Title: Pollinator Protection Efforts for NYSIPM – 2015

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Abstract:
Pollinators, including native and managed bees, wasps, flies, butterflies, moths and other insects, are threatened all over the world by numerous factors. In New York and the Northeast habitat loss, pesticide use and disease may be among the most important stresses on pollinator communities, and especially hard on native bees. The New York State IPM Program (NYSIPM) undertook two major projects in 2015 to address threats faced by pollinators in New York. The first was an assessment of a pollinator community in a large State Park golf course surrounded by dense suburban communities. This project included the hand-and-net collection of specimens on several dates over three months, along with recording host plant species from which specimens were collected. These data will guide native plant recommendations for other state parks and may serve as a relative measurement of pollinator community diversity. In September of 2015 the NYSIPM program organized a conference titled "Protecting Pollinators: The New York Pollinator Conference" in Albany, NY. Nearly 100 people were involved in this educational and networking event: a wide diversity of speakers and of audience members. The speakers were divided into two topics. The State of Pollinators included background information on native and managed bees and other pollinators and what is being done in NY with the Pollinator Task Force. The second topic was Practical Applications for Pollinator Protection and conservation. Seven speakers provided research based and applied methods for protecting pollinators in fruit production and backyards. Based on the survey results before and after the conference, the conference goals of increasing knowledge and encouraging discussion on the issue of pollinators in NYS was achieved.

Background and justification:

Assessment of pollinators at Bethpage State Park

Bees are usually the first insects that come to mind when mentioning pollinators. Bees are certainly the most important group of insects that pollinate plants vital to humans, such as food crops, but are also critical to ecosystems worldwide. Other insects serve smaller roles as pollinators, but are still valuable. One analysis of 39 studies showed that insects other than bees are effective pollinators providing 39% of visits to flowering crops (Rader et al. 2016). These include flies, beetles, wasps, butterflies and other species. The authors suggest that non-bee pollinators may provide a buffer when bees are in decline.

There has been a worldwide decline in pollinators, especially native bees in Europe and America (phys.org/news/2016-01-complex-worldwide-bee-declines.html). In addition, managed honey bee colonies have suffered several disastrous years of colony collapse in the US (www.ars.usda.gov/News/docs.htm?docid=15572#history), which has only recently begun to abate (www.epa.gov/pollinator-protection/colony-collapse-disorder).

Bethpage State Park is the largest publicly owned golf course in the U.S. It comprises 1,477 acres of parkland on the borders of Nassau and Suffolk Counties, Long Island, with five golf courses, a polo field, trails, some forested areas and several relatively small (< 1 acre) native plant gardens. The park is surrounded by suburban communities, making it a natural oasis for wildlife, including great horned owls, hawks, foxes, bullfrogs and insects. Bethpage State Park's five golf courses are highly-managed public courses, hosting the 2002 and 2009 US Open and other tournaments. An ongoing IPM demonstration and pesticide reduction study led by NYSIPM on one of the courses has resulted in IPM adoption and 33-85% reduction in excess and unnecessary pesticide use. However, pesticides are still used judiciously (www.gcsaa.org/gcm-magazine/2014/february/gcm-february-2014-environmentally-friendly-golf). While much of the land is cultivated into fairways and greens, tracts of wooded and meadow areas receive little management and three acre-sized plots of native flowering plants have been established and managed for more than a decade without insecticides. All of these factors make Bethpage State Park an interesting case study of the results of urban land management on pollinator communities.

Protecting Pollinators: The New York Pollinator Conference

Pollinator health is a hot topic for consumers of NYS agricultural products. Growers and consumers are trying to understand the problem and how it affects their production or buying practices. Media coverage of the topic can be unclear. All these factors led us to propose a series of presentations on the topic of pollinators in NYS and what New Yorkers might do to reduce pollinator population losses. Our intent was to encourage the audience to consider both the research being done on the topic and how they might apply this information, and create a space for discussion and the sharing of ideas.

6. Objectives:

Assessment of pollinators at Bethpage State Park

- **a.** Assess the pollinator community at Bethpage State Park by collecting active pollinators and noting their host plants.
- **b.** Use pollinator census data to draw conclusions about the health and diversity of the pollinator community at Bethpage State Park, by comparing these results to similar efforts and results.
- **c.** Increase outreach efforts for pollinator protection, both in agricultural and community settings, and especially as it relates to the adoption of integrated pest management.

Protecting Pollinators: The New York Pollinator Conference

a. to increase practitioner knowledge on the state of pollinator health and provide strategies to enhance native and managed pollinating insects

b. to provide a forum for discussion of methods for protecting pollinators in NYS

7. Procedures:

Assessment of pollinators at Bethpage State Park

a. Pollinator assessment at Bethpage State Park

The Community IPM Program undertook a pollinator census in 2015 to assess the diversity of insects in wildflower planting gardens. On June 30, July 1, 29, 30, and September 3 a team of entomologists set up a collecting and processing station at the edge of a garden called "Green Acre". Sampling was conducted in two other gardens ("Red Eye" and "The Valley") concurrently, but not as extensively as Green Acre due to a lower abundance of blooms. Collecting began at 9 or 10am each day and continued through each hour until 2 or 3pm. During each hour, each collector focused on capturing insects from a specific host plant. Using collecting nets, kill jars with plaster and ethyl acetate and deli containers, we collected all insects from wildflowers in the three gardens. Samples were labeled with time of day (hour), garden and host plant. Samples were kept cold and then frozen until they could be pinned and labeled with data. In addition, weather conditions were noted.

b. Use pollinator census data to draw conclusions about the health and diversity of the pollinator community at Bethpage State Park, by comparing these results to similar efforts and results.

The pollinator census data from Bethpage State Park is likely not robust or quantitative enough to draw conclusions about species abundance. Instead these data will be used to characterize species diversity as a measure of pollinator community health. We will compare the number of species collected with similar studies in the Northeast to understand species richness and to identify species that are common but not present in this sampling. The data will help us identify which host plants are visited by the greatest number and diversity of insects. From there, we will make a list of recommended native and flowering plants that can be established and cultivated in other state parks and public areas for the purpose of protecting and feeding pollinators.

Image 1. Green acre, Bethpage State Park. Google Earth, accessed 2-11-16

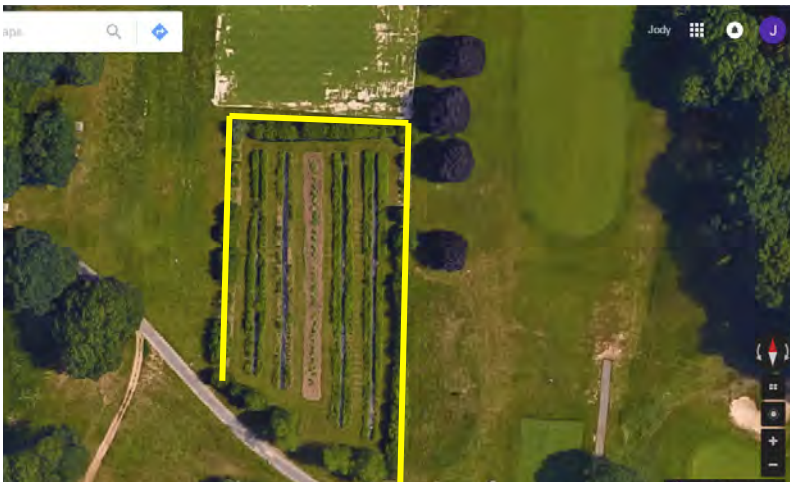

Image 2. The Red Eye, Bethpage State Park. Google Earth, accessed 2-11-16

Image 3. The Valley, Bethpage State Park. Google Earth, accessed 2-11-16

Protecting Pollinators: The New York Pollinator Conference

The NYS IPM Program serves as a Program Work Team within the College of Agriculture and Life Sciences. With funding budgeted for this PWT, a group of educators organized a conference aimed at highlighting the current status of pollinator health and research in New York, actionable steps that participants can take to protect pollinators and to provide a forum for discussion and networking among participants.

In order to encourage discussion and involve a wide variety of audience members, we sought speakers that had a diversity of opinions. While pollinators are important in most agricultural commodity areas, at this conference there were emphases on ornamentals and fruit crops as we had resources for speakers on those topics.

The conference was held in the Albany area in order to encourage the participation of government departments and legislators. A half hour for discussion was included for each major topic rather than the usual few minutes as we felt that the participants would have expertise and information to share. While one goal was certainly to provide information, another was to learn more about what New Yorkers were thinking about pollinators. Advertising went out through NYS IPM social media, CCE Albany listserves, the Ornamental IPM listserve, the Cornell University Event listing, regional Extension newsletters, the CCE Master Gardener listserve, the Empire State Honey Producers Association website and eXtension.

Conference Agenda:

State of pollinators

8:30 Registration

9:00-9:15 **Intro, pre-test**

9:15-10:15 Scott McArt/Emma Mullen, Entomology Department, Cornell University
State of knowledge on health of native and managed bee species – applied research

10:15-10:45 Carmen Greenwood, SUNY Cobleskill
Other insect pollinators

10:45- 11:15 Susan Kegley, Pesticide Research Institute, Inc.
Adoption of Bee Friendly Policies on Government and Private Properties: Motivations, Expectations, and Results

11:15-11:30 Chris Logue, Division of Plant Industry, NYS Department of Ag and Markets, Scott Menrath, Bureau of Pest Management, NYS Department of Environmental Conservation
New York State Pollinator Task Force

11:30-12:00 Discussion

Practical applications for pollinator protection and conservation – success stories

1:00-1:15 **Current research on ornamental production options** – Dan Gilrein, Cornell Cooperative Extension, Suffolk County

1:15-1:30 **Current research on wild pollinators in apple** – Maria VanDyke Department of Entomology, Cornell University

1:30-1:45 **Practical applications - As a landscaper** – Laurie Broccolo, Broccolo Tree and Lawn Care, Rochester NY

1:45-2:00 **Practical applications -As an ornamental producer** – Mark Adams, Mark Adams Greenhouses, Adams Fairacre Farms

2:00-2:15 **Practical applications - Using mason bees** – Charles Mohr, Crown Bees

2:15-2:30 **Current research on pollinators and strawberry yield** – Heather Connelly Department of Entomology, Cornell University

2: 30-2:45 **Practical applications - As a gardener** – Jennifer Stengle, Cornell Cooperative Extension, Putnam County

2:45-3:00 Break
3:00-3:45 Discussion with panel
3:45-4:00 Post-test and evaluation

8. Results and discussion:

Assessment of pollinators at Bethpage State Park

During the Bethpage pollinator census, over 1500 samples were collected, preserved, pinned, labeled and stored for future identification. Samples from the pollinator census of 2015 are currently being processed by identifying to genus or species, where possible. The majority of specimens were Hymenoptera in the Apidae, Anthophoridae, Halictidae, Andrenidae, Mellitidae families and others. Many Syrphidae flies and wasps were collected as well as pollen beetles, milkweed beetles, some true bugs and butterflies. Several flowering host plants were clearly most attractive to the highest number and diversity of pollinator species, including mountain mint (Pycnanthemum), sunflower (Heliopsis), cone flowers, Queen Anne's lace, mullein, milkweed, yarrow, and bee balm.

A potentially healthy level of diversity, except among bumble bee species, may indicate that native plant gardens can be beneficial, even in golf course landscapes, where pesticides are used to maintain turfgrass. Clear host flower preferences among pollinating species suggest the importance of those plants during the time of sampling. These plants will likely be incorporated into the recommendations made by NYSIPM to other golf course and state parks for pollinator protection.

Protecting Pollinators: The New York Pollinator Conference

There were 99 participants in the conference. There were many Master Gardeners in the audience, but also representative of Cornell Cooperative Extension, the Nature Conservancy, Audubon International, the New York Botanic Garden, the Farm Bureau, the Department of Transportation, University of New Hampshire, the Albany Pine Bush Preserve, the Environmental Design Partnership, the St. Regis Mohawk Tribe, Hildene, Bayer, Bard College, NYS Parks Department, Nativebeeology, and the NYS Department of Agriculture and Markets Apiary Industry Advisor Committee.

Media coverage

Innovation Trail: Public media reports on the economy and technology in upstate New York
http://innovationtrail.org/post/protecting-pollinators-new-york
https://www.youtube.com/watch?v=-MIqDrUjQvE

The Times Union of Albany
http://www.timesunion.com/tuplus-local/article/Fight-the-bee-collapse-crisis-in-your-backyard-6533880.php

Evaluation

The audience filled out pre-and post-conference questionnaires in order for us to evaluate knowledge gained.

1. While many knew types of managed pollinators besides honeybees in the pretest, 30% more knew after the presentations.
2. Twenty percent more knew other important pollinators after the talks
3. Ten percent more knew about mating disruption as a technique for insect management
4. While similar percentages mentioned reducing pesticide use, planting native plants or wildflowers, planting diverse plants to create a long blooming period, or providing pollinator habitat as strategies to promote pollinators both before and after the presentations, only in the post survey did people include promoting mason bees, using strip of plants for habitat and food sources, and checking the pesticides used on purchased plants, suggesting that they were, indeed, listening to the speakers.
5. For a multiple choice question on adding wildflower strips that had answers which couldn't really convey the complexity of the situation, the post survey showed quite a change in answers, suggesting that people were thinking differently about the topic after the conference.

Additional questions:

List the 3 most helpful presentations and why they were helpful:

All the speakers received audience votes. In the words of one attendee, "no talks were irrelevant.' The recurring themes of why the talks were helpful were (in no specific order):

1) we liked hearing the research talks – real data, science based;
2) the information in the applied talks gave us practical ideas to use ourselves – 'opened our eyes to other solutions';
3) the overall clarity of the speakers and the information they presented – they were considered 'consumer friendly'; and
4) the relevance of all the material presented.

In general, the discussion sessions were much appreciated. They were found to be helpful because of the exchange of ideas and information, the involvement of the audience, and the possibility of hearing additional views and questions.

What was missing? The suggestions included a primer on identifying bees, information on citizen science, lists of specific pollinator friendly plants, a beekeeper as a speaker, information on how beekeepers and farmers can work together, having questions submitted in writing to be answered during discussions, information on how to engage the public in the discussion, and information on other pollinators.

When asked if future pollinator conferences should be organized, no-one said one was enough, 79% wanted annual conferences, 5% wanted them every 6 months and the rest suggested different frequencies.

9. Project location(s):

Assessment of pollinators at Bethpage State Park – Nassau/Suffolk Counties
Protecting Pollinators: The New York Pollinator Conference – Albany County

10. Samples of resources developed:

Protecting Pollinators: The New York Pollinator Conference

A website was created to help advertise the conference and as a permanent record of the information presented. All presentations and discussion sessions were videotaped and recorded. Authors who were willing provided their presentations on Powerpoint. A list of references was created from each talk. Videos, presentations and references will be linked to the author and title for each talk on the website.
http://nysipm.cornell.edu/pollinators/pollinator_conf2015/default.asp