHMENT 1-9**).

Effects Determinations Summary

For diazinon, the results of the Step 1 ('**No Effect**' (NE) or '**May Affect**' determinations) and Step 2 ('**Not Likely to Adversely Affect**' (NLAA) or '**Likely to Adversely Affect**' (LAA) determinations) for species and designated critical habitats are presented in **Tables 1 and 2**, respectively. For species/critical habitats with a NE determination in Step 1, no additional analyses are conducted (they do not proceed to Step 2). In Step 2 analyses, all of the diazinon uses and use patterns modeled result in threshold exceedances for most taxa. For species/critical habitats with NLAA determinations, they will be sent to the Services for concurrence. For species/critical habitats with a LAA determination, additional analyses will be conducted (*i.e.*, they proceed to Step 3).

[1] Interim approaches and agreement: https://www.epa.gov/endangered-species/interim-approaches-pesticide-endangered-species-act-assessments-based-nas-report

TABLE 1. Summary of Species Effects Determinations for Diazinon (Counts by Taxon).

TAXON/ CRITICAL HABITAT	STEP 1 EFFECTS DETERMINATIONS		STEP 2 EFFECTS DETERMINATIONS	
	NO EFFECT[1]	MAY EFFECT[2]	NOT LIKELY TO ADVERSLY AFFECT[3]	LIKELY TO ADVERSELY AFFECT[4]
Amphibians	0	40	2	38
Aquatic Invertebrates	5	215	7	208
Birds	7	101	19	82
Fish	0	193	23	170
Mammals	3	106	25	81
Plants	69	892	199	693
Reptiles	1	47	0	47
Terrestrial Invertebrates	29	126	9	118
TOTALS	114	1720	284	1437

[1] No further analyses is conducted for these critical habitats
[2] These species proceed to Step 2
[3] These species determinations go to the Services for concurrence
[4] These species proceed to Step 3

TABLE 2. Summary of Designated Critical Habitat Effects Determinations for Diazinon (Counts by Taxon).

TAXON/ CRITICAL HABITAT	STEP 1 EFFECTS DETERMINATIONS		STEP 2 EFFECTS DETERMINATIONS	
	NO EFFECT[1]	MAY EFFECT[2]	NOT LIKELY TO ADVERSLY AFFECT[3]	LIKELY TO ADVERSELY AFFECT[4]
Amphibians	2	23	2	20
Aquatic Invertebrates	3	72	7	65
Birds	5	26	4	22
Fish	0	106	9	97
Mammals	2	30	8	23
Plants	59	403	280	123
Reptiles	2	15	5	10
Terrestrial Invertebrates	10	36	11	25
TOTALS	83	711	326	385

[1] No further analyses is conducted for these critical habitats
[2] These species proceed to Step 2
[3] These species determinations go to the Services for concurrence
[4] These species proceed to Step 3

Exhibit 4

Carbaryl Executive Summary for Final Biological Evaluation

This Biological Evaluation (BE) assesses potential risks that registered uses of carbaryl (PC code 056801) may pose to an individual of a listed species or designated critical habitat. The federal action considered in this BE is the Registration Review for carbaryl, which encompasses the review of all the registered uses, and the approved product labels for all pesticide products containing carbaryl.

The term "listed species" includes those that are federally listed as endangered and threatened, as well as those that are proposed and candidates for listing and experimental populations. The methods employed in this BE follow the Revised Method for National Level Listed Species Biological Evaluations of Conventional Pesticides (referred to as the "Revised Method")[1]. The Revised Method incorporates input from the public, US Fish and Wildlife Service (FWS), National Marine Fisheries Service (NMFS) and US Department of Agriculture (USDA).

As described in the Revised Method, EPA's development of this BE includes two steps. The BE includes an evaluation of whether an individual of a listed species is reasonably expected to be exposed to a pesticide at a level that results in a discernable effect, and, if so, distinguishes effects that are likely to adversely affect an individual of a species from those that are not likely to adversely affect an individual. This process is also applied to the designated critical habitat of listed species (when available). In Step 1, for every listed species and designated critical habitat, EPA determines whether carbaryl will have No Effect (NE) or May Affect (MA) (separate determinations made for each species and critical habitat). For those species and critical habitats with MA determinations, in Step 2, EPA will determine if carbaryl is Not Likely to Adversely Affect (NLAA) or Likely to Adversely Affect (LAA) an individual species or critical habitat. Details on the method, models and tools used for making NE, NLAA and LAA determinations are provided in the Revised Method document.

In March 2020, EPA released the Revised Method for National Level Listed Species Biological Evaluations (BEs) of Conventional Pesticides. EPA used the Revised Method to conduct the draft BEs for carbaryl. On March 17, 2020, EPA released the draft BE for carbaryl for public comment. EPA received public comments on the proposed Revised Method and the carbaryl BE through July 2, 2020, which included a 45-day extension of the original public comment period. Updates to the Revised Method and updates that were specific to carbaryl were implemented in the final BE.

1 General Information

Carbaryl is used on a wide variety of terrestrial food and feed crops, as well as uses in turf management, ornamental production, rangeland, and residential settings. Additionally, carbaryl is used to thin fruit in orchards to enhance fruit size and enhance repeat bloom. Carbaryl is also used to control mud and ghost shrimp in commercial shrimp ponds in Texas. There are currently five active technical registrants of carbaryl with 61 active product registrations (60 Section 3s and 1 Special Local Needs), which include formulated products (**APPENDIX 1-1**). Carbaryl can be applied in liquid (*i.e.*, flowable concentrate, emulsifiable concentrate, wettable powder, water soluble powder), bait, granular, or dust forms. Aerial and ground application methods are allowed, as are pressure sprayers, dust applicators, spreaders and shank applicators, and baits (see **APPENDIX 1-2** for details).

[1] Available at: https://www.epa.gov/endangered-species/revised-method-national-level-listed-species-biological-evaluations-conventional

This BE assesses all currently registered labels. **APPENDIX 1-2** provides the master use summary table summarizing all currently registered use patterns. **APPENDICES 1-3** and **3-1** provide additional details on how these uses were modeled.

Carbaryl enters the environment via direct application to use sites. It may move off-site via spray drift and runoff. Major routes of carbaryl transformation in the environment include alkaline hydrolysis, photolysis in water, and soil and aerobic aquatic metabolism. Abiotic hydrolysis under acidic conditions and anaerobic metabolism do not seem to play a significant role in the degradation and dissipation processes. Information on leaching and adsorption/desorption indicate that carbaryl is considered moderately mobile. The logarithm octanol-water partition coefficient (log K_{ow} 2.36) suggests that carbaryl has a low tendency to accumulate in aquatic and terrestrial organisms. Carbaryl has no degradates that are considered residues of toxicological concern.

Carbaryl is an N-methylcarbamate insecticide which acts by inhibiting acetylcholinesterase, thereby reducing the degradation of the cholinergic neurotransmitter acetylcholine. As a result, inter-synaptic concentrations of acetylcholine increase as the neurotransmitter accumulates leading to increased firing of the postsynaptic neurons which may lead to convulsions, paralysis, and death of an organism exposed to the chemical. Acetylcholinesterase inhibition is rapidly reversed in many taxa once exposure to an N-methylcarbamate insecticide has ended. Carbaryl is also used to thin blossoms in orchards; its activity in the abscission of flower buds may be related to its structural similarity to plant auxins, such as α-naphthalene acetic acid. Additional details on the fate of carbaryl are provided in **Chapter 3** of the Biological Evaluation.

Carbaryl is practically nontoxic to birds and moderately toxic to mammals on an acute exposure basis. However, carbaryl demonstrated a variety of growth and reproductive effects at a range of exposure concentrations in birds and mammals as discussed in **Chapter 2**. Carbaryl is highly toxic to beneficial insects and bees. Carbaryl is moderately toxic to freshwater fish, and highly toxic to freshwater and estuarine/marine invertebrates on an acute exposure basis. Carbaryl has demonstrated adverse effects on growth to both vascular and non-vascular aquatic plants as well as terrestrial plants. There are reported ecological incidents involving carbaryl use for birds, mammals, terrestrial invertebrates, and terrestrial plants which are detailed in **Chapter 2**.

2 Exposure Methods

Exposure estimates are based primarily on fate and transport model results. Aquatic exposures (surface water and benthic sediment pore water) are quantitatively estimated for representative carbaryl uses in specific geographic regions within generic habitats (referred to as bins) using the Pesticide Root Zone Model (PRZM5) and the Variable Volume Water Model (VVWM)[2] in the Pesticides in Water Calculator (PWC) version 2.001. Aquatic exposure results for the bin(s) most appropriate for the species and/or critical habitat are discussed in **Chapter 3**. Also discussed in **Chapter 3** are available water monitoring data for carbaryl. For terrestrial exposures, existing models [*i.e.*, AgDRIFT, earthworm fugacity model, Terrestrial Herpetofaunal Exposure Residue Program Simulation (T-HERPS), Terrestrial Residue Exposure model (T-REX) and portions of the Terrestrial Investigation Model (TIM)] were combined and modified into a single tool that is referred to as the MAGTool (**Chapter 4**). This assessment replaces EPA's TerrPlant model with the Plant Assessment Tool (PAT), the latter is a more refined exposure model for

[2] The exposure models can be found at: http://www.epa.gov/pesticides/science/models_pg.htm

terrestrial, wetland and aquatic plants. Between the draft BE and the final BE, an updated methodology was utilized to estimate exposure in residential settings.

3 Overlap Analyses

Step 1 of the BE involves an analysis of the potential overlap of the action area and individual species ranges and critical habitat. The action area was derived in ArcGIS 10.8 by combining the data layers representative of carbaryl potential uses plus off-site transport. The overlaps of action area and individual species' ranges or critical habitats were calculated. This analysis used spatial data of species' ranges and habitats from the Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS). In the contiguous United States (ConUS), agricultural potential use sites are represented using the USDA Crop Data Layer (CDL) (**APPENDIX 1-5**). Other data sources are used to represent agricultural areas in states and US territories outside of the contiguous United States, for which the CDL is not available (**APPENDIX 1-6)**. All species or critical habitats with some overlap of the action area and their range or designated critical habitat, or with some overlap on species that the listed species depends on (**Chapter 4**) are assessed in the MAGTool to make LAA/NLAA determinations. Between the draft BE and the final BE, several UDLs were updated include splitting alfalfa and other agricultural grasses (non-grazing area) from the pasture/rangeland (grazing areas).

4 Effects Determinations

This BE makes effects determinations (NE, NLAA or LAA) for 1,805 listed species, and 791 designated critical habitats. For each species and designated critical habitat, the effects determination is based on the methodology detailed in **Chapter 1** of this BE and the Revised Method document[3]. NE determinations were made for three species and their designated critical habitats; all other species received a MA determination. All species and critical habitats with a MA determination progressed to the Step 2 analysis where a NLAA or LAA determination is made. NLAA determinations were made for 162 species and 52 species' critical habitat and LAA determinations were made for 1,640 species and 736 species' critical habitats. Most NLAA determinations were based on a qualitative analysis of species, based on factors such as being presumed extinct or having incomplete exposure pathways. Specific species determinations are provided in **APPENDIX 4-1.**

The MAGTool estimates the number of individuals of a listed species that are potentially affected, incorporating the degree of overlap of a species range with potential use sites and associated usage data for a chemical (and associated off-site transport areas) into the effects determinations. Using the toxicity endpoints for each taxon (**Chapter 2**), the MAGTool utilizes both deterministic and probabilistic methods to assess the likelihood that carbaryl will adversely affect an individual of a given species. To help determine the potential for risk, the MAGtool incorporates many of EPA's standard pesticide exposure models to estimate exposures to listed species and their prey, pollination, habitat, and dispersal vectors (PPHD). Details on the individual effects determinations are found in **APPENDIX 4-1**. If the model estimates are not considered representative of the exposure of the species (due to an inconsistency in the exposure model and assessed species' habitat), a qualitative analysis is conducted. In those cases, EPA makes either a LAA or a NLAA determination based on a qualitative weight of

[3] USEPA. 2020. *Revised Method for National Level Listed Species Biological Evaluations of Conventional Pesticides*. March 12, 2020. Environmental Fate and Effects Division. Office of Pesticide Programs. U.S. Environmental Protection Agency. Available at https://www.epa.gov/endangered-species/revised-method-national-level-listed-species-biological-evaluations-conventional.

evidence. For each LAA determination, this assessment employs three categories (*i.e.,* strongest, moderate and weakest) to characterize the strength of the weight of evidence. Each species or critical habitat was assigned a weak, moderate or strong evidence in the LAA determination based on multiple factors, including: the impact of using less conservative assumptions in the analysis, the quality of the species range or usage data, impacts to both the species and PPHD as opposed to only one, the presence of reported incidents involving the species taxa or PPHD taxa, the presence of monitoring data that exceeds endpoints, exposure only due to spray drift and the likelihood of drift into a species habitat (*e.g.*, if the species inhabits forests).

Of the LAA determinations, the majority (70% of species and 73% of critical habitats) were considered to have moderate evidence. Strongest evidence was found for 8% of species and 10% of critical habitat LAA determinations. Weakest evidence was found for 22% of species and 18% of critical habitat LAA determinations.

Non-agricultural UDLs, including Open Space Developed, Right of Way and Developed UDLs were often cited as the top use sites associated with predicted impacts to species or critical habitats with LAA determinations, although numerous other non-agricultural and agricultural UDLs may also impact species. When interpreting UDL rankings based on impact to the species, it is important to remember the UDLs are not mutually exclusive from one another. Therefore, other influences related to this lack of independence may influence the high rankings of a given layers. LAA determinations were made for species across all taxa. For certain species, there were uncertainties in the carbaryl effects determinations based on the resolution of spatial data. For species and critical habitats there were uncertainties in the resolution of usage data and the threshold for assessing impacts on PPHD (detailed in **Chapter 4**). **Tables 1** and **2** summarize the NE, NLAA and LAA determinations for species and critical habitats. **Table 3** summarizes the strength of evidence classifications for the LAA determinations.

Table 1. Summary of Species Effects Determinations for Carbaryl (Counts by Taxon).

Taxon	Step 1 Effects Determinations		Step 2 Effects Determinations		Totals
	No Effect	May Affect	Not Likely to Adversely Affect	Likely to Adversely Affect	
Mammals	1	101	27	74	102
Birds	0	107	26	81	107
Amphibians	0	38	0	38	38
Reptiles	0	46	14	32	46
Fish	0	192	11	181	192
Plants	0	950	38	912	950
Aquatic Invertebrates	0	209	24	185	209
Terrestrial Invertebrates	2	159	22	137	161
Total	3	1802	162	1640	1805
Percent of total	0%	100%	9%	91%	

Table 2. Summary of Critical Habitat Effects Determinations for Carbaryl (Counts by Taxon).

Taxon	Step 1 Effects Determinations		Step 2 Effects Determinations		Totals
	No Effect	May Affect	Not Likely to Adversely Affect	Likely to Adversely Affect	
Mammals	0	33	6	27	33
Birds	0	31	1	30	31
Amphibians	0	25	0	25	25
Reptiles	2	14	6	8	16
Fish	0	106	2	104	106
Plants	1	459	20	439	460
Aquatic Invertebrates	0	71	5	66	71
Terrestrial Invertebrates	0	49	12	37	49
Total	3	788	52	736	791
Percent of total	0%	100%	7%	93%	

Table 3. Classification of LAA Determinations by Strength of Evidence.

Strength of LAA call	Species range		Critical Habitat	
	Number	% of LAA determinations	Number	% of LAA determinations
Strongest evidence of LAA	131	8%	70	10%
Moderate evidence of LAA	1147	70%	534	73%
Weakest evidence of LAA	362	22%	132	18%

Exhibit 5

Methomyl Executive Summary for Final Biological Evaluation

This Biological Evaluation (BE) assesses potential risks that registered uses of methomyl (PC code 090301) may pose to an individual of a listed species or designated critical habitat. The federal action considered in this BE is the Registration Review for methomyl, which encompasses the review of all the registered uses, and the approved product labels for all pesticide products containing methomyl.

The term "listed species" includes those that are federally listed as endangered and threatened, as well as those that are proposed and candidates for listing and experimental populations. The methods employed in this BE follow the Revised Method for National Level Listed Species Biological Evaluations of Conventional Pesticides (referred to as the "Revised Method") [1]. The Revised Method incorporates input from the public, US Fish and Wildlife Service (FWS), National Marine Fisheries Service (NMFS) and US Department of Agriculture (USDA).

In March 2020, EPA released the Revised Method for National Level Listed Species Biological Evaluations (BEs) of Conventional Pesticides. EPA used the Revised Method to conduct the draft BE for methomyl. On March 17, 2020, EPA released the draft BE for methomyl for public comment. EPA received public comments on the proposed Revised Method and the methomyl BE through July 2, 2020, which included a 45-day extension of the original public comment period. Updates to the Revised Method and updates that were specific to methomyl were implemented in the final BE.

As described in the Revised Method, EPA's development of this BE includes two steps. The BE includes an evaluation of whether an individual of a listed species is reasonably expected to be exposed to a pesticide at a level that results in a discernible effect, and, if so, distinguishes effects that are likely to adversely affect an individual of a species from those that are not likely to adversely affect an individual. This process is also applied to the designated critical habitat of listed species (when available). In Step 1, for every listed species and designated critical habitat, EPA determines whether methomyl will have No Effect (NE) or May Affect (MA) (separate determinations made for each species and critical habitat). For those species and critical habitats with MA determinations, in Step 2, EPA will determine if methomyl is Not Likely to Adversely Affect (NLAA) or Likely to Adversely Affect (LAA) an individual species or critical habitat. Details on the method, models and tools used for making NE, NLAA and LAA determinations are provided in the Revised Method document.

1. General Information

Methomyl is an insecticide used on a wide variety of terrestrial food and feed crops, terrestrial non-food crops, greenhouse food/non-food, and non-agricultural indoor and outdoor sites. There are currently 3 active registrants of methomyl with 34 active product labels (16 Section 3s, 18 Special Local Needs), which include formulated products and technical grade methomyl (see **APPENDIX 1-1**). All of the formulated methomyl products, with the exception of the fly bait products, are Restricted Use Pesticides (RUPs) – meaning that they can only be applied by, or under the supervision of, a certified applicator. Methomyl can be applied in a liquid, granular (corn only), scatter bait, bait station, or as a brush-on paste. Aerial and ground application methods (including broadcast, soil incorporation, orchard airblast, and chemigation) are allowed. Registered labels require applications to use a buffer of 25 feet for ground and 100 feet for aerial applications around natural and artificial bodies of water. Additionally,

[1] Available at: https://www.epa.gov/endangered-species/revised-method-national-level-listed-species-biological-evaluations-conventional

granular products require a 25-foot (ground) buffer zone adjacent to waterbodies (see **APPENDIX 1-2** for details).

This BE assesses all currently registered labels. **APPENDIX 1-2** provides the master use summary table summarizing all currently registered use patterns. **APPENDICES 1-3** and **3-1** provide additional details on how these uses were modeled.

Methomyl enters the environment via direct application to use sites. It may move off-site via spray drift and runoff. Studies indicate that the major route of methomyl transformation in the environment is aerobic and anaerobic biodegradation. There are data that indicate that abiotic hydrolysis under neutral and acidic conditions, photodegradation, and volatilization do not play a significant role in the degradation and dissipation processes. Based on methomyl's aerobic soil metabolism and aerobic and anaerobic aquatic metabolism data, methomyl is not considered persistent in the environment. Information on leaching and adsorption/desorption indicate that methomyl is considered mobile. Low octanol/water partition coefficient (log K_{ow} 0.12) suggests that the chemical will have a low tendency to accumulate in aquatic and terrestrial organisms. Methomyl has no degradates that are considered residues of toxicological concern.

Methomyl is an N-methylcarbamate insecticide. Carbamate insecticides act by inhibiting acetylcholinesterase, thereby reducing the degradation of the cholinergic neurotransmitter acetylcholine. As a result, intersynaptic concentrations of acetylcholine increase as the neurotransmitter accumulates leading to increased firing of the postsynaptic neurons which may lead to convulsions, paralysis, and death of an organism exposed to the chemical. Acetylcholinesterase inhibition is rapidly reversed in many taxa once exposure to an N-methylcarbamate insecticide has ended (see **Chapter 3** for details).

Methomyl is classified as highly toxic to birds and mammals on an acute exposure basis. Growth and reproductive endpoints were also affected in chronic studies at a variety of concentrations in birds and mammals, with mammals showing greater sensitivity than birds. Methomyl is highly toxic to beneficial insects and bees on an acute exposure basis, and it exhibits toxicity to adult bees on a chronic exposure basis. Methomyl is classified as very highly toxic to freshwater fish and moderately toxic to estuarine and marine fish on an acute exposure basis. Methomyl is characterized as very highly toxic to freshwater and estuarine and marine invertebrates on an acute exposure basis. There are reported ecological incidents involving methomyl use for aquatic animals, birds, mammals, terrestrial invertebrates, and terrestrial plants which are detailed in **Chapter 2**.

2. Exposure Methods

Exposure estimates are based primarily on fate and transport model results. Aquatic exposures (surface water and benthic sediment pore water) are quantitatively estimated for representative methomyl uses in specific geographic regions within generic habitats (referred to as bins) using the Pesticide Root Zone Model (PRZM5) and the Variable Volume Water Model (VVWM)[2] in the Pesticides in Water Calculator (PWC) version 2.001. Aquatic exposure results for the bin(s) most appropriate for the species and/or critical habitat being assessed are discussed in **Chapter 3**. Also discussed in **Chapter 3** are available water monitoring data for methomyl. For terrestrial exposures, existing models [*i.e.*, AgDRIFT, earthworm fugacity model, Terrestrial Herpetofaunal Exposure Residue Program Simulation (T-HERPS),

[2] The exposure models can be found at: http://www.epa.gov/pesticides/science/models_pg.htm

Terrestrial Residue Exposure model (T-REX) and portions of the Terrestrial Investigation Model (TIM)] were combined and modified into a single tool that is referred to as the MAGTool (**Chapter 4**). This assessment replaces EPA's TerrPlant model with the Plant Assessment Tool (PAT), the latter is a more refined exposure model for terrestrial, wetland and aquatic plants**.**

3. Overlap Analyses

Step 1 of the BE involves an analysis of the potential overlap of the action area and individual species ranges and critical habitat. The action area was derived in ArcGIS 10.8 by combining the data layers representative of methomyl potential uses plus off-site transport. The overlaps of action area and individual species' ranges or critical habitats were calculated. This analysis used spatial data of species' ranges and habitats from the Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS). In the contiguous United States (ConUS), agricultural potential use sites are represented using the USDA Crop Data Layer (CDL) (**APPENDIX 1-5**). Other data sources are used to represent agricultural areas in states and US territories outside of the contiguous United States, for which the CDL is not available (**APPENDIX 1-6)**. All species or critical habitats with some overlap of the action area and their range or designated critical habitat, or with some overlap on species that the listed species depends on (**Chapter 4**) are assessed in the MAGTool to make LAA/NLAA determinations. Between the draft BE and the final BE, several UDLs were updated include splitting alfalfa and other agricultural grasses (non-grazing area) from the pasture/rangeland (grazing areas).

4. Effects Determinations

This BE makes effects determinations (NE, NLAA or LAA) for 1,805 listed species, and 791 designated critical habitats. For each species and designated critical habitat, the effects determination is based on the methodology detailed in **Chapter 1** of this BE and the Revised Method document[3]. NE determinations were made for 218 listed species and 236 critical habitats. MA determinations were made for the 1587 species and 555 critical habitats. All species given a MA determination at Step 1 progressed to the Step 2 analysis where an NLAA or LAA determination is made. NLAA determinations were made for 489 species, and 274 species' critical habitats. LAA determinations were made for 1098 species and 281 critical habitats. Specific species determinations are provided in **APPENDIX 4-1.**

The MAGTool estimates the number of individuals of a listed species that are potentially affected, incorporating the degree of overlap of a species range with potential use sites and associated usage data for a chemical (and associated off site transport areas) into the effects determinations. Using the toxicity endpoints for each taxon (**Chapter 2**), the MAGTool utilizes both deterministic and probabilistic methods to assess how likely methomyl will adversely affect an individual of a given species. To help determine the potential for risk, the MAGtool incorporates many of EPA's standard pesticide exposure models to estimate exposures to listed species and their prey, pollination, habitat, and dispersal vectors (PPHD). Details on the individual effects determinations are found in **APPENDIX 4-1**. If the model estimates are not considered representative of the exposure of the species (due to an inconsistency in the exposure model and assessed species' habitat), a qualitative analysis is conducted. In those cases, EPA makes either a LAA or a NLAA determination based on a qualitative weight of evidence. For each LAA

[3] USEPA. 2020. *Revised Method for National Level Listed Species Biological Evaluations of Conventional Pesticides*. March 12, 2020. Environmental Fate and Effects Division. Office of Pesticide Programs. U.S. Environmental Protection Agency. Available at https://www.epa.gov/endangered-species/revised-method-national-level-listed-species-biological-evaluations-conventional.

determination, this assessment employs three categories (*i.e.,* strongest, moderate and weakest) to characterize the strength of the weight of evidence. Each species or critical habitat was assigned a weak, moderate or strong evidence in the LAA determination based on multiple factors, including: the impact of using less conservative assumptions in the analysis, the quality of the species range or usage data, impacts to both the species and PPHD as opposed to only one, the presence of reported incidents involving the species taxa or PPHD taxa, the presence of monitoring data that exceeds endpoints, exposure only due to spray drift and the likelihood of drift into a species habitat (*e.g.*, if the species inhabits forests).

For approximately 61% of all species and 36% of critical habitats, an LAA determination was made. Of the species LAA determinations, 34% were considered to have strongest evidence of LAA, 37% were considered to have moderate evidence of LAA, and 29% were considered to have weakest evidence of LAA. Of the critical habitat LAA determinations, 60% were considered to have strongest evidence of LAA, 18% were considered to have moderate evidence of LAA, and 22% were considered to have weakest evidence of LAA. In considering prominent risk drivers, the Corn Use Data Layer (UDL) was cited as the top use site associated with impacts to species or critical habitats with LAA determinations. Other UDLs frequently cited included Vegetables and Ground Fruit, Alfalfa, Other Grains, and Other Orchards. When interpreting UDL rankings based on impact to the species, it is important to remember the UDLs are not mutually exclusive from one another. Therefore, other influences related to this lack of independence may influence the high rankings of given layers. LAA determinations were made for species across all taxa. For certain species and critical habitats, there were uncertainties in the methomyl effects determinations based on the resolution of spatial data, resolution of usage data, and the threshold for assessing impacts on PPHD (detailed in **Chapter 4**). **Tables 1** and **2** summarize the NE, NLAA and LAA determinations for species and critical habitats (respectively). **Tables 1** and **2** summarize the NE, NLAA and LAA determinations for species and critical habitats. **Table 3** summarizes the strength of evidence classifications for the LAA determinations.

TABLE 1. Summary of Species Effects Determinations for Methomyl (Counts by Taxon).

Taxon	Step 1 Effects Determinations		Step 2 Effects Determinations		Totals
	No Effect	May Affect	Not Likely to Adversely Affect	Likely to Adversely Affect	
Mammals	1	101	33	68	102
Birds	2	105	33	72	107
Amphibians	1	37	3	34	38
Reptiles	1	45	17	28	46
Fish	0	192	17	175	192
Plants	180	770	306	464	950
Aquatic Invertebrates	3	206	28	178	209
Terrestrial Invertebrates	30	131	52	79	161
Total	218	1587	489	1098	1805
Percent of total	12%	88%	27%	61%	

TABLE 2. Summary of Critical Habitat Effects Determinations for Methomyl (Counts by Taxon).

Taxon	Step 1 Effects Determinations		Step 2 Effects Determinations		Totals
	No Effect	May Affect	Not Likely to Adversely Affect	Likely to Adversely Affect	
Mammals	2	31	9	22	33
Birds	8	23	7	16	31
Amphibians	3	22	6	16	25
Reptiles	4	12	6	6	16
Fish	1	105	12	93	106
Plants	196	264	213	51	460
Aquatic Invertebrates	4	67	6	61	71
Terrestrial Invertebrates	18	31	15	16	49
Total	236	555	274	281	791
Percent of total	30%	70%	35%	36%	

Table 3. Classification of LAA Determinations by Strength of Evidence.

Strength of LAA call	Species range		Critical Habitat	
	Number	% of LAA determinations	Number	% of LAA determinations
Strongest evidence of LAA	376	34%	169	60%
Moderate evidence of LAA	408	37%	51	18%
Weakest evidence of LAA	314	29%	61	22%

Exhibit 6

Glyphosate Executive Summary for Biological Evaluation

A biological evaluation (BE) is a generic term for an analysis that a federal agency conducts when it takes action subject to review under the Endangered Species Act (ESA). EPA prepares a BE to evaluate the potential effects of an agency action (here registered uses of glyphosate (PC Codes: 417300, 103601, 103604, 103607, 103608, 103613, 103605) on listed and proposed species and designated and proposed critical habitat). This BE encompasses the review of all the registered uses and the approved product labels for all pesticide products containing glyphosate as well as any agreed upon changes to these labels from the registrants.

Under its current approach for registration review for conventional pesticides, EPA meets its ESA obligations through a three-step process. EPA's development of this BE includes two steps. In Step 1, for each listed species and each designated critical habitat, EPA evaluates whether the registered uses of glyphosate will have No Effect (NE) or if the registered uses May Affect (MA) an individual of such species or habitat (separate determinations made for each species and critical habitat). More specifically, Step 1 is intended to be a conservative screen that is heavily reliant upon overlap of (1) areas where an environmentally discernable effect could occur from any labeled use of the pesticide being assessed (assumes the pesticide could be used in all areas allowable on the label) with (2) areas where species range/designated critical habitat occurs. It uses conservative assumptions and is intended to screen out species that are not reasonably expected to be exposed to the pesticide because they are outside of the pesticide use area, or when no environmentally discernable effect is expected to occur. If EPA determines there is no effect, that is the end of the analysis for that particular species.

In Step 2, for those species and critical habitats that EPA determines an individual may be affected, EPA uses additional information to determine if glyphosate may affect but is Not Likely to Adversely Affect (NLAA) or may affect and is Likely to Adversely Affect (LAA) an individual of a species or its critical habitat. Step 2 uses a more refined spatial overlap with specific pesticide use sites to calculate the portion of the population exposed, considers life history information, considers actual pesticide applications (usage data), additional toxicity data, and a range of potential exposure concentrations. If EPA makes a NLAA determination, then EPA must informally consult with the Services to seek concurrence on the determination. Otherwise, if EPA makes a LAA determination, EPA must engage in formal consultation with the Services. Details on the method, models and tools used for making NE, NLAA and LAA determinations are provided in the Revised Method document.[1]

Practically, the LAA threshold for a BE is very conservative as the likely predicted "take" of even one individual of a species triggers an LAA determination (even if that species is almost recovered). This often results in a high number of MA and LAA determinations in a BE. An LAA determination in the BE, however, should not be interpreted to suggest that EPA has made a determination that glyphosate is putting a species in jeopardy or adversely modifying its critical habitat. Those determinations are made in the course of Step 3 by the National Marine Fisheries Service and the Fish and Wildlife Service (referred to as The Services) using additional information not considered in Steps 1 and 2.

Step 3 is part of the formal consultation process. Here, the Services prepare a biological opinion (BiOp), which builds upon EPA's BE to determine whether the potential adverse effect is likely to jeopardize the continued existence of a species or destroy or adversely modify critical habitat. The analysis in Step 3

[1] https://www3.epa.gov/pesticides/nas/revised/revised-method-march2020.pdf

considers whether the anticipated adverse effects to individuals described in the BE will negatively affect populations and the species they comprise such that they jeopardize the continued existence of the species.

These documents reflect the final biological evaluation for glyphosate. In regard to addressing public comments and initiating consultation with the Services under Section 7, EPA carefully considered the comments to determine if any updates to the BEs were necessary. In many cases the information or data submitted in the comments is expected to have little bearing on the likelihood of impacting one individual, considering the conservative nature of the NE/LAA/NLAA determinations. Early in the consultation, we plan to identify species that may need additional data refinements to be used when considering mitigation options. Where we received public comments and/or data that are useful for these purposes, we will consider it at that time.

1 General Information

Glyphosate is one of the most widely used herbicides in North America. Glyphosate belongs to the phosphono amino acid class of herbicides and is a foliar, non-selective, systemic herbicide widely used to control weeds in agricultural crops and non-agricultural sites. Glyphosate inhibits an enzyme on the shikimate pathway that is essential for the biosynthesis of some aromatic amino acids in algae, higher plants, bacteria and fungi. Inhibition of this enzyme leads to cell death. Glyphosate is used on a wide variety of agricultural food and feed crops, non-food/feed crops, for plantation/silviculture uses, and for nursery/greenhouse use. Important non-agricultural uses include applications for noxious and invasive weed control in aquatic systems, pastures/rangelands, public lands, forestry, and rights-of-way applications. Glyphosate is also used for general weed control or for lawn replacement/renovation in commercial, industrial, and residential areas (by homeowners, landscaping operators, etc.).

This BE assesses all currently registered labels. The label data used in this assessment were derived from the label/use information compiled by the Joint Glyphosate Task Force (JGTF) and submitted to the Agency to provide further clarification on the label use patterns. **APPENDIX 1-2** provides the use information as further refined by EPA, summarizing details relevant for modeling the maximum use patterns. **APPENDICES 1-2** and **3-1** provide additional details on how these uses were modeled.

Glyphosate is formulated as water-dispersible granules (WG) (80% active ingredient), emulsifiable concentrate (EC) (13.4% - 36.5% active ingredient), water-dispersible liquids (L) (5% - 14.6% active ingredient), ready to use (RTU) (0.81% active ingredient), and soluble concentrate/solid (SC/S) (95.2% - 96.7% active ingredient). Application equipment includes aircraft and various ground equipment. Application is via band treatment, broadcast, crack and crevice treatment, directed spray, edging treatment, ground spray, high volume spray (dilute), low volume spray (concentrate), perimeter treatment, soil broadcast treatment, spot treatment, spray, strip treatment, stump treatment, and wipe-on/wiper treatment. Single application rates are up to 8 pounds active ingredient (as acid equivalents)/acre (lb a.e./A) but are generally 1.55 lb a.e./A for aerial applications and 3.75 lb a.e./A for ground application. Maximum combined annual application rates are up to generally 6 to 8 lbs a.e./A. For some non-agricultural uses, the single application rates were calculated at rates up to 40 lbs a.e./A. These higher rates of 40 lbs a.e./A are calculated by extrapolating up from a smaller area as is expressed on the label (*e.g.,* rate expressed per 150 sq. feet instead of per acre). These rates are interpreted to be relevant for a wide variety of non-crop areas where total vegetation control is desired. In the absence of

a pound a.e/acre rate, these calculated rates were selected for modelling and it is noted that this is an area that may lead to refinement should the labels be revised in the future.

Between 2013 and 2018, the national annual total agricultural usage averaged approximately 280 million pounds of glyphosate whereas the average total treated acreage was 285 million. During this time frame, the crops with the most usage in terms of annual average total pounds of active ingredient applied were soybeans (114 million lbs), corn (90 million lbs), and cotton (20 million lbs). The crops with the most usage in terms of total treated acreage were the same with 114, 93 and 19 million acres treated for soybeans, corn and cotton, respectively. Over 21 million pounds of glyphosate are applied to non-agricultural sites annually (**APPENDIX 1-4**).

The major transport routes off the treated area for glyphosate include runoff and spray drift. Glyphosate has a high solubility, low octanol-water partitioning coefficient, low vapor pressure, and low Henry's Law Constant. These data suggest that glyphosate has a low potential for volatilization and bioaccumulation. It is assumed that the glyphosate salts dissociate rapidly to form glyphosate acid and the counter ion. The main routes of dissipation are microbial degradation under aerobic conditions, and runoff. Glyphosate is expected to reach surface water primarily through spray drift; however, transport in runoff may also occur primarily via sorption of glyphosate-metal complexes to eroded soil. The highest concentrations of glyphosate in surface water are in urban environments and in the vicinity of local use areas. Additional details on the fate of glyphosate are provided in **Chapter 3** of the Biological Evaluation.

Glyphosate is an acid which can be associated with different counter cations to form salts. These different salts, which have separate registrations, are included in this assessment. For comparison purposes, in this assessment, each salt is considered in terms of its "glyphosate equivalent," (acid equivalent; ae) as determined by multiplying the glyphosate salt endpoint value by the acid equivalence ratio (the ratio of the molecular weight of N-(phosphonomethyl)glycine to the molecular weight of the salt). For the assessment, both application rates and the toxicity endpoint values are expressed as acid equivalents.

Technical glyphosate is practically non-toxic to terrestrial and aquatic animals on an acute exposure basis. Toxicity studies, particularly acute aquatic toxicity studies, show that while some formulated products are less toxic than glyphosate active ingredient alone, others can be up to 2 orders of magnitude more toxic. Formulated glyphosate is moderately to highly toxic to fish, highly to very highly toxic to aquatic invertebrates, moderately toxic to mammals, and slightly toxic to birds on an acute exposure basis. In both terrestrial and aquatic animals, technical and formulated glyphosate demonstrate a variety of growth and reproductive effects at a range of chronic exposure concentrations. Glyphosate has demonstrated adverse effects on growth to both vascular and non-vascular aquatic plants as well as terrestrial plants. There have been over 1,000 reported ecological incidents involving glyphosate use for birds, fish, terrestrial invertebrates, and terrestrial plants. More details on the available toxicity data and incident reports are provided in **Chapter 2**.

2 Exposure Methods

Exposure estimates are based primarily on fate and transport model results. Aquatic exposures (surface water and benthic sediment pore water) are quantitatively estimated for representative glyphosate uses in specific geographic regions within generic habitats (referred to as bins) using the Pesticide Root Zone

Model (PRZM5) and the Variable Volume Water Model (VVWM)[2] in the Pesticides in Water Calculator (PWC). Aquatic exposure results for the bin(s) most appropriate for the species and/or critical habitat are discussed in **Chapter 3**. Also discussed in **Chapter 3** are available water monitoring data for glyphosate. For terrestrial exposures, existing models [*i.e.*, AgDRIFT, earthworm fugacity model, Terrestrial Herpetofaunal Exposure Residue Program Simulation (T-HERPS), Terrestrial Residue Exposure model (T-REX) and portions of the Terrestrial Investigation Model (TIM)] were combined and modified into a single tool that is referred to as the MAGTool (**Chapter 4**). This assessment replaces EPA's TerrPlant model with the Plant Assessment Tool (PAT), the latter is a more refined exposure model for terrestrial, wetland and aquatic plants.

3 Overlap Analyses

Step 1 of the BE involves an analysis of the potential overlap of the action area and individual species ranges and critical habitat. The action area was derived in ArcGIS 10.7 by combining the data layers representative of glyphosate potential uses plus off-site transport. Due to the broad extent of the potential uses the action area has a minimal off-site transport zone, almost all area is captured as potential use. For this reason, a separate 'drift layer' was derived by combining just the off-site transport zone across potential uses then buffering it out to the off-site transport distance estimated using the AgDRIFT model (**APPENDIX 1-6**). The overlaps of action area and individual species' ranges or critical habitats were calculated. This analysis used spatial data of species' ranges and habitats from the Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS). In the contiguous United States (ConUS), agricultural potential use sites are represented using the USDA Crop Data Layer (CDL) (**APPENDIX 1-6**). Other data sources are used to represent agricultural areas in states and US territories outside of the contiguous United States, for which the CDL is not available. All species or critical habitats with some overlap of the action area and their range or designated critical habitat, or with some overlap on species that the listed species depends on (**Chapter 4**) are assessed in the MAGTool to make LAA/NLAA determinations.

4 Effects Determinations

This BE makes effects determinations (NE, MA, NLAA, or LAA)[3] for 1795 listed species, and 792 designated critical habitats. No NE determinations were made for any species or designated critical habitats; therefore, all species received a MA determination and progressed to the Step 2 analysis where an NLAA or LAA determination is made. NLAA determinations were made for 119 species and 33 critical habitats. EPA made LAA determinations for 1676 species and 759 critical habitats. Specific species determinations are provided in **APPENDIX 4-1.**

For each LAA determination, EPA also grouped these determinations into three categories (*i.e.,* strongest, moderate and weakest) which characterize the strength of the weight of evidence. Each species or critical habitat was assigned a weak, moderate or strong evidence in the LAA determination based on multiple factors, including: the impact of using less conservative assumptions in the analysis, the quality of the species range or usage data, whether impacts could occur due to direct toxicity to the species or to both direct toxicity and to its prey, pollination, habitat, and dispersal (PPHD), the presence

[2] The exposure models can be found at: https://www.epa.gov/pesticide-science-and-assessing-pesticide-risks/models-pesticide-risk-assessment

[3] NE = No effect. MA = May affect. NLAA = Not likely to adversely affect. LAA = Likely to adversely affect.

of reported incidents involving the species taxa or PPHD taxa, the presence of monitoring data that exceeds endpoints, whether species' habitats are potential use sites or if they could only be exposed from spray drift, and the likelihood of drift into a species habitat (*e.g.*, if the species inhabits forests).

Of the LAA determinations, the majority (96% of species and 97% of critical habitats) were considered to have moderate evidence. The majority of the moderate evidence designations were based on non-agricultural uses being the main risk drivers and the lack of availability and uncertainty in usage data associated with these use sites. Strongest evidence was found for <1% of species and <1% of critical habitat LAA determinations. Weakest evidence was found for 4% of species and 3% of critical habitat LAA determinations.

Non-agricultural UDLs, including Non-cultivated, Open Space Developed, Right of Way, Forest Trees and Developed were the use sites most frequently associated with predicted impacts to species or critical habitats with LAA determinations, although numerous other non-agricultural and agricultural UDLS may also impact species. The Aquatic Herbicide UDL, which has overlap with all aquatic species ranges and critical habitats, is also anticipated to have potential impacts on aquatic species for which a LAA determination was made. LAA determinations were made for species across all taxa. For certain species, there were uncertainties in the glyphosate effects determinations based on the resolution of spatial data. For species and critical habitats there were uncertainties in the resolution of usage data and the threshold for assessing impacts on PPHD (detailed in **Chapter 4**). Error! Reference source not found. and Error! Reference source not found. summarize the NE, NLAA and LAA determinations for species and critical habitats. Error! Reference source not found. summarizes the strength of evidence classifications for the LAA determinations.

Table 1. Summary of Species Effects Determinations for Glyphosate (Counts by Taxon).

Taxon	Step 1 Effects Determinations		Step 2 Effects Determinations		Totals
	No Effect	May Affect	Not Likely to Adversely Affect	Likely to Adversely Affect	
Mammals	0	99	24	75	99
Birds	0	108	20	88	108
Amphibians	0	36	0	36	36
Reptiles	0	47	14	33	47
Fish	0	190	11	179	190
Plants	0	948	8	940	948
Aquatic Invertebrates	0	207	22	185	207
Terrestrial Invertebrates	0	160	20	140	160
Total	0	1795	119	1676	1795
Percent of total	0%	100%	7%	93%	

Table 2. Summary of Critical Habitat Effects Determinations for Glyphosate (Counts by Taxon).

Taxon	Step 1 Effects Determinations		Step 2 Effects Determinations		Totals
	No Effect	May Affect	Not Likely to Adversely Affect	Likely to Adversely Affect	
Mammals	0	33	6	27	33
Birds	0	31	1	30	31
Amphibians	0	25	0	25	25
Reptiles	0	16	6	10	16
Fish	0	107	2	105	107
Plants	0	460	4	456	460
Aquatic Invertebrates	0	71	3	68	71
Terrestrial Invertebrates	0	49	11	38	49
Total	0	792	33	759	792
Percent of total	0%	100%	4%	96%	

Table 3. Classification of LAA Determinations by Strength of Evidence.

Strength of LAA call	Species range		Critical Habitat	
	Number	% of LAA determinations	Number	% of LAA determinations
Strongest evidence of LAA	1	<1%	6	<1%
Moderate evidence of LAA	1605	96%	733	97%
Weakest evidence of LAA	70	4%	20	3%

Exhibit 7

Atrazine Executive Summary for Biological Evaluation

A biological evaluation (BE) is a generic term for an analysis that a federal agency conducts when it takes action subject to review under the Endangered Species Act (ESA). EPA prepares a BE to evaluate the potential effects of an agency action (here registered uses of atrazine (PC code 080803) on listed and proposed species and designated and proposed critical habitat). This BE encompasses the review of all the registered uses and the approved product labels for all pesticide products containing atrazine as well as any agreed upon changes to these labels from the registrants.

Under its current approach for registration review for conventional pesticides, EPA meets its ESA obligations through a three-step process. EPA's development of this BE includes two steps. In Step 1, for each listed species and each designated critical habitat, EPA evaluates whether the registered uses of atrazine will have No Effect (NE) or if the registered uses May Affect (MA) an individual of such species or habitat (separate determinations made for each species and critical habitat). More specifically, Step 1 is intended to be a conservative screen that is heavily reliant upon overlap of (1) areas where an environmentally discernable effect could occur from any labeled use of the pesticide being assessed (assumes the pesticide could be used in all areas allowable on the label) with (2) areas where species range/designated critical habitat occurs. It uses conservative assumptions and is intended to screen out species that are not reasonably expected to be exposed to the pesticide because they are outside of the pesticide use area, or when no environmentally discernable effect is expected to occur. If EPA determines there is no effect, that is the end of the analysis for that particular species.

In Step 2, for those species and critical habitats that EPA determines an individual may be affected, EPA uses additional information to determine if atrazine may affect but is Not Likely to Adversely Affect (NLAA) or may affect and is Likely to Adversely Affect (LAA) an individual of a species or its critical habitat. Step 2 uses a more refined spatial overlap with specific pesticide use sites to calculate the portion of the population exposed, considers life history information, considers actual pesticide applications (usage data), additional toxicity data, and a range of potential exposure concentrations. If EPA makes a NLAA determination, then EPA must informally consult with the Services to seek concurrence on the determination. Otherwise, if EPA makes a LAA determination, EPA must engage in formal consultation with the Services. Details on the method, models and tools used for making NE, NLAA and LAA determinations are provided in the Revised Method document.[1]

Practically, the LAA threshold for a BE is very conservative as the likely predicted "take" of even one individual of a species triggers an LAA determination (even if that species is almost recovered). This often results in a high number of MA and LAA determinations in a BE. An LAA determination in the BE, however, should not be interpreted to suggest that EPA has made a determination that atrazine is putting a species in jeopardy or adversely modifying its critical habitat. Those determinations are made in the course of Step 3 by the National Marine Fisheries Service and the Fish and Wildlife Service (referred to as The Services) using additional information not considered in Steps 1 and 2.

Step 3 is part of the formal consultation process. Here, the Services prepare a biological opinion (BiOp), which builds upon EPA's BE to determine whether the potential adverse effect is likely to jeopardize the continued existence of a species or destroy or adversely modify critical habitat. The analysis in Step 3 considers whether the anticipated adverse effects to individuals described in the BE will negatively

[1] https://www3.epa.gov/pesticides/nas/revised/revised-method-march2020.pdf

affect populations and the species they comprise such that they jeopardize the continued existence of the species.

These documents reflect the final biological evaluation for atrazine. In regard to addressing public comments and initiating consultation with the Services under Section 7, EPA carefully considered the comments to determine if any updates to the BEs were necessary. In many cases the information or data submitted in the comments is expected to have little bearing on the likelihood of impacting one individual, considering the conservative nature of the NE/LAA/NLAA determinations. Early in the consultation, we plan to identify species that may need additional data refinements to be used when considering mitigation options. Where we received public comments and/or data that are useful for these purposes, we will consider it at that time.

1 General Information

Atrazine is one of the most widely used herbicides in North America. It is a chlorotriazine herbicide registered in the U.S. to control annual broadleaf and grass weeds. During the most recent five years of available survey data (2013-2017), an annual average of 72,000,000 pounds of atrazine were applied to an average of 75,000,000 acres of agricultural crops. The majority of atrazine is applied to corn both in terms of pounds a.i. applied (87% of total; 62 million lbs applied annually) and acres treated (88%). Sorghum and sugarcane make up the majority of the remaining annual usage. Annual use on sorghum is approximately 6.4 million pounds and sugarcane is 1.7 million pounds. Most recent non-agricultural usage data from 2013 – 2017 shows that for non-agricultural sites, thousands of pounds of atrazine were applied to non-agricultural sites with average annual applications of 300,000 pounds to residential turfgrass, 200,000 pounds to non-residential turfgrass (institutional facilities and sod farms) and 7,000 pounds to CRP land **(APPENDIX 1-4**).

This BE assesses all currently registered labels and any agreed upon changes to these labels from the registrants. Prior to the completion of the November 2020 draft BE, the technical registrants indicated their intent in the form of commitment letters (see **APPENDIX 1-2**) to update the atrazine formulated product labels to reflect the changes (uses summarized in **APPENDIX 1-3**). The commitment letters include restriction of applications to the contiguous United States only, removal of certain uses, and implementation of new buffers and mandatory spray drift language (see **APPENDIX 1-2** for specific details). EPA will complete the review and approval of product labels reflecting the requested amendments by November 12, 2021. Atrazine can be applied as a liquid formulation for all crops as well as a granule formulation for turf. Atrazine may be applied by ground or aerial applications, which may occur at different times throughout the year including multiple applications to the same crop.

The major transport routes off the treated area for atrazine include runoff and spray drift. The main routes of dissipation for atrazine are microbial degradation under aerobic conditions in water and soil, runoff, and leaching. Because of its persistence and mobility, atrazine can move into surface and ground water. Atrazine has a low vapor pressure and Henry's Law Constant, suggesting low potential for volatilization. Atrazine is highly soluble in water with a reported aqueous solubility value of 33 mg/L at 20-25oC. Bioaccumulation of atrazine is expected to be low due to a low octanol water partitioning coefficient (Kow = 501) and low bioconcentration factors (BCF). Soil sorption coefficients for atrazine (KF) range from 0.203-2.71 mL/g (1/n=0.89-0.94); average Koc= 75 mL/gOC (MRID 41257901). Information on leaching and adsorption/desorption indicate that atrazine is considered moderately mobile according to the Food and Agricultural Organization (FAO) mobility classification system.

Additional details on the fate of atrazine are provided in **Chapter 3** of the Biological Evaluation. Residues of concern are discussed in **Appendix 1-8**.

Similar to the other chlorotriazine herbicide with current registrations in the United States (simazine), atrazine works by binding with a protein complex of the photosystem II in chloroplast photosynthetic membranes (Schulz et al., 1990). The result is an inhibition in the transfer of electrons through the light reactions of photosynthesis that in turn inhibits the formation and release of oxygen, production of adenosine triphosphate, and the fixation of carbon dioxide into sugars. Plant death results from starvation and oxidative damage caused by the breakdown in photosynthesis. The two chlorotriazines result in similar herbicidal effects to terrestrial and aquatic plants.

Atrazine is slightly toxic to birds and mammals and is practically non-toxic to terrestrial invertebrates on an acute exposure basis. In most terrestrial animal species, sublethal effects are the predominant concern and are discussed further below. On an acute exposure basis, atrazine is moderately toxic to freshwater and estuarine/marine fish, highly toxic to freshwater aquatic invertebrates and very highly toxic to estuarine/marine aquatic invertebrates. In both terrestrial and aquatic animals, atrazine demonstrates a variety of growth and reproductive effects at a range of chronic exposure concentrations. Atrazine has demonstrated adverse effects on growth to both vascular and non-vascular aquatic plants as well as terrestrial plants. There are reported ecological incidents involving atrazine use for birds, mammals, fish, terrestrial invertebrates, and terrestrial plants. More details on the available toxicity data and incident reports are provided in **Chapter 2**.

2 Exposure Methods

Exposure estimates are based primarily on fate and transport model results. Aquatic exposures (surface water and benthic sediment pore water) are quantitatively estimated for representative atrazine uses in specific geographic regions within generic habitats (referred to as bins) using the Pesticide Root Zone Model (PRZM5) and the Variable Volume Water Model (VVWM)[2] in the Pesticides in Water Calculator (PWC). Aquatic exposure results for the bin(s) most appropriate for the species and/or critical habitat are discussed in **Chapter 3**. Also discussed in **Chapter 3** are available water monitoring data for atrazine. For terrestrial exposures, existing models [*i.e.*, AgDRIFT, earthworm fugacity model, Terrestrial Herpetofaunal Exposure Residue Program Simulation (T-HERPS), Terrestrial Residue Exposure model (T-REX) and portions of the Terrestrial Investigation Model (TIM)] were combined and modified into a single tool that is referred to as the MAGTool (**Chapter 4**). This assessment replaces EPA's TerrPlant model with the Plant Assessment Tool (PAT), the latter is a more refined exposure model for terrestrial, wetland and aquatic plants.

3 Overlap Analyses

Step 1 of the BE involves an analysis of the potential overlap of the action area and individual species ranges and critical habitat. The action area was derived in ArcGIS 10.7 by combining the data layers representative of atrazine uses and then buffering them out to the off-site transport distance estimated using the AgDRIFT model (**APPENDIX 1-6**). The overlaps of action area and individual species' ranges or critical habitats were calculated. This analysis used spatial data of species' ranges and critical habitats from the FWS and NMFS. In the contiguous United States (ConUS), agricultural potential use sites are

[2] The exposure models can be found at: https://www.epa.gov/pesticide-science-and-assessing-pesticide-risks/models-pesticide-risk-assessment

represented using the USDA Crop Data Layer (CDL) (**APPENDIX 1-5**). Because the atrazine product labels are limited to use only in the ConUS, spatial layers of use sites in AK, HI and the territories are not needed. All species or critical habitats with some overlap of the action area and their range or designated critical habitat, or with some overlap on species that the listed species depends on (**Chapter 4**) are assessed in the MAGTool to make LAA/NLAA determinations.

4 Effects Determinations

This BE makes effects determinations (NE, MA, NLAA, or LAA)[3] for 1795 listed species, and 792 designated critical habitats. Under Step 1, EPA made NE determinations for 676 species and 412 critical habitats because there was either no overlap between the species range/critical habitat and the action area or no discernable effects are reasonably expected to occur. Many of the NE determinations were made for species that only inhabit areas outside of ConUS (*e.g.*, Hawaii). These NE determinations were based on the exclusion of states and US territories outside of the ConUS based on commitment letters provided by the technical registrants (**APPENDIX 1-2**). EPA made MA determinations for 1119 species and 380 critical habitats. As explained above, all species and critical habitats with a MA determination progressed to the Step 2 analysis where an NLAA or LAA determination is made[4]. In Step 2, EPA made NLAA determinations for 106 species and 52 critical habitats. EPA made LAA determinations for 1013 species and 328 critical habitats. Specific species determinations are provided in **APPENDIX 4-1.**

For each LAA determination, EPA also grouped these determinations into three categories (*i.e.,* strongest, moderate and weakest) which characterize the strength of the weight of evidence. Each species or critical habitat was assigned a weak, moderate or strong evidence in the LAA determination based on multiple factors, including: the impact of using less conservative assumptions in the analysis, the quality of the species range or usage data, whether impacts could occur due to direct toxicity to the species or to both direct toxicity and to its prey, pollination, habitat, and dispersal (PPHD), the presence of reported incidents involving the species taxa or PPHD taxa, the presence of monitoring data that exceeds endpoints, whether species' habitats are potential use sites or if they could only be exposed from spray drift, and the likelihood of drift into a species habitat (*e.g.*, if the species inhabits forests).

Of the LAA determinations, the majority (71% of species and 77% of critical habitats) were considered to have moderate evidence. Strongest evidence was found for 25% of species and 18% of critical habitat LAA determinations. Weakest evidence was found for 4% of species and 5% of critical habitat LAA determinations. Developed, Open Space Developed, Other Crops (representing use on turf sod farms) and Corn UDLs, were the use sites most frequently associated with impacts to species or critical habitats with LAA determinations. LAA determinations were made for species across all taxa. For certain species, there were uncertainties in the atrazine effects determinations based on the resolution of spatial data. For species and critical habitats, there were uncertainties in the resolution of spatial data, resolution of usage data and the threshold for assessing impacts on PPHD (detailed in **Chapter 4**). Error! Reference source not found. and Error! Reference source not found. summarize the NE, NLAA and LAA determinations for species and critical habitats. Error! Reference source not found. summarizes the strength of evidence classifications for the LAA determinations.

[3] NE = No effect. MA = May affect. NLAA = Not likely to adversely affect. LAA = Likely to adversely affect.
[4] Available at: https://www.epa.gov/endangered-species/revised-method-national-level-listed-species-biological-evaluations-conventional

Table 1. Summary of Species Effects Determinations for Atrazine (Counts by Taxon).

Taxon	Step 1 Effects Determinations		Step 2 Effects Determinations		Totals
	No Effect	May Affect	Not Likely to Adversely Affect	Likely to Adversely Affect	
Mammals	14	85	16	69	99
Birds	58	50	8	42	108
Amphibians	4	32	1	31	36
Reptiles	10	37	11	26	47
Fish	0	190	20	170	190
Plants	497	451	12	439	948
Aquatic Invertebrates	10	197	17	180	207
Terrestrial Invertebrates	83	77	21	56	160
Total	676	1119	106	1013	1795
Percent of total	38%	62%	6%	56%	

Table 2. Summary of Critical Habitat Effects Determinations for Atrazine (Counts by Taxon).

Taxon	Step 1 Effects Determinations		Step 2 Effects Determinations		Totals
	No Effect	May Affect	Not Likely to Adversely Affect	Likely to Adversely Affect	
Mammals	6	27	5	22	33
Birds	14	17	1	16	31
Amphibians	3	22	0	22	25
Reptiles	7	9	3	6	16
Fish	4	103	7	96	107
Plants	354	106	17	89	460
Aquatic Invertebrates	5	66	8	58	71
Terrestrial Invertebrates	19	30	11	19	49
Total	412	380	52	328	792
Percent of total	52%	48%	7%	41%	

Table 3. Classification of LAA Determinations by Strength of Evidence.

Strength of LAA call	Species range		Critical Habitat	
	Number	% of LAA determinations	Number	% of LAA determinations
Strongest evidence of LAA	250	25%	60	18%
Moderate evidence of LAA	723	71%	253	77%
Weakest evidence of LAA	40	4%	15	5%

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THE UNITED STATES DISTRICT COURT
OF ARIZONA

Center for Biological Diversity, et al., *Plaintiffs,* v. United States Environmental Protection Agency, et al., *Defendants,* and Bayer Cropsciences LP, et al., *Defendant-Intervenors.*	Case No. CV-20-00555-DCB **DECLARATION OF JOHN BUSE IN SUPPORT OF PLAINTIFFS' MOTION FOR SUMMARY JUDGMENT**

DECLARATION OF JOHN BUSE

I, JOHN BUSE, declare that if called as a witness in this action I would competently testify of my own personal knowledge, as follows:

1. I submit this declaration in support of Plaintiffs' Motion for Summary Judgment for the U.S. Environmental Protection Agency (EPA)'s failure to consult with expert wildlife agencies under the Endangered Species Act (ESA) on its 2020 registrations of dicamba for over-the-top use on soy and cotton genetically engineered to resist it, as amended in 2022 and 2023, as filed by Plaintiffs National Family Farm Coalition, Center for Food Safety, Center for Biological Diversity, and Pesticide Action Network North America.

2. I have been a member of the Center for Biological Diversity since 2005. I am also a Senior Counsel and the General Counsel for the Center for Biological Diversity (the Center).

3. I live in Indianapolis, Indiana. The state of Indiana is one of the largest producers of soybeans, and much of the agricultural land in and around Marion County where I live is used for soybean production.

4. I am a 1985 graduate of the University of Chicago, with a degree in the History, Philosophy, and Social Studies of Science and Medicine. I also have a master's degree in Biological Chemistry from the University of Illinois–Chicago Medical Center. I am a 1992 graduate of the University of California–Davis School of Law, where I focused on environmental law and related topics.

5. Thanks to my educational background and personal experience, I have a deep professional and personal interest in evolutionary biology and the diversity of life on earth.

6. As a member and staff member of the Center, I count on the Center to represent my interest in protecting biodiversity and conserving threatened and endangered species and their habitats through legal advocacy, public education, and other means.

7. Through my professional work and personal observation, I have become very

concerned about the effect of conventional agriculture on threatened and endangered species. I have become aware of the enormous quantities of pesticides used to support conventional agricultural operations in Indiana and other Midwestern states and have followed with interest the reports that agricultural chemicals disrupt endocrine activity in amphibians. I am concerned that the effects of commonly used pesticides such as dicamba extend beyond impacts on amphibians and may pose a significant threat to the wellbeing and recovery of many other threatened and endangered species, as well as to water quality and human health.

8. I enjoy looking for rare native wildlife, fish, and plants in their natural habitats in and around where I live.

Indiana Bat

9. I regularly observe bats at or near my home in Indianapolis on summer and fall evenings. I have specifically observed Indiana bats (*Myotis sodalis*) at a known colony south of the Indianapolis International Airport as part of a bat count. I watched and counted the bats as they emerged from their tree colony at twilight.

10. I appreciate the Indiana bat and its continued existence in the wild for its quiet but persistent presence, for its stealthy hunting of insects, and for the valuable habitat it maintains in close proximity to urban centers. I also believe that all species, including the Indiana bat, have inherent value, and I have an interest in maintaining the diversity of life.

11. I have hiked and recreated near the Indiana bat's habitat on numerous occasions while attempting to observe wildlife. I will continue to seek out and observe bats, including Indiana bats, as long as I live here. I watch for bats on many evenings during the summer and early autumn, and I plan on returning to observe known Indiana bat colonies near Indianapolis in the late summer of 2023.

12. I hope to again see an Indiana bat in the wild here in Indiana and elsewhere, and I look forward to the recovery of the Indiana bat throughout its native range. I am concerned about the 2020 registrations and amendments, which allow growers to routinely

apply dicamba in Indiana and elsewhere in and around Indiana bat habitat without regard to the species' conservation and recovery. Killing of non-target insects and plants by pesticides such as dicamba is well-documented, and I fear that Indiana bats are being inadvertently killed and harmed by dicamba drift and runoff. If the remaining populations of Indiana bats in Indiana were extirpated or reduced, my appreciation of the area's unique natural environment would be diminished.

Karner Blue Butterfly

13. I frequently observe native insects in their natural habitats. In particular, I enjoy seeking out, observing, and photographing native butterflies and their host plants. In August 2023, I intend to visit Indiana Dunes National Park to attempt to view Karner blue butterflies (*Lycaeides Melissa samuelis*) and their habitat.

14. I am concerned that EPA's 2020 registrations, as amended in 2022 and 2023, will cause increased dicamba use in soybean production in Indiana and elsewhere on soybean crops in close proximity to Karner blue butterfly habitat, including their host plants and plants that provide nectar, without regard to the species' conservation and recovery. As with Indiana bats, I fear that Karner blue butterflies are being inadvertently killed and harmed by agricultural chemicals such as dicamba. If the remaining populations of Karner blue butterflies were extirpated or reduced, my appreciation of the areas currently occupied by Karner blue butterflies, including the Indiana Dunes, would be diminished.

Mitchell's Satyr Butterfly

15. I am also a periodic visitor to Michigan's Lake Michigan shore. In particular, during these trips, I visit, stay near, and recreate near Van Buren State Park in Van Buren County, Michigan. I hike, boat, swim, and observe wildlife during my visits to this area.

16. When I visit, I enjoy searching for rare wildlife, fish, and plants endemic to the area in their natural habitats. In reviewing the U.S. Fish and Wildlife Service's website, I found that the Mitchell's satyr butterfly (*Neonympha mitchellii mitchellii*), a federally-listed endangered species, is native to Van Buren County, Michigan.

17. I appreciate the Mitchell's satyr butterfly and its continued existence in the wild for its role as a native pollinator, for its beauty, and for its status as an indicator species for the health of the fens, bogs, and other wetlands. I also believe that all species, including the Mitchell's satyr butterfly, have inherent value, and have an interest in maintaining the diversity of life.

18. I have hiked and recreated near this species' habitat on numerous occasions while attempting to observe wildlife. To my knowledge, I have not seen a Mitchell's satyr butterfly during my visits to Michigan, but I intend to return to Van Buren County, Michigan in early summer 2023 and beyond to look for Mitchell's satyr butterflies.

19. I am concerned that dicamba will be applied in and around Mitchell's satyr butterfly habitat without regard to the species' conservation and recovery and will harm the species through drift and runoff. Killing of non-target insects by pesticides is well-documented, and I fear that Mitchell's satyr butterflies are being inadvertently killed and harmed by agricultural chemicals like dicamba. Additionally, from reviewing the U.S. Fish and Wildlife Service's website, I learned that contamination of the Mitchell's satyr butterfly's habitat by agricultural pesticides like dicamba is one of the primary threats to this endangered species.

20. On my visits to Michigan, I have frequently observed soybean production. From visiting the U.S. Department of Agriculture website, I learned that soybeans are the second most produced crop in Van Buren County.

21. Because dicamba is likely to be very toxic to the Mitchell's satyr butterfly and is likely to be used extensively on soybean crops in Van Buren County and other soybean growing counties in Michigan where the butterfly is native, I am concerned that dicamba could severely impact the already-imperiled Mitchell's satyr butterfly.

22. In addition, the Mitchell's satyr butterfly is native to Lagrange and La Porte counties in northern Indiana. Use of dicamba in Indiana may impact recovery of Mitchell's satyr butterflies in Indiana and harm the viability of the species as whole, which would diminish my chances of seeing the butterfly during my next trip to Michigan.

23. I hope to see a Mitchell's satyr butterfly in the wild, but even if I fail to observe the species, I am happy knowing that the species persists in the wild. I would be happier if the species can recover, and I look forward to the recovery of the Mitchell's satyr butterfly throughout its native range. If the remaining populations of Mitchell's satyr butterflies in Michigan were extirpated or reduced, my appreciation of the area's unique natural environment would be diminished.

Hine's Emerald Dragonfly

24. As the Center's General Counsel, I worked on a lawsuit involving the Hine's emerald dragonfly (*Somatochlora hineana*). The lawsuit resulted in a settlement in which the U.S. Fish and Wildlife Service revised its critical habitat designation for the dragonfly. This experience reinforced my personal interest in the Hine's emerald dragonfly, one of the few federally listed species found in Chicago's urban environment.

25. I appreciate the Hine's emerald dragonfly for its resilience in persisting in an urban environment, for its beauty, and for its status as an indicator species for the health of the fens, bogs, and other wetlands that remain in Chicago and surrounding areas. I also believe that all species, including the Hine's emerald dragonfly, have inherent value, and have an interest in maintaining the diversity of life.

26. On several occasions I have attempted to observe Hine's emerald dragonflies in their known habitat in and around Chicago, but I have not experienced a confirmed Hine's emerald observation. I intend to return to Chicago in early summer 2023 and beyond to look for Hine's emerald dragonflies in their known habitat.

27. Even if I fail to observe a Hine's emerald dragonfly, I take comfort in the continued existence of the dragonfly in the wild. I look forward to the recovery of the Hine's emerald dragonfly throughout its native range. I am concerned that dicamba will be applied in and around Illinois and elsewhere without regard to Hine's emerald dragonfly conservation and recovery and will harm the dragonfly through runoff and drift. Killing of non-target insects by pesticides is well-documented, and I fear that Hine's emerald dragonflies are being inadvertently killed and harmed by agricultural chemicals. In

addition, Hine's emerald dragonflies spend most of their lifecycle in water (eggs and larvae are aquatic). I am concerned that pesticide runoff is harming the quality of the aquatic ecosystems that Hine's emerald dragonflies depend on and is disrupting biochemical signals essential for the perpetuation of the species. If the remaining populations of Hine's emerald dragonflies in and around Chicago and other locations in the Midwest were extirpated or reduced, my appreciation of the area's unique natural environment would be markedly diminished.

28. I know that in October 2020, EPA reapproved the use of over-the-top dicamba on genetically engineered, dicamba-resistant soybeans and cotton crops. And I am also aware that as a result of EPA's approval, farmers in my area can spray dicamba on their dicamba-resistant soybean crops. I am also aware that in March 2022 and February 2023, EPA amended the registrations for a few states. However, these amendments did not include additional protections for species, and harm to species continued last summer.

29. I know that EPA failed to assess the risks to endangered species from its 2020 registrations and amendments, nor consulted with the Fish & Wildlife Service, which has expertise in endangered species. It concerns me that given the stresses the Indiana bat, the Karner blue butterfly, the Mitchell's satyr butterfly, and the Hine's emerald dragonfly already have to endure, EPA's 2020 dicamba registrations, as amended, will increase their exposure to toxic pesticides.

30. EPA also issued the dicamba decision without notice and comment and without following the proper procedures after its initial cancellation order. This failure to follow proper procedures harms my interests because EPA may have chosen not to register dicamba again after reading comments from conservationists like me that remain concerned about dicamba's impacts on species. And had EPA followed proper post-cancellation procedures, it may have determined that insufficient evidence existed to re-register dicamba and allow for the ongoing harm to species.

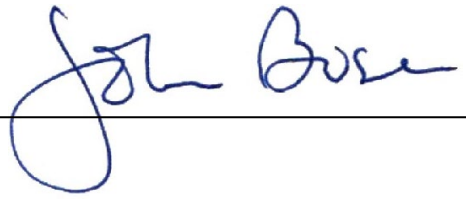
31. In summary, I have professional, aesthetic, and recreational interests in the preservation of the Indiana bat, the Karner blue butterfly, the Mitchell's satyr butterfly, and

the Hine's emerald dragonfly, and their habitat. These interests are being harmed by the Environmental Protection Agency's failure to consult with the U.S. Fish and Wildlife Service on impacts of its registration of new uses of the herbicide dicamba on these species.

32. Specifically, I believe that EPA's failure to follow the law makes these species more likely to suffer further population declines. And if Indiana bats, Karner blue butterflies, Mitchell's satyr butterflies, or Hine's emerald dragonflies decline or become extinct, this loss would deprive me of the benefits I currently enjoy from their existence. Consultation with the U.S. Fish and Wildlife Service could result in protective measures aimed at reducing impacts of dicamba on these species, which is important to ensure that my interests in the species are preserved and remain free from injury. An order vacating the registrations, as amended, and requiring EPA to fully comply with the Endangered Species Act and the Federal Insecticide, Fungicide, and Rodenticide Act, and other legal requirements prior to taking any further action would remedy my injuries.

Pursuant to 28 U.S. C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 7th day of March, 2023, in Indianapolis, Indiana.



John Buse

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THE UNITED STATES DISTRICT COURT
OF ARIZONA

Center for Biological Diversity, et al., *Plaintiffs,* v. United States Environmental Protection Agency, et al., *Defendants,* and Bayer Cropsciences LP, et al., *Defendant-Intervenors.*	Case No. CV-20-00555-DCB **DECLARATION OF ROBERT FAUX IN SUPPORT OF PLAINTIFFS' MOTION FOR SUMMARY JUDGMENT**

DECLARATION OF ROBERT FAUX

I, ROBERT FAUX, declare that if called as a witness in this action I would competently testify of my own personal knowledge, as follows:

1. I submit this declaration in support of Plaintiffs' Motion for Summary Judgment for the U.S. Environmental Protection Agency (EPA)'s failure to support its 2020 registrations of dicamba for over-the-top use on soy and cotton genetically engineered to resist it and its 2022/23 amendments with substantial evidence, as filed by Plaintiffs National Family Farm Coalition, Center for Food Safety, Center for Biological Diversity, and Pesticide Action Network North America.

2. I am a resident of Bremer County, Iowa, where I own and operate Genuine Faux Farm. The farm is located northwest of Tripoli and south of Frederika, incorporated towns in Bremer County. Overall, Bremer County is a rural, largely agricultural county, dominated by corn and soybean crops. Iowa is one of the states for which EPA approved dicamba for over-the-top uses in 2020.

3. Our farm is about fifteen acres and produces a wide variety of certified organic vegetables, herbs, flowers, fruits, and seeds. The farm also maintains a flock of about 90 egg-laying hens all year; raises 100 to 200 meat chickens each summer, and raises 75 bronze turkeys.

4. In addition to farming, I am currently employed as a Communications Manager for Pesticide Action Network North America (PANNA), having joined the staff in March of 2020. Prior to that, I was a farmer partner with PANNA for several years, joining a larger community of like-minded growers and advocates working towards sustainable and equitable food systems.

5. I have a doctoral degree in Computer Science and Adult Education from Union Institute and University in Cincinnati. Prior to farming, I taught Computer Science at the University of Minnesota Morris for two years. In 2004, after moving to Tripoli, Iowa for my wife's work, I began farming after noticing the lack of local foods, especially

vegetables, produced in the area. In 2005, Genuine Faux Farm began selling vegetables and poultry to residents of Bremer County.

6. Genuine Faux Farm is committed to a sustainable approach to agriculture. We maintained organic certification through the Iowa Department of Agriculture and Land Stewardship (IDALS) from 2007 to 2021. We do not use any synthetic fertilizers or sprays, and we firmly believe that organic agricultural practices are the key to maintaining environmental health and long-term farm productivity. We are proud of our sustainable approach to agriculture and our commitment to diverse production. Sadly, the use of dicamba on nearby soybean fields has made organic certification extremely difficult and works counter to our farm's goals.

7. Our farm has always focused on local distribution for its food products. Up until 2020, we delivered much of our product through a Community Supported Agriculture (CSA) operation, with as many as 120 shareholding families or groups in one season. Our cooperative shareholder approach to farming cultivated a sense of community, connecting our members to the crops that we grow and the land we grow them on. We continue to work within the community through local direct sales and planned food donations to the local food bank.

8. Our CSA program required our farm to produce sufficient fresh product for each week during the delivery contract. This meant we needed to plan and work to provide food for as many as 34 weeks of any given year. This production and sales model relies on data and predictions of yields, factoring in weather, pests, and other issues. Unfortunately, dicamba drift and misapplication in recent years has made it increasingly difficult to create a growing plan that accounts for the uncertainty dicamba damage has created on our farm. As a result, we have modified our approach to sales and delivery methods that are less demanding of consistent weekly production.

9. Beginning in 2017, our farm began experiencing increasing damage from dicamba use on the GE crop systems surrounding our property. All of these nearby crops

are genetically engineered to tolerate heavy use of herbicides, such as over-the-top dicamba. Although we do not rely on pesticides at Genuine Faux Farm, we have no control over their use by the spray operators on neighboring fields. Since 2017, when over-the-top dicamba use on soybeans became widespread in our area, we found the negative impacts of pesticide drift increased significantly on our farm.

10. For example, dicamba has repeatedly damaged my crops, as neighboring farms use it on soybeans genetically engineered to tolerate its use. Crops with the highest susceptibility on our farm to dicamba include peppers, tomatoes, eggplants, and potatoes. I have also experienced issues with vine crops and cupping on bean crops. Typically, dicamba damage on our farm comes when an application is made, and temperatures around and above 80 degrees follow during subsequent days. The product volatilizes and moves, and impacts non-target plants through runoff, making it impossible for me to identify a source. Dicamba inhibits plant growth, causing growth points on the plant to curl and stunt, and fruits and flowers to drop from the plant. While plants usually survive the herbicide, they cannot grow to a healthy maturity, and they fail to produce marketable fruit.

11. One specific example of harm from dicamba drift from GE crops systems can be seen in our bell pepper crops. Prior to 2017, we produced between 1800 to 3000 marketable fruits each season, with numbers approaching 7000 if we include second quality fruit for processing. But following EPA's approval of dicamba for use on GE dicamba-resistant soybeans in 2016, our production dipped to 140 marketable fruits for the 2017 season, and the following year we only harvested seven fruits of sufficient quality to sell. As a result, we were forced to stop growing bell peppers in the field and only grow them under cover in our high tunnels. The success of these plants, as compared to our field plants, provides a useful case study. Plants in both locations are started from seed on the farm, transplanted using similar methods, grown in the same soil, and cultivated using similar schedules and methods. The biggest difference has been the protection afforded by

the cover, preventing dicamba drift from reaching them. Unfortunately, the space in high tunnels is extremely limited, and we cannot simply cover our entire farm in hopes that this will solve the problem of pesticide drift from GE crop systems. And we have found that the edges of our covered spaces are not immune to drift.

12. Over the years, I have come to recognize damage from dicamba on my plants, and I am able to tell this damage apart from disease or pest damage. As a professional farmer, my job requires me to understand disease vectors and develop pest management strategies. Unfortunately, I am finding it increasingly difficult to respond effectively to dicamba drift. It is clear to me that some of the solution needs to come from the source of the problem, which would be EPA's registrations of dicamba products for over-the-top use on soybeans.

13. Beginning in 2020, our farm changed models, modifying our crop list to fit the conditions and shifting to a seed production enterprise for some crops, versus a fresh, local food enterprise. While these changes respond to multiple factors, the primary impetus for this change came as a result of continued struggles with dicamba drift promoted by the introduction of dicamba-resistant soybean crops on the surrounding landscape.

14. Prior to 2018, Genuine Faux Farm produced between 10-14 tons of food annually. However, in 2018, our production numbers dropped to the lowest they had been since 2010, a year with excessive rain, coming in at only 7 tons of production. These numbers have not recovered since. This motivated me to seek employment off of the farm and for our farm to adjust production and marketing strategies. At this time, we are still attempting to find a solution that works, given the difficulties dicamba has created for our farm.

15. I am aware of the controversy surrounding dicamba products that are sprayed "over the top" of crops like cotton and soy. I know that EPA originally approved these pesticide uses a few years ago, and they caused great harm to my farm and other

farmers' fields as well as natural environments from off-field drift. I know that in June 2020 a court struck down EPA's approval as unlawful in a lawsuit brought by Center for Food Safety and other nonprofits.

16. I know that in October 2020, EPA reapproved the use of over-the-top dicamba on genetically engineered, dicamba-resistant soybeans and cotton crops. And I am also aware that, as a result of EPA's approval, farmers in my area can spray dicamba on their dicamba-resistant soybean crops. I am also aware that in March 2022, EPA amended the registrations for Iowa. However, despite these amendments, dicamba damage continued last summer. In an attempt to diversify production, we have added fruit producing trees to the farm, which suffered damage from dicamba drift last summer. Even our mature apple trees exhibited damage. It feels to me as if our options for continuing to grow good food grows more limited each year this dicamba registration is allowed to continue.

17. I am also aware that in February 2023, EPA approved a June 12 cutoff date for Iowa. But considering past widespread damage, and the difficulties applicators have in following the complex dicamba label, I have little confidence that its 2023 cutoff date will effectively prevent damage to my farm.

18. These dicamba registrations harm my vocation by limiting my ability to produce crops sustainably and protect my crops from drift. I have buffer zones in place, which are required to receive organic certification, but I find that they are insufficient protection. I have worked to improve the effectiveness of these buffer zones by growing "vertical buffers" with bushes and tall grasses, and I have taken other areas on the farm out of production entirely. Unfortunately, it is difficult to establish vertical buffers when they, too, are damaged by dicamba drift. The costly development of the buffer zones dips into my limited labor resources, and the removal of production areas reduces my ability to produce food. However even these efforts have proved futile, as my crops continue to suffer dicamba damage from surrounding GE dicamba-resistant soybeans.

19. In addition to working with our buffer strips, moving sensitive crops to covered growing conditions, and taking areas prone to more dicamba drift out of production, I have implemented several other strategies in an attempt to mitigate damage. I have altered our crop rotations, changed the planting schedules, used floating row covers, and planted flowering companion crops near sensitive crop rows. We have moved away from marketing and distribution models that require continuous production at higher levels. We have made attempts to move to alternative crops. However, I still have not found an economically feasible strategy to address the problem and return to farming full-time.

20. I am also aware that EPA failed to hold notice and comment on its decision to reverse FIFRA Section 24(c), which permitted states to take quick action to address special local needs in their states. As a result, states can no longer undertake any restrictive action without using much more time-consuming measures, such as state legislative action or formal agency rulemaking. This harms my interests, as Iowa has historically used FIFRA 24(c) to add restrictions and protect farmers like myself and can no longer do so. Had EPA held notice and comment, it may have chosen to continue allowing Iowa to use FIFRA 24(c) to take quick action as necessary.

21. EPA also issued the dicamba decision without notice and comment and without following its post cancellation order procedures. These failures harm my interests because EPA may have chosen not to register dicamba again after reading comments from farmers like me with damaged crops. And had EPA followed proper post-cancellation procedures, it may have determined that insufficient evidence existed to re-register dicamba and allow for the ongoing damage to my crops and livelihood.

22. There is no compensation available for losses caused by dicamba damage to our conventional or organic crops. Cost efficient crop insurance does not exist for our small-scale, diversified operation, and regulatory enforcement has failed to provide swift testing and investigation of dicamba drift damage incidents. As a result, our only potential

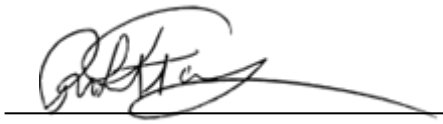
for reparations comes through litigation and/or pursuit of insurance settlements through the applicators or farm operators. In both of these cases, the process is time-consuming and confrontational, often leaving our farm at a significant resource disadvantage. Even if compensation is provided, it always comes well after the point at which compensation was most needed: the point when an anticipated crop is lost. I believe that, rather than relying on an insufficient system for responding to chemical or biological trespass, EPA should proactively engage in careful oversight before registering pesticides like dicamba that result in damage to crops.

23. The dicamba drift damage has also hurt my personal relationships with my neighbors. Because I do not use herbicides, nor plant herbicide-resistant crops, many of my neighbors see me as a "hindrance" to their own farming operations because they have to think harder about dicamba applications. This clearly illustrates to me that they are aware that dicamba applications will go off-target. As a result, some resent my presence and have threatened to respond aggressively if and when I must report incidents to the Pesticide Bureau in Iowa.

24. In sum, I am injured economically by EPA's decision to reregister dicamba and amend the registrations without adequate analysis of the unreasonable adverse effects these pesticide registrations have on the environment. Without a court finding that EPA violated its duties under FIFRA in expanding dicamba use, the well-being of my farm will continue to be adversely affected by the use of dicamba.

Pursuant to 28 U.S. C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed in Tripoli, Iowa on this 3rd day of March, 2023.



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Counsel for Plaintiffs

THE UNITED STATES DISTRICT COURT
OF ARIZONA

Center for Biological Diversity, et al., *Plaintiffs,* v. United States Environmental Protection Agency, et al., *Defendants,* and Bayer Cropsciences LP, et al., *Defendant-Intervenors.*	Case No. CV-20-00555-DCB **DECLARATION OF JOHN HESS IN SUPPORT OF PLAINTIFFS' MOTION FOR SUMMARY JUDGMENT**

DECLARATION OF JOHN HESS

I, JOHN HESS, declare that if called as a witness in this action I would competently testify of my own personal knowledge, as follows:

1. I submit this declaration in support of Plaintiffs' Motion for Summary Judgment for the U.S. Environmental Protection Agency (EPA)'s failure to consult with expert wildlife agencies under the Endangered Species Act (ESA) on its 2020 registrations of dicamba for over-the-top use on soy and cotton genetically engineered to resist it and its 2022 amendments, as filed by Plaintiffs National Family Farm Coalition, Center for Food Safety, Center for Biological Diversity, and Pesticide Action Network North America.

2. I am a member of the Center for Food Safety (CFS), and I support the organization's efforts to avoid the adverse effects of agricultural pesticides on wildlife. I joined CFS because I am concerned about agricultural and environmental issues and feel responsible for the welfare of native wildlife.

3. I reside in the city of Warrensburg, located in Johnson County, Missouri. Missouri is one of the states where EPA registered dicamba for use on soybeans genetically engineered to resist dicamba. I am a professor emeritus of biology; I have taught courses on ecology, evolutionary biology, and ornithology. I also have taught courses on scientific and technical photography that included components of wildlife photography, and particularly photography of small animals and insects. In that role, I trained professional photographers, among others. In addition to my academic work, I am an avid wildlife photographer, and I travel around the country taking photos and lecturing. I also sell my photos and author a blog about photography.

4. My professional, economic, aesthetic, and recreational interests are being, and will be, adversely affected by EPA's failure to consult under the ESA with the United States Fish and Wildlife Service (FWS) on potential impacts of EPA's 2020 dicamba registrations, as amended in 2022 and 2023, on endangered species and critical habitat.

5. I own approximately thirty acres, on which I am reestablishing native diversity of plants and animals. I have a sign on my property identifying it as a wildlife sanctuary, and my property is also certified through the National Wildlife Federation's backyard habitat program. My land hosts native wildflowers, pawpaw trees, persimmons, and wild plums, all of which require pollination by insects or birds. In addition, I maintain a backyard garden that has tomatoes and zucchinis, as well as ornamentals—all of which also require pollination by insects or birds. I eat the fruits and vegetables that grow on my land in part to avoid the pesticides that are commonly applied in commercial agriculture. However, despite my efforts to protect the animals on my property from exposure to pesticides, I know that pesticides are used extensively on commercial agricultural fields two or three miles from my land—within the range of drift and runoff.

6. I maintain my garden and land in part to attract native pollinators, and I gain a great deal of personal enjoyment from providing a habitat for them. I understand how important pollinators are to the continued health of my garden, from which I collect food, as well as to the reliability of my food supply more generally. Further, bees and other insects sustain predators such as spiders, which I value very highly. I am extremely concerned about the harm to birds, bees, and other pollinators posed by EPA's 2020 dicamba registrations, as amended in 2022 and 2023. Specifically, I am concerned that ongoing over the top uses of dicamba will harm flowering plants near the agricultural fields that the bees rely on for pollen and nectar. The rusty patched bumble bee already has lost much of its natural habitat and is likely exposed to insecticides in addition to herbicides like dicamba.

7. I regularly visit natural areas, such as rivers and local, state, and national parks, all over the country in order to photograph wildlife. For example, I often visit the Boundary Waters Canoe Area Wilderness and Big Bend National Park. I have photographed a variety of endangered species, including the Audubon's crested caracara (*Polyborus plancus audubonii*); Florida scrub jay (*Aphelocoma coerulescens*); piping plover

(*Charadrius melodus*); red-cockaded woodpecker (*Picoides borealis*); whooping crane (*Grus americana*); and wood stork (*Mycteria americana*). I also have seen (but not photographed) the California gnatcatcher (*Polioptila californica*). In addition to those endangered species, I have sought, but not yet seen, many others, including the black-capped vireo (*Vireo atricapilla*); California condor (*Gymnogyps californianus*); golden-cheeked warbler (*Setophaga chrysoparia*); northern aplomado falcon (*Falco femoralis septentrionalis*); and northern spotted owl (*Strix occidentalis caurina*). To view and photograph endangered species, I visit their natural habitats; for example, to see the northern aplomado falcon, I visit the Laguna Atascosa National Wildlife Refuge in Texas. I plan to continue visiting the natural habitats of endangered species to view and photograph them.

8. I am aware that in October 2020, EPA reapproved the use of over-the-top dicamba on genetically engineered, dicamba-resistant soybeans and cotton crops. And I am also aware that as a result of EPA's approval, farmers in my area can spray dicamba on their dicamba-resistant soybean crops and throughout the more than eighty thousand soybean acres in Johnson County. I am also aware that in March 2022 and February 2023, EPA amended the registrations for several other states, but not Missouri, and that those amendments did not address the numerous incidents in ESA counties across the country EPA reported in 2021. I remain concerned about the effects dicamba has on the wildlife I observe.

9. Birds and other endangered species can be harmed by over the top uses of dicamba in numerous ways. For example, runoff and drift has caused significant damage to state natural areas, wildlife management areas, national wildlife refuges, and family farms, and in turn, to the birds that rely on these areas as habitat. And in general, pesticides such as dicamba can also kill birds directly, poison them, and reduce their food sources. EPA is not the expert about these species, the FWS is, yet it is my understanding that EPA did not ask the expert FWS to help them ensure that the 2020 dicamba registrations and amendments will not cause harm to these species or other endangered species.

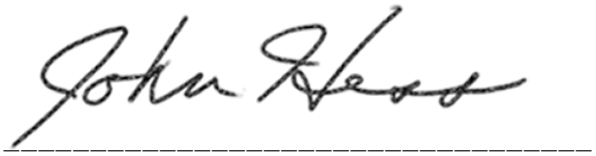
10. If the Audubon's crested caracara; Florida scrub jay; piping plover; red-cockaded woodpecker; whooping crane; wood stork; California gnatcatcher; black-capped vireo; California condor; golden-cheeked warbler; northern aplomado falcon; northern spotted owl, or any other endangered species, is harmed or goes extinct because of increased exposure to dicamba through drift or runoff, my enjoyment of viewing and photographing wildlife would greatly suffer by never again seeing those animals in their native habitats. The adverse effects that dicamba has on endangered species injure my professional and recreational interests in viewing and photographing wildlife.

11. EPA also issued the dicamba decision without notice and comment and without following the proper procedures after its initial cancellation order. These procedural failures harm my interests because EPA may have chosen to forego its decision after reading comments from conservationists like me on harms to species. And had EPA followed proper post-cancellation procedures, it may have determined that insufficient evidence existed to re-register dicamba and allow for the ongoing damage to the species I enjoy observing.

12. In sum, I am injured by EPA's 2020 dicamba registrations, as amended in 2022 and 2023, without analysis of the unreasonable adverse effects that dicamba has on native bees, birds, insects, and other animals, including threatened and endangered species. Additionally, the agency's failure to consult with the expert FWS on the impacts to listed species and their critical habitats from dicamba drift and runoff harms my aesthetic, recreational, and professional interests in, among other things, viewing and photographing wildlife, including threatened and endangered species, in their native habitats, and providing a safe environment on my land for native pollinators and other animals. An order from this Court vacating the 2020 dicamba registrations, as amended in 2022 and 2023, and requiring EPA to fully comply with the applicable legal requirements prior to taking any further action would remedy these injuries.

Pursuant to 28 U.S. C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed in Warrensburg, Missouri on this 3rd day of March, 2023.



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THE UNITED STATES DISTRICT COURT
OF ARIZONA

Center for Biological Diversity, et al., *Plaintiffs,* v. United States Environmental Protection Agency, et al., *Defendants,* and Bayer Cropsciences LP, et al., *Defendant-Intervenors.*	Case No. CV-20-00555-DCB **DECLARATION OF LESLIE LIMBERG IN SUPPORT OF PLAINTIFFS' MOTION FOR SUMMARY JUDGMENT**

DECLARATION OF LESLIE LIMBERG

I, LESLIE LIMBERG, declare that if called as a witness in this action I would competently testify of my own personal knowledge, as follows:

1. I submit this declaration in support of Plaintiffs' Motion for Summary Judgment for the U.S. Environmental Protection Agency (EPA)'s failure to consult with expert wildlife agencies under the Endangered Species Act (ESA) on its 2020 registrations of dicamba for over-the-top use on soy and cotton genetically engineered to resist it, as amended in 2022 and 2023, as filed by Plaintiffs National Family Farm Coalition, Center for Food Safety, Center for Biological Diversity, and Pesticide Action Network North America.

2. I have been a member of Center for Food Safety for roughly seven years. As a member, I rely on the Center for Food Safety to represent my interests in protecting biodiversity, including sensitive species and their habitats, from the adverse impacts of industrial agriculture and pesticide use through litigation, public education, and other means.

3. I live in Wentzville, Missouri in St. Charles County. Missouri is one of the states for which EPA approved dicamba for over the top use on soybeans genetically engineered to resist it.

4. I earned a Bachelor of Science in Nutrition and Dietetics from Dominican University. Although I am retired in my professional life, my commitment to quality diet and public nutrition continues as a farmers market manager. I look for food vendors aware of chemicals in food that compromise our health. In my personal and family life, I always aim to avoid toxins, stay on the lookout for chemicals, and try to find honest food with the least amount of artificial ingredients.

5. I am also always looking for worthwhile causes to which I can lend and raise my voice. One way in which I have done so is being involved in bat habitat improvement,

rehabilitation, and public education, particularly for the endangered Indiana bat (*Myotis sodalis*) and the little brown bat.

6. I have been a board member of the Missouri Master Naturalists, a volunteer arm of the Missouri Department of Conservation, since 2005, and I have been a master gardener with the University of Missouri Extension since 2007.

7. I am concerned about the conservation of the Indiana bat's habitat and the species itself, because the bat is a keystone species. Indiana bats are indicators like the proverbial canary in the mine. They are hugely valuable pollinators and control millions of insects every night. They are exceptionally vulnerable to temperature change, microbial diseases, habitat change, and environmental contamination. The bat immune system is already seriously compromised, and it is under threat from chemicals in the environment. Without the Indiana bat, we ourselves are at risk.

8. I am concerned about the impacts to the Indiana bat from EPA's 2020 dicamba registrations, as amended in 2022 and 2023, at issue in this case. I understand that dicamba, when sprayed over the top of soybeans, is volatile and can drift over a mile from where it is applied, resulting in widespread harm to species. I also understand that dicamba runoff poses a threat to wildlife and plants.

9. I am aware that EPA's initial 2016 approval of dicamba for over-the-top uses on soy and cotton resulted in great harm to farmers' fields and natural environments from off-field drift and runoff. I know that in June 2020 a court struck down EPA's approval as unlawful in a lawsuit brought by CFS and other nonprofits. I also know that in October 2020, EPA reapproved the use of over-the-top dicamba on genetically engineered, dicamba-resistant soybeans and cotton crops. And I am also aware that as a result of EPA's approval, farmers in my area can spray dicamba on their dicamba-resistant soybean crops and throughout the over tens of thousands of acres of soybeans growing in St. Charles County. I am concerned about the effects dicamba has on native wildlife.

10. In Missouri, the bat habitat consists of hardwood forests with numerous caves interspersed among farmland and watersheds. Caves, sinkholes, and karst formations produce perfect hibernation temperatures for bats. Bat habitat is primarily porous dolomite-limestone caves carved out by underground water. These water sources are hugely important when conditions are hot and dry, as well as in winter, with deep drops well below freezing temperatures. Groundwater with dicamba runoff can pollute these water sources that are so important for the bats.

11. Southern Illinois, where dicamba is heavily used to produce soy, is also extremely important for the Indiana bat's survival. Several major rivers converge and drain into the Mississippi River watershed in this area. This watershed consists of important cropland and swampland for bats. Bats living in the caves of Southern Illinois and Missouri can fly fifty to one hundred miles in a night, and their primary feeding ground is wherever there are the most insects. The swamps of Southern Illinois are important feeding grounds for bats, as they are breeding grounds for the insects on which bats subsist. In turn, the dicamba that is being sprayed over the top of soybean fields in Illinois and other Midwestern states harms bats' health, since the insects and larvae on which bats subsist feed on soybean crops.

12. The Indiana bat is already struggling to recover due to disturbances from humans during winter hibernation, commercialization of caves, loss of summer habitat, and the disease commonly known as white-nose syndrome. Herbicides like dicamba only further slow their recovery.

13. As a member of the Missouri Master Naturalists, I have taken part in multiple activities to help protect the Indiana bat, particularly to help research, reduce, and prevent occurrences of "white nose syndrome," an illness that has killed millions of bats since 2006, causing massive population declines for multiple hibernating bat species, including the Indiana bat.

14. One such activity is netting to help research occurrences of white nose syndrome. When bats come out of hibernation, we put up nets to capture the bats, and observe and record their weight, wingspan, occurrences of white nose syndrome, and their overall health.

15. Caves that serve as bat habitat must now be gated to reduce the vulnerability of fragile bats from park visitors and sports enthusiasts (spelunkers) who contribute to the spread of disease. With the Missouri Master Naturalists, I have also gated off caves to prevent the public from entering and spreading disease or otherwise disturbing the bats.

16. I have participated, and plan to continue to participate, in these activities in various locations throughout Missouri, including the Ozark National Scenic Riverways, Missouri's largest national park, in Shannon County; Washington State Park, in Washington County; Johnson Shut-Ins State Park, in Reynolds County; and Elephant Rocks State Park, in Iron County.

17. The Missouri Master Naturalists also work to conserve Indiana bat populations in Illinois. As a volunteer with Missouri Master Naturalists, I have provided assistance in bat habitat conservation in Southern Illinois. For example, I have helped with research on the impacts of flooding on populations of roosting colonies in Green Ash, Sweet Gum, and Pin Oak trees in the Greater Mississippi River floodplain and adjacent farmland, including the Oakwood Bottoms floodplain, in Jackson County, Illinois, east of the Big Muddy River and Cedar Creek; as well as in the Bluff Lake Swamp area, near Millcreek, in Union County, Illinois. In past years, I have also worked with Bat Conservation International in Texas approximately five hours a week, taking part in the Friday night public education event for locals and tourists to view and learn about Austin's South Congress Bridge bats. For years, I also volunteered sixteen hours annually with Bat Conservation International to build and install bat houses in Texas. I continue to volunteer my time monitoring bat populations in Northern Missouri with the Department of Conservation.

18. In addition to these activities, I help with outreach and public education so humans do not disturb the bats and their habitats. I plan to continue these activities and continue to volunteer with conservationists.

19. In light of my ongoing efforts to protect and conserve the habitat of Indiana bats in both Missouri and Illinois, I am injured by EPA's failure to consult with the U.S. Fish and Wildlife Service (FWS) regarding the impacts that its 2020 dicamba registrations, as well as 2022 and 2023 amendments, will have on the Indiana bat population.

20. I am worried about how over the top uses of dicamba may affect Indiana bats because they subsist on insects, moths, and larvae that frequent agricultural fields. I am concerned that dicamba use will further contaminate food sources, as well as groundwater with toxic chemicals, which may enter the caves that serve as habitat for the bats.

21. I do not believe that the risks of EPA's 2020 dicamba registrations, as amended in 2022 and 2023, have been properly assessed in regards to the Indiana bat populations that I care about so deeply. It concerns me that allowing over the top spraying of dicamba in the areas surrounding the bat habitat, and that serve as the habitat for the insects on which the bat subsists, will be another stress that will harm the recovery of the Indiana bat. I know that in March 2022 and February 2023, EPA amended the registrations for a few states, but did not complete additional assessments regarding species and changed nothing in my state. I remain injured by the threat to the continued existence of the Indiana bat from EPA's 2020 dicamba registrations, as amended in 2022 and 2023.

22. I am also aware that EPA did not provide an opportunity for notice and comment prior to issuing its 2020 decision and failed to follow the proper procedures for re-registration after its initial cancellation order. I am injured by these procedural failures because EPA may have chosen to forego its decision after reading comments from conservationists like me on harms to species. And had EPA followed proper post-cancellation procedures, it may have determined that insufficient evidence existed to re-register dicamba and allow for the ongoing damage to the species I enjoy observing.

23. In summary, I have aesthetic and recreational interests in the preservation of the Indiana bat and its habitat that will continue to be injured by EPA's 2020 dicamba registrations, as amended in 2022 and 2023, absent review from this Court. An order vacating the registrations and requiring EPA to fully comply with the Endangered Species Act, the Federal Insecticide, Fungicide, and Rodenticide Act, and other legal requirements prior to taking any further action would remedy my injuries.

Pursuant to 28 U.S. C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed in Wentzville, Missouri on this 1st day of March, 2023.

Leslie Limberg

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THE UNITED STATES DISTRICT COURT
OF ARIZONA

Center for Biological Diversity, et al., *Plaintiffs,* v. United States Environmental Protection Agency, et al., *Defendants,* and Bayer Cropsciences LP, et al., *Defendant-Intervenors.*	Case No. CV-20-00555-DCB **DECLARATION OF DEAN MORMANN IN SUPPORT OF PLAINTIFFS' MOTION FOR SUMMARY JUDGMENT**

I, DEAN MORMANN, declare that if called as a witness in this action I would competently testify of my own personal knowledge as follows:

1. I am a member of the National Family Farm Coalition, and I support the coalition's efforts to mitigate the long-term impacts of dicamba use on food systems and family farmer livelihoods.

2. I have lived in Bloomfield, Nebraska for the last twenty years. I am a full-time farmer, and my wife and parents are also farmers. Farming is the only occupation I've ever had. I farm approximately 1000 acres of corn, 300 acres of soybeans, 300 acres of hay, and I keep mother cows and raise their calves until they're butchered. My property is in an agricultural area predominated by corn and soybeans, with most farmers using dicamba on these crops.

3. My farming operation is in-house, and I am the sole applicator of pesticide products. I have worked with the same seed dealer for twenty years, and he is not affiliated with Bayer, nor does he sell dicamba-resistant soybeans. In the past, I have only planted Roundup-Ready and some Enlist Duo corn and soy. I did not want to be the only person among the Enlist Duo farmers planting dicamba-resistant seeds for numerous reasons described below.

4. I am aware of the controversy surrounding dicamba products that are sprayed "over the top" of crops like cotton and soy that are genetically engineered with resistance to them. I know that EPA originally approved these pesticide uses a few years ago, and they caused great harm to other farmers' fields and natural environments from off-field drift. I am also aware that in June 2020 a court struck down EPA's approval as unlawful in a lawsuit brought by National Family Farm Coalition and numerous other organizations.

5. I am aware that in October 2020, EPA reapproved the use of over-the-top dicamba on genetically engineered, dicamba-resistant soybeans and cotton. And I am also aware that as a result of EPA's approval, farmers in my area can spray dicamba on their

dicamba-resistant soybean crops. In March 2022 and February 2023, I know EPA amended the registrations for some states but not mine. Despite these amendments, dicamba damage continued last summer, and I remain concerned about the ongoing effects that over-the-top dicamba use has on my farm.

6. Dicamba was once helpful, as it is very effective for managing many broadleaf weeds. The half-life is relatively short, and it does not cause as much damage as other products, like Tordon. For many years, dicamba has been approved for use on corn, but this was never a major issue for neighboring farmers because farmers know to be very careful when applying it, to avoid damaging their own crops. There is only a week to ten days early in the growing season—from V2 (two-leaf) stage up to about V4 or V5—during which dicamba can be applied safely as corn is growing. Contrary to BASF's contention that dicamba may be used later on larger corn, farmers know that applying it outside that short 7-10 day window makes the corn brittle and harms the corn crop. As a result, farmers used to only apply dicamba very early in the growing season.

7. This all changed after EPA approved dicamba for over-the-top use on soybeans and cotton genetically engineered to resist dicamba in 2016. Most producers in my area did not adopt the crop system right away because no one was certain if it would be a high-yielding crop. However, in my area, I really started to notice widespread dicamba damage in 2019. The negative effects of dicamba on non-dicamba-resistant soybeans in my area are so obvious that I can point the fields out while driving at seventy miles per hour.

8. Personally, in 2021, I had over 100 soybean acres exhibiting signs of cupping. I could not pinpoint where the damage was coming from at that time.

9. However, following EPA's 2022 amendments, I experienced substantial damage from dicamba that I could trace to a single incident. I planted my largest soybean field, a 130-acre field of soybeans near my residence. My neighbors to the north and south also planted soybeans. One of my neighbors asked which soybeans I planted because he planted dicamba-resistant ones. A few days later, this same neighbor called me to ask if he

could spray dicamba. Because we had a bit of south wind, I asked him not to spray and to wait for the north wind, and he agreed.

10. On June 28, 2022, I left the house to work on the ranch all day, and when I returned, I witnessed this neighbor spraying. I thought it would be fine because the wind was northeasterly, but the next morning the wind turned southward. On June 29, it was going to be 103 degrees, and the wind was blowing south at fifteen to twenty miles per hour. Two days later, my soybeans began to cup and curl, and my wife's garden nearly died. Her tomato plants were all but destroyed.

11. I called my neighbor to tell him what happened and informed him that he had damaged my whole field, except for a small section beyond my tree barrier. He said that he followed the label instructions and sprayed correctly, and that I should speak with the dicamba retailer, as they would contact BASF.

12. Subsequently, the Nebraska Department of Agriculture came to visit and agreed that we had dicamba damage, and that the drift came from the south. But nobody agreed that the drift came from my neighbor's field, so he was not liable, leaving me with no options. Despite giving my damaged soybeans foliar fertilizer, fungicide treatment, and everything other treatment I could think of, they never recovered. In combination with current drought conditions, dicamba drift severely damaged my soybeans.

13. In the past, I have done business with BASF, and believed I had a helpful local ally who worked for BASF. I called him as well, and BASF sent out a representative. However, the representative only told me that BASF had no intention of assisting me simply because I could not prove where the dicamba came from.

14. As a result, although I do not know the exact dollar amount of crop damage, I estimate I lost about $140/acre in my 130-acre field. As a small farmer, this is a major economic loss.

15. Last summer in 2021 I also observed the same damage down the road, where I have forty more acres of soy. Although there are no other soybeans for three miles from

the south, based on the location of the damage to my field, the damage must have also come from the south.

16. I am certain the damage came from dicamba because the soybeans I planted later in the growing season, after most neighbors finished spraying, did not exhibit dicamba damage. After the damage in 2021, a seed dealer advised me to plant soybeans in mid- June, 2-3 weeks later than I typically would, so that other farmers are nearly finished spraying dicamba. So last summer I planted some soybeans on June 10, which is very late, and those did well, eventually surpassing the height of the earlier soybeans, as they missed the dicamba damage.

17. This past summer, I passed out the cell number for the director of the Nebraska Department of Agriculture to my neighbors, but only two people have called because no one in the community wants to create conflict. Instead, all my neighbors plan to plant dicamba-resistant soybeans next year to avoid the damage.

18. I am also aware that EPA's decision approving the 2020 dicamba registrations also reversed FIFRA Section 24(c), which permitted states to take quick action to address special local needs in their states, without notice and comment. As a result, states can no longer undertake any restrictive action without using much more time-consuming measures, such as state legislative action or formal agency rulemaking. This harms my interests, as Nebraska may have chosen to act on ongoing damage and use FIFRA 24(c) to add restrictions and protect farmers like me. Had EPA held notice and comment, it may have chosen to continue allowing Nebraska to use FIFRA 24(c) to take quick action as necessary.

19. EPA also issued the dicamba decision without notice and comment and without following the proper procedures after its initial cancellation order. This failure to follow proper procedures harms my interests because EPA may have chosen not to register dicamba again after reading comments from farmers like me that have been experiencing ongoing damage. And had EPA followed proper post-cancellation procedures, it may have

determined that insufficient evidence existed to re-register dicamba and allow for the ongoing damage to my crops and livelihood.

20. As a result of my occupation as a farmer, I am very concerned about the impacts of dicamba on my property. EPA's decision to reregister dicamba injures my economic interests. My property is surrounded by vast agricultural fields. As dicamba can drift miles from the site of application, my fields are affected by EPA's decision to allow the over-the-top uses of dicamba on the fields near my property.

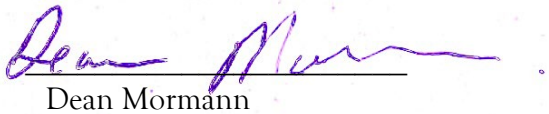
21. I know that dicamba can damage or kill non dicamba-resistant soybeans, fruiting vegetables, beans, potatoes, cherries, tomatoes, and the other vegetables my wife grows in her garden, which we both enjoy. I also understand that dicamba harms the fruiting trees and other ornamental plants I have on my property, and believe that as a result of dicamba drift, all of these will be destroyed.

22. I believe that farmers do not need dicamba as a tool, and that it is ineffective. In August 2022, at the Pro Farmer Crop Tour, it was stated that this is the weediest soybean crop ever observed in Nebraska. And we are starting to develop dicamba-resistant weeds, such as kochia, which gets everywhere in my fields because we use manure from our livestock operations on the fields.

23. In sum, I am injured economically by EPA's decision to reregister dicamba and amend the registrations in 2022 and 2023 without adequate analysis of the unreasonable adverse effects these pesticide registrations have on the environment. Without a court finding that EPA violated its duties in expanding dicamba use, the well-being of my farm and my garden will continue to be adversely affected by the use of dicamba.

I declare under penalty of perjury that the foregoing is true and correct.

Respectfully submitted this 1st day of March, 2023.



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THE UNITED STATES DISTRICT COURT
OF ARIZONA

Center for Biological Diversity, et al., *Plaintiffs,* v. United States Environmental Protection Agency, et al., *Defendants,* and Bayer Cropsciences LP, et al., *Defendant-Intervenors.*	Case No. CV-20-00555-DCB **DECLARATION OF LOU NELMS IN SUPPORT OF PLAINTIFFS' MOTION FOR SUMMARY JUDGMENT**

I, LOU NELMS, declare that if called as a witness in this action I would competently testify of my own personal knowledge as follows:

1. I am a member of Center for Food Safety (CFS). I joined CFS because I am concerned about the environmental, health, and public safety impacts of food and agriculture. I support CFS's efforts to advocate for more stringent government oversight of food production and its work on reducing the amount of chemical inputs into U.S. agriculture.

2. I am a resident of Mason City, Illinois, which is located in Mason County. The state of Illinois is one of the largest producers of both corn and soybean. The majority of agricultural land in and around Mason County is used for corn and soybean production (88,000 acres of soybeans in Mason County in 2020, USDA).

3. I earned a Bachelor of Science degree in environmental biology from Eastern Illinois University in 1973, and a Masters in horticulture from the University of Illinois in 1978. My professional career began with fifteen years in vegetable crop research, first at the University of Illinois working under a weed scientist completing herbicide trials, and then at Campbell's Soup Company in Napoleon, Ohio engaging in vegetable crop research aimed at improving yields and food quality. I then worked at Asgrow Seed Company in Wisconsin for five years, assisting plant breeders in developing vegetable varieties for food processing in the Midwest.

4. Following my years of vegetable crop research, I owned a native seed company for seventeen years in Illinois. We grew and sold 35 species of Illinois ecotype, native wildflowers, much of which the state of Illinois purchased in its efforts to restore prairies and native habitat for pollinators and other species.

5. In 1996, I moved to Illinois and purchased the property on which I currently reside. I own thirteen acres, surrounded by corn and soybean fields. When I initially moved, I devoted six acres of my property to producing wildflower seeds. I am now retired from the native seed business, but I continue to maintain six acres of native prairie on my

property for my own enjoyment and benefit to wildlife. Beyond those acres, my residential property is landscaped in other native species including oak, sycamore, and redbud trees. I also have a garden where I grow tomatoes, peppers, and beans.

6. I have been following the use of dicamba for decades. When I first completed my master's degree in 1978, I became aware of Banvel, another version of dicamba applied to corn that was damaging soybeans at the time due to its volatility. When I heard that Monsanto petitioned to deregulate dicamba-resistant soy and cotton, I had concerns of further dicamba damage. I submitted comments to the United States Department of Agriculture (USDA), describing dicamba's volatility and propensity to drift off-field.

7. I am aware that EPA's 2016 approval of dicamba for over-the-top uses on soy and cotton resulted in great harm to farmers' fields and natural environments from off field- drift and runoff. I know that in June 2020 a court struck down EPA's approval as unlawful in a lawsuit brought by CFS and other nonprofits. I also know that in October 2020, EPA reapproved the use of over-the-top dicamba on genetically engineered, dicamba-resistant soybeans and cotton crops. And I am also aware that, as a result of EPA's approval, farmers in my area can spray dicamba on their dicamba-resistant soybean crops and throughout the over ten thousand acres of soybeans growing in Mason County. I am also aware that in March 2022, EPA amended the registrations for a couple of states. However, despite these amendments, dicamba damage continued last summer, and I remain concerned about the effects dicamba has on my garden, my ornamentals, my native prairie, and my trees.

8. I am also aware that, in February 2023, EPA amended the registrations for Indiana, Illinois, Iowa, and South Dakota, and continued the 2022 restrictions for Minnesota. These amendments include a June 12 cutoff date for Illinois. I remain concerned about impacts to my property, as Illinois has had a cutoff date and temperature restriction since the 2019 growing season, and damage has continued.

9. Prior to EPA's 2016 approval, grain farmers in my county could only spray dicamba early in the planting season in the spring before planting and as early post-emergent treatments on their corn. They would never spray dicamba during the summer because doing so would injure their crops. As a result of EPA's approval, many of the farmers in my locality switched over to planting dicamba-resistant soybeans and spraying dicamba later in the growing season, when the temperature is higher, and the pesticide is able to volatilize for a longer period of time, thus extending the period when my property may potentially be damaged by dicamba.

10. Beginning in 2017, I was on the lookout for dicamba injury. I am aware that as a result of EPA's approval, many soybean farmers in Illinois and other states experienced devastating levels of crop damage to their soybean crops during the 2017-2019 planting seasons.

11. I was one of the many who was injured by EPA's approval of dicamba use on dicamba-resistant soybeans. In 2018, an application near my property on a hot day with wind going towards my property, resulted in off-target drift injury. This spraying damaged the ornamental plants on my property and my vegetable garden (5000 square feet; includes potatoes, peas, onions, radish, lettuce, carrots, peppers, tomatoes, summer and winter squash, and garden beans that we depend on for fresh and stored food). Specifically, dicamba drift significantly damaged my garden beans, causing their leaves to curl and cup and reducing yields. I can no longer grow them with any assurance they will not be injured by dicamba (which they have been every summer since 2017). My tomatoes and peppers also no longer grow as they should during dicamba spraying season.

12. Dicamba also damaged some trees on my property. Every year, 2017-2022, in June, my sycamore trees have developed significant leaf cupping, and residue samples from my sycamore trees have been positive for dicamba. (A recent review of my photo collection showed healthy leaves on my sycamore trees in August of 2016, the year before over-the-top applications began on soybeans in Illinois.) In the midst of central Illinois where so few

natural areas with tree cover remain, I greatly value our little tree grove for its beauty, the habitat and shelter the trees create for birds and other wildlife, and for the trees' shade and cooling on hot summer days. I appreciate very much the foresight of the previous owners in creating such a hospitable place that attracted us to live here. I have continued their wise stewardship. There can be no dollars assigned to measure their value and no economic loss that registers the pain of seeing them damaged, year after year.

13. In summer of 2022, following EPA's amendment to the registration in March 2022, my sycamore trees, oak trees, and sweet black eyed susan plants experienced cupping. Additionally, my Swamp White Oak, which I recently purchased for 150 dollars, exhibited "leaf-tatters," a skeletonizing effect of exposure to volatilized herbicides when the Swamp White Oak was at the early leaf unfolding stage of development.

14. I am vigilantly aware of my neighbors' herbicide applications. I know that some of the dicamba drifts from more than a half mile away because, this past summer, corn surrounded my property instead of soybeans with no evidence of dicamba being sprayed on the fields immediately surrounding my property. Yet my sycamore trees tested positive for dicamba.

15. I began filing Pesticide Misuse Complaints with the Illinois Department of Agriculture (IDOA) in 2017 and did so again in 2018, 2020, and 2021. Although applicator misuse may not have occurred, but volatility of dicamba products did, this complaint process is my only recourse for providing essential feedback to pesticide regulators on the environmental impacts of the pesticides they register. I thus view my participation in this process as a duty, a citizen service. Unfortunately, my standing against uninvited trespass of toxic herbicides and their unacceptable harm, and my use of the only tools provided to me by the Illinois Pesticide Act (as weak as they are), has strained my relationships with my neighbors, who see and value only their own economic interests and view my using the law as thwarting those interests. In 2018, my complaint to IDOA was the only one in Mason County even though I saw evidence of dicamba damage everywhere

on sycamore trees and numerous non-dicamba resistant soybean fields. I have also learned that the summary information on misuse complaints provided to EPA by the Illinois Department of Agriculture has been almost entirely deficient in the intelligence EPA would need to truly understand the nature of each complaint, and to thus have any meaningful understanding of the causes and harms of registrant products (based on a Freedom of Information Act request from me to IDOA). In other words, the feedback I have been trying to provide via my complaints has not been getting to EPA in a way that would inform their regulatory decisions on dicamba.

16. I did not submit a pesticide misuse complaint with the Illinois Department of Agriculture after my 2022 damage because in past years the Department has dismissed my complaints as "light" damage. Additionally, I did not want the Department to launch an investigation into the potential source because of the conflicts this would have reignited with my neighbors.

17. I am aware that other farmers in my area do not report damage. In 2022, as in past years, I observed during my road travels many non-dicamba-tolerant soybean fields with cupping symptoms uniformly distributed across the entire fields, which never showed up as complaints.

18. I am also aware that EPA's decision approving the 2020 dicamba registrations also reversed FIFRA Section 24(c), which permitted states to take quick action to address special local needs in their states, without notice and comment. As a result, states can no longer undertake any restrictive action without using much more time-consuming measures, such as state legislative action or formal agency rulemaking. This harms my interests, as I have been submitting complaints to Illinois almost every year for the state to take into account in adding restrictions under FIFRA 24(c). Had EPA held notice and comment, it may have chosen to continue allowing Illinois to use FIFRA 24(c) to take quick action as necessary.

19. EPA also failed to hold notice and comment on the 2020 decision and failed

to follow its own mandatory procedures following its initial cancellation order. This failure to follow proper procedures harms my interests because EPA may have chosen not to register dicamba again after reading comments from property owners like me that have been experiencing ongoing damage. And had EPA followed proper post-cancellation procedures, it may have determined that insufficient evidence existed to re-register dicamba and allow for the ongoing damage to my property.

20. In sum, my aesthetic, social, and economic interests have, and will continue to be, injured by EPA's decision to approve over-the-top dicamba for use on dicamba-resistant soybean. Without a court finding that EPA violated its duties in issuing the unconditional registration of over-the-top dicamba, my property and my relationships with my neighbors will continue to be adversely impacted.

I declare under penalty of perjury that the foregoing is true and correct.

Executed in Mason City, Illinois on this 3rd day of March, 2023.

_____
Lou Nelms

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THE UNITED STATES DISTRICT COURT
OF ARIZONA

Center for Biological Diversity, et al., *Plaintiffs,* v. United States Environmental Protection Agency, et al., *Defendants,* and Bayer Cropsciences LP, et al., *Defendant-Intervenors.*	Case No. CV-20-00555-DCB **DECLARATION OF BRYAN P. NEWMAN IN SUPPORT OF PLAINTIFFS' MOTION FOR SUMMARY JUDGMENT**

DECLARATION OF BRYAN P. NEWMAN

I, BRYAN P. NEWMAN, declare that if called as a witness in this action I would competently testify of my own personal knowledge, as follows:

1. I submit this declaration in support of Plaintiffs' Motion for Summary Judgment for the U.S. Environmental Protection Agency (EPA)'s failure to consult with expert wildlife agencies under the Endangered Species Act (ESA) on its 2020 registrations of dicamba for over-the-top use on soy and cotton genetically engineered to resist it, as amended in 2022 and 2023, as filed by Plaintiffs National Family Farm Coalition, Center for Food Safety, Center for Biological Diversity, and Pesticide Action Network North America.

2. I have been a member of the Center for Biological Diversity since June of 2016.

3. I live in Blaine, Minnesota. Minnesota is one of the states where EPA registered dicamba for use on genetically engineered soybeans that have been engineered to resist dicamba.

4. I am an amateur naturalist, avid bird watcher, and I look for wildlife wherever I go or travel.

5. I first became interested in whooping cranes (*Grus Americana*) as a child reading about endangered wildlife. I recall being fascinated by all the efforts people have made to save these amazing birds from extinction.

6. For many years, the only cranes I saw were in zoos. I vowed to one day see the birds in the wild. That dream came true when I was in my thirties, and I saw whooping cranes in the wild at Aransas National Wildlife Refuge near Rockport, Texas.

7. The next time I saw whooping cranes was on my annual road trip from Minnesota to visit family in Tennessee. That encounter was very special to me. I saw a flock of sandhill cranes fly over the road and noticed that two whooping cranes were included in the flock. I had been reading about people using ultralights to help whooping cranes

migrate, and I took great joy in seeing the birds making their journey on their own and knowing that the recovery efforts were making a difference.

8. After that I made three visits to the International Crane Foundation in Baraboo, Wisconsin, and I saw whooping cranes on each visit.

9. The next time that I saw the cranes in the wild was fall of 2013, when I travelled to Necedah National Wildlife Refuge in Necedah, Wisconsin with the specific purpose of seeing the cranes in the wild. I was thrilled to see several flocks at the refuge.

10. In the fall of 2014, my partner and I went to the Necedah National Wildlife Refuge in Necedah, Wisconsin. I saw and heard whooping cranes on several occasions during that visit. I photographed the beautiful birds and shared the photos with my family and friends. We also visited the nearby International Crane Foundation.

11. In the fall of 2016 and 2017, I took trips to central Wisconsin. I travel there several times a year for vacations and to see family, and I look for wildlife every time I go. East of the city of Tomah, I saw a whooping crane standing in an agricultural field along with several sandhill cranes. It was great to see the cranes, but I know about the threats to birds from agricultural pesticides, and I was concerned about how their feeding on agricultural residue could hurt them. Wisconsin is one of the states where EPA registered dicamba for use on genetically engineered soybean.

12. In June of this year, I again went to the Necedah National Wildlife Refuge, where I viewed and photographed whooping cranes. I also visited the nearby International Crane Foundation, and I became a member of that organization. This year I also visited central Wisconsin in August and November and plan to visit there again this upcoming summer and fall, and I will again look for whooping cranes in the agricultural fields during my travels. For example, I plan to rent a cabin in central Wisconsin next August 2023 and will look for whooping cranes en route to the cabin.

13. Most years, I drive to Tennessee to visit family and look for whooping cranes on the road trip. I plan to continue making road trips to Tennessee and look for whooping

cranes and other wildlife along the way.

14. In early March of 2021, I visited Aransas National Wildlife Refuge with my family for the specific reason of viewing whooping cranes. We took a boat tour and got amazing closeup views of the cranes feeding.

15. As an avid bird watcher, I follow posts from the birding community where birders share rare bird sightings in Minnesota and adjacent states. I make every effort to try to find any whooping cranes posted near where I live or travel.

16. I am concerned about the impacts to whooping cranes from EPA's 2020 dicamba registrations, as amended in 2022 and 2023, at issue in this case. I am aware that in October 2020, EPA reapproved the use of over-the-top dicamba on genetically engineered, dicamba-resistant soybeans and cotton crops, and, as a result, farmers in my area can spray dicamba on their dicamba-resistant soybean crops and throughout the thousands of acres of soybeans growing in Anoka County. I am concerned about the effects dicamba has on the wildlife I observe.

17. I am also aware that in March 2022 and February 2023, EPA amended registrations for Minnesota, adding a June 12 cutoff date south of I-94 and a temperature restriction of 85 degrees for application. However, for my county north of I-94, the cutoff date of June 30 is now later than in prior years when it was June 20, and with the same temperature restriction we have had since 2020, providing even weaker protections for the cranes. I am aware that these amendments do not address the ongoing harms to federally protected species EPA found in its December 2021 Report, despite EPA admitting to 34 reported dicamba drift incidents in Minnesota counties where endangered species and/or their critical habits may be present. And I am aware that EPA added no restrictions for other states in which I observe whooping cranes, including, among others, Wisconsin and Tennessee.

18. Specifically, I am concerned about whooping cranes because whooping cranes frequent agricultural fields. For example, the flyway of the western flock goes right

through parts of North Dakota, South Dakota, Nebraska, Kansas, and Texas, where growers heavily spray dicamba over the top of soybean and cotton genetically engineered to resist dicamba. The eastern flock migrates through the states of Wisconsin, Illinois, Indiana, Kentucky, Tennessee, Georgia, and Florida where the dicamba-resistant genetically engineered crop system is also used. Many of the "crane cam" views of whooping cranes show them foraging in dicamba-resistant soybean fields in the fall where dicamba is sprayed, and I am aware that they also stopover in soybean fields in the spring, where they have the potential to be exposed to dicamba.

19. These exposures to dicamba through foraging in treated fields, drift, and runoff may have adverse effects on the whooping cranes.

20. I know that the risks to endangered species from EPA's 2020 registrations and amendments have not been properly assessed by a federal agency with expertise in endangered species. That is, EPA has not asked the U.S. Fish and Wildlife Service about its views and analysis on the risks to whooping cranes and other endangered species from the 2020 dicamba registrations or amendments. It concerns me that, given the stresses the cranes already have to endure, continuing to allow over the top uses of dicamba will add another serious stress that can and will severely harm their recovery.

21. In addition, I have strong aesthetic, recreational, and scientific interests in the rusty patched bumble bee. Near my home in Blaine, Minnesota, I look for these bees on a weekly basis in the summer. My partner and I have planted native prairie plants in our yard, including bee balm, which attract lots of bees. I have bee identification guides, and I know how to recognize the rusty patched bumble bee. We have wooded wetlands adjacent to our home and native prairie with lots of wildflowers, and I remain hopeful that someday I will see a rusty patched bumble bee in this bee habitat near my home.

22. I have done several "citizen science" surveys for bumble bees in the Twin Cities metropolitan area, where I have worked with scientific professionals to capture and identify numerous bee species.

23. A few summers ago, I walked along the shore of Como Lake in St. Paul, Minnesota, with the goal of seeing a rusty patched bumble bee, as I had heard that the species had been found near there. I was thrilled to find one as I observed dozens of bees of various species buzzing from flower to flower in this beautiful area.

24. With the Endangered Species Act listing of the rusty patched bumble bee, I began to learn about the status and threats facing the bee. I know that one of the dangers facing the bee is harm from pesticides. I was fascinated to learn that the bee is found primarily in urban areas, which suggests that the bee is susceptible to pesticides used in genetically engineered crop systems in agricultural areas.

25. My home is in an outer-ring suburb, and large agricultural fields can be found within just a few miles of my home. I'm concerned that the survival and recovery of the bee in these areas will continue to be impacted by EPA's 2020 dicamba registrations, as amended.

26. I try to quickly identify any bee that I notice when I'm out and about and taking a walk. I will continue to look for the rusty patched bumble bee whenever I'm out walking and observing potential bee habitat such as patches of wildflowers.

27. If the bee were to make progress toward recovery, I would have hope of seeing the bee in additional areas, such as near my home and during my travels in central Wisconsin.

28. I do not believe that EPA properly assessed the risks of its 2020 registrations or amendments on the rusty patched bumble bee through consultation with the U.S. Fish and Wildlife Service. It concerns me that ongoing over the top uses of dicamba will harm flowering plants near agricultural fields that the bee relies on for pollen and nectar. The rusty patched bumble bee already has lost much of its natural habitat and is likely exposed to insecticides in addition to herbicides like dicamba. Continuing over the top uses of dicamba will pose another serious stress that can and will severely harm their recovery.

29. EPA also issued the dicamba decision without notice and comment and

without following the proper procedures after its initial cancellation order. This failure to follow proper procedures harms my interests because EPA may have chosen not to register dicamba again after reading comments regarding ongoing damage to species. And if EPA had followed its own mandatory post-cancellation procedures, it may have concluded that insufficient evidence existed to re-register dicamba and allow for the ongoing damage to species.

30. In summary, I have aesthetic and recreational interests in the preservation of whooping cranes, rusty patched bumble bees, and their habitats that will continue to be injured by EPA's 2020 dicamba registrations, as amended in 2022 and 2023, absent review from this Court. An order vacating the registrations and amendments and requiring EPA to fully comply with the Endangered Species Act, Federal Insecticide, Fungicide, and Rodenticide Act, and other legal requirements prior to taking any further action would remedy my injuries.

Pursuant to 28 U.S. C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed in Anoka County, Minnesota on this 7th day of March, 2023.

Bryan P. Newman

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THE UNITED STATES DISTRICT COURT
OF ARIZONA

Center for Biological Diversity, et al., *Plaintiffs*, v. United States Environmental Protection Agency, et al., *Defendants*, and Bayer Cropsciences LP, et al., *Defendant-Intervenors*.	Case No. CV-20-00555-DCB **DECLARATION OF GARY SMITH IN SUPPORT OF PLAINTIFFS' MOTION FOR SUMMARY JUDGMENT**

I, GARY SMITH, declare that if called as a witness in this action I would competently testify of my own personal knowledge as follows:

1. I am a member of the Center for Food Safety (CFS), and I support CFS's efforts to put an end to the long-term impacts of dicamba use on food systems and family farmer livelihoods.

2. I have lived in Sumner, Iowa since 1978. I have been a farmer for 47 years and a seed dealer until just last year. I farm approximately 150 acres of soybeans. My property is in an agricultural area predominated by corn and soybeans, at least eight miles from the nearest town.

3. I have never purchased dicamba-resistant seeds because these seeds do not have a high yield. For many years, I have grown non-GMO soybeans and have been paid a good premium for them.

4. I am aware of the controversy surrounding dicamba products that are sprayed "over the top" of crops like cotton and soy that are genetically engineered with resistance to them. I know that EPA originally approved these pesticide uses a few years ago, and they caused great harm to other farmers' fields and natural environments from off-field drift and runoff. I am also aware that in October 2020, EPA reapproved the use of over-the-top dicamba on genetically engineered, dicamba-resistant soybeans and cotton, allowing farmers in my area to spray dicamba on their dicamba-resistant soybean crops. In March 2022 and February 2023, I know EPA amended the registrations for Iowa. However, despite the 2022 amendments, dicamba damage continued last summer, and I am concerned about the ongoing effects that over-the-top dicamba use has on my farm.

5. I started noticing dicamba damage to my fields, as well as my neighbors' fields, in 2017. Prior to 2017, there were some instances of dicamba damage from dicamba use on corn, but the damage became significantly worse after EPA approved dicamba for over-the-top uses in 2016.

6. In 2017, seed companies in my area began to limit options for farmers to

only dicamba-resistant seeds. As a result, 70-80 percent of farmers in my area switched to the dicamba crop system for the 2017 growing season. Some of the remaining farmers later adopted the system after experiencing significant dicamba damage to their soybean crops.

7. Personally, dicamba damage to my fields has only gotten worse over the past few years. I noticed damage in 2017, but now I experience damage to my entire soybean fields each year, resulting in significant economic losses.

8. For example, in 2020, an immediate neighbor sprayed his soybean field with dicamba. As a result, the first two rows of my field were destroyed, the next 60-80 rows were stunted, and the entire field showed signs of dicamba damage. I called the Iowa Department of Agriculture to report the damage, and officials came and took samples. Sure enough, officials found dicamba in my soybeans, which is the reason my field was damaged and not my neighbor's dicamba-resistant field.

9. That same year, I had also planted another soybean field on the same day, treated those soybeans the same, and harvested them at the same time. Without the dicamba damage, this field yielded much more and was not stunted.

10. This past summer 2022, I reported dicamba damage again on two separate fields. I lost 5-7 bushels per acre this past summer because a neighbor sprayed dicamba nearby at peak bloom, so my crop stopped blooming for two weeks.

11. Overall, I estimate I lost approximately 75-100 dollars per acre on both damaged soybean fields this past summer because of dicamba damage.

12. In addition to farming, I drill Conservation Reserve Program acres with wildflowers and native grasses for other farmers in my county and several neighboring counties. Combined, the drilling costs and seed costs add up to approximately 250-500 dollars per acre, the bulk of which the United States Department of Agriculture (USDA) pays. Unfortunately, dicamba frequently damages the wildflowers that I plant, and which USDA pays for. I can distinguish dicamba damage from other injuries because of the cupped leaves.

13. Dicamba has also damaged the trees on my four-acre property. Around here, the Emerald ash borer injures about thirty percent of trees, but dicamba injures the rest. This past summer, an apple tree died on my property.

14. Dicamba damage has also created conflict in my community. When some farmers contact the state to report damage, other farmers become angry. Some people are afraid to report damage because they fear retaliation from neighbors.

15. As a result of my occupation as a farmer, I am very concerned about the impacts of dicamba on my property. EPA's decision to reregister dicamba injures my economic interests. My property is surrounded by vast agricultural fields. As dicamba can drift miles from the site of application, my fields are affected by EPA's decision to allow the over-the-top uses of dicamba on the fields near my property.

16. I know that dicamba can damage or kill non dicamba-resistant soybeans, and I understand that dicamba harms the fruiting trees I have on my property.

17. I believe that farmers do not need dicamba as a tool, as other pesticides I use do not volatilize as dicamba does.

18. I am also aware that EPA's decision approving the 2020 dicamba registrations reversed FIFRA Section 24(c), which permitted states to take quick action to address special local needs in their states, without notice and comment. As a result, states can no longer undertake any restrictive action without using much more time-consuming measures, such as state legislative action or formal agency rulemaking. This harms my interests, as Iowa has historically used FIFRA 24(c) to add restrictions and protect farmers like me. Had EPA held notice and comment, it may have chosen to continue allowing Iowa to use FIFRA 24(c) to take quick action as necessary.

19. EPA also issued the dicamba decision without allowing for notice and comment and without following the proper procedures following its initial cancellation order. This procedural failure harms my interests because EPA may have made a different decision in response to comments from farmers like me whose crops have been damaged

year after year. And had EPA followed proper post-cancellation procedures, it may have determined that insufficient evidence existed to re-register dicamba and allow for the ongoing damage to my crops and livelihood.

20. In sum, I am injured economically by EPA's decision to reregister dicamba and amend the registrations without adequate analysis of the unreasonable adverse effects these pesticide registrations have on the environment. Without a court finding that EPA violated its duties in expanding dicamba use, the well-being of my farm and my trees will continue to be adversely affected by the use of dicamba.

I declare under penalty of perjury that the foregoing is true and correct.

Respectfully submitted this 1st day of March, 2023.

Gary Smith

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THE UNITED STATES DISTRICT COURT
OF ARIZONA

Center for Biological Diversity, et al., *Plaintiffs,* v. United States Environmental Protection Agency, et al., *Defendants,* and Bayer Cropsciences LP, et al., *Defendant-Intervenors.*	Case No. CV-20-00555-DCB **DECLARATION OF BRIGID TRIMBLE IN SUPPORT OF PLAINTIFFS' MOTION FOR SUMMARY JUDGMENT**

I, BRIGID TRIMBLE, declare that if called as a witness in this action I would competently testify of my own personal knowledge as follows:

1. I am a member of the Center for Food Safety (CFS), and I support the organization's efforts to avoid adverse effects of herbicides and pesticides on agriculture, species, and the environment. In fact, I joined CFS because I am concerned about the long-term impacts of herbicide and pesticide use on human health, our water supply, trees, and the soil.

2. I have lived on my property in Elgin, Illinois for the last six years. I own 1.25 acres, and my property is surrounded by farm fields, a small woodland, and subdivisions. Soybean agriculture is a major industry here in Illinois, with many commercial farmers farming massive fields of crops and extensively using herbicides, specifically dicamba.

3. I am aware of the controversy surrounding dicamba products that are sprayed "over the top" of crops like cotton and soy that are genetically engineered with resistance to them. I know that EPA originally approved these pesticide uses a few years ago, and they caused great harm to farmers' fields and natural environments from off-field drift. I know that in June 2020 a court struck down EPA's approval as unlawful in a lawsuit brought by Center for Food Safety and other nonprofits.

4. I know that in October 2020, EPA reapproved the use of over-the-top dicamba on genetically engineered, dicamba-resistant soybeans and cotton crops. And I am also aware that, as a result of EPA's approval, farmers in my area can spray dicamba on their dicamba-resistant soybeans and have been doing so since 2017. I am also aware that in March 2022, EPA amended the registrations for some states, but not mine. I remain concerned about the effects of dicamba on my trees, my property, and the health of my community.

5. I am a high school level environmental science and AP biology teacher. I am also a master naturalist. Starting around 2017, I noticed damage to trees near where I teach and on my property.

6. When I moved to my property, it was heavily wooded with oak trees. I enjoy these trees because they provide us endless entertainment and ecoservices, as they are food and shelter for countless birds, amphibians, insects, and mammals. The trees allow us to support an oak savanna woodland ecosystem at our very doorstep. The trees also completely shaded my house. I had over 100 trees, 40 of which were oak trees that are over 100 years old, and some are between 150 and 200 years old. Now, many of these very large trees have died, and others have visible leaf-cupping, slowed growth, and other stress from dicamba drift.

7. I am aware that dicamba is drift-prone and volatile and can only be sprayed during certain times of the growing season, dependent on the climate. My area has had an enormous amount of heat and humidity the past few summers, causing dicamba to drift for weeks. As dicamba can drift over a mile from the site of application, my trees are affected by EPA's decision to allow the spraying of dicamba on the fields just blocks from my property.

8. As a result of my love for my trees, I am very concerned about the impacts of dicamba on my property. I am aware that the species of trees on my property are particularly sensitive to dicamba damage, particularly my native oaks, hickory, and redbud trees. The signs of dicamba damage are all over my property, including dead trees, dead native plants, and leaf cupping. I also had drift reach 30 feet up hickory and oak trees on my property, resulting in dead leaves high in the canopy.

9. I am also concerned about the impacts of dicamba on my native landscaping. When I moved to this property, I spent a lot of time and effort removing landscaped plants and invasive species to replace them with more native plants. Now, my native plants are exhibiting signs of dicamba damage. My smaller native plants are simply dying outright. The plants turn brown, dry up, and die down to the ground level. The root systems are affected as well since they do not re-sprout. Early in spring, we noticed cupped leaves on the growing portions of most of our tree species. The distorted leaves show what looks like

scorched leaves that die and drop prematurely. Younger oak and hickory trees, those 40 years and younger, are showing stunted growth and show sparse vegetation. I am not sure how many consecutive years of premature defoliation they can handle before they die. Our 100+ year old oak trees have thinning canopies, allowing increasing amounts of sunlight to hit the forest floor, stressing the plants that grow there. My fear is that our weakened trees will become more susceptible to fungal and viral diseases.

10. The Illinois Department of Agriculture has tested and confirmed dicamba in my trees, and the inspectors were able to track down which field or lawn was sprayed with dicamba. In the summer of 2021, an inspector confirmed that dicamba had been sprayed on soybeans about one football field away from my property.

11. As a result of EPA's 2020 registrations, 2021 was the worst year of damage for the trees on my property. I tried to plant five-gallon red bud trees that cost over $150 dollars each, but they curled up and died as a result of the drift. My trees were almost completely bare this year, and the smaller ones are dying beneath because there is no more shade. Each year that dicamba has been approved for over-the-top use on dicamba-resistant soy and cotton, I have lost at least one 100-year-old tree on my property. We are averaging about one large tree a year that necessitates hiring tree removal specialists. Fortunately, minimal damage has occurred to our building on site so far.

12. I am aware that EPA made some changes in March 2022 to the label. However, last summer my trees continued to have leaf curling, and the crowns of the trees experienced damage as well. The crowns of my old trees continued to thin out, and the leaves are deformed and much smaller.

13. I am also aware that EPA made some changes in February 2023 for five states, including Iowa, South Dakota, Illinois, and Indiana, and continued the amended label for Minnesota. But for my state, Illinois, EPA only added a cutoff date of June 12. I do not predict that this will prevent harm to my trees from applications before that date, as Illinois experiences high temperatures starting in May, making drift highly likely.

14. I have tried to take action to prevent further dicamba damage on my property. Over the past six years, I have talked to the Illinois Department of Agriculture multiple times. I filed complaints with the Illinois Department of Agriculture in 2019, 2020, and 2021. I had also planned to file a complaint in 2018, but the inspector said it was covered by my neighbor's complaint.

15. EPA's 2020 approval of over-the-top dicamba for use on dicamba-resistant crops and amendments also injure me economically. As a result of the dicamba use surrounding my property causing my trees to die, more areas of my house are hit by the sun, requiring me to spend more money on air conditioning during our hot summers. The cost of removal of trees that are over 100 years old has been in the thousands of dollars. That cost is over ten thousand dollars at this point. These mature trees can, when healthy, live for a hundred more years and are dying prematurely. I have continuously invested money into native landscaping just to have it destroyed by dicamba. I have spent, on average, $200-$400 a year trying to reestablish native plants, many of which have been either killed or stunted by the herbicides.

16. It is not possible to "replace" trees that are 100 years old. To buy a "large" oak tree and have it planted on our lot is incredibly expensive, as we are on a slope, and the necessary machinery cannot physically maneuver on our lot. Planting replacement trees that are more than 4 feet tall could be more than $1000 each, and their survival rate would be questionable due to the continued use of herbicides. The food, shelter, and shade of a 100-year-old oak cannot be replaced by a 10-year-old sapling.

17. I am also aware that EPA issued the 2020 decision without notice and comment and without following its own mandatory procedures following the initial cancellation order. These procedural failures harm my interests because EPA may have chosen not to register dicamba again after taking into account the public's input on ongoing harm to trees and the environment. And had EPA followed its post-cancellation

procedures, it may have found insufficient evidence to re-register dicamba and allow for the ongoing damage to my property.

18. In sum, I am injured both aesthetically and economically by EPA's decision to reregister dicamba in 2020 and to amend the registration in 2022 and 2023 without adequate analysis of the unreasonable adverse effects these pesticide registrations have on the environment. Without a court finding that EPA violated its duties in expanding dicamba use, the well-being of my trees, my enjoyment of them, as well as the economic costs associated with maintaining my home and property, will continue to be adversely affected by the use of dicamba.

I declare under penalty of perjury that the foregoing is true and correct.

Respectfully submitted this 3rd day of March 2023.

Brigid Trimble

THE UNITED STATES DISTRICT COURT
OF ARIZONA

Center for Biological Diversity, et al., *Plaintiffs,* v. United States Environmental Protection Agency, et al., *Defendants,* and Bayer Cropsciences LP, et al., *Defendant-Intervenors.*	Case No. CV-20-00555-DCB **[PROPOSED] ORDER GRANTING PLAINTIFFS' MOTION FOR SUMMARY JUDGMENT**

The Court has reviewed Plaintiffs' Motion for Summary Judgment. Upon consideration of the Motion, the papers submitted in support [and in response] to the Motion, and finding good cause exists for the Motion to be granted, it is hereby ORDERED that Plaintiffs' Motion is GRANTED.