

**PETITION TO CONDUCT INTERIM ADMINISTRATIVE REVIEW FOR THE
PESTICIDE GLYPHOSATE, IN LIGHT OF SERIOUS HARM TO MONARCH
BUTTERFLIES**

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The Natural Resources Defense Council (NRDC) petitions the U.S. Environmental Protection Agency (EPA) to undertake interim administrative review for glyphosate, and to restrict the pesticide's uses and/or impose other necessary mitigation measures, to prevent unreasonable adverse effects to the North American monarch butterfly, *Danaus plexippus*. In light of significant ongoing harm to monarchs, urgent review of glyphosate is needed. EPA should ensure that imposing restrictions on glyphosate use does not lead to increased use of other herbicides that may be equally harmful to monarchs, and that may pose health risks. This petition is filed pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), 7 U.S.C. § 136 *et seq.*, and the Administrative Procedure Act (APA), 5 U.S.C. § 551 *et seq.*

I. INTRODUCTION

Glyphosate is an herbicide that has been registered for many agricultural and non-agricultural uses.¹ EPA has approved glyphosate's use on over 100 terrestrial food crops, including fruit, vegetable, and field crops.² The agency has also registered glyphosate for use in non-crop settings, often to achieve total vegetation control.³ Non-crop areas to which glyphosate

¹ U.S. EPA, Glyphosate Final Work Plan (FWP): Registration Review Case No. 0178, at 2 (2009) [hereinafter 2009 Glyphosate Final Work Plan].

² *Id.*

³ U.S. EPA, Reregistration Eligibility Decision Facts: Glyphosate 1 (1993) [hereinafter 1993 Glyphosate R.E.D. Facts].

is applied include residential, industrial, forestry, greenhouse, ornamental, aquatic, and other sites.⁴ When applied at lower rates, glyphosate also functions as a plant growth regulator.⁵

EPA first registered glyphosate for use in pesticides in 1974. As a non-selective herbicide, glyphosate does not discriminate between target and non-target plant species. Because of its damage to crops, glyphosate's use was initially limited. Since glyphosate was reregistered in 1993, however, the development of genetically-modified, glyphosate-resistant crops has facilitated a dramatic rise in the herbicide's application. As of 2009, approximately 182 million pounds of glyphosate were applied to over 261 million acres annually—compared to about 18.7 million pounds used on 13 to 20 million acres annually between 1989 and 1991. Having experienced an approximately ten-fold increase in use since its reregistration, glyphosate is now the most widely used herbicide in the United States.⁶

The unprecedented increase in glyphosate use has adversely affected the North American monarch butterfly, an iconic species that migrates through the United States as part of its annual life cycle. Over the last decade, there has been a sharp decline in the monarch population that traverses the American Midwest and overwinters in Mexico. By eliminating milkweed—the exclusive food source for monarch larvae—the pervasive use of glyphosate has contributed to the monarch's decline. The decimation of milkweed communities, particularly from agricultural

⁴ 2009 Glyphosate Final Work Plan, *supra* note 1, at 2; 1993 Glyphosate R.E.D. Facts, *supra* note 3, at 1.

⁵ 1993 Glyphosate R.E.D. Facts, *supra* note 3, at 1.

⁶ M.J. Livingston, *Economics of Pest Control*, in 2 Encyclopedia of Energy, Natural Resource, and Environmental Economics 66 (Jason Shogren ed., 2013); U.S. EPA, 2006-2007 Pesticide Market Estimates: Usage (Page 2), http://www.epa.gov/opp00001/pestsales/07pestsales/usage2007_2.htm (last visited February 14, 2014); *see also* U.S. Geological Survey, Glyphosate Found in Wastewater Discharged to Streams, http://toxics.usgs.gov/highlights/glyphosate_wastewater.html (last visited Jan. 31, 2014) (noting that glyphosate is also the most widely used herbicide in the world).

areas, is associated with an 81% decrease from 1999 to 2010 in the production of monarchs in the Midwest and a 65% decrease over the same period in the size of the entire monarch population that overwinters in Mexico. This winter's annual monarch census in Mexico reported the lowest population levels ever measured, down from last year's record low.

II. LEGAL STANDARD

FIFRA requires EPA to register any pesticide before it is sold or distributed in the United States. 7 U.S.C. § 136a(a). A FIFRA registration is a product-specific license setting forth the terms and conditions under which the product can be legally distributed, sold, and used. *See id.* § 136a(a), (c)-(e). EPA can register a pesticide only upon determining that “it will perform its intended function without unreasonable adverse effects on the environment,” *id.* § 136a(c)(5)(C), and that “when used in accordance with widespread and commonly recognized practice it will not generally cause unreasonable adverse effects on the environment,” *id.* § 136a(c)(5)(D). FIFRA has defined “[u]nreasonable adverse effects on the environment” to include “any unreasonable risk to . . . the environment, taking into account the economic, social, and environmental costs and benefits of the use of any pesticide,” *id.* § 136(bb).

In addition, FIFRA section 4 sets forth detailed reregistration procedures for pesticides whose active ingredients were first registered in a pesticide before November 1, 1984. *See* 7 U.S.C. § 136a-1(a). At the end of the section 4 process, EPA must determine whether a pesticide is eligible for reregistration. *See id.* § 136a-1(g)(2)(C). The standard for reregistration is the same as the standard for initial registration. *See id.* If EPA determines not to reregister a pesticide, it “shall take appropriate regulatory action . . . as expeditiously as possible.” *Id.* § 136a-1(g)(2)(D).

For every registered pesticide, EPA must also complete a registration review and then subsequent registration reviews “each 15 years thereafter.” *Id.* § 136a(g)(1)(A)(iv). A pesticide

product remains registered until EPA or the registrant cancels it pursuant to FIFRA section 6. *See* 7 U.S.C. § 136d. Under section 6, if it appears to EPA that a registered pesticide has “unreasonable adverse effects on the environment” when “used in accordance with widespread and commonly recognized practice,” then EPA may undertake cancellation proceedings. *Id.* § 136d(b). Before taking any final action pursuant to section 6, EPA “shall consider restricting a pesticide’s use or uses as an alternative to cancellation.” *Id.* § 136d(b). If EPA classifies a pesticide for restricted use “because of a determination that its use without additional regulatory restriction may cause unreasonable adverse effects on the environment, the pesticide shall be . . . subject to such . . . restrictions as the Administrator may provide by regulation.” *Id.* § 136a(d)(1)(C)(ii).

EPA may, moreover, undertake interim administrative review of a pesticide at any point, either as part of formal cancellation proceedings or based on “a validated test or other significant evidence raising prudent concerns of unreasonable adverse risk . . . to the environment.” *Id.* § 136a(c)(8). EPA has defined “[o]ther significant evidence” to include “factually significant information that relates to the uses of the pesticide and its adverse risk . . . to the environment.” 40 C.F.R. § 154.3. The agency may issue “an interim registration review decision,” which “may require new risk mitigation measures, impose interim risk mitigation measures, identify data or information required to complete the review, and include schedules for submitting the required data, conducting the new risk assessment and completing the registration review.” *Id.* § 155.56.

III. GLYPHOSATE’S EFFECTS ON MONARCHS

Glyphosate has contributed to significant habitat loss along monarch migratory paths. The increased use of glyphosate across the Midwest, spurred by widespread adoption of glyphosate-resistant crops (including Roundup Ready crops), has drastically reduced the

presence of agricultural milkweed over the last decade. The pervasive suppression of milkweed has, in turn, contributed to a sharp decline in the monarch population. In 1997, before the widespread adoption of glyphosate-resistant crops, approximately one billion monarchs journeyed across the country between summer havens in the United States and Canada and a single winter home in Mexico.⁷ As of this year, only about 35 million butterflies reached their winter refuge.⁸ Scientists have warned that the annual monarch migration may be in danger of effectively vanishing.⁹

A. Glyphosate Use Has Increased Significantly Since Reregistration in 1993

EPA first registered glyphosate for use in pesticide products in 1974.¹⁰ As a non-selective herbicide,¹¹ glyphosate does not discriminate between target and non-target plants. Because of its harm to crops, glyphosate's early use was relatively limited.¹² In a typical year between 1989 and 1991, 18.7 million pounds of glyphosate were applied as an active ingredient to between 13 and

⁷ Michael Wines, *Migration of Monarch Butterflies Shrinks Again Under Inhospitable Conditions*, N.Y. Times, Jan. 29, 2014; Sylvia Fallon, *Monarch Butterfly Population Hits a New Low*, *Switchboard: Natural Resources Defense Council Staff Blog* (Jan. 29, 2014), http://switchboard.nrdc.org/blogs/sfallon/monarch_butterfly_population_h.html.

⁸ *Id.*

⁹ *Id.*; see also Michael Wines, *Monarch Migration Plunges to Lowest Level in Decades*, N.Y. Times, Mar. 13, 2013; see also Tracy Wilkinson, *U.S., Mexico and Canada are Asked to Protect Monarch Butterflies*, L.A. Times, Feb. 14, 2014.

¹⁰ Nat'l Pesticide Info. Ctr., *Glyphosate Technical Fact Sheet 1*, available at <http://npic.orst.edu/factsheets/glyphotech.pdf>.

¹¹ 2009 Glyphosate Final Work Plan, *supra* note 1, at 2.

¹² See J.M. Pleasants & K.S. Oberhauser, *Milkweed Loss in Agricultural Fields Because of Herbicide Use: Effects on the Monarch Butterfly Population*, *Insect Conservation and Diversity* 1, 2 (2012).

20 million acres.¹³ Out of this aggregate amount of glyphosate used across all types of acreage, 1.1 to 1.2 million pounds of the herbicide were applied to between 1.3 and 1.7 million acres of corn, and 2.2 to 2.4 million pounds of the herbicide were applied to between 2.6 and 4.8 million acres of soybeans.¹⁴ In deciding to reregister glyphosate in 1993, EPA assumed that the pesticide was used in accordance with these estimates.¹⁵

Following the reregistration of glyphosate in 1993, however, genetically-modified, glyphosate-resistant crops were introduced in American agriculture. Glyphosate-resistant soybeans first appeared in 1996,¹⁶ followed by glyphosate-resistant corn in 1998.¹⁷ By 1999, glyphosate-resistant soybeans comprised the majority of all soybean crops.¹⁸ The ascendancy of glyphosate-resistant crops is reflected in data from the corn-soy belt; by 2006, for example, 75% of farmers in Iowa reported planting continuous glyphosate-resistant crops.¹⁹ By 2011, 94% of all soybean crops, and 72% of all corn crops, were glyphosate-resistant.²⁰

¹³ Special Review and Reregistration Div., Office of Pesticide Programs, U.S. EPA, Reregistration Eligibility Decision Document: Glyphosate 9 (1993) [hereinafter 1993 Glyphosate R.E.D.].

¹⁴ *Id.* at 7-8.

¹⁵ *See id.* at 8-9.

¹⁶ G.M. Dill, et al., *Glyphosate-resistant Crops: Adoption, Use and Future Considerations*, 64 Pest Mgmt. Sci. 326, 326 (2008).

¹⁷ Pleasants & Oberhauser, *supra* note 12, at 2.

¹⁸ R.G. Hartzler, *Reduction in Common Milkweed (Asclepias Syriaca) Occurrence in Iowa Cropland from 1999 to 2009*, 29 Crop Protection 1542, 1542 (2010).

¹⁹ *Id.*

²⁰ Pleasants & Oberhauser, *supra* note 12, at 2.

The proliferation of glyphosate-resistant crops facilitated a dramatic expansion in glyphosate use.²¹ In a screening level usage analysis based only on reported numbers, EPA estimated that, in an average year between 2004 and 2011, 95% of all soybean crops and 60% of all corn crops were treated with glyphosate; this required 86.4 million pounds of glyphosate for soybeans annually and 54.6 million pounds of glyphosate for corn annually.²² Between 2008 and 2009, approximately 182 million pounds of glyphosate²³ were applied to over 261 million acres²⁴—a more than ten-fold increase from the amounts and acreage underlying EPA’s decision to reregister glyphosate in 1993.

In 2009, EPA initiated a registration review for glyphosate.²⁵ Extensive public comment submitted to the agency identified “profound changes in the usage patterns” of glyphosate, driven in part by the “widespread adoption of transgenic, glyphosate-resistant” crops.²⁶ EPA affirmed its “aware[ness] of the tremendous growth in the use of glyphosate since it was

²¹ See Pleasants & Oberhauser, *supra* note 12, at 1-2; Ctr. for Food Safety, Comments to EPA on Opening of Glyphosate Docket for Registration Review 2-8 (Sept. 21, 2009) [hereinafter 2009 Ctr. for Food Safety Comments].

²² Memorandum (EPA Updated Screening Level Usage Analysis (SLUA) Report in Support of Registration Review of Glyphosate) from Sepehr Haddad, Env’tl. Prot. Specialist, Bio. and Econ. Analysis Div., EPA, to Carissa Cyran, Chem. Review Manager, Pesticide Re-evaluation Div., EPA (Dec. 6, 2012).

²³ 2009 Ctr. for Food Safety Comments, *supra* note 21, at 4 (converting EPA’s estimate of 135 million pounds of glyphosate in acid equivalent form to 182 million pounds of glyphosate in isopropylamine salt form, the most common form of glyphosate as an active ingredient).

²⁴ Am. Farm Bur. Fed’n, Comments to EPA in Support of Reregistration of Glyphosate 1 (Sept. 17, 2009).

²⁵ Registration Review; Glyphosate Docket Opened for Review and Comment, 74 Fed. Reg. 36,217 (July 22, 2009).

²⁶ 2009 Ctr. for Food Safety Comments, *supra* note 21, at 1, 3.

reregistered, and its relationship with the development of herbicide tolerant crops.”²⁷ The agency moreover recognized that “[a]ccurate estimates of current use patterns will indeed be important for evaluating the . . . environmental effects of glyphosate.”²⁸ EPA’s registration review for glyphosate is scheduled for completion in 2015.²⁹ According to the timeline EPA set forth in its Glyphosate Final Work Plan in 2009, the agency would accept public comments on its Preliminary Risk Assessment between January and March 2014.³⁰ NRDC looks forward to the publication of EPA’s Preliminary Risk Assessment for glyphosate, and appreciates that the agency may have already begun to examine glyphosate’s impacts on non-target terrestrial invertebrates including butterflies.³¹

B. Increased Use of Glyphosate Has Contributed to Monarch Population Decline

The expanded use of glyphosate has contributed to a sharp decrease in monarch population levels, through the herbicide’s large-scale suppression of milkweed. Milkweed is a perennial plant in the *Asclepiadaceae* family, and common milkweed is native to northcentral and northeastern United States.³² Members of this plant family constitute the sole food source for

²⁷ Memorandum (BEAD Responses to Selected Glyphosate Comments) from Derek Berwald, Economist, Biological and Econ. Analysis Div., EPA, to Jude Andreasen, Chemical Review Manager, Pesticide Re-Evaluation Div., EPA 5 (Dec. 16, 2009).

²⁸ *Id.*

²⁹ 2009 Glyphosate Final Work Plan, *supra* note 1, at 4.

³⁰ *Id.*

³¹ Email from Khue Nguyen, Chemical Review Manager, U.S. EPA, to Margaret Hsieh, NRDC (Feb. 3, 2014).

³² R.G. Hartzler & D.D. Buhler, Occurrence of Common Milkweed (*Asclepias syriaca*) in Cropland and Adjacent Areas, 19 Crop Protection 363, 363 (2000).

monarch larvae.³³ Stable isotope analysis has revealed that 50% of the North American monarch population that overwinters in Mexico fed on milkweed in the Midwestern United States during their lifecycle.³⁴

Glyphosate is applied in part to control milkweed.³⁵ Because glyphosate is also detrimental to crops, however, its use was not widespread until the creation and approval of glyphosate-resistant crops.³⁶ The rapid replacement of traditional crop strains with glyphosate-resistant strains substantially accelerated an increase in the use of glyphosate, contributing to a significant decline in milkweed communities.³⁷ Prior to the widespread adoption of glyphosate-resistant crops, for example, a 1999 survey of croplands in Iowa found that approximately 50% of all corn and soybean fields contained common milkweed.³⁸ By 2009, milkweed was found in only 8% of surveyed fields.³⁹ Additionally, the area occupied by common milkweed in these fields was reduced by 90%.⁴⁰ Since 1996, the adoption of herbicide-resistant corn and soybeans has contributed to approximately 150 million acres of habitat loss for monarchs; this loss is

³³ *Id.*

³⁴ L.I. Wassenaar & K.A. Hobson, *Natal Origins of Migratory Monarch Butterflies at Wintering Colonies in Mexico: New Isotopic Evidence*, 95 Proc. Nat'l Acad. Sci. U.S. 15436, 15439 (1998).

³⁵ See Pleasants & Oberhauser, *supra* note 12, at 2; W.A. Pline et al., *Weed and Herbicide-resistant Soybean (Glycine max) Response to Glufosinate and Glyphosate Plus Ammonium Sulfate and Pelargonic Acid*, 14 Weed Tech. 667, 667 (2000).

³⁶ See *supra* Section III.A.

³⁷ See *id.*

³⁸ Hartzler, *supra* note 18, at 1542.

³⁹ *Id.*

⁴⁰ *Id.*

likely to increase as uncultivated lands are increasingly converted into cropland planted with glyphosate-resistant crops.⁴¹

There has been a pronounced loss of both agricultural and non-agricultural habitat for monarchs since the adoption of glyphosate-resistant crops.⁴² Agricultural milkweed has disappeared at a faster rate, however, and its loss is particularly detrimental to monarchs.⁴³ Studies have shown that monarchs in the Midwest preferentially use milkweed in agricultural habitat versus non-agricultural habitat, with soy and corn fields producing over 70 times more monarchs than non-agricultural habitats in Iowa, Minnesota, and Wisconsin.⁴⁴ This pattern of monarchs preferring agricultural over non-agricultural sites was recently confirmed by Pleasants and Oberhauser in 2012.⁴⁵

The disappearance of milkweed along monarch migratory paths has had a significant impact on monarch production.⁴⁶ Adult females must now travel further and expend more energy

⁴¹ See Chip Taylor, *Monarch Population Status*, MonarchWatch.org (Jan. 29, 2014, 12:10 PM), <http://monarchwatch.org/blog/2014/01/monarch-population-status-20/>; see also Scott Faber et al., *Plowed Under: How Crop Subsidies Contribute to Massive Habitat Losses* 8 (2012), available at http://static.ewg.org/pdf/plowed_under.pdf (documenting numbers of acres of grasslands, wetlands, and shrub lands converted to corn and soybean farmland between 2008 and 2011).

⁴² See Pleasants & Oberhauser, *supra* note 12, at 3-5.

⁴³ See *id.* at 3-6

⁴⁴ See K.S. Oberhauser et al., *Temporal and Spatial Overlap Between Monarch Larvae and Corn Pollen*, 98 Proc. Nat'l Acad. Sci. U.S. 11913, 11917 (2001).

⁴⁵ Pleasants & Oberhauser, *supra* note 12, at 8.

⁴⁶ See *id.* at 1-10; see also Ctr. for Food Safety, *Correlation Between Glyphosate Use and Monarch Migration Routes and Breeding*, <http://www.centerforfoodsafety.org/issues/304/pollinators-and-pesticides/map-of-monarch-migration-breeding-and-glyphosate-use#> (last visited Feb. 19, 2014).

to find milkweed plants on which to lay their eggs.⁴⁷ With depleted body fat, the butterflies lay fewer eggs and face a heightened risk of dying before having the chance to reproduce.⁴⁸ Over the period marked by increased glyphosate-use and planting of glyphosate-resistant corn and soy, Pleasants and Oberhauser examined monarch production in the Midwest as measured by the number of eggs and larvae on milkweed.⁴⁹ They found a 58% decline in milkweed across the Midwest landscape and an 81% decrease in monarch production in the Midwest from 1999 to 2010.⁵⁰ During this time, there was also a 65% decrease in the size of the entire monarch population overwintering in Mexico.⁵¹

According to a survey of this population, taken just this winter, the area inhabited by overwintering monarchs has shrunk to an all-time low: a mere 1.65 acres, the equivalent of about one-and-a-quarter football fields.⁵² Not only was this a record low, but it was only 56% percent of last year's acreage, which was itself a record low.⁵³ The area of winter habitat occupied by monarchs, which has been surveyed annually since 1993, provides a proxy for the number of

⁴⁷ Wines, *supra* note 7.

⁴⁸ *Id.*

⁴⁹ See Pleasants & Oberhauser, *supra* note 12, at 1.

⁵⁰ *See id.*

⁵¹ *Id.* at 8; see also L.P. Brower et al., *Decline of Monarch Butterflies Overwintering in Mexico: Is the Migratory Phenomenon at Risk?*, Insect Conservation and Diversity, at 1 (2011).

⁵² Wines, *supra* note 7; see E. Rendón-Salinas & G. Tavera-Alosno, *Monitoreo de la Superficie Forestal Ocupada por las Colonias de Hibernación de la Mariposa Monarca en Diciembre de 2013*, at 1, http://awsassets.panda.org/downloads/monitoreo_mariposa_monarca_en_mexico_2013_2014.pdf (last visited Jan. 29, 2014); World Wildlife Fed'n, *La Migración de la Mariposa Monarca en Riesgo de Desaparecer*, WWF Mexico (Jan. 29, 2014), <http://www.wwf.org.mx/?214870/La-migracin-de-la-mariposa-Monarca-en-riesgo-de-desaparecer>.

⁵³ Wines, *supra* note 7.

butterflies that survive the arduous, 2,500-plus-mile journey between Canada and Mexico.⁵⁴ This winter's survey reflected a remaining population of about only 33.5 million butterflies—down from a long-term average annual count of approximately 350 million individuals over the last 15 years.⁵⁵

The migrating monarch population has so diminished that its prospects for recovering to levels observed even five years ago are fading.⁵⁶ With fewer individuals, the population may be increasingly vulnerable to stressors such as climate change, extreme weather events, and deforestation.⁵⁷ The potential approval of new herbicide-resistant crops,⁵⁸ which may facilitate substantial increased use of other herbicides that further eliminate milkweed, poses an additional threat to monarchs. In the face of steep, continuing population decline, the phenomenon of monarch migration is at risk of disappearing.⁵⁹

IV. THERE IS AN URGENT NEED FOR INTERIM ADMINISTRATIVE REVIEW AND APPROPRIATE RESTRICTIONS ON GLYPHOSATE USE

The precipitous drop in monarch numbers constitutes an “unreasonable adverse effect[] on the environment,” 7 U.S.C. § 136d(b), arising from glyphosate’s use “in accordance with widespread and commonly recognized practice,” *id.* In light of this significant adverse impact,

⁵⁴ *Id.*

⁵⁵ Fallon, *supra* note 7.

⁵⁶ Wines, *supra* note 7.

⁵⁷ Pleasants & Oberhauser, *supra* note 12, at 9; Wines, *supra* note 7.

⁵⁸ See Animal Plant and Health Inspection Serv. (APHIS), USDA, *Petitions for Determination of Nonregulated Status*, http://www.aphis.usda.gov/biotechnology/petitions_table_pending.shtml#not_reg (last visited Jan. 31, 2014) (listing genetically modified crops, including those with tolerance to various herbicides, for which petitions for determination of nonregulated status have been filed).

⁵⁹ Wines, *supra* note 7.

EPA should undertake immediate, interim review of glyphosate's registrations and take measures to mitigate the harm to monarchs. *See id.* §§ 136a(c)(8), 136d(b); 40 C.F.R. § 155.56. In doing so, the agency should ensure that restricting glyphosate use does not result in intensified use of other herbicides that may be just as detrimental to monarchs, and that may pose human health risks.

EPA's prior decision to reregister glyphosate in 1993 rested on information that is now outdated. The current data reflect levels of glyphosate use, in terms of both amount and acreage, that exceed pre-1993 levels by more than a factor of ten. Although EPA is currently undertaking registration review of glyphosate, the agency's preliminary problem formulation for the ecological risk of glyphosate did not identify the herbicide's adverse effects on monarchs as a relevant environmental risk.⁶⁰ Moreover, EPA's schedule for reviewing glyphosate is far too slow. Given the rapid decline in monarch numbers, EPA should take immediate steps to review and restrict glyphosate's uses, rather than wait until 2015, when the agency is currently scheduled to issue a final registration review decision.

In light of new information on glyphosate's usage and effects on monarchs, EPA should also immediately undertake to reweigh the "economic, social, and environmental costs and benefits," 7 U.S.C. § 136(bb), of glyphosate's registrations. As part of this process, the agency should determine what amount of milkweed, in which geographical areas, is necessary to sustain a monarch population free from unreasonable risks. In reweighing the costs and benefits of glyphosate, the agency should also take into account the cumulative impact on milkweed and

⁶⁰ *See* Memorandum (Registration Review - Preliminary Problem Formulation for the Ecological Risk and Drinking Water Exposure Assessments for Glyphosate and Its Salts) from Pamela Hurley, Toxicologist, et al., Env'tl. Fate and Effects Div., Office of Pesticide Programs, EPA, to John Pates, Chem. Review Manager, Special Review and Reregistration Div., EPA (June 5, 2009).

monarchs posed by other herbicides—including those that may undergo a dramatic increase in use if additional herbicide-resistant crops are approved. If necessary, EPA should “identify data or information required to complete the review, and include schedules for submitting the required data.” 40 C.F.R. § 155.56.

Among other data, EPA should gather information on non-agricultural uses of glyphosate, including use on roadsides and along utility rights-of-way.⁶¹ Although roadsides comprise a relatively small proportion of land, they nevertheless constitute important monarch habitat.⁶² Roadsides tend to be uniformly distributed throughout the landscape, extend along monarch migratory pathways, and may serve as important egg-laying sites.⁶³ In 2010, 20% of milkweeds were found in roadsides, and this percentage will likely increase as remaining agricultural milkweeds disappear.⁶⁴ Like roadways, utility rights-of-way also extend along monarch migratory routes, and may provide habitat for the butterflies.⁶⁵ Moreover, milkweed is generally compatible with utility rights-of-way; because of its low height, milkweed is less likely

⁶¹ According to the data underlying EPA’s decision to reregister glyphosate back in 1993, non-agricultural uses comprised 33% of all glyphosate applied in a typical year between 1989 and 1991. 1993 Glyphosate R.E.D., *supra* note 13, at 9.

⁶² *See, e.g.*, Hartzler, *supra* note 18, at 1543 (noting that roadsides comprise approximately 330,000 hectares of land in Iowa); Taylor, *supra* note 41 (reporting that “the area from the edge of the road to the edge of the field was about 1% of the total land area in most eastern states”); *see also* Jennifer L. Hopwood, *Roadsides as Habitat for Pollinators: Management to Support Bees and Butterflies*, Proc.2013 Int’l Conf. Ecology and Transp., at 1 (2013).

⁶³ *See* Hartzler, *supra* note 18, at 1543; V.A. Wojcik & S. Buchmann, *Pollinator Conservation and Management on Electrical Transmission and Roadside Rights-of-way: A Review*, 7 *Journal of Pollination* 16, 24 (2012).

⁶⁴ *See* Pleasants & Oberhauser, *supra* note 12, at 9.

⁶⁵ Wojcik & Buchmann, *supra* note 63, at 24.

to interfere with access for maintenance or emergency crews.⁶⁶ Restricting unnecessary glyphosate use along roadsides and utility rights-of-way has the potential to conserve monarch habitat.

There is, however, no good data on how much glyphosate is used on roadsides and utility rights-of-way, and it is unclear whether EPA has sought to collect this data.⁶⁷ To evaluate the extent of harm to monarchs, the agency should, at a minimum, collect state-specific information about all glyphosate use on roadsides and utility rights-of-way. It should also survey effective roadside and utility right-of-way vegetation management programs that do not rely heavily on herbicides and that allow milkweed to remain.⁶⁸ It is impossible for EPA to make an informed decision about this and other non-agricultural uses of glyphosate without knowing how many pounds are used each year and where, and without knowing the potential impact of those applications on monarchs.

In addition, EPA should also collect information necessary for assessing, in light of harm to monarchs, what restrictions are necessary on agricultural uses of glyphosate. Notably,

⁶⁶ Am. Transmission Co., *Trees and Vegetation Management*, <http://www.atcllc.com/learning-center/trees-and-vegetation/> (last visited Feb. 14, 2014); *see also* Univ. of Nevada Cooperative Extension, *Nevada Pesticides Applicator's Certification Workbook* 229 (rev. ed. 2013) (“Selective applications of herbicides should be used to reduce or eliminate taller vegetation while maintaining lower-growing plants that do not interfere with site goals.”).

⁶⁷ *See, e.g.*, Haddad, *supra* note 22, at 2 (explaining that EPA’s December 2012 screening level usage analysis for glyphosate did not estimate how much of the herbicide was used on non-agricultural sites, and that “[a] separate request must be made to receive these estimates”).

⁶⁸ *See, e.g.*, Hartzler, *supra* note 18, at 1543 (“Herbicide use on Iowa roadsides has declined since the establishment of an integrated roadside vegetation management program in 1988, which likely contributes to the high frequency of occurrence of common milkweed in this habitat.” (internal citation omitted)); Monarch Joint Venture, *Creating Habitat in Corporate Landscapes and Utility Right-of-Way Areas*, <http://monarchjointventure.org/our-work/creating-habitat-in-corporate-landscapes> (last visited February 14, 2014) (“Utility rights-of-way, the large swaths of land cleared for power lines and pipelines, are ideal for planting monarch habitat.”).

common milkweed in agricultural fields “rarely reaches population densities that impact crop yield and typically does not drive weed management decisions.”⁶⁹ The agency should gather data on the extent to which milkweed is compatible with different crops. It should also assess the feasibility of herbicide-free and reduced-herbicide weed management programs that selectively permit compatible milkweed growth in agricultural settings.

After EPA has completed its interim review, the agency should restrict uses of glyphosate, and/or impose risk mitigation measures, to eliminate unreasonable adverse effects to monarchs. Among other measures, the agency should consider, at a minimum:

- restricting or prohibiting use of glyphosate and other herbicides along roads, power lines, and other rights-of-way;
- requiring herbicide-free buffer zones around, or safe harbors within, agricultural areas along monarch migratory corridors;
- requiring the creation of milkweed-friendly habitat zones, where use of glyphosate and other herbicides is prohibited, in both agricultural and non-agricultural settings;
- protecting monarchs from further harm when approving or reapproving herbicide uses, by guarding against potential dramatic increases in herbicide use as a result of new herbicide-resistant crops, such as glyphosate-resistant wheat⁷⁰; and
- assessing the risks to monarchs posed by cosmetic and ornamental uses of glyphosate.

⁶⁹ Hartzler, *supra* note 18, at 1542.

⁷⁰ See APHIS, *supra* note 58 (identifying glyphosate-resistant crops that have been deregulated or are pending deregulation).

To the extent that EPA can act more quickly to implement some mitigation measures before others, it should do so, without waiting to implement all mitigation measures simultaneously at a future time. For example, if EPA is already prepared to limit or ban uses of glyphosate on roadsides and rights-of-way, it should do so immediately and implement other mitigation measures thereafter. NRDC recognizes that EPA may have already started to examine glyphosate's adverse effects on butterflies, and the interim review process authorizes EPA to undertake immediately the urgent measures needed to mitigate these effects, without waiting for completion of the agency's ongoing registration review.

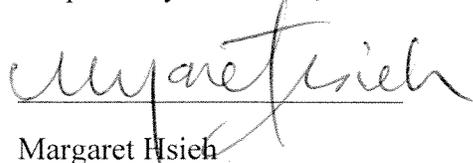
EPA should moreover ensure that implementation of these and other mitigation measures does not simply lead to increased use of alternative herbicides that may be equally harmful to monarchs, and that may cause adverse health effects. And to the extent that the agency approves new herbicide uses on new herbicide-resistant crops, it should impose comparable mitigation measures to avoid unreasonable adverse effects to monarchs, taking into consideration the potential for sharp increases in herbicide use in the wake of the new crop approvals.

V. CONCLUSION

The dramatic increase in glyphosate use since EPA reregistered the pesticide more than twenty years ago, combined with the severe declines in monarch butterfly population levels in recent years, compel EPA to conduct an urgent interim registration review of glyphosate and to restrict the pesticide's use to protect monarchs. Given the critical circumstances here, we ask EPA to initiate this review within thirty days and complete the review within six months. To the extent EPA believes it needs to collect further data before taking action to restrict the pesticide's use, it should do so promptly, and complete that data collection within five months.

NRDC reserves the right to supplement this petition based on new information.

Respectfully submitted,



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Office of Pesticide Programs (OPP) Regulatory Public Docket (7502P)