Pollinator Potential: Mapping Pollinator Friendly Spaces in Williamstown, MA

Molly Knoedler, Tasha Baranow, & Katy Dix
Roadmap

- The state of pollination globally and nationally
- Williamstown and the Pollinator Friendly Project
- Maps of land practices
- Site-specific recommendations
- Future directions & partnerships
Background
Pollinators in Decline

**Figure 4:** US honey-producing colonies

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of honey-producing bee colonies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1940</td>
<td>6,000,000</td>
</tr>
<tr>
<td>1950</td>
<td>5,000,000</td>
</tr>
<tr>
<td>1960</td>
<td>4,500,000</td>
</tr>
<tr>
<td>1970</td>
<td>4,000,000</td>
</tr>
<tr>
<td>1980</td>
<td>3,500,000</td>
</tr>
<tr>
<td>1990</td>
<td>3,000,000</td>
</tr>
<tr>
<td>2000</td>
<td>2,500,000</td>
</tr>
<tr>
<td>2007</td>
<td>2,000,000</td>
</tr>
</tbody>
</table>

Data source: U.S. Department of Agriculture’s (USDA) National Agricultural Statistics Service (NASS) NB: Data collected for producers with 5 or more colonies. Honey producing colonies are the maximum number of colonies from which honey was taken during the year. It is possible to take honey from colonies which did not survive the entire year.

**Relying on Bees**

Some of the most valuable fruits, vegetables, nuts and field crops depend on insect pollinators, particularly honeybees.

<table>
<thead>
<tr>
<th>Crop</th>
<th>Crop value in billions 2006</th>
<th>Percentage pollinated by honeybees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soybeans</td>
<td>$19.7</td>
<td>5%</td>
</tr>
<tr>
<td>Cotton</td>
<td>5.2</td>
<td>16%</td>
</tr>
<tr>
<td>Grapes</td>
<td>3.2</td>
<td>75%</td>
</tr>
<tr>
<td>Almonds</td>
<td>2.2</td>
<td>100%</td>
</tr>
<tr>
<td>Apples</td>
<td>2.1</td>
<td>90%</td>
</tr>
<tr>
<td>Oranges</td>
<td>1.8</td>
<td>27%</td>
</tr>
<tr>
<td>Strawberries</td>
<td>1.5</td>
<td>2%</td>
</tr>
<tr>
<td>Peanuts</td>
<td>0.6</td>
<td>2%</td>
</tr>
<tr>
<td>Peaches</td>
<td>0.5</td>
<td>48%</td>
</tr>
<tr>
<td>Blueberries</td>
<td>0.5</td>
<td>90%</td>
</tr>
</tbody>
</table>

Besides insects, other means of pollination include birds, wind and rainwater.

Sources: United States Department of Agriculture; Roger A. Morse and Nicholas W. Calderone, Cornell University

The New York Times
Law and Policy

● National legislation
  ○ Pres. Obama’s Pollinator Health Task Force
  ○ Pres. Trump and the rusty patched bumblebee

● Statewide legislation
  ○ Massachusetts Pollinators Protection Plan (PPP)
  ○ Winter 2017: House Bill 2113

● Local pollinators resolution
  ○ Modeled on other small towns
  ○ ~$9,000 grant to implement
Case Studies

- Public list of pledges
- Awareness events
- Buzzways or pathways (Seattle)
- Campaigns
Project Goals

- Interview local landowners
- Map meadows, lawns, chemical applications, and mowing practices in Williamstown
- Create site-specific recommendations
- Raise awareness
- Change the aesthetics

Why aren’t we including agricultural or residential land?

Client: Bridget Spann
Reducing Chemical Use

- Neonicotinoids
Mowing Less and Later

- Mowing meadows after the first frost rather than during summer leads to higher density of plants and more resources for pollinators
Site Description and History
Obstacles to Change
Landscaping company attitudes

“People despise dandelions.”

“I could make more money if I pushed chemicals.”

-Valerie Ross, New England Land and Garden Care
Incentives for Change & Economic Factors

- Less expensive
- Lowering of carbon footprint
- Benefits to ecosystem & farms
- Can be aesthetically pleasing
- Health benefits
- Pets & kids

Image from Leslie Reed-Evans
<table>
<thead>
<tr>
<th>Who did we interview?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Government</strong></td>
</tr>
<tr>
<td>✓ Jason Hoch, Williamstown Town Manager</td>
</tr>
<tr>
<td>✓ Dr. Hank Art from the Williamstown Conservation Commission (and Williams College)</td>
</tr>
<tr>
<td>✓ Chris Lemoine, Director of Public Works</td>
</tr>
<tr>
<td>✓ Craig Clough, Parks &amp; Cemeteries</td>
</tr>
<tr>
<td><strong>Institutions</strong></td>
</tr>
<tr>
<td>✓ Dave Fitzgerald at Williams College</td>
</tr>
<tr>
<td>✓ Matt Noyes at The Clark</td>
</tr>
<tr>
<td>✓ Jim Sylvester at Mt. Hope</td>
</tr>
<tr>
<td><strong>Schools</strong></td>
</tr>
<tr>
<td>✓ Mike St. Pierre at Buxton School</td>
</tr>
<tr>
<td>✓ Sue Wells at Pine Cobble School</td>
</tr>
<tr>
<td>✓ Joelle Brookner at Williamstown Elementary</td>
</tr>
<tr>
<td>✓ Jesse Wirtes at Mt Greylock HS</td>
</tr>
<tr>
<td><strong>Golf Clubs</strong></td>
</tr>
<tr>
<td>✓ Jim Easton from Taconic Golf Club</td>
</tr>
<tr>
<td>✓ Waubeeka Golf Links</td>
</tr>
<tr>
<td><strong>Organizations / Other</strong></td>
</tr>
<tr>
<td>✓ Leslie Reed-Evans, former director of Williamstown Rural Lands Foundation</td>
</tr>
<tr>
<td>✓ Julie Richburg at The Trustees of Reservation</td>
</tr>
<tr>
<td>✓ Shira Wohlberg referred to by the Hoosic River Watershed Association</td>
</tr>
<tr>
<td>✓ Drew Jones at Hopkins Forest</td>
</tr>
<tr>
<td>✓ Dr. Joan Edwards from the Williams College Biology Department</td>
</tr>
<tr>
<td>✓ Lauren R. Stevens</td>
</tr>
<tr>
<td><strong>Landscaping Companies</strong></td>
</tr>
<tr>
<td>✓ New England Lawn and Garden Care</td>
</tr>
<tr>
<td>✓ Countryside Landscape</td>
</tr>
</tbody>
</table>
Results
Mapping: Land-Use

- Mapping of open lands
- How do we maximize our efficiency and impacts?
- Using quantitative and qualitative data from interviewing large landowners to map out spaces for pollinators
Interviewed Landowners

The College
- Williams College
- Hopkins Forest
- Mt Hope

Institutions and Organizations
- The Clark
- Trustees of Reservation: Mountain Meadow and Field Farm
- WRLF Land

Schools
- Pine Cobble School
- Buxton School
- Williamstown Elementary
- Mt Greylock HS

Golf Courses
- Taconic Golf Course
- Waubeeka Golf Links

The Town
- Williamstown-owned land
Chemical Application on Parcels of Interest
Mowing Schedules on Parcels of Interest

Legend
- Lawns

Land-Use Practices:
Parcels Containing Significant Areas of Lawn

Land-Use Practices:
Mowing Schedules for Parcels with Large Meadow Spaces

Legend
- Fall
- Summer
- Spring/Summer
- Spring/Summer & Fall

Compass Directions
- North (N)
- South (S)
- East (E)
- West (W)
- Scale: 0, 1.25, 2.5, 5 Miles
Recommendations
Williams College Practices & Recommendations

Specific site recommendations

Bee Campus USA taskforce
Williamstown Practices & Recommendations
Field Park and the Library
Golf Course Practices & Recommendations
## Evaluation Matrices

<table>
<thead>
<tr>
<th>PLAN</th>
<th>COST</th>
<th>TIME</th>
<th>OTHER CONSIDERATIONS</th>
</tr>
</thead>
</table>
| **Proposal 1:** Switch to alternative pesticide, Acelepryn, for golf course management | $1000/ gallon | N/A | § Successful at other golf courses nationally  
§ Successful locally (used at Williams College) |
| **Proposal 2:** Install artificial bee nests in natural areas of golf course | Varies; ~$100 | 20 hrs/ year | § See Appendix D for details on construction and maintenance  
§ Install away from high-pesticide use areas (particularly greens) |
| **Proposal 3:** Signs on site that advertise pollinator habitat areas | $100/ sign | <10 hrs/ year | § Potential for funding through town grant |
| **Proposal 4:** Participation in Williamstown Buzzway | Negligible to $4000 | None to Significant | § Contribution of 1.5 to 3 feet strip of land along northern or southern edge of property (see section on Williamstown Buzzway)  
§ Variability in time and cost depending on whether the garden is intensively designed or one simply ceases mowing area  
§ See Appendix D for details on creating foraging habitat |
| **Proposal 5:** Join the Audubon Cooperative Sanctuary Program for Golf | $300 annual membership fee | 20+ hrs/yr | § Must take stock of environmental resources and potential liabilities.  
§ Develop and implement a management plan for site (variability in time and cost depending on management plan decisions, which may include Proposal 1 and Proposal 2)  
§ See Appendix D for details |
School Practices and Recommendations

- MGRHS
- Williamstown Elementary
- Pine Cobble School
- Buxton School
What are all these weeds doing here?

This site provides milkweed and shelter for monarch butterflies as they migrate throughout North America. Monarchs are one of many important pollinators in decline worldwide. In 2017, Williamstown passed a resolution to encourage the adoption of more Pollinator-friendly practices.

Habitat loss and toxic chemical use are two of the leading causes of pollinator decline globally. This school doesn’t apply chemicals to minimize detrimental environmental and health impacts.
Clark Art Institute Practices & Recommendations

Image: https://www.bluffton.edu/homepages/facstaff/sullivnm/maassachusetts/williamstown/clarkcenter/CAMPUS_Map3.jpg
Steps Moving Forward

Allocating funding from the grant: Field Park, Library, The Spruces, and/or Williamstown Buzzway

Making Williams a certified Bee Friendly campus

Landscaping Companies & Re-certification credits

Potential Collaborators

- Williamstown Garden Club
- Nurseries
- Williams Garden Club
- Williams Beekeeping Club
- Agricultural Commission
- Countryside Landscaping
- New England Lawn and Garden Care
Acknowledgements

Special thanks to Bridget Spann, Sarah Gardner, Andrew Groff, Leslie Reed-Evans, Shira Wohlberg, our classmates, and all key informants.