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POLLINATOR HEALTH

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EXECUTIVE SUMMARY

Pollinators, a diverse group of animals including bees, butterflies, moths, and birds, provide valuable support to agriculture and natural ecosystems. In Wisconsin, as elsewhere, pollinators have experienced notable declines in recent decades as a result of several separate but sometimes interrelated causes, including pests and disease, pesticide exposure, and habitat loss.

Recognizing the significance of pollinators and the threats they face, lawmakers nationwide, at all levels of government, have taken action to promote pollinator health. Specifically in state legislatures, bipartisan efforts have resulted in legislation to secure pollinator habitat, promote beekeeping, support awareness and research, and reduce pesticide exposure. According to the National Conference of State Legislatures (NCSL), at least 28 states have enacted pollinator health legislation in recent years.

Noting bipartisan recognition of the importance of pollinators to Wisconsin's agricultural, ecological, and economic health, the Joint Legislative Council Co-Chairs directed Legislative Council staff to prepare this interim research report. The report presents options for legislation to support Wisconsin pollinators, based on stakeholder input, relevant scientific literature, and approaches taken by other states and at the federal level.

The report: summarizes relevant background information regarding Wisconsin pollinators (Part I); describes state and federal laws and programs that support pollinator health (Part II); highlights examples of various public and private initiatives (Part III); and presents options for legislation (Part IV).

The options for legislation fall in the following five categories:

- Expanding pollinator habitat.
- Supporting research, monitoring, and public education.
- Changes relating to beekeeping.
- Best practices in pest management.
- A coordinated approach to state policy on pollinator health.

The report appendices list the many entities and individuals who provided feedback and information in the preparation of this report and provide a compilation of submitted letters.

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PART I
BACKGROUND

Pollinators such as bees, butterflies, moths, and birds support the reproduction of nearly 90 percent of the world's flowering plants.[1] This role is especially significant to agriculture, where 35 percent of food crop production relies upon these animals for fruit or seed set.[2] That reliance translates to vast economic impacts, with pollinators estimated to support between $235 billion and $577 billion in annual crop production worldwide.[3] While more challenging to quantify, pollinators also provide substantial benefits to natural ecosystems, supporting plants that reduce soil erosion, promote water quality, and provide food and habitat for diverse species.[4] Together, the importance of pollinators to agricultural and natural systems has prompted bipartisan interest in promoting and protecting these species nationwide.

POLLINATORS IN WISCONSIN

As in other states, pollinators are vital contributors to Wisconsin's agricultural, ecological, and economic health. Numerous Wisconsin crops depend on pollinators, including cranberries, apples, cherries, snap beans, and cucumbers. According to the U.S. Department of Agriculture (USDA) National Agricultural Statistics Service, Wisconsin's leading pollinator-dependent crops were valued at over $247 million in 2017.[5] Further value may be found in crops with yields that benefit from pollinators, even if the crops are not strictly dependent upon these animals. Finally, honey itself is a notable Wisconsin commodity, with the state's production valued at over $8 million in 2017.[5]

Managed Pollinators

While native pollinators play a role in agricultural pollination, many agricultural producers depend upon managed pollinators (typically honey bees) to support crop production. Through commercial pollination services, producers of crops, such as cranberry and apple, pay a fee to beekeepers for placement of hives. These services can represent a substantial expense for producers. For example, a 2017 University of Wisconsin (UW)-Madison study estimated that each

[1] Ollerton, J.; Winfree, R.; Tarrant, S. How many flowering plants are pollinated by animals? *Oikos*. **2011**, *120* (3), 321–326. DOI: 10.1111/j.1600-0706.2010.18644.x.
[2] Klein, A.; Vaissière, B.E.; Cane, J.H.; Steffan-Dewenter, I.; Cunningham, S.A.; Kremen, C.; Tscharntke. Importance of pollinators in changing landscapes for world crops. *Proceedings of the Royal Society B: Biological Sciences*. **2007**, *274*, 303–313. DOI: 10.1098/rspb.2006.3721.
[3] Lautenbach, S.; Seppelt, R.; Liebscher, J.; Dormann, C.F. Spatial and Temporal Trends of Global Pollination Benefit. *PLoS ONE*. **2012**, *7* (4), e35954. DOI: 10.1371/journal.pone.0035954.
[4] U.S. Forest Service, *Why is Pollination Important?*, (n.d.), https://www.fs.fed.us/wildflowers/pollinators/importance.shtml.
[5] USDA National Agricultural Statistics Service, *2019 Wisconsin Agricultural Statistics*, (September 2019), https://www.nass.usda.gov/Statistics_by_State/Wisconsin/Publications/Annual_Statistical_Bulletin/2019AgStats-WI.pdf.

Wisconsin cranberry farm may spend between $2,555 and $45,990 each year on honey bee pollination.[6] Indeed, pollination service fees are the leading source of revenue for beekeepers nationwide, with revenue from fees slightly exceeding that derived from honey sales.[7]

While local beekeepers may provide pollination services, many agricultural producers look to migratory beekeeping operations for their pollination needs. These operations transport bees around the nation to meet pollination demands for crops blooming at different times of year. Each February, most migratory beekeepers converge on California's almond orchards. In spring and summer, many migratory beekeepers then travel to alfalfa, clover, and sunflower fields in North and South Dakota, where bees produce much of their honey for the year. Alternatively, others may travel to provide pollination to diverse crops across the nation, such as apples in Washington, blueberries in Michigan, or cranberries in Wisconsin. When winter returns, these operations return to states such as California, Texas, and Florida to overwinter their hives.[8]

In Wisconsin, the import of honey bee hives is regulated by the state's Department of Agriculture, Trade and Consumer Protection (DATCP). As described in Part II, state law generally prohibits individuals from importing live honey bees or beekeeping equipment without first reporting the shipment to DATCP. Generally, the report must include certifications that the bees or beekeeping equipment are free from certain pests and pathogens. Some stakeholders expressed concern regarding DATCP's limited enforcement of these rules, highlighting the risk that diseased or infested hives may pose to Wisconsin beekeepers.

Honey Bee Losses

Although the number of United States honey bee colonies has remained stable in recent decades, elevated winter loss rates have drawn attention to threats facing managed pollinators. Nationwide, winter loss rates have averaged 27.5 percent since 2007, nearly double the historically typical rate of 15 percent.[9,10] Over the same period, Wisconsin's losses averaged 28.4 percent, comparable to the national rate.[11] These increased losses can increase beekeeper costs, which may be passed along to agricultural producers.

One of the leading drivers of colony loss is Colony Collapse Disorder (CCD), a phenomenon first identified in 2006. When CCD occurs, the majority of a colony's worker bees disappear suddenly, leaving behind a queen and brood (young) that cannot sustain itself. Researchers have identified a

[6] Gaines-Day. H.R.; Gratton, C. Understanding Barriers to Participation in Cost-Share Programs For Pollinator Conservation by Wisconsin (USA) Cranberry Growers. *Insects*. **2017**, *8* (3), 79. DOI: 10.3390/insects8030079.
[7] USDA National Agricultural Statistics Service, *Honey Report*, (March 2020), https://downloads.usda.library.cornell.edu/usda-esmis/files/hd76s004z/v979vm595/dn39xk32q/hony0320.pdf.
[8] Ferris Jabr, *The Mind-Boggling Math of Migratory Beekeeping*, Scientific American (September 1, 2013), https://www.scientificamerican.com/article/migratory-beekeeping-mind-boggling-math/.
[9] Bee Informed Partnership, *National Management Survey*, (2020), https://research.beeinformed.org/survey/.
[10] Peyton M. Ferrier, Randal R. Rucker, Walter N. Thurman, Michael Burgett, *Economic Effects and Responses to Changes in Honey Bee Health*, USDA Economic Research Service (March 2018), https://www.ers.usda.gov/webdocs/publications/88117/err-246.pdf?v=.
[11] Bee Informed Partnership. *National Management Survey*, (2020), https://research.beeinformed.org/survey/.

range of potential causes of CCD, including pathogens, pesticides, changes in forage habitat, and stress experienced from management practices.[12]

Native Pollinators

In addition to its managed pollinators, Wisconsin is home to a diverse population of native pollinators, including approximately 400 species of bees.[13] However, a number of Wisconsin's native pollinators have been found to be in decline. For example, various Wisconsin bees, including the American bumble bee (*Bombas pensylvanicus*) and the yellow-banded bumble bee (*Bombus terricola*), have experienced declines across North America.[14] Additionally, Wisconsin provides habitat to the rusty-patched bumble bee (*Bombas affinis*), a species that has experienced an 87 percent decline over the past 20 years. In 2017, these declines led the species to become the first bee granted protections under the federal Endangered Species Act (ESA).[15]

In addition to its native bees, Wisconsin also provides habitat to a number of endangered species of butterfly and moth. These species include the Karner blue butterfly (*Plebejus melissa samuelis*), designated endangered under the federal ESA, as well as a number of butterflies and moths listed as endangered under Wisconsin law.[16] Wisconsin also lies along the migration route for the monarch butterfly (*Danaus plexippus*), an iconic pollinator that has experienced an 80 percent decline in recent decades.[17]

POLLINATOR HEALTH THREATS

Though crucial to agricultural and natural systems, pollinators face an array of threats, including pathogens and pests, pesticide exposure, and habitat loss. While certain threats have disparate effects upon managed and native species, many threats nevertheless impact both classes of pollinator. Threats facing pollinator populations may have cumulative or synergistic impacts, with no lone threat driving pollinator loss.

Pathogens and Pests

Mortality due to pathogens and pests is a significant cause of managed pollinator losses. One of the leading threats to managed honey bee colonies is the invasive *Varroa* mite. Since it was first detected in the United States in Wisconsin in 1987, this pest has since become ubiquitous across

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[12] U.S. Environmental Protection Agency, *Colony Collapse Disorder*, (April 2018), https://www.epa.gov/pollinator-protection/colony-collapse-disorder.
[13] Wolf, A.T.; Ascher, J. S. Bees of Wisconsin (Hymenoptera: Apoidea: Anthophila). *Great Lakes Entomologist*. **2008**, *41* (1 & 2), 129–168.
[14] Cameron, S. A.; Lozier, J. D.; Strange, J. P.; Koch, J. B.; Cordes, N.; Solter, L. F.; Griswold, T. L. Patterns of widespread decline in North American bumble bees. *Proceedings of the National Academy of Sciences*. **2011**, *108* (2), 662–667. DOI: 10.1073/pnas.1014743108.
[15] 82 Fed. Reg. 3186 (2017).
[16] 57 Fed. Reg. 59236 (1992).
[17] Semmens, B.X.; Semmens, D.J.; Thogmartin, W.E.; Wiederhold. R.; López-Hoffman, L.; Diffendorfer, J.E.; Pleasants, J.M.; Oberhauser, K.S.; Taylor, O.R. Quasi-extinction risk and population targets for the Eastern, migratory population of monarch butterflies (*Danaus plexippus*). *Scientific Reports*. **2016**, *6*, 23265. DOI: 10.1038/srep23265.d

the country.[18] While the mite directly harms bees through parasitism, it also acts as a vector for debilitating viruses such as deformed wing virus and acute bee paralysis virus.[19] Other significant threats to honey bees include American foulbrood, a bacterial disease that kills immature bees, and *Nosema*, a fungal gut disease.[20]

While concerns surrounding pathogens and pests center on managed pollinators, these threats may also afflict native pollinator populations.[21,22] For example, this so-called "spillover" of pathogens and pests to native bumble bee populations may be a contributor to their ongoing decline.[23]

Habitat Loss

As with numerous other species, the loss and degradation of habitat poses a significant threat to pollinators. While pollinators can forage nectar and pollen from a variety of landscapes, they particularly benefit from habitat with diverse and abundant floral resources.[24] However, such habitat is increasingly scarce due to a variety of human actions, including shifts in agricultural practices and increasing urbanization.

While agricultural fields can provide foraging resources for pollinators, modern, intensive agricultural practices can pose challenges. For example, monocultures (i.e., the cultivation of only a single crop in a field) have often replaced more complex cropping systems.[25] In turn, these increasingly homogenous landscapes reduce the availability of foraging resources and nesting sites for pollinators.[26] Similarly, the consolidation and expansion of farm fields can remove uncultivated features such as hedgerows and brushy margins, further limiting pollinator habitat. Ultimately, habitat loss in agricultural settings can reduce the effectiveness of natural pollination services. However, efforts to preserve habitat may be beyond the capacities of individual producers, forcing tradeoffs between conservation and economic interests.

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[18] Wenner, A.M.; Bushing, W.W. *Varroa* mite spread in the United States. *Bee Culture*. **1996**, *124* (6), 341–343.
[19] Jamie Ellis, *Biotic Stressors of Honey Bee Colonies*, American Bee Journal (July 2016), http://entnemdept.ufl.edu/media/entnemdeptifasufledu/honeybee/pdfs/31,-July-2016,-Biotic-Stressors-of-Honey-Bees,-low-res.pdf.
[20] *Id.*
[21] Graystock, P.; Goulson, D.; Hughes, W.O.H. Parasites in bloom: flowers aid dispersal and transmission of pollinator parasites within and between bee species. *Proceedings of the Royal Society B: Biological Sciences*. **2015**, 282, 20151371. DOI: 10.1098/rspb.2015.1371.
[22] Singh, R.; Levitt, A.L.; Rajotte, E.G.; Holmes, E.C.; Ostiguy, N.; vanEnglesdorp. D.; Lipkin, W.I.; dePamphilis, C.W.; Toth, A.L.; Cox-Foster, D.L. RNA Viruses in Hymenopteran Pollinators: Evidence of Inter-Taxa Virus Transmission via Pollen and Potential Impact on Non-*Apis* Hymenopteran Species. *PLoS ONE*. **2010**, *5*, e14357. DOI: 10.1371/journal.pone.0014357.
[23] Otterslatter, M.C.; Thomson, J.D. Does Pathogen Spillover from Commercially Reared Bumble Bees Threaten Wild Pollinators? *PloS ONE*. **2008**, *3* (7), e2771. DOI: 10.1371/journal.pone.0002771.
[24] Mallinger, R.E.; Gibbs, J.; Gratton, C. Diverse landscapes have a higher abundance and species richness of spring wild bees by providing complementary floral resources over bees' foraging periods. *Landscape Ecology*. **2016**, *31*, 1523–1535. DOI; 10.1007/s10980-015-0332-z.
[25] Plourde, J.D.; Pijanowski, B.C.; Pekin, B.K. Evidence for increased monoculture cropping in the Central United States. *Agriculture, Ecosystems & Environment*. **2013**, *165*, 50–59. DOI: 10.1016/j.agee.2012.11.011.
[26] Kennedy, C.M. et al. A global quantitative synthesis of local and landscape effects on wild bee pollinators in agroecosystems. *Ecology Letters*. **2013**, *16*, 584–599. DOI: 10.1111/ele.12082.

Similar to shifts in agricultural practices, urbanization also impacts pollinator populations. Pollinators are particularly influenced by the intensity of urbanization, measured as the share of manmade elements in a landscape. Intense urbanization is particularly detrimental to pollinator abundance and diversity, reducing available habitat and increasing pollinator exposure to air and water pollution.[27] Conversely, green spaces in urban landscapes may support diverse and abundant pollinator populations, even when these spaces are unevenly distributed.[28,29]

Pesticide Exposure

Though various pesticides impact pollinators, scrutiny has centered on neonicotinoids. Neonicotinoids, the most widely used class of pesticides in the world, are systemic pesticides used in both landscaping and agriculture. As systemic pesticides, they function by being absorbed into plants and distributed throughout the plant tissue, harming pests that feed upon them. While neonicotinoids are applied using a variety of methods, they are most commonly used as seed treatments to preemptively combat various pests. A 2011 study estimated that about 40 percent of soybean and over 80 percent of corn acres nationwide were planted with neonicotinoid-treated seed.[30]

While there is a continued need for research into neonicotinoid impacts, a substantial body of research has demonstrated their potentially deleterious effects on pollinators.[31] Observed effects in bees include altered foraging behavior, reduced colony growth, and impaired learning and memory.[32] Additional concerns exist when neonicotinoids are combined with other pollinator stressors (such as pathogens or other pesticides), with potential additive or synergistic effects.[33]

Along with neonicotinoids, stakeholders highlighted issues posed by other broad-spectrum pesticide applications. For example, spraying for mosquitos and other nuisance insects can harm pollinators. Certain practices such as spraying in the evening and avoiding flowering plants can

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[27] Geslin, B.; Le Féon, V.; Folschweiller, M.; Flacher, F.; Carmignac, D.; Motard, E.; Perret, S.; Dajoz, I. The proportion of impervious surfaces at the landscape scale structures wild bee assemblages in a densely populated region. *Ecology and Evolution*. **2016**, *6* (18), 6599–6615. DOI: 10.1002/ece3.2374.

[28] Tonietto, R.; Fant, J.; Ascher, J.; Ellis, K.; Larkin, D. A comparison of bee communities of Chicago green roofs, parks and prairies. *Landscape and Urban Planning*. **2011**, *103* (1), 102–108. DOI: 10.1016/j.landurbplan.2011.07.004.

[29] Cane, J.H. Habitat Fragmentation and Native Bees: a Premature Verdict? *Ecology and Society*. **2001**, *5* (1). DOI: 10.5751/ES-00265-050103.

[30] Douglas, M.R.; Tooker, J.F. Large-Scale Deployment of Seed Treatments Has Driven Rapid Increase in Use of Neonicotinoid Insecticides and Preemptive Pest Management in U.S. Field Crops. *Environmental Science & Technology*. **2011**, *49*, 5088−5097. DOI: 10.1021/es506141g.

[31] Lundin, O.; Rundlöf, M.; Smith. H.G.; Fries. I; Bommarco, R.; Neonicotinoid Insecticides and Their Impacts on Bees: A Systematic Review of Research Approaches and Identification of Knowledge Gaps. *PLoS ONE.* **2015**, *10* (8), e0136928. DOI: 10.1371/journal.pone.0136928.

[32] Pollinator Network @ Cornell, *Neonicotinoids*, Cornell College of Agriculture and Life Sciences (n.d.), https://pollinator.cals.cornell.edu/threats-wild-and-managed-bees/pesticides/neonicotinoids/.

[33] Lundin, O.; Rundlöf, M.; Smith. H.G.; Fries. I; Bommarco, R. Neonicotinoid Insecticides and Their Impacts on Bees: A Systematic Review of Research Approaches and Identification of Knowledge Gaps. *PLoS ONE.* **2015**, *10* (8), e0136928. DOI: 10.1371/journal.pone.0136928.

limit pollinator exposure to these chemicals.[34] However, improper applications and pesticide drift may present concerns.

Other Threats to Pollinator Health

In addition to the primary threats described above, pollinators face a variety of other challenges. For example, beekeeping practices can substantially impact pollinator health, even beyond issues related to pathogen and pest management. For instance, migratory management of honey bees (i.e., transporting hives to pollinate fields across the country) has been linked to increased oxidative stress relative to stationary bees. This added stress from migratory management may be a contributor to CCD.[35]

Native and managed pollinators are also impacted by various invasive species. Though the *Varroa* mite (discussed previously) is perhaps the most significant invasive challenge, invasive species of pollinators may themselves pose a threat. A recent example is the Asian giant hornet, the so-called "murder hornet." First sighted in the United States in 2019, Asian giant hornets can attack and destroy honey bee hives.[36] Various invasive plants may also impact pollinators, with complex effects. While invasive plants can outcompete native species that support pollinators, invasive plants may also benefit pollinators by providing additional foraging resources. However, this benefit comes at a cost, as pollinator visits to invasive plants can deprive native species of pollination services.[37]

Climate change is expected to widely and significantly impact pollinators. Many plants have already responded to warming temperatures with earlier flowering each year.[38] Pollinators have responded similarly, with research finding earlier emergence dates for various butterflies and bees.[39,40] While these impacts on plants and pollinators act largely in parallel, there are concerns about potential temporal mismatches between plants and pollinators. Research will continue to elucidate these impacts as well as the myriad other impacts that climate change is expected to have upon pollinators.

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[34] David Smithley et al., *Potential impact of mosquito and nuisance insect sprays on pollinators*, Michigan State University Extension (May 1, 2019), https://www.canr.msu.edu/news/potential-impact-of-mosquito-and-nuisance-insect-sprays-on-pollinators.

[35] Simone-Finstrom, M.; Li-Byarlay, H.; Huang, M.H.; Strand, M.L.; Rueppelli, O.; Tarpy, D.R. Migratory management and environmental conditions affect lifespan and oxidative stress in honey bees. *Scientific Reports*. **2016**, *6*, 32022. DOI: 10.1038/srep32023.

[36] Animal and Plant Health Inspection Service, *Asian Giant Hornet*. USDA (October 23, 2020). https://www.aphis.usda.gov/aphis/ourfocus/planthealth/plant-pest-and-disease-programs/honey-bees/agh/asian-giant-hornet.

[37] Stout, J.C.; Tiedekan, E.J. Direct interactions between invasive plants and native pollinators: evidence, impacts and approaches. *Functional Ecology*. **2017**, *31*, 38–46. DOI: 10.1111/1365-2435.12751.

[38] Miller-Rushing, A.J.; Primack, R.B.; Mukunda, S. Photographs and Herbarium Specimens as Tools to Document Phenological Changes in Response to Global Warming. *American Journal of Botany*. **2006**, *93* (11), 1667–1674. DOI: 10.3732/ajb.93.11.1667.

[39] Forister, M.L.; Shapiro, A.M. Climatic trends and advancing spring flight of butterflies in lowland California. *Global Change Biology*. **2003**, *9* (7), 1130–1135. DOI: 10.1046/j.1365-2486.2003.00643.x.

[40] Bartomeus, I.; Ascher, J.S.; Wagner, D.; Danforth, B.N.; Colla, S.; Kornbluth, S.; Winfree, R. Climate-associated phenological advances in bee pollinators and bee-pollinated plants. *Proceedings of the National Academy of Sciences*. **2011**, *108* (51), 20645-20649. DOI: 10.1073/pnas.1115559108.

PART II
CURRENT STATE AND FEDERAL LAW AND PROGRAMS

Together with private landowners, advocacy organizations, local governments, and research institutions, state and federal law and programs play an important role in addressing threats to pollinator populations. This part summarizes existing state and federal laws that provide a backdrop for potential legislative action in this area. It also describes selected programs already in place relating to Wisconsin's pollinators. In general, at the state level, programs have been developed as agency initiatives; Wisconsin has not enacted legislation to specifically address pollinator health, as many other states have done.

STATE LAW AND PROGRAMS

A dispersed set of state agencies and programs impact pollinators in Wisconsin. As described below, both DATCP and the Department of Natural Resources (DNR) have important regulatory functions. DATCP's most direct regulatory roles relate to pesticide applicator licensing and the state apiary program, while DNR's primary roles relate to invasive species control, protection of threatened and endangered species, and land management. Both DATCP and DNR also administer programs that affect pollinators more indirectly, such as conservation-related grant programs, land acquisition, water pollution permitting, and development of agricultural standards.

The Department of Transportation (DOT) and the Public Service Commission (PSC) impact pollinators through their roles relating to highway and utility rights-of-way, spaces often used to supplement pollinator habitat.

Finally, UW-Extension, as well as research laboratories at UW-Madison and other UW campuses, support beekeepers and growers with research and technical support. Beekeepers and growers engaged for this report widely stressed the importance of these research and technical support efforts.

Pollinator Protection Plan

DATCP issued the Wisconsin Pollinator Protection Plan in April 2016 to provide scientific background and voluntary guidance relating to pollinators in Wisconsin.[41] DATCP partnered with the UW-Madison Department of Entomology and solicited input from an array of stakeholders to produce the plan. The plan identifies best management practices and generally does not recommend options for changes to state law. Best management practices detailed in the plan include measures for: (1) improving pollinator habitat in lawns and gardens; (2) beekeeping to maximize pollinator health; (3) maximizing pollinator health and pollination services on farms; and (4) improving pollinator habitat in prairies, roadsides, and open spaces. Many of the same groups engaged for the Pollinator Protection Plan were again engaged for this report.

[41] The plan is available at https://datcp.wi.gov/Documents/PPPComplete.pdf.

State Apiary Program

The Wisconsin statutes require DATCP to "maintain surveillance of the beekeeping industry for the detection and prevention of honeybee diseases and pests." DATCP may establish rules, orders, or control measures that it judges to be necessary to prevent, suppress, or control honey bee diseases and pests in Wisconsin, and it has "free access at all reasonable times" to a broad range of places relating to honey bees. [s. 94.76 (1) and (2), Stats.]

Through its apiary program, DATCP offers free, voluntary inspections for both hobbyist and commercial beekeepers. These inspections can help identify various pests and diseases that afflict honey bee hives. The program is staffed by the state apiarist, together with two inspectors hired as limited-term employees.

The apiary program also regulates the import of bees (primarily by migratory beekeepers) through a notification and inspection requirement. Specifically, the statutes prohibit bringing honey bees or related equipment into Wisconsin without first reporting the shipment to DATCP. Any such report must include a certification from an official inspector certifying that the materials have been inspected as required by DATCP and are free from honey bee diseases or pests. [s. 94.76 (4), Stats.]

As implemented by DATCP's administrative rules, a person may submit a single report covering multiple shipments of migratory honey bees in the same calendar year. Together with certain logistical information regarding a proposed shipment, a report must include original copies of the following certificates:

- A certificate showing that the honey bees originate from colonies that are apparently free of infestation by the invasive *Varroa* mite, and that any imported beekeeping equipment is apparently free of *Varroa* mite infestation.
- A certificate showing that the honey bees originate from colonies that are apparently free of American foulbrood.
- If the honey bees originate from a county or parish in which USDA has found undesirable honey bees,[42] a certificate showing that the honey bees are European honey bees, and that any equipment is free of live honey bees.

[s. ATCP 21.13, Wis. Adm. Code.]

Certification of Pesticide Applicators

Although pesticides are primarily regulated at the federal level, Wisconsin has enacted certain state-level restrictions, including licensing and certification requirements for pesticide applicators.[43] Specifically, the statutes require that a commercial applicator must be licensed and

[42] USDA identifies such locations through the Cooperative Agricultural Pest Survey (CAPS) program. Further information is available at https://caps.ceris.purdue.edu/.

[43] Pesticides are regulated at the federal level primarily by two laws: the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA); and the Federal Food, Drug, and Cosmetic Act (FFDCA). For more information, see Legislative Council, *Pesticide Regulation* (Oct. 2019), https://docs.legis.wisconsin.gov/misc/lc/issue_briefs/2019/agriculture/ib_pesticides_el_2019_10_01.

certified before using any pesticide. A private applicator must be certified before using a restricted-use pesticide.[44] DATCP also must establish training and certification standards by rule. In doing so, DATCP may establish separate categories for pesticide use and application. Pesticide applicator certifications are valid for five years. [s. 94.705 (1) (a) and (2), Stats.]

Under DATCP's administrative rules, a person seeking certification as a commercial pesticide applicator must generally obtain training from UW-Extension. Training consists of a self-study manual and, for some certification categories, supplementary training sessions. A prospective pesticide applicator must also pass a certification exam, demonstrating knowledge and competency in certain general areas as well as each category for which the person seeks certification. To pass, an individual must score at least 70 percent on a written test administered by DATCP.[45] [s. ATCP 29.26 (6) and (7), Wis. Adm. Code.]

Pesticide Notification Requirements

DATCP maintains a landscape pesticide registry, through which a person may register to be notified before nearby pesticide applications. Specifically, commercial application businesses must notify people who are registered at least 12 hours before applying pesticides on a registrant's block or an immediately adjacent block. The notification requirement generally applies to applications to turf, ornamental, and mulched areas. Certain pesticide applications are not subject to the notification requirement, including applications to buildings, farm fields, and utility and transportation rights-of-way. [s. ATCP 29.56, Wis. Adm. Code.]

Separate from the landscape pesticide registry, DATCP rules establish notification requirements for applications of certain pesticides that are toxic to bees. A beekeeper can request advance notice of at least 24 hours before an application of any pesticide labeled "Highly Toxic to Bees" or containing the active ingredient methomyl. To receive the notice, a beekeeper within one and a half miles of a pesticide application site must make a written request to the person who owns or controls the application site. DATCP rules specify information that must be included in the request as well as information that must be included in the notice that precedes a pesticide application. [s. ATCP 29.51 (1), Wis. Adm. Code.]

Threatened and Endangered Species Protection

Under the federal ESA, the U.S. Fish and Wildlife Service (FWS) lists animal and plant species as either endangered or threatened, based on factors relating to the risk of extinction.[46] Wisconsin law similarly requires DNR to establish a list of species that are threatened and endangered in this

[44] A restricted-use pesticide is a pesticide for which some or all of the uses are categorized as restricted under FIFRA. [s. 94.67 (31), Stats.]

[45] DATCP's administrative rules also establish criteria under which applicators certified in other states may obtain certification in Wisconsin. [s. ATCP 29.26 (10), Wis. Adm. Code.]

[46] Those factors include: (1) the present or threatened destruction, modification, or curtailment of a species' habitat or range; (2) overutilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) the inadequacy of existing regulatory mechanisms; or (5) other natural or manmade factors affecting the species' continued existence. [16 U.S.C. s. 1533.]

state. [s. 29.604, Stats.; ch. NR 27, Wis. Adm. Code.] A person may not "take"[47] a plant or animal listed on either the state or federal list without a permit. [16 U.S.C. s. 1538 (a) (1); s. 29.604 (4), Stats.]

As noted previously, various species of Wisconsin pollinators have been designated as threatened or endangered under the federal ESA or on the state threatened and endangered species list. Additionally, in December 2020, FWS determined that listing the monarch butterfly under the federal ESA is "warranted but precluded at this time by higher priority listing actions." With this finding, the species becomes a candidate for listing and FWS will review the monarch butterfly's status each year until the agency can develop a proposal for its listing.[48]

Land Management

In Wisconsin, over 5.9 million acres, or approximately 17 percent of state's land area, consists of public conservation land. Of this land, 1.5 million acres is managed by DNR. The remaining 4.4 million acres is managed by a variety of other government entities, including the Board of Commissioners of Public Lands, counties, schools, and the federal government.[49] The state's public lands are managed with a variety of objectives, including outdoor recreation, sustainable timber management, and preservation of natural communities. Many of these objectives may support pollinator health goals. Through its Bureau of Natural Heritage Conservation, DNR has also specifically increased its focus on pollinators in recent years, especially through projects in state natural areas.

The Warren Knowles-Gaylord Nelson Stewardship program may support pollinator health through land purchases that preserve natural areas and wildlife habitat. The stewardship program is administered by DNR and includes land acquisition, property development and local assistance, and recreational boating aids subprograms. The stewardship program is set to sunset in 2022 if it is not reauthorized.

Landowner Incentive Program

As discussed later in the report, cost-share programs relevant to pollinator health are chiefly administered by the federal government. However, the DNR's Landowner Incentive Program (LIP) has also supported pollinator habitat restoration with funding from a FWS State Wildlife Grant. Though LIP is no longer accepting applications, the program provided cost-share funding and technical assistance to private landowners to help them create and manage habitat for species that are rare or declining. Only lands within the Driftless Area were eligible for LIP funding.

Highway Rights-of-Way

The Wisconsin DOT is responsible for maintaining the state trunk highway system, which is the system of interstate and interregional highways that accounts for approximately 60 percent of the

[47] In this context, "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. [16 U.S.C. s. 1532 (19).]
[48] FWS, *Monarch Butterfly: Status and Conservation*, (December 15, 2020), https://www.fws.gov/savethemonarch/.
[49] Legislative Fiscal Bureau, *Warren Knowles-Gaylord Nelson Stewardship Program*, Informational Paper 61 (January 2019).

highway miles in the state. However, DOT may contract with counties or municipalities to conduct that maintenance, including for "the care and protection of trees and other roadside vegetation and suitable planting to prevent soil erosion or to beautify highways." [s. 84.07, Stats.] DOT has negotiated such contracts with county highway departments throughout the state. The contracts are renegotiated every year and follow policy set forth in the state Highway Maintenance Manual, which is also updated annually.

DOT follows a longstanding "natural roadsides" policy, which encourages minimal mowing and natural vegetation in rights-of-way when feasible. DOT also implements several pollinator-specific initiatives in highway rights-of-way, including a pilot vegetation management plan along Highway 26 in Dodge, Jefferson, and Rock Counties. However, DOT staff note unique concerns that can arise with right-of-way habitat, including potential negative impacts when pollinators are struck by traffic.

County and municipal highway rights-of-way are maintained locally. State law gives local highway departments broad discretion to maintain highway rights-of-way in a manner that a local authority determines "promotes the public use and enjoyment" of the roadside. They may "improve such lands by suitable planting, to prevent the erosion of the soil, or to beautify the highway." [s. 66.1037 (1), Stats.] The statutes do not specifically require highway departments to take any particular actions relating to pollinator health.

Utility Rights-of-Way

Utility rights-of-way are often used as spaces to support pollinator habitat. Maintenance of these rights-of-way is regulated by the PSC. Under administrative rules, utilities are required to periodically inspect power lines to identify and eliminate natural hazards. [s. 113.0512, Wis. Adm. Code.] Vegetation management in transmission rights-of-way is further regulated by the Federal Energy Regulatory Commission under reliability standards developed by the North American Electric Reliability Corporation.[50]

Maintenance of pollinator habitat in utility rights-of-way is often impacted by the terms of a utility's easement. While easement terms vary, landowners who sign an easement for certain transmission lines may have specific rights provided under Wisconsin law. These rights are expressed in s. 182.017 (7) (c) to (h), Stats., as requirements for utilities. Under s. 182.017 (7) (d), Stats., a utility may not use herbicides for weed or brush control without the express written consent of the landowner, even if the landowner cannot be identified or reached. This requirement may present challenges to pollinator habitat maintenance, as herbicides may be useful tools for invasive species management.

Wisconsin Monarch Collaborative

The Wisconsin Monarch Collaborative is a coalition that addresses the decline of the monarch butterfly in Wisconsin. Its goal is to increase the quantity of native milkweed and monarch-friendly plants through habitat conservation, education and outreach, and research and

[50] Further information is available at https://www.ferc.gov/industries-data/resources/tree-trimming-and-vegetation-management.

monitoring.[51] The collaborative formed in response to the Wisconsin Monarch Summit convened by DNR in 2017. Participants include a wide variety of government agencies and stakeholder groups.

Pollinator Health Proposals in Recent Legislative Sessions

In addition to the laws and programs described above, the state's legislative and executive branches have made various efforts to promote pollinator health in recent years. In the executive branch, Governor Evers joined nearly all other states in declaring "pollinator awareness week," most recently as June 22-28, 2020.

In the Legislature, action has been taken to promote beekeeping, specifically by adding beekeeping to the types of farming businesses that are exempt from certain sales and use taxes. These exemptions were enacted as part of the 2017-19 Biennial Budget Act, though they originated in a standalone bill, 2017 Assembly Bill 278. Comparable legislation was introduced (though not enacted) in the 2019 Legislative Session to extend sales and use tax exemptions to beekeeping equipment used in hobby beekeeping.[52]

Legislators also introduced companion bills during the 2019 Legislative Session to establish a state task force on native pollinator health.[53] If it had been enacted, the legislation would have directed a task force, comprised of legislators, stakeholders, and technical experts, to investigate a variety of issues related to pollinator health.

Federal Policy and Programs

Federal policy and programs have included an increasing focus on pollinator health in the last five years, partly as a result of goals outlined in a 2015 "National Strategy." Although programs administered by USDA have been an obvious area of emphasis, federal law has fostered cooperation across various federal agencies, partly through a honey bee and pollinator research coordinator position.

The National Strategy

The National Strategy to Promote the Health of Honey Bees and Other Pollinators ("National Strategy"), issued in 2015, was the final report of a task force established pursuant to a 2014 presidential memorandum.[54] The task force included representation from a broad range of federal entities. The National Strategy identifies three overarching goals:

- Reduce honey bee colony losses during winter to no more than 15 percent within 10 years.

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[51] In 2019, the collaborative issued the Wisconsin Monarch Conservation Strategy, which establishes a specific goal of adding over 119 million new stems of native milkweed in Wisconsin by 2038, primarily through voluntary landowner efforts.

[52] 2019 Assembly Bill 580/Senate Bill 526.

[53] 2019 Assembly Bill 574/Senate Bill 617.

[54] The National Strategy is available at https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/Pollinator%20Health%20Strategy%202015.pdf.

- Increase the eastern population of the monarch butterfly to 225 million butterflies by 2020 through domestic/international actions and public-private partnerships.
- Restore or enhance 7 million acres of pollinator habitat over five years.

Farm Bill Programs

Federal agriculture policy is largely established through periodically enacted "farm bills."[55] The current federal farm bill is the Agricultural Improvement Act of 2018 ("2018 Farm Bill"), which is in effect through federal fiscal year 2023. Among many other provisions relating to national food and agriculture policy, the 2018 Farm Bill provides commodity programs and crop insurance to aid agricultural producers.

The 2018 Farm Bill programs that most directly address pollinators include the Conservation Reserve Program (CRP) and the related Conservation Reserve Enhancement Program (CREP), as well as certain programs relating to coordination and research. CRP subsidizes conservation of over 24 million acres of eligible agricultural land nationally.[56] To be eligible for enrollment in CRP, land generally must be marginal as cropland or be likely to cause specified types of environmental harm. [16 U.S.C. s. 3831 (b).] When awarding CRP contracts, USDA may give priority to certain types of enrollments. For grassland enrollments, for example, USDA may prioritize enrollments that may assist a species that is either listed under the federal ESA or at risk of being listed. USDA may also prioritize enrollments that improve or create habitat corridors. [16 U.S.C. s. 3831 (d) (2) (B).]

To enroll in CRP, a land owner or operator must negotiate a 10- to 15-year contract in a given "conservation practice." One of the conservation practices, referred to as "CP-42," is directly focused on pollinator habitat. The CP-42 practice is relatively expensive to implement, partly because it requires a minimum of nine pollinator-friendly plant species, but it is viewed as providing the highest quality pollinator habitat.[57] Other conservation practices, such as those for introduced or native grasses or wildlife habitat, are relatively less expensive to implement because they have less seed mix diversity. According to USDA staff, only about 2,000 acres are currently enrolled in the CP-42 practice category in Wisconsin, whereas approximately 54,000 acres are enrolled in CP-1, the practice for introduced grasses.

Other 2018 Farm Bill programs relevant to pollinators include several programs administered by the Natural Resources Conservation Service (NRCS), an entity in USDA that provides technical and financial assistance to agricultural producers for conservation. NRCS includes a focus on pollinators in several of its programs, including the Environmental Quality Incentives Program, the Conservation Stewardship Program, and the Agricultural Conservation Easement Program.

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[55] All farm bills include sunset provisions, which force a reexamination of federal agricultural policy. New farm bills have been enacted every three to six years since 1965. For a timeline, see Congressional Research Service, *Farm Bills: Major Legislative Actions, 1965-2018* (Dec. 21, 2018).

[56] The aggregate acreage limits are graduated over the life of the 2018 Farm Bill. 24.5 million acres are authorized during the current federal fiscal year, and 27 million acres will be authorized in fiscal year 2023.

[57] Although the 2018 Farm Bill included some changes that were viewed as favorable for pollinator projects, including making CP-42 more accessible as a "stand alone" practice, the bill decreased the amount of federal subsidy for pollinator-friendly seed mixes.

Similar to CRP, described above, NRCS assists producers who voluntarily agree to follow one of a number of "conservation practices" in exchange for financial and technical assistance.

According to NRCS staff in Wisconsin, more than three dozen NRCS conservation practices provide benefits to pollinator species, in some cases with a particular focus on honey bees. Examples of NRCS conservation practices utilized by Wisconsin producers include practices that provide diverse native plantings, establish seasonal forage for honey bees, establish cover in livestock grazing systems, and include diverse legumes in field borders.

Monarch Agreement

Multiple stakeholders emphasized the Nationwide Candidate Conservation Agreement with Assurances (CCAA) for Monarch Butterfly on Energy and Transportation Lands ("Monarch Agreement") as a successful model for enhancing habitat through public-private partnership.[58] A CCAA operates as a formal contract between FWS and one or more public or private entities to take certain steps to help an "at-risk" species – i.e., a species at risk of being listed as threatened or endangered under the federal ESA.

The Monarch Agreement protects monarch habitat in energy and transportation rights-of-way, in particular. Interested parties may voluntarily enroll in the agreement through a "certificate of inclusion" issued by FWS. In exchange for agreeing to take certain conservation measures on identified right-of-way land, enrollees receive certain regulatory flexibility. For example, the Monarch Agreement authorizes the incidental take of monarchs on land where conservation measures are employed. According to FWS's website, more than "45 companies and agencies in the energy and transportation sectors" currently participate in the agreement.[59]

[58] The monarch CCAA is available at https://www.fws.gov/savethemonarch/pdfs/Final_CCAA_040720_Fully%20Executed.pdf.
[59] FWS, *Questions and Answers: Candidate Conservation Agreement with Assurances for the Monarch Butterfly*, (December 2, 2020), https://www.fws.gov/savethemonarch/CCAA_faq.html.

PART III
EXAMPLES OF PUBLIC AND PRIVATE INITIATIVES

According to NCSL, more than half of the states have enacted legislation to address pollinator health.[60] Many states' enactments have raised the profile of pollinator health by creating a coordinating body or directing a study, but some states have taken other steps to address pollinators. This part of the report highlights examples of such legislation, as well as certain other private or public initiatives highlighted by stakeholders engaged for this report.

POLLINATOR-FRIENDLY SOLAR ACTS

Recognizing that solar installations are compatible with pollinator habitat, several states have enacted "pollinator-friendly solar" legislation with bipartisan support.[61] The acts establish voluntary, pollinator-friendly management practices on solar installations, typically through the use of a "scorecard" with metrics for specified pollinator-friendly practices. For example, Minnesota enacted a statewide standard in 2016, with a unanimous vote in its legislature.[62] In general, the acts have directed relevant state agencies to develop the scorecards.[63]

MINNESOTA "LAWNS TO LEGUMES" PROGRAM

Minnesota's "Lawns to Legumes" program was created as a pilot project focused on providing technical resources and cost-share grants for pollinator habitat in residential lawns. The program provides up to $350 to an individual landowner for a habitat project. It also includes grants for demonstration neighborhoods, which are community pollinator habitat programs run by local governments and nonprofit organizations. Initial funding for the program was provided through a state appropriation. The Minnesota Board of Water and Soil Resources is currently seeking other funding sources for a second phase of the program.[64]

IOWA "STRIPS" PROGRAM

Stakeholders mentioned the "STRIPS" (Science-based Trials of Rowcrops Integrated with Prairies Strips) project as a successful model for integrating pollinator habitat in agriculture. Led by Iowa State University, the STRIPS project is a long-term, interdisciplinary research project collaborating

[60] NCSL, *Pollinator Health*, (Sept. 23, 2020), https://www.ncsl.org/research/environment-and-natural-resources/pollinator-health.aspx.
[61] According to Fresh Energy, pollinator-friendly solar acts have been enacted in Illinois, Maryland, Minnesota, Missouri, New York, South Carolina, and Vermont. Some other states have adopted pollinator-friendly solar installation standards without legislation.
[62] Minn. Stat. s. 216B.1642.
[63] For example, New York's legislation directed the New York Commissioner of Agriculture to develop a scorecard.
[64] For more information, see https://bwsr.state.mn.us/l2l.

with farmers and farmland owners to implement prairie strips as a conservation practice. The project touts benefits including improved water quality, reduced erosion, and the creation of pollinator habitat.[65] Prairie strips were newly designated as a CRP-eligible practice under the 2018 Farm Bill. [16 U.S.C. s. 3831 (b) (4).]

INDIANA HIGHWAY RIGHT-OF-WAY PROGRAM

Stakeholders characterized the Indiana Department of Transportation's vegetation management policy as the "gold standard" example for creating pollinator-friendly habitat in highway rights-of-way. The department established the "Hoosier Roadside Heritage Program" in the 1990s to increase native plants and wildflowers. Relying on research conducted by Purdue University, the department refined the program by developing a plan in 2014. The plan established four "zones": (1) paved road; (2) a safety or clear zone; (3) a selective zone; and (4) a zone where minimal vegetation management is used. A review of the program by the Federal Highway Administration found that the program resulted in $1 million in cost savings for the state.[66]

WASHINGTON LIABILITY PROTECTIONS FOR APIARISTS

In 2019, the State of Washington enacted legislation to provide liability protections for registered apiarists.[67] Under the legislation, any registered apiarist that conforms to all applicable ordinances regarding beekeeping is not liable for civil damages for acts or omissions in connection with a variety of beekeeping practices, unless such acts or omissions constitute gross negligence or willful misconduct. Beekeepers contacted for this report highlighted the value of such legislation, emphasizing the protections it provides from lawsuits that may arise over bee stings.

BEECHECK APIARY REGISTRY

The BeeCheck Apiary Registry is a voluntary, web-based tool designed to help pesticide applicators and beekeepers communicate more effectively.[68] Through BeeCheck, beekeepers can register the locations of their hives, helping pesticide applicators avoid the hives when spraying. The registry is managed by FieldWatch, a nonprofit company formed through a collaboration between agricultural stakeholders and Purdue University. From its origins in Indiana, BeeCheck has grown to include 22 states, including Wisconsin.

[65] Further information is available at https://www.nrem.iastate.edu/research/STRIPS/.
[66] Federal Highway Administration, *Pollinator-Friendly Practices Case Studies*, (May 2015), https://www.environment.fhwa.dot.gov/env_topics/ecosystems/INDOT_pollinators_casestudy.aspx.
[67] Rev. Code of Wash. s. 15.60.250.
[68] More information is available at https://beecheck.org/.

WISCONSIN MUNICIPALITIES' INITIATIVES IN PARTNERSHIP WITH THE XERCES SOCIETY

The Xerces Society for Invertebrate Conservation, a nonprofit organization that works to protect invertebrates, launched a "Bee City USA" program to encourage local initiatives to enhance pollinator habitat.[69] The Cities of Appleton, Elm Grove, Greenfield, Hales Corners, Madison, and Mequon have been designated "bee cities" through the initiative. Each of those cities has made certain commitments to create sustainable pollinator habitat through the program. For example, in April 2020, the Appleton Common Council passed a resolution recognizing the month of May as "No Mow May" and stating that the city will not enforce its ordinance limiting grass and weed height to eight inches during that month.[70] The City of Madison established a pollinator protection task force, which issued a report in 2015.[71]

[69] For more information about the Bee City USA initiative, see www.beecityusa.org.
[70] The resolution is available at https://cityofappleton.legistar.com/LegislationDetail.aspx?ID=4339047&GUID=A027AA9A-D14C-4447-AC2A-0ED1BBA82CCE&Options=&Search=.
[71] The task force report is available at https://www.cityofmadison.com/mayor/documents/Pollinator%20Protection%20Task%20Force%20Report%20FINAL%203-24-16(1).pdf.

PART IV
OPTIONS FOR LEGISLATION

Based on stakeholder input and informed by scientific research and existing law and initiatives, this part of the report outlines options for legislation to support Wisconsin's pollinators. The options fall in five major categories: (1) expanding pollinator habitat; (2) supporting research, monitoring, and public education; (3) changes relating to beekeeping; (4) best practices in pest management; and (5) a coordinated approach to state policy on pollinator health.

All five of these categories were raised by stakeholders from various perspectives, and many of the options are similar to approaches taken with bipartisan support in other states. In general, the options below are neither mutually exclusive nor interdependent. Each option could be separately enacted or discarded.

OPTIONS TO EXPAND POLLINATOR HABITAT

The critical need for habitat was the theme most consistently mentioned by interested groups.[72] Many stakeholders emphasized the need for increased habitat in both rural and urban settings and on both public and private land.

Incentive Program for Private Property Owners

Legislation could establish a voluntary program to provide small grants and resources for private landowners interested in creating pollinator habitat on their property. Multiple stakeholders emphasized the need for a culture shift toward more natural lawns in residential areas, particularly in the spring, when clover and other lawn plants bloom. Stakeholders also noted that habitat solutions can be effective in urban as well as rural areas, and that landowner incentive programs can play an educational role. This option could be accomplished through legislation that offers resources and funds to both urban and rural residential landowners. The "lawns to legumes" demonstration program in Minnesota, described in Part III and highlighted as a success by various stakeholders, could serve as a model.

Incentive Program for Local Governments

As a possible corollary or alternative to an incentive program for residential landowners, legislation could provide a competitive grant to local units of government that pursue pollinator habitat initiatives, such as the "Bee City" initiatives described in Part III.

Prohibit Local and Private Lawn Height Restrictions

Legislation could facilitate the goal of increasing habitat by preempting local ordinances that designate lawn height as a nuisance above a certain number of inches, particularly in spring.

[72] However, some groups emphasize that habitat solutions must be done in tandem with solutions to manage the effects of certain pesticides on pollinators.

Additionally, legislation could also prohibit restrictive lawn height requirements in new neighborhood association bylaws.

Pollinator-Specific Incentives in Agricultural Cost Share Programs

Recognizing the close connection between pollinator habitat and water quality, legislation could incorporate pollinator habitat objectives in existing state programs that address water pollution. The federal Clean Water Act requires DNR and DATCP to establish agricultural performance standards, with the objective of helping to meet water quality standards by addressing pollution from "nonpoint" (i.e., dispersed) sources. Among other practices, those standards address erosion control and tillage setbacks. Current state law also provides grants to producer-led groups for certain water pollution abatement activities. The legislation could direct DNR and DATCP to incorporate pollinator habitat in those standards and grant requirements, where feasible. As applied to row crops, this option could draw inspiration from the Iowa "STRIPS" project described in Part III.

This legislation could also include an increase in funding for county conservation staff. Wisconsin Land+Water noted that, while existing programs provide financial assistance for certain conservation practices, funding for staff is also needed.

Pollinator Focus in Stewardship Program Reauthorization

Legislation could establish pollinator habitat as a program priority in the Warren Knowles-Gaylord Nelson Stewardship program. As mentioned, the 2022 sunset for the program provides an opportunity to emphasize pollinator habitat in one or more subprograms, possibly the existing land acquisition or local assistance subprograms, in any reauthorization of the program. Alternatively, a new subprogram could be created to designate certain stewardship funds for land acquisition, conservation easements, or restoration projects that expand grassland or prairie habitat for Wisconsin pollinators.

The legislation could establish specific priorities for such habitat. For example, the Nature Conservancy and other stakeholders mentioned a need for 10,000 acres of proximate grassland or prairie habitat in the southern part of the state. Alternatively, DNR could be given discretion for the use of the funds, subject to oversight by the Joint Committee on Finance.

Pollinator Habitat on DNR-Managed Land

Legislation could require DNR to develop additional pollinator habitat on DNR-managed land. The option could include an appropriation, or it could simply require DNR to create pollinator habitat whenever the department determines it is financially feasible to do so. Types of land to which the requirement could apply include state parks, state forests, state trails, state natural areas, and wildlife management areas.[73] In addition, DNR could be directed to incorporate pollinator habitat considerations when approving contracts for new or renewed managed forest land enrollments or when negotiating easements.

[73] Stakeholders particularly emphasized opportunities for pollinator habitat in wildlife management areas. Organizations, such as Pheasants Forever, are actively involved in promoting pollinator habitat, particularly as pollinators may serve as a food source for game birds.

Pollinator Habitat in Landscaping at State Facilities

As a corollary to the above approach, legislation could require the Department of Administration (DOA) to incorporate pollinator habitat on property around state facilities, when feasible. Such landscaping could also support education and outreach, informing the public about pollinator-friendly practices.

Scorecard for Solar Installations

Fresh Energy and other stakeholders cited the myriad benefits of incorporating pollinator-friendly habitat in solar installations. In addition to new pollinator habitat, pollinator-friendly solar can include "co-benefits," such as carbon sequestration, soil retention, opportunities for grazing, and, in some cases, reduced maintenances costs. As mentioned in Part III, other states have developed "scorecards" to encourage pollinator-friendly solar installations.

Legislation could direct PSC and DATCP to adopt a state scorecard to encourage pollinator-friendly habitat as part of solar energy installations. The scorecard would be voluntary, with possible regulatory flexibility incentives. For example, the percentage of ground required to be under vegetative cover for a storm water permit could be reduced for projects installing pollinator habitat. Legislation could also require a scorecard to be considered in state energy policy under s. 1.12, Stats.[74]

The legislation could be modelled on pollinator-friendly solar acts enacted in several other states. Multiple scorecards have been developed for that purpose, including a scorecard developed at UW-Madison and a scorecard developed by Purdue University. Some stakeholders noted that scorecards need to strike a balance between feasibility and efficacy, recognizing tradeoffs between cost considerations and pollinator habitat goals.

Changes to Aid Habitat on Utility Rights-of-Way

State law could be modified to remove impediments to pollinator habitat projects in utility rights-of-way. Current state and federal law requires energy utilities to manage vegetation in their rights-of-way to limit natural hazards to power lines. In some cases, utility companies are utilizing enhanced seed mixes to provide pollinator habitat, but legal obstacles sometimes arise.

Legislation could modify state law in two ways. First, it could modify utility requirements under s. 182.017 (7), Stats., to allow a utility easement holder to utilize a targeted herbicide to control invasive plant species as part of a pollinator habitat project after providing notification to a landowner and not receiving an objection within a specified time period. In contrast, as described in Part II, current law requires an easement holder to obtain a landowner's affirmative approval in such circumstances, even if the landowner cannot be identified or reached.

Second, legislation could also require DNR to create a general permit for incidental takes of species on the state threatened or endangered species lists when such takes occur as part of a

[74] DOA is generally required to implement the priorities in the state energy policy in designing and implementing its energy programs. [s. 16.95 (13), Stats.] Additionally, PSC is required, to the extent cost-effective, technically feasible, and environmentally sound, to implement the energy policy priorities in making all energy-related decisions and orders. [s. 196.025 (1), Stats.]

project to create pollinator habitat in a utility right-of-way. A general permit could be modelled after the types of conditions developed as part of the Monarch CCAA, described in Part II.

Increased Emphasis on Highway Rights-of-Way

Legislation could establish requirements for pollinator habitat in highway rights-of-way in one or both of the following contexts. First, legislation could require local highway departments to provide pollinator habitat in local highway rights-of-way, whenever feasible.

Second, legislation could require DOT to include pollinator habitat in county highway maintenance contracts for state highway trunk systems highways. As mentioned in Part II, DOT currently implements several initiatives to enhance pollinator habitat in highway rights-of-way. This option would require those efforts to be integrated in county maintenance contracts. Legislation could be modeled on the Indiana Department of Transportation's vegetation management policy, described in Part III, which has resulted in cost savings.[75]

General Regulatory Flexibility for Habitat Projects

While stakeholders shared recommendations for regulatory flexibility for solar installations and rights-of-way projects, these options could be applied more broadly. Specifically, to the extent allowed under federal law, legislation could provide broad regulatory flexibility in one or both of the following ways:

- Legislation could direct DNR to issue a general permit to allow the incidental take of species listed on the state threatened and endangered species list, if the incidental take occurs as a result of a pollinator habitat project and conditions specified by DNR are satisfied.
- Legislation could provide flexibility for state storm water permit timelines to incentivize pollinator-friendly vegetation, rather than faster-growing grasses, on sites requiring vegetation.

Options to Support Research, Monitoring, and Public Education

Agricultural producers, beekeepers, and state agency staff consistently mentioned the importance of research and education in supporting pollinator-friendly practices. Academic faculty, in turn, mentioned that the public can play an important role by helping to collect data to inform research on the status of Wisconsin's pollinators.

Resources for UW-Extension

The Wisconsin Cranberry Growers and other stakeholders noted that UW-Extension research has helped agricultural producers to shift away from the use of broad spectrum insecticides and to adopt other pollinator-friendly practices. UW-Extension also provides technical assistance for integrated pest management, a practice that uses a variety of strategies to control pests while limiting environmental impacts. Legislation could provide new funding or positions for UW-Extension to engage with agricultural producers in adopting pollinator-friendly practices.

[75] See https://secure.in.gov/indot/files/INDOT_and_POLLINATOR-F1.pdf.

Resources for Monitoring Native Pollinators

Various stakeholders emphasized a need for improved monitoring of native pollinator populations. Such efforts would help assess baseline population levels and track the efficacy of conservation efforts. Legislation could provide new funding or positions at DNR to support monitoring. Additionally, monitoring could be conducted in collaboration with UW-Madison to leverage the institution's expertise and training.

As an alternative or complement to the above, legislation could also support citizen science initiatives. For instance, the Gratton Laboratory at UW-Madison developed a smartphone application (the "WiBee" app) to gather data on wild bee abundance and diversity from growers and citizen scientists.[76] The Wisconsin Bumble Bee Brigade, a DNR-sponsored initiative, likewise relies on volunteers to assist with long-term monitoring of bumble bees.

Steps to Increase Public Awareness

As mentioned in Part II, the Governor has designated a pollinator awareness week. The Legislature could codify that designation in statute or take other actions to increase public awareness about the importance of pollinators in Wisconsin. More specifically, legislation could do one or more of the following:

- Codify a pollinator awareness week.
- Designate an official state native pollinator or butterfly.[77]
- Create a new pollinator-focused state license plate.

OPTIONS FOR CHANGES RELATED TO BEEKEEPING

One Additional UW-Extension Position

As a possible complement or alternative to additional UW-Extension resources for growers, legislation could appropriate funds for a new UW-Extension position specific to beekeeping. As discussed in Part II, the current state apiary program, within DATCP, has a small staff, including a full-time apiarist and two limited-term employees. The program provides support to commercial and hobby beekeepers in Wisconsin and is also responsible for enforcing requirements for imported bees. An additional UW-Extension position could provide additional support to Wisconsin beekeepers.

Enforce Existing Requirements for Migratory Bees

Legislation could enhance enforcement of existing notification requirements for imported commercial bees. As discussed in Part I, growers of various pollinator dependent crops—particularly cranberries—may employ migratory beekeeping operations for their pollination needs. In some situations, imported, managed bees can create issues for local beekeepers by

[76] Data collected through the WiBee app is available at https://data-viz.it.wisc.edu/wibee/.
[77] The European honey bee has been designated the state insect (Ch. 326, Laws of 1977), though it is not native to Wisconsin.

spreading pathogens or pests. State law addresses these potential issues by requiring migratory beekeepers to notify DACTP when they import hives. Some stakeholders suggested that compliance can be a problem for a small number of bad actors, and raised concerns that the state apiary program is typically focused more on providing technical support to hobbyists than enforcing commercial bee regulations.

Under this option, legislation would enhance enforcement in one or both of the following ways: (1) require DATCP staff to focus primarily on enforcement during the weeks of the year when out-of-state bees are most active; and (2) create a tip line to allow people to easily report violations of current law.

Establish Liability Protections for Beekeepers

As noted in Part II, beekeepers emphasized the value of liability protections for issues such as bee stings. Such legislation could mirror Washington's 2019 HB 1133, described previously.

OPTIONS TO ENCOURAGE BEST PRACTICES IN PEST MANAGEMENT

Changes to Certification Requirements

As described in Part II, DATCP currently requires a person seeking a commercial pesticide applicator certification to answer 70 percent of questions correctly on a written examination and pay a relatively modest fee. Some stakeholders mentioned that the relatively low bar for entry into the industry can sometimes result in problems. For example, not all newly certified mosquito sprayers follow the best practices when spraying in residential areas.

Legislation could strengthen certification requirements relating to pollinators. DATCP staff, the Xerces Society, and other stakeholders identified the following possible modifications:

- Increase the portion of pollinator-related content in the pesticide applicator examination.
- Require a score higher than 70 percent on the examination, at least with respect to the portion of the examination relating to pollinators.
- Create a continuing education requirement for pesticide applicators that would include content regarding impacts to pollinators.
- Increase the penalties for applying pesticides without a certification or in an otherwise unauthorized manner.

Voluntary Pilot Program for Use of Untreated Seeds

Legislation could create an incentives-based program to reduce agricultural use of seeds treated with broad spectrum, systemic insecticides harmful to pollinators. Various stakeholders expressed concern regarding the wide, prophylactic use of seed treatments such as neonicotinoids. Some

stakeholders stressed that pesticide usage should be more targeted and highlighted research suggesting that neonicotinoid seed treatments may provide negligible benefits.[78]

Under a voluntary pilot program, growers could receive funds in exchange for using untreated seeds. A program would serve as an incentive for transitioning away from systemic pesticide use by demonstrating the potential efficacy of untreated seeds. A bill[79] introduced in Minnesota could serve as a model. The Minnesota legislation offers grants to farmers who plant corn or soybean seeds that do not contain systemic insecticides.[80] Legislation could similarly be modeled on a USDA Conservation Stewardship Program (CSP) Enhancement (E595116Z2), which also offers financial assistance to farmers who plant seed without neonicotinoid treatments. A state initiative could fill gaps left in federal support, given that the CSP Enhancement was only available to farmers enrolled in CSP and is currently unavailable.

OPTIONS FOR A COORDINATED APPROACH TO STATE POLICY

Currently, state programs relating to pollinator health are dispersed among at least four state agencies. As discussed in Part II, DATCP houses the state apiary program and oversees certifications for pesticide use. DNR manages state land and is responsible for implementing the threatened and endangered species program. DOT implements programs to encourage habitat in highway rights-of-way, primarily through county contracts. PSC establishes standards for maintaining transmission rights-of-way and solar installations. Multiple stakeholders suggested that an entity at the state level could help develop and ensure a more coordinated state response to pollinator health. Similarly, stakeholders recommended more communication across various land management efforts and noted that county conservation staff serve as liaisons between programs housed throughout multiple agencies and partner organizations.

State Coordinating Council

Legislation could establish a council at the state level to ensure a coordinated approach to pollinator health and provide ongoing feedback to the Legislature. The council could include legislators, representatives of relevant state agencies, academic experts, and members representing agricultural producers and pollinator advocacy groups. The council could be directed to develop recommendations to support both managed and native pollinators. Those recommendations could incorporate practices identified in the Pollinator Protection Plan, discussed in Part II. The legislation could require the council to periodically report to the Legislature regarding the status of those recommendations. The legislation could also require the council to coordinate with county conservation staff or other local initiatives.

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[78] Environmental Protection Agency, *Benefits of Neonicotinoid Seed Treatments to Soybean Production*, (n.d.), https://www.epa.gov/pollinator-protection/benefits-neonicotinoid-seed-treatments-soybean-production.

[79] 2019-2020 Minnesota HF2487.

[80] The legislation defines "systemic insecticide" to mean "any chemical active ingredient intended to kill or otherwise harm insect or invertebrate wildlife and designed or intended to translocate into the tissues of plants, including but not limited to acetamiprid, clothianidin, dinotefuran, fipronil, imidacloprid, nitenpyram, sulfoxaflor, thiacloprid, and thiamethoxam."

APPENDIX 1

ACKNOWLEDGEMENTS

We are grateful to the multiple legislative offices who provided feedback on the topic of pollinator health in Wisconsin. We would also like to thank the following people, agencies, and organizations for sharing invaluable information and responding to questions as we prepared this report:

- American Transmission Company.
- DATCP.
- Israel Del Toro, Assistant Professor, Lawrence University.
- DNR.
- DOT.
- Fresh Energy.
- Friends of Wisconsin State Parks.
- Claudio Gratton, Professor, UW-Madison.
- IPM Institute.
- Municipal Environmental Group – Wastewater Division.
- The Nature Conservancy.
- NRCS Wisconsin.
- John Henry Piechowski, Henry's Honey Farm.
- Pollinator Partnership.
- USDA.
- Wisconsin State Cranberry Growers Association.
- Wisconsin Corn Growers Association.
- Wisconsin Farm Bureau Federation.
- Wisconsin Pest Control Association.
- Wisconsin Honey Producers Association.
- Wisconsin Land+Water.
- Xerces Society for Invertebrate Conservation.

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WISCONSIN DEPT. OF NATURAL RESOURCES

November 6, 2020

Anna Henning, Senior Staff Attorney
Benjamin Kranner, Staff Analyst
Wisconsin Legislative Council
One East Main Street, Suite 401
Madison, WI 53703

Subject: Wisconsin DNR pollinator efforts and additional considerations

Dear Anna & Benjamin:

Pollinators, primarily insects in Wisconsin, play a crucial role in pollinating our native plants and many of our crop species. More than one of every three bites of food we eat or beverages we drink are because of pollinators. Without the assistance of pollinators, many plants cannot produce fruits and seeds. Pollination is essential for maintaining genetic diversity in plants and ensuring adequate fruit and seed production for crops, wildflowers, and food for wildlife.

Populations of some of our wild pollinators have been declining for decades. A wide range of factors are associated with pollinator declines: habitat loss, nutritional deficiency, parasites, pathogens, chemical exposure, and extreme weather events (e.g., drought or floods). Habitat loss and degradation is a significant problem for pollinators and diverse native plant communities are needed to support diverse pollinator communities across Wisconsin. Pollinators are vital to creating and maintaining the habitats and ecosystems that many animals rely on for food and shelter. They facilitate the reproduction of over 80% of the world's flowering plants. In Wisconsin, pollinator-dependent crops account for more than $55 million in annual production. These crops include apple, cranberry, cherry, green beans, pickling cucumber and fresh market fruits and vegetables. The Wisconsin Department of Natural Resources has significantly ramped up efforts to support and protect pollinators in recent years, although current resources are limiting.

Thank you for the opportunity to provide additional information regarding pollinators in Wisconsin. Below we summarize current Wisconsin DNR efforts related to pollinators, potential opportunities to consider and challenges facing pollinators.

Wisconsin DNR Initiatives:

- The Wisconsin DNR manages 1.5 million acres of state-owned land, including a full range of terrestrial and aquatic habitats. Conserving pollinators is a major consideration on a portion of this area, but there are opportunities to improve.
- Wildlife Areas make up the largest acreage of state lands. Currently, the primary focus of most of these areas is game species, but they provide important habitat for many non-game species, including pollinators, some of which are rare and declining.
- State Parks provide meaningful outreach to the public with pollinator plantings near their nature centers and buildings. These plantings are great opportunities to educate the public about pollinators.

- The Bureau of Natural Heritage Conservation (NHC) has responsibility for a wide range of species and has increased its work on pollinators in recent years, including hundreds of native pollinator species. These efforts include habitat management, particularly on Wisconsin's State Natural Areas (s. 23.27 and 23.28, Wis. Stats.), inventory and monitoring, research, data management and interpretation. Partnerships and citizen scientists are growing and invaluable to these efforts.
- NHC's Wisconsin Bumble Bee Brigade trains a growing number of volunteers to take photos of bumble bees and document and submit their observations. Staff then identify the photos. This has greatly expanded our knowledge of our 20 bumble bee species, including the federally endangered rusty patch bumble bee. To date, 284 citizen scientists have submitted over 6,758 observations since the project started in 2018.
- NHC staff coordinate the Wisconsin Monarch Collaborative, a consortium of organizations and individuals across the state who work in agriculture, land conservation, urban/greenspace, transportation and utility rights-of-way management, and research dedicated to conserving the monarch butterfly. In 2019 the collaborative produced the Wisconsin Monarch Conservation Strategy and established the goal of helping Wisconsinites voluntarily add over 119 million new stems of native milkweed (monarch caterpillar food plant) and monarch-friendly nectar plants across the Wisconsin landscape through habitat creation and enhancement, education, and outreach by 2038.

Potential Opportunities:

- There are many unrealized opportunities to better examine the needs of pollinators and to increase and improve pollinator habitat in Wisconsin. Pollinators have captured the public interest, and there are many ways for volunteers to get involved. Creating habitat can range from hundreds of acres of planted prairie to a potted native plant on a balcony. Citizen monitoring programs could help measure how effective pollinator plantings and gardens are depending on landscape context and size. In addition, there are numerous citizen projects on public lands across the state.
- Wisconsin's Endangered Resources license plate raises a good portion of funding for pollinator work. State law currently authorizes two designs for the ER plate. If that authority were increased, we could explore the potential for a pollinator plate (e.g., Monarch butterfly) to raise additional funds for pollinator conservation.
- Most of the Department's pollinator work relies on grants and donated funds. If an incentive or grant program could be developed to increase pollinator habitat in Wisconsin, and it was to be administered by the Department, additional resources would be necessary for administering the program.
- Minnesota has enacted pollinator legislation and incentivization of habitat, and lessons could be learned from their experiences. Also, Ohio and Illinois are working on innovative roadside management with their state transportation departments.
- Additional pollinator habitat could be incorporated into landscaping around state-owned buildings/properties.
- A statewide pollinator habitat geodatabase could be created for Wisconsin (although this would be a major effort, requiring funding).

- Additional funding could help nurseries provide more seed for native prairie plants (host plants and nectar plants)
- Wisconsin could consider designating a state native bee to highlight the importance of native pollinators (the European honey bee is already the state insect). Minnesota recently designated the rusty-patched bumblebee as their state bee.

Challenges

- Recently, pollinators have been added to the U.S. Threatened/Endangered list. This leads to regulatory burdens and more work. We can expect more species to be added to the list moving forward. It would be in everyone's best interest, as well as the species' best interest, to avoid the need for federal protection, wherever possible. National initiatives have been proposed to better fund proactive work to keep species off Threatened/Endangered lists (i.e., the "Recovering America's Wildlife Act.")

- Neonicotinoids are the most widely used insecticides globally, and they can directly impact wildlife in negative ways. They are highly toxic to many invertebrates such as bees, even in small quantities. Direct sub-lethal effects have also been observed on a large and growing number of other species, including game and non-game birds, salamanders, frogs, and white-tailed deer, along with the potential for negative impacts to fish. This is a difficult problem that is undoubtedly impacting pollinators in Wisconsin.
- Commercial bumble bees enter Wisconsin and compete with native bumble bees. These are used in greenhouse operations and some open field agriculture (e.g., cranberries) and are not regulated. Eastern common bumble bee, the most common species in the state, is used, and the colonies often get released into the wild, leading to interactions with our native common eastern bumble bees and disease issues.
- Commercial honey bees are shipped all over the country. They start their season in almond orchards in CA where they pick up diseases before being shipped around the country, leading to disease transmission in native pollinators. Also, honey bees live in large colonies and out-compete our native bees for floral resources.
- Commercial solitary bees (e.g., leafcutter and blue orchard bees) are shipped all over North America. Some have even introduced European species into the mix that are probably competing with our native bees.

Again, thank you for the opportunity to provide this information. Please contact Sean Kennedy, DNR Legislative Liaison, at seanp.kennedy@wisconsin.gov with any questions you have.

Sincerely,

Drew Feldkirchner
Director, WI DNR Bureau of Natural Heritage Conservation

WisDOT DTSD
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November 19, 2020

The Legislative Council is currently preparing a report regarding pollinator health. At the council's request, WisDOT has prepared this memo to serve as a reference for the report. This memo includes information about WisDOT's work to promote pollinator health within the context of roadsides and the transportation system.

Current Pollinator efforts

Education, Outreach, and Collaboration

WisDOT continues to be involved in pollinator-related education and outreach. WisDOT has presented at multiple conferences and trainings on the topic of Pollinators and Monarchs and has conducted other outreach through newsletters and participation in panel discussions and presentations at non-DOT local events. WisDOT has collaborated with a variety of partners on several statewide and national initiatives, including the following.

- Collaborate with Department of Agriculture and Consumer Protection (DATCP) to develop the Wisconsin Pollinator Protection Plan
- Participate as members of the Wisconsin Monarch Collaborative through the Department of Natural Resources (DNR).
  http://wiatri.net/Projects/Monarchs/
- Participate as members of the Rights-of-way as Habitat working group out of the University Illinois Chicago (UIC)
  http://rightofway.erc.uic.edu/
- Collaborated with the Rights-of-way as Habitat working group to develop and review the Nationwide Candidate Conservation Agreement with Assurances (CCAA) for Monarch Butterflies.
  https://www.fws.gov/savethemonarch/ccaa.html
- Participated with the Monarch Joint Venture (MJV) in the National Cooperative Highway Research Program (NCHRP) project
  https://monarchjointventure.org/

Maintenance Activities

Natural Roadsides Policy

In the 1950's, reflecting the fiscal impracticality of mowing the entire highway right of way, the natural roadsides philosophy was adopted. This philosophy encourages minimal mowing with the use and preservation of native vegetation when possible. Current policy is to mow for safety locations, such as vision corners, when needed and roadside shoulder cuts to once a season. This helps preserve the existing habitats and encourage new ones.

Karner Blue Butterfly (KBB) Habitat Conservation Plan

WisDOT has been part of the statewide conservation plan since KBB became endangered in the 1990's, adjusting roadside maintenance activities in the identified KBB conservation areas. In 2016 KBB has received press for doubled population numbers in WI, where in other states the butterfly has ceased to exist. WisDOT continues to work with WDNR to improve this partnership.

Remnant Prairies

Bureau of Highway Maintenance (BHM) and the Bureau of Technical Services (BTS) Environmental Services Section performed an analysis and prioritization of known roadside remnant prairies in 2016. During the 2018 growing season, three of the high-quality prairies have implemented integrated vegetation management, which combines multiple methods of control, starting with woody vegetation removals. These efforts are ongoing in 2020 with prescribed burning and invasive species management.

Pilot Integrated Vegetation Management Corridor

Highway 26, a corridor running through, Dodge, Jefferson, and Rock Counties, has been identified for implementation of a vegetation management plan specific to pollinators. WisDOT is currently developing best management practices for pollinators and invasive species and evaluating effectiveness.

Roadside Facilities - Rest Area Prairie demonstration gardens

Since the 1970's, WisDOT has been establishing prairie demonstration gardens in many of our rest areas. The most recent additions were the installation of prairie gardens at our Portage, Poynette rest areas on I-39/90/94. Currently WisDOT is assessing these valuable education opportunities for additional needs and/or updates.

Living snow fence installation

WisDOT has a strong program to install native shrubs along areas of the right of way to reduce blowing snow on the pavement. While the main goal of these installations is safety, the native shrubs also provide critical floral resources for

pollinators. WisDOT plans to expand this program over time and is considering a pilot project that would add native seeding to these projects.

Improvement Project Activities

Special Projects

WisDOT works with local partners, such as Friends of The Monarch Trail, to restore WisDOT lands for Monarch habitat outside of the right of way fence. Other projects include installing native seed mixes designed for pollinators and developing long-term management plans.

Wetland Mitigation

These sites focus on wetland restoration and mitigation for WisDOT projects and provide beneficial nectar resources for pollinators.

Native Seed

WisDOT specifications currently includes two pollinator friendly native seed mixes. WisDOT is working to improve and expand these options.

Unique concerns to roadsides

These are unique concerns related to the management of vegetation that may affect the potential for the creation of more pollinator habitat on roadsides. WisDOT uses these research efforts to help guide policy decisions related to pollinator habitat creation and management.

- Unique to roadsides is deer-vehicle crashes. The concern is that reduced roadside mowing increases the opportunity for deer-vehicle interactions. The result was inclusive. The research contained a small data set and lacked robustness in analyses and did not allow any general conclusions to be made with respect to the potential relationship between deer-vehicle collisions per year and reduced mowing.
  Deer-Vehicle Crash (DVC), Ecological and Economic Impacts of Reduced Roadside Mowing
  https://intrans.iastate.edu/app/uploads/sites/10/2018/11/DVC-Mowing.pdf
- A common concern identified when pollinator habitat is discussed on roadsides is insect-vehicle collisions. The concern is pollinator habitat on the roadside will increase the potential for insect traffic mortality. This following research report discusses this issue more in depth.
  Roadside habitat impacts on insect traffic mortality
  https://www.researchgate.net/publication/323459526_Roadside_habitat_impacts_insect_traffic_mortality

Policy needs and/or hurdles

The Legislative Council also asked WisDOT to identify any policy needs or hurdles to improving pollinator health. While the Council's report will primarily focus on nonregulatory approaches to supporting pollinator health in Wisconsin, below are challenges WisDOT experiences. While it may not be feasible to implement regulatory changes, there may be an opportunity to find new partners.

- Limited vegetation professionals. WisDOT, county highway departments, and professionals that maintain vegetation on roadsides to benefit the pollinator are limited. This limits the capability of policy change and education specific to roadsides. Developing a structure like cooperative invasive species management (CISMA) areas would help with outreach, education, and developing partnerships. CISMAs are local organizations that bring together landowners and land managers to coordinate action and share expertise and resources to manage invasive species. More information can be found at the following website, https://ipaw.org/the-solution/education/cismas/.
- There are conflicting interests within existing agency rules, which creates conflicting policy. For example, in Wis. Admin Code ch. NR40 Invasive Species Identification, Classification and Control, sometimes identifies invasive species plants as pollinator beneficial. This results in a situation where invasive plants could be intermixed with quality native plants causing challenges for control. As another example, Wis. Admin. Code ch. NR216 Storm Water Discharge Permits, requires erosion control during construction and after. One economical option for erosion control is planting non-native grasses that establish quickly, which is a deterrent to using native plants, which benefit the pollinator, that take different establishment requirements and more time to establish.
- Native seed can be cost prohibitive. There is a need to build the availability of native seed to reduce costs.
- A lack of qualified and knowledgeable landscape contractors to install and manage native seed. Landscape contractor certification and training could increase the number of installations and improve the overall success of the plantings.

Christa Schaefer, PLA, ASLA, LEED AP BD+C
State Transportation Landscape Architect

USDA
United States Department of Agriculture

November 2, 2020

Anna Henning
Wisconsin Legislative Council
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Madison, WI 53703

Dear Anna,

This correspondence is in response to the Wisconsin Legislative Council's inquiry into opportunities available in Wisconsin through the U.S Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) to advance the establishment, management and protection of habitat for pollinator species. Pollinator species are recognized as a critical part of a healthy agricultural landscape. Pollination services from honey bees and other insects and animals provide the backbone to ensuring our diets are diverse and plentiful with fruits, nuts and vegetables. Over 100 crops grown in the United States depend on pollination. It is estimated that one out of every three bites of food we eat exists because of animal pollinators like bees, butterflies and moths, birds and bats, and beetles and other insects.

Currently there are more than three dozen NRCS conservation practices that provide benefits to pollinator species. NRCS conservation practices designed to help honey bees and other pollinators also help reduce erosion, improve soil health, control invasive species, provide quality forage for livestock, increase populations of other beneficial insects and wildlife and make agricultural operations more efficient. Implementation of these conservation practices help improve agricultural productivity on working lands and strengthen rural economies.

Through authorizations provided in the 2018 Farm Bill, NRCS in Wisconsin has been able to provide technical and financial assistance to assist agricultural producers address resource concerns on their land using multiple programs. The Environmental Quality Incentives Program (EQIP), Conservation Stewardship Program (CSP) and Agricultural Conservation Easement Program (ACEP) provide opportunities to help implement beneficial conservation practices for pollinators. Through EQIP, special initiatives are made available in Wisconsin to target financial assistance funding for implementation of conservation practices that will provide safe and diverse food sources for honey bees. Through CSP and ACEP, agricultural producers and landowners are establishing and managing diverse native prairie habitat that are important for pollinator species.

In Wisconsin, NRCS also works closely with conservation partners to provide outreach, education and technical assistance opportunities for the public. For example, the Xerces Society for Invertebrate Conservation collaborates to provide conservation experts with technical guidance on plant lists and pollinator habitat restoration techniques; and the Pollinator Partnership assists NRCS with outreach and promotion for pollinator habitat establishment. Additionally, NRCS works closely in Wisconsin with USDA's Farm Service Agency to

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provide technical assistance for the Conservation Reserve Program (CRP). As of 2019, there were over 14,000 acres enrolled in the Pollinator and Monarch CRP State Acres for Wildlife Enhancement (SAFE) initiative in Wisconsin.

The following are NRCS Wisconsin's technical assistance accomplishments in the past three years that may provide benefit to pollinator species:

Performance Measure	Federal Fiscal Year		
Conservation applied on land being actively managed for wildlife habitat	2018	2019	2020
	5,367 acres	5,904 acres	8,998 acres

The following are examples of individual conservation practices planned through NRCS Wisconsin's technical assistance in Federal Fiscal Year 2020 that can have benefit to pollinator species:

Conservation Practice (Code)	*Planned	Pollinator Notes
Conservation Cover (327)	4,250 acres	Permanent plantings can include diverse native and nonnative forbs to increase plant diversity and ensure flowers are in bloom for as long as possible, providing nectar and pollen throughout the growing season.
Upland Wildlife Habitat Management (645)	1,396 acres	Establishment of seasonal forage for honey bees in the vicinity where bee keepers locate hives.
Forage and Biomass Planting (512)	5,102 acres	Establishment and management of clovers in livestock grazing systems to provide perennial floral resources for honey bees and other pollinators throughout the growing season.
Field Border (386)	203 acres	Can include diverse legumes or other forbs that provide pollen and nectar for bees. Stable (untilled) field borders may provide opportunities for solitary bees to nest in the soil.

**Data Source: NRCS Performance Results System*

I would like to thank the Wisconsin Legislative Council for the opportunity to provide comment on the activities being performed by NRCS in Wisconsin to provide assistance for pollinator habitat establishment and management. If you have any questions or desire any additional information, please do not hesitate to contact me at 608-662-4422.

Sincerely,

Digitally signed by ANGELA BIGGS
Date: 2020.11.02 16:16:37 -06'00'

ANGELA L. BIGGS
State Conservationist

cc:
Elizabeth Hill, Honey Bee and Pollinator Research Coordinator, USDA OCS, Washington, D.C.
Rich Iovanna, Senior Economist, FPAC Business Center, Washington, D.C.
Christine Taliga, National Ecologist, NRCS, Washington, D.C.
Danielle Flynn, National Biologist. NRCS, Washington, D.C.
Eric Hurley, State Resource Conservationist, NRCS, Madison, WI
Steve Bertjens, State Biologist, NRCS, Madison, WI

COLLEGE OF AGRICULTURAL & LIFE SCIENCES
UNIVERSITY OF WISCONSIN-MADISON

Department of Entomology

October 30, 2020

Anna Henning
Benjamin Kramer
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Dear Anna and Ben,

I would like to start by thanking you and the Wisconsin Legislative Council for the opportunity to offer my, and my research group's, perspectives on the topic of pollinator conservation in Wisconsin and what we can do better to support their populations in the state. I have been working on the topic of insect conservation in agricultural landscapes since I started at the University of Wisconsin's Department of Entomology in 2003. In 2016, I was fortunate to have been part of the steering committee for the group that assembled the Wisconsin Pollinator Protection Plan.

The topic of pollinator conservation is a timely one, and one that benefits all of the citizens of Wisconsin. Wisconsin has a thriving and competitive fruit and vegetable industry that is dependent in part on the availability of both managed and wild bees. Wisconsin is home to over 400 species of native bees, several of which are important pollinators of our crops. I am attaching below some important statistics based on some of our research. One key fact is that the hypothetical full loss of pollinators in the state could mean a hit to Wisconsin agriculture of as much as $107 million in lost fruit and vegetable production, a figure that does not include jobs or other effects on the economy. This demonstrates the economic value of pollinators as a healthy natural resource for the Wisconsin economy. This does not, however, attempt to value the incalculable benefits that these wild animals have for our natural communities and to our personal relations with nature.

A clear pattern that is emerging from research on insect pollinators, bees in particular, including our own studies here in Wisconsin, is that the **loss of high quality habitat** is one of the key reasons for their decline in our landscapes. It is important to point out that though not all species are declining, we sadly have scant information to really say much about the population trends of most species. For those groups where we have good long-term data such as bumble bees, it is clear that species are shrinking in range, and becoming rare where they were once common. Wisconsin is one of the few places where the once common rusty patched bumble bee, which is

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now federally listed as endangered, can still be found. These findings come at the same time as information about global insect declines are beginning to be documented, something that is popularly referred to as the "insect apocalypse". Although these headline grabbing news are shocking and worrisome, it is not too late to act to reverse these trends.

The direct connection between pollinator health and agricultural production means that any efforts that boost pollinators are a win-win for farmers' livelihoods, as well as private landowners who value the wildlife, beauty, and the health of their land. The State has a central role to play in providing leadership, setting priorities, and offering resources to efforts that will benefit all of us through the judicious management of our natural resources. This would build on the strong legacy of Wisconsin as a conservation innovator over the last century, conservation that includes people and working landscapes.

I briefly outline below some key initiatives that can help build towards healthier pollinator populations for Wisconsin. There are models from other places in the country that can be adapted to work here, and most of them start with getting better quality habitat - which for pollinators means more flowers, and less disturbance - into our rural (and urban) landscapes.

I would submit that an important step to begin to implement the Wisconsin State Pollinator Protection Plan is to establish a **Pollinator Conservation Initiative** which would invest in the *monitoring of pollinators* and coordinate and support *pollinator habitat creation* efforts in the State. This initiative would strengthen collaborations with University, Tribal, and Federal partners to jointly design and manage pollinator monitoring and conservation efforts. Below I provide more details, and offer some additional ideas to consider for pollinator conservation.

I look forward to seeing Wisconsin provide leadership in pollinator conservation that would make a difference to the state and that could provide an example that other states can look to as a model. These investments in the stewardship of our natural resources will pay dividends for healthy and vibrant agricultural communities that provide not only high quality produce that support our local farming communities, but also inspiration to the people of Wisconsin who see our leaders making an investment in the future.

Please do not hesitate to reach out if you have any additional questions.

Sincerely

Dr. Claudio Gratton
Professor of Entomology
cgratton@wisc.edu, 608-265-3762

Appendix:

Wisconsin pollinator dependent crops and native bees

Wisconsin is home to some of the most diverse and growing vegetable production industries in the country. The top five pollinator dependent crops include cranberries and snap beans (the nation's largest producer of both), apples, cucumbers, pumpkins, and cherries. According to the USDA NASS, in 2017 these crops alone covered ~106,000 acres and were valued at around $247 million in annual sales. Although the degree of dependence on pollinators varies among these crops (from "highly dependent" cranberries and apples, to "essential" for fruit production such as pumpkins, to "slightly dependent" snap beans) complete loss of pollinators could reduce fruit and vegetable production by as much as 57% for the top five crops, costing growers about $107 million (Gaines-Day and Gratton, *unpublished data*). This does not include production of another 5,000+ acres of pollinator dependent crops on smaller organic or community supported farms in Wisconsin. The demand for pollinators throughout Wisconsin is variable, but based on the most common crops for which we have good data, it is centered on the middle part of the state and north (Fig. 1, Gaines-Day and Gratton, *unpublished data*). These are areas that would most likely see economic consequences from declines in wild and managed pollinators.

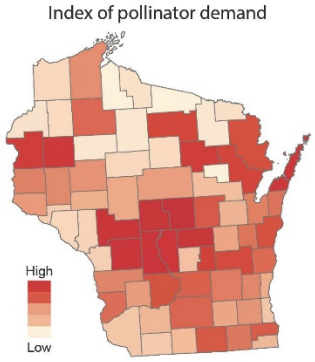

Fig. 1. Index of pollinator demand by county in Wisconsin, based on area-weighted estimates of crops that are pollinator-dependent, and the degree of dependency on insect pollination.

Wisconsin is also home to over 400 species of native, wild bees (Wolf and Ascher 2008). Within our cropping systems, studies at the University of Wisconsin have documented over 80 species of bees in apple (Mallinger 2015), 182 species in cranberries (Gaines-Day 2013), and about 60 species in cucumber (Lowenstein et al. 2012). These species depend on the availability of a diversity of habitats in the landscape in order to nest and find food when crops are not in bloom. In Wisconsin cucumber production, increases in non-crop and herbaceous land cover resulted in a more abundant and diverse pollinator community (Lowenstein et al. 2012). In Door County apple orchards, wild bee abundance and richness increased as nearby forested areas increased (Watson et al. 2011). Our work in southern Wisconsin apple orchards showed that the bee community responded positively to landscape diversity (Mallinger et al. 2016). Finally, in commercial cranberry marshes, increasing amounts of forest in the landscape was associated with a greater abundance and richness of wild bees within cranberry marshes (Gaines-Day 2013).

Taken together, these patterns show that diverse Wisconsin landscapes have the capacity to harbor native species that are associated with agricultural crops. Many of these crops are dependent on insect pollinators for setting fruit and developing viable yields. As such, Wisconsin agriculture is in part dependent on our ability to maintain landscapes that are hospitable to wild and managed pollinators.

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Pollinator Conservation Initiative

Invest in *monitoring of pollinators* and coordination and support of *pollinator habitats* efforts

The Wisconsin Pollinator Protection Plan (PPP) developed in 2015-16 outlined numerous strategies to expand pollinator conservation efforts across the state. To ensure progress on the PPP as well as other initiatives being proposed, it would be helpful to have a State position or office to coordinate pollinator conservation activities; provide information and technical expertise; support for understaffed state and county-level pollinator conservation efforts; and to evaluate progress toward achieving pollinator conservation goals. These efforts could be coordinated with ongoing University, Tribal and Federal pollinator conservation initiatives.

Establishing habitat for pollinators on public and private lands is a key aspect of improving pollinator conservation and a valuable step forward. Yet, these efforts need to be supported with technical knowledge, cost-share, and coordination with other efforts to best synergize efforts. As agriculture is the most likely to benefit from healthy pollinator populations, and agriculture also has the greatest capacity to influence pollinator populations, financial support for these efforts could be obtained through a voluntary or mandatory checkoff for fertilizer and pesticide sales in the state (e.g., IL, IA) that would go towards conservation efforts.

Approach and/or examples where this has been tried:

- WI Monarch Collaborative -- could use this framework but grow the program beyond monarchs to include projects focused on bees. Currently there is only one part time staff person at DNR to support this monarch effort.
- Strengthen collaborations with Tribal and Federal partners to jointly design and manage pollinator conservation efforts
    - Part of the former Badger Army Ammunitions Plant in Sauk Prairie, WI, was returned to Ho-Chunk control, now used for prairie establishment, pollinator plantings, and managed grazing [WPR].
- Re-funding of the Working Lands Initiative could include stronger alignment with pollinator conservation
- Joint DNR/DATCP hires for insect conservation and management would help ameliorate a general lack of capacity in the state. At the federal level, the USDA NRCS currently has only 1 staff member dedicated to pollinator conservation in the state.
    - e.g., http://bwsr.state.mn.us/pollinator-toolbox-identifying-programs-and-funding
- Georgia Pollinator Partnership: https://gapp.org/
- Minnesota Pollinator Initiative:
    - https://www.revisor.mn.gov/statutes/cite/84.973
- Urban habitat initiatives: Lawn-to-Legumes (MN)

Moreover, there are currently few resources at the state level for pollinator monitoring. It is impossible to know the state of Wisconsin pollinators without good baseline data that can be tracked over time. Monitoring is a key tool needed to understand what conservation efforts are working and where improvements can be made. Currently, most of this monitoring is being done through independent University research. Additional efforts need to be made in agricultural areas to see how pollinator populations change over time in association with different production trends. Partnerships and training of agribusiness professionals (e.g., crop scouts, industry groups, etc.) could create stronger connections between conservation and agriculture. The University could partner with DNR to create a system for carrying out efforts at the Statewide level, with the expertise and training to do so, e.g., Department of Entomology, Wisconsin Insect Research Collection. A notable exception is the WI DNR's citizen science program on bumble bees (Bumble Bee Brigade). This program is a model that could be enhanced and expanded. The DNR has 1 dedicated person responsible for pollinators at state level. More resources could be devoted to these monitoring efforts, increasing capacity at state level, and promoting State-University-Tribal collaborations in pollinator monitoring efforts.

Approach and/or examples where this has been tried:

- MN DNR: MN Biological Survey with long-term monitoring for pollinator protection goals
- Oregon State Bee Atlas
- Nebraska Bumble Bee Atlas

Pesticide education and outreach

Reduce use of insecticides and herbicides through education and outreach

In addition to habitat loss, managed and wild pollinators are threatened by pesticide exposure in agricultural landscapes. While pesticides may be necessary for farm management in some circumstances, research shows that the widespread use of certain pesticides such as neonicotinoids is incongruent with their potential benefits to crop production. For example, neonicotinoids have been linked to declines in pollinator health and reproduction, which can be just as consequential for pollinator populations as direct mortality effects. They have also been associated with declines in other beneficial insects such as crop pest predators which in turn necessitates greater use of insecticides, creating a negative cycle of dependency. Absent regulation, managers should be made more aware of the high risks to pollinators and often negligible benefits of neonicotinoids, fungicides, and other pesticides to crop production. Use of integrated pest management where pesticides are used as a last resort and not prophylactically should be the standard for best management practices in agricultural production. As agrichemicals directly and indirectly influence pollinators, financial support for education efforts

could be supported by a voluntary or mandatory checkoff for fertilizer and pesticide sales in the state (e.g., IL, IA).

Approach and/or examples where this has been tried:

- https://beebettercertified.org/
- Extension offices at land grant universities like UW have Pesticide Safety Education Programs. Most of these programs currently focus on safety training and certification for pesticide applicators, but these programs or other programs through extension could be expanded to provide extension agents with the most recent research on pesticide use, including pollinator associated risks and assessment of the utility/necessity of pesticide use across different crops with an added emphasis on pollinator conservation. This information could be incorporated into applicator training programs and conveyed to farmers, food companies, urban land managers, and other relevant stakeholder groups through extension outreach.
- Wisconsin farmers don't always have the capacity to make decisions about whether or not to use pesticides or which pesticides to use. Agreements with food processing companies sometimes require the incorporation of pesticides in their crop management as a form of insurance, even when research shows that pesticides don't always benefit crop yields. In addition to education for farmers and land managers, providing education to food companies about the risks and negligible benefits of pesticides would be helpful. Prophylactic use of pesticides, including as seed treatments, should be discouraged under most circumstances.

Supporting Materials / Literature Science, etc.:

- Mourtzinis et al. 2019 - Neonicotinoid seed treatments of soybean provide negligible benefits to US farmers
- Krupke et al. 2017 - Planting of neonicotinoid-treated maize poses risks for honey bees and other non-target organisms over a wide area without consistent crop yield benefit
- Lu 2020 - review of sub-lethal neonicotinoid insecticides exposure and effects on pollinators
- Sviter & Muth 2020 - Do novel insecticides pose a threat to beneficial insects?
- EPA must modify agrochemical regulatory process to protect bees
- Frank, S. D., and J. F. Tooker. 2020. Opinion: Neonicotinoids pose undocumented threats to food webs. Proceedings of the National Academy of Sciences.

Solar Energy for Pollinators

Ground-based photovoltaic arrays for generating electricity are growing in Wisconsin as a way to produce carbon-neutral energy. If situated appropriately and managed well, they also have the opportunity to create high-quality pollinator habitat while providing farmers with additional sources of income. Ensuring that ground-based solar is designed to create pollinator habitat is an easy way to increase flowers in the landscape, a key element needed to support pollinator populations. We suggest that all new ground-based solar installations above a certain size be designed to include pollinator habitat.

Approach and/or examples where this has been tried:

- Wisconsin Pollinator guidelines for solar development https://pollinators.wisc.edu/solar/
    - In consultation with other states and with PV solar groups, we have developed simple guidelines and a program for ensuring that pollinator habitat is established and maintained in ground-based solar developments in Wisconsin.
    - This includes a scorecard for evaluating the quality of the installation for pollinator habitat. This approach has been tried in several other states including Michigan, Minnesota, Vermont.

Wisconsin Land+Water Conservation Association

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October 29, 2020

Dear Members of the Wisconsin Legislative Council,

Thank you for the opportunity to provide input on pollinator health in Wisconsin.

Wisconsin Land and Water Conservation Association (WI Land+Water) is a nonprofit organization that represents and serves over 800 county land and water conservation department staff and elected county board officials that oversee the conservation departments in all 72 counties across the state. Our members work closely with diverse stakeholders and landowners to implement conservation practices across Wisconsin's landscape to protect and restore our natural resources.

Wisconsin county conservationists understand the critical role pollinators play in ecological health and have implemented a range of successful programs throughout the state. From participating in Monarch Watch through citizen programs, to integrating pollinator assessments into County Land and Water Resource Management plans that include strategies to strengthen pollinator health, county conservation departments are local leaders in promoting and improving pollinator habitat.

We are encouraged by the Wisconsin Legislative Council request to learn more about the efforts across the state. We hope you consider the following as you prepare policy recommendations:

- **Provide staff funding to implement local programs**. There is limited funding available for county conservation department staff, yet demand for their critical service to provide local leadership continues to increase. While there are ample grant opportunities that support buying seed to plant pollinator habitat, there are few resources for staff positions that build and sustain programs.

- **Improve coordination, shared understanding across programs.** Pollinator health intersects all land management efforts. From agriculture, invasive species, and transportation, pollinator habitat is affected through various management efforts. County conservation department staff serve as liaisons between programs housed throughout multiple agencies and partner organizations. It is clear that more communication is needed to provide a shared understanding of the benefits of pollinator habitat to limit unintended consequences.

For example:

- Pesticides used to eradicate invasive species can be detrimental to pollinator health. Oneida County has developed best management practices to remove invasive species as well as promote pollinator health.
- The Department of Transportation has planted excellent pollinator habitat, but mowing schedules destroy this opportunity for improved pollinator health. Better coordination is needed to accommodate pollinators while maintaining safety.

- **Increase opportunities to integrate pollinator habitat across all landscapes.** While there are opportunities to promote pollinator habitat along waterfront properties through grants such as the Department of Natural Resources' Healthy Lakes and Rivers grant, we need to invest in programs that encourage improving residential yards and agriculture practices to promote pollinator health. Minnesota's Lawn to Legumes program is one great example of providing resources to residential homeowners to convert lawns into pollinator habitat.

Many county conservation department staff have experience coordinating successful pollinator programs. We hope you utilize their unique expertise through continued engagement while advancing state policies that promote pollinator health.

Thank you for initiating this important conversation.

Regards,

Matt Krueger
Executive Director
WI Land+Water

Wisconsin Honey Producers Association

The Wisconsin Honey Producers Association (WHPA) has some major concerns about pollinator health in Wisconsin. These concerns go beyond media recognized problems of mite and small hive beetle control, Colony Collapse Disorder, widespread insecticide and fungicide use and the continuing decline of bee forage.

The State of Wisconsin, and DATCP, is doing a less than sufficient job of protecting bees. DATCP's philosophy, as they have expressed to WHPA officers, is that their role is to educate hobbyists and issue permits for Wisconsin beekeepers to move bees to other states. In the meantime, DATCP is not checking permits and the health off bees coming into Wisconsin for cranberry pollination. The result of this is an influx of bees into Wisconsin that are potentially spreading disease to the bees of resident beekeepers. WHPA feels this is a major threat to honey bees in Wisconsin. DATCP's philosophy appears to be different that that of other states. In January of 2020 at the American Beekeeping Federation convention I attended a session where we were given the opportunity to ask questions of bee inspectors from around the country. I asked if they felt their job was mainly to educate hobby beekeepers or to enforce state beekeeping laws. All six members of the panel said their number one job was the enforcement of state beekeeping laws. For the record, Wisconsin was not represented on this panel of bee inspectors.

Wisconsin has not done an adequate job developing plans to protect honey bees. In the Pollinator Protection Plan honey bees are grouped with other pollinators. Not that other pollinators are not important, however, this was no recognition that honey bees do 98% of the pollination. The Pollinator Protection Plan was created to provide best practices to protect pollinators. Unfortunately, the plan has no enforcement element which, in effect, renders it useless.

We need DATCP to do its job, insuring the health of honey bees especially within the commercial beekeeping industry where a majority of managed honeybees are kept. DATCP's job is not to teach hobbyists or promote native pollinators.

In addition, WHPA feels that Wisconsin needs legislation to eliminate frivolous lawsuits where beekeepers are sued over alleged bee stings. These lawsuits are never successful and result in beekeepers need to hire legal counsel to defend against them. This type of legislation has either been enacted or is being proposed in several states. Attached is a copy of the state of Washington's law.

Washington Bee Sting Liability Law.p

Today beekeepers in Wisconsin and around the United States are struggling with numerous challenges. Most states have legislators and administrative agencies which work diligently with beekeepers because they understand the importance of the honey bee to our food supply and economy. Unfortunately, currently Wisconsin is not one of the states which sees the importance.

To: Benjamin Kranner and Anna Henning. Staff Analysts, Wisconsin Legislative Council
From: Sarah Foltz Jordan, Aimee Code, Eric Lee-Mader, and Mace Vaughan.
The Xerces Society for Invertebrate Conservation
Re: Pollinator Policy Recommendations to the Wisconsin Legislative Council
Date: September 29, 2020

Thank you for the invitation to provide recommendations for pollinator policy changes in Wisconsin. Below we have highlighted a few priority ideas. As you move forward with this process, we welcome further discussion about these and any other recommendations you are considering.

Agricultural Policy

We urge Wisconsin legislators to develop and pass legislation that provides incentives for farmers to transition towards cropping systems that are more compatible with pollinator health, for example: increasing crop diversity especially of pollinator-attractive crops; establishing high-quality native habitat areas; planting flowering cover crops and managing their termination for the benefit of pollinators; and reducing or eliminating pollinator-toxic pesticide use.

One such idea that focuses on reducing neonicotinoid-seed treatments in corn/soy cropping systems is presented below:

On-Farm Seed-Treatment Experimentation Program (OSEP)
Program Description: The model for this initiative comes from a federal USDA Conservation Stewardship Program (CSP) Enhancement (E595116Z2). This Enhancement was introduced in 2017, in recognition of the agricultural and environmental benefits of reducing neonic-treated seed use, as well as the financial and logistical challenges associated with switching to non-neonic-treated seeds. In short, Enhancement E595116Z2 provides corn and soybean farmers with financial assistance to plant seed without neonic treatments; in the Upper Midwest, the payment was ~$4.95 for each acre of neonic-free corn or soybean being seeded on land that was formerly planted with neonic-treated seed. Since this assistance was only available to farmers enrolled in CSP—a small percentage of Wisconsin farms--and is currently unavailable, **the new state initiative described here is important to ensure accessibility of these resources to all farmers interested in making this change**. For the state initiative, it will be important to reassess the per-acre payment rate to determine if this amount is appropriate for each crop, to encourage a significant number of Wisconsin farmers to enroll.

This initiative could be implemented to provide Wisconsin farmers an opportunity to evaluate the need for neonicotinoid insecticide seed treatments on corn and soybeans in the context of

their own specific farming operations. The program would be available to farmers who are currently using neonicotinoid seed treatments, but are interested in trialing untreated seeds on some or all acres. Per acre compensation would be provided for any acres switched from neonicotinoid-treated to untreated seed, for up to five years. Through trainings and outreach efforts, Wisconsin growers would be made aware of the initiative, and would be given the guidance they need to decide if this is a good fit for their cropland.

This state initiative will help farmers trial untreated seed across some or all of their acreage (e.g., side-by-side comparisons of treated & untreated seeds could be conducted to help inform future decision making). For most Wisconsin farmers, decreasing use of neonic-treated corn and soybean seed can lower input costs while protecting local water quality and agriculturally valuable beneficial insect populations— potentially without sacrificing yield or income. Use of neonicotinoids only when there is a clear pest threat can also slow down the development of pest resistance to these pesticides. However, converting fields to non-neonic-treated seed can present logistical and financial challenges, and a state program that provides guidance and financial incentives is needed. Benefits to farmers include:

1. **Reduce Input Costs.** Soybean growers report spending roughly $10-15 an acre on neonicotinoid seed treatments. There are some uncommon scenarios in the Midwest and northern states when researchers believe neonicotinoid-treated soybean seed are a useful management option. These include: fields with recently incorporated animal manure, as seedcorn maggots prefer rotting organic matter; and when planting a second crop of food grade soybeans, as aphids could migrate from mature plants to younger plants. Yet, many studies and farm research trials across the Midwest have found no measured effect of neonicotinoid seed treatment on soybean yield, suggesting that neonicotinoid seed treatments are an unnecessary input cost for many farmers. Neonicotinoid-treated seeds are generally not effective against soybean aphid, due to the timing of their emergence. Cost estimates in soy have found that traditional IPM was more cost-effective than use of neonicotinoid-treated seeds, whether aphid pressure was above or below economics threshold levels. Similarly, in corn cropping systems, yield benefits due to neonicotinoid seed treatments are inconsistent, suggesting a more targeted approach to usage is warranted.
2. **Slow down pest resistance.** Studies find that many of the pests targeted by neonicotinoid applications develop resistance quickly, resulting in higher inputs over time. Using targeted applications when most needed can help slow down the development of resistance in pest populations.
3. **Improve water quality.** The Environmental Protection Agency is currently re-evaluating its registration of three neonicotinoid pesticides. EPA thresholds for neonicotinoid contamination of public waterways are already low—for imidacloprid, the chronic benchmark for invertebrate wildlife is just .01 µg/L. As Wisconsin lawmakers become increasingly concerned with groundwater contamination, farmers are looking for ways to preemptively reduce inputs to avoid reactionary state regulation.

4. **Reduce non-target impacts to beneficial insect populations**, including pollinators and natural enemies for pest control. For example, research has found that neonicotinoid seed treatments can harm ground beetles and other pest predators, reducing soybean yield as pests like slugs go unchecked by their natural enemies.

Bill language (HF2487) has been developed for this program in Minnesota and could be used by Wisconsin as a starting point if desired.
https://www.revisor.mn.gov/bills/bill.php?b=house&f=HF2487&ssn=0&y=2019

Non-Agricultural Policy

Residential Native Habitat Program
We urge Wisconsin legislators to develop and pass legislation that provides funding for a state program focused on **replacing or enhancing turf with flowering habitat in urban, suburban, and rural nonagricultural lands.** This program could be modeled after the Lawn to Legumes program in MN, a new and incredibly popular state program that provides cost-share funding to residential pollinator habitat projects.
http://bwsr.state.mn.us/l2l#:~:text=The%20Lawns%20to%20Legumes%20program,native%20plantings%20in%20residential%20lawns.

Urban habitat and rural non-farm habitat have been identified as major gaps in pollinator habitat in Wisconsin in terms of 1) land use categories not currently eligible for habitat conversion under most existing state and federal programs, 2) numerous opportunities for partnership with a high level of interest/demand, and 3) unique opportunities to support imperiled pollinator species. Turf conversion is a relatively easy, rapid, and low-cost form of restoration, and would have immediate benefits to pollinators, as well as high visibility and potential for "ripple effects" through neighborhoods and communities. The program could provide emphasis on supporting the rusty-patched bumble bee, a federally endangered bee species that was formerly one of Wisconsin's most common bees, and now occurs in very low numbers relative to previous decades. Existing populations of this species require abundant forage and nesting opportunities on residential urban, suburban, and rural lands, in order to rebound in numbers. Habitat options could include bee lawns, native flowering habitat, native shrub plantings, rain gardens, and other pollinator-friendly options. Pesticide drift issues should be addressed via education/outreach and in habitat placement decisions. Habitat mapping of existing and potential habitat could help identify priority areas for projects based on habitat connectivity, at-risk species distributions, and protection from pesticides. Installations could be tailored to support select species (e.g., monarchs, rusty patched bumble bees, honey bees) or diverse species.

Establish Best Management Practices (BMPs) for Pollinators on State Lands:
Encourage or require that public facilities (government offices, schools, other institutions) and other state-owned lands (state parks, etc) to (1) include a certain percentage of pollinator habitat and (2) commit to reducing or eliminating pollinator-harming pesticides used in landscaping and other practices.

Other Considerations

Look to Pennsylvania, Washington and Other States for Ideas

Many other states have taken time to consider how best to support pollinators and respond to the risks they face. These efforts could provide valuable insights for the state of Wisconsin. Pennsylvania has a pollinator protection plan that includes recommendations regarding habitat, pesticide use and bee keeping. The plan is considered a living document and is updated as needed. The state of Washington established a pollinator health task force which created recommendations regarding research pesticides, habitat, managed pollinators and education. The task force is currently voting on those recommendations. Both of these states took the time to consider native pollinators along with protections for honey bees. That is an important consideration for Wisconsin especially in light of the Wisconsin pollinator protection plan which specifically highlights native bees.

Again, thank you for taking the time to meet with us. Please feel free to reach out if you have further questions.

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October 30, 2020

Dear Ms. Henning and Mr. Kranner,

Thank you for reaching out to Pollinator Partnership on behalf of the Legislative Council of Wisconsin. In 2016, the State of Wisconsin, through the Department of Agriculture, Trade and Consumer Protection, released the *Wisconsin Pollinator Protection Plan.* And every year, the state legislature has declared the third week of June as Pollinator Week. We applaud these important steps forward and are happy to provide some policy suggestions in support of these initiative for pollinator health in the State of Wisconsin.

Pollinator Partnership is a 501(c)3 non-profit dedicated to the support and preservation of pollinators and their ecosystems in the United States, and throughout North America. We achieve our conservation goals by engaging stakeholders in active conservation on lands they manage, by conducting original research to fill data gaps that hamper pollinator conservation, and through outreach and education to the public and to policy makers. Our work has resulted in the development of many conservation resources and initiatives, including the annual North American Pollinator Protection Campaign's annual Pollinator Roadside Management Award that recognizes state and county DOT's efforts to improve management for conservation.

State legislatures have an important role to play in protecting pollinators and the key ecosystem service they provide. In recent years, at least 28 states have enacted legislation related to pollinators and that deals with a wide range of topics, including research, education, habitat and pesticides. The *Wisconsin Pollinator Protection Plan* provides important goals and Best Management Practices, which the recommendations below aim to support.

Research

- Pollinator Advisory Committee: Convening a group of experts to inform the legislature on matters pertaining to pollinators specific to your State and to help guide policy and develop resources; and encourage the creation of municipal Pollinator Advisory Committees.
- Direct University of Wisconsin funding to pollinator research, including habitat identification, protection and restoration.
- Support pollinator monitoring to establish baseline population levels and measure changes over time, thus providing key information on populations' health and the effectiveness of policies that are implemented.

Habitat

Making pollinator habitat a welcome part of the Wisconsin landscape will add native beauty, build an ecological identity, increase carbon sequestration, add to soil health, prevent erosion, and add multiple benefits including increased pollination services.

- Identify and protect significant and rare pollinator habitats, including those where species at risk are present (e.g. rusty-patched bumble bee).
- Set State-level goals to preserve and increase habitat acres.
- Encourage the inclusion of pollinator habitat whenever state facilities are re-landscaped; encourage pollinator habitat on farm edges, out of play areas on golf courses, hospitals, schools, places of worship, and parks.
- Prohibit the use of invasive species in any government funded planting and landscaping efforts and provide funding for education and outreach on the environmental dangers and high management and removal costs associated with invasive species.
- Create policies that encourage the propagation of native species of grasses, forbs, shrubs, and trees to help meet the growing demand for these regionally appropriate plants and seeds by homeowners and land managers.

Department of Transportation

- Identify rights-of-ways where significant pollinator habitat is present and institute practical mowing practices that preserve habitat throughout bloom and during prime reproduction windows for species such as monarchs.
- Reduce or eliminate mowing and apply targeted invasive species removal beyond clear zones to foster pollinator habitat and reduce maintenance costs.
- Use native plant species to re-vegetate roadsides after road work is completed, which can be branded as highway beautification or a roadside pollinator habitat program.
- Identify annual targets in acres of roadside habitat restoration.
- Provide access and encourage training to DOT staff on the importance of pollinators and the habitat that managed ROWs can provide, along with BMPs and basic plant/pollinator identification to empower them with the skills to manage with pollinators in mind.
- Incorporate pollinator habitat and interpretive signage into DOT managed areas such as: retired and current weigh stations, retired and current rest areas, land surrounding DOT garages and district offices, Brownfields, any excess right of way the DOT has purchased for future growth.
- Partner with universities, NGOs, or agency biologists to monitor and conduct surveys to help develop case studies and guidelines for habitat establishment and maintenance along roadways as well as record changes in biodiversity resulting from improved practices.

Agriculture and apiculture

- Support pollinator protection in agricultural lands through Extension programs.
- Incorporate pollinator habitat creation, integrated pest management and pollinator protection initiatives in cost-share programs and other agricultural incentive programs.
- Encourage and support communications between growers and beekeepers to prevent accidental bee poisonings from pesticide applications, using a hive registration model and/or communication app.
- Encourage Bee Friendly Farming Certification or other practices that partner with growers to build best management practices that support crop and pollinator sustainability.

Landowner and Homeowner incentives

- Develop model ordinances to reduce barriers to landowners and homeowners that naturalize their properties and create pollinator habitat; promote these ordinances to municipalities.
- Offer incentives to landowners and homeowners to naturalize their lawns with pollinator-supporting vegetation.
- Offer habitat protection incentives to homeowners whose properties support species at risk.
- Review state and local ordinances to ensure that beneficial native wildflowers such as milkweeds are not banned due to relic laws.
- Prohibit the buying, selling, and movement of invasive species by seed distributors, plant retailers, and residents within the state.
- Incentivise water quality improvement projects (such as rain gardens and bioswales) to include pollinator supporting host and forage species.

Solar

- Adopt a State Pollinator-Friendly Solar Scorecard to establish voluntary habitat creation guidelines and recognition thereof in field solar energy installations.

In closing, we would like to reiterate the importance of state legislatures role in developing policy frameworks and resources for pollinator conservation. These initiatives not only benefit pollinators and their environment, but can help government agencies reduce maintenance costs, beautify the landscape and engage residents.

Thank you,

Laurie Davis Adams,
President and CEO

The Nature Conservancy
Protecting nature. Preserving life.

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October 16, 2020

Dear Members of the Wisconsin State Legislature and Wisconsin Legislative Council Staff:

Thank you very much for the opportunity to provide comments on potential improvements to Wisconsin statutes promoting the use of pollinators in our state. My name is Alex Madorsky and I am Associate Director of Government Relations at The Nature Conservancy in Wisconsin. The Nature Conservancy (TNC) is the world's largest conservation organization, working in all 50 states and 74 countries around the globe to protect the land and water on which all life depends. Guided by science, we create innovative, on-the-ground solutions to our world's toughest challenges so that nature and people can thrive together. In Wisconsin, the Conservancy has protected more than 233,800 acres of land and water since 1960. TNC's agriculture work in Wisconsin includes aiding farmers and conservation-minded gardeners on the cutting edge of sustainability practices like pollinator health.

Biodiversity is a critical component of ensuring Wisconsin has a resilient and connected network of habitats capable of mitigating climate impacts and improving human health. (For more information, TNC's Resilient Mapping Tool allows the public to obtain more information on climate and land resiliency by municipality, zip code, and other search parameters at https://maps.tnc.org/resilientland). Current federal programs such as the Conservation Reserve Program (CRP) and the Environmental Quality Pollinator Initiative (EQIP) already exist to encourage the use of pollinators. However, the diversity of species in prairie planting should be expanded beyond the narrow range currently promoted by federal law. Adding additional species to the seed mix, including a broad array of wildflowers and native grasses, would help reduce nutrient runoff and hold soil which attracts nesting grassland birds. A dedicated program to strengthen coordination between experts

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and practitioners at DATCP, DNR, and the United States Fish and Wildlife Private Lands Program would also yield scientifically sound results.

A look at pollinator public policy in some of our neighboring states pollinator incentives could be improved in Wisconsin. In Minnesota, a "Lawn for Legumes" programs provide direct payments to property owners looking to install and grown pollinator-friendly laws. Payments and corresponding state agency staff in this program are modest, but a similar program could be established in Wisconsin through DATCP's pre-existing Pollinator Protection Program or through a new, separate initiative.

Minnesota law also focuses on creating synergies between pollinator health and low-impact renewable energy. Done properly, pollinator-friendly solar siting can simultaneously increase sustainability outcomes for both pollinators and solar energy, rather than having two worthwhile conservation goals working at cross purposes. Wisconsin should use Minnesota's certification processes (*see* Minn. Stats. 216B.142) a strong template for solar developers seeking business benefits from "gold standard" certification as habitat friendly.

Thank you again for the opportunity to comment on the vital need for increasing the use of pollinators in Wisconsin. If I or my science colleagues can provide you with any additional information on pollinators, please do not hesitate to contact me.

Sincerely,

Alex Madorsky
Associate Director of Government Relations, The Nature Conservancy
E-mail: a.r.madorsky@tnc.org Cell: 608-516-5174