Invasive Plants 2014
WHERE ARE WE NOW?

Connecticut Invasive Plant Working Group

2014 Symposium
University of Connecticut, Storrs, CT
Tuesday, October 7, 2014

PROGRAM
Speakers, Posters, Exhibits, Co-Sponsors

INVASIVE PLANTS 2014: WHERE ARE WE NOW?

Connecticut Invasive Plant Working Group
October 7, 2014

8:00 **Check-in and Refreshments:** Posters and exhibits will be on display throughout the day.

9:00 **Greetings and Orientation:** Donna Ellis, UConn, CIPWG Co-Chair *and* Gregory Weidemann, Dean, UConn College of Agriculture, Health and Natural Resources

9:15 **Opening Remarks:** Clark Chapin, Connecticut State Senator, 30th District

9:30 **Connecticut Invasive Plants Council Update:** William A. Hyatt, Bureau Chief, Connecticut Department of Energy and Environmental Protection, Bureau of Natural Resources

9:40 **Leslie J. Mehrhoff Award:** Presented by Olga Mehrhoff

9:50 **Invited Talk:** ***Contractor Impossible -Tips for Contracting Invasive Plant Control***
Steven Manning, Invasive Plant Control, Inc.

10:10 **BREAK:** Posters and exhibits on display.

10:40 **Keynote Address:** ***Five-Year Target: A down-to-earth vision bridging policy, research and management*** Sarah Reichard, Orin and Althea Soest Professor of Urban Horticulture and Director, Botanic Gardens, University of Washington

11:40 **Poster Session:** Posters and exhibits on display.

12:00 **LUNCH**

1:00 **Concurrent Sessions 1 through 3**

Session 1 (Ballroom 330)	*Session 2 (Theater)*	*Session 3 (Room 304)*
A Progress Report – What's Working	PANEL - Identification, Management and Alternative Plants	Aquatics Update

2:15 **BREAK:** Refreshments; move to next session

2:30 **Concurrent Sessions 4 through 6**

Session 4 (Ballroom 330)	*Session 5 (Room 304)*	*Session 6 (Theater)*
Wildlife Habitats Large and Small	Introduction to Field Botany and Plant Identification	PANEL - Priorities and Partnering for Invasive Plant Management

3:45 **Closing Remarks:** David Gumbart, Assistant Director of Land Management, The Nature Conservancy

4:15 **Raffle**

4:30 **Adjournment**

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8:00 **Check-in and Refreshments**: Posters and exhibits will be on display throughout the day. Poster list starts on page 17.

9:00 **Greetings and Orientation:**

Donna Ellis, UConn, Senior Extension Educator and CIPWG Co-Chair

Gregory Weidemann, Dean, UConn College of Agriculture, Health and Natural Resources

Biography: Greg Weidemann serves as Dean and Director of the College of Agriculture, Health and Natural Resources at the University of Connecticut. As Dean and Director, he has responsibility for all aspects of the academic, research and outreach missions for the college.

As a faculty member at the University of Arkansas, his research focused on the taxonomy and biology of plant-pathogenic fungi and biological control. As a teacher, he received several teaching awards, including the National Association of Colleges and Teachers of Agriculture 1990 Award of Merit, the John W. White Teaching Award and the Gamma Sigma Delta Teaching Award of Merit. In 1993, he was elected to the University of Arkansas Teaching Academy.

Dr. Weidemann has served in a number of leadership roles within the land grant university system including serving as chair of the Southern Association of Agricultural Experiment Station Directors and as chair of the Administrative Heads Section for the Northeast region.

Greg is a native of Wisconsin and holds a bachelor's degree in Zoology and a Ph.D. in Plant Pathology from the University of Wisconsin.

9:15 **Opening Remarks:**

State Senator Clark Chapin, Ranking Member, Connecticut General Assembly Environment Committee

Biography: After representing New Milford residents as a member of the House for 12 years, State Senator Clark Chapin was elected to his first term in the State Senate in November 2012 and now represents residents in the 30th Senate District which covers 14 towns in northwestern Connecticut. Among his many responsibilities as a Deputy Minority Leader, Senator Chapin serves as Ranking Member of the General Assembly's Environment Committee. He has received statewide recognition for his work on a number of issues - a few highlights include the protection of Connecticut's water supplies and water quality, farmland preservation, and clean energy.

Representing a district which undoubtedly has more freshwater acreage than any other legislative district, Senator Chapin worked to raise awareness in Connecticut about aquatic invasive species this year. He organized and hosted a special forum at the state Capitol to discuss problems and solutions related to ecosystem damage caused by invasive species. His efforts helped develop new laws that aim to educate people in Connecticut about preventing the spread of these species. New legislation will also allow the state to provide grants to help fund efforts to stop invasive species.

Senator Chapin holds a Bachelor of Science degree in Animal Science and Technology from the University of Rhode Island and also a Master of Science degree in Community Development from Iowa State University. He has been a self-employed carpenter in New Milford since 1988.

As a senator for the 30th District, Senator Chapin represents the communities of Brookfield, Canaan, Cornwall, Goshen, Kent, Litchfield, Morris, New Milford, North Canaan, Salisbury, Sharon, Torrington, Warren and Winchester.

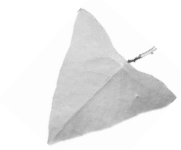
9:30 Connecticut Invasive Plants Council Update:

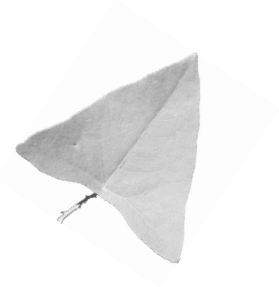
William A. Hyatt, Bureau Chief, Connecticut Department of Energy and Environmental Protection Bureau of Natural Resources

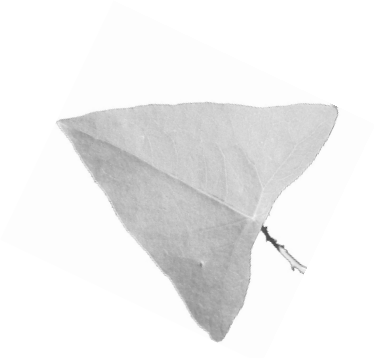
Abstract: The Connecticut Invasive Plants Council was established and operates pursuant to Connecticut General Statutes §22a-381 through §22a-381d. The Council is authorized to develop and conduct initiatives to educate the public about the problems created by invasive plants in lakes, forests and other natural habitats; recommend ways of controlling their spread; make information about invasive plants available to the public; annually update and publish the invasive plant list; and support research on developing and improving methods for controlling invasive species and for developing new non-invasive plant varieties. The Council consists of nine members representing government, the nursery industry, academia, and environmental groups. The Council provides the well-structured, legislatively authorized forum needed to develop cohesive invasive plant management strategies. This assemblage of representation from the State's key plant-related agencies, educational institutions, businesses and non-profit organizations has been able to develop the consensus strategies and collaboration needed to balance the interests of protecting Connecticut's environment and maintaining healthy nursery and related industries. The actions of the Council also enhance regional coordination in addressing invasive species, which know no boundaries and continue to spread across political lines.

Biography: Bill is Chief of the Bureau of Natural Resources at the Department of Energy and Environmental Protection (DEEP), which includes the Inland Fisheries, Marine Fisheries, Wildlife and Forestry Divisions. He was chair of the CT Invasive Plants Council from 2011 - 2014, is current chair of the Association of Fish & Wildlife Agencies Invasive Species Committee, and a member of the Federal Invasive Species Advisory Council. His prior positions with DEEP include Director of Inland Fisheries, Supervisor of Fisheries Management and Senior Fisheries Biologist. Bill also served as a Research Associate at the Institute of Ecosystem Studies in Millbrook, NY, where he did graduate research leading to an MS from the University of Connecticut. Bill has served as President of the Southern New England Chapter and the Northeast Division of the American Fisheries Society, and is the current chair of the CT River Atlantic Salmon Commission.

9:40 Leslie J. Mehrhoff Award: Presented by Olga Mehrhoff







9:50 Invited Talk: *Contractor Impossible - Tips for Contracting Invasive Plant Control*

Steven Manning, President, Invasive Plant Control, Inc., and **Lee Patrick**, Vice President, Invasive Plant Control, Inc.

Abstract: Adequately managing invasive plant populations requires a synergy among all types of available labor. Volunteers, in house labor and contractors are just a few of the key players that need to be considered when developing a long term management scheme. This presentation will focus on the advantages and disadvantages of utilizing contractors to manage invasives in your natural areas. Mr. Manning will elaborate on several key components to consider when hiring a contractor, including; understanding your contractual options, knowing the company you hire, stressing selectivity, defining the project, being tough, project tracking requirements and performance guarantees.

Biographies:

Mr. Steven Manning has spent the past 20 years working on invasive species issues. He is founder and President of Invasive Plant Control, Inc. (*IPC). IPC* was created to extend internationally its dedication to the control of invasive species utilizing a revised Integrated Pest Management approach and has successfully controlled more than 100 species of invasive plants for a wide variety of land managers including federal, state, municipal and private landowners throughout the United States. In 2006 IPC extended its efforts globally and now offers multiple training courses and workshops with topics ranging from "Invasive Species in Ports of Entry" to "On the Ground Control Techniques." IPC invests heavily in educational and awareness activities annually. Mr. Manning's knowledge of environmentally and economically sound control techniques offers a unique perspective not readily found in this field. Mr. Manning is also heavily involved with local, state and international industry development projects including the development of a Volunteer Based Early Detection Network for National Wildlife Refuges in the US. His 2010 publication, Miller, J.H.: Manning, S.; Enloe, S.F. 2010 "*A Field Guide for the Management of Invasive Plants in Southern Forests"* was recently published by the U.S. Department of Agriculture Forest Service, Southern Research Station. (http://www.srs.fs.usda.gov/pubs/36915 and http://wiki.bugwood.org/Invplantmgmt). He is the acting President of the Pacific Northwest Invasive Plant Council and current Vice President of the Mid Atlantic Invasive Plant Council.

Lee Patrick graduated from East Tennessee State University with a Bachelor of Science degree with an emphasis in resource management in 1990 and is working on a master's degree part-time at Vanderbilt University. Since 1990, his career has led him to numerous opportunities of studying our natural resources, from fisheries management and environmental education to vegetation management.

As a co-founder of Invasive Plant Control, Inc. in 1997, Lee is responsible for the identification and management of invasive exotic/noxious weeds in natural areas and the restoration of these sites with native plant material. Lee is in charge of operations and project management for IPC.

Lee has served on the board of directors for both the Tennessee Exotic Pest Plant Council (TN-EPPC) and the Southeast Exotic Pest Plant Council (SE-EPPC) and as the treasurer for both organizations.

10:10 BREAK: Posters and exhibits on display.

10:40 Keynote Address: ***Five-Year Target: A Down-to-Earth Vision Bridging Policy, Research and Management***

Sarah Reichard, Ph.D., Orin and Althea Soest Professor of Urban Horticulture at the University of Washington and Director of University of Washington Botanic Gardens

Abstract: Academic research scientists, policymakers, and land managers all have roles in invasive plant management. Research scientists may do theoretical work, such as modeling, that may lead to insights in plant movement or management. Many others work on herbicide or biological control methods or other types of applied research. While scientists would like to believe that their research leads to policy innovations, policy change more often comes from changes in the values of the public, with science fulfilling the technical needs to implement the policy. Land managers may be the bridge between the policies – often regulations – and the incomplete research needed implement the policies. Researchers may also engage in intellectual debates through literature and at meetings that may ultimately influence the public and policy makers. For instance, the concept of "novel ecosystems" has received widespread interest among biologists. These anthropogenic ecosystems do not have wild analogs and are the results of the transformation of the planet to such an extent that this epoch is now widely referred to as the Anthropocene. This can be interpreted by policy makers as a relaxation of regulations to accept that invasive plants are now a part of our landscape. While that is inevitably true for some systems, others have special attributes – rare species or ecosystems – that are deserving of more rigorous protection. Will this nuance be understood or will values change, resulting in less effective regulations? More recent is the newly introduced concept of "conservation science" as opposed to "conservation biology." The latter was introduced by Michael Soule in 1985 to bring biological science to bear on the problems of species, communities, and ecosystems affected by humans. In 2012 Kareiva and Marvier proposed "conservation science" as a conservation approach in which "strategies must be promoted that simultaneously maximize the preservation of biodiversity and the improvement of human well-being." In other words, it is far more centered on the humans and their interests. It is critical that all of those interested in landscape science, policy, and management share ideas and realities with each. Each should step outside their comfort zone because the stakes are very large. Over the next five years public opinion, policies, and research may shift to affect management priorities – a Gallup poll conducted in both 1984 and 2011 showed a steep decline in the number of people prioritizing the environment over the economy. Communication and understanding among all three groups must be actively encouraged.

Biography: Dr. Sarah Reichard is a conservation biologist who applies ecological principles to the practice of horticulture. Her research is primarily focused on understanding the biology of invasive plants and using that understanding to develop risk assessment methods to prevent their introduction and spread. Dr. Reichard is the author of *The Conscientious Gardener: Cultivating a Garden Ethic* (University of California Press, 2011) and is also the co-author of *Invasive Species in the Pacific Northwest* (University of Washington Press, 2006) and *Predicting Invasions of Nonindigenous Plants and Plant Pests* (National Academy of Science Press, 2002). She is the author or co-author of 50 peer-reviewed scientific papers and numerous popular articles. She is currently the Orin and Althea Soest Professor of Urban Horticulture at the University of Washington and is Director of its Botanic Gardens (Washington Park Arboretum and Center for Urban Horticulture).

11:40 Poster Session: Posters and exhibits on display.

12:00 LUNCH

1:00 Concurrent Sessions 1 through 3

Session 1 (Ballroom 330) *A Progress Report - What's Working*

Moderator: Lindsay Michel, Land Conservation Director, Connecticut Forest and Park Association

A. ***Tried and True Techniques for Long-term Invasive Plant Management***

Chris Polatin, Habitat Restoration Specialist, Polatin Ecological Services, LLC

Abstract: Chris will share his experiences working professionally over the last 10 years to successfully control New England invasive plants using a variety of methods with an emphasis on judicious and selective herbicide use. Control work usually consists of one initial treatment followed by two follow-up treatments in order to obtain 99% control within three years for many invasive plant species. A stewardship/maintenance phase of work follows the invasive plant management and assures land owners and managers that the effort/investment is protected. Early Detection and Rapid Response protocols figure prominently into the long term land stewardship. Restoration is realized once the native species displaced by the invasive plants are restored to the site and the secondary ecological effects of herbicides or other invasive eradication methods are reduced to a minimum. This can take up to six or more years to be realized. Case studies highlighting a variety of invasive plants at various scales will be presented in order to demonstrate successful project planning and implementation. Chris will discuss educating, training and working alongside land owners, managers and volunteers to steward and care for the property into the future.

Biography: Chris Polatin works on invasive plant management projects through his company Polatin Ecological Services, LLC which dedicates itself to ecological restoration planning, invasive species management and native plant establishment. He and his crew regularly perform all aspects of invasive plant management including planning, mapping, prioritization, permitting, monitoring and implementing various control activities. Chris has a Bachelor's degree in environmental studies/biology from University of California Santa Cruz and a Master's degree in conservation biology from Antioch University New England. He serves as Massachusetts Director for the New England Chapter of the Society for Ecological Restoration.

B. ***New Native Shrubs to Replace Tough Invasives***

Jessica Lubell, Assistant Professor, UConn Dept. of Plant Science and Landscape Architecture

Abstract: Japanese barberry (*Berberis thunbergii*) and winged euonymus (*Euonymus alatus*) have been important landscape shrubs because they are adaptable to different planting locations, including sites that present challenging conditions such as infertile soils, exposure to high winds, heat and reflected sunlight, and people pressure. Native plants are a desirable replacement for Japanese barberry and winged euonymus because they are not invasive, and can actually enhance the local ecology by providing habitat for wildlife and support for pollinators. When looking to replace Japanese barberry and winged euonymus with native species, the ideal plants would be able to perform in challenging landscapes and be easy to grow. Furthermore, low growing plants are needed for smaller residential landscapes and commercial landscapes where compact plant material is important. Research at the University of Connecticut has identified underutilized native shrubs that are adaptable and able to directly replace invasives in landscapes.

Biography: Jessica Lubell is an Assistant Professor of Ornamental Horticulture at the University of Connecticut. She has 14 years of experience working with the Connecticut green industry. She has specific experience with propagation and container production of shrubs. Jessica has authored or co-authored 16 peer-reviewed publications since 2005; eight of these were focused on invasive Japanese barberry and four were focused on native shrubs. Jessica has authored or co-authored seven trade publications on native shrubs since 2011.

Session 1 (Ballroom 330) *A Progress Report - What's Working*

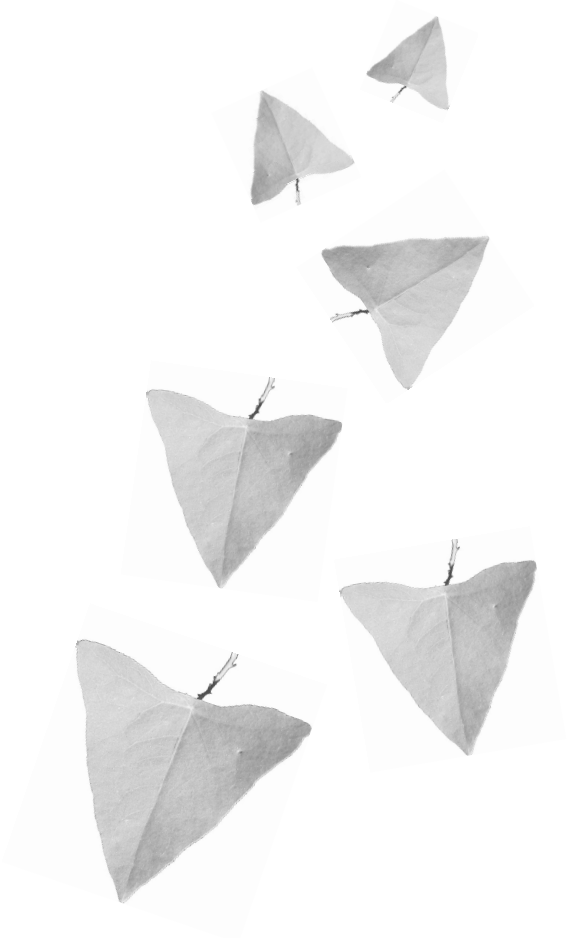
- continued

C. ***Getting Community Involvement: Volunteers and Partnerships***

Jeff Hill, Vice President, Glastonbury Partners in Planting

Abstract: Jeff Hill's talk will reflect on the organization's efforts in responding to the problem of invasive plants, particularly oriental bittersweet. He will discuss their efforts to increase community awareness of the invasive plant problem through educational outreach, newspaper articles, advertisements, and the electronic media. He will review their experience in recruiting and retaining volunteers for a site restoration demonstration and the status of the effort. The importance of partnering with municipal government, community service organizations, and groups involved in natural resource preservation will be emphasized.

Biography: Jeff Hill is a retired research engineer, UTC. He serves as Vice President for Glastonbury Partners in Planting.



Session 2 (Theater) PANEL - *ID, Management and Alternative Plants*

Moderator: Andy Brand, Nursery Manager, Broken Arrow Nursery

Donna Ellis (University of Connecticut), *Todd Mervosh* (Weed Scientist), *Michael Nadeau* (Wholistic Land Care Consulting, LLC), *Kathleen Nelson* (Mad Gardeners), *David Roach* (All Habitat Services, LLC), *Lisa Turoczi* (Earth Tones Native Plant Nursery and Landscaping), *Jeffrey Ward* (Connecticut Agricultural Experiment Station), *Adam Wheeler* (Broken Arrow Nursery)

SESSION ABSTRACT: Ten invasive plants were chosen to be addressed by a panel of experts. The species represent examples of trees, shrubs, vines, herbaceous species and grasses, some of which are more straightforward to identify and control and others that present difficulties. The species included were Tree-of-heaven (*Ailanthus altissima*), Autumn olive (*Elaeagnus umbellata*), Japanese Barberry (*Berberis thunbergii*), non-native shrubby Honeysuckles (*Lonicera* spp.), Oriental (Asiatic) Bittersweet (*Celastrus orbiculatus*), Swallow-worts (*Cynanchum* spp.), Japanese Knotweed (*Polygonum cuspidatum*), Mugwort (*Artemisia vulgaris*), Japanese Stilt Grass (*Microstegium vimineum*) and Garlic Mustard (*Alliaria petiolata*).

For each invasive plant the panel will address (1) identification (Donna Ellis, Kathleen Nelson), (2) management (Todd Mervosh, Michael Nadeau, David Roach, Jeffrey Ward) and (3) non-invasive alternative plants (Lisa Turoczi and Adam Wheeler). A PowerPoint presentation will be used to show the close-up details of plant identification and other information about management and non-invasive alternative plants. In addition, the panel species will be included among the live specimens on display outside of Ballroom 331, the room in which the posters, display tables, and refreshments are located. Management options will include chemical and non-chemical approaches as well as information on how to manage situations in which tracts are infested with multiple invasive species. Options which are appropriate for homeowner use as well as options best left to contractors will be included. For each invasive plant discussed, a selection of non-invasive alternative plants will be presented.

BIOGRAPHIES

Donna Ellis, Senior Extension Educator, UConn Department of Plant Science and Landscape Architecture and Co-Chair, Connecticut Invasive Plant Working Group (CIPWG). (Invasive identification)

Donna Ellis is a Senior Extension Educator in the UConn Department of Plant Science and Landscape Architecture, where she has worked for 24 years. She has a B.S. in Plant Science from the University of Rhode Island and an M.S. in Plant Science from UConn. Donna is the UConn Integrated Pest Management (IPM) Program Coordinator and conducts IPM training programs for nurseries and garden centers. She teaches at UConn and is involved with educational outreach and applied research for insects, pathogens, and weeds, with an emphasis on invasive plants. Donna coordinates biological control programs for purple loosestrife and mile-a-minute weed. She serves as Co-chairperson of the Connecticut Invasive Plant Working Group (CIPWG). She is also a member of the UConn Ornamental Plant Extension Team that presents two annual plant conferences, the Perennial Plant Conference for landscape and horticultural professionals and the Garden Conference for garden enthusiasts.

Todd L. Mervosh, Ph.D, Weed Scientist, Suffield, CT (Invasive management)

Todd Mervosh worked as the weed scientist for The Connecticut Agricultural Experiment Station (CAES) at the Valley Laboratory in Windsor, CT for 20 years through September 2014. A native of Illinois, he earned a B.S. degree at the University of Illinois, a M.S. in agronomy at the University of Wisconsin, and a Ph.D. in agronomy / weed science at the University of Illinois. At CAES, Dr. Mervosh conducted research in a variety of crops, especially nursery plants (ornamentals) and Christmas trees. He has also conducted experiments on management of non-native invasive plants including Oriental bittersweet, Japanese knotweed, pale swallow-wort, Japanese stiltgrass and mile-a-minute weed. Much of his emphasis has been on providing information to growers and property managers about weeds and the proper use of herbicides in vegetation management programs.

Session 2 (Theater) PANEL - *ID, Management and Alternative Plants*

Biographies, continued

Michael Nadeau, Wholistic Land Care Consulting, LLC, Sole Proprietor, Sharon, CT (Organic management)

Michael has worked for forty-seven years in the landscape and tree industry, beginning at age 12. He is a CT-licensed Arborist & Custom Grounds Supervisor, a founding member of CT-MA NOFA's (Northeast Organic Farming Association) Organic Land Care Program; co-author of the first Organic Land Care Standards in the country; co-creator and instructor of the NOFA Organic Land Care Course taught to professionals around the region; recipient of the New England Wildflower Association's CT Award for Conserving Native Plants and their Habitats and for educating the public about designing with natives and alternatives to synthetic herbicides and fertilizers; and former owner of Plantscapes Organics, Inc., a Fairfield-based organic land care company that specializes in non-toxic and least disturbance invasive plant management, habitat restoration, and organic landscape maintenance. He is now a self-employed land care consultant.

Kathleen Nelson, Mad Gardeners' Mile-a-Minute Control Project (Invasive identification)

Kathleen Nelson has managed a Mile-a-Minute control project in New Milford, Bridgewater, and Roxbury CT since 2007. Prior to that she had a one-person nursery specializing in perennial plants and before that she taught college biology. She has an MA in Zoology from the University of Minnesota and extensive further graduate work at Columbia University. Her goal as a child was to go to school forever. Her retirement project is battling invasive plants. Her interest in invasive plants stems from what she has seen on the many properties she has visited as a long time member of the New Milford Inland Wetlands Commission.

David Roach, General Manager, All Habitat Services, LLC , Madison, CT ("Big Picture" management)

David Roach is the General Manager of All Habitat Services, LLC, a diverse ecological management services provider. He holds commercial supervisory pesticide applicator licenses in numerous categories in several states. David works collaboratively with manufacturers and government scientists to develop highly effective, wise use management prescriptions and techniques. He has 19 years experience in the management of aquatic, emergent and terrestrial vegetation. This background and specialization provides a unique ability to develop practical integrated management solutions using cultural, mechanical and chemical control techniques. All Habitat Services' clients include federal, state and municipal agencies as well as non-profit conservation organizations and private landowners.

Lisa Turoczi, Owner, Earth Tones Native Plant Nursery and Landscapes, Woodbury, CT (Alternatives)

Lisa Turoczi has an Associate degree in Landscape Design from SUNY Cobleskill (1990) and a Bachelors degree in Landscape Architecture from SUNY Environmental Science and Forestry (1993). In 1999 Lisa and her husband Kyle, a wetlands Ecologist and Soil Scientist, bought the property in Woodbury, CT which is now the home of Earth Tones Native Plant Nursery and Landscapes. Lisa's designs call for plants native to the CT and New England eco-region. Earth Tones was started because of the need and realization of the intrinsic relationship between flora and fauna. Earth Tones offers native trees, shrubs, perennials, ferns and grasses native to our local region, now offering over 400 species propagated from native seed sources. In addition, Earth Tones provides landscape design, consulting, installation and wetlands mitigation services with a focus on environmentally sound practices. Earth Tones was awarded "Best Native Plant Nursery in New England" by *Yankee Magazine* in 2014.

Session 2 (Theater) PANEL - *ID, Management and Alternative Plants*

Biographies, continued

Jeffrey S. Ward, Chief Scientist-Forestry and Horticulture, The Connecticut Agricultural Experiment Station, New Haven, CT (Invasive management)

Jeff received his B.S. and M.S. from The Ohio State University, and after service in the Peace Corps, his Ph.D. from Purdue University. His research focuses on vegetation population dynamics, invasive species control, and forest management. He is an advisor to Audubon Connecticut and serves on the Connecticut State Vegetation Management Task Force and the Connecticut Endangered Species Committee. He is a past president of the Connecticut Tree Protective Association and Forest Science Coordinator for the New England Society of American Foresters.

Adam Wheeler, Propagation and Plant Development Manager, Broken Arrow Nursery, Hamden, CT (Alternatives)

Adam started work at Broken Arrow in 2004 after completing his BS degree in Urban Forestry and Landscape Horticulture at the University of Vermont. At the nursery, Adam manages plant propagation, container production, mail order and the acquisition and development of new plants. He is a recent recipient of the Young Nursery Professional Award from the New England Nursery Association. He loves to share his passion for plants through photography and educational outreach. As a result he lectures widely on a variety of subjects and is also an adjunct lecturer at Naugatuck Valley Community College and the Berkshire Botanical Garden.

Session 3 (Room 304) *Aquatics Update*

Moderator: Rose Hiskes, Diagnostician and Horticulturalist, The Connecticut Agricultural Experiment Station, Valley Laboratory, Windsor, CT

A. *Phragmites Control in Connecticut*

Paul Capotosto, Program Specialist, Connecticut Department of Energy and Environmental Protection

Abstract: The CT Department of Energy and Environmental Protection, Bureau of Natural Resources, Wildlife Division, Wetlands Habitat and Mosquito Management (WHAMM) Program has been trying to control Phragmites throughout Connecticut since 1995. Some of the things we have learned are: Installing larger culverts will restore a Phragmites dominated tidal marsh if the salinity is above 18 parts per million of salinity to a brackish tidal marsh. Mowing Phragmites, just mowing, is not an option on a large site. Changing herbicides and surfactants will eliminate Phragmites, each site is different. Standing water or low water will make a difference in how well your herbicide works. These are just a few options listed here. We will be discussing several more in detail.

Biography: Paul Capotosto is a Program Specialist with the State of CT Department of Energy and Environmental Protection. He is a Wetlands Restoration Biologist and the Mosquito Management Supervisor for the Wetlands Habitat and Mosquito Management (WHAMM) Program in the Wildlife Division, in the Bureau of Natural Resources. Paul received a Bachelor of Science in Wildlife Biology from the University of Rhode Island in 1975. Since 1976, Paul started working for the Town of Barrington, Rhode Island as an Assistant Superintendent of Natural Resources. In 1985, Paul moved to Connecticut and became the Chief of the Mosquito and Vector Control Section in the State of Connecticut Department of Public Health. Duties included an Integrated Pest Management (IPM) program along the Connecticut shoreline in controlling salt marsh mosquitoes using larviciding, adulticiding and Open Marsh Water Management techniques. In 1993, Paul moved to the Connecticut Department of Environmental Protection and the WHAMM Program was started. The WHAMM Program uses an IPM approach to control mosquitoes using larviciding; adulticiding and a new term called Integrated Marsh Management (IMM). IMM uses several techniques to restore wetland habitats including invasive plant control.

B. *Herbicide Resistance in Hydrilla and Other Aquatic Plants*

Lori Benoit, Fish and Wildlife Biologist, US Fish and Wildlife Service, Southern New England-New York Bight Coastal Program

Abstract: Reliance on herbicides with a single mode of action to control weedy aquatic plants has led to the evolution of herbicide resistance in a few target species. Of particular economic and ecological importance is the non-native, invasive aquatic plant *Hydrilla verticillata* ("hydrilla"). To date, only US dioecious hydrilla in the South has developed resistance to the herbicide Sonar© (fluridone). Recent research on the genetics of resistance in hydrilla will be reviewed. Also, implications for resistance developing in US monoecious hydrilla, which is found mainly on the East Coast, including five water bodies in Connecticut, will be discussed.

Biography: Lori Benoit holds a B.S. from the University of Connecticut in Biology, an M.S. from Connecticut College in Zoology, and a Ph.D. from the University of Connecticut in Ecology and Evolutionary Biology. Her research has focused on the ecological impacts of Phragmites and on herbicide resistance and systematics of the invasive aquatic plant *Hydrilla verticillata*. She works on coastal habitat restoration projects, currently for the US Fish and Wildlife Service, and previously for the Connecticut Department of Energy and Environmental Protection Office of Long Island Sound Programs.

Session 3 (Room 304) *Aquatics Update* - *continued*

C. ***Invasive Aquatic Plants - The State of the State***

Greg Bugbee, Associate Scientist, Connecticut Agricultural Experiment Station, New Haven, CT

Abstract: Connecticut's lakes and ponds are being invaded by plants from other parts of the world. These invasive species negatively impact native aquatic ecosystems, interfere with recreation and lower property values. Since 2004, the Connecticut Agricultural Experiment Station Invasive Aquatic Plant Program (CAES IAPP) has taken a multifaceted approach to document and search for solutions to the State's invasive aquatic plant problem. We have surveyed over 200 water bodies and documented over 100 native and 14 invasive plant species. Approximately two-thirds of the State's lakes and ponds contained one or more invasive species. Eurasian watermilfoil (*Myriophyllum spicatum*), variable watermilfoil (*Myriophyllum heterophyllum*), fanwort (*Cabomba caroliniana*), curly leaf pondweed (*Potamogeton crispus*) and minor naiad (*Najas minor*) are the most common. Less frequently found are newer arrivals - hydrilla (*Hydrilla verticillata*), Brazilian waterweed (*Egeria densa*), and yellow floating heart (*Nymphoides peltata*). CAES IAPP has documented relationships between water chemistry and invasive plants. Some invasives prefer water with high alkalinity and high nutrients while others prefer the reverse. No water bodies are therefore safe. Most aquatic invasive plants were sold to aquaria enthusiasts for use in fish tanks. Unwanted tank contents are often dumped into lakes and ponds causing many invasive plant populations to get their start. Aquarium suppliers are now banned from selling invasive species but more education is needed to assure compliance. CAES IAPP performed three statewide surveys of aquaria suppliers and approximately a third were selling banned live plants. After CAES IAPP distributed educational material, most were no longer selling the plants. Other educational initiatives are in progress by government and private stakeholders with the hope of similar success. Once invasive aquatic plants are established, control is difficult. Herbicides, biological agents, water level drawdowns and other methods are being utilized to manage invasive aquatic plants statewide. CAES IAPP research and case studies with these practices will be discussed.

Biography: Greg Bugbee is an Associate Scientist at the Connecticut Agricultural Experiment Station, New Haven, in the Department of Environmental Sciences. He is the principal investigator in the Invasive Aquatic Plant Program. He has led aquatic plant surveys of over 200 Connecticut lakes and ponds and directed research projects on invasive aquatic plant control statewide. He also oversees the Station's soil testing laboratory, is an expert on soil fertility and fields public inquires relating to plant nutrition.

D. ***Efforts to Prevent the Spread of Aquatic Invasives by Boaters on Inland Waters***

Eleanor Mariani, Director, Department of Energy and Environmental Protection Boating Division

Abstract: The Department of Energy and Environmental Protection believes that education, backed by effective law, is the best way to prevent the spread of aquatic invasive species. The DEEP Boating Division has utilized seasonal staff at state boat launches to educate boaters about aquatic invasive species, including the laws, and to show boaters how to inspect their vessels for invasives. Efforts to educate boaters, pertinent laws and results of agency efforts will be discussed.

Biography: Eleanor Mariani has served as Director of the DEEP Boating Division for 16 years. She is responsible for Connecticut's mandatory boating safety education program, issuing a variety of permits to promote navigation safety, and manages programs to keep boat sewage out of Connecticut's waters and to designate "Clean Marinas". She manages a program that provides boating infrastructure opportunities and amenities for transient boats 26 feet and up and is responsible for Connecticut's 118 state boat launches. Eleanor also directs environmentally focused boating education programs to boaters and law enforcement officers. She serves as Connecticut's Boating Law Administrator and is poised to become President of the National Association of State Boating Law Administrators in October, 2014.

2:15 **BREAK:** Refreshments; move to next session

2:30 **Concurrent Sessions 4 through 6**

Session 4 (Ballroom 330) *Wildlife Habitats Large and Small*

Moderator: Peter Picone, Wildlife Biologist, Connecticut Department of Energy and Environmental Protection

A. ***Bringing Nature's Beauty into Our Yards: Plants, Insects and More***

Andy Brand, Nursery Manager, Broken Arrow Nursery, Hamden, CT

Abstract: Too many landscapes today consist mainly of lawn and very few trees and shrubs which supports very little wildlife. Andy will discuss how we can increase biodiversity in our yards concentrating on the importance of native plants. An array of insects will be presented with an emphasis on butterflies, caterpillars and their specific host plants. Plants, both ornamental and yes some valuable weeds, will be discussed. To show the vast diversity of critters that can be enticed into one's yard with very little effort, Andy will share pictures of some of the 1000's of species found in his Hamden yard.

Biography: Andy Brand is an avid naturalist. He is a cofounder and past President of the Connecticut Butterfly Association as well as a long standing member of the New Haven Bird Club. He has put his interest in native plants to use as a volunteer for the New England Plant Conservation Program where he helps monitor historical sites for endangered native plants. For the past 24 years Andy has been employed at Broken Arrow Nursery in Hamden where he is currently the nursery manager. He is also past President of the Connecticut Nursery and Landscape Association. Andy works hard to protect Hamden's open space and natural resources as a member of the Hamden Land Conservation Trust and the Town's Inland Wetlands Commission and is currently a commissioner on the Hamden Tree Commission. He has spoken to groups throughout the northeast on a range of topics including native plants, new and unusual ornamentals, butterfly gardening, and butterflies of Connecticut and their life histories. In January, 2014 Andy started the Facebook page, Seeing Nature: Observations from New England, a page dedicated to native flora and fauna.

B. ***Enhancing Habitat for Wildlife on Small and Large Scales: Native Plants and Wildlife are Inextricably Linked***

Peter Picone, Wildlife Biologist, Connecticut Department of Energy and Environmental Protection, Wildlife Division, Sessions Woods Wildlife Management Area, Burlington, CT

Abstract: Habitat managers can influence biological diversity by encouraging native vegetation which has co-evolved with wildlife and managing invasive non-natives both on small and large acreages. Enhancing or creating wildlife habitat requires understanding a species' food, water, cover and space needs. There are approximately 1800 native plant species in Connecticut that create the plant communities which wildlife depend upon. This talk will show examples of utilizing native plants to provide seasonal habitat components and improving conditions for native plants through the management of selected invasive non-natives. The author will illustrate wildlife and plant interactions through his slides and short video out-takes.

Biography: Peter Picone is a wildlife biologist for the Connecticut Department of Energy and Environmental Protection's Wildlife Division. He has a B.S. from the University of Connecticut's College of Agriculture and Natural Resources. He has worked as a wildlife biologist for the past 27 years and has experience managing and enhancing habitats on state-owned land and his private property at Charter Oak Tree Farm in Sprague, CT. Mr. Picone will share insights gained from both his state land and private land experiences.

Session 5 (Room 304) *Introduction to Field Botany and Plant Identification*

Moderator: Penni Sharp, Connecticut Botanical Society and Co-Chair, Connecticut Invasive Plant Working Group

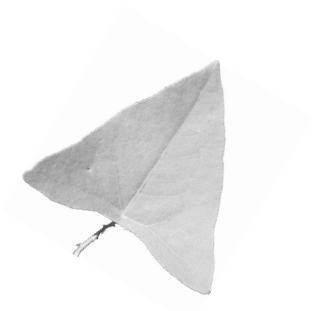
Introduction to Field Botany and Plant Identification

Bryan A. Connolly, Ph.D., Assistant Professor, Framingham State University

Abstract: Combating invasive plant species begins with identification of the threats on the landscape. Without detection and documentation, invasive plant distribution and population density remain unknown and therefore unaddressed.

This workshop is aimed at allowing more people to detect, observe, and document invasive plant infestations. Basic botanical skills aimed toward teaching the participants how to identify invasive plants will be covered. Morphology, botanical vocabulary, and use of basic botanical keys will be taught. Additionally, new online tools will be demonstrated.

Biography: Bryan holds a B.A. from the University of Vermont, and a M.S. and Ph.D. from the University of Connecticut. Previous to his appointment as an Assistant Professor at Framingham State University, he served as the Massachusetts State Botanist for the Massachusetts Division of Fisheries and Wildlife. He has consulted for the Guilford Land Trust and the Connecticut Department of Energy and Environmental Protection. He has taught botany, plant science, and environmental studies classes at Connecticut College and the University of Connecticut. He is currently serving as Vice President of the New England Botanical Club.



Session 6 (Theater) PANEL - *Priorities and Partnering for Invasive Plant Management*

Moderator: Charlotte Pyle, Landscape Ecologist, USDA – Natural Resources Conservation Service

Panel Members: *Gregory Foran* (Town of Glastonbury, Parks), *Julie Richburg* (Westfield River Watershed Invasive Species Partnership [MA]), *Thomas Roy* (Town of Simsbury, Public Works), *Patricia Sesto* (Town of Wilton, Environmental Affairs), *Rob Sibley* (Town of Newtown, Planning and Land Use)

SESSION ABSTRACT: Following a brief presentation by each panel member outlining their organizations' concerns with invasive plants, the panel members will respond to questions that address priorities and opportunities for partnering for invasive plant management. Factors that underlie prioritization include a lack of funding (which means that not every project can be funded and which may set biological and public safety concerns in opposition), short term versus long term concerns, and questions of what is the appropriate geographical scale for planning for invasive control. Partnering is useful on many levels (*e.g.*, people, knowledge and materials and equipment); and, partnering may be beneficial for multiple aspects of management (*e.g.*, identification, prevention, and control).

Questions to be addressed by the panel include the following (with all panel members to respond to the first question):

1. What are your top two priorities in regard to invasive plants; and, what makes them the top?
2. What is the level of awareness of invasive plants in your community – for example, knowledge of the problem, people willing to control invasives, etc.?
3. What efforts to educate and inspire the public have you found effective?
4. Partnering:
   (a) What sort of activities in your work area would benefit from partnerships?
   (b) What groups have you, or can you, partner with to work on invasive plants in your community?
   (c) What needs to be done to facilitate this happening?
   (d) What are barriers to these partnerships?
5. Are you aware of a partnership/approach/mission that failed? What could have been done differently?
6. Are there existing Town or State regulations that are hindering your efforts to address your priorities or to form partnerships?
7. Who is the right person or group in the Town/State to stop the SPREAD of invasive plants and upon what should they focus?
8. Quick examples of how much an infestation grew/spread because treatment was delayed.
9. Often it is possible to get funding for an initial attack on invasives. How is your group managing the long term maintenance then needed to keep ahead of *re*-infestations?
10. What do you see as good current or potential ways to find funding?

Finally, what gives you hope for the future?

Session 6 (Theater) PANEL - *Priorities and Partnering for Invasive Plant Management*

Biographies

Gregory A. Foran, Parks Superintendent and Tree Warden, Town of Glastonbury, CT

Greg Foran graduated from Ratcliffe Hicks School of Agriculture at UConn in 1979; His work experience includes Wickham Park, Manchester (5 years); a private estate (3 years); and Towns of Newington, South Windsor and Glastonbury (municipal experience 28 years). He is a licensed arborist, a certified tree warden and holds a CT supervisory pesticide license. He is a past president of the Tree Wardens Association of CT.

Greg has been involved in the partnership between the Town of Glastonbury and Glastonbury Partners in Planting (GPIP) working together on an initiative called Battling Bittersweet. This has included educational information, training and hands on removal efforts by GPIP volunteers, with treatments to control invasives, with an emphasis on bittersweet. GPIP has adopted a philosophy that total victory/control is probably not viable, but to do nothing at all would be to accept total defeat.

Julie Richburg, Western Regional Ecologist, The Trustees of Reservations, Holyoke, MA

Dr. Julie Richburg is currently the Western Regional Ecologist for The Trustees of Reservations (a state-wide non-profit land trust) in Massachusetts. She works on natural resource inventory and management for the 40 properties owned or managed by The Trustees in western Massachusetts (approximately totaling 9,000 acres). Julie has a Masters degree and PhD in forest ecology from the University of Massachusetts Amherst where she studied the impacts of road salt on plant species within a calcareous basin fen natural community in Stockbridge and control of woody invasive plants using mechanical and prescribed fire treatments across the Northeast. In 2008, she wrote "Invasive Plant Management: Guidelines for Managers" which includes guidelines for prioritizing invasive plant management by property or region. In 2009, she organized a partnership of individuals, organizations, and agencies interested in invasive species control within the Westfield River Watershed. Currently she is working on several projects to restore natural areas by controlling invasive plant species, planting floodplain trees, and addressing erosion issues.

Thomas J. Roy, PE, Director of Public Works, Town of Simsbury, CT

Tom Roy is Director of Public Works for the Town of Simsbury, where he is responsible for the day-to-day operation of the Highway Department, Water Pollution Control Facility, Landfill and Town owned buildings. His responsibilities also include serving as the Town Tree Warden, where he is responsible for the care and maintenance of all roadside trees. Tom graduated from the University of Connecticut with a bachelor's degree in Civil Engineering and later attained a Master's Degree in Construction Management from Central Connecticut State University. He is a licensed Professional Engineer and a past President of the Connecticut Society of Civil Engineers.

Session 6 (Theater) PANEL - *Priorities and Partnering for Invasive Plant Management*

Biographies, continued

Patricia Sesto, Director of Environmental Affairs, Town of Wilton, CT

Pat holds a B.S. in biology from Eastern CT State University. She has served as Wilton's Director of Environmental Affairs for 22 years, and prior to that, was a private consultant. Pat has represented the town on many special projects of regional and statewide significance, including the Norwalk River Watershed Initiative, Legislative Working Group for land-based transmission lines, FFD Co. Deer Management Alliance, Norwalk River Valley Trail, and the Interstate Environmental Commission. In connection with her work for the town, Pat has orchestrated the preservation of 12 open spaces parcels and manages nearly 2,000 acres of conserved land.

Rob Sibley, Deputy Director of Planning and Land Use, Town of Newtown, CT

Rob has served for 10 years as Deputy Director of Planning and Land Use Agency for the Town of Newtown, where he oversees the inland wetlands, aquifer protection, open space acquisition, flood management, forest practices, and planning and zoning enforcement for the town. Rob also serves the Town of Newtown as staff for Emergency Management team where he serves in disaster recovery and mitigation capacity.

3:45 Closing Remarks:

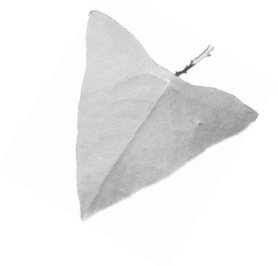
David Gumbart, Assistant Director of Land Management, The Nature Conservancy

Abstract: Throughout the day during the 2014 CIPWG Symposium, important information will be presented. This talk will summarize key points from many of the talks, and will provide perspective on "Where Are We Now?" as compared to past CIPWG Symposia. In addition to a realistic look at invasive issues in the northeast in 2014, it will also provide optimism and encouragement to continue efforts on studying and managing invasive species.

Biography: David Gumbart oversees the Connecticut Nature Conservancy portfolio of preserved lands, including 66 fee-owned preserves and more than 100 conservation easements. Habitat management is a priority for David's position, with invasive species management often part of efforts to improve Connecticut's most unique natural communities. He supervises three full-time conservation/stewardship staff, along with a seasonal position at Griswold Point, in Old Lyme, home to the rare nesting shorebirds the piping plover and least tern. David has been with the Conservancy for over 24 years, since 1990. His experience before joining the Conservancy includes positions as the Wetlands Enforcement Officer for the Town of Branford, CT, a Biologist's Assistant in the Wildlife Division of the CT DEEP, and a Forestry Research Assistant with the Connecticut Agricultural Experiment Station. A life-long resident of Connecticut, David now resides in Killingworth, where he is a Director with the Killingworth Land Conservation Trust.

4:15 Raffle

4:30 Adjournment



Poster Presentations for the 2014 CIPWG Symposium

1. Nate Bush, Environmental Conservation, Univ. of Massachusetts, Amherst, MA

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Lights, Camera …Citizen Science: Assessing the Effectiveness of Smartphone-Based Video Training in Invasive Plant Identification

The rapid growth and increasing popularity of smartphone technology is putting sophisticated data-collection tools in the hands of more and more citizens. This has exciting implications for the expanding field of citizen science. With smartphone-based applications (apps), it is now increasingly practical to remotely acquire high quality citizen-submitted data at a fraction of the cost of a traditional study. Yet, one impediment to citizen science projects is the question of how to train participants. The traditional "in-person" training model, while effective, can be cost prohibitive as the spatial scale of a project increases. To explore possible solutions, we analyze three training models: 1) in-person, 2) app-based video, and 3) app-based text/images in the context of invasive plant identification in Massachusetts. Encouragingly, we find that participants who received video training were as successful at invasive plant identification as those trained in-person, while those receiving just text/images were less successful. This finding has implications for a variety of citizen science projects that need alternative methods to effectively train participants when in-person training is impractical.

2. Paul Capotosto, Roger Wolfe, Bonnie Lathrop, Wetlands Habitat and Mosquito Management Program, Franklin Wildlife Management Area, CT DEEP

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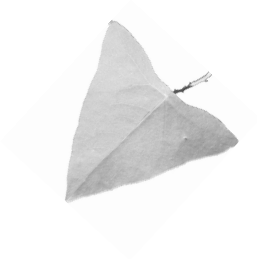
Control of Phragmites australis in Connecticut

Common Reed (*Phragmites australis*) is an invasive exotic plant that has taken over thousands of acres of wetlands in Connecticut. The Wetland Habitat and Mosquito Management (WHAMM) Program of the Connecticut Department of Energy and Environmental Protection (CT DEEP) has had an active program of control and management on invasive Phragmites for over 20 years. The WHAMM Program uses a combination of methods to control Phragmites including restoration of tidal salt-water flows, and/or a combination of herbicide applications and mowing to remove dead stems. Control of Phragmites is a vital component of the WHAMM Program's more comprehensive Integrated Marsh Management (IMM) Program for restoring tidal wetlands in Connecticut.

Posters, *continued*



3. Carole Cheah[1], Donna Ellis[2] and Todd Mervosh,
[1]The Connecticut Agricultural Experiment Station; [2] University of Connecticut

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Biological Control of Mile-a-Minute Weed (MAM) in CT

Mile-a-minute weed (MAM), *Persicaria perfoliata*, originally from Asia, is considered a serious and problematic invasive weed because of its prolific ability to spread in disturbed environments. First verified in Greenwich in 2000, currently 42 towns in Connecticut have confirmed MAM reports. *Persicaria perfoliata,* though an annual, can quickly overwhelm native vegetation with its exponential growth and is a serious threat to forest regeneration. A tiny weevil, *Rhinoncomimus latipes,* native to China, with high host plant specificity and great damaging potential to MAM, was first released as a biological control agent in Delaware and New Jersey in 2004. In 2009, the first releases were implemented in Connecticut in a joint collaboration between The Connecticut Agricultural Experiment Station and the University of Connecticut, in cooperation with the University of Delaware and the Phillip Alampi Beneficial Insect Laboratory, New Jersey Department of Agriculture, and more recently, the University of Rhode Island. Annual releases of this weed-feeder, assessments of weevil survival and impact, and monitoring of the MAM populations at release sites are part of the regional MAM biological control program supported by the USDA APHIS PPQ and USDA Forest Service. From 2009-2014, >38,000 weevils have been released in 32 sites in 18 Connecticut towns, with the help of many cooperators from the town, state and private citizen levels. Identifying characters of MAM are presented and the lifecycle of the MAM weevil, *R. latipes*, is described. Larval and adult stages of the weevil feed exclusively on MAM. Results from the latest monitoring in 2014 are summarized. Since 2009-2014, weevils have successfully survived every Connecticut winter, severe flooding and storms and even habitat or site interference, although the latter have resulted in localized reductions in weevil populations. Weevil dispersal was widespread in 2014.

4. Georgianne Copley, for Eastford Conservation and Historic Preservation Commission, Eastford, CT

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Water Chestnut Control: Persistence Pays Off

Members of the Eastford Conservation and Historic Preservation Commission present their success with control of a population of water chestnut (*Trapa natans*) growing in a privately-owned pond in Eastford . The techniques used were low-tech and took only one Saturday morning a year … for 13 years.

5. Tyler Cross and Bethany Bradley, University of Massachusetts, Amherst

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Mapping Invasive Plant Abundance in the Northeast United States

The spread of invasive species is considered one of the greatest threats to biodiversity in the twenty-first century. As a result, a great deal of effort has been invested in mapping the distribution of invasive species. However, while distribution maps (i.e. maps showing locations where a given species is 'present') are useful for early detection and rapid response, they may be less helpful for scientific assessments of invasion severity or risk because they typically do not include abundance information. Furthermore, the diverse range of mapping programs and services used to create the currently available maps has led to a fragmented and non-standardized dataset. We aim to compile data from multiple sources, including expert knowledge, to create more comprehensive distribution and abundance maps for twelve important invasive plants across the Northeastern United States. To that end, we are currently looking for individuals willing to assist us with abundance surveys.

Posters, *continued*

6. Lindsay Dreiss, Dept. of Natural Resources and the Environment, Univ. of Connecticut, Storrs, CT

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Influence of Canopy Phenology on Invasive Plant Success in Forest Understories

Invasive exotic species (IES) pose a serious threat to ecosystem structure and function worldwide, but the causes for IES success in introduced environments are often unclear. In temperate forests of eastern North America, the ability of IES to colonize understories is notable given the intense competition for light and other resources. One of several widely cited mechanisms facilitating invasion is an extended duration of annual photosynthetic activity in IES foliage, due to early leaf flush in the spring and/or delayed autumnal senescence. However, the amount of "extra" light harvested by IES foliage is determined in large part by overstory canopy phenology, which varies considerably among tree species. We assessed IES presence in interior, intact temperate forest understories in relation to environmental conditions induced by five different native canopy types (Quaking Aspen, Sugar Maple, White Ash, Oak/Hickory, and Pine/Hemlock) and one nonnative canopy species, Black Locust. Understory light availability and timing of canopy bud break and leaf flush were significantly different among canopy types with higher light in aspen, ash, and locust understories and later phenology in ash and locust canopies. As expected, soil analyses showed higher nitrate levels in the nitrogen-fixing Black Locust stands, but unexpectedly, also in the White Ash stands. Under these two canopy types, IES cover and relative abundance were significantly higher suggesting the importance of greater resource availability in invasive plant success. As such, deciduous forests canopies with late leaf flush and comparatively short leaf duration are, on average, more extensively colonized by IES. Given the sensitivity of plant phenology to variation in climate, and the inevitability of further climate warming, pronounced phenological responses to future climate change will likely have important implications for the susceptibility of temperate forest understories to IES.

7. Hannah Gousse and Jenica Allen, Dept. of Ecology and Evolutionary Biology, Univ. of Connecticut, Storrs, CT

Email: Hannah.Gousse@uconn.edu, Phone: 860-881-0506

Chilling Requirements for Woody Plants in CT: Phenological Responses to Warmer Winters

Phenology, or the timing of biological events, influences individual fitness, population dynamics, community composition, and ecosystem function. Temperature and phenology are linked for a variety of organisms. Often the focus for phenology studies is increasing warm temperatures, but for many plants in temperate climates, cold winter weather is required for breaking dormancy. We sought to find the relative chilling requirements for six native and four invasive woody plant species that are common in Connecticut. By gathering specimens from habitats surrounding UConn and bringing them inside to simulate springtime warming at different intervals of time, we were able to measure the amount of time that it took each individual plant to leaf out with different amounts of chilling. Invasive plants were able to leaf out quickly with little chilling, whereas native plants needed more chilling and took longer to leaf out. These results suggest that as winters become warmer due to climate change, invasive plants may have an advantage over native plants with longer growing seasons.

Posters, *continued*

8. Andrew Ma, Greenwich High School, Greenwich, CT

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Solvent Extraction of Hydrocarbon-based Biofuels from Lythrum salicaria

Invasive plants can potentially be a cheaper source of biofuels and other biological compounds than conventional bioenergy plants such as corn. If useful chemicals are found in invasive plants, it can provide a financial incentive for their removal. Discovery of such compounds in *Lythrum salicaria* (purple loosestrife) would be particularly desirable as the plant is widely available and highly problematic; annual control costs and forage losses in the U.S. total $50 million. The objective of this research project is to obtain biofuels and other biological compounds from *Lythrum salicaria* seed capsules using hexane solvent extraction. Single-Step Solvent Extraction (Method 1) and Solvent Extraction with Grinding Pretreatment and Sonication (Method 2) were evaluated. The extract solutions were analyzed via GC-FID and GC-MS. Method 1 yielded hydrocarbons and hydrocarbon derivatives of carbon chain length range C7-C29; Method 2 yielded a range of C13-C40. Given the wide range of carbon chain lengths and the chemistry of the extracts, different components can be used as a surrogate or additive for a variety of fuels, including gasoline and diesel. Moreover, online database research indicated that possible applications of the extracted compounds extend beyond fuel application and include medicinal and other commercial uses. Extracted chemicals can be combusted collectively as a single biofuel mixture or separated for individual applications. Discovery of biofuels and other useful chemicals in *Lythrum salicaria* provides a simple and inexpensive pathway to obtain the organic compounds, and could ultimately make the invasive plant management process more financially practical.

9. Ann Pettengill, for Glastonbury Partners in Planting Battling Invasives Group

Email: annhardy1@cox.net, Phone: 860-633-1327

Beware The Beasts In Your Backyard!

This poster was designed by Asha and Stephen Shipman for our Battling Invasive Group as part of our educational outreach program to educate our community about the common invasive plants found in Glastonbury. The poster is displayed at all of our many town farm stands as well as stores throughout our town. The large bittersweet wreath with an X through the middle of it is a great eye catcher when displayed at events and meetings. The poster also hangs in the Glastonbury Town Hall since GPIP's Battling Invasive Group partners with the Town trying to rid our Town Parks of these destructive plants.

10. Chris Polatin, Habitat Restoration Specialist, Polatin Ecological Services, LLC

Email: chris@polatineco.com, Phone: 413-262-9102

How to Restore In-Situ Native Plants to a Site Overwhelmed with Common Reed (Phragmites australis)

This how-to poster describes the process of controlling phragmites through selective and judicious herbicide use in order to facilitate total site revegetation within 6 years without use of outside plant materials This process has proven effective on 20 sites in both tidal and freshwater systems. Sequential treatment methods are demonstrated along with six years worth of monitoring photos to show the effects after each year of work.

Posters, *continued*

11. Juliana M. Quant, Dr. Christopher A. Nowak, Dr. Martin Dovčiak

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Human-Based Spread of Invasive Plants along Powerline Rights-of-Way in New York

When invasive exotic (IE) plant species are introduced to new ecosystems, they can have significant costs to native biodiversity, ecological function, wildlife habitat, and the human economy. States are increasingly requiring that personnel managing vegetation on power line rights-of-way take measures to reduce the spread of IE plant species. Our goal is to quantify the potential spread of IE propagules during typical vegetation management operation and to make science-based recommendations for cleaning protocols for vehicles and/or personnel.

We met with vegetation managers in the field in summer 2013. Before they began work, we pre-cleaned focal areas on their vehicle (e.g., wheel, floorboard, fuel tank) and on one person (boots and chainsaw chaps). The movements of the vehicle and person were recorded with GPS units. After a few hours, workers returned and we collected samples by brushing and washing the same (pre-cleaned) focal areas. Samples were weighed, sieved, and planted in trays in the greenhouse. The samples were monitored weekly for new germinants for 10 weeks, followed by cold stratification at 40^{o}F for 8 weeks, and then another 10 week germination period. Finally, all germinants were classified as IE species or not.

In the 2013 samples, over 6,000 germinants were observed. Of these, at least 165 were IE species on our focal list. In preliminary analyses, fewer IE propagules were transported when soil and vegetation were dry, but approximately equal IE transport occurred when vegetation was lightly wet (e.g., with dew) and wet (as after a rain). Far more invasive propagules were found on vehicles than on a worker's boots or chaps. Cleaning protocol recommendations for the vegetation management personnel will be based on results from the full analyses, but will incorporate considerations of vehicle type, weather, soil drainage, distance traveled, site traits such as propagule pressure, and IE species life history.

12. Joanne Rebbeck, US Forest Service Northern Research Station, Delaware OH, **Cheryl Coon,** Hoosier National Forest, Bedford, Indiana, **Aaron Kloss,** Ohio Department of Natural Resources, Division of Forestry, Columbus, OH, and **Rebecca Nisley,** Northern Research Station, US Forest Service

Email: rnisley@fs.fed.us, Phone: 860-306-6315

Finding The Tree-Of-Heaven from the Heavens: Winter Aerial Mapping Determines Extent and Severity of Ailanthus Infestations to Improve Oak Restoration Efforts

Aerial detection can pinpoint locations of female ailanthus in winter so that ground crews can later treat them with herbicide. In the Appalachian Mountains of Pennsylvania, West Virginia, and Ohio, ailanthus is growing in the forests, not just along roads and railroads and in wastelands. It is interfering with the regeneration of oak forests, which are important both ecologically and economically. In Ohio, the U.S. Forest Service, Northern Research Station's Joanne Rebbeck has developed a technique that locates female ailanthus after tree-fall because of their signature heavy seed loads. Aerial surveys from helicopters and GPS marking identify the trees for later treatment, usually "hack & squirt."

Posters, *continued*

13. Richard Rizzitello, Vernie Sagun, and Carol Auer, Dept. of Plant Science, University of Connecticut, Storrs, CT

Email: richard.rizzitello@uconn.edu

Risk Assessment for a Novel Crop: <u>Camelina sativa</u> (camelina, false flax).

Today's plant invasions are the result of past species introductions and gene flow events, so science-based risk assessments should precede introductions of novel crops. *Camelina sativa* (camelina, false flax) is a non-native, annual, oilseed crop that is being engineered for the production of omega-3-fatty acid dietary supplements, jet fuel, and other chemicals. If these high-value traits are successful in US and UK field trials, genetically engineered camelina could be more widely grown in the US. Because there is no history of camelina cultivation in New England, information is insufficient for robust risk assessments. For example, there is no information about pollination mechanisms or gene flow to closely-related plants. Thus, our camelina research goals are to: 1) determine the potential to become a more serious weed in natural and managed landscapes, and 2) determine the potential for crop-to-wild or crop-to-weed transgene flow. In 2014, *Camelina sativa* was grown at the Univ. of Connecticut research farm. Data was collected on: crop development, pollen movement, insect activity, weed populations, seed production, and other traits. Synchronous flowering of camelina and weedy *Capsella bursa-pastoris* within the field suggested potential for crop-to-weed gene flow. A high level of bee activity on camelina flowers suggested long-distance pollen movement. High crop yield suggested that seed dispersal could contribute to weedy camelina populations that have been observed since the turn of the 20th century (1902). Final conclusions will require further data analysis and a second year of field work.

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Small Plants, Big Questions: Asian Waterwort and Threestamen Waterwort

In the U.S., invasive plants cause approximately $35 billion dollars per year in damage to the infrastructure and losses of biodiversity. *Elatine ambigua* Wight (Asian waterwort) and *E. triandra* Schkuhr (threestamen waterwort) are two cosmopolitan plant species that are considered to be invasive in many countries around the world, e.g. U.S. (California), Sardinia, Taiwan, Japan, Italy, and Romania. In California and Japan, these plants are commonly found in rice paddies, marshes, lakes, and ponds. The general appearances of the two species are almost identical, which makes identification difficult. Furthermore, these plants can exhibit different morphologies when growing in different conditions. These different morphologies are due to their ability to thrive in substrates with variable levels of water saturation. Due to these facts, accurate identification of the two species is difficult for botanists and plant collectors. Considering the fact that *E. triandra* and *E. ambigua* have been reported from similar localities around the world, we hypothesized that these two species might in fact belong to the same species. To test this, we extracted and sequenced DNA from both fresh specimens as well as dry specimens obtained from many herbaria around the world. Through our studies, we found that while these plants are very closely related, there are enough differences within their DNA sequences to indicate that they are two separate species. Also, using DNA sequencing technology, we a) uncovered a recent introduction of *E. ambigua* to the eastern United States (the first confirmed case in the US, outside of California), b) suggested possible vectors of introduction, and c) discussed the threat that these plants pose to the biodiversity and the global community.

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Paul Capotosto Roger Wolfe Bonnie Lathrop	Wetlands Habitat and Mosquito Management Program Franklin Wildlife Management Area, CT DEEP	roger.wolfe@ct.gov	860-642-7630	Control of *Phragmites australis* in Connecticut
Carole Cheah Donna Ellis Todd Mervosh	The Connecticut Agricultural Experiment Station University of Connecticut Weed Scientist	carole.cheah@ct.gov	860-683-4980	Biological Control of Mile-a-Minute Weed (MAM) in CT
Georgianne Copley	Eastford Conservation and Historic Preservation Commission, Eastford, CT	coplee@mindspring.com	860-974-2300	Water Chestnut Control: Persistence pays off
Tyler Cross Bethany Bradley	University of Massachusetts - Amherst	cross.tylerj@gmail.com	215-738-8087	Mapping Invasive Plant Abundance in the Northeast United States
Lindsay Dreiss	Department of Natural Resources and the Environment University of Connecticut	lmdreiss@gmail.com	860-874-2287	Influence of Canopy Phenology on Invasive Plant Success in Forest Understories
Hannah Gousse Jenica Allen	Department of Ecology and Evolutionary Biology University of Connecticut	hannah.gousse@uconn.edu	860-881-0506	Chilling Requirements for Woody Plants in CT: Phenological responses to warmer winters
Andrew Ma	Greenwich High School Greenwich, CT	andrew.andi.ma@gmail.com	203-446-6781	Solvent Extraction of Hydrocarbon-based Biofuels from *Lythrum salicaria*

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Juliana M. Quant Dr. Christopher A. Nowak Dr. Martin Dovciak	SUNY College of Environmental Science & Forestry	juliana.quant@gmail.com	315-727-5134	Human-based Spread of Invasive Plants along Powerline Rights-of-Way in New York
Joanne Rebbeck Cheryl Coon Aaron Kloss Rebecca Nisley	US Forest Service Northern Research Station Delaware, OH Hoosier National Forest Bedford, IN Ohio Department of Natural Resources, Division of Forestry, Columbus, OH US Forest Service Northern Research Station Delaware, OH	rnisley@fs.fed.us	860-306-6315	Finding the Tree-of-Heaven from the Heavens: Winter aerial mapping determines extent and severity of ailanthus infestations to improve oak restoration efforts
Richard Rizzitello Vernie Sagun Carol Auer	Department of Plant Science and Landscape Architecture, University of Connecticut	richard.rizzitello@uconn.edu	n/a	Risk Assessment for a Novel Crop: *Camelina sativa* (camelina, false flax)
Aaron Rosman Hamid Razifard Donald H. Les	Department of Ecology and Evolutionary Biology University of Connecticut	aaron.rosman@uconn.edu	860-933-4055	Small Plants, Big Questions: Asian Waterwort and Threestamen Waterwort

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