Pollinator Conference: Information for Action October 3 & 4, 2008
Alphabetical list of Speaker Biography and Abstract

Lynn Adler

Lynn's research integrates plant-animal interactions across mutualisms and antagonisms, including floral, foliar, and belowground tissues, to arrive at a more complete understanding of how multiple species select on resistance and attractive traits. Her approach has combined novel techniques and experimental manipulations in the field with greenhouse and laboratory experiments to dissect aspects of this complex empirical question, and involves studies in both basic and applied systems. Lynn is an assistant professor at the University of Massachusetts, 2004-present, Amherst, MA, in the Department of Plant, Soil and Insect Science. Lynn did her doctoral studies at the University of California at Davis in Population Biology and undergraduate work at Brown University, B.S. in Biology with Honors, magna cum laude.

Urbanization shaping plant-pollinator interactions

Rebecca E. Irwin, Lynn Adler and Paige S. Warren

Human activities have drastically altered earth's ecosystems. Chief among these changes is the alteration of habitats and the conversion of forests, pastures, and rangeland into homes, schools, and commercial and industrial sites. The ecological consequences of land-use change associated with housing development (hereafter urbanization) could alter plant interactions with pollinators and floral antagonists, and thereby affect natural selection on native plant traits. We estimated nectar robbing and florivory in *Gelsemium sempervirens* from pairs of suburban and forested sites in Raleigh, NC across 2 years, estimated pollen deposition on stigmas, and used bowl traps to measure bee abundance as potential pollinators. Plants received almost twice as much florivory and nectar robbing in suburban vs. forested sites Plants also received nearly 25% more *Gelsemium* pollen per day in suburban vs. forested sites, but this effect was not statistically significant. However, plants in suburban sites received over 5 times more heterospecific pollen per day than in forested sites, potentially from the greater number of flowering garden species. We also found significantly higher bee abundances in suburban compared to forested sites. Thus, urbanization has the potential to change natural selection on plant traits by altering interactions with floral antagonists and pollinators.

John S. Ascher

Division of Invertebrate Zoology, American Museum of Natural History

Dr. Ascher manages the American Museum Bee Database project, which makes available taxonomic and distributional data on world bees including data recorded from AMNH specimens. His dissertation research at Cornell University (PhD, 2004) on the morphological and molecular systematics of the bee family Andrenidae reflects his interests in global bee phylogeny and biogeography. He leads Hymenoptera collecting trips in the USA, the Neotropics, and elsewhere, and is a taxonomic consultant for additional faunistic and ecological studies of bees. Recently he has placed online nomenclatural and distributional data for nearly all world bee species as lead contributor to the World Bee Checklist and the Apoidea Species guide on Discover Life. Ongoing research projects include descriptions of new bee taxa and collaborative phylogenetic studies of bees including the social corbiculates.

New England's 400 Bee Species in Crisis?

Pollinator declines have received a great deal of attention recently, but what exactly is the evidence for these putative declines? Are New England's nearly 400 native bee species really declining and, if so, which ones and what can we do about it? This talk will first summarize patterns of bee diversity in New England, based in part on the results of recent and as yet unpublished collecting, highlighting species of particular interest such as those with limited or changing distributions. The difficulties of sampling and conserving bees, especially those with highly specialized or poorly understood life histories, will be discussed. Evidence for general declines or lack thereof among New England's bees will be presented. Particular bee taxa that appear to have greatly declined or expanded in New England in recent decades will be reviewed. The cause of declines among bumble bees in subgenus Bombus and their social parasites Psithyrus will be presented as entirely unrelated to declines in honey bees or to declines among other native bees including bumble bees belonging to other subgenera. Neglected factors highly relevant to bee conservation such as fire suppression and deer overbrowsing will be discussed. Additional "unscientific" sampling and qualitative life history studies will be advocated. Throughout, the inherent value of New England bee species will be considered in addition to their generally recognized value as pollinators.

Anne Averill

Anne L. Averill is on the faculty at the University of MA-Amherst and is a member of the Entomology Division in the department of Plant, Soil, and Insect Sciences. She received her BS from Smith College and PhD in Entomology from the University of MA. She was a Post-Doctoral Associate at the NYSAES of Cornell University where she carried out research on isolation of host fruit volatiles attractive to *Rhagoletis* fruit flies. Currently, at the University of MA, her research program follows both basic and applied studies of insects of cranberry. Her program covers diverse areas in ecology and behavior, particularly regarding host plant utilization, competition, mating, and movement. She also studies native bee pollinators and their conservation. She participates in the USDA-CSREES project NC-508 (Sustainable solutions to problems affecting honey bee health) and is one of several Co-PDs on the recently awarded $4 million USDA-CSREES-CAP project on protection of managed bees. Regarding applied work and extension responsibilities, she interfaces with the cranberry industry; MA is one of the largest cranberry-producing areas in the world. Significant effort focuses on integration of sustainable management options, particularly cultural control tactics, reduced-risk spray programs, and development of sampling tools and IPM guidelines. She is the author of 60 refereed scientific publications. She also has an active grower-education program and has given over 100 extension presentations. She is involved in graduate student training and teaches the graduate-level course Insect Behavior (ENTMOL 511) and an undergraduate course Insect Ecology and Pest Management (PSIS 397K).

Native Pollinators in Cranberry

For native bee pollinators in the Cape Cod area of MA, a sequence of studies is ongoing or planned to: 1) determine their diversity and abundance, and 2) possibly understand the reasons of observed population changes. A first year of study comparing current and historic *Bombus* data (collections from blooming cranberry bogs) revealed that while some species remained similar in abundance(e.g *B. bimaculatus*), the relative abundance of *B. impatiens* nearly doubled, three species were absent that previously had been collected (*B. terricola B. affinis, and B. rufocinctus*), and there was a reduction in abundance of *B. vagans*. A second year of collection has been completed and is being processed, but it was noteworthy that two rare *B. terricola* individuals were found. Stressors implicated in native bee decline include pathogens (particularly

spillover from commercial bumble bees), novel pesticides (particularly the newly introduced neonicotinoids), and habitat loss. Work is underway to examine each of these possibilities: 1) in bumble bees and pollen, we are identifying microbes via molecular techniques, 2) we plan to elucidate lethal and sublethal effects of insecticides beginning next year, and 3) we have completed the first year of bee collections where degree of urbanization at a landscape-scale varies across 32 sites.

Dan Conlon

Dan Conlon of Warm Colors Apiary is a full-time beekeeper operating beeyards in western Massachusetts. He is a life member and director of the Eastern Apicultural Society (EAS), President of the Massachusetts Beekeeper's Association (MBA), and a director for the Massachusetts Northeastern Organic Farmers Association (NOFA).

Honeybees and Mason Bees in Agriculture

Honeybees continue to be the primary source of pollinators for fruits and vegetables in U.S. agriculture. The number of managed colonies has declined, and fewer beekeepers are providing pollination services. Making the farm environment safe for honeybees and native pollinators is a priority for beekeepers and growers. This presentation will identify some of the challenges facing beekeepers and suggest management to reduce risks to the honeybee, and increase populations of native mason bees and bumblebees on small farms.

Sam Droege

Sam Droege received an undergraduate degree at the University of Maryland and a Master's at the State University of New York – Syracuse. Most of his career has been spent at the USGS Patuxent Wildlife Research Center. He has coordinated the North American Breeding Bird Survey Program, developed the North American Amphibian Monitoring Program, the Bioblitz, and FrogwatchUSA programs and worked on the design and evaluation of monitoring programs. Currently he is developing an inventory and monitoring program for native bees, online identification guides for North American bees at www.discoverlife.org, and with Jessica Zelt reviving the North American Bird Phenology Program.

Native Bee Inventory and Monitoring
Techniques and Approaches

Your project goals as well as the behavior and life history of native bees affect how one should set up an inventory and monitoring program. Some groups are easy to detect and observe (e.g., bumblebees) while others are tiny and difficult to find (e.g., *Perdita*). They differ in habitat preferences (e.g., open sand, field, scrub, spring woodlands); time of year (many only out for a month window of time); trapability (e.g., trap color preferences, differing detectability); trap location (e.g., where in relationship to the ground); the use of scents (e.g., most bees are repelled by citrus scents). The use of survey technique has a major influence on the resulting statistics (i.e., netting, bowls traps, trap nests). Variances of counts are generally quite high. Number of sites occupied rather than the size of the population may be a better index to numbers. Observers effects can be quite important. Detecting rare bees can require specialized surveys or searches. We present preliminary recommendations for surveys on refuges and small land areas as well as large status surveys.

Howard S. Ginsberg

Howard Ginsberg is a Research Ecologist at the USGS Patuxent Wildlife Research Center, and Unit Leader of Patuxent's Coastal Field Station at the University of Rhode Island. He received his Ph.D. in entomology from Cornell University in 1979. Research interests include the ecology of vector-borne diseases, including tick-transmitted infections such as Lyme disease, and mosquito-borne pathogens such as West Nile Virus. His emphasis is on managing vector-borne diseases so as to protect public health, while minimizing negative effects on sensitive natural systems. He is also interested in bee foraging ecology and pollination, especially the interactions between native and introduced species. Dr. Ginsberg received the Director's Award for Natural Resource Research, 1999, from the National Park Service.

Effects of invasive plants on pollinator visitation and native plant reproduction in Acadia National Park.

Constance S. Stubbs[1], Howard S. Ginsberg[2], and Francis Drummond[1]
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The effects of invasive plant species on pollination of native plants were investigated by recording pollinator visitation and fruit set in three native plant species at sites with and without co-flowering invasive plants. The invasives sometimes attracted more pollinators than the natives, and they generally supplied more nectar and pollen. Visitation to natives was sometimes lower in the presence of invasives, and species composition of visitors to native plants sometimes differed in the presence of invasive plants. Nevertheless, fruit set and seed set of native plants was never significantly lowered in the presence of invasives. Therefore, native plant reproduction was not adversely affected in the short term by these invasive species.

Rebecca Irwin

Rebecca Irwin received a PhD from the University of Vermont in 2000. She then was a post-doc for two years at the University of California-Davis. From 2002-2004, Rebecca was an Assistant Professor at the University of Georgia in the Institute of Ecology. In 2004, Rebecca moved to Dartmouth College. Rebecca's research focuses on the ecology and evolution of plant-pollinator interactions.

Effects of an invasive plant on native plant-pollinator interactions and native plant fitness: patterns and mechanisms

Species invasions are a leading component of global environmental change. Despite the recognition that invaders affect competitive and antagonistic interactions among natives, relatively less is known about how invaders affect mutualisms, such as those between native plants and pollinators. This talk will describe results from experimental studies testing how an invasive flowering plant, Linaria vulgaris (Scrophulariaceae), affects the strength of native plant-pollinator interactions, native plant fitness, and pollinator performance, focusing on both patterns and mechanisms.

Robert P. Jean

Rob Jean is currently an Assistant Natural History Biologist for the Missouri Department of Conservation and a PhD candidate at Indiana State University in Terre Haute, Indiana. His interest in bees started over ten years ago while he was doing his master's research on the effects of forest fragmentation on pollinators visiting spring wildflowers. It was during this study he realized how difficult it was to get identifications on the bee specimens he was catching. With the help of Wally LaBerge he started identifying bees in the genus Andrena. Amazed at the diversity, his passion for bees began. Since then he has worked on inventorying the bees of the black oak savannas of northern Indiana and has been working on producing a list of the bees of Indiana. He has also worked extensively sampling bees in western Missouri over the last three years. He has identified bees for several federal and state agencies for their studies on pollinators and taught several courses on bee identification with Sam Droege during the last five years. His current research interests include increasing the natural history knowledge of bee species especially in the Midwest and examining differences among different bee sampling techniques. He also does field research for the St. Louis Zoo on the federally endangered American Burying Beetle.

Bee sampling methods and the differences between collecting with nets and bee bowls in northern Indiana

Robert P. Jean, Missouri Department of Conservation/Indiana State University

This talk will discuss several bee collection techniques, including some common protocols currently used with each technique. Pros and cons of each method will also be discussed. I will then compare data from two popular collection techniques, netting at flowers and bee bowls. These data were collected at four sandy black oak savanna sites in northern Indiana. Each site was sampled approximately biweekly throughout the entire bee flight season, April-September in 2003. Nets collected more species (160) than bee bowls (135). Combining the two methods 195 bee species were represented. Bee bowls collected many more individuals (5129) than netting at flowers (2037), which was mainly due to an increase in halictid bees in the genus Lasioglossum. Netting at flowers collected more individuals and species of the other four major bee families (combined). Both sampling techniques captured the 61 most common bee species, but each method differed in the uncommon to rare species captured. Smaller bees were more often collected by bee bowls and larger bees by nets at flowers. The two methods sampled the bee community in a complimentary fashion. This research suggests that a combination of the two methods gives the best picture of the species richness and abundance of bees at any given site or set of sites.

John Losey

John's research has two complementary foci the management of pest insect populations and the conservation of endangered or declining insect populations. His program in pest management focuses on the ecological impacts of transgenic crops for insect control. John's research in insect conservation biology focuses on the assessment of the current status of both native and exotic lady beetles and the determination of the impact of recent trends in the composition of lady beetle species (e.g. a higher proportion of exotic species and individuals) on the ability of this

group to suppress pest populations. John received his PhD from the University of Maryland in 1996 and is currently an Associate Professor in the Entomology Department at Cornell University.

Integrating pollinator and natural enemy conservation: Opportunities for cross-pollination

Pollinators and predators represent some of the most important providers of ecological services in agroecosystems. A great deal of research has focused on the conservation of pollinators and natural enemies in agricultural settings. Common natives species of both groups are in rapid decline and may be in danger of extinction. Unfortunately, there has been very little integration of these two efforts. From the perspective of an applied ecologist with a background in pest management and research on the role of natural enemies I will offer some perspective on the potential for facilitating more integrated research and management strategies.

Elizabeth Johnson, Edward Toth and Kevin Matteson

Elizabeth Johnson is the manager of the Metropolitan Biodiversity Program for the Center of Biodiversity and Conservation at the American Museum of Natural History. An important goal of the Metro program is to integrate the Museum's scientific resources directly into conservation-related research, education, planning, and management initiatives. She is particularly interested in raising awareness about biodiversity in urban and suburban areas, with focused attention on invertebrate conservation. She and Edward Toth established the Great Pollinator Project in 2007.

Edward Toth is Director of the Greenbelt Native Plant Center, a 13-acre greenhouse, nursery and seed bank complex owned and operated by the City of New York, Department of Parks & Recreation. The facility produces on average 400,000 native plants a year, representing over 250 species. The GNPC's approach to plant production recognizes the importance of local plant populations and seeks to conserve them through the use of only local ecotypic material. He has had an interest in plant/insect interactions since college days at Ohio State where he double majored in Botany and Entomology.

Kevin Matteson is a Postdoctoral Teaching Fellow in the Department of Biological Sciences at Fordham University. For his doctoral research he studied patterns of bee and butterfly biodiveristy in urban community gardens of the Bronx and East Harlem. In addition to teaching at Fordham, Kevin currently is coordinating the NYC Bee Watchers Program which is a citizen-science initiative created by the American Museum of Natural History and the NYC Department of Parks and Recreation.

The Great Pollinator Project - Engaging the public in urban bee conservation
Elizabeth Johnson, Edward Toth, and Kevin Matteson

Bees are our most important plant pollinators -- essential to the productivity of many crops in community gardens and to the long-term sustainability of plants in city parks and other natural areas. Yet these pollinators are often not considered in urban settings. In 2007, the Center for Biodiversity and Conservation and the Greenbelt Native Plant Center began the Great Pollinator Project in collaboration with the Great Sunflower Project in San Francisco, CA. The goals of the Great Pollinator Project are: 1) identify which areas of New York City have good pollinator service (as determined by how quickly bees show up to pollinate flowers at various locations

throughout the city); 2) increase understanding of bee distribution; 3) raise public awareness of native bees; and 4) improve park management practices to benefit native bees. A total of 148 New Yorkers attended 12 "Bee Watchers" workshops this summer and to date have submitted over 250 datasheets from 75 different locations across the five boroughs of the City. This presentation will provide an overview of the project with detailed discussion of "Bee Watchers", the citizen science component of the project.

Eric Mader

Eric Mader is the Xerces Society's National Pollinator Outreach Coordinator. In this role he works to raise awareness of native pollinator conservation techniques among growers and government agencies. His previous work includes commercial beekeeping and crop consulting for the native seed industry where he provided weekly insect and disease scouting on hundreds of native crops. He is a graduate of the University of Minnesota, Department of Horticulture's Masters program. Eric has recently co-authored a book with Dr. Marla Spivak, on how to manage non-Apis bee species for the USDA-SARE and the Natural Resource, Agriculture, and Engineering Service at Cornell University.

Talk 1: Pollinator Conservation Economics and the 2008 Farm Bill

In June 2008, Congress took a major step in supporting pollinator conservation in the United States by voting on H.R. 6124, the Food, Conservation, and Energy Act of 2008, commonly known as the Farm Bill. Although the Farm Bill covers a wide range of agricultural and nutrition programs, the passage of this bill means that over the next five years more than $100 million could be made available to support bee research. More importantly, the bill makes pollinators a central concern of Farm Bill conservation programs and makes pollinators and their habitat a priority for every USDA land manager and conservationist. This discussion provides an overview of the pollinator-specific language within the Farm Bill, how that translates to real projects being implemented across the country, and the economic impact on growers and consumers.

Talk 2: Xerces Society's Pollinator Conservation Program: Converting Science into Conservation Practice

The Xerces Society is an international non-profit organization that protects wildlife through the conservation of invertebrates and their habitat. Their Pollinator Conservation Program collaborates with scientists around the world to translate the latest research findings into conservation practices that can be implemented in agricultural, urban, and natural settings. This talk provides an overview the Xerces Society, their education and outreach efforts, their publications, and the services they provide to scientists, policymakers, government agencies, agricultural professionals, educators, and land managers.

Dolores A. Savignano

Dolores A. Savignano is currently the USFWS liaison to the North American Pollinator Protection Campaign (NAPPC), and coordinates the Service's Pollinator Conservation and

Education Program. In addition, she is the Restoration Coordinator for the Service's Natural Resource Damage Assessment and Restoration (NRDAR) Program, which conducts and oversees restoration of fish and wildlife at Superfund and Spill sites. Previous FWS positions include Northeast Regional NRDAR, Superfund and Oil Spill Coordinator and Supervisor of the Las Vegas, Nevada SubOffice. The Las Vegas SubOffice handled Endangered Species Act issues for a variety of desert species. She has a Ph.D. in Zoology from the University of Texas at Austin and a B.S. in Biology from Yale University. Her doctoral dissertation focused on the Karner blue butterfly (*Lycaeides melissa samuelis*) and attendant ants. She also conducted status surveys on the now endangered Karner blue butterfly. She also has held positions with non-profit organizations and environmental consulting firms.

The NAPPC Collaboration

The North American Pollinator Protection Campaign is a collaboration of non-profit, government, private and academic entities dedicated to promoting the health of pollinators across North America. Through Task Forces and agreements with individual organizations, the group provides products to help target groups and the public conserve pollinators. Products include a pollinator curriculum and Ecoregional planting guides. Individual NAPPC partners were instrumental in promoting the National Academy of Science review of the status of pollinators and release of U.S. postage stamps featuring pollinators. Learn more about how NAPPC works and how you can apply some of the same philosophy and methods in your local communities to help pollinators.

Cory S. Sheffield

Cory completed his BScH degree in Biology at Acadia University; his Honours research topic was pollination in lowbush blueberry by honey bees in Maritime Canada. Cory's MSc degree was also completed at Acadia University, where he was jointly supervised at Agriculture and Agri-Food Canada, in Kentville, NS; this research focused on the life history of an important crop pest, the tarnished plant bug, and aspects of its control for berry and tree fruit production. During this time, Cory also did contract work in pollination biology and leafcutter bee management for lowbush blueberry pollination. After completing his MSc degree he took a year off to work as an IPM consultant, and to write grant proposals. Then Cory enrolled in the PhD program in Environmental Biology at the University of Guelph. Cory's studies were on the diversity and management potential of bees for apple pollination. Cory is presently a post doctoral fellow at York University in Toronto, working in Laurence Packer's lab.

Talk 1: DNA Barcoding the Bees of the World
Cory S. Sheffield and Laurence Packer

Bees are diverse, with estimates of approximately 20,000 species globally. With the recognition that bees and the ecological services they provide are under threat, the need for basic and applied ecological studies is of these important pollinators is increasing. However, many of the required studies are heavily dependant on taxonomic knowledge of bees, but a large taxonomic impediment exists. DNA barcoding has recently been advocated to address this issue, and this presentation will review some of our findings on the barcoding project "Bees of North America", a project started to facilitate accurate species-level identification. The project will then introduce the recent campaign to barcode the bees of the World.

Talk 2: Cleptoparasites as Indicators of "Ecosystem Status" in Studies of Bee (Hymenoptera: Apoidea) Communities

Cory S. Sheffield, Laurence Packer, Peter G. Kevan, and Alana Taylor

Bees, as pollinators in most terrestrial ecosystems, contribute greatly to the maintenance of global productivity and biodiversity. Declines in pollinators, thus the pollination services they provide, are now being documented globally. Correspondingly, the need to conserve pollinators is receiving much attention. Although several methods of surveying bee populations have been developed and evaluated, very little research has been done on interpreting these results to provide diagnoses of community status. In this presentation, we show that bee populations in natural communities in northeastern North America are structured in a relatively consistent manner, and measuring deviations from these patterns might be a useful indicator of stress. Cleptoparasitic bees in particular are ideal taxa for monitoring bee communities as they are the first guild to respond to system stress.

Ellen Sousa

Ellen Sousa is a garden coach, writer and educator living on a central MA farm certified as a Backyard Habitat by the National Wildlife Federation. Ellen has a BA in English from Clark University, a Certificate in Native Plant Horticulture & Design from New England Wild Flower Society, and is certified as a Master Habitat Naturalist from Windstar Wildlife Institute. She writes regularly for Massachusetts Wildlife magazine on habitat landscaping. She also writes a Habitat Landscaping blog at http://blog.THBFarm.com.

Local Pollinator Habitat Enhancement

As New England's landscape becomes increasingly developed, backyards are becoming a "final frontier" in providing essential habitat for pollinators and other wildlife. Find out how you can help sustain and restore pollinator populations in your own back yard, regardless of its size or location. Learn to choose the best plants to help feed and shelter pollinators, and some best practices for providing habitat for the myriad of pollinators that play such an important role in the health of our environment.

Kimberly Stoner

Kimberly Stoner, of the Connecticut Agricultural Experiment Station, is relatively new to studying bees. Since receiving her Ph.D. from Cornell in 1987, she has worked at CAES as a vegetable entomologist, with a focus on alternatives to insecticides for managing vegetable insects. She became interested about four years ago in the research in Europe on imidacloprid and other systemic insecticides, and suggested to her colleague, Dr. Brian Eitzer of the CAES Analytical Chemistry Department that they look at pesticide residues, particularly imidacloprid and other neonicotinoids, in pollen.

Pesticides in Pollen Collected from Honey Bee Hives in Connecticut

Dr. Kimberly Stoner and Dr. Brian Eitzer, Connecticut Agricultural Experiment Station

Pesticides have been frequently suggested as a factor in the decline of honey bees and other pollinators. As a result of honey bee die-offs in Europe, considerable research has been done on neonicotinoid insecticides, including their movement from treated seeds of sunflower into pollen and nectar, and chronic and sub-lethal effects on honey bees and bumble bees. As a first step toward evaluating the risks of pesticide contamination in pollen to honey bees and other pollinators, we have been collecting pollen from pollen traps on honey bee hives for two years from 3 locations in Connecticut and testing the pollen for a wide range of pesticide residues. In 2007, we found 41 different active ingredients in pollen, mostly at low levels, but with occasional spikes. We will be continuing this work with experiments applying neonicotinoids to fruit and vegetable crops and measuring pesticide levels in pollen and nectar.

Nan Vance

Dr. Vance studied plant biology and restoration ecology for over 25 years, and as a scientist with the USDA Forest Service for 20 years including 7 years as research lead. She has a doctorate in plant physiology with a minor in biochemistry, a masters degree in environmental studies and one in forestry. Her career (not completely over) was spent engaged in studies that ranged from plant restoration and remediation to conservation of plant resources for botanical and medicinal products. Vance has presented and published papers covering a range of topics, but has focused on pollination ecology in the past decade because of the need for greater understanding of this critical part of a plant's life cycle in developing strategies for successful conservation.

Who Will Take my Place?

The native North American perennial, brown's peony (Paeonia brownie) and orchid species in the genus Cypripedium are used to compare different pollination systems. Floral biology is presented as it functionally relates to the insect pollinator and other visitors as well as to its own fitness. Comparing the orchids and the peony provides insights on how changes in habitat and climate may increase the vulnerability of species that appear to rely on a specific insect for achieving allogamy. Although some plant species have evolved to be pollinator specific, ultra-specificity may be the sign of a genetic dead-end unless the plant species can maintain its genetic structure through autonomous pollination. The strong relation of the pollinator to the flower as a selection mechanism in speciation certainly contributes to the diverse floral traits and presentations of angiosperms, most notably in Orchidaceae. In a semi-generalist, or even in what appears to be a specialist, pollinator system, different pollinators may function as surrogate cross-pollinating vectors when the primary pollinator is scarce or absent. This is another reason for protecting and creating habitats that attracts diverse flower-visiting insects as climate and human activities alter indigenous insect communities that are historically/functionally associated with specific plants.

David Wagner

Dave Wagner is a Professor of Ecology and Evolutionary Biology at the University of Connecticut. He has a BS from Colorado State University and Ph.D. from the University of California at Berkeley. His research interests and taxonomic expertise are with moths, and especially their immature stages, and invertebrate conservation. He has published three identification guides to caterpillars of eastern North America. His 2005 guide with Princeton

University Press, Caterpillars of Eastern North America: A Guide to Identification and Natural History is in its fifth printing. Together with Larry Gall and Jane O'Donnell, Wagner recently completed work on a butterfly atlas for the state of Connecticut-the summary report, rich in both life history information and images of early stages was published in June 2007. Dave and Dale Schweitzer and Marc Minno, submitted a book manuscript on Rare, Declining, and Poorly Known Butterflies and Moths (Lepidoptera) of Forests and Woodlands in the Eastern United States in August, and he is nearing completion on a caterpillar identification guide to over 750 species of eastern owlets (Noctuidae). Outside of the sphere of Lepidoptera, Wagner chairs Connecticut's Advisory Committee on Endangered Invertebrates and is serving on boards for The Connecticut Chapter of the Nature Conservancy, Connecticut State Museum of Natural History, and Organization of Tropical States, and is Co-Director of the University of Connecticut's Center for Conservation and Biodiversity.

The native fauna of a Connecticut powerline right-of-way

Bees were sampled and identified from 19 sites along a powerline right-of-way in southeastern Connecticut over a two-year period beginning in June 2005. The 3899 bees, taken in bee bowls (n=2167) and with effort-based net samples (n=1732), included 163 species representing 31 genera and all 6 Nearctic families-approximately 20% of the eastern North American bee fauna. One hundred and ten species were represented in bee bowls samples and 133 species in the net samples. Chao richness estimates suggest total faunas of 152, 180, and 204 bee species for the bee bowl, net, and net + bee bowl combined samples, respectively. Seven bee species accounted for 50% of all sampled individuals: Augochlorella aurata (=striata) (Halictidae), Lasioglossum rohweri (Halictidae), Ceratina calcarata or dupla females (Apidae), Ceratina strenua (Apidae), Halictus ligatus (Halictidae), Bombus impatiens (Apidae), and Apis mellifera (Apidae). Bombus affinis, B. ashtoni, B. pensylvanicus, and B. terricola--all believed to have been widespread in Connecticut just a decade ago--were not among the 343 Bombus individuals representing 8 species taken. One globally rare bee, Epeoloides pilosula, formerly thought to be possibly extinct in the United States was recovered from a bee bowl sample. Two rarely collected bees, Melitta melittoides and Colletes productus, were netted while visiting maleberry (Lyonia ligustrina) flowers. Our results underscore the importance of powerline right-of-ways to bees, including rare species, in addition to other early successional plants and wildlife in the largely reforested landscapes of the Northeast.