

# Recommendations for Pollinator Protection in Minnesota

REPORT TO THE GOVERNOR

GOVERNOR'S COMMITTEE ON POLLINATOR PROTECTION

NOVEMBER 2018

## *GOVERNOR'S COMMITTEE ON POLLINATOR PROTECTION*

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# EXECUTIVE SUMMARY

It is the intention of the Governor’s Committee on Pollinator Protection that decision makers in the Minnesota governor’s office, state agencies, and the legislature will use this document to help prioritize and enact meaningful policy and other positive changes for pollinators in our state. The committee hopes that many of the recommendations in this document will be selected, refined, and enacted to measurably benefit Minnesota’s pollinators.

It is important to note that this is largely an informational, rather than directional, document. The 39 recommendations presented in this document were contributed by committee members and represent a wide range of perspectives and approaches. Our committee decided to list the full array of ideas that were seriously discussed by our group, along with the results of a voting process (see the Recommendations for Pollinator Protection section and Appendices A and B).

We organized the recommendations under three goals, abbreviated here as: 1) Habitat, 2) Pesticides, and 3) Education. Committee members voted in two ways. Members individually registered their support, opposition, or neutral position for each recommendation. Additionally, committee members elevated, or prioritized, a set number of recommendations within each goal. We have highlighted high-priority recommendations with broad support under each goal, as we believe they are the most likely to gain traction in Minnesota and be highly beneficial to pollinators.

## Priority recommendations for Goal 1: Habitat

Under the goal of increasing habitat to support pollinators, four of the 10 recommendations were elevated by the committee. The committee voted unanimously in support of recommendations 1.1, 1.3 and 1.4; recommendation 1.2 received one opposing vote.

Table 1. Priority recommendations for Goal 1: Habitat

Ref #	Recommendations	Priority Votes	Support votes (support – oppose – neutral)
1.1	Expand funding and eligibility criteria for pollinator habitat and management practices on rural lands, beyond what is provided by existing pollinator habitat programs.	11	15 – 0 – 0
1.2	Establish a turf conversion and enhancement program focused on replacing or enhancing turf with flowering habitat in urban, suburban, and rural non-agricultural lands	9	14 – 1 – 0
1.3	Encourage and incentivize new public education facilities (schools, colleges, and universities) and major remodeling projects to include a certain percentage of pollinator landscaping	8	15 – 0 – 0
1.4	Increase use of flowering cover crops by establishing a Minnesota Department of Agriculture-directed cover crop incentive initiative	7	15 – 0 – 0

## Priority recommendations for Goal 2: Pesticides

The committee elevated seven of the 22 recommendations under Goal 2. None of these recommendations received unanimous support; votes in support ranged from nine to 12 of the 15 total committee members.

*Table 2. Priority recommendations for Goal 2: Pesticides*

Ref #	Recommendations	Priority votes	Support votes (support – oppose – neutral)
2.1	Increase awareness and adoption of the new federal Conservation Stewardship Program (CSP) Enhancement E595116Z2 and develop a similar state-level program for non-CSP farmers for planting corn/soy seeds not treated with neonicotinoids	9	12 – 2 – 1
2.2	Restrict the use and sale of neonicotinoid insecticides to licensed applicators	8	11 – 2 – 2
2.3	Minnesota Department of Agriculture Neonicotinoid Review Action 1: Create a Treated Seed Program	8	10 – 4 – 1
2.4	Establish a Minnesota Department of Agriculture Crop Pest Loss Indemnity Fund for farmers avoiding pollinator-harming pesticides	7	12 – 3 – 0
2.5	Promote incentives to increase adoption of drift-reduction technologies	6	10 – 3 – 2
2.6	Adopt in statute a goal to reduce overall use of pesticides harmful to pollinators and designate an agency to create and implement a plan to meet the target	6	10 – 4 – 1
2.7	Discontinue neonicotinoid seed treatments in soybeans	6	9 – 5 – 1

## Priority recommendations for Goal 3: Education

Elevated recommendations under the Education goal included three of seven discussed. One of these recommendations (3.3) received unanimous support.

*Table 3. Priority recommendations for Goal 3: Education*

Ref #	Recommendations	Priority votes	Support votes (support – oppose – neutral)
3.1	Include the importance of pollinators and their habitat, as appropriate, in resources developed for teachers within and related to the next version of science standards	10	14 – 0 – 1
3.2	Amend Minnesota statute to designate all currently reported pesticide use data as public	8	9 – 4 – 2
3.3	Provide continued funding for an enhanced pollinator extension education and outreach program at the University of Minnesota along with the funding needed to maximize pollinator education across the state of Minnesota	7	15 – 0 – 0

## Taking action

The committee calls on decision makers to advance and implement recommendations in this report to protect our state’s pollinators. The voting results associated with each recommendation offer decision makers a sense of whether a given idea will be widely supported or encounter opposition, and whether it may be viewed as highly impactful for pollinator conservation. We urge decision makers to take timely and thoughtful action based on the recommendations proposed in this report.

# CONTENTS

Executive Summary .....	i
Introduction .....	1
Committee journey .....	4
Recommendations for Pollinator Protection .....	5
Voting process and terms.....	5
Recommendations for Goal 1: Habitat .....	6
Recommendations for Goal 2: Pesticides .....	16
Recommendations for Goal 3: Education .....	36
Appendices .....	A-1
Appendix A    Voting results in priority order .....	A-1
Appendix B    Votes by committee members .....	B-1
Appendix C    Committee member biographies .....	C-1
Appendix D    Definition of integrated pest management .....	D-1
Appendix E    Glossary of acronyms .....	E-1
Appendix F    Executive Order 16-07 text.....	F-1
Appendix G    Meetings, presentations, and tours .....	G-1

# INTRODUCTION

The health and diversity of Minnesota pollinators are declining. While population changes in wild bees are difficult to document, existing data show serious declines for many species. A recent assessment by the International Union for Conservation of Nature’s Bumblebee Specialist Group found that more than one quarter of North American bumble bee species are at risk of extinction.<sup>1</sup> This includes at least six species of native bumble bees in Minnesota – most notably the endangered rusty-patched bumble bee (*Bombus affinis*), a once-common bee which has declined by 92% in relative abundance over the past decade. The endangered Poweshiek skipperling (*Oarisma poweshiek*), formerly one of Minnesota’s most common prairie butterflies, has recently experienced a population collapse leading to its complete disappearance from the state. Similarly, the Dakota skipper (*Hesperia dacotae*) is barely hanging on in Minnesota. A total of 33 species of butterflies and moths and five bee species have been identified by the Minnesota Department of Natural Resources (DNR) as species in greatest conservation need (rare, declining, and/or facing serious threats).

Even some of our most common and abundant pollinators are experiencing dramatic declines. For example, the eastern migratory population of North American monarch butterfly has dropped in numbers by nearly 90% since the mid-1990s. Approximately 30-40% of all honey bee colonies die every year due to parasites, pathogens, pesticides, and poor nutrition. Beekeepers struggle to recuperate these losses by splitting surviving colonies, which poses economic hardships and risks to the ability to provide pollination services.<sup>2</sup>

These declines in health and diversity of pollinators have consequences for both our wild plant communities and cultivated agricultural systems. Over 85% of our flowering wild plants require animal pollination, typically by bees, for seed set. As such, our prairies, woodlands, wetlands, and other natural areas are dependent on pollinators, primarily native bees, for maintaining diverse plant communities and ecosystem health. Approximately two-thirds of crop plants and 35% of crop production, globally, is dependent on pollinators.<sup>3</sup> The value of pollination services in Minnesota is estimated at \$11.8 million per year in apple crops, alone.<sup>4</sup> A recent study in Wisconsin apple orchards found the number of different kinds of wild bees in the orchard during bloom to be the most important driver of fruit set in this crop.<sup>5</sup> Globally, wild bees improve crop yields in all crops examined.<sup>6</sup>

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<sup>1</sup> IUCN (International Union for the Conservation of Nature). 2018. [Red List of Threatened Species](#). Version 2015.2. (Accessed 30 October 2018).

<sup>2</sup> [Bee Informed Partnership](#)

<sup>3</sup> Klein et al. 2007. Importance of pollinators in changing landscapes for world crops. Proc. R. Soc. B 274: 303-313.

<sup>4</sup> USDA National Agricultural Statistics Service: [Statistics by State](#)

<sup>5</sup> Mallinger, R.E., and Gratton, C. 2015. Species richness of wild bees, but not the use of managed honey bees, increases fruit set of a pollinator-dependent crop. Journal of Applied Ecology 52: 323–330.

<sup>6</sup> Garibaldi, L. A. et al. 2013. Wild pollinators enhance fruit set of crops regardless of honey bee abundance. Science 339 (6127): 1608-1611.

## Taking action on pollinator decline

For effective pollination to be achieved in both wild and agricultural systems, the specific resource requirements of bees must be met. These include adequate floral resources, nesting resources, overwintering sites, and protection from pesticide exposure. Where these resource needs are scarce or lost, pollinator communities suffer.

Habitat loss and pesticide exposure are considered leading drivers of pollinator decline. Significant efforts are being made around the world to address both of these concerns. Nationally, at least 22 states have enacted legislation to protect and promote pollinators through habitat creation and protection and reducing pollinator-harming pesticide use. In 2017, the 28 countries of the European Union banned all outdoor use of three types of neonicotinoid chemicals based on the growing evidence that their use negatively impacts pollinator populations.

In 2013, the Minnesota legislature authorized the Minnesota Department of Agriculture (MDA) to complete a special review of neonicotinoid use, registration, and insect pollinator impacts in Minnesota. Following up on this process, Governor Mark Dayton issued an executive order (16-07) in August 2016 aimed at addressing pollinator exposure to neonicotinoids in Minnesota and bolstering pollinator conservation efforts. This executive order, included in Appendix F of this report, outlined a series of directives, including 1) requiring that MDA take immediate action to complete and implement the recommendations in the Special Registration Review of Neonicotinoid Insecticides, 2) establishing an Interagency Pollinator Protection Team (IPPT) to take immediate action to restore pollinator health in the state, and 3) forming the Governor's Committee on Pollinator Protection (GCPP) to help advise the Governor and state agencies on statewide pollinator protection efforts, and identify and support opportunities for pollinator conservation improvements.

## Governor's Committee on Pollinator Protection

The Governor's Committee on Pollinator Protection was established as a citizen stakeholder committee. Interested citizens submitted applications to the governor's office, and the 15 of us were selected to serve on the committee. We represent a wide range of backgrounds, expertise, and viewpoints (see our biographies in Appendix C).

As members of the GCPP, our work together was guided by the following values:

- 1) **ACTION:** The committee recognizes the need for sustainable and measurable proactive efforts to immediately slow and reverse pollinator population decline. Science-based information will be utilized to inform action-oriented and measurable recommendations. Recommendations provided by the committee will be crafted to result in the most immediate results of protecting the greatest numbers of pollinators.
- 2) **LEADERSHIP:** The committee will provide precedent-setting leadership in pollinator protection efforts. As the first of its kind in the country, this governor-appointed committee strives to create a strategic, forward-looking model for others to follow in their pollinator protection efforts. The committee recognizes our responsibility of ensuring meaningful, tangible, and significant results towards pollinator protection.

- 3) **RESPONSIBILITY:** The committee holds a diverse set of responsibilities. While charged explicitly with pollinator protection, the committee is also responsible for bringing our actions to a larger audience, engaging in collaborative discussions, and forging sustainable alliances that will result in the greatest degree of pollinator protection.
- 4) **RESPECT:** The committee understands the need for respect in all aspects of our work. Committee actions and recommendations will reflect an acknowledgment of and respect for our mutual objective of pollinator protection, diversity of opinions, creating sustainable solutions, reaching shared understandings, and ensuring balance and equity in our conversations and actions.

*This report summarizes our recommendations for improving pollinator health in Minnesota. We have divided our recommendations into the three goals established by the Interagency Pollinator Protection Team in their 2017 report. The full titles of these goals are included below, but can be shortened to Habitat, Pesticides, and Education. Some of our recommendations are small and relatively simple to achieve, others are more involved, complicated, and in need of further development by the agencies/parties identified. These goals were developed over the course of nearly two years of meeting with each other, state agencies, and other experts, as we worked to deepen our collective understanding of the pollinator crisis, the current efforts that are already underway, and the most pressing ongoing needs.*

Overall, our goal is to achieve healthy, diverse pollinator populations that sustain and enhance Minnesota's environment, economy, and quality of life. We recognize that focusing solely on habitat or solely on pesticide exposure will not be sufficient to sustain and enhance pollinator populations.

The recommendations in this report provide a variety of means to increase and maintain uncontaminated pollinator habitat across rural, suburban, and urban areas of Minnesota. In addition, these recommendations provide strategies to reduce the use of, and harm caused by, pollinator-toxic pesticides in our state, as well as strategies aimed at increasing pesticide education and integrated pest management. Many of our recommendations focus on neonicotinoid insecticides, due to their high toxicity to pollinators, unique exposure routes, and increasing prevalence in both agricultural and urban/suburban landscapes. In addition to addressing habitat and pesticides, several of our recommendations are aimed at increasing educational resources that inform and empower local communities, individuals, schools, and other organizations to take meaningful action for pollinators.



## COMMITTEE JOURNEY

Committee members were appointed in December 2016. We first met together later that month, and established a regular meeting schedule every six weeks. During our first several meetings, agency staff from the Interagency Pollinator Protection Team (IPPT), including MDA, DNR, Minnesota Department of Transportation (MnDOT), and Department of Administration, shared issues facing Minnesota pollinators.

Our first task as a committee was to advise the IPPT on the content and framing of their inaugural Minnesota State Agency Pollinator Report, published in December 2017. During this time, we also decided on a supermajority decision-making process, and developed a values document (see list of values in the Introduction). We had opportunity for public comment at every meeting, and meetings were attended by concerned citizens, school groups, representatives of pollinator conservation organizations, private stakeholders, state agency staff, and others.

Much of the time during our early meetings was spent “establishing a common base of knowledge.” This was achieved by hearing from committee members and agency staff with expertise in different aspects of our work, and by calling in outside experts to present to our group. Our meetings were held in a variety of locations, and often included a tour designed to build common knowledge. Meetings, presentations, and tours are listed in Appendix G.

Throughout this process, we each developed ideas that we thought would best protect pollinators, based on individual knowledge and/or the perspectives of the organizations we are affiliated with and sectors we represent. These ideas were loosely categorized into two groups – habitat and pesticides – and we formed one habitat subcommittee and two pesticide subcommittees to further develop and refine ideas.

All subcommittees presented draft recommendations at our January 2018 meeting, and we spent the next several months receiving feedback from each other, agency staff, and other local experts in an effort to improve our recommendations. Committees incorporated or discarded this feedback, edited and improved recommendations, and received additional feedback over the course of 2018. When the proposed recommendations were finalized, each committee member voted on every recommendation to voice their support and elevate high-priority ideas.

This report represents the culmination of two years of collaborative effort by committee members.

## RECOMMENDATIONS FOR POLLINATOR PROTECTION

Our 39 recommendations are categorized according to the goals developed by the IPPT. The IPPT's goals relate to habitat (Goal 1), pesticide use (Goal 2), and education (Goal 3). Each recommendation includes a rationale statement; suggestions such as responsible entities, implementation, funding, timeline, and evaluation; and a list of potential challenges. Voting results are included with each recommendation and are summarized in Appendix A, and committee members' votes are recorded in Appendix B.

The recommendations are listed in the order of their priority ranking by the committee members (highest to lowest priority) under each of the goals. If recommendations received the same number of priority votes, we ordered them according to the number of support votes (highest to lowest).

### Voting process and terms

Committee members voted on recommendations in September 2018 to assess the level of support and priority within the group. This vote did not eliminate any recommendations, but rather allowed committee members to register their opinion about them.

#### *Support vote*

To assess support, each member selected a support, oppose, or neutral vote for each recommendation. Each recommendation can have up to 15 votes. After voting, the committee reflected on the varied meanings of the terms as described as follows:

*Support:* This vote meant approval. Additionally, some committee members reported selecting this option when a recommendation aligned with the committee's values (e.g., sustainable, precedent-setting, bold), fell in the "okay-to-good-to-excellent spectrum," represented the right thing to do, or had the potential to have a big impact on the issue.

*Oppose:* This vote meant disapproval. Some committee members selected an oppose vote if they felt a recommendation distracted from work that should be done, would have negative consequences for pollinators, or would have more negative than positive consequences overall.

*Neutral:* This vote had the most variable definition within the committee. Committee members used a neutral vote on recommendations to indicate that they had mixed feelings about the recommendation; to indicate that it was not strong enough, impractical, or vague; or to abstain.

#### *Priority vote*

To assign priority to recommendations, committee members were able to select up to one-third of recommendations within each goal as priority recommendations. Only one priority vote per person could be assigned to a recommendation. For example, Goal 1 had 10 total recommendations and each member could select up to 4 recommendations (one-third of 10, rounded up to the next whole number). These priority votes were then added up for each recommendation, with a maximum of 15 votes. After voting, the committee reflected on how they made their selections. Members reported selecting recommendations they felt were most impactful on pollinator health and most impactful on a meaningful scale, were the first actions that should be implemented, were innovative, or were achievable.

## Recommendations for Goal 1: Habitat

### *GOAL 1: LANDS THROUGHOUT MINNESOTA SUPPORT HEALTHY, DIVERSE, AND ABUNDANT POLLINATOR POPULATIONS*

Rationale: Prairie historically encompassed over one-third of the state of Minnesota. Today most of this land has been replaced by row crop farmland which provides minimal floral resources for pollinators, and less than 2% of our native tallgrass prairie remains. The diversity, abundance, and health of pollinators requires access to sufficient and diverse flowers that bloom throughout the growing season, as well as undisturbed and uncontaminated habitat for foraging, nesting, and overwintering. The following recommendations address pollinator habitat concerns in Minnesota. They reflect a variety of opportunities for habitat creation and enhancement, prioritizing landscapes, and practices that are highly meaningful but currently lacking resources for implementation in our state.

#### *Recommendation 1.1*

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#### *Expand funding and eligibility criteria for pollinator habitat and management practices on rural lands, beyond what is provided by existing pollinator habitat programs*

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*PRIORITY VOTES – 11      SUPPORT – 15, OPPOSE – 0, NEUTRAL – 0*

*Rationale:* There are a number of existing farm habitat programs (see Board of Soil and Water Resources, Natural Resources Conservation Service, and Xerces Society resources) that provide guidance and funding for increasing native habitat on farms. However, rural lands without cropping history are often ineligible for pollinator habitat funding, despite large tracts of available acreage available for habitat enhancement, and significant interest among rural landowners. Even on agricultural sites, land management needs do not always match the timeline and resources available through existing habitat programs. As such, additional technical support and funding for plant materials and habitat management on rural lands (both farm and non-farm) is needed. The state should direct resources to work with farmers or rural landowners that meet one or more of the following criteria:

- Property is ineligible for pollinator habitat funding through existing state and federal programs.
- Property is in range of at-risk pollinator species (e.g., federally listed species, state listed species, state species of greatest conservation need), and landowners/managers are interested in providing the best seed mixes and management practices to support these species.
- Property is in need of funding for select practices (including habitat management actions) that benefit pollinators, but falls outside of the scope of current programs.

Criteria to rank applicants should include funding need, resource concerns addressed, the likelihood of project success, value to at-risk pollinators, protection of planned habitat from pesticide exposure, and other factors.

For farmers seeking the Xerces Society’s Bee Better Certification (a third-party verified certification program focused on integrating flower-rich habitat into farms), cost-share assistance should be provided to help off-set the costs associated with certification (habitat installation, inspection, etc.).

*Responsible entities:* Board of Soil and Water Resources (BWSR), MDA, Xerces Society, and other interested partners, ideally working in coordination with USDA field staff to connect interested producers with state resources and technical support.

*Implementation:* An application process should be used to identify/prioritize partners. Once partners are selected, technical assistance would be provided and funding needs determined and allocated for plant materials (i.e., seed mix enhancements), certification, or other practices. Cost-share funding for farmers to obtain Bee Better certification could be modeled after similar certification cost-shares provided by the state for Organic Certification, Good Agricultural Practices (GAP) certification, and other forms of certification.

*Funding:* Funding for implementation and staff time/ technical assistance are both needed. Private funding may be an option, in addition to (or instead of) state dollars.

*Evaluation:* Possible evaluation metrics include an increase in high quality seed mixes planted in Minnesota, number of farms certified as Bee Better, number of acres restored/enhanced, and/or number of additional milkweed stems and high quality nectar plants for monarch butterflies (as there are protocols in place for measuring this, and specific goals set for our state).

*Challenges:* Pesticide drift in this landscape is a concern that would ideally be mitigated by thoughtful habitat placement or other strategies.

## *Recommendation 1.2*

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### *Establish a turf conversion and enhancement program focused on replacing or enhancing turf with flowering habitat in urban, suburban, and rural non-agricultural lands*

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PRIORITY VOTES – 9      SUPPORT – 14. OPPOSE – 1, NEUTRAL – 0

*Rationale:* Urban habitat and rural non-farm habitat have been identified as major gaps in pollinator habitat in Minnesota in terms of 1) land use categories not currently eligible for habitat conversion under most existing state and federal programs, and 2) numerous opportunities for partnership with a high level of interest/demand. Also, conversion of state-owned turf was identified as part of Goal 1 (habitat) in the 2017 Minnesota State Agency Pollinator report. 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. Urban habitats currently support the endangered rusty-patched bumble bee, but in very low numbers relative to previous decades. Existing populations of this species and other bees require abundant forage and nesting opportunities in urban, suburban, and rural lands, in order to rebound in numbers.

*Responsible entities:* BWSR and partners. Potential partners include other state agencies, University of Minnesota (UMN) Extension, UMN Bee Lab, Xerces Society, local non-governmental organizations already involved in urban habitat installations and/or education (e.g., Metro Blooms, Wild Ones, Pollinator Friendly Alliance), neighborhood associations, homeowner associations, and schools/corporate campuses, and municipalities that have passed pollinator friendly ordinances or are simply interested in pollinator friendly practices. UMN Bee Lab and Minnesota Zoo could serve as partners for outreach efforts.

*Implementation:* Create a Turf Conversion Pollinator Habitat Program to allocate funding for conversion of managed turf grass in Minnesota to flowering habitat on urban, suburban, rural, and other lands currently not eligible for existing state/federal programs. Funding and education opportunities would be made available on public lands such as parks, trails, wildlife management areas (WMAs), schools, and government facilities. Private lands including yards, golf courses, corporate campuses, private schools and colleges, as well as in rural areas without crop history or lands not currently eligible for existing programs would also be eligible to participate. Habitat options include bee lawns, native flowering habitat, native shrub plantings, rain gardens, and other pollinator-friendly options. Pesticide drift issues are to 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.

*Funding:* Funding would be needed for staff to run the program (e.g., project management, turf conversion specialists; outreach) and for habitat implementation. Some entities, like corporate campuses, would be able to bring implementation funding to the table, while others, like public schools, would not. Funders could include LCCMR /ENRTF, Parks and Trails Legacy Fund Coalition, and the Lessard-Sams Outdoor Legacy Fund.

*Evaluation:* Success evaluated in terms of acres planted to habitat. Outreach objectives could also be developed/quantified.

*Challenges:* Urban habitat may not offer as much acreage for habitat improvements as other landscapes, and also tends to be higher maintenance to meet aesthetic criteria. Weed-free turf is a cultural, and in some cases a mandated, norm and widespread acceptance may be difficult. Significant outreach and signage will be needed. Sod production and turf maintenance industries may be impacted.

### *Recommendation 1.3*

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*Encourage and incentivize new public and private education facilities (schools, colleges, and universities) and major remodeling projects to include a certain percentage of pollinator landscaping*

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PRIORITY VOTES – 8      SUPPORT – 15; OPPOSE – 0; NEUTRAL – 0

*Rationale:* It is important to engage students and school neighborhoods by providing pollinator education and awareness, including about the need for pollinator habitat through demonstration and hands-on

participation. The use of on-site venues when teaching concepts related to insects, plants, and ecology is particularly valuable.

*Responsible entities:* Minnesota Departments of Education and Administration, independent school districts, UMN, and Minnesota State Colleges and Universities.

*Implementation:* Utilize existing or create new agency resources to increase outreach, technical, and maintenance assistance to educational facilities that wish to establish pollinator-friendly habitat. A recognition program could be implemented to further incentivize educational facilities to create pollinator habitat.

*Funding:* School district levies; public, non-profit, or corporate sponsorship.

*Evaluation:* Success would be evaluated by the percentage of schools that meet an established pollinator-friendly landscaping goal, number of acres of pollinator habitat on school properties, and number of students impacted.

*Challenges:* Pollinator plantings will require some maintenance initially, as well as committed care over the long term.

## *Recommendation 1.4*

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### *Increase use of flowering cover crops by establishing a Minnesota Department of Agriculture-directed cover crop incentive initiative*

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PRIORITY VOTES – 7      SUPPORT – 15, OPPOSE – 0, NEUTRAL – 0

*Rationale:* MDA reports that 2% or less of Minnesota cropped acres are planted to a cover crop, based on data from the National Agricultural Statistics Service (NASS). Most cover crops are planted on acres where potatoes, edible beans, peas, sweet corn, and corn silage are grown. Although the integration of cover crops into crop rotations can be challenging, such efforts are well-known to provide a wide range of landscape benefits to water, soil, and wildlife including pollinators and beneficial insects for pest control. To benefit pollinators, cover crop strategies should focus on *flowering* cover crop species (e.g., red clover, alfalfa, buckwheat) integrated into cropping systems in which systemic insecticides have not been in use for at least one growing season. Benefits of non-native legumes to honey bees would be particularly significant, and could address a much needed resource concern for this group.

*Responsible entities:* MDA and BWSR, working with crop consulting professionals and other local partners (e.g., Land Stewardship Project, Sustainable Farming Association, Natural Resources Conservation Service, and soil and water conservation districts).

*Implementation:* MDA would set goals for acres planted to cover crops in MN, and develop programs (outreach material, technical assistance, and funding pools) to achieve these goals. The state would fund an MDA-directed Cover Crop Initiative - a program to promote farmer participation, working with crop advisers or other local partners (e.g., Land Stewardship Project, Sustainable Farming Association, Natural Resources Conservation Service, soil and water conservation districts), in cover crop trials on their operations. A blanket incentive payment would be provided to participants to help cover seed cost, time,

maintenance, necessary equipment, and potential (although unlikely) yield loss. The MDA currently has a similar, very successful initiative focused on nutrient management that this program could be modeled after. A certain amount of resources should be specifically earmarked for flowering covers (e.g., red clover, alfalfa, buckwheat, brassicas, cocktail blends) to be integrated into organic or other cropping systems in which pollinator-toxic pesticides are not in use to provide the most benefit to pollinators. As part of this work, the initiative could develop and showcase examples of cover cropping systems and rotations that work economically, and complete an Assessment of Needs (market development, infrastructure, crop insurance, research, transition year period incentives, etc.).

*Funding:* Cover crops are currently being funded as an eligible activity through state cost-share funding, but these General Funds have been decreased over time, and more funding is needed. Funding from the Clean Water Council is one option to explore.

*Evaluation:* One simple pollinator metric would be acres of habitat planted per year to flowering cover crops allowed to bloom (i.e., acres providing foraging resources for honey bees and other insects).

*Challenges:* Considerable research has focused on cover crops and their integration into agricultural systems, but the idea has not been widely accepted. Better incentives are needed and would likely include a need for significant funding. Benefits of single species, non-native flowering cover crops to a wide array of native pollinators may be limited, so it should be clear that these plantings supplement but do not replace the need for native habitat on farms. That said, the honey bee benefits provided by this type of habitat could be quite high, relative to native habitat. It would be important to avoid impacts from neonicotinoids where flowering cover crops would be used, as they can persist in the soil and be taken into the flowering plants. Finding enough opportunities to plant flowering cover crops in soils without recent neonicotinoid use may be challenging, and may also require an education/outreach component. Benefits to pollinators need to be balanced with the other benefits offered by cover crops and the logistics of establishment (e.g., in some situations, termination may need to happen before bloom, to achieve other goals).

### *Recommendation 1.5*

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*Develop an integrated, comprehensive strategy for the enhancement, creation, and maintenance of high-quality pollinator habitat along surface water corridors, primarily in rural areas*

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PRIORITY VOTES – 6

SUPPORT – 11, OPPOSE – 1, NEUTRAL – 3

*Rationale:* This initiative would provide multiple environmental and socioeconomic benefits in addition to high-quality pollinator habitat, including enhanced wildlife habitat and protected and improved water quality. Farmstead and other rural lands are the primary focus of this recommendation because they occupy the largest footprint in Minnesota (approximately 26 million acres; 54% of the Minnesota landscape) and have had a significant impact on pollinator habitat across the state. Surface water corridors include rivers, streams, lakes, and wetlands, in combination with suitable road, utility, and rail corridors and other public (DNR lands, parks, natural areas, etc.) and private lands in rural areas.

A strategic program with a rural habitat corridor that is initially focused on surface water corridors builds on an existing base of publicly-owned and other protected lands and fits within the framework of a variety of existing federal, state, and local priorities including USDA programs like the Wetland Reserve Program (WRP), Environmental Quality Incentives Program (EQIP), Agricultural Conservation Easement Program (ACEP), Conservation Reserve Program (CRP), and the Conservation Stewardship Program (CSP), the Natural Resources Conservation Service's Monarch Butterfly Habitat Development Project and Mid-America Monarch Conservation Strategy (an increased habitat and milkweed stem initiative with a goal of 1.3 to >1.8 billion additional milkweed stems), Governor Dayton's clean water initiative, and DNR, BWSR, local government, and private land conservation programs (The Nature Conservancy, Ducks Unlimited, Pheasants Forever, Trout Unlimited, etc.).

*Responsible entities:* The DNR, MDA, MnDOT, and BWSR; these agencies, in addition to soil and water conservation districts, watershed districts and other water management organizations would likely be the lead agencies in the implementation of this recommendation. The Minnesota Pollution Control Agency and Minnesota Department of Health, as well as other state agencies, may also have a role.

*Implementation:* The pollinator habitat created along surface water corridors should be appropriately diverse, connected, functional, safe and in all the necessary forms (i.e., prairie, forest, savanna, and wetlands with the required habitat components – native plant diversity and enhanced floristic diversity with a special focus on pollinator-specific species, bare soil, woody debris, snags, etc.). Once a network of primary habitat corridors has been identified, the habitat corridors should be expanded to include additional adjacent lands permanently acquired and placed in the public's trust, including private lands on a voluntary basis through donations, donated and purchased conservation easements, and fee-for-title purchases in combination with existing and future federal, state, and private conservation programs and efforts and incentivized and enhanced on-farm initiatives (cover/companion crops, windbreaks/hedgerows, crop diversification, etc.).

*Funding:* Potential funding mechanisms might include prioritized Clean Water, Land, and Legacy Amendment funds, given the constitutional purpose of these funds – “to protect drinking water sources; to protect, enhance, and restore prairies, forests, and fish, game, and wildlife habitat; to preserve arts and cultural heritage; to support parks and trails; and to protect, enhance, and restore lakes, rivers, streams, and groundwater,” specific projects approved by the Minnesota State Legislature, state agency funding, conservation easements, property tax credits, and other sources.

*Evaluation:* Documentation of the number of acres of quality pollinator habitat created or restored on an annual basis with 5-year, 10-year, and longer-term and ultimate targets.

*Challenges:* A long-term program with significant, long-term commitment of funding needed for implementation.



## Recommendation 1.6

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### Increase flowering pasture

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PRIORITY VOTES – 5      SUPPORT – 11, OPPOSE – 3, NEUTRAL – 1

Rationale: Livestock grazing offers an opportunity to increase pollinator food and nesting resources on “working lands” actively used for agricultural production. By controlling the number of cattle, timing, frequency, and duration of grazing, land managers can support wildflowers and pollinators while still meeting the nutritional demands of their livestock. Additional benefits of pasture include reduced tillage, reduced pesticide use, increased habitat for grassland birds, and improved soil health. In order to promote additional pasture in Minnesota, it is recommended that policy makers and the MDA set goals for acres planted to pasture in MN, and develop programs (outreach materials, technical assistance, and financial incentives) to achieve these goals.

#### *Responsible entities:*

- MDA - Identify incentives to increase pasture in areas that are currently row crop agriculture. In collaboration with the DNR, set a target acreage to convert existing row crop agriculture to pasture.
- DNR - Using the Minnesota Prairie Conservation Plan as a framework, work with MDA to identify areas where incentives can be used to encourage private landowners to convert existing row crop agriculture to pasture, especially in areas next to remnant prairie containing at risk pollinators which are susceptible to pesticide drift. Implement a working lands approach as identified in the Minnesota Pheasant Summit Action Plan.
- BWSR - Continue (and expand) Working Lands Program.
- UMN - Support research on range ecology, with an emphasis on using grazing as a tool to increase flowering resources for pollinators.
- Minnesota Department of Revenue - work with MDA to identify tax break incentive solutions.
- Land Stewardship Project (LSP), Sustainable Farming Association (SFA), and Minnesota Cattlemen’s Association should be partners on these efforts.

Implementation: State agencies and legislators would develop incentives to implement. Incentives may be region-specific, focusing on increasing pasture around high quality habitats, or at-risk species which need protection from pesticide drift (i.e., such as areas identified in the Minnesota Prairie Plan, and BWSR Pollinator Habitat mapping efforts).

Funding: General funds could be used to dedicate agency staff resources towards implementation. Supplemental funds could be obtained through the Clean Water Land and Legacy Amendment (Outdoor Heritage or Clean Water Fund) or LCCMR.

Evaluation: Set region specific goals based on acres.

Challenges: Federal policies related to crop insurance and subsidies may be difficult for state policy to overcome. Care must be taken to use livestock stocking rates that provide enough flowering resources for pollinators.

## Recommendation 1.7

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### *Encourage policies and practices that increase pollinator habitat on roadsides*

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PRIORITY VOTES – 4      SUPPORT – 13, OPPOSE – 1, NEUTRAL – 1

*Rationale:* Roadside vegetation is important to ensure safe passage for vehicles, draining stormwater, and soil stabilization. Roadside vegetation also provides habitat for pollinators, and is especially important in areas where nectar and pollen resources are limited on the landscape.

Roadside vegetation stewardship statutes, policies, and practices should be developed to provide a safe roadway corridor for motor vehicles, while maintaining and increasing pollinator habitat.

As part of a MnDOT Mowing & Haying Stakeholder Committee, a concept called “take half – leave half” was developed that would provide safe roadways, habitat for wildlife and pollinators, and hay for adjacent landowners. Under the concept, an adjacent landowner could hay the first 16’ at any time throughout the season, while only haying the remaining areas once from July 1<sup>st</sup> through August 15<sup>th</sup> to provide regrowth of milkweed and other nectar and pollen resources for pollinators. This type of system would maximize pollinator habitat, and encourage roadside vegetation stewardship that would help keep quality habitat on the landscape.

*Responsible entities:* MnDOT, DNR, MDA, local road authority.

*Implementation:* Implementation would require adjustments to the state statute to allow for an earlier season cut in the first 16’ of roadway, and an earlier cut date for the remaining area from July 1 through August 15th. Adoption by farmers would be voluntary.

*Evaluation:* Increased number of roadways where first 16’ hayed anytime during the season, and the remained hayed once between July 1<sup>st</sup> and August 15<sup>th</sup>.

*Challenges:* Attitudes on private use of public land. Use of public funds to mow what a private landowner would otherwise. Lack of plant knowledge from farmers, and roadside operators. Haying can reduce pollinator habitat if timed poorly, or if conducted too frequently.

## Recommendation 1.8

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### *Recognize the value of flowering non-native species for honey bees*

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PRIORITY VOTES – 4      SUPPORT – 12, OPPOSE – 0, NEUTRAL – 3

*Rationale:* Diverse native plant communities are critical in providing habitat for a large array of native bees, butterflies, and other pollinators, and should be prioritized whenever possible. However, there is also a need to increase floral resources for honey bee colonies, whose honey production in Minnesota depends predominantly on clover, basswood trees (*Tilia* spp.), alfalfa, and other “wildflowers” (native and non-native species). Average honey production in the state of Minnesota has decreased by half over the last 30 years due to changes in land use resulting in fewer nectar plants available for bees. To bolster

honey production and economic security for Minnesota beekeepers, the use of non-invasive, non-native species in hay fields, pastures, energy installations, and ROW, utility, and parks should be considered in areas that do not allow for successful establishment of native flowering species. The ecosystem services associated with non-invasive, non-native species in recommended seed mixes, such as *Trifolium* spp. clovers, and alfalfa, should be recognized, as these plants may provide the significant floral resources for all pollinators, especially in areas devoid of native plant species.

*Responsible entities:* MDA, DNR, land stewards.

*Implementation:* Minnesota Natural Resources Conservation Service, DNR and BWSR should allow and promote the use of non-invasive, non-native flowering seed mixtures in select hayfields, pastures, energy installations, ROW, utilities and parks, in areas that do not allow for successful establishment of native flowering species.

*Evaluation:* Increased 5-year average honey production by beekeepers in the state of Minnesota.

*Challenges:* Attitudes on plant impact, institutional, lack of plant knowledge. Concern: Economic impact.

### *Recommendation 1.9*

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#### *Expedite the update of the Minnesota Department of Natural Resources wildlife food plot policy with a focus on pollinator habitat*

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PRIORITY VOTES – 2

SUPPORT – 11, OPPOSE – 2, NEUTRAL – 2

*Rationale:* There are currently about 15,000 acres of wildlife food plots managed by the Department of Natural Resources (DNR) in Minnesota, mostly planted to monoculture corn and soybeans. Neonicotinoid insecticide seed treatments are prohibited in these plots, but are likely still commonplace because coordination, follow-up, and enforcement efforts present challenges in ensuring compliance. There is a need for better education for cooperative farmers about the management requirements and where to purchase untreated seed, and/or the need to shift away from crops that are typically treated with neonicotinoid insecticides and instead plant species that can benefit a broader spectrum of wildlife. If designed and managed to promote a diversity of plants that benefit pollinators, these plots have the potential to provide valuable, pesticide-free habitat for pollinators and other wildlife including foraging, nesting, breeding, and overwintering habitat. These food plots provide a relatively easy opportunity to benefit pollinators and other wildlife on public lands by diversifying the crops grown, including crops and cover crops that flower, and ensuring that the plantings are protected from pollinator-toxic pesticides. These plots also offer an opportunity for farmers/researchers to trial new cover crop blends, alternative crops, etc. on public lands.

*Responsible entity:* DNR. Once policy changes are in place, technical assistance could be provided through local soil and water conservation districts. Other local groups with relevant expertise may help move this recommendation forward.

*Implementation:* The DNR is three years into the process of developing a new policy on food plots, including phasing out of monocultures and placing a new emphasis on multispecies covers. Expediting

this process and ensuring that changes take into account pollinators' best interests is within the power of the DNR. Policy updates should specifically address pollinator resource concerns, including forage, nesting, and protection from pesticides.

*Funding:* There is no cost for the DNR to expedite their policy update. Changes to cropping systems on these plots may come with implementation costs; e.g., there may be funding needs for seed if plots do not pay for themselves.

*Evaluation:* Success evaluated in terms of acreage planted to species that provide valuable nesting and foraging resources for bees.

*Challenges:* Farmers may need technical assistance for planting new species; some farmers may be resistant to changing crop species; others may see this as an opportunity to trial new approaches/seed mixes on public land.

### *Recommendation 1.10*

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#### *Increase funding for the Minnesota Board of Water and Soil Resources to assess and certify solar developments for pollinator-friendly habitat*

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PRIORITY VOTES – 1      SUPPORT – 14, OPPOSE – 0, NEUTRAL – 1

*Rationale:* Solar farms offer an excellent opportunity to leverage private sector dollars to increase pollinator habitat in the state. There is strong interest and commitment from major utilities in purchasing solar energy from “pollinator friendly” sites. Currently, a pollinator friendly Solar Site Habitat Assessment Form has been developed by the Board of Soil and Water Resources (BWSR) for solar farms to be assessed in Minnesota, however funding has not been made available to increase BWSR’s capacity to assess and certify sites.

*Responsible entities:* BWSR, Minnesota Department of Commerce (Division of Energy Resources), MDA, DNR.

*Implementation:* Provide funding to BWSR to increase capacity to assess and certify sites for pollinator friendly criteria. Encourage solar developers to provide exemplary pollinator habitat (score of 85 or greater on BWSR scorecard) on all possible sites, Encourage utilities, state agencies, state universities and colleges, and municipalities, to include pollinator-friendly vegetation in their request for proposals (RFP) criteria when soliciting bids for solar energy procurement. Encourage and increase BWSR’s, as well as MDA’s and DNR’s, staff capacity to educate counties, townships, and soil and water conservation districts about the state standard for pollinator-friendly solar.

*Funding:* Increasing staff capacity will require funding. This could come from various sources such as a pollinator license plate initiative.

*Evaluation:* Percentage of solar installations that meet BWSR pollinator-friendly criteria, and the number of acres of pollinator habitat installed on solar sites.

*Challenges:* Knowledge of the program will be a barrier to implementation and cost and time to implement. Funding will be needed for maintenance to control weeds and grasses.

## Recommendations for Goal 2: Pesticides

### *GOAL 2: MINNESOTANS USE PESTICIDES JUDICIOUSLY AND ONLY WHEN NECESSARY, IN ORDER TO REDUCE THE HARM TO POLLINATORS FROM PESTICIDES WHILE RETAINING ECONOMIC STRENGTH*

*Rationale:* While Minnesotans increase flowering habitats that provide good nutritional resources for pollinators, we must protect these habitats from undue pesticide exposure in urban, suburban, and rural areas. Insecticide application onto or into flowers and plants that pollinators use for food or nesting materials can harm pollinators via acute lethal toxicity or via sublethal effects on behavior and physiology. Herbicide exposure can kill off the flowering habitat directly. Some fungicides synergize the toxic effects of insecticides, or disrupt pollinators' natural microbiota, leading to their increased susceptibility to pathogens and parasites.

The grand challenge moving forward is figuring out how to protect pollinator habitat from pesticide exposures while protecting crops, gardens, and human occupied areas from undue pest and pathogen exposure: How do we encourage beneficial pollinators while discouraging harmful pests?

Under this goal are recommendations which strive to increase awareness and education to ensure all Minnesotans use insecticides, herbicides, and fungicides properly, and within an integrated pest management (IPM) framework, as defined in Appendix D. Recognizing that pesticide exposure is a serious problem facing pollinators, education forms the basis to protect them now and into future generations.

Other recommendations strive to reduce or eliminate drift and off-target movement of insecticides, fungicides and herbicides, through education and training, voluntary incentives, and/or MDA funding for enforcement of label. The expectation is that reducing above- and below-ground movement of pesticides to flowering plants would reduce pollinator exposure and protect pollinator habitat.

Further recommendations strive to reduce use of pollinator harming pesticides in general (including insecticides, herbicides, and fungicides) through establishing an indemnity fund for farmers who experience crop loss as a result of not using pollinator harming pesticides; setting a goal to reduce use of pollinator harming insecticides in Minnesota within 3 years; and supporting efforts to prevent the spread of invasive species.

Neonicotinoid insecticides are a class of neuroactive chemicals that include the most widely-used insecticides in the country. Nationally it is estimated that more than 80% of corn and nearly 40% of soybeans are coated with neonicotinoids. While originally the planting of coated seeds was considered a low-risk use of pesticides (as low quantities are applied to the seed), research is showing heavy costs from the growing trend of planting seeds pretreated with systemic insecticides.

A robust and growing body of research shows the many ways that neonicotinoids are harmful to pollinators, even at sublethal levels. Exposure to neonicotinoids impacts the learning, foraging, immune health and overall hive fitness of pollinators. Neonicotinoids reach pollinators through spray drift, dust from pesticide-coated seeds, uptake and expression by flowering plants, watershed contamination, and wind erosion in contaminated soil.

These recommendations strive to reduce use of neonicotinoid insecticides as a targeted approach to pollinator protection. The expectation is that reducing the use of this class of pollinator-toxic insecticides would have measurable benefits to pollinators.

Also included are recommendations that strive to reduce the use of neonicotinoid seed treatments, in particular. In the United States, recent governmental reviews have concluded limited efficacy from the planting of neonicotinoid-coated seed in soybean production in the Upper Midwest. A 2015 joint publication of 12 state extension services, "[Effectiveness of Neonicotinoid Seed Treatments in Soybean](#)," concludes that: "Neonicotinoid seed treatments offer soybean plants a narrow window of protection — a maximum of three weeks after planting. As such, they can be useful for managing early-season pests in targeted, high-risk situations.... These high-risk scenarios are uncommon in northern states." Similarly, the analysis by the Environmental Protection Agency's Biological and Economic Analysis Division 2014 report, "[Benefits of Neonicotinoid Seed Treatments to Soybean Production](#)," concluded "...that these seed treatments provide negligible overall benefits to soybean production in most situations."

There appear to be only a handful of pests of economic concern that can be managed by the use of insecticidal seed treatments in corn production – and these pests do have alternative control options including host plant resistant varieties and crop rotation. Based on the results of these studies, the expectation is that strategic reductions in seed treatments recommended by our committee would have measurable benefits to pollinators, without impacting crop yield.

### *Recommendation 2.1*

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*Increase awareness and adoption of the new federal Conservation Stewardship Program (CSP) Enhancement E595116Z2 and develop a similar state-level program for non-CSP farmers for planting corn/soy seeds not treated with neonicotinoids*

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PRIORITY VOTES – 9      SUPPORT – 12, OPPOSE – 2, NEUTRAL – 1

*Rationale:* The goal of CSP Enhancement E595116Z2 is to reduce routine neonicotinoid insecticide seed treatments on corn and soybeans. If farmers were made more aware of the financial incentives to not use neonicotinoid treated seeds more farmers would participate in this program. This strategy could result in a meaningful reduction of neonicotinoids applied in our state, and would be achieved in farmer-friendly way (rewards farmers for positive environmental action vs. penalizing for detrimental action).

*Responsible entities:* Education/outreach should be completed by corn and soybean growers associations, extension offices, IPM educators, farm agency staff, conservation planners, etc. A new state-level program that models the federal program but is more widely accessible to any Minnesota corn/bean farmer (not just those enrolled in CSP) should be developed.

*Implementation:* Through trainings and outreach efforts, ensure that Minnesota corn and soybean growers are aware of the new federal CSP Enhancement E595116Z2, and have the guidance they need to decide if this enhancement is a good fit for their cropland (given historic pest pressure, etc.). Since this enhancement is currently only available to farmers enrolled in the CSP program (roughly 5% of Minnesota farms), develop similar state-level program to provide compensation for the same action taken by non-CSP farmers (a change from neonicotinoid-treated to untreated seed, for up to five years). Assess compensation rate provided under CSP enhancement (\$4.95/acre in MN) to determine if this amount is adequate to encourage a significant number of Minnesota farmers to enroll.

*Funding:* Outreach on existing program is low or no cost. Creation of new state level program would need funding allocated to this issue.

## *Recommendation 2.2*

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### *Restrict the use and sale of neonicotinoid insecticides to licensed applicators*

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PRIORITY VOTES – 8      SUPPORT – 11, OPPOSE – 2, NEUTRAL – 2

*Rationale:* Neonicotinoid insecticides are the most widely used insecticides in the country and the world, and they are used by homeowners, farmers, and nursery growers. The general public can purchase neonicotinoids and use them at their discretion. While this use does not make up a large percentage of overall neonicotinoid use, the individual application rates are much higher, and can be above LD50 (dose required to kill 50% of the test population) rates for honey bees. Restricting use and sale of neonicotinoids to only certified applicators would protect pollinators from this exposure.

*Responsible entities:* MDA.

*Implementation:* MDA can use its current authority to restrict the sale and use of neonicotinoids to certified applicators. This recommendation should focus on outdoor uses of neonicotinoids. Neonicotinoid use to manage bedbugs, cockroaches, and other indoor pests need not be restricted under this recommendation.

*Funding:* Funding for program administration should come from the MDA's Pesticide Regulatory Account or a newly created Pollinator Protection Account.

*Evaluation:* The MDA should create metrics to measure reductions.

## *Recommendation 2.3*

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### *Minnesota Department of Agriculture Neonicotinoid Review Action 1: Create a Treated Seed Program*

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PRIORITY VOTES – 8      SUPPORT – 10, OPPOSE – 4, NEUTRAL – 1

*Recommendation summary:* From the MDA's [8 Proposed Action Steps Regarding Use of Neonicotinoids](#) webpage: "Currently, the State does not have the authority to regulate the sale and use of pesticide treated seeds; they are considered to be "Treated Articles" and not pesticides. Treated articles that meet Environmental Protection Agency's (EPA) exemption criteria are not subject to EPA or MDA pesticide regulations. The Treated Seed Program will provide the State with the authority to regulate seeds treated with pesticides. The program will also fund research to develop need based recommendations for the use of seed treatments. The program may also require that untreated seeds and seeds treated at lower pesticide application rates are available in the market. The program would be funded through a new pollinator protection account. Creation of such a program will require legislative action. The bill to create treated seed program was introduced in Minnesota legislation in 2017. However, it was not approved."

*Rationale:* From the MDA’s source listed above: “Seed treatments protect young plants against early-season soil and foliage pests, reduce potential risks to workers, minimize potential runoff to waterways, and lower the overall amount of pesticide usage. However, broad-scale and prophylactic uses of seed treatments with pesticides such as neonicotinoids may increase the risk to the environment and specifically to pollinators. Therefore, it is important that treated seed use decisions be based on the best available science and Minnesota specific conditions.”

*Responsible entities:* 2019 Legislature and MDA

*Implementation:* MDA will implement once authority is given by the Minnesota Legislature. From the MDA’s source listed above: “The treated seed program will provide staff and resources to ensure a sound understanding of efficacy of seed treatment rates, scouting techniques, pest pressures, economic thresholds, planting technology differences, etc. In addition, farmers may not have ready access to untreated seed or seed treated at lower pesticide application rates. The MDA will continue to evaluate national and international research for its applicability to Minnesota-specific conditions. The MDA will also work with the UMN and other interested parties to identify the research needs and projects. Appropriate changes will be introduced on the use of treated seeds based on the outcome of research data. The bill to create pollinator protection account was introduced in Minnesota legislation in 2017. However, it was not approved.”

*Funding:* The MDA, in their review, determined that funding will be provided by the pollinator protection account.

*Challenges:* As mentioned above, the creation of a treated seed program was introduced through legislation in the 2017 Minnesota legislative session and was not approved.

## *Recommendation 2.4*

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### *Establish a Minnesota Department of Agriculture Crop Pest Loss Indemnity Fund for farmers avoiding pollinator-harming pesticides*

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PRIORITY VOTES – 7      SUPPORT – 12, OPPOSE – 3, NEUTRAL – 0

*Recommendation summary:* The MDA will manage a Crop Pest Loss Indemnity Fund, which will reimburse voluntarily participating farmers for partial crop losses on enrolled acres (for losses below the level covered by traditional Multi-Peril Crop Insurance), which could have been prevented by the use of pesticides when the farmer chooses not to use pollinator-harming pesticides.

*Rationale:* Farmers are confronted with many perils including drought, hail, and pests. Farmers take careful precautions to reduce these risks as much as possible. Much pesticide use is prophylactic in nature to ensure damage cannot occur—even if the chance of pest-related damage is very low. Treating pest damage like hail or drought, and insuring against actual damage would eliminate prophylactic chemical use greatly. This model is based on other crop indemnity programs, like Italy’s, that support farmers in reducing unnecessary inputs while mitigating risk.

*Responsible entities:* 2019 Legislature, MDA.



*Implementation:* The legislature should create a Crop Pest Loss Indemnity Fund, managed by the MDA, that will reimburse voluntarily participating farmers for partial crop losses on enrolled acres (for losses below the level covered by traditional Multi-Peril Crop Insurance), which could have been prevented by the use of pesticides when the farmer chooses not to use pollinator harming pesticides. This program should be created on a trial basis with claim payments made available for four crop years. This program will be claim based. The agency responsible for implementing this recommendation will need to create a set of claim criteria and a claim process, probably one that mirrors Multi-Peril Crop Insurance. This agency must be provided with additional resources to fulfil this work and to pay claims. This would be similar to losses paid for wolf depredation of livestock. The farmer would need to prove or document that they did not use the prohibited chemicals and that the losses result from pests that would have been controlled by using a commercially available pesticide. Acres impacted depends on program budget and what would be voluntary program registration.

The MDA is authorized to make rules to implement provisions of the legislation.

*Funding:* This program shall be available at no cost to participating farmers. Funding for claims and program administration should come from the Pesticide Regulatory Account or a newly created Pollinator Protection Account.

*Evaluation:* MDA is responsible for setting a management and evaluation schedule to track participating farmers. This program will be established on a trial basis lasting one four-year cycle of claim payments.

*Challenges:* Securing appropriate funding is a legislative barrier to implementing any program. Because there is no domestic precedent for a Crop Pest Loss Indemnity Fund, clear planning and management by MDA will be crucial to its success.

## *Recommendation 2.5*

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### *Promote incentives to increase adoption of drift-reduction technologies*

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PRIORITY VOTES – 6      SUPPORT – 10, OPPOSE – 3, NEUTRAL – 2

*Recommendation summary:* This recommendation will work in tandem with Recommendation 2.11 through education and incentives to increase adoption of drift reduction technologies and practices, which will decrease exposure of pollinators to pesticides.

*Rationale:* Reduction of pesticide drift will reduce pesticide load in flowering non-crop habitats, thereby reducing risk of pollinator exposure to pesticides.

*Responsible entity:* MDA.

*Implementation:* MDA should convene a stakeholder working group of equipment manufacturers, the American Seed Trade Association, CropLife America, grower groups, and seed dealers to identify drift-reduction technologies (e.g., fluency agents and planter technologies) where incentives would benefit and drive adoption. As an example, the incentives could cover the difference between a standard seed lubricant and a new alternative lubricant with proven dust-reduction characteristics. Incentives of this kind would be a new approach to reduce drift and adoption would be measurable. This approach could

also include practices and strategies that go beyond label requirements.

*Funding:* MDA and relevant agencies will identify mechanisms for funding.

*Evaluation:* Adoption of drift reduction technologies can be assessed through surveys performed at targeted educational events, such as pesticide applicator training, or through electronic surveys sent to association membership lists.

## *Recommendation 2.6*

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### *Adopt in statute a goal to reduce overall use of pesticides harmful to pollinators and designate an agency to create and implement a plan to meet the target*

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PRIORITY VOTES – 6            SUPPORT – 10, OPPOSE – 4, NEUTRAL – 1

*Recommendation summary:* Minnesota’s legislature should adopt in statute a goal to reduce the overall use, both public and private, of pesticides harmful to pollinators within 3 years of state adoption of the goal. The goal of this proposal is to decrease overall pesticide use, with no increase in use of products that are toxic to pollinators or to human health, and favoring the use of short residual pesticides (less than 8 hours) over those with extended residual properties.

*Rationale:* Decreasing use of products that are harmful to pollinators by a measurable quantity will mean that fewer pollinators come into contact with these chemicals. Because many agencies are involved in the management and tracking of state pesticide use, it is difficult to establish common goals for regulatory action. This recommendation outlines a set of steps for interagency cooperation.

*Responsible entities:* 2019 Legislature, implemented by all state agencies.

*Implementation:* Minnesota Legislature should adopt in statute a goal to reduce the overall use, both public and private, of pesticides harmful to pollinators within 3 years of state adoption of the goal. The goal of this proposal is to decrease overall pesticide use, with no increase in use of products that are toxic to pollinators or to human health, and favoring the use of short residual pesticides (less than 8 hours) over those with extended residual properties. A “reduction” means both a decrease in total volume of pesticides used including seed treatments, and no increase in toxicity of products used. For example, using a lesser volume of a more toxic product does not constitute a successful reduction in pesticide use.

The legislation should designate a lead state agency to accomplish this goal and include a charge to every state agency involved in pesticide monitoring and or regulation be directed in statute to prepare an Agency Plan of Action to be submitted to the legislature prior to the next legislative session that includes at least the following:

- Steps the agency intends to take to reduce the use of pollinator-harming pesticides through regulation, educational outreach, improved reporting requirements, and other steps determined by the agency;
- New or expanded statutory agency authority needed to implement its Agency Plan of Action;
- Plans for reduction of pollinator-harming pesticide use by the agency itself;

- Additional resources needed by the agency to fully implement its Agency Plan of Action, including identification of any necessary research on alternatives to pesticides currently in use;
- UMN shall be charged with identifying the most significant pests and diseases for which pollinator-harming pesticides are used, and identifying non-chemical IPM practices for managing pest and disease issues identified.

Agencies and the UMN may also explore other strategies to facilitate this reduction, which may include development of new best management practices (BMPs), new insurance or compensation programs to minimize financial impacts on farmers, increased UMN Extension outreach on non-chemical alternatives, etc. Additionally, MDA will update pollinator lethal pesticide list every 2 years.

*Funding:* The Legislature should provide reasonable appropriations to fund the development of the required Agency and University Plans of Action. Alternatively, MDA could assess a new, small fee on sales of all pollinator-harming pesticides. Funds collected through this fee could be used to fund this program.

*Evaluation:* The MDA and UMN should collaborate to create metrics to measure reductions. This includes generating or updating a list of pesticides known to be harmful to pollinators, and creating measurement systems to determine if and how reductions are made.

*Challenges:* Securing appropriate funding is a legislative barrier to implementing any program. Dedicating resources and time to interagency cooperation can also be a challenge, but the Environmental Quality Board has an already established Interagency Pollinator Team that could take on this work.

## *Recommendation 2.7*

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### *Discontinue neonicotinoid seed treatments in soybeans*

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PRIORITY VOTES – 6      SUPPORT – 9, OPPOSE – 5, NEUTRAL – 1

*Recommendation summary:* Discontinue the use of neonicotinoid seed treatments, or other methods of pre-emergent insecticide applications, in soybeans.

*Rationale:* University Extension researchers have found that neonicotinoid seed treatments are rarely effective as soybean seed treatments in Minnesota – and sometimes harmful to crops by accelerating resistance or killing beneficial insects (see [“Effectiveness of Neonicotinoid Seed Treatments in Soybean,”](#) 2015). Minnesota soybean farmers only purchased treated seeds for about 50% of their fields in 2017.

*Responsible entities:* 2019 Legislature, or to be implemented by MDA by rulemaking authority.

*Implementation:* The sale and use of neonicotinoid treated soybean seed in Minnesota should be phased out, to be discontinued by the 2020 planting season.

*Funding:* Funding for program administration should come from the Pesticide Regulatory Account or other MDA determined account.

*Evaluation:* MDA is responsible for setting a management and evaluation schedule of relevant entities.

*Challenges:* As with other recommendations that address treated seed, this will either need to be implemented by the legislature, or MDA must first be granted to regulate treated seed. This

recommendation is likely to be most successful when paired with funding and technical assistance (as outlined in other recommendations) to support farmers to successfully make this transition.

### *Recommendation 2.8*

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#### *Institute an immediate moratorium against all outdoor uses of neonicotinoid pesticides in Minnesota*

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PRIORITY VOTES – 6      SUPPORT – 8, OPPOSE – 6, NEUTRAL – 1

*Recommendation summary:* Immediately prohibit all outdoor uses of neonicotinoid products in Minnesota.

*Rationale:* Neonicotinoid insecticides represent an intrinsic risk to pollinators. They are designed to be taken up by plants and moved to all plant parts including pollen and nectar. They are long lived in the environment, and are water soluble. Neonicotinoid insecticides are the only class of insecticides which have been proven to disrupt insects' immune systems, making them susceptible to pathogens and viruses. Strong evidence exists of damage to pollinators, including honey bees, monarch butterflies and other native pollinating species. When combined with evidence of damage to aquatic insect larvae and crustaceans, immediate suspension of use of this class of chemistry is warranted until such time as safe uses can be developed.

*Responsible entities:* Minnesota governor, through executive order or 2019 Legislature, to be implemented by MDA.

*Implementation:* Neonicotinoid use will be suspended at a date to be determined by responsible entities.

*Funding:* Funding for program administration should come from the Pesticide Regulatory Account or other MDA determined account.

*Challenges:* Opposition from agricultural producers.

### *Recommendation 2.9*

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#### *Promote incentives for increasing adoption of integrated pest management (IPM) strategies*

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PRIORITY VOTES – 5      SUPPORT – 11, OPPOSE – 1, NEUTRAL – 3

*Rationale:* Implementation of integrated pest management (IPM) will reduce overall pesticide use and thereby reduce the risk of pesticide exposure to pollinators.

*Responsible entities:* MDA and relevant agencies.

*Implementation:* Identify programs currently available that would incentivize adoption of IPM strategies. Where gaps exist, MDA (or other agency) would consider development of an incentive program to

increase adoption of practices not covered by existing programs. Examples of IPM strategies that could be considered are use of pest-resistant crops and crop rotations and cropping systems. This effort would facilitate/increase adoption of a diversity of management tactics and other IPM practices. This effort would complement the educational programs in Recommendation 2.13 and further increase the rate of adoption while removing any perceived risk associated with a given change in management strategies.

*Funding:* MDA and relevant agencies will identify mechanism for funding.

*Evaluation:* Adoption of IPM practices by some stakeholders can be assessed through surveys performed at targeted educational events, such as pesticide applicator training, or through electronic surveys sent to association membership lists.

*Challenges:* Identification of funding sources/mechanisms may pose a challenge.

## *Recommendation 2.10*

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### *Increase Minnesota Department of Agriculture enforcement of pesticide labels for pollinator protection*

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PRIORITY VOTES – 5      SUPPORT – 11, OPPOSE – 1, NEUTRAL – 3

*Recommendation summary:* The MDA shall ensure that pesticide labels are enforced in a manner that ensures intended pollinator protection (described by [EPA Label Review Manual, Chapter 8: Environmental Hazards](#), revised September 2012) with a focus on changing future behavior if a pesticide applicator violates the label.

*Rationale:* Protections have been in place to mitigate pesticide exposure to pollinators since USDA regulations of the 1960s prior to the formation of EPA. The cornerstone has always been the clear and unambiguous admonition: “Do not apply to blooming crops or weeds,” which appears on the label. Pollinator exposure to pesticides can be avoided if the label is followed. Extended residual toxicity (greater than 8 hours) cannot be legally applied or drifted onto blooming crops or weeds. Short residual toxicity products (less than 8 hours) can be legally applied to bloom in early morning, late evening, or when temperatures are below 55F.

MDA is not currently citing or fining violators for illegal applications to bloom. This complete lack of enforcement encourages pollinator-dangerous behavior in the same way that speeding would be encouraged if no speeding tickets were ever written.

The American Beekeeping Federation (ABF) the largest national organization of beekeepers “[u]rge(s) EPA to change the bee-hazard warning on pesticide product labels to eliminate ‘exemptions’ which allow their use on blooming plants and push USDA and EPA to convene a Pesticide (crop protection) Summit to illuminate these issues and facilitate solutions.”

Additionally, The US EPA is currently in the process of weakening this long standing safeguard. If the federal EPA moves to weaken labels, our committee recommends that Minnesota maintain long standing label protections that were in effect on January 1, 2017. Minnesota should, through statute or administrative rule, establish its own label protections. Under the MDA’s charter with EPA, the MDA can

be more stringent in regulating pesticides than the federal government, but not less stringent. This is one area where Minnesota can and must lead the way for the nation.

*Responsible entity:* MDA is currently the sole authority governing pesticide registration and oversight in the state of Minnesota through a “primacy agreement” with EPA.

*Implementation:* The MDA shall ensure that pesticide labels are enforced in a manner that ensures intended pollinator protection with a focus on changing future behavior if a pesticide applicator violates the label. Enforcement should include special attention to violations that occur when pesticides are applied while crops are in bloom and pollinators are foraging (in violation of bee hazard label). This may include: increased random enforcement checks during specific periods, as defined by the MDA and stakeholders; increased random enforcement checks in specific places, as defined by the MDA and stakeholders. Fines should be levied when there are label violations, with the intent of changing future behavior.

The MDA should immediately publish a comprehensive list of products of short residual toxicity and extended toxicity. This list should clearly state the law, that only short residual toxicity products can be legally applied to blooming crops or weeds.

*Funding:* The legislature should provide adequate funding to the MDA to allow for their ability to enforce federal law.

*Evaluation:* MDA is responsible for setting a management and evaluation schedule.

*Challenges:* The label has been the law, but a law that hasn’t been enforced. Increasing enforcement can be challenging.

## *Recommendation 2.11*

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### *Reduce/eliminate off-target movement of pesticides through applicator training, BMPs, demonstration, and continued research*

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PRIORITY VOTES — 5      SUPPORT — 9, OPPOSE — 0, NEUTRAL — 6

*Recommendation summary:* This recommendation will work in tandem with Recommendation 2.5 through education and incentives to increase adoption of technologies and practices to reduce off-target movement of pesticides, which will decrease exposure of pollinators to pesticides.

*Rationale:* Reduction of off-target movement will reduce pesticide load in flowering non-crop habitats, thereby reducing risk of pollinator exposure to pesticides.

*Responsible entities:* MDA and UMN Extension.

*Implementation:* This educational campaign would be a coordinated effort among key “information sources” to deliver consistent messaging on the reduction of drift/off target movement through stakeholder networks. MDA and UMN Extension would include drift reduction strategies as part of pesticide applicator training, pollinator best management practices, field demonstration and research. These stakeholders include farmers, businesses (commercial landscaping, golf courses, etc.), state and

county roadside managers, and homeowners in rural and urban areas. For agriculture sector, for example, these “information sources” could comprise MDA, equipment manufacturers, the American Seed Trade Association, CropLife America, grower groups, seed sealers and UMN Extension providing consistent messaging to the state’s growers and agricultural professionals. Drift reduction recommendations will include the latest research-based information on practical steps to reduce off-target movement and will provide consistent educational messaging for stakeholders. As part of this approach, entities such as BWSR and DNR could make localized maps of sensitive sites (e.g., remnant prairie with threatened skipper populations) available to landowners, applicators and agricultural producers. Information dissemination through this recommendation would leverage the stakeholder networks and education/communication/media infrastructure of the participating “information sources.”

The novelty of this suggestion is in bringing the various information sources together to identify gaps in drift reduction training materials and funding requirements. Furthermore, having these information sources disseminate unified messaging on drift reduction would improve stakeholder education.

*Funding:* Funding requirements are to be estimated by the responsible entities. The MDA will identify mechanism for funding.

*Evaluation:* Adoption of drift reduction practices and technologies can be assessed through surveys performed at targeted educational events, such as pesticide applicator training, or through electronic surveys sent to association membership lists.

*Challenges:* Assessment of adoption of drift reduction technologies and practices by some stakeholders (e.g., general public) will be difficult.

## *Recommendation 2.12*

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### *MDA Neonicotinoid Review Action 2: Create a Dedicated “Pollinator Protection Account”*

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PRIORITY VOTES – 4      SUPPORT – 11, OPPOSE – 3, NEUTRAL – 1

*Recommendation summary:* From the MDA’s [Review of Neonicotinoid Use, Registration, and Insect Pollinator Impacts in Minnesota](#) (2016): “Create a dedicated “Pollinator Protection Account” funded through fees on pesticide treated seeds and on pesticides classified by the EPA as moderately or highly toxic to pollinators on acute exposure basis.”

*Rationale:* The MDA has taken on and identified a number of different areas to work to improve pollinator populations. This committee, as highlighted in these recommendations, has additional recommendations to the MDA. In order to fund these diverse pollinator efforts, the MDA has recommended, through their 2016 neonicotinoid review, the creation of a Pollinator Protection Account.

*Responsible entities:* 2019 Legislature and MDA.

*Implementation:* From the MDA’s 2016 Review: The program will carry out activities related to pollinators including evaluating and supporting research on economic thresholds, developing an educational campaign on the use of pesticides, development of stewardship materials, etc. Creation of such an

account would require legislative action.

*Funding:* From the MDA's 2016 Review: "Funding will be provided through fees on pesticide treated seeds and on pesticides classified by the EPA as moderately or highly toxic to pollinators on acute exposure basis" and will be determined by the Legislature.

*Evaluation:* Success will be determined if a pollinator protection account is created OR Not necessary to determine success of program.

*Challenges:* As defined by the MDA in their 2016 neonicotinoid review, a portion of this account's funding will come from fees on pesticide treated seeds, which would first require the creation of a treated seed program (MDA Review Action 1.)

### *Recommendation 2.13*

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#### *Increase education on integrated pest management practices and proper pesticide application*

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PRIORITY VOTES – 4      SUPPORT – 10, OPPOSE – 0, NEUTRAL – 5

*Recommendation summary:* This recommendation will work in tandem with Recommendation 2.9 to increase adoption of IPM practices, which will reduce overall pesticide use and decrease risk to pollinators.

*Rationale:* Implementation of integrated pest management will reduce overall pesticide use, thereby reducing risk of exposure to pollinators.

*Responsible entities:* MDA and UMN Extension.

*Implementation:* This educational campaign would be a coordinated effort among key "information sources" to deliver consistent IPM messaging (including: scouting, thresholds, alternate tactics) and proper pesticide application to stakeholders. These stakeholders include, but may not be limited to, farmers, beekeepers, businesses (commercial landscaping, golf courses, etc.), state and county roadside managers, and homeowners, in rural and urban and suburban areas. For the agriculture sector, for example, these "information sources" could comprise grower associations, state agencies, extension and industry providing consistent messaging to the state's growers and agricultural professionals. Information dissemination through this recommendation would leverage the stakeholder networks and education/communication/media infrastructure of the participating "information sources." The novelty of this suggestion is in bringing the various information sources together to identify gaps in IPM training materials and funding requirements. Furthermore, having these information sources disseminate unified messaging on IPM would improve stakeholder education.

*Evaluation:* Adoption of IPM practices by some stakeholders can be assessed through surveys performed at targeted educational events, such as pesticide applicator training, or through electronic surveys sent to association membership lists.

*Challenges:* Assessment of adoption of IPM practices by some stakeholders (e.g., general public) will be difficult.



## Recommendation 2.14

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*Enhance existing programs intended to prevent the introduction and establishment of invasive species and encourage the use of integrated pest management (IPM) practices to control the spread of new and existing invasive species in an effort to reduce the need for pesticide applications and their unintended environmental impacts including impacts on pollinators*

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PRIORITY VOTES— 4      SUPPORT — 10, OPPOSE — 1, NEUTRAL — 4

*Rationale:* Invasive species are a primary driving force behind pesticide use, and pesticide use can have unintended environmental consequences including negative impacts on pollinators. From both a short- and long-term perspective, preventing the introduction and spread of invasive species (invasive plants/weeds, insects, and diseases, including honey bee pests and diseases), with a stronger focus on prevention and eradication within an IPM strategy, may reduce the current and future use of pesticides and pollinator exposure to pesticides.

The socioeconomic and environmental costs of managing invasive species are already large and continue to increase and mitigating the effects of invasive species is a constant battle. As a result, a more serious and sustained commitment to manage existing and new invasive species is needed and has the potential to reduce pesticide use over time and avoid the need for increased pesticide use in the future (all pesticides – insecticides, herbicides, fungicides, miticides, etc.).

While invasive species prevention and management programs already exist, they lack the funding, and sometimes the will, needed to proactively prevent the introduction, establishment, and spread of new invasive species. This too often results in inadequate prevention and management initiatives and failed efforts. The need to rely on pesticides to manage invasive species with the goal of maintaining crop quality, crop yields, and profitability can also result in the development of pesticide resistance which complicates the ability to combat invasive species threats.

*Responsible entities:* MDA, DNR, BWSR, Minnesota Invasive Species Advisory Council (MISAC), Minnesota Invasive Terrestrial Plants and Pests Center (MITPPC), and other relevant agencies and groups.

*Implementation:* To be effective, the state must recognize the importance of invasive species prevention and management efforts as a means to decrease current and future pesticide use and embrace the need for a comprehensive, targeted, statewide, outcome-focused invasive species prevention and management strategy. As part of this strategy, the responsible state agencies should identify gaps in invasive species identification and management efforts and gaps in the funding needed for these endeavors. An increased commitment to pursue existing and enhanced, outcome-based efforts to prevent the establishment and spread of new and existing invasive species, along with enhanced funding and resources are needed to reduce the need for pesticide applications and the potential for associated, negative environmental impacts. Sustained support of current and future research efforts focused on the management of invasive species will also be needed to realize improved invasive species management outcomes.

*Funding:* Agency budgets supported by legislative funding, targeted Legislative-Citizen Commission on Minnesota Resources (LCCMR) funding for research.

*Evaluation:* Preventing the introduction and spread of invasive species must be the primary objective and the agencies must be held accountable if these goals are not met; the introduction and establishment of new invasive species and the spread of invasive species already in the state should be tracked and existing invasive species threats should be prioritized and targeted for management and eradication in a strategic manner.

*Challenges:* Funding is the primary challenge; a poor understanding of the seriousness of the growing invasive species threat; potential impacts on commerce and other human activities; and, too often, a cannot-be-done attitude.

### *Recommendation 2.15*

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*Provide the Minnesota Department of Agriculture with the resources and tools to assure that Environmental Protection Agency label requirements intended to protect pollinators are followed in Minnesota*

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PRIORITY VOTES – 3      SUPPORT – 11, OPPOSE – 0, NEUTRAL – 4

*Rationale:* The Environmental Protection Agency (EPA) has delegated sole oversight authority over pesticides in Minnesota to the MDA. MDA must have sufficient resources to ensure labels are being protective as envisioned in the EPA registration process to ensure safe use practices are adhered to.

The MDA, in its own pollinator protection recommendations, proposed creation of a Pollinator Protection Account. The recommendation suggests that additional resources are needed by MDA to implement its own recommendations.

At present many persons, including commercial beekeepers as well as pollinator protection advocates, are calling for increased MDA activities in EPA label enforcement, as we do here in Recommendation 2.10. Current enforcement efforts are restrained by budget limitations, additional resources will be needed if greater enforcement is to take place.

Many recommendations of the Governor’s Pollinator Protection Committee call for additional work by the MDA. Since all MDA resources are now allocated to important work which must continue, additional resources must be made available to MDA through the legislative appropriations process.

*Responsible entity:* Minnesota Legislature.

*Implementation:* The MDA should be charged with making pollinator protection EPA label compliance an agency priority. MDA should define resources and tools needed and be fully funded to do what they need to do.

*Challenges:* Securing appropriate funding is a legislative barrier.

## Recommendation 2.16

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### *Significantly reduce use of neonicotinoid insecticide seed treatments in corn*

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PRIORITY VOTES – 2      SUPPORT – 9, OPPOSE – 5, NEUTRAL – 1

*Recommendation summary:* Discontinue the use of neonicotinoid seed treatments, or other methods of pre-emergent insecticide applications, in corn.

*Rationale:* Research on specific situations where neonicotinoid seed treatments are useful for managing early season pests is less conclusive regarding seed treatment use in corn than in soybeans, but indicates that there is a similar overuse of seed treatments in field conditions in which it is not highly effective.

*Responsible entities:* 2019 Legislature, or to be implemented by MDA by rulemaking authority.

*Implementation:* The sale and use of neonicotinoid-treated corn seed in Minnesota will be significantly reduced. Neonicotinoid-treated corn, or other pre-emergent neonicotinoid insecticide applications, will be available as needed to farmers for planting acres where there is a demonstrated pest presence.

*Funding:* Funding for program administration should come from the Pesticide Regulatory Account or other MDA determined account, or through legislative appropriation.

*Timeline:* Ongoing, significant reductions achieved by 2020 planting season.

*Evaluation:* MDA is responsible for setting a management and evaluation schedule of relevant entities.

*Challenges:* As with other recommendations that address treated seed, this will either need to be implemented by the legislature, or MDA must first be granted authority to regulate treated seed. This recommendation is likely to be most successful when paired with funding and technical assistance (as outlined in other recommendations) to support farmers to successfully make this transition. There is potential for opposition from agricultural producers.

## Recommendation 2.17

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### *Ban neonicotinoids for use in Minnesota for production, cultivation, or growing of decorative gardening or landscaping plants and nursery stock*

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PRIORITY VOTES – 2      SUPPORT – 8, OPPOSE – 5, NEUTRAL – 2

*Rationale:* Neonicotinoids are highly effective insecticides that may be necessary for food production at adequate levels to sustain world population. In order to preserve the future use of neonicotinoids in food production, while recognizing their harmful effect on pollinators and other beneficial insects, neonicotinoids should only be used on crops raised for human consumption or crops raised as part of the human food chain.

Neonicotinoid (systemic) insecticides represent an intrinsic risk to pollinators. They are designed to be taken up by plants and moved to all plant parts including pollen and nectar. They are long-lived in the

environment and water soluble. Neonicotinoid insecticides are the only class of insecticides which have been proven to disrupt the insects' immune system, making them susceptible to pathogens and viruses. If neonicotinoids are critical to the protection of food, we should not be using them prophylactically in order to not build resistance.

*Responsible entities:* Likely Legislature, to be implemented by MDA.

*Implementation:* Through statute or administrative rule, ban neonicotinoids for use in Minnesota for production, cultivation, or growing of decorative gardening or landscaping plants and nursery stock. An exception should be provided for regulated application to address a specific pest, such as the emerald ash borer, when a pest presence has been demonstrated.

*Funding:* Funding for program administration should come from the Pesticide Regulatory Account or other MDA determined account.

*Challenges:* Opposition by agricultural producers.

### *Recommendation 2.18*

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#### *Limit use of neonicotinoid insecticides on plants to crops grown for food production except where needed*

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PRIORITY VOTES – 2      SUPPORT – 7, OPPOSE – 5, NEUTRAL – 3

*Rationale:* Neonicotinoids are highly effective insecticides that may be necessary for food production at adequate levels to sustain world population. In order to preserve the future use of neonicotinoids in food production, while recognizing their harmful effect on pollinators and other beneficial insects, neonicotinoids should only be used on crops raised for human consumption or crops raised as part of the human food chain.

Neonicotinoid (systemic) insecticides represent an intrinsic risk to pollinators. They are designed to be taken up by plants and moved to all plant parts including pollen and nectar. They are long lived in the environment and water soluble. Neonicotinoid insecticides are the only class of insecticides which have been proven to disrupt the insect's immune system, making them susceptible to pathogens and viruses. We should not be using them prophylactically in order to not build resistance.

*Responsible entities:* Likely legislature, to be implemented by MDA.

*Implementation:* Through statute or administrative rule, limit use of neonicotinoid insecticides on plants to crops grown for food production or as part of the human food chain except when needed, pursuant to DA decision, to provide protection against a specific pest and then applied in pre-approved methods for that pest and plant.

*Funding:* The legislature should provide reasonable appropriations to fund program development.

*Evaluation:* Success will be determined if neonicotinoid insecticides are limited to crops grown for food production except where needed.

*Challenges:* MDA will need to create a clear system to define which crops are grown for food production.

### *Recommendation 2.19*

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#### *Require seed companies, wholesalers, or retailers to offer non-neonicotinoid treated versions of top corn seed varieties*

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PRIORITY VOTES – 1      SUPPORT – 10, OPPOSE – 4, NEUTRAL – 1

*Rationale:* Farmers report that while neonicotinoid-free seeds are available, they can be very hard to find. Virtually all commercial seed corn is treated, leaving the farmer little choice but to plant treated seed. The seed corn industry is highly concentrated.

*Responsible entities:* 2019 Legislature, to be implemented by MDA.

*Implementation:* Minnesota ought to require, by statute or administrative rule, seed companies, wholesalers or retailers, to offer non-neonicotinoid treated versions of their top corn seed varieties at all levels of or days to maturity.

*Funding:* Funding for program administration should come from the Pesticide Regulatory Account or other MDA-determined account.

*Evaluation:* MDA is responsible for setting a management and evaluation schedule to track participating seed companies, wholesalers and retailers.

*Challenges:* As with other recommendations that address treated seed, the MDA must first be granted authority over treated seed regulation. There is potential for opposition from seed producers and sellers.

### *Recommendation 2.20*

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#### *Discontinue neonicotinoid insecticide seed treatments in other Minnesota crops that are highly attractive to pollinators*

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PRIORITY VOTES – 1      SUPPORT – 10, OPPOSE – 5, NEUTRAL – 0

*Rationale:* Neonicotinoids are systemic and move to all plant parts including pollen and nectar and should not be used on pollinator-attractive crops.

*Responsible entities:* 2019 Legislature, or to be implemented by MDA by rulemaking authority.

*Implementation:* Discontinue use of neonicotinoid insecticide seed treatments, without substituting a different pre-emergent neonicotinoid application method, in Minnesota crops that are highly attractive to pollinators, like canola, sunflower, edible beans and other fruit and vegetable crops where neonicotinoid insecticide seed treatments are currently used.

*Evaluation:* MDA is responsible for setting a management and evaluation schedule of relevant entities.

*Challenges:* As with other recommendations that address treated seed, this will either need to be implemented by the legislature, or MDA must first be granted to regulate treated seed. This recommendation is likely to be most successful when paired with funding and technical assistance (as outlined in other recommendations) to support farmers to successfully make this transition.

## *Recommendation 2.21*

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### *MDA Neonicotinoid Review Action 3: Require formal verification of need prior to use of neonicotinoid pesticides, where appropriate*

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PRIORITY VOTES – 0      SUPPORT – 9, OPPOSE – 4, NEUTRAL – 2

*Recommendation summary:* From the MDA’s [8 Proposed Action Steps Regarding Use of Neonicotinoids](#) webpage: “The MDA will ensure that applications of neonicotinoids are made only when a qualified individual verifies that there is a demonstrated pest problem and there is a need for neonicotinoid pesticide use. The MDA will develop a formal process for verification of need by a trained and approved individual prior to the use of neonicotinoid pesticides on crops.

These requirements would be phased in over time as Minnesota specific pest thresholds and similar need based guidance becomes available and would only apply to products and uses which have MDA approved need based guidance for their use.”

*Rationale:* From the MDA source listed above: “Application requirements restricting foliar application of neonicotinoid pesticide products on pollinator attractive food crops and commercially grown ornamentals while bees are foraging and until flowering is complete already exist on product labels. This includes applications to soybeans, the most important crop for neonicotinoid use in Minnesota. Under these requirements farmers would be able to apply neonicotinoids when the application is needed because of an imminent threat of significant crop loss, consistent with an IPM plan, or when a predetermined economic threshold is met. However, what qualifies as an imminent threat or an adequate IPM plan requires further definition for Minnesota specific conditions.”

*Responsible entities:* 2019 Legislature and MDA.

*Implementation:* From the MDA source listed above: “The MDA will work with the UMN and other stakeholders to develop pest thresholds and acceptable IPM criteria that should be used to justify product application before final flowering for those products and crops which currently have these requirements on the label. The MDA will also work with the UMN and other stakeholders to develop need based guidance and acceptable IPM criteria for other significant crop uses of neonicotinoids.

As this criteria is developed there will be an education period where it is widely promoted through multiple channels including pesticide applicator training and in coordination with registrant stewardship and other educational activities.”

*Funding:* Funding for program administration should be determined by the MDA.

*Evaluation:* MDA is responsible for setting a management and evaluation schedule to track participating farmers. This program will be established on a trial basis lasting one four-year cycle of claim payments.

*Challenges:* In the Minnesota 2017 legislative session, defining how this program would be implemented was a major concern to stakeholder groups. To move this forward the MDA must engage stakeholders, as articulated above, to ensure the program is both workable for farmers and rigorous in providing pollinator protection.

We also recommend fully implementing MDA Neonicotinoid Review Actions 4-8 and have not detailed them here both because they are articulated elsewhere in this document and already in process by the MDA. They are:

4. Develop an educational campaign for homeowners and residential users of insecticides.
5. Review product labels for appropriate use of neonicotinoids for homeowners and residential users.
6. Develop Minnesota specific pollinator stewardship materials.
7. Increase use inspections for insecticides that are highly toxic to pollinators.
8. Review label requirements for individual neonicotinoid products.

### *Recommendation 2.22*

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*Adopt in statute a goal to reduce the use of neonicotinoid seed treatments to only those justified by current or historical pest pressure*

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PRIORITY VOTES – 0      SUPPORT – 9, OPPOSE – 5, NEUTRAL – 1

*Recommendation summary:* The Minnesota Legislature should adopt in statute a goal to reduce the use of neonicotinoid seed treatments to only those justified by current or historical pest pressure, not to be replaced with another neonicotinoid treatment method.

*Rationale:* According to a publication from a number of Midwest land grant universities, including the UMN ([Effectiveness of Neonicotinoid Treatments in Soybean](#), 2015), there are a handful of specific situations in which neonicotinoid seed treatments are useful for managing early season pests in soybeans. The publication explains that these situations are “uncommon in northern states” like Minnesota. The research is less conclusive regarding seed treatment use in corn, but indicates that there may be a similar overuse of seed treatments in field conditions in which it is not highly effective. This is not likely due to any irresponsible intent on the part of farmers, but simply the norm that most corn and soybean seed sold is pre-treated with neonicotinoids. This recommendation would shift the norm – untreated seed should be planted unless there is evidence of pest pressure or field conditions that would call for use of a seed treatment, instead of planting treated seed on most acres in the state.

*Responsible entities:* 2019 Legislature, to be implemented by MDA.

*Implementation:* Minnesota Legislature should grant the MDA regulatory authority over pesticide application through the use of treated seeds. The MDA should be directed to begin to track the use of pesticide seed treatments immediately. Explore other strategies to facilitate this reduction, which may include development of new BMPs, new insurance or compensation programs to minimize financial

impacts on farmers, increased UMN Extension outreach on non-chemical alternatives, etc. *References and resources:* [Neonicotinoid Regulations for Growers](#), Ontario Ministry of Environment, Conservation and Parks.

*Funding:* The legislature should provide reasonable appropriations to fund the development of this program. Funding for program administration should come from the Pesticide Regulatory Account or other MDA-determined account.

*Evaluation:* After three years, the MDA shall assess:

- The reduction in the use of neonicotinoid seed treatments, not replaced by another neonicotinoid treatment method;
- The economic impact, positive or negative, on farmer livelihoods in Minnesota resulting from reduced use of neonicotinoids; and
- Pollinator populations.

*Challenges:* The state will need to develop an effective and efficient mechanism to work with farmers to verify that field conditions or pest history call for the use of neonicotinoid seed treatments. Ontario's model can be a starting point, though Minnesota will need to consult with farmers, crop consultants, seed dealers, and other stakeholders to determine the most effective process for this. As with other recommendations in this section, this will either need to be implemented by the legislature, or MDA must first be granted to regulate treated seed.



## Recommendations for Goal 3: Education

### *GOAL 3: MINNESOTANS UNDERSTAND, VALUE, AND ACTIVELY SUPPORT POLLINATOR POPULATIONS*

*Rationale:* To conserve and enhance pollinator populations for future generations, it is vital to educate all Minnesotans about the value of pollinators to our food systems and ecosystems. These recommendations strive to promote education about the biology of pollinators, their habitat needs, and the use of pesticides through our state.

#### *Recommendation 3.1*

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*Include the importance of pollinators and their habitat, as appropriate, in resources developed for teachers within and related to the next version of science standards*

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PRIORITY VOTES – 10      SUPPORT – 14, OPPOSE – 0, NEUTRAL – 1

*Recommendation summary:* Pollinators are a critical piece of ecological and food production systems both in Minnesota and globally. The Minnesota Science Standards are under review and revision in 2018 and 2019. During this process, benchmark language associated with various standards that are developed could be drafted to include references to and examples of how standards can be accomplished and evaluated utilizing pollinators and their habitat as topical teaching platforms. Resources such as lesson plans and suggested activities to accomplish standards that relate to pollinators and their habitat will be shared with various organizations that provide teacher’s resources such as SciMathMN and the DNR School Forest curriculum resource groups.

*Rationale:* These standards will endure for 10 years, offering significant opportunity to expose Minnesota students to pollinator-related topics and activities and enhance general understanding of the value of pollinators, the threats they face, and how to support their populations.

*Responsible entities:* MDE/Science Standard Review Committee (Starting August 1-3, 2018); input and curricular resources provided by members of the GCPP and others.

*Implementation:* The 2018-2019 Science Standard revision process should include standards reflecting the importance of pollinators and their habitat and/or include benchmark language that references pollinator-related issues where appropriate. This recommendation may be furthered by members of the GCPP working directly with MDE staff and/or the Science Curriculum Review Committee including examples that utilize pollinator habitat.

Members of the GCPP may contact the Science Standard Review Committee to discuss the process and potential approaches to integrating pollinator references/benchmarks into revised standards. There will also be multiple input periods for public comment, of which members of the GCPP and other interested partners could be a part.

Appropriate entities should identify areas where referencing pollinators in benchmark language is appropriate and enhances a standard area. The potential exists to develop and/or share existing curricular materials through the SciMathMN framework resource webpage and other portals that provide

curricular resources to teach using pollinators as a subject and resource.

*Funding:* Minimal staff time/expense.

*Timeline:* Connect with the science standard review committee in fall, 2018 and identify when and where suggestions can be provided on how to accomplish this goal.

*Evaluation:* Degree to which or number of times that pollinators and/or pollinator habitat considerations are referenced in the new standards.

*Challenge:* Lots of suggestions for alternative topics/language where this could be accomplished. Ensuring resources are available to support teachers in delivering pollinator-related information, and activities to their students.

### *Recommendation 3.2*

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#### *Amend Minnesota statute to designate all currently reported pesticide use data as public*

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PRIORITY VOTES – 8      SUPPORT – 9, OPPOSE – 4, NEUTRAL – 2

*Rationale:* While pesticide applicators are currently required to maintain accurate records of pesticide use, these records are not available to the public. Removing this barrier to transparency would allow farmers, beekeepers, and scientists to easily determine whether nearby pesticide applications could be harmful to pollinators or damage property—a process that is only currently possible via word-of-mouth reporting between neighbors. In the event of a drift incident or bee kill, public access to pesticide data could speed up MDA’s reporting process. Additionally, our knowledge of pesticides’ toxicity to pollinators is continually building. Increased access to and better understanding of pesticide use data increases our knowledge about how best to protect pollinators.

*Responsible entities:* 2019 Legislature, implemented by the MDA.

*Implementation:* Current certified pesticide applicators in Minnesota are required to keep records of pesticide applications and submit records upon MDA request. This amendment would require that these records be available to the public. These reports are already required by Minnesota statute. There is national precedent; a number of states use public pesticide use reporting, with varying models for sharing the information with the public.

*Funding:* Through legislative appropriation.

*Evaluation:* Not necessary to determine success of program.

*Challenges:* Program will need to be implemented, as it is in other states, with privacy in mind.

### Recommendation 3.3

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*Provide funding for an enhanced pollinator extension education and outreach program at the University of Minnesota along with the funding needed to maximize pollinator education across the state of Minnesota*

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PRIORITY VOTES – 7      SUPPORT – 15, OPPOSE – 0, NEUTRAL – 0

*Rationale:* Recognizing the importance of education in the protection of managed and native bees and other pollinators, the MDA, together with UMN Extension and other state and local partners (including input from agricultural and other industry partners), should develop a science-based, statewide, pollinator-specific education plan for pesticide manufacturers, sellers and applicators (certification), beekeepers, agricultural producers, land managers, and the general public. The resulting education plan should focus on pollinator best management practices including the provision of quality pollinator habitat and the proper and judicious use of pesticides; a permanent, statewide, pollinator-specific, extension educator position (or positions as needed) should be created to coordinate and lead the implementation of this recommendation.

*Responsible entity:* UMN Extension.

*Implementation:* Implementation of this recommendation should begin with a review of the statewide education needs related to pollinator education followed by the development of a plan that outlines a set of key goals related to pollinator education in the state and the personnel and other resources needed to achieve those goals.

*Funding:* Federal extension funding supplemented by state funding.

*Evaluation:* Documentation of educational activities and their impacts.

*Challenges:* Funding is likely the primary challenge.

### Recommendation 3.4

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*Create a native pollinator and habitat documentation and tracking program*

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PRIORITY VOTES – 6      SUPPORT – 12, OPPOSE – 0, NEUTRAL – 3

*Rationale:* Recognizing the importance of the services provided by native pollinators in agricultural systems and native ecosystems, that baseline documentation of the native species of bees and other insect pollinators in Minnesota is incomplete, and a need to track native pollinator populations and health, the state of Minnesota should create a program dedicated to documenting Minnesota native pollinators, their habitat requirements, and existing pollinator habitat and habitat needs. The program should also actively promote and support research efforts focused on the identification, population dynamics (distribution and abundance), and habitat requirements of the pollinator species that are native to Minnesota in order to accurately document the species of pollinators that are native to Minnesota and

understand their habitat needs.

Some of these activities are ongoing, but are limited and need to be formalized as part of a strategic effort. These efforts will enhance our understanding of native bees and other pollinators and will provide the statistically-sound, baseline information on the distribution and abundance of these species that are needed to support ongoing efforts to accurately track changes in the population dynamics of native pollinators.

*Responsible entities:* The DNR and the UMN are already involved in these types of activities and should be the lead entities in these efforts; BWSR may also have a role to play (habitat mapping, establishment, and management).

*Implementation:* Provide the funding and personnel required to achieve the goals outlined in this recommendation.

*Funding:* The Clean Water, Land and Legacy Amendment may be a source of initial funding, DNR budget, grant funding (public and private).

*Evaluation:* Demonstrated success in the documentation of pollinator species and habitat on an annual basis.

*Challenges:* Recognition of the importance of these efforts and dedicated funding.

### *Recommendation 3.5*

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#### *Increase availability of pollinator-related resources in libraries*

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PRIORITY VOTES – 5      SUPPORT – 13, OPPOSE – 0, NEUTRAL – 2

*Rationale:* Libraries are a public resource and providing programmatic content for libraries is part of the MDE's work.

*Responsible entity:* MDE.

*Implementation:* State agencies, federal, and university partners should work with the MDE to ensure that all resources related to pollinators, pollinator habitat, and pollinator research published in the format required by the MDE Library are made available through the Minnesota Library System to the greatest extent possible, including hard copies, eBooks, and other appropriate formats. Identify format/sourcing requisites and then compile a list of materials that fits these parameters. Example: eBooks – a DNR staff member has been working with the MDE to get some pollinator resources into ebooks format (available online).

*Funding:* Utilize existing resource sharing/distribution channels.

*Timeline:* Initiated, summer 2018.

*Challenges:* Compiling the list itself, delivering materials to the library system for inclusion.

### *Recommendation 3.6*

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#### *Continue active partnership in the national strategy to improve honey bee health*

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PRIORITY VOTES – 3      SUPPORT – 7, OPPOSE – 2, NEUTRAL – 6

*Rationale:* To avoid duplication of effort, maximize resources and impact, and promote enhanced outcomes related to improving pollinator populations and health, the State of Minnesota should be an active partner in the national strategy to improve honey bee health.

*Responsible entities:* The governor’s office and all pertinent state agencies.

*Implementation:* The various agencies of the state of Minnesota should proactively develop working partnerships with federal agencies and neighboring states to promote and enhance the implementation of the National Strategy to Promote the Health of Honey Bees and Other Pollinators (Pollinator Health Task Force, 2015) within Minnesota and neighboring states with a focus on measurable outcomes and should report new and continuing initiatives and achievements to the governor of the state of Minnesota and the Governor’s Committee on Pollinator Protection on an annual basis.

*Funding:* Agency budgets with federal assistance as appropriate and available.

*Evaluation:* Goals that achieve measurable outcomes should be set and reviewed and updated as needed on an annual basis.

*Challenge:* Meaningful cooperation can be difficult.

### *Recommendation 3.7*

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#### *Reinstate the state Apiary Authority within the Minnesota Department of Agriculture and create a bee registry for the purposes of education, information gathering, and research*

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PRIORITY VOTES – 3      SUPPORT – 5, OPPOSE – 5, NEUTRAL – 5

*Rationale:* Given ongoing concerns about honey bees and their central role in the pollination of a variety of agronomic and horticultural crops, actions that are specifically designed to address the protection of managed bees, including European honey bees and other managed bees, are needed. Most pollinator protection plans include specific recommendations for honey bees and should not be overlooked in efforts to protect honey bees in the state of Minnesota.

The value of the pollination provided by honey bees and concerns about honey bee health are issues that are specifically included in Governor Dayton’s Executive Order 16-07 (Directing Steps to Reverse Pollinator Decline and Restore Pollinator Health in Minnesota, August 2016; see Appendix F) and therefore should not be ignored. This recommendation is also consistent with the apiary authorities and programs in all neighboring states and across the country.

*Responsible entities:* Minnesota Legislature, MDA, Minnesota beekeepers.

*Implementation:* Specific to European honey bees (*Apis mellifera*) and other bees, including bumble bees (*Bombus* spp.), that are managed to provide pollination services and/or the production of honey, pollen, and other bee-related products, and in support of education, pest tracking, and research efforts focused on bee health and pest management, the Minnesota Legislature should reinstate the Apiary Authority in the MDA. The MDA should create an online bee registry and a requirement that all resident bee colonies be individually labelled and registered with the MDA and inspected for health purposes on an ongoing basis.

For the purposes of pest tracking, assessing honey bee health, and research efforts focused on honey bee health and pest management, the gathering of contemporaneous, colony-specific information related to the source of the bees, management practices, pesticide treatments and outcomes, colony losses, and other data could be useful in tracking honey bee populations and health, pest abundance, and pesticide use and efficacy and should be considered as part of the proposed apiary program.

Education focused on the status of managed pollinators and pollinator pests in the state, honey bee best management practices, and pollination protection programs and resources like [BeeCheck](#), [DriftWatch](#), and [FieldWatch](#) should also be a key component of the program.

To be successful, the proposed apiary program should be a cooperative effort with input from beekeepers, researchers, and other stakeholders whose expertise should be sought as guidance for creating the framework of the program. The creation of a stakeholder advisory committee should also be considered to promote such cooperation.

*Funding:* The proposed apiary program should generally be self-supporting through a standard fee per beekeeper.

*Timeline:* The basic program should be active within two years (December 2020).

*Evaluation:* Potential metrics include colony and health statistics, a summary of education activities and resources produced, and an annual status report to the MDA commissioner and the governor (available to the general public).

*Challenges:* Funding will be required and lack of consensus within beekeeping community.

# APPENDICES

## Appendix A Voting results in priority order

Table A-1. Voting results in priority order for Goal 1: Habitat

Ref #	Recommendations <i>Goal 1: Lands throughout Minnesota support healthy, diverse, and abundant pollinator populations</i>	Priority Votes	Support votes (support – oppose – neutral)
1.1	Expand funding and eligibility criteria for pollinator habitat and management practices on rural lands, beyond what is provided by existing pollinator habitat programs	11	15 – 0 – 0
1.2	Establish a turf conversion and enhancement program focused on replacing or enhancing turf with flowering habitat in urban, suburban, and rural non-agricultural lands	9	14 – 1 – 0
1.3	Encourage and incentivize new public education facilities (schools, colleges, and universities) and major remodeling projects to include a certain percentage of pollinator landscaping	8	15 – 0 – 0
1.4	Increase use of flowering cover crops by establishing a Minnesota Department of Agriculture-directed cover crop incentive initiative	7	15 – 0 – 0
1.5	Develop an integrated, comprehensive, strategy for the enhancement, creation, and maintenance of high-quality pollinator habitat along surface water corridors primarily in rural areas	6	11 – 1 – 3
1.6	Increase flowering pasture	5	11 – 3 – 1
1.7	Encourage policies and practices that increase pollinator habitat on roadsides	4	13 – 1 – 1
1.8	Recognize the value of flowering non-native species for honey bees	4	12 – 0 – 3
1.9	Expedite the update of the Minnesota Department of Natural Resources wildlife food plot policy with a focus on pollinator habitat	2	11 – 2 – 2
1.10	Increase funding for the Minnesota Board of Water and Soil Resources to assess and certify solar developments for pollinator-friendly habitat	1	14 – 0 – 1

Table A-2. Voting results in priority order for Goal 2: Pesticides

Ref #	Recommendations	Priority votes	Support votes (support – oppose – neutral)
	<i>Goal 2: Minnesotans use pesticides judiciously and only when necessary, in order to reduce the harm to pollinators from pesticides while retaining economic strength</i>		
2.1	Increase awareness and adoption of the new federal Conservation Stewardship Program (CSP) Enhancement E595116Z2 and develop a similar state-level program for non-CSP farmers for planting corn/soy seeds not treated with neonicotinoids	9	12 – 2 – 1
2.2	Restrict the use and sale of neonicotinoid insecticides to licensed applicators	8	11 – 2 – 2
2.3	Minnesota Department of Agriculture (MDA) Neonicotinoid Review Action 1: Create a Treated Seed Program	8	10 – 4 – 1
2.4	Establish an MDA Crop Pest Loss Indemnity Fund for farmers avoiding pollinator-harming pesticides	7	12 – 3 – 0
2.5	Promote incentives to increase adoption of drift-reduction technologies	6	10 – 3 – 2
2.6	Adopt in statute a goal to reduce overall use of pesticides harmful to pollinators and designate an agency to create and implement a plan to meet the target	6	10 – 4 – 1
2.7	Discontinue neonicotinoid seed treatments in soybeans	6	9 – 5 – 1
2.8	Institute an immediate moratorium against all outdoor uses of neonicotinoid pesticides in Minnesota	6	8 – 6 – 1
2.9	Promote incentives for increasing adoption of integrated pest management strategies	5	11 – 1 – 3
2.10	Increase MDA enforcement of pesticide labels for pollinator protection	5	11 – 1 – 3
2.11	Reduce/eliminate off-target movement of pesticides through applicator training, best management practices, demonstration, and continued research	5	9 – 0 – 6
2.12	MDA Neonicotinoid Review Action 2: Create a dedicated “Pollinator Protection Account”	4	11 – 3 – 1
2.13	Increase education on integrated pest management practices and proper pesticide application	4	10 – 0 – 5
2.14	Enhance existing programs intended to prevent the introduction and establishment of invasive species and encourage the use of integrated pest management practices to control the spread of new and existing invasive species to reduce the need for pesticide applications and their unintended environmental impacts	4	10 – 1 – 4
2.15	Provide the Minnesota Department of Agriculture with the resources and tools to assure that Environmental Protection Agency label requirements intended to protect pollinators are followed in Minnesota	3	11 – 0 – 4
2.16	Significantly reduce use of neonicotinoid insecticide seed treatments in corn	2	9 – 5 – 1
2.17	Ban neonicotinoids for use in Minnesota for production, cultivation, or growing of decorative gardening or landscaping plants and nursery stock	2	8 – 5 – 2
2.18	Limit use of neonicotinoid insecticides on plants to crops grown for food production except where needed	2	7 – 5 – 3
2.19	Require seed companies, wholesalers, or retailers to offer non-neonicotinoid treated versions of top corn seed varieties	1	10 – 4 – 1
2.20	Discontinue neonicotinoid insecticide seed treatments in other Minnesota crops that are highly attractive to pollinators	1	10 – 5 – 0
2.21	MDA Neonicotinoid Review Action 3: Require formal verification of need prior to use of neonicotinoid pesticides, where appropriate	0	9 – 4 – 2
2.22	Adopt in statute a goal to reduce the use of neonicotinoid seed treatments to only those justified by current or historical pest pressure	0	9 – 5 – 1



Table A-3. Voting results in priority order for Goal 3: Education

Ref #	Recommendations <i>Goal 3: Minnesotans understand, value, and actively support pollinator populations</i>	Priority votes	Support votes (support – oppose – neutral)
3.1	Include the importance of pollinators and their habitat, as appropriate, in resources developed for teachers within and related to the next version of science standards	10	14 – 0 – 1
3.2	Amend Minnesota statute to designate all currently reported pesticide use data as public	8	9 – 4 – 2
3.3	Provide funding for an enhanced pollinator extension education and outreach program at the University of Minnesota along with the funding needed to maximize pollinator education across the state of Minnesota	7	15 – 0 – 0
3.4	Create a native pollinator and habitat documentation and tracking program	6	12 – 0 – 3
3.5	Increase availability of pollinator-related resources in libraries	5	13 – 0 – 2
3.6	Continue active partnership in the national strategy to improve honey bee health	3	7 – 2 – 6
3.7	Reinstate the state Apiary Authority within the Minnesota Department of Agriculture and create a bee registry for the purposes of education, information gathering, and research	3	5 – 5 – 5

## Appendix B Votes by committee members

Table B-1. Votes by committee members for Goal 1: Habitat

Ref #	Recommendations	Bailey-Johnson	Calkins	Ellis	Flakne	Foltz Jordan	Horan	Koch	MacSwain	Paap	Rupp	Schutte	Spivak	Suss	Thalman	Yang
1.1	Expand funding and eligibility criteria for pollinator habitat and management practices on rural lands, beyond what is provided by existing pollinator habitat programs	S	S*	S*	S*	S*	S*	S*	S	S	S*	S*	S	S*	S*	S*
1.2	Establish a turf conversion and enhancement program focused on replacing or enhancing turf with flowering habitat in urban, suburban, and rural non-agricultural lands	S*	O	S	S	S*	S*	S	S*	S	S*	S*	S*	S*	S*	S
1.3	Encourage and incentivize new public education facilities (schools, colleges, and universities) and major remodeling projects include a certain percentage of pollinator landscaping	S*	S	S	S*	S*	S	S*	S	S*	S	S*	S	S	S*	S*
1.4	Increase use of flowering cover crops by establishing a Minnesota Department of Agriculture-directed cover crop incentive initiative	S	S*	S*	S	S	S*	S	S*	S	S*	S	S*	S*	S	S
1.5	Develop an integrated, comprehensive, strategy for the enhancement, creation, and maintenance of high-quality pollinator habitat along surface water corridors primarily in rural areas	S*	S*	S	S*	N	S	S*	N	S	N	S	S*	S	O	S*
1.6	Increase flowering pasture	S	S	S	O	S*	S*	N	S*	O	S*	S*	S	S	O	S
1.7	Encourage policies and practices that increase pollinator habitat on roadsides	N	S	S*	S*	S	S	S*	S*	O	S	S	S	S	S	S
1.8	Recognize the value of flowering non-native species for honey bees	S	S*	S*	S	N	N	S	S	S	S	N	S*	S	S*	S
1.9	Expedite the update of the Minnesota Department of Natural Resources wildlife food plot policy with a focus on pollinator habitat	S	S	S	O	S	S	N	S	N	S	S	S	S*	O	S*
1.10	Increase funding for the Minnesota Board of Water and Soil Resources to assess and certify solar developments for pollinator-friendly habitat	S*	S	S	S	S	S	S	S	S	S	S	S	S	S	N

TABLE KEY: SUPPORT = S; OPPOSE = O; NEUTRAL = N; PRIORITY = \*

Table B-2. Votes by committee members for Goal 2: Pesticides

Ref #	Recommendations <i>Goal 2: Minnesotans use pesticides judiciously and only when necessary, in order to reduce the harm to pollinators from pesticides while retaining economic strength</i>	Bailey-Johnson	Calkins	Ellis	Flakne	Foltz Jordan	Horan	Koch	MacSwain	Paap	Rupp	Schutte	Spivak	Suss	Thalmann	Yang
2.1	Increase awareness and adoption of the new federal Conservation Stewardship Program (CSP) Enhancement E595116Z2 and develop a similar state-level program for non-CSP farmers for planting corn/soy seeds not treated with neonicotinoids	S*	S	S*	O	S*	S*	S	S*	O	S*	S*	S*	S	N	S*
2.2	Restrict the use and sale of neonicotinoid insecticides to licensed applicators	S*	S	S*	O	S*	S*	N	S*	O	S*	S*	S	S*	N	S
2.3	Minnesota Department of Agriculture Neonicotinoid Review Action 1: Create a Treated Seed Program	S*	O	S*	O	S*	S*	N	S	O	S*	S	S*	S*	O	S*
2.4	Establish a Minnesota Department of Agriculture Crop Pest Loss Indemnity Fund for farmers avoiding pollinator-harming pesticides	S*	S	S*	O	S	S*	S	S	O	S*	S*	S*	S	O	S*
2.5	Promote incentives to increase adoption of drift-reduction technologies	N	S*	S	S*	O	O	S*	S*	S	O	N	S*	S	S*	S
2.6	Adopt in statute a goal to reduce overall use of pesticides harmful to pollinators and designate an agency to create and implement a plan to meet the target	S*	O	S*	O	S*	S*	N	S	O	S*	S*	S	S	O	S
2.7	Discontinue neonicotinoid seed treatments in soybeans	S	O	S	O	S*	S*	O	S	O	S*	S*	N	S*	O	S*
2.8	Institute an immediate moratorium against all outdoor uses of neonicotinoid pesticides in Minnesota	S*	O	S*	O	S*	S	O	S*	O	S*	S*	N	O	O	S
2.9	Promote incentives for increasing adoption of integrated pest management strategies	S	S*	S	S*	S	O	S*	N	S	N	N	S*	S	S*	S
2.10	Increase Minnesota Department of Agriculture enforcement of pesticide labels for pollinator protection	S	S*	S*	N*	S	S*	N	S	O	S	S	S*	S	N	S
2.11	Reduce/eliminate off-target movement of pesticides through applicator training, best management practices, demonstration, and continued research	N	S*	S	S*	N	N	S*	N	S	N	N	S*	S	S*	S
2.12	Minnesota Department of Agriculture Neonicotinoid Review Action 2: Create a Dedicated "Pollinator Protection Account"	S*	N	S	O	S*	S	S	S*	O	S	S	S	S	O	S*
2.13	Increase education on integrated pest management practices and proper pesticide application	S	S*	S	S*	N	N	S*	N	S	N	N	S	S	S*	S
2.14	Enhance existing programs intended to prevent the introduction and establishment of invasive species and encourage the use of IPM practices to control the spread of new and existing invasive species to reduce the need for pesticide applications and their unintended environmental impacts	O	S*	N	S*	S	S	S	N	S*	N	N	S	S	S*	S
2.15	Provide the Minnesota Department of Agriculture with the resources and tools to assure that Environmental Protection Agency label requirements intended to protect pollinators are followed in Minnesota	S	S*	S	N*	S	S	S	S*	N	S	S	S	S	N	N
2.16	Significantly reduce use of neonicotinoid insecticide seed treatments in corn	S	O	S	O	S	S	O	S	O	S	S	N	S*	O	S*

Ref #	Recommendations <i>Goal 2: Minnesotans use pesticides judiciously and only when necessary, in order to reduce the harm to pollinators from pesticides while retaining economic strength</i>	Bailey-Johnson	Calkins	Ellis	Flakne	Foltz-Jordan	Horan	Koch	MacSwain	Paap	Rupp	Schutte	Spivak	Suss	Thalman	Yang
2.17	Ban neonicotinoids for use in Minnesota for production, cultivation, or growing of decorative gardening or landscaping plants and nursery stock	S	O	S	O	S	S	O	S	O	N	S*	N	S*	O	S
2.18	Limit use of neonicotinoid insecticides on plants to crops grown for food production except where needed	O	O	S	O	S	S	N	S	O	N	S	S	S*	O	N*
2.19	Require seed companies, wholesalers, or retailers to offer non-neonicotinoid treated versions of top corn seed varieties	S	O	S	O	S	S	N	S*	O	S	S	S	S	O	S
2.20	Discontinue neonicotinoid insecticide seed treatments in other Minnesota crops that are highly attractive to pollinators	S	O	S	O	S	S	O	S	O	S	S	S	S*	O	S
2.21	Minnesota Department of Agriculture Neonicotinoid Review Action 3: Require formal verification of need prior to use of neonicotinoid pesticides, where appropriate	S	O	S	O	S	S	N	S	O	S	S	N	S	O	S
2.22	Adopt in statute a goal to reduce the use of neonicotinoid seed treatments to only those justified by current or historical pest pressure	N	O	S	O	S	S	O	S	O	S	S	S	S	O	S

TABLE KEY: SUPPORT = S; OPPOSE = O; NEUTRAL = N; PRIORITY = \*

Table B-3. Votes by committee members for Goal 3: Education

Ref #	Recommendations <i>Goal 3: Minnesotans use pesticides judiciously and only when necessary, in order to reduce the harm to pollinators from pesticides while retaining economic strength</i>	Bailey-Johnson	Calkins	Ellis	Flakne	Foltz Jordan	Horan	Koch	MacSwain	Paap	Rupp	Schutte	Spivak	Suss	Thalman	Yang
		3.1	Include the importance of pollinators and their habitat, as appropriate, in resources developed for teachers within and related to the next version of science standards	S*	S	S*	S	S*	N	S*	S*	S	S*	S*	S*	S*
3.2	Amend Minnesota statute to designate all currently reported pesticide use data as public	S*	O	S*	O	S*	S*	N	N	O	S*	S*	S*	S*	O	S
3.3	Provide continued funding for an enhanced pollinator extension education and outreach program at the University of Minnesota along with the funding needed to maximize pollinator education across the state of Minnesota	S	S*	S	S*	S	S*	S*	S*	S	S	S*	S	S	S*	S
3.4	Create a native pollinator and habitat documentation and tracking program	S*	S*	S*	S	S	S*	S	N	N	S	S	S*	N	S	S*
3.5	Increase availability of pollinator-related resources in libraries	S	N	S	S	S*	S	S*	N	S*	S*	S	S	S*	S	S
3.6	Continue active partnership in the national strategy to improve honey bee health	N	S	O	S*	O	N	S	N	S*	N	N	S	N	S*	S
3.7	Reinstate the state Apiary Authority within the Minnesota Department of Agriculture (MDA) and create a bee registry for the purposes of education, information collecting, and research	N	S*	O	S*	O	O	S	O	S	O	N	N	N	S*	N

TABLE KEY: SUPPORT = S; OPPOSE = O; NEUTRAL = N; PRIORITY = \*

## Appendix C      Committee member biographies

Each committee member brought a unique perspective to pollinator protection. To describe some of this diversity of backgrounds and approaches, we have provided brief biographies, ordered alphabetically, and written by each committee member.

### *Erika Bailey-Johnson*

Erika Bailey-Johnson just wrapped up her tenth year as the Sustainability Director at Bemidji State University in Bemidji, Minnesota. She works in the *Ganawendakamigaawigamig* (Office of Earth-Caretaking or Sustainability Office) and coordinates the People of the Environment academic program. She speaks at regional and national conferences on BSU's unique sustainability model which includes a wellness component and an emphasis on integrating indigenous voices. Erika recently became the Director of the *Niizoo-gwayakochigewin* project to integrate an indigenous lens into campus sustainability work and academic programs. Erika's Ojibwe name is *Memengwe* which means Butterfly Woman.

### *James Calkins, Ph.D.*

Jim is a nursery production and landscape horticulturist and the Research Information Director and Regulatory Affairs Manager for the Minnesota Nursery and Landscape Association (MNLA). Recognizing the vital role of pollinators in natural and agricultural systems, the MNLA strongly supports efforts that genuinely benefit pollinators, including honey bees. Among other factors, honey bees are threatened by varroa mites and other pests, limited genetic diversity, and multiple apicultural stressors while habitat degradation and loss and the unintended effects of pesticides threaten all pollinators. Dedicated research, sincere communication, and cooperation among all concerned are needed if meaningful solutions are to be realized.

### *Steve Ellis*

As a commercial beekeeper for over forty years, Steve learned quickly that for the bees to be productive they must be kept healthy. In an effort to maintain his own bees' health, Steve has had to learn firsthand how pesticides can devastate a beekeeping operation. Fifteen years of meetings with national beekeeping organizations, EPA pesticide division, chemical registrants, USDA scientists, and litigation have taught him that we all must work to improve pollinator protections if we are to reverse the current global pollinator crisis. Pollinators need clean safe forage, and poisons must be kept off of and out of bloom.

### *David Flakne*

David Flakne is Senior Director of State Affairs for Syngenta Crop Protection LLC. After graduating from the University of Minnesota, David joined Syngenta's legacy company Ciba-Geigy and has enjoyed a 36-year career advancing agricultural science, technology innovation and stewardship. David has served on many state and national boards and advisory teams in the development of pollinator protection plans. David believes the key to success in protecting pollinators is to build trust and advance collaborative efforts embraced by all stakeholders. Working together can ensure the protection of pollinators and their habitat while maintaining United States Agriculture as the envy of the world.

### *Sarah Foltz Jordan*

Sarah is a Senior Pollinator Conservation Specialist for the Xerces Society, where she works to promote sound pollination conservation on farmlands and other landscapes. She provides technical support to hundreds of Midwest farmers and farm agency staff, and has authored numerous pollinator conservation resources on topics ranging from native bee monitoring to habitat installation using organic (non-herbicide) site preparation methods. In her work on the ground, it is often a struggle to find places to install pollinator habitat that are relatively protected from pesticide drift. As such, Sarah strongly believes that “more habitat” is not the only answer to the pollinator crisis— pesticide reductions are essential, too.

### *Lex Horan, Chair*

Lex Horan has been an organizer in movements for justice for more than a decade. He worked as a policy organizer for Pesticide Action Network North America from 2013-2017, where he partnered with people across Minnesota facing issues related to pesticide exposure and its effects on their health, livelihoods, or communities. In this role, he worked alongside beekeepers, farmers, and researchers to shape Minnesota policy to stop pollinator decline. Since January 2018 he’s continued as a consultant with PAN, focusing on pollinator policy.

### *Robert Koch*

Dr. Robert (Bob) Koch is an Associate Professor and Extension Entomologist in the Department of Entomology at the University of Minnesota. The goals of his research and extension efforts are to improve the environmental and economic sustainability of crop production through development and dissemination of research-based integrated pest management recommendations. Prior to his current position at the University of Minnesota, he worked for six years with the Minnesota Department of Agriculture. Dr. Koch received a Ph.D. in entomology from the University of Minnesota and Bachelor's degree in biology from St. John's University.

### *Dan MacSwain*

Dan MacSwain is a Natural Resource Coordinator in Washington County, MN, one of 28 local governments that have adopted a pollinator-friendly resolution to create pollinator habitat and encourage best management practices. Dan is involved with stewardship activities on over 4,400 acres of regional park land which varies from prairie planting, noxious weed control, and crop land administration. In order to protect and stabilize pollinator populations, Dan encourages state and federal policymakers to restore grassland on marginal areas of crop land, while connecting people to the land by grazing and haying in a way that increases pollinator habitat.

### *Kevin Paap*

Kevin and his wife Julie own and operate a family farm in Blue Earth County where they grow corn and soybeans. He is President of the Minnesota Farm Bureau and a member of the American Farm Bureau Board of Directors. Kevin believes that proactive engagement between farmers, consumers and policymakers is critical in making decisions that will impact our families, our farms and agriculture today and 20 years from now. “To be part of the process of working on solutions is the foundation on which agriculture has been built,” said Paap. “Farmers and private landowners involvement is vital to implementing policy that works for all stakeholders.

### *Erin Rupp*

Erin Rupp is an educator, beekeeper, and founder of Pollinate Minnesota where she serves as Executive Director. Pollinate Minnesota’s standards-based classes connect students directly to live bees. According to a Minnesota Environmental Partnership poll, 87% of Minnesotans are concerned about pollinator decline, as are our communities; Minnesota has 38 pollinator-friendly municipalities as of October 2018. Pollinate Minnesota drove this effort in Minneapolis and Saint Paul, and is seen as a leader in the growing network of individuals, communities, and organizations working on pollinator protection in Minnesota. Erin is working to represent these grassroots voices on the committee. She is a member of the Minnesota Hobby Beekeepers and the Minnesota Honey Producers Associations.

### *Dan Schutte*

Dan Schutte is an environmental education specialist at a rural public charter school in Duluth and owns Shoreview Natives LLC, a native plant nursery and landscaping company in Two Harbors. Raised in northern Iowa surrounded by corn and soybeans, he vividly remembers observing strong pollinator populations during his childhood, which are now strikingly absent at the home where he was raised. Through his work, he helps his school community understand the importance of ecological systems as the underpinnings of human sustainability, and promotes environmental stewardship in the lives and choices of the students he teaches. His business focuses on connecting people and communities with pollinator-friendly landscaping options.

### *Marla Spivak, Chair*

Marla Spivak is a MacArthur Fellow and McKnight Distinguished Professor in the Department of Entomology at the University of Minnesota. Her research and extension efforts focus on breeding honey bees for their natural defenses against diseases and parasites, and on propagating floral-rich and pesticide-free landscapes to support the health and diversity of all bee pollinators. She promoted recommendations that would be tractable and result in immediate and quantifiable benefits to pollinators. Her long-view is that protecting pollinators also regenerates soil and water, and improves quality of life.



### *Ted Suss, Chair*

Ted L. Suss is a resident of Redwood County where he raises a small amount of beef and pork for his friends' freezers. He was raised on a family dairy farm in Southeastern Minnesota and is a member of the Minnesota Farmers Union. Ted was a member of the Minnesota Legislature for two terms and served on the House Agriculture Committee. Although he does not consider himself an active farmer, he has always maintained a strong interest in agriculture policy. Mr. Suss spent most of his work career as a public school administrator including twelve years as a School Superintendent for three rural Minnesota school districts. He is now retired and devotes most of his time to volunteer work with the Izaak Walton League, Friends of the Minnesota Valley, Minnesota Farmers Union, and various other organizations.

### *Brian Thalmann*

Brian Thalmann is a fifth-generation crop farmer from Plato and a graduate of the University of Minnesota with a degree in agricultural business management. Along with his father and son, they also operate a grain cleaning facility. He sits on the board for the Minnesota Corn Growers Association (MCGA), which he represents on this committee. MCGA's mission is to help the state's corn growers become the most environmentally responsible and sustainable corn farmers in the nation. As part of this goal, they are using crop science and technology to protect pollinators and their role in our ecosystem. They have made great progress in this area, and look forward to continuing to evolve to reach their ultimate goal.

### *Yao Yang*

Yao Yang joined the Saint Paul Area Chamber of Commerce in March as a Public Affairs Specialist. Prior to the chamber, she was the Food Hub Director at Hmong American Farmers Association (HAFA) where she focused on economic development programs to help HAFA members build equitable wealth in the Twin Cities. She deepened her passion for pollinators when she led 10 HAFA farmers in how to be beekeepers on the HAFA Farm. Yao is an advocate for sustainable local food production, immigrants, local businesses, and protecting a future for growing generations. She has a Bachelor's degree in Environmental Studies from the College of Saint Benedict.

## Appendix D      Definition of integrated pest management

The phrase “integrated pest management” (IPM) appears in some of the recommendations included in this report. The committee reviewed two different definitions of IPM and, by a vote of the committee, selected the following definition. When reading the recommendations which reference IPM, the reader should be aware that IPM actions recommended by the committee will be in accordance with this definition.

### *Integrated pest management*

Source: [Environmental Protection Agency Integrated Pest Management \(IPM\) Principles](#)

Integrated pest management is an effective and environmentally sensitive approach to pest management that relies on a combination of common sense practices. IPM programs use current, comprehensive information on the life cycles of pests and their interaction with the environment. This information, in combination with available pest control methods, is used to manage pest damage by the most economical means, and with the least possible hazard to people, property, and the environment.

The IPM approach can be applied to both agricultural and non-agricultural settings, such as the home, garden, and workplace. IPM takes advantage of all appropriate pest management options including, but not limited to, the judicious use of pesticides. In contrast, organic food production applies many of the same concepts as IPM but limits the use of pesticides to those that are produced from natural sources, as opposed to synthetic chemicals.

IPM is not a single pest control method but, rather, a series of pest management evaluations, decisions and controls. In practicing IPM, growers who are aware of the potential for pest infestation follow a four-tiered approach. The four steps include:

- **SET ACTION THRESHOLDS.** Before taking any pest control action, IPM first sets an action threshold, a point at which pest populations or environmental conditions indicate that pest control action must be taken. Sighting a single pest does not always mean control is needed. The level at which pests will either become an economic threat is critical to guide future pest control decisions.
- **MONITOR AND IDENTIFY PESTS.** Not all insects, weeds, and other living organisms require control. Many organisms are innocuous, and some are even beneficial. IPM programs work to monitor for pests and identify them accurately, so that appropriate control decisions can be made in conjunction with action thresholds. This monitoring and identification removes the possibility that pesticides will be used when they are not really needed or that the wrong kind of pesticide will be used.
- **PREVENTION.** As a first line of pest control, IPM programs work to manage the crop, lawn, or indoor space to prevent pests from becoming a threat. In an agricultural crop, this may mean using cultural methods, such as rotating between different crops, selecting pest-resistant varieties, and planting pest-free rootstocks. These control methods can be very effective and cost-efficient and present little to no risk to people or the environment.

- **CONTROL.** Once monitoring, identification, and action thresholds indicate that pest control is required, and preventive methods are no longer effective or available, IPM programs then evaluate the proper control method based on effectiveness and risk. Effective, less risky pest controls are chosen first, including highly targeted chemicals, such as pheromones to disrupt pest mating, or mechanical control, such as trapping or weeding. If further monitoring, identifications and action thresholds indicate that less risky controls are not working, then additional pest control methods would be employed.

## Appendix E      Glossary of acronyms

BMP – best management practice

BWSR – Board of Water and Soil Resources

CSP – Conservation Stewardship Program

DNR – Minnesota Department of Natural Resources

ENRTF – Environment and Natural Resources Trust Fund

EPA – Environmental Protection Agency

GCPP – Governor’s Committee on Pollinator Protection

IPM – integrated pest management

IPPT – Interagency Pollinator Protection Team

LCCMR – Legislative-Citizen Commission on Minnesota Resources

MDA – Minnesota Department of Agriculture

MDE – Minnesota Department of Education

MN – Minnesota

MnDOT – Minnesota Department of Transportation

UMN – University of Minnesota

USDA – United States Department of Agriculture

## Appendix F Executive Order 16-07 text

STATE OF MINNESOTA

EXECUTIVE DEPARTMENT

MARK DAYTON

GOVERNOR

### Executive Order 16-07

#### *Directing Steps to Reverse Pollinator Decline and Restore Pollinator Health in Minnesota*

*I, Mark Dayton, Governor of the State of Minnesota, by virtue of the authority vested in me by the Constitution and applicable statutes, do hereby issue this Executive Order:*

*Whereas, Minnesota farmers provide food, feed, fuel, and fiber for the nation and the world, and agriculture is a cornerstone of Minnesota's economy;*

*Whereas, Minnesota's agricultural economy provides over 340,000 jobs and \$90 billion in economic activity;*

*Whereas, pollinators are essential to the reproduction of many native plants and cultivated food crops;*

*Whereas, pollinators sustain habitat that support wildlife and provide aesthetic and ecological benefits such as carbon storage and improved water quality;*

*Whereas, more than 200,000 pollinator species including insects, birds, bats, and other animals exist worldwide; including insect pollinators such as bees, wasps, flies, butterflies, moths, and beetles that are critical to our food production system;*

*Whereas, bees are considered to be the most efficient and important pollinators for our food crops; the estimated annual value of honey bee pollination alone for food production is \$17 billion dollars while that of native pollinators is estimated at \$6 billion;*

*Whereas, over the past decade there has been a significant loss of pollinators including honey bees, native bees, butterflies, moths, birds and bats;*

*Whereas, bees and other pollinator populations have been in decline in Minnesota and across the country due to a variety of pressures including habitat loss, pesticides, diseases, and parasites;*

*Whereas, the Special Registration Review conducted by the Minnesota Department of Agriculture found sufficient scientific evidence that neonicotinoid pesticides present toxicity concerns for honey bees, native bees, as well as other pollinating insects; and*

*Whereas, pollinator decline is serious and requires immediate attention to ensure the sustainability of our food production systems, avoid economic impact on our farmers and rural communities, and to protect the health of the environment in Minnesota.*

*Now, Therefore, I hereby order that:*

1. The Minnesota Department of Agriculture (MDA) shall take immediate action to implement the recommendations in the Department's Special Registration Review of Neonicotinoid Pesticides, including:
  - a. Requiring a "verification of need" prior to the use of neonicotinoid pesticides, where appropriate;
  - b. Review pesticide product labels and implement restrictions, as appropriate, to minimize impact on pollinator communities;
  - c. Increase inspections and enforcement of label requirements for pesticides that are acutely toxic to pollinators;
  - d. Develop pollinator stewardship materials for pesticides to minimize non-target exposures; and
  - e. Continue to develop and promote best management practices designed to protect and enhance pollinator health in Minnesota.
2. The Environmental Quality Board (EQB) shall convene agency leadership and Minnesotans to implement this Executive Order; including the following steps:
  - a. The EQB shall establish an Interagency Pollinator Protection Team to provide operational support, ensure interagency coordination, develop cross agency policies and programs, and report regularly on progress;
  - b. The Interagency Pollinator Protection Team shall consist of designees of the Departments of Administration, Agriculture, Corrections, Education, Health, Natural Resources, Transportation, Board of Water and Soil Resources, the Minnesota Pollution Control Agency, and the Minnesota Zoo;
  - c. The Interagency Pollinator Protection Team shall develop statewide pollinator goals and metrics and report on the progress toward those goals in a report to the EQB by December 1 of each year. The report shall include recommendations for pollinator policy, research needs, and budget recommendations; and
  - d. Member agencies of the EQB will contribute available staff resources as requested by the EQB Chair for purposes of carrying out the work directed by this Executive Order.
3. The Governor's Committee on Pollinator Protection is created to advise the Governor, the Environmental Quality Board, the Interagency Pollinator Protection team, and participating agencies on pollinator policy and programs.
  - a. The committee shall consist of up to 15 members appointed by the Governor with relevant experience in agriculture, conservation, education, academia, or local government.
  - b. The committee will do the following:
    - i. Promote statewide collaboration on pollinator protection efforts;
    - ii. Raise public awareness of pollinator issues;

- iii. Review and comment on agency pollinator programs, reports, and recommendations; and
  - iv. Identify and support opportunities for local and public-private partnerships.
- 4. The Commissioner of the Department of Natural Resources (DNR) shall develop an integrated pest management strategy to minimize pesticide use on public lands administered by the Department of Natural Resources; and shall develop a strategy to maximize restoration, creation, and management of habitat for pollinators on DNR administered land consistent with the DNR's ecological, economic, and recreational mission and mandates.
- 5. The Board of Water and Soil Resources (BWSR) shall direct work to restore and improve high quality pollinator habitat by:
  - a. Incorporating pollinator habitat into BWSR programs, including wetland protection and restoration, conservation easements, agricultural conservation practices, and urban water quality projects;
  - b. Creating and updating program policies and technical resources to enhance opportunities for pollinator habitat restoration;
  - c. Coordinate with other agencies, conservation partners, and researchers to use best available science; and
  - d. Guiding program and project improvements by measuring outcomes, evaluating restoration projects, and documenting successful restoration strategies.
- 6. The Commissioner of the Department of Transportation (MnDOT) shall manage state-owned transportation properties and rights of way to create, protect, and enhance pollinator habitat.
- 7. The Commissioner of the Minnesota Pollution Control Agency (MPCA) shall manage closed landfills under its supervision to create, protect, and enhance pollinator habitat.
- 8. The Commissioner of Administration shall take immediate measures to support pollinator health on the State Capitol Complex, other state buildings, and where applicable on leased property, including:
  - a. The purchase of neonicotinoid plants and pesticide products are prohibited for use on the Capitol Complex, unless no other suitable product is available;
  - b. Pollinator friendly plants shall be included in the Capitol Landscaping Design Plan, as part of the Capitol Preservation, where practical;
  - c. The State's Design Guidelines and the Minnesota Sustainable Building Guidelines shall be modified to incorporate that products must be neonicotinoid free on all state funded projects, where practical;
  - d. The Department of Administration will work with leased properties where the State is the sole (or majority) lessee to incorporate nonuse of neonicotinoid applied plants and neonicotinoid pesticide products at leased buildings; and

- e. To the extent available and verifiable, state contracts must accommodate the purchasing of neonicotinoid free plants and pesticides.

This Executive Order is effective fifteen days after publication in the State Register and filing with the Secretary of State, and shall remain in effect until rescinded by proper authority or until it expires in accordance with Minnesota Statute, section 4.035, subdivision 3.

*In Testimony Whereof*, I have set my hand on this 25<sup>th</sup> day of August, 2016.

[signature]

Mark Dayton, Governor

Filed According to Law:

[signature]

Steve Simon, Secretary of State



## Appendix G Meetings, presentations, and tours

Meeting date	Presentations and tours
December 22, 2016	<ul style="list-style-type: none"> <li>Welcome – Commissioner David Frederickson (MDA)</li> <li>Overview of the Pollinator Report – Crystal Boyd (DNR), Matthew Wohlman (MDA), Chris Guevin (Department of Administration), Tina Markeson (MnDOT)</li> </ul>
February 8, 2017	<ul style="list-style-type: none"> <li>Current Pollinator Protection Initiatives – (MDA)</li> </ul>
March 16, 2017	<ul style="list-style-type: none"> <li>MDA Special Registration Review Process of Findings – (MDA)</li> </ul>
April 27, 2017	<ul style="list-style-type: none"> <li>BWSR Pollinators Overview – Dan Shaw (BWSR)</li> <li>DNR Pollinators Overview – Crystal Boyd (DNR)</li> </ul>
June 8, 2017	<ul style="list-style-type: none"> <li>Bee Lab Tour – UMN Bee Lab Staff</li> <li>A Year in the Life of a Commercial Beekeeper – Dan Whitney, Mark Sundberg</li> <li>Pollinator Research at UMN – Wendy Caldwell, Dan Cariveau, Bob Koch, Emilie Snell-Rood, Marla Spivak</li> </ul>
July 20, 2017	<ul style="list-style-type: none"> <li>UMN Pollinator Presentation – Vera Krischik</li> <li>Roadside Habitat Management – (MnDOT)</li> </ul>
August 31, 2017	<ul style="list-style-type: none"> <li>Introduction to the Minnesota Zoo – Erik Runquist (MN Zoo), Tara Harris (MN Zoo)</li> <li>Zoo Tour of Prairie Butterfly Conservation Program Work – MN Zoo Staff</li> </ul>
October 26, 2017	<ul style="list-style-type: none"> <li>Syngenta’s Stanton Seedcare Institute Tour – Dave Flakne and Syngenta Staff</li> <li>Farm Conservation Practices Tours – Sarah Foltz Jordan and members of Open Hands Farm, Spring Wind Farm, Little Hill Berry Farm, Kimber Contours Farm</li> </ul>
December 8, 2017	<ul style="list-style-type: none"> <li>Seven Grandfather Teachings – Erika Bailey-Johnson</li> <li>Update on Legislative Funding to the UMN Bee Lab – Marla Spivak</li> </ul>
January 4, 2018	No presentations or tours
February 15, 2018	<ul style="list-style-type: none"> <li>Pollinator Mapping Project – Dan Shaw (BWSR)</li> </ul>
March 29, 2018	<ul style="list-style-type: none"> <li>Pollinator-Friendly Solar, Fresh Energy – Rob Davis</li> </ul>
June 4, 2018	<ul style="list-style-type: none"> <li>Washington County Parks Opportunities and Barriers to Promoting Pollinator Habitat on Public Lands: Tour and Presentation – Dan MacSwain</li> </ul>
July 10, 2018	<ul style="list-style-type: none"> <li>Municipal Efforts in Pollinator Protection – Russ Stark, Adam Robbins, Mary Henke-Haney (City of Saint Paul)</li> </ul>
August 2, 2018	No presentations or tours
September 13, 2018	No presentations or tours
October 25, 2018	No presentations or tours

