Pollinator Working Group Initial Report to the Director of the Department of Environmental Management and the Rhode Island House of Representatives

February 15, 2017

Executive Summary

Recognizing the importance of pollinators and the extreme stresses they face, the RI General Assembly directed the RI Department of Environmental Management (RI DEM) to form this Pollinator Working Group (PWG). The PWG was charged with examining the condition of pollinator populations in Rhode Island and asked to make recommendations on how to maintain, protect and enhance pollinator health and habitats in the state. The thirteen (13) members of the PWG have met ten times since convening in September 2016 and have heard presentations from a broad set of experts including educators, beekeepers, entomologists, green industry professionals, pesticide manufacturers, environmental managers, and conservationists. The presentations, meeting agenda and minutes and information related to the work of the group are publicly available on the RI DEM site (http://www.dem.ri.gov/programs/agriculture/pollinator-working-group.php). The approved minutes are attached to this preliminary summary.

The findings of this PWG confirm the complexity of the pollinator issue and the need for action. While it was prudent to review and educate the working group and stakeholders about the variety of issues facing pollinator health, there is little doubt that pollinators have been in decline in both species and abundance for some time and the state must begin to address these problems without delay.

Pollinator protection is within the purview of RI DEM, which already does a great deal of work related to protecting the environment, establishing habitat, monitoring beekeepers, and regulating pesticides. RI DEM staff's expertise and commitment to the state's communities and the environment are evident despite very real constraints. The findings of the PWG suggest an update of regulations and rules, coupled with further public training, and enforcement is necessary. It is abundantly clear to the PWG that, as it is currently configured, RI DEM lacks both the staff and funding to sufficiently monitor and regulate the complex issues facing pollinators.

Yet, the PWG believes this is an endeavor that must be undertaken. While there are gaps in research and data needed to determine the extent to which pesticide use in Rhode Island is affecting pollinators, it is clear from the findings of the PWG that the misuse of pesticides may harm pollinators, and there are documented cases confirming this throughout the country. The PWG finds that misuse of pesticides is a contributing factor to pollinator decline and as such, it is reasonable to recommend the fees collected in their registration and for the licensure of applicators be used to fund the RI DEM and the directive of saving pollinators in Rhode Island.

The PWG is ready to continue working with the RI Department of Environmental Management and its partners including the U.S. Department of Agriculture's Natural Resource Conservation Service (NRCS), the University of Rhode Island, and relevant NGOs on these important issues. We respectfully request extension of our charge.

Initial Findings and Recommendations

This initial report provides an outline of the group's findings, which are described in more detail in the attached minutes. The group is preparing a final report that will be available this spring.

Pollinators in Rhode Island

Initial findings:

- The PWG acknowledges the broad diversity of pollinators. For the purposes of this report we define pollinators as bees, butterflies and moths.
- We do not have an accurate inventory of pollinator species in Rhode Island. We do have a few directed research studies looking at specific agriculture sectors.
- Studies in neighboring states show that there is a decline in bees. Feral bees have been infected by Varroa mites and are likely in decline. The yellow-banded bumblebee (*Bombus terricola*) was once common, but is not anymore. In January 2017, the U.S. Fish and Wildlife Service designated the rusty patched bumblebee (*Bombus affinis*) as an endangered species. This is the first such designation for a bumblebee and for a bee species in the Continental U.S.
- The Rhode Island Beekeepers Association works in partnership with RI DEM Division of Agriculture to educate beekeepers about best management practices for managed honey bee hives.
- There are diseases that affect honey bees, including American Foulbrood, European Foulbrood, and Chalkbrood. There are treatments for these diseases. Varroa mites, an Asian species, were first discovered in the United States in 1987 and are the biggest problem for hives. They can be treated, but unmanaged hives spread the mites to neighboring hives and native pollinators.
- Continuous monitoring of honey bee colonies is important. Untreated colonies can infect surrounding bee colonies.
- Re-queening of a colony is important and is best done when using genetically superior stock. RI DEM's Apiary Inspector Jim Lawson and the Rhode Island Beekeepers Association (RIBA) have partnered to re-queen beehives throughout Rhode Island through a grant by the Division of Agriculture to RIBA. This successful program also helped to ensure that beehives were registered with the state.
- Honey bees travel 2 – 3 miles searching for pollen while most northeastern solitary bees probably forage within a few hundred meters of the nest.
- Colony Collapse Disorder (CCD) is a condition where the bees just leave the hive. Scientists do not understand the exact cause, but it is likely caused by many factors. It is primarily a problem with large commercial scale beekeepers.

Although not a big problem in Rhode Island, it does occur. Potential causes include insufficient nutrition and buildup of sub-lethal doses of pesticides in the beeswax.

- Over wintering survival is the biggest problem facing honey bees in Rhode Island and worldwide. Disease and pests are the major contributors.
- Pollinator decline is caused by several interrelated factors: habitat loss, poor nutrition, parasites and disease, pesticide use, and the changing climate.
- Climate change with increased precipitation has impacts on pollinators. Pollination days depend on wind, temperature and wetness. Pollination decreases during rain.
- Pollination is improved when both honey bees and bumble bees are present, as their efforts are complimentary. Bumble bees use buzz pollination and are superior pollinators. If a honey bee follows a bumble bee, they pick up more pollen grains.
- Pollination intensity directly relates to agricultural productivity. In the 1980s, native bees were more abundant in Rhode Island. Pollination is necessary to obtain fully formed fruit. There is also a direct correlation between the presence of nearby bee hives and higher yields of fruits and vegetables. This was demonstrated at Dame Farm in Johnston when they brought in hives and saw a substantial increase in production.
- Many states have worked with stakeholders to develop pollinator management plans. Maryland, North Dakota, California, Wisconsin and New York have model pollinator plans.

Recommendations and next steps:

- Conduct an in-depth, on-going inventory of RI pollinators. Better information on the status of pollinators in Rhode Island would help refine management plans and allow monitoring of results. Support increased inventory and monitoring of bees, butterflies, and moths including status and trends in domesticated honey and bumble bees as well as wild species diversity and abundance. Include citizen science programs.
- Conduct sampling of hives, pollen and nectar for pesticides.
- Support and enhance education of beekeepers. Improperly managed honey bee hives negatively impact neighboring hives and native pollinators.
- Increase registration of hives so beekeepers can receive training on proper management and obtain beneficial information about beekeeping and receive notification regarding potential threats to bees. Improve on-going monitoring of hives.
- Improve the state apiary program, perhaps by revitalizing the Beekeeping Advisory Board (RIGL 4-12-16). Consider statutory membership and funding.
- Develop and implement a Rhode Island pollinator management plan.

Pollinator Habitats in Rhode Island

Initial findings:

- The PWG has not discovered robust data on the current or past condition of pollinator habitats in Rhode Island.
- Rhode Island's small size, the scale of local agriculture, and work throughout the state to protect land for wildlife habitat suggest robust pollinator habitats exist in the state.
- NRCS has incorporated pollinator habitat enhancement into all its programs since passage of the 2008 Farm Bill.
- Rhode Island DEM's Forestry and Fish and Wildlife divisions are working to enhance pollinator habitats in state management areas and through forestry management projects. These efforts will increase with two pending hires: outreach coordinator and volunteer coordinator.
- Urbanization impacts pollinators, and the RI landscape is increasingly urbanized. Research has demonstrated that residential landscapes, neighborhood gardens, natural lawns, and overgrown roadsides do provide pollinator habitat.
    - In lawn-dominated yards, 90% of the bee species are generalists and 73% of bee species are ground nesting,
    - There is a strong correlation between garden areas and density of bees,
    - Low-impact lawns are suitable habitat for ground-nesting bees.
- The North American pollinator campaign has a committee looking at vector-borne disease management and the intersection with pollinator management.

Recommendations and next steps:

- The PWG is partnering with Dr. Peter August of the University of Rhode Island on GIS land use analysis to explore pollinator habitat health and diversity.
- Roadsides represent potential significant pollinator habitat. The PWG is meeting with the RI Department of Transportation to explore opportunities for pollinator-supportive construction and restoration standards and roadside management/maintenance practices.
- Management recommendations emerging from the PWG include:
    - Enhance urban habitats for pollinators.
    - Increase fall flowering habitat.
    - Maximize soil health.
    - Leave bare ground as habitat for ground nesting native bees.
    - Maintain some brushy habitat for bees.
    - Avoid practices associated with high impact lawns.
    - Incorporate "weed" diversity.

Pesticide Stewardship and Best Management Practices

Initial findings:

- Pesticide management is complex. Pesticide regulators, manufacturers, and applicators strive to balance pollinator stewardship with the need for pesticides for agricultural production, pest management, and public health.

- The major categories of pesticides include fungicides, herbicides, and insecticides. Each category is managed separately. There are research questions to be answered by the scientific community regarding chemical synergies, modes of action, sub-lethal impacts and impacts on non-target species.
- The RI DEM regulates pesticides under the authority of FIFRA (Federal Insecticide, Fungicide and Rodenticide Act) and RIPCA (Rhode Island Pest Control Act).
- Correct application of pesticides is important for minimizing non-target effects on pollinators, but labels are complex and difficult to follow without training, especially for concentration (non-premixed) pesticides.
- In Rhode Island, pesticide training is provided by trade organizations and businesses, and through a partnership between RI DEM and URI.
- Pesticide registration in Rhode Island brings in about $1.5 million per year and licensing and certification bring in about $71,000. These monies go to the general fund. The RI DEM pesticide program budget is about $550,000, yet the budget has decreased significantly over the past four years.
- Nationally, there are funds to pay for cleanup after the misapplication of pesticides. Yet there is a comparative lack of funding to invest sufficiently in prevention and oversight through training and monitoring.
- RI DEM staff upholds and meets the EPA pesticide obligation despite the agency's lack of resources.
- The state has committed not to aerial spray for gypsy moths or mosquitoes.

Best practices for pesticide application include:

Avoid mixing (stacked) pesticides when possible.

- Synergistic interactions do happen, some with unknown effects on pollinators.
- Pesticide synergies are not fully understood.
- Sub-lethal impacts on pollinator health are not completely understood but may be significant.

Pesticide recommendations (farm and home)

- Promote selective use of pesticides – use the right tool for the right job.
- Help people understand landscape planting requirements. Healthy plants do not need pesticides.
- Use pesticides with the lowest effective toxicity.
- Follow label directions.
- Spray chemicals at night, when conditions are dry with low wind.
- Bloom periods are important. Avoid application on flowers in bloom and just prior to bloom.
- Mow before applying pesticides, followed by watering (this can reduce exposure by 99%).
- Spray less and minimize spray drift and runoff.

- Re-educate the public – not all insects are bad and not all plant damage is bad. Some plant damage is necessary – for example, butterfly larvae need to eat.
- Recognize that many organic approved pesticides like pyrethrins and spinosad are dangerous to bees as well.
- Organophosphates pose the highest risk to bees.

Neonicotinoid (Neonic) Best Management Practices (BMP) for turf and lawn application

- Do not apply when bees are foraging on lawn weeds.
- Mow off clover and weed flowers before applying.
- Water lawn after application or soon after application.

Neonic BMPs for trees and shrubs (pollinator attractive/flowering)

- Do not apply pre-bloom through bloom.
- Wait until plants have completed flowering for foliar application.
- Use non-neonics on Linden, Basswood or other *Tilia* species.
- Systemic and soil application – follow labels.

Neonic BMPs for trees and shrubs (nursery plants). Plants for sale are required to be pest free by RIGL § 2-18.1-4.

- Do not spray flowers in the last 1 – 2 weeks before shipping.
- Do not apply soil drenches of imidacloprid to hanging baskets any later than 5 weeks before shipping.

Recommendations and next steps:

- As pesticides are likely one of the contributing factors in pollinator decline, it is reasonable to recommend the fees collected in their registration and for the licensure of applicators be used to fund the RI DEM and the directive of protecting pollinators in Rhode Island.
- Rhode Island should evaluate pesticide applicator training and licensure, exploring ways to strengthen the program.
- Look for opportunities to limit retail/homeowner misuse of pesticides.
- Consider limited access to the most dangerous pesticides in non-premixed formulations.
- Increase enforcement of pesticide use regulations in Rhode Island.

Public education on issues of pollinator health and habitats

Initial findings:

- Rhode Island has excellent educational programs on pollinators and pollinator habitats. The URI Master Gardener Program reached a wide audience estimated at 8,000 people in 2016. RI College also has a robust beekeeping program that reaches a broad audience.

- The Xerces Society, working in partnership with the USDA NRCS, provides excellent information on pollinator health and habitats.

Recommendations and next steps:

- Create ways to make native plants for gardens and habitat restoration projects more affordable and accessible to Rhode Islanders.
- Rhode Island needs an affordable and local pollinator habitat seed mix for flower gardens, field/roadsides and lawn applications. Current seed mixes are expensive and not appropriate for Rhode Island application.

Attachment 1: Working Group charge and membership

Working Group to Make Findings and Recommendations with Regard to Maintaining, Protecting and Enhancing Pollinator Habitat and Health in Rhode Island

Charged with: (a) Making findings with regard to: (1) Developments in the scientific and technical understanding of conditions and practices affecting pollinator population; (2) Conditions and practices affecting the maintenance, protection, and enhancement of pollinator habitat and health in Rhode Island; (3) Potential costs and benefits of changing such conditions and practices; and (b) With making recommendations, based on its findings, to maintain, protect, and enhance pollinator health and habitat in Rhode Island.

Reporting to: the RI DEM Director and the RI House of Representatives on or before February 15, 2017

Link to House resolution establishing the working group:
http://webserver.rilin.state.ri.us/BillText/BillText16/HouseText16/H8265.pdf

Membership:

Ken	Ayars	R.I. Dept. of Environmental Management, Div. of Ag.
Meg	Kerr	Audubon Society of Rhode Island (committee/admin. support)
Joel	Tirrell	R.I. Nursery and Landscape Association
Shannon	Brawley	R.I. Nursery and Landscape Association (admin. support)
David	Brunetti	Environment Council of R.I.
Lyn	Spinella	R.I. Farm Bureau
Ken	Payne	
Gary	Casabona	USDA Natural Resources Conservation Service
David	Gregg	R.I. Natural History Survey
Lisa	Tewksbury	University of R.I., Plant Sciences - Bio-Control Lab
Rafael	Nightingale	Kaiser Tree Preservation
Don	Joslin	R.I. Beekeepers Association
Robert	Mann	Lawn Dawg, Inc.

Attachment 2: Pollinator Working Group meetings and invited speakers

2016	
September 22	Organizational & review plan and outline
October 12	*Overview of beekeeping in RI* (Don Joslin, RI Beekeepers, member PWG) *Overview of pollinators in RI* (Dr. David Gregg, RI Natural History Survey, member PWG)
October 27	*Overview of pollinators and habitat restoration in New England/RI* (Gary Casabona, State Biologist, Natural Resources Conservation Service, RI, member PWG)
November 3	*Best Management Practices for Pollinator Protection in Turf, Ornamentals, Vegetation Management and Pest Control* (Dr. Frank Wong, Senior Regulatory Affairs Consultant, Bayer Crop Science) *Risks to Bees from Pesticide Exposure: If You've Seen One Bee You Haven't Seen Them All* (Dr. Nancy Ostiguy, Associate Professor of Entomology, Pennsylvania State University)
November 10	*Rhode Island Pesticide Laws and Regulation* (Howard Cook, Pesticide Supervisor, RI Department of Environmental Management) *Rhode Island's Pesticide Training Program* (Dr. Steven Alm, Professor of Entomology, University of Rhode Island)
December 8	*Bees, Pollination and Agricultural Habitats* (Dr. Frank Drummond, University of Maine) *Characteristics of Urban Spaces that Promote Pollinator Conservation and Health* (Rebeccah Waterworth, University of Maryland)
2017	
January 5	*An overview of Syngenta's leadership concerning issues relating to stewardship, pollinator health and pest management* (Caydee Savinelli, Syngenta Pollinator and IPM Stewardship Lead) *An overview of the apiary regulation in the state of Rhode Island* (Jim Lawson, R.I. Dept. of Environmental Management, Plant Industry Unit Apiary Inspector)

January 12	*Vector-borne disease management and pollinator protection* (Dr. Howard Ginsburg, University of Rhode Island) *An Overview of the RI DEM Forestry/Fish and Wildlife division's work on pollinators* (Catherine Sparks, Assistant Director, Bureau of Natural Resources, RI Department of Environmental Management)
January 26	*An overview of what the Master Gardener program is doing to educate the public about pollinators* (Vanessa Venturini, Master Gardener State Program Leader) *An overview of RI College's beekeeping program* (Jim Murphy, RI College Sustainability Coordinator)
February 10	**Review initial plan**

Attachment 3: Stakeholders Participating in Pollinator Working Group Meetings

Owen Lynch Keith Salisbury Vanessa Venturini RI Wild Plant Society Mary O'Connor Helen Drew Steve Alm Howie Ginsberg Timothy Philip Schwartz Jim Lawson Terry Meyer Nyssa Sky Judie Sky Brianna O'Connor Gail Read Ambar Espinoza Rupert Friday Scott Ruhren Scott Comings Howie Cook Catherine Weaver	Riley Titus Barbara Chaves Jane Halliday James Wilkinson Jr. Mike Ventura Kevin Brewer Steve Alm Anthony Russo Paul Faria Julie Medeiros Julia Bancroft Simona Tradafir Hanna Phelan Christie Milligan Allison Hamel Clarkson Collins Azure Giroux Amanda Freitas Tim Faulkner Billy Wilson Nancy Parker Wilson John Bresnahn Hope Leeson