



Invasive Plants Council

Tenth Annual Report

December 11, 2012



INVASIVE PLANTS COUNCIL
TENTH Annual Report
December 11, 2012

The Honorable Edward Meyer
State of Connecticut Senate
Legislative Office Building, Room 3200
Hartford, CT 06106

The Honorable Richard Roy
State of Connecticut
House of Representatives
Legislative Office Building, Room 3201
Hartford, CT 06106

Dear Senator Meyer, Representative Roy, and members of the Environment Committee:

As Chairman of the Invasive Plants Council, I respectfully submit this letter and attachments summarizing activities conducted during 2012. This Council was established and operates pursuant to Connecticut General Statutes §22a-381 through §22a-381d, and is responsible for the following: developing and conducting initiatives to educate the public about problems created by invasive plants in lakes, forests and other natural habitats; recommending control methods; making information about invasive plants available to the public; annually updating and publishing the invasive plant list; supporting research on developing and improving methods for controlling invasive species and on developing new non-invasive plant varieties.

The Council

The Council consists of nine members representing government, the nursery industry, scientists, and environmental groups. I am Chief of the Bureau of Natural Resources at the Department of Energy and Environmental Protection (DEEP), and serve as Chairman of the Invasive Plants Council. Louis Magnarelli, Director of the Connecticut Agricultural Experiment Station (CAES) serves as Vice Chairman. There have been no changes in membership since last year's report. A list of all Council members can be found in Attachment 1.

The Council has met eight times since its last annual report dated December 13, 2011. See Attachment 2 for the minutes of seven of those meetings. The minutes for the Nov. 13, 2012 meeting are not yet approved, and so will appear in next year's report. The Council has repeatedly demonstrated that it can find solutions to complex problems and work constructively. The Council provides the well-structured, legislatively authorized forum needed to forge and implement a cohesive invasive plant management strategy. This assemblage of representation from the State's key plant-related agencies, educational institutions, plant 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 keeping the nursery and related industries productive. The actions of the Council also enhance regional coordination in

addressing invasive species, which know no boundaries and continue to spread across political lines.

The continuation of funding for the Invasive Plant Coordinator position has strongly benefitted the Council's work. Mr. Logan Senack, the state's Invasive Plant Coordinator, is commended for taking care of the various administrative duties and for undertaking important outreach and education, prevention, and control efforts that make it possible for the Council to meet and follow through on its initiatives. Funding specifically for the Invasive Plant Coordinator position has been provided by the State Legislature through the end of this fiscal year. These funds are appropriated to the Department of Agriculture (DoAg) for the specific purpose of supporting the Coordinator position at the University of Connecticut. Support for the Coordinator position and related operating expenses has been invaluable to the Council's efforts in limiting the introduction and spread of invasive plants and in raising public awareness on these issues. The Council also acknowledges the cooperation of DoAg for providing conference room space for this year's meetings.

Council Activities

The continuation of funds for the Invasive Plant Coordinator position is a key component of Connecticut's response to invasive plants and continues to benefit the state. Assistance from the Coordinator allowed for the further development of early detection and rapid response procedures for emerging problems. With the Coordinator in place, the Council continues to serve as an advisory body to DEEP as it moves these programs forward. The following is a summary of Council activities and accomplishments during 2012.

After review and discussion of the effects and spread of mugwort (*Artemisia vulgaris*; common wormwood), the Council voted to list this aggressive and non-native species as a potentially invasive plant. Numerous reports of occurrences of this species growing throughout Connecticut were discussed by the Council. The updated 2012 Invasive Plant List is included in this report as Attachment 3.

The Invasive Plant Coordinator continues outreach efforts to inform the public about invasive plants, gather information on new infestations, work with municipalities and environmental organizations to eliminate new or emerging invasions of invasive plants, review literature and invasive plant lists from other states, and provide input about new plants for potential examination and evaluation by the Council.

The Coordinator also assisted the Connecticut Invasive Plant Working Group to organize, develop, plan and host a full-day invasive plant conference at the University of Connecticut on October 25, 2012. The conference attracted 475 registrants, and an additional 60 individuals had to be turned away due to full capacity. This large, sold-out audience from Connecticut and throughout the region demonstrates the high interest in and need for information about invasive plants, management of their effects, and control strategies desired by the public.

Suggested Plant Regulation Changes

Individuals requesting that certain plants be listed as invasive or potentially invasive often fail to understand the nuances of the lists that the Council is charged with maintaining, and the related

but separate list in CGS §22a-381d that prohibits the sale of certain plants. The Invasive Plants Council is charged with maintaining and annually updating a list of invasive and potentially invasive plants determined by scientific criteria to be invasive, as defined in CGS §22a-381. The General Assembly has the option of passing legislation to further prohibit a plant from sale, and the Invasive Plants Council is empowered to recommend that step to the Environment Committee on a 2/3 affirmative vote.

During 2012, the Council continued its review of the status of golden bamboo (*Phyllostachys aurea*) and yellow groove bamboo (*Phyllostachys aureosulcata*) in Connecticut in response to a request from the Attorney General's Office and numerous reports of bamboo problems from concerned property owners. Site visits by staff from various Agencies, organizations and the University of Connecticut were conducted in areas around the state where bamboo has been reported. Members of the Invasive Plants Council visited selected sites in August 2012. The purpose of these site visits, coupled with a review of the technical literature on bamboo, was to determine the extent to which these species might qualify as invasive or potentially invasive plants under the requirements of CGS 22a-381b. At this time, the Council is of the opinion that neither bamboo species meets the necessary criteria to be considered invasive in Connecticut. More specifically, many on the Council question whether bamboo in Connecticut meets the requirement that "under average conditions, the plant has the biological potential for existing in high numbers outside of habitats that are intensely managed." However, the Council did observe extensive damage to residential lawns and properties in instances when bamboo was not properly installed and maintained, and has decided to support any measure put forward by the legislature that would require sellers of running bamboo to educate customers, require property owners who plant bamboo to install and maintain proper containment, and assign liability in situations where property owners fail to prevent the spread of bamboo. See Attachment 4 for the full text of the Council's decisions at the September 18 and October 9 meetings.

Overview of Current Activities and Needs in Connecticut

The cost of inaction in addressing the spread of invasive plants should not be underestimated. Nationally, the cost associated with invasive plants and their control is estimated to exceed \$35 billion per yearⁱ. Invasive plants can further impact the economy in other ways. For example, Japanese barberry, an invasive shrub, has been associated with an increased risk of Lyme diseaseⁱⁱ, a disease for which an estimated \$203 million/year is spent on treatment in the United States.ⁱⁱⁱ

In Connecticut, invasive plants continue to cause obvious environmental problems, and public concern about these problematic, non-native species continues to grow. During 2012, the Council received numerous requests from land holders who want relief from the problems of invasive plants. Removal of invasive species from minimally managed areas is a costly proposition, and the State would be well served by a program that prevents future invasions and provides educational and financial resources to implement eradication campaigns. Prevention and early detection of invasive plants is critical to an efficient, timely, and effective response to emerging invasions.

We realize that it would be unrealistic at this time to suggest a return to the \$500K/yr funding level that existed for the Invasive Plant Council prior to 2010. However, we do respectfully request continuing support for key "keep-alive" functions, such as the

Coordinator's salary and operating expenses. These total \$90,000 per year and are absolutely essential if the state is going to be able to address the invasive plants problem.

In its ten years of operation, the Council has worked to refine the initial invasive plants legislation so that the mechanisms for inspection and enforcement are now in place for both terrestrial and aquatic problem plants. We have envisioned what a comprehensive invasive plants program would look like in Connecticut, and with the initial funding for the program, we were able to move forward to create a Coordinator position and begin to implement this vision. Staff in DEEP, CAES and DoAg have taken up the charge of responding to the invasive plants problem, and have utilized the resources and network that the Council provides. When state finances improve and funding for invasive plants is restored, this infrastructure is ready to fulfill the goals initially enunciated by the legislation that formed the Council in 2002. That said, the near term funding for the State Coordinator's position remains our top priority. I and other Council members are available to answer questions and provide advice as needed. Feel free to contact me at (860) 424-3010 if questions arise.

Sincerely,



William A. Hyatt
Chairman

Attachments:

1. List of Council Members and Contact Information
2. Minutes of Meetings
3. 2012 Revised Invasive Plant List
4. Running Bamboo Status Update

Member Reports:

5. DEEP Invasive Plant Program 2012 Accomplishments
6. Green Industry Report
7. Department of Agriculture Report
8. UConn College of Agriculture and Natural Resources Report

Additional Information:

9. Connecticut Invasive Plant Working Group (CIPWG) Update 2012

ⁱ Pimentel, D., R. Zuniga, and D. Morrison. 2005. Update on the environmental and economic costs associated with alien-invasive species in the United States. *Ecological Economics* **52**: 273-288.

ⁱⁱ Duik-Wasser et al. 2010. Human risk of infection with *Borrelia burgdorferi*, the Lyme disease agent, in eastern United States. *American Journal of Tropical Medicine and Hygiene* **86**:320-327

ⁱⁱⁱ Zhang, X., M.I. Meltzer, C.A. Pena, A.B. Hopkins, L. Wroth, and A.D. Fix. 2006. Economic impact of Lyme disease. *Emerging Infectious Diseases* **12**: 653-660.

INVASIVE PLANTS COUNCIL MEMBERSHIP

December 2012

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Invasive Plants Council
Tuesday, December 13, 2011
2 pm, Dept. of Ag Conference Room G8-A
Hartford, CT

Council members present: Dave Goodwin, Bill Hyatt, Paul Larson, Lou Magnarelli, Richard McAvoy, Tom McGowan, John Silander, Katherine Winslow

Others present: Ellen Bender, Donna Ellis, Wendy Flynn, Matt Fritz, Bob Heffernan, Nancy Murray, Logan Senack, guest

1. Hyatt called the meeting to order at 2:00 pm. Bill introduced Matt Fritz, Bureau Chief for Outdoor Recreation, Department of Energy and Environmental Protection (DEEP), and Wendy Flynn of the DEEP Boating Division.

2. Distribution of annual report

Copies of the annual report were distributed to the Council members. Hyatt discussed the annual report and thanked the members and the member agencies and organizations for contributing material for the report. Hyatt thanked Murray and Senack for assembling and producing the report. Hyatt distributed the distribution list for the annual report. Senack will deliver the other copies of the annual report this afternoon.

A PDF of the 2011 Annual Report is available at the following link:
www.hort.uconn.edu/cipwg/ipc.html

3. Aquatic invasive sticker proposal and Invasive Investigators Program

Tom McGowan arrived at 2:07 pm.

a. Possible legislative proposal for Invasive Plants Council (IPC)

Hyatt introduced Matt Fritz and Wendy Flynn, who delivered a presentation on an aquatic invasive plant sticker proposal and the Invasive Investigators Program.

Flynn presented information about DEEP Boating Education Assistants (BEAs) and Invasive Investigators (IIs). Flynn's presentation is attached to these minutes. DEEP employed paid seasonal staff from mid-May to mid-October at boat launches throughout the state to educate boaters on clean and safe boating practices and to conduct Vessel Safety Checks. In 2011, the BEA program employed 21 seasonal employees, who conducted 4,145 Vessel Safety Checks and collected 5,480 clean boater pledges.

The Invasive Investigator (II) program was developed to help the BEAs reach additional boaters and cover additional boat launches. Invasive Investigators attend an initial training of 2.5 hours and are assigned to visit local boat launches. They familiarize boaters with Aquatic Invasive Species (AIS) present in the water body, distribute educational materials, and conduct voluntary inspections. In 2011, 75 people were trained as Invasive Investigators. Invasive Investigators conducted over 1,200 inspections in 2011. Flynn provided information regarding a legislative

change to CGS Section 26-55, which prohibits importing, possessing, or liberating any prohibited animals in Connecticut. Prohibited animals include zebra mussels and other aquatic invertebrates. Flynn also detailed possible proposed changes to add the list of prohibited animals to CGS Sec. 15-180.

Fritz summarized the need for a Boating Division funding source to address problems such as zebra mussels and abandoned boats and vessels throughout the state. He also detailed the current status of boating funds in the state and past funding scenarios. Fritz suggested a proposal for an addition to the current registration fee that could be used to fund AIS efforts and provide a grant program to towns to deal with abandoned boats and vessels through a Waterways Maintenance Fund. The amount of the fee would be up to five dollars per registered boat, and both marine and inland boats would be included.

Fritz proposed two main options:

1. The IPC could move forward with a proposal to increase license fees by \$5 and use the funds to support AIS and abandoned vessel work. A portion of the funds would go towards AIS prevention, remediation, and education, and another portion would be distributed to towns as a grant based program for abandoned boats.
2. A sticker program could be developed that used different fees for in-state and out-of-state vessels. This plan might be more complex but would allow the state to capture funds from out-of-state vessels in addition to in-state vessels.

Fritz and Eleanor Mariani (Boating Division Director, DEEP) will submit a one page information summary to the Council and will coordinate with Hyatt and the IPC on these issues.

Flynn announced that educational inserts will be added to the 2012 registration information from the state Department of Motor Vehicles. The inserts will include information about properly cleaning boats, zebra mussels in Connecticut, and an announcement about the Invasive Investigator program. Flynn briefly summarized the topics included in the training program for BEAs, including species identification and conducting voluntary boat inspections for AIS. A job description for BEA positions will be posted online by late February 2012 for the 2012 season. Flynn will send Senack the presentation materials so they can be shared with the group and posted online, and will supply information about a forum to be held in February regarding coordination with Massachusetts on zebra mussel control.

***12/16/11 Note:** The Housatonic River Zebra Mussel Forum will be held Feb. 4, 2012 (snow date Feb. 11) at Simons Rock College, Great Barrington, MA. - LS*

Hyatt asked if the BEA/II programs held presentations to recruit members. Flynn responded that they use web materials and press releases to attract new individuals, and also coordinate through Senack to post materials through the listserv of the Connecticut Invasive Plant Working Group (CIPWG). Hyatt noted that education and outreach efforts similar to what the Boating Division is doing are extremely valuable in helping to limit the spread of AIS to new areas. Murray added that education is more cost effective than trying to control an invasion after the fact.

Silander asked about the advantages and disadvantages of a separate sticker. Fritz reported that having a separate sticker may allow for the inclusion of both in-state and out-of-state vessels in the program, which would be different from a registration fee that would only capture funds from Connecticut-registered vessels. Goodwin asked for information about how many out-of-state boats use CT inland waterways. Fritz responded that that information could be prepared and shared with the Council. Hyatt asked how many states have boating sticker programs. The group discussed the various options and McGowan emphasized the importance of making sure whatever plan was developed was practical and valuable.

In response to a question from Goodwin, Flynn reported that aquarium trade species were included in the training workshops.

4. Further discussion of bamboo issue

McGowan left the room at 2:50 pm.

Hyatt recapped the current status of bamboo, including the September 2010 response from the Invasive Plants Council to the Attorney General regarding the invasive status of running bamboos. Hyatt noted that the scientific inquiry regarding this species is still continuing and that no bamboos are listed at this time. Murray announced that she has submitted Connecticut bamboo specimens to Dr. Lynn Clark at Iowa State University, who will attempt to identify them. Silander added that Dr. Dick Mack at Washington State University has a post-doctoral researcher, Dr. Melissa Smith, working on an Animal and Plant Health Inspection Service (APHIS) funded project about bamboo species and distributions across the nation who may collect specimens from Connecticut.

Magnarelli reported that the Connecticut Agricultural Experiment Station (CAES) plans to conduct experiments on at least three CAES properties to determine the degree of growth of running bamboo and also how to kill it. The projects are expected to take 3 to 5 years and will test chemical control and mechanical containment. CAES will coordinate with the industry on this project.

McGowan returned at 2:53 pm.

Hyatt noted that listing the plant as potentially invasive could remain a possibility and that two questions remained:

1. Since the plants are difficult to identify to species, Hyatt asked if it would be more appropriate to list a genus of this group instead.
2. Even though the Council has not decided to list bamboo, Hyatt pointed out that the plants can be damaging in managed landscapes, which may be outside the purview of the Council. As DEEP and other agencies will still need to address incoming inquiries, Hyatt asked if it would be appropriate for the Council to present information to towns suggesting or simply informing them that the towns may pass ordinances to require barriers when planting bamboo.

Murray mentioned that a town in Delaware had passed an ordinance regarding bamboo. The group discussed the possibility of towns passing ordinances, enforcement of such an ordinance, and other aspects of this issue. Heffernan added that the Connecticut Nursery and Landscape Association (CNLA) has maintained a position since 2000 that 169 different town laws would make it very difficult for landscape professionals and nurserymen to work in towns with multiple laws.

The group discussed whether CT towns can currently pass such an ordinance, whether recommendations from CNLA regarding bamboo planting and control can be developed, and whether the Invasive Plants Council should actively recommend to towns that they pass town ordinances regarding this species. Goodwin noted that this action would help put in the forefront of the public's awareness that some responsible action is required when planting species that may spread. Murray will pass the ordinance information from Delaware to Senack to distribute with the minutes.

Hyatt asked Larson about the status of the position of the CNLA board with regards to informing customers about bamboo. Larson said CNLA can provide recommendations, but they would not be mandatory. Heffernan emphasized that the recommendations would not be mandatory. Hyatt asked for clarification from Larson regarding how this information is being distributed and what kinds of things are actually happening at points of sale.

The group discussed the possibility of listing difficult to identify bamboos at a broader taxonomic grouping than the species level. Silander suggested that the Council wait for a response from the taxonomic experts first, as there may be key characters that can be used to distinguish the plants, especially during spring shoot growth. Heffernan added that the industry is aware of the importance of this issue and that it would be good for the industry to develop a public document about bamboo control that could be made available online, and possibly also a tag to be attached to plants for sale regarding control of spreading species.

5. Old/ New business

a. Bittersweet sales action taken

Murray informed the group that DEEP had received a report that Asiatic bittersweet (*Celastrus orbiculatus*) was being sold at a farmer's market in southeastern Connecticut. DEEP sent a letter to the seller requesting that sales of the plants be stopped. Hyatt requested that anyone seeing invasive plants being sold intentionally or unintentionally in the state contact CIPWG or DEEP.

b. Invasive Plant Coordinator funding question

Hyatt noted that the 2011 IPC annual report identified the need for a request of \$90,000 to continue the Invasive Plant Coordinator position and asked the group how to move forward and push that request. Hyatt also asked that this discussion be continued at the next meeting in January 2012.

The group discussed the possibility of holding a legislative briefing as discussed at previous meetings. Hyatt suggested that if a briefing was held, it would need to be held at the Legislative Office Building in late January and everyone on the Council would need to be present.

The group discussed aspects of DEEP budget requests and the invasive plant funding.

Bender suggested that the Council share the information about any upcoming legislative briefing with the listserv of the Connecticut Invasive Plant Working Group so that additional interested people could attend. Silander suggested that a short white paper could be prepared in preparation for this event.

Hyatt added that any proposal would require broad grass-roots support. Magnarelli added that it would be important to make sure that DEEP was the recipient agency for the funds. Heffernan suggested that if the CT Nursery and Landscape Association (CNLA), The Nature Conservancy (TNC), Rivers Alliance, and Audubon all support the measure, it might have more chance of success.

c. Mugwort (*Artemisia vulgaris*) status

Ellis requested that mugwort (*Artemisia vulgaris*) be addressed at the January meeting.

6. Adjournment

Larson moved (second: Goodwin) to adjourn the meeting. **The Council decided to adjourn at 3:30 pm.**

The next meeting is scheduled for 2 pm, January 10, 2012 at the Department of Agriculture in Hartford, CT.

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Invasive Plants Council
Tuesday, January 10, 2012
2 pm, Dept. of Ag Conference Room G8-A
Hartford, CT

Council members present: Bill Hyatt, Paul Larson, Lou Magnarelli, Rich McAvoy, Tom McGowan, Katherine Winslow

Others present: Donna Ellis, Nancy Murray, Will Rowlands, Logan Senack, Dick Shaffer, Penni Sharp

1. Hyatt called the meeting to order at 2:04 pm.

2. The minutes for the 12/13/11 meeting were reviewed

A few typographical errors were noted and corrected. In addition, Senack proposed two additional changes to the minutes: on page 1, in section 3a paragraph 2, add “BEA” (Boating Education Assistant) to sentence 4, so that it reads “In 2011, the BEA program...”, and on page 2, in section 3a paragraph 3, delete the words “Together, BEAs and” at the start of sentence 5. Larson moved (second: Magnarelli) to accept the minutes as corrected. **The Council decided to accept the minutes as corrected.**

3. Follow-up discussion of proposal from Boating Division, Department of Energy and Environmental Protection (DEEP)

Hyatt recapped the discussion on this topic from the December meeting and distributed a document from DEEP Boating Division detailing the possible options to pursue to obtain funding to address aquatic invasive plants. The document described the 3 options regarding this plan from DEEP Boating:

1. New fee for Aquatic Invasive Species and abandoned boats (up to \$5 per CT registered boat; marine and inland boats.
2. Fee of \$3 per CT registered marine and inland boat; \$3 fee for out-of state inland boats; sticker for out-of-state boats.
3. Redirect revenues from boat registrations that were formerly provided to municipalities but now go to the General Fund. This proposal would redirect these funds to DEEP in order to fund the Waterways Maintenance Fund (including ANS work) and potentially other local law enforcement initiatives that would serve to benefit the towns.

The group discussed various aspects of these proposals, including the need to ensure that boaters were aware of or supportive of these changes, the importance of funding invasive aquatic species efforts, and whether or not DEEP could move forward with some options independently of the Council.

Hyatt asked the Council to prioritize its actions for this legislative year, including funding for the Coordinator position and this boating proposal. The group discussed whether or not to take on a second legislative issue and discussed the possibility of providing a letter of support for DEEP

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Boating's plans regarding funding for aquatic invasive species. McGowan suggested the Council provide a letter in support of option 3 (redirect existing funds) first, and note in the letter that if this option was unsuccessful, the Council would have to support another source of funding and advocate the necessity of the funds being allocated specifically for invasive aquatic plants.

Magnarelli expressed support for these options but highlighted the importance of focusing on the coordinator funding issue. He reminded the group of the need to prioritize the things that were most important to the Council directly. Additionally, Murray cautioned that the Council could still lend support to another issue but cannot be the primary promoter of it. McAvoy asked if any letter of support from the Council would need to include support of funding for abandoned boats too. Hyatt clarified that the Council would only speak in support of the proposals directly relating to the funding of invasive aquatic species.

Hyatt suggested the Council hold off acting on this item and revisit it pending further developments in the legislature. The Council could request an update from Matt Fritz (DEEP) at a later date where a support letter could be given if needed.

4. Report on mugwort (*Artemisia vulgaris*) invasive status (Ellis)

Ellis presented information on mugwort to the group. Mugwort is a non-native herbaceous plant that spreads predominantly by vegetative growth via the production of rhizomes. Ellis reported that mugwort is common in disturbed areas such as roadsides but has also been found in natural areas that are not in deep shade. Ellis provided distribution information about mugwort to the group, including a completed "Guidelines for Council Review of Species" form and photographs submitted by members of the Connecticut Invasive Plant Working Group (CIWPG).

Magnarelli asked for clarification on one section of the handout that said mugwort "may" reproduce and disperse by seed. Ellis responded that the plants do reproduce by seed, but this is rare, and rhizomatous growth is the primary means by which mugwort spreads. Magnarelli asked if the plants met the criteria for the definition of an invasive plant. Ellis clarified that she was not asking for a vote on this plant at this time, but that the plants did seem to be showing invasive characteristics. Hyatt asked if this plant was likely to invade only transiently. Ellis responded that she saw no evidence that the plants would be outcompeted or become less dense over time and that the reports she is receiving are mugwort populations in minimally managed habitats. Senack added that one of the dense populations in Ellis's report, at Quinnipiac River State Park, has been present for a number of years and does not seem to be dying out or being replaced by other species.

Murray and Sharp will ask the Connecticut Botanical Society and the New England Wildflower Society to look for this species.

McAvoy asked if mugwort was more likely to spread than bamboo. Murray reported that mugwort was much more likely to spread than bamboo, especially through accidental or unintentional means. Hyatt asked about the native range of the species. Ellis answered that the species is native to Eurasia. The group discussed the flowering habits of the species and other factors.

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Ellis will continue to collect information and will present new findings from the 2012 field season at a Council meeting in the fall.

a. “Guidelines for Council review of species” organization sheet

Senack distributed copies of the form originally designed by the Council to organize incoming requests for the new listing of a species. Ellis explained that she used this document to prepare her information and presentation.

5. Bamboo

a. Connecticut Nursery and Landscape Association (CNLA) position on informing customers about bamboo (Larson)

Hyatt asked if Larson was able to provide any updated information on CNLA’s position and activities related to bamboo. Larson reported that CNLA was discussing working on a document that could be provided to members for use at points of sale. Hyatt asked if this was something that was on the agenda of a CNLA meeting. Larson responded that a new Board had recently been elected and was just getting started. Hyatt asked if the Council should wait on hearing from CNLA for further action. Larson suggested that Bob Heffernan (CNLA executive secretary) was going to be following up on this as there seemed to be broad support of moving forward on this at the meeting, and added that another aspect of this project is educating retailers about issues concerning bamboo.

Hyatt suggested that CNLA may want to consider a more proactive approach such as recommending warning labels on individual bamboo plants. Larson will contact Heffernan for additional information.

McAvoy asked if potential CNLA action on this item would be ready for this year’s growing season. Larson reported that he thinks the goal is to have this ready by the end of April.

Winslow asked if Heffernan could report to the group in March regarding progress on this issue. Larson will request that Heffernan present an update at the March meeting on this topic.

b. Text of Delaware town ordinance for discussion (Murray)

Murray reminded the group that there was a question of how to respond to towns with questions about bamboo, and that a property owner in Connecticut had submitted a large amount of information about bamboo, including the text of an ordinance from a town in Delaware that prohibited the planting of bamboo without proper barrier/containment & setback. Hyatt noted that CT municipalities could do likewise and asked the group to discuss and decide on the circumstances where this information could be provided to towns and how the Invasive Plants Council, DEEP, and others should answer inquiries on this topic.

Murray noted that although bamboo is not being treated as an invasive plant, many people are still being impacted by it, and the state should be working on information to protect its citizens. Murray also added that the Council and DEEP can continue researching whether or not bamboo is invasive while undertaking other actions.

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McGowan asked if DEEP could act independently of the Council on this issue by putting information relating to bamboo control and laws up on their website. Hyatt stated that DEEP could act independently but prefers to work collaboratively with the Council. Hyatt further noted that there was a big difference in approach between providing this information only in response to specific requests vs. proactively sending it out to towns.

Winslow suggested a multifaceted approach: DEEP could respond by providing the information on request while the Council continued to research bamboo and while CNLA moved forward on preparing their recommendations. The group continued to discuss this issue. McAvoy added that if the focus of the response to an inquiry was education, then the response should include all options and information, including information about herbicide control, other controls, and the legal information about town ordinances.

Hyatt noted that there seemed to be clear agreement that the Council should not be advocating to towns that they pass their own ordinances. However in response to inquiries, this ordinance information could be provided as part of the inquiry response. Ellis added that the CNLA materials, when complete, would be provided at the point of sale of the plants. Larson added that the CNLA board's position would be to encourage all members to provide this information to customers, and include it on the industry website.

Hyatt noted that a strong incentive for the industry to take aggressive action on this issue is the possibility that disgruntled landowners could advocate for town ordinances.

6. Review of draft PowerPoint and discussion of legislative presentation

Hyatt explained the upcoming potential legislative update and shared a draft of the presentation with the group. The group discussed the presentation and provided feedback and edits. Senack will make the requested edits and will work with Murray and Hyatt to reduce the length of the presentation and make sure all items are relevant.

The group discussed the importance of making sure legislators could attend the event. The group discussed inviting the entire Environment Committee, and Magnarelli reminded the group of the importance of inviting the Appropriations Committee as well. Winslow suggested that other groups, such as the Federated Garden Clubs of Connecticut and the Garden Club of America, might also be interested in supporting this proposal. Hyatt will seek further advice from DEEP's legislative liaison.

7. Old/new business

a. Dredging at Hartford flood control ponds update water chestnut (*Trapa natans*) (Murray)

Murray reported that Supplemental Environmental Project (SEP) funds were used to continue water chestnut control at the flood control ponds along the Connecticut River in East Hartford. After two years of control have been conducted, the area will be dredged since it has started to fill in.

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b. Press release for annual report

Senack reported that Heffernan had suggested that a press release could be developed to highlight the publication of the 2011 Invasive Plants Council annual report.

Magnarelli noted that this might provide an opportunity for better exposure of the Council's work. The group discussed the potential benefits of preparing a press release. Senack will coordinate with DEEP to prepare a press release for distribution in a few weeks.

8. Adjournment

Winslow moved (second: McGowan) to adjourn the meeting. **The Council decided to adjourn at 4:07 pm.**

The next meeting is scheduled for Feb. 14, 2012 at the Department of Agriculture in Hartford, CT.

MINUTES

Invasive Plants Council
Tuesday, February 14, 2012
2 pm, Dept. of Agriculture
Conference Room G8-A
Hartford, CT

Council members present: David Goodwin, Bill Hyatt, Paul Larson, Lou Magnarelli, Tom McGowan, John Silander, David Sutherland

Others present: Ellen Bender, Donna Ellis, Bob Heffernan, Nancy Murray, Logan Senack, Dick Shaffer, Penni Sharp

1. Hyatt called the meeting to order at 2:08 pm.

2. The minutes for the 1/10/12 meeting were reviewed.

The group discussed the minutes and two changes were proposed: Larson proposed changing the last sentence in section 5a first paragraph to read "...educating retailers about issues concerning bamboo." Goodwin recommended correcting the word "planning" to "planting" in section 5b first paragraph, line 4. Larson moved (second: Goodwin) to approve the minutes as corrected.

The Council decided to approve the minutes as corrected.

3. Legislative update preparations and information

Hyatt updated the group on the preparations for the legislative update. A date for the update presentation has not yet been determined. Sutherland met with the Department of Energy and Environmental Protection (DEEP) legislative liaison and will continue to work with DEEP and others on this issue. The group discussed the importance of making sure legislators could attend the update session and the need to clarify which Council members would be presenting which parts of the update. Hyatt will deliver the introductory material and Sutherland, McGowan, and green industry representatives will be involved in the other parts of the presentation.

Hyatt and DEEP will continue to work on the slides and speakers notes and will prepare a short handout that summarizes the presentation.

a. Enlisting non-governmental organizations (NGOs)

The group discussed the need to include NGOs in the presentation and the importance of having NGO support going forward. Important groups to contact would be the River Alliance, CT Audubon, CT Forest and Parks, individual lake associations, CT Federation of Lakes, CT Botanical Society, and the Federated Garden Clubs of Connecticut.

McGowan offered to contact lake associations and the CT Federation of Lakes.

Sutherland discussed the possibility of asking a legislator to propose a bill to directly fund the coordinator position. The group discussed the importance of the coordinator position in working with the Council and the importance of the Council in complying with state statutes, maintaining the invasive plant lists, and providing advice to the legislature on invasive plant issues.

Sutherland will explore the possibility of asking a legislator to propose a bill. There was consensus that getting a legislator to propose a bill to provide funding for the coordinator's position was more important than doing the presentation and that it accomplishes the objective of the presentation. Hyatt, Murray and Senack will work on shortening the slide presentation and preparing a summary sheet. Small meetings for key legislators may be the way to proceed if a bill is proposed.

b. Development of letterhead

Hyatt shared with the group sample letterhead produced by Senack. Hyatt would like to develop letterhead to more clearly identify the Council and make it clear that the Council is a multi-organizational group, not just DEEP or another state agency.

The group discussed possible uses for the letterhead and provided feedback on the design. Senack will create a revised letterhead based on this feedback.

4. Press release for Annual Report

Hyatt distributed a draft press release detailing the accomplishments of the Council as noted in the 9th annual Invasive Plants Council annual report. This press release would be for general distribution. Ellis and Sharp added that the CT Invasive Plant Working Group (CIPWG) could also distribute it to the CIPWG listserv of 700 email addresses. The group suggested adjusting the document to make it fit on one page.

Sutherland moved (second: McGowan) to approve the press release. **The Council decided to approve the press release.**

5. Old/New Business

a. Bamboo

Larson provided information from the CT Nursery and Landscape Association (CNLA), including sample draft tags providing information about the proper planting of bamboo. Larson explained that CNLA would try to have a local CT outlet produce the tags to alert customers about the proper planting of bamboo. Heffernan added that the artwork for the tags would be made available for retailers to use and that CNLA could do a contract for a label making company to make them and have an inventory of labels on hand for use. Hyatt asked for additional information about the CNLA position on this issue relative to its members.

Murray suggested clarifying on the tag that this is for running types of bamboo, not clumping types. Larson and Goodwin agreed that this was an important distinction. The group discussed the wording on the tags. Silander added that he was pleased to see the industry taking this kind of proactive approach.

Sutherland pointed out that there is a concept bill in the legislature regarding bamboo in Connecticut.

Hyatt asked for a copy of the tags to be sent to Senack and distributed to the group. CNLA will send out a copy when the tags have been finalized.

b. Bamboo: DEEP response to calls

Murray reported to the group regarding how DEEP plans to respond to incoming inquiries about bamboo: DEEP plans to report that the plants are not listed as invasive in CT and will continue to track reports of running bamboo in the Early Detection and Distribution Mapping System (EDDMapS; www.eddmaps.org). DEEP will also provide information about control and the proper installation and use of barriers if asked, and additional information including the language of the town ordinance used in Delaware that had been discussed at prior meetings. Murray noted that Caryn Rickel of Seymour has already begun entering bamboo records into EDDMapS.

Murray also reported that there was no response yet from Dr. Lynn Clark (Iowa State University) on the identification of the samples Murray submitted, and that Dr. Melissa Smith, post-doctoral researcher at Washington State University, will be visiting Connecticut in late February or early March to collect specimens.

c. New water chestnut population found

Murray reported that a large population of water chestnut (*Trapa natans*) has been found in a pond a few miles east of the University of Connecticut (Storrs, CT) that drains into the Mt. Hope River. Murray and DEEP will be investigating this situation further.

d. Invasive Plant Atlas of New England (IPANE) progress

Silander reported that IPANE has developed a full and formalized collaborative relationship with EDDMapS. IPANE will be moving forward with that agreement, which may benefit the long-term sustainability of the project.

6. Adjournment

Sutherland moved (second: Goodwin) to adjourn the meeting. **The Council decided to adjourn at 3:25 pm.**

The next meeting is scheduled for March 13, 2012, at the Department of Agriculture Building in Hartford, CT.

MINUTES

Invasive Plants Council
Tuesday, March 13, 2012
2 pm, Dept. of Agriculture
Conference Room G8-A
Hartford, CT

Council members present: Bill Hyatt, Paul Larson, Lou Magnarelli, Rich McAvoy, John Silander, David Sutherland, Katherine Winslow

Others present: Donna Ellis, Nancy Murray, Logan Senack, Dick Shaffer, Penni Sharp

1. Hyatt called the meeting to order at 2:00 pm.

2. The minutes for the 2/14/12 meeting were reviewed.

A typographical error was noted and corrected. Magnarelli moved (second: Silander) to approve the minutes as corrected. **The Council decided to approve the minutes as corrected.**

3. Status of legislative update and bill

a. Copies of House Bill 5413

Senack distributed copies of H.B. 5413, “An Act Concerning Invasive Plants” to the group.

Hyatt noted that DEEP had been asked for some additional information about the bill and added that it was important to clarify to all involved that the Department of Energy and Environmental Protection (DEEP) does not have funds in its budget to support the coordinator position in the next fiscal year. The only way DEEP was able to provide temporary, short-term funding support in past years was by using end-of-the-year funding from unfilled vacancies; those vacancies have been eliminated and budgets reduced such that there are no funds at DEEP that can be used for this position.

Hyatt added that the University of Connecticut College of Agriculture and Natural Resources (UConn) is the appropriate place for the coordinator position, considering the strong and important focus of the coordinator on outreach efforts and public education. Additionally, Hyatt clarified that it was his understanding that UConn did not have any money available for this purpose either. Funding always had come through DEEP in past years, either from legislatively-designated Invasive Plants Council funds or from DEEP end-of-the-year monies, so direct funding allocated by the legislature to UConn is necessary. The group agreed that UConn is the appropriate place for the Coordinator position and discussed the funding issue further.

Paul Larson arrived at 2:12 pm.

b. Organizations providing testimony

Hyatt reported that DEEP has prepared testimony in support of this bill, but it is not certain whether it will be submitted.

Larson reported that the Connecticut Nursery and Landscape Association (CNLA) planned to submit testimony in support of the bill. McAvoy, Silander, and Winslow reported that their organizations may also submit testimony. Ellis reported that the Connecticut Invasive Plant Working Group (CIPWG) may submit testimony pending approval through UConn. Sharp added that the Connecticut Botanical Society and/or the Connecticut Association of Wetland Scientists may submit testimony, and Murray reported that the Connecticut Department of Transportation may also submit testimony. A number of other organizations are considering submitting testimony.

The group discussed the direction the bill would take if it passed in the Environment Committee. Magnarelli highlighted the need for constituent involvement and Appropriations Committee support if the bill was going to pass.

c. Review of testimony: key points to make

The group discussed the draft Invasive Plants Council testimony and proposed changes and edits. The importance of prevention activities, early detection, and the costs associated with species invasion were emphasized. Senack will incorporate the changes and redistribute to the group. The group discussed the importance of having someone deliver the testimony in person, if possible.

Silander added that states like Montana, with a population much smaller than that of Connecticut, spend millions of dollars per year on prevention efforts (excluding control, management or outreach efforts on invasives). Murray reported that the Aquatic Nuisance Species groups she corresponds with in other states have also reported that they spend much more than Connecticut does on invasive plant issues.

4. Handout for legislators and other interested parties

- Review draft developed from PowerPoint

The group discussed the need to provide additional information to the legislature and others regarding invasive plants, the Council, and the importance of the coordinator position. The group discussed a summary handout prepared after discussion at the February meeting. Senack will re-distribute the revised copy to the group. The group discussed submitting the handout as an attachment with the testimony and decided to include the attachment. Magnarelli reminded the group of the need to keep the testimony short and to the point.

5. Old/New Business

a. Press release for annual report released

The press release regarding the Invasive Plants Council 2011 annual report has been released via DEEP. Senack distributed copies of the press release. The story was included in some local newspapers and was posted on the DEEP website. The press release will also be posted on the CIPWG website.

b. Coordination with Invasive Plant Atlas of New England (IPANE)

Silander reported that IPANE was preparing at least one spring training session on invasive plants in Connecticut. Silander asked if Senack would be able to assist with this effort. Senack will contact IPANE staffer Sarah Treanor to discuss possible training sessions on IPANE, Connecticut early detection species, and reporting species using the Early Detection and Distribution Mapping System (www.EDDMapS.org).

c. Letterhead developed

Senack incorporated the comments from the discussion on the letterhead at the last meeting and shared the revised letterhead with the group. Based on comments from the group, Senack will modify the letterhead with the CIPWG/Invasive Plants Council website link, the Coordinator's contact information and customizable fields to allow members to edit the letterhead as needed.

d. Water chestnut in eastern CT update

Murray provided an update on the new population of water chestnut found in a lake in eastern CT. She will be contacting the landowners around two other lakes near the lake with water chestnut. In addition, she plans to get volunteers to do a pulling party and will work with people from Joshua's Trust to hold a meeting to organize this. Murray reported that there will also be surveys of other nearby water bodies.

e. Status of bamboo legislation

Senack distributed copies of the Invasive Plants Council testimony provided on H.B. 5122, "An Act Regulating the Growth and Sale of Bamboo". Hyatt noted that the Invasive Plants Council did not initially plan to submit testimony on this bill, but reported that Representative Len Greene specifically requested that the Council provide information about its actions regarding bamboo.

Murray reported that she did receive a response from Dr. Lynn Clark (Iowa State University); the samples submitted were not identifiable to species. Murray also reported that Dr. Melissa Smith (Washington State University) had changed her travel plans and would not be visiting Connecticut to collect samples, but that samples could still be submitted via mail for DNA analysis.

f. Connecticut Agricultural Experiment Station (CAES) representative

Magnarelli announced that Dr. Jeff Ward would be representing CAES on the Council after the end of the year. Major construction projects at a number of CAES facilities and other duties will not permit Magnarelli to attend regular meetings, but he will still be actively interested in the activities of the Council.

Sutherland arrived at 3:16 pm.

g. Delivery of testimony at March 16 hearing

Sutherland reported that he may or may not be able to speak on behalf of the Council to provide testimony in support of H.B. 5413. He suggested another Council member deliver testimony.

h. Other issues

- Senack will work with DEEP staff to find out when votes on H.B. 5413 are occurring and will notify the Council as soon as possible.

- The group discussed whether the local garden clubs might be interested in submitting testimony and the need for the bill to have broad support in the legislature. The group noted that several legislators had been supportive of invasive plant issues in the past, and that the Grants to Municipalities for the Control of Invasive Plants Program offered by

DEEP in 2008/2009 had received \$978,903 in funding requests, with \$631,334 offered by municipalities in matching funds, when only \$175,000 was available. Of the 10 projects proposed for funding, only 3 were able to be funded due to the funding loss associated with the deteriorating economy.

- Hyatt reported that an email had just been received from Tom McGowan indicating that Larry Marsicano would be submitting testimony on behalf of the CT Federation of Lakes, and may be appearing in person to deliver the testimony at the hearing.

6. Adjournment

Sutherland moved (second: Winslow) to adjourn the meeting. **The Council decided to adjourn at 3:30 pm.**

The next meeting is scheduled for June 12, 2012, at the Department of Agriculture Building in Hartford, CT.

MINUTES

Invasive Plants Council
Tuesday June 12, 2012
2 pm, Dept. of Agriculture
Conference Room G8-A
Hartford, CT

Council members present: Bill Hyatt, Paul Larson, Lou Magnarelli, Rich McAvoy, Tom McGowan, John Silander, Katherine Winslow

Others present: Ellen Bender, Donna Ellis, Nancy Murray, Caryn Rickel, Logan Senack

1. Hyatt called the meeting to order at 2:03 pm.

2. The minutes for the 3/13/12 Council meeting were reviewed.

Silander moved (second: Magnarelli) to approve the minutes. **The Council decided to approve the minutes as submitted.**

3. Presentation by Caryn Rickel

Caryn Rickel of Seymour, CT delivered a presentation about bamboo in Connecticut. Rickel has been compiling a list of sites where bamboo is growing since 2010. Rickel presented photos and additional information about bamboo occurrences in towns including Milford, New Canaan, New Milford, Newtown, Orange, Southbury, and Woodbury.

Paul Larson and Tom McGowan arrived at 2:09 pm.

Silander added that he joined Rickel for a site visit last Sunday to Orange, CT and observed a bamboo planting that was spreading into a forest understory area.

Dave Goodwin arrived at 2:21 pm.

Rickel was concerned that the recommendations for containment on the CNLA bamboo tags may not be adequate to prevent spread of the bamboo from the planting site and that the recommendations for control via herbicides may not be effective. Rickel also expressed concerns that bamboo was frequently sold online and advocated that some species, such as *Phyllostachys aureosulcata* (yellow groove bamboo), be prohibited from sale in the state. She also answered questions from the group. Hyatt thanked Rickel for her presentation and the information she provided.

4. Legislative debriefing and Invasive Plant Coordinator position

Hyatt thanked Bob Heffernan, Linda Kowalski, and David Sutherland for their efforts in obtaining funding for the Invasive Plants Coordinator position. \$90,000 has been approved for continuing the position. The language in the original Appropriations Committee budget indicated that the position would remain at UConn.

5. Update on Senack activities

Senack distributed finalized copies of the Guidelines for the Disposal of Terrestrial and Aquatic Plants to the group. Copies have been printed and are available for distribution. Both guides are also available on the Connecticut Invasive Plant Working Group website at www.hort.uconn.edu/cipwg.

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Senack reported that there are two new mile-a-minute sites this year: one in Prospect, CT and one in Madison, CT. Hyatt asked about the possibility of control at both locations. Senack reported that both populations were small but that it is very likely there are other plants nearby as the populations have been present since at least 2011, or earlier.

6. Outdoor burning of invasives

Winslow reported that the Department of Agriculture is seeking clarification from the Invasive Plants Council about the burning of invasives in brush piles in the state. The group discussed burning options, including slash-and-burn, targeting flame weeding, and burning piled material. The Guidelines for the Disposal of Terrestrial and Aquatic Plants documents provide information for all groups regarding state laws for open burning, permits required, and health and safety considerations.

7. Old/New business

a. Bamboo

Genetics: Murray reported on the status of the genetic testing being conducted at the University of Washington by Dr. Melissa Smith. Plant material from 8 to 10 populations in Connecticut has been sent to Dr. Smith and viable DNA has been extracted. The project is still in progress. Murray highlighted the fact that these species were extremely difficult to tell apart and noted that the group was taking the required steps for proper identification of species. In addition, Murray reported that specimens from these populations will be deposited at the UConn Herbarium.

Winslow asked if the specimens and populations mentioned were the same sites as those found in Rickel's presentation. Some populations are the same, and some are different.

Rickel added that other species besides *Phyllostachys aureosulcata* (yellow-groove bamboo) are less common and therefore she recommended that they should not be listed. Rickel has sent Dr. Smith an additional 8 specimens from a variety of locations in the state. Silander added that presumably the group will have some sort of update on the bamboo genetics at the next meeting in September.

Site visit reports (DEEP/UConn): Hyatt updated the group on a bamboo visit to properties in Waterbury with Murray and Senack. A large patch of bamboo is spreading onto several neighboring properties.

Hyatt discussed compiling a list of contractors willing to remove bamboo. Heffernan requested this information from growers and others through a CNLA Update and is assembling a contractor list for bamboo removal and control. Only one response has been received so far. Heffernan noted there was not much concern over bamboo until recently, and so landscape professionals may not have previously been asked to remove this plant. Silander added that one other company that may be involved with bamboo removal could be Invasive Plant Control, based in Tennessee.

Rickel added that she feels landscapers do not really know how to deal with this plant and that some landscapers say that they need multiple years for control. Rickel also voiced concerns that some landowners were calling unlicensed people to do removal of bamboo. McAvoy reminded the group that nursery owner Mike Johnson had conducted some

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research in controlling bamboo with various herbicides and had found control to be very successful. Senack noted that other sources had also indicated that bamboo control via herbicide use may be possible.

Larson and Magnarelli reminded the group that the Connecticut Agricultural Experiment Station will be planting some bamboo on their properties, experimenting with barriers, herbicide applications, and measuring growth rates. Heffernan wondered if it would be possible to offer control training for landscapers or if Mike Johnson should be invited to discuss bamboo control with the Council. Murray reminded the group that homeowners may want non-chemical control options as well. Senack added that eradication of any difficult-to-control plant may take more than one year.

Senack reported that he worked with Ellis and Murray to visit several bamboo sites in April and collected specimens and material for DNA analysis.

Bamboo field trip: Hyatt suggested that the group set up a field trip to see some areas where bamboo was growing into unmanaged habitats and locations where it is causing property damage. Senack will set up a bamboo field trip for the group.

Murray added that she is still giving out information on town ordinances and provided this information at the Waterbury site. Hyatt reported that Senack had asked the DEEP legal department about possible issues with bamboo being killed across property lines due to systemic herbicide application. The report back was that there was no clear answer.

Winslow reminded the group that state law preempts towns from restricting the sale of a plant if the plant is on the state invasive plant list.

b. Water chestnut

Murray reported that she and others from DEEP worked with federal staff to remove water chestnut from the West Thompson flood control reservoir. The group will return in a few weeks to monitor the site and remove any additional plants. The plants removed were only vegetative at this time. McGowan reminded the group that in 6 years of aquatic vegetation surveys, only one plant in each of 2 years had been found at Lake Waramaug, and the plants found were nowhere near the boat launches. Silander noted that this dispersal could be due to birds. Murray reported that another location for water chestnut is in Mansfield, CT at McLaughlin Pond. Murray will be visiting the site with Dr. Don Les (UConn) and will also check other waterbodies nearby.

Hyatt reported that water chestnut control projects have been very successful so far, but small populations do frequently arise. He noted that a vigilant public is a major help in identifying new locations. The group discussed water chestnut seed viability and other topics.

c. Mugwort and wavyleaf basketgrass presentations in September

Ellis will provide the group with an update on mugwort (*Artemisia vulgaris*) and Senack will provide the group with a report on wavyleaf basketgrass (*Oplismenus hirtellus ssp. undulatifolius*) at the September meeting.

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d. Invasive Plant Symposium

Ellis informed the group that the Connecticut Invasive Plant Working Group will be holding an Invasive Plant Symposium on Thursday, October 25, 2012. Ellis invited the group and encouraged the Council members to distribute information about the event within their organizations. She added that Pesticide Certification Credits and other Continuing Education Credits will be offered.

e. Other topics

i. Invasive Species Advisory Committee (ISAC) update

Hyatt provided an update about topics from the recent meeting of the Federal Invasive Species Advisory Committee. The committee discussed building consensus on how to move forward for better funding of invasive species efforts at the national level. A Memorandum of Understanding is circulating for comment between the Department of Interior, the pet industry, and state agencies involving a collaborative non-obligatory approach to reducing the impacts of invasives, particularly fish in the aquarium trade.

Hyatt also reported that Oregon passed a law to take coal-fired power plants offline. The plan calls for converting their largest power plant to run on biofuels, and would use giant cane (*Arundo donax*) as the plant material. Hyatt noted that giant cane is considered an invasive species in parts of the west coast. 90,000 acres of fruit and food production would be instead planted with giant cane to produce enough charcoal for the power plant. Large areas of the northeast are also targeted for biofuel development in the current Farm Bill.

ii. Phosphorus and weed growth in lakes

McGowan reported on progress in restricting phosphorus in established yards and noted that excess phosphorus ending up in lakes contributes to the growth of weeds and invasive plants. McGowan noted that this could be a potential educational idea or opportunity for something that could go through either DoAg or the Invasive Plants Council to address phosphorus. Goodwin reported that many companies have been taking phosphorus out of their fertilizer formulations. The group discussed this issue.

iii. IPANE app available

Silander reported that the Invasive Plant Atlas of New England (IPANE) now has an iPhone and Android app. The app, called "IPANE", allows users to report populations of invasive plants with photos and GPS locations to a public website where that information can be viewed.

8. Adjournment

McGowan moved to adjourn (second: Larson) the meeting. **The Council decided to adjourn at 3:30 pm.**

The next meeting is scheduled for September 11, 2012, at the Department of Agriculture Building in Hartford, CT.

8/6/12 note: This meeting has been rescheduled to September 18, 2012. -LS

MINUTES

Invasive Plants Council
Tuesday September 18, 2012
2 pm, Dept. of Agriculture
Conference Room G8-A
Hartford, CT

Council members present: David Goodwin, Bill Hyatt, Paul Larson, Tom McGowan, David Sutherland, John Silander, Jeff Ward, Katherine Winslow

Others present: Ellen Bender, Donna Ellis, Bob Heffernan, Mike Johnson, Nancy Murray, John Nassif, Dick Shaffer, Penni Sharp, Logan Senack

1. Hyatt called the meeting to order at 2:05 pm.

2. The minutes for the 6/12/12 meeting were reviewed.

Ellis provided a suggested change on behalf of Rich McAvoy: in section 3, change second sentence to read: "Since 2010, Rickel has been compiling a list of sites where bamboo is growing in the state". Winslow recommended changing the wording in section 7a, paragraph 3, first sentence to read: "Rickel added that other species besides *Phyllostachys aureosulcata* (yellow groove bamboo) are less common and therefore she recommends they should not be listed."

Winslow moved (second: Larson) approved to accept the minutes with the corrections. **The Council decided to approve the minutes as corrected.**

Dave Sutherland arrived at 2:09 pm.

3. Bamboo presentation- Mike Johnson of Summer Hill Nursery

Hyatt introduced Mike Johnson of Summer Hill Nursery in Madison, CT. Johnson spoke to the group about his experiences with bamboo over the past twelve years and his experience as a nursery grower over the past 50 years. He detailed several different genera and species of bamboo, including clumping and running types, and noted that some running types are small, low growing ground covers that do not behave in the same way as the larger running types. Clumping bamboos also do not spread in the same way that running bamboos do, but are not suitable for all areas, especially areas in full sun, and are slow to gain height. Bamboo is avoided by deer.

Johnson reported that there are not many known instances of bamboo spreading by seed in this area and that bamboo seeds may not always be viable. He also noted that in his opinion it was not likely that bamboo would spread by water. He discussed various containment systems and recommended that a 36-inch plastic 60-mil barrier be planted 34 inches into the ground around the bamboo with two inches protruding above the soil surface for the best containment. All containment systems must be maintained and rhizomes that are growing over the top should be cut back yearly.

Johnson also discussed his experiences using glyphosate-based products to control bamboo and has had success with cutting followed by two applications of herbicide over a year. He noted that the time period of the year was important in the treatment of the plants and that applications in the late summer or fall were more likely to be successful than applications in the spring.

Ward added that the CT Agricultural Experiment Station will be doing an experiment along Route 15 to test the translocation of herbicides in bamboo.

Johnson reported that in his opinion, the problem is not bamboo. He feels the problem is people and made the distinction that bamboo has to be planted in order to appear in Connecticut—it does not appear on its own. Johnson added that he felt the solution was to educate people, especially since bamboo is fairly new to the trade. People need to be educated on how to handle them, what varieties to use, where to use them, and how to use them. He also reported that *Phyllostachys aurea* may not be hardy in CT and answered questions from the group. Johnson estimated that approximately 3% of his total sales are of bamboo and two-thirds of those bamboo sales are of the running types of bamboo.

Murray added that labeling the plants would be important so that if any homeowner were to buy the plant, they would know what to do with it. Johnson agreed but noted that his nursery is wholesale only, so they sell to landscapers and land managers and not the general public.

Hyatt thanked Johnson for sharing this information with the group.

4. Bamboo

a. Invasive Plants Council site visits

Senack summarized the Invasive Plants Council bamboo field trip that took place on August 16. Council members Bill Hyatt, Rich McAvoy, Jeff Ward, and Katherine Winslow visited 4 bamboo sites in Waterbury, Newtown, and Woodbury. The group discussed the field trip site visits.

b. Visits to Orange and Bozrah, CT

Senack visited a site where bamboo was growing in Orange, CT. The site had been visited previously by Silander. The planting, which spread from a yard, has grown into the surrounding wooded areas which are more shaded. The homeowner is concerned about the potential for property damage.

Senack also visited a site where bamboo was growing in Bozrah, CT. The planting had spread against the side of the house, and plants had grown up between the siding and the house walls and had emerged along the edge of the roof.

c. Report on genetics information

Senack reported on the results of the genetics/DNA testing of selected bamboo specimens by Dr. Melissa Smith at Washington State University. Murray and Dr. Smith had been in contact for the past several months to arrange and coordinate the testing. Dr. Smith found that many of the populations would appear to be *Phyllostachys aureosulcata* (yellow groove bamboo), while a few populations are likely to be from another species such as *P. aurea*. 7 samples were sent from DEEP and were tested. 5 samples matched *P. aureosulcata* in all 4 genetic markers. 2 sites did not match the rest and were more suggestive of *P. aurea*. Dr. Smith would need to conduct additional tests with at least 4 additional primers at substantial cost to find a more definitive result.

d. Council action on bamboo

Hyatt summarized the status of other Council bamboo actions, discussions, presentations, and legislative issues relating to bamboo in Connecticut.

Hyatt moved (second: Sutherland) that the bamboo species *Phyllostachys aureosulcata* (yellow groove bamboo) be added to the Council's list of potentially invasive plants. The group discussed this motion. Ellis provided comments from Rich McAvoy regarding the impacts of listing or not listing this species. Goodwin emphasized the need for plants that were to be listed to meet the criteria as stated in CGS §22a-381b. The Council reviewed the criteria for listing as provided in CGS §22a-381b. Winslow shared with the group a USDA Weed Risk Assessment for yellow groove bamboo (*Phyllostachys aureosulcata*), published August 20, 2012. Ward expressed concern that he had not been accurately quoted in the report and that he had provided corrections to the USDA group working on the report.

A roll call vote was conducted:

Bill Hyatt- nay

Jeff Ward- nay

Paul Larson- nay

Tom McGowan- nay

Dave Sutherland- nay

Katherine Winslow- yes

John Silander- yes

Dave Goodwin- nay

The vote was 2 for, 6 against. The motion to list *Phyllostachys aureosulcata* (yellow groove bamboo) as a potentially invasive plant failed. Winslow asked Hyatt for clarification on why he voted against the motion. Hyatt responded that based on the information and field visits he did not believe that criteria number #5 (“under average conditions, the plant has the biological potential for existing in high numbers outside of habitats that are intensely managed”; CGS §22a-381b[5]) had been met.

Hyatt moved (second: McGowan) that the Invasive Plants Council, while recognizing that yellow groove bamboo (*Phyllostachys aureosulcata*) and other species of running bamboo in the genus *Phyllostachys* do not meet the criteria for invasive or potentially invasive plants as set forth in CGS §22a-381b, does recognize that said species have caused significant damage to residential properties, and, as such, is supportive of legislation that aims to prohibit the importation and sale of these plants in Connecticut.

McGowan moved to amend this motion with alternate wording. **The motion to amend the wording failed due to lack of a second.** The group discussed possible ways of re-wording and clarifying some aspects of this statement. Sutherland and other members expressed concern about various bamboos, and noted that the Council could re-evaluate whether or not to list bamboo species as needed in the future. Goodwin stated that the Council should limit their actions to what the statutes allow. **Goodwin moved (second: McGowan) to table the motion about yellow groove bamboo to the next meeting. The group decided to postpone this motion to the next meeting.**

5. Mugwort and Wavyleaf basketgrass presentations

The group decided to postpone discussion on mugwort (*Artemisia vulgaris*) and Wavyleaf basketgrass (*Oplismenus hirtellus* ssp. *undulatifolius*) to the next meeting.

6. Invasive Plant Coordinator position update

a. Funds transferred from Ag to UConn

Hyatt summarized actions that had been taken to continue to fund the Invasive Plant Coordinator position at UConn to date. Ellis reported that funding had been transferred from the Department of Agriculture for this purpose.

Ellis asked what the necessary reporting requirements would be for the funding from the Department of Agriculture (DoAg). Winslow responded that she wasn't sure. Sutherland asked if the position was in the state budget going forward. Hyatt will ask George Krivda at DoAg to clarify both items.

Sutherland asked that he and Bob Heffernan be kept informed about the status of the position in the budget.

Goodwin left the room at 4:02 pm.

b. Workplan/deliverables

Senack distributed the project workplan for the Invasive Plant Coordinator position for the upcoming year and asked for comments from the group. Winslow and Ward suggested various edits. These edits will include clarifying that recommendations regarding the Invasive Plant List would be provided to the Invasive Plants Council, re-titling sections for greater clarity, and additional minor changes. These edits will be incorporated into the document.

Ward left the room at 4:10 pm.

Larson left the room at 4:10 pm.

c. Mile-a-minute vine report

Senack distributed a map of the known distribution of mile-a-minute vine (*Persicaria perfoliata*) in Connecticut. Mile-a-minute vine is now known to be present in at least 29 towns in Connecticut, and is present at multiple locations within many towns. Senack also reported that the biological control agent, a beneficial weevil first introduced in 2009, has been spreading throughout the state and is now present at several new locations.

7. Annual Report

Senack reported that in past years, the invasive plant list has been updated in October, and the draft cover letter from the Chair has been presented by November. Items to be included in the annual report should be sent to Senack in advance of the November meeting.

8. Old and new business

New Business: Hyatt requested that new business be postponed until the next meeting.
Paul Larson entered the room at 4:15.

Old business: Ellis reminded the group about the upcoming CIPWG invasive plant symposium at UConn on October 25.

9. Adjournment:

Hyatt moved (second: Larson) to adjourn the meeting. **The Council decided to adjourn at 4:15 pm.**

The next meeting is scheduled for October 9, 2012, 2-4 pm, in room G8-A at the Department of Agriculture building in Hartford, CT.

MINUTES

Invasive Plants Council
Tuesday October 9, 2012
2 pm, Dept. of Agriculture
Conference Room G8-A
Hartford, CT

Council members present: David Goodwin, Bill Hyatt, Paul Larson, Rich McAvoy, Lou Magnarelli, John Silander, Dave Sutherland

Others present: Ellen Bender, Donna Ellis, Bob Heffernan, Nancy Murray, Jim Paidas, Caryn Rickel, Enilda Rosas, Logan Senack, Penni Sharp

1. Hyatt called the meeting to order at 2:03 pm.

Hyatt reported that all State Forest Management Plans now include an invasive plant component and provided copies for the group to review.

2. The minutes for the 9/18/12 meeting were reviewed.

Sutherland moved (second: Larson) to approve the minutes as submitted. The Council decided to approve the minutes as submitted. Magnarelli and McAvoy abstained since they were not present at the last meeting.

3. Species introductions and discussions

a. Mugwort- Donna Ellis

Ellis presented an update on her January 2012 presentation to the group on mugwort (*Artemisia vulgaris*) and provided a handout. The updated included additional reports on the presence of this species in Connecticut (at least 70 locations in natural areas distributed across 7 of 8 counties). Ellis noted that the reports she included were not intentionally planted. Several land managers who reported the plants also stated that the stands have been present for many years. The group discussed the species and whether or not it met the given criteria for an invasive plant. Main points of the discussion were how often the plants produced seeds, mode of dispersion, and invasion into natural areas. Mugwort may not be a preferred food source for deer. Ellis asked the group to consider listing this species as potentially invasive in Connecticut.

Silander reported that he had seen this plant in eastern Russia last week on a trip and noted that populations did cover many acres. He also reported that related plants in the same genus are allelopathic. The group discussed the differences between listing a plant as potentially invasive or invasive according to the criteria.

Sutherland moved (second: Silander) to list mugwort (*Artemisia vulgaris*) as potentially invasive on the Connecticut Invasive and Potentially Invasive Plant List. The group discussed genetic techniques and other methods that could be used to determine the level of reproduction by seed, and the tendency of this plant to hitchhike in nursery crops.

A roll call vote was conducted: Goodwin, no; Hyatt, yes; Larson, no; McAvoy, yes; Magnarelli, no; Silander, yes; Sutherland, yes. The vote was 4 for, 3 against. The motion to add mugwort (*Artemisia vulgaris*) to the Connecticut List as a potentially invasive plant passed.

McAvoy noted that the plant has a high potential for inadvertent spread. Larson, Goodwin and Magnarelli asked for more information on seed production of the plants. Hyatt asked Ellis and Senack to provide more information on seed production at a future meeting.

b. Wavyleaf basketgrass- Logan Senack

Senack presented information to the group about a potential new invader, wavyleaf basketgrass (*Oplismenus hirtellus* ssp. *undulatifolius*). The plant was first found in the continental US in 1996 in Maryland and has since spread to locations in Maryland, Washington, DC and Virginia. Senack provided copies of a June 2012 Weed Risk Assessment from USDA-Plant Protection and Quarantine (PPQ). The USDA-PPQ report lists basketgrass as “high risk” for 30% of the United States. An additional report from the New York Invasive Species Council lists wavyleaf basketgrass as “high risk” for New York State. The plant also produces sticky awns, allowing the seeds to be picked up and spread by anything that brushes against the plant. The viability of seeds may be up to 97%. The plant would be hardy in all or most of Connecticut. Hyatt asked to review this plant annually if it was not listed this year. **Silander moved to list wavyleaf basketgrass as a potentially invasive plant. The motion to list basketgrass as a potentially invasive plant failed due to lack of a second.**

4. Bamboo

a. Site update

Senack updated the group on the status of a bamboo location in Bozrah, CT. The homeowners requested information about barriers and companies available for bamboo control.

b. Update of Contractor List

The group discussed the contractor list. The list includes 3 companies that report they are available for bamboo control. Heffernan and Senack will coordinate on distributing the list.

c. Continuation of Council discussion

Rickel provided the group with information about new bamboo laws in other states and suggested that any Connecticut law should include a minimum 10-foot setback from property lines for planting bamboo. Rosas reported that bamboo has invaded her yard from an adjacent property and that a quote for control from a landscaper for chemical control, barriers, yard excavation and other work exceeded \$20,000. Rickel shared a rhizome from Paidas’s location.

Hyatt summarized bamboo actions taken by the Council to date and the motion regarding bamboo that had been tabled at the last meeting. **Hyatt asked to withdraw the motion regarding recommended legislative action on bamboo that was proposed at the September meeting. There were no objections. The Council decided to withdraw the motion.**

The group discussed language for a new motion. Sutherland and Larson distributed potential new wordings. The group discussed the past Council vote on bamboo as well as liability for plants planted prior to purchase of a property, real estate disclosure laws, property damage, and potential burdens on people who sell bamboo.

Sutherland moved (second: Silander) that the Council approve the following language:

“The Connecticut Invasive Plants Council, while recognizing in a split vote on Sept. 18, 2012, that yellow groove bamboo (*Phyllostachys aureosulcata*) and other species of running

bamboo in the genus *Phyllostachys* do not meet the criteria for invasive or potentially invasive plants as set forth in CGS §22a-381b, does recognize that said species have demonstrated the potential to cause significant damage to residential properties when not properly installed and maintained. The Council is therefore supportive of legislation that 1) requires sellers and installers of bamboo in the genus *Phyllostachys* to provide to the retail customer educational material on the growth habit of the plant and how to properly contain the plant, 2) requires property owners to install proper containment for any planting of bamboo in the genus *Phyllostachys* when such planting is within 100 feet of any abutting property or public right-of-way, and 3) addresses situations in which property owners fail to prevent the spread into neighboring properties.”

A roll call vote was conducted: Goodwin, yes; Hyatt, yes; Larson, yes; McAvoy, yes; Magnarelli, yes; Silander, yes; Sutherland, yes. The vote was 7 for, 0 against. The motion to provide a recommendation to the legislature as worded above passed unanimously.

5. Announcement from CNLA regarding Euonymus

Heffernan updated the group on CNLA actions regarding winged euonymus (*Euonymus alatus*; burning bush). The University of Connecticut (Dr. Yi Li, Dr. Mark Brand) has been researching winged euonymus and Japanese barberry (*Berberis thunbergii*) for several years. This research is ending and is being published in scientific journals. Heffernan reported that the research shows that some cultivars are more invasive than previously thought. In addition, Dr. Li’s triploid, sterile euonymus research has been successful and plants are being established. In response to this research, CNLA growers met and decided unanimously that as soon as Dr. Li’s euonymus is ready, there will be no further production of other cultivars. Dr. Li estimates that the new triploid euonymus will be ready in approximately 3 years. Dr. Brand’s research examined 10 to 20 cultivars and found that they were more invasive than previously believed. The University may receive royalties from sales of the new plant. Silander reported that Dr. Li’s successful euonymus technique has not been as successful for Japanese barberry.

6. Annual report

Senack reminded the group that submissions for the annual report need to be received in advance the November meeting. The cover letter from the Chair on behalf of the Council should also be reviewed by the Council at that meeting.

7. Old Business/New Business

Hyatt requested that all new business be postponed to the November meeting.

8. Adjournment

Larson moved (second: Goodwin) to adjourn the meeting. The Council decided to adjourn at 3:53 pm.

The next meeting is scheduled for November 13, 2012, 2-4 pm, in room G8-A at the Department of Agriculture building in Hartford, CT.

CONNECTICUT INVASIVE PLANT LIST October 2012

Connecticut Invasive Plants Council

Ordered by Scientific Name

Statement to accompany list -- January 2004: This is a list of species that have been determined by floristic analysis to be invasive or potentially invasive in the state of Connecticut, in accordance with PA 03-136. The Invasive Plants Council will generate a second list recommending restrictions on some of these plants. In developing the second list and particular restrictions, the Council will recognize the need to balance the detrimental effects of invasive plants with the agricultural and horticultural value of some of these plants, while still protecting the state's minimally managed habitats.

In May 2004, Public Act 04-203 banned a subset of the January 2004 list making it illegal to move, sell, purchase, transplant, cultivate or distribute banned plants. Effective July 1, 2009, Public Act 09-52 removed the ban on *Pistia stratiotes*.

@ column indicates growth form or habitat: A = Aquatic & Wetland; G = Grass & Grass-like; H = Herbaceous; S = Shrub; T = Tree; V = Woody Vine

Explanation of symbols after Common Name:

(P) indicates Potentially Invasive (all other plants listed are considered Invasive in Connecticut)

* denotes that the species, although shown by scientific evaluation to be invasive, has cultivars that have not been evaluated for invasive characteristics. Further research may determine whether or not individual cultivars are potentially invasive. Cultivars are commercially available selections of a plant species that have been bred or selected for predictable, desirable attributes of horticultural value such as form (dwarf or weeping forms), foliage (variegated or colorful leaves), or flowering attributes (enhanced flower color or size).

BAN column indicates prohibited status: Y= banned under CT Gen. Stat. 22a-381d N/A= not banned

^ indicates species that are not currently known to be naturalized in Connecticut but would likely become invasive here if they are found to persist in the state without cultivation

The taxonomic names used by the Connecticut Invasive Plants Council on the Invasive Plant List are consistent with the names used by the United States Department of Agriculture PLANTS database, accessible online at www.plants.usda.gov. The Council also maintains a list of scientific name synonyms for reference purposes.

COMMON NAME	@	SCIENTIFIC NAME	SYNONYMS	BAN
Amur maple (P)	T	<i>Acer ginnala</i> L.		N/A
Norway maple*	T	<i>Acer platanoides</i> L.		N/A
Sycamore maple (P)	T	<i>Acer pseudoplatanus</i> L.		Y
Goutweed	H	<i>Aegopodium podagraria</i> L.		Y
Tree of heaven	T	<i>Ailanthus altissima</i> (Mill.) Swingle		Y
Garlic mustard	H	<i>Alliaria petiolata</i> (M. Bieb.) Cavara & Grande		Y
False indigo (P)	S	<i>Amorpha fruticosa</i> L.		Y
Porcelainberry*	V	<i>Ampelopsis brevipedunculata</i> (Maxim.) Trautv.		N/A
Mugwort (P)	H	<i>Artemisia vulgaris</i>	Common wormwood	N/A
Hairy jointgrass (P)	G	<i>Arthraxon hispidus</i> (Thunb.) Makino	Small carpgrass	Y
Common Kochia (P)	H	<i>Bassia scoparia</i> (L.) A.J. Scott	<i>Kochia scoparia</i> ; Fireweed; Summer cypress	Y
Japanese barberry*	S	<i>Berberis thunbergii</i> DC.		N/A
Common barberry	S	<i>Berberis vulgaris</i> L.		Y
Drooping brome-grass (P)	G	<i>Bromus tectorum</i> L.	Cheatgrass	Y
Flowering rush (P)	A	<i>Butomus umbellatus</i> L.		Y
Fanwort	A	<i>Cabomba caroliniana</i> A. Gray		Y
Pond water-starwort (P)	A	<i>Callitriche stagnalis</i> Scop.		Y
Narrowleaf bittercress	H	<i>Cardamine impatiens</i> L.		Y
Japanese sedge^ (P)	G	<i>Carex kobomugi</i> Owhi		Y
Oriental bittersweet	V	<i>Celastrus orbiculatus</i> Thunb.	Asiatic bittersweet	Y
Spotted knapweed	H	<i>Centaurea stoebe</i> (L.)	<i>Centaurea biebersteinii</i> ; <i>Centaurea maculosa</i>	Y
Canada thistle (P)	H	<i>Cirsium arvense</i> (L.) Scop.		Y
Black swallow-wort	H	<i>Cynanchum louiseae</i> Kartesz & Ghandi	<i>Cynanchum nigrum</i> ; <i>Vincetoxicum nigrum</i>	Y
Pale swallow-wort	H	<i>Cynanchum rossicum</i> (Kleoe.) Borhidi	<i>Vincetoxicum rossicum</i>	Y
Jimsonweed (P)	H	<i>Datura stramonium</i> L.		Y
Brazilian water-weed (P)	A	<i>Egeria densa</i> Planchon	Anacharis; Egeria	Y
Common water-hyacinth^ (P)	A	<i>Eichhornia crassipes</i> (Mart.) Solms		N/A
Russian olive (P)	S	<i>Elaeagnus angustifolia</i> L.		Y
Autumn olive	S	<i>Elaeagnus umbellata</i> Thunb.		Y
Crested late-summer mint (P)	H	<i>Elsholtzia ciliata</i> (Thunb.) Hylander	Elsholtzia	Y
Winged euonymus*	S	<i>Euonymus alatus</i> (Thunb.) Sieb.	Burning bush	N/A
Cypress spurge (P)	H	<i>Euphorbia cyparissias</i> L.		Y
Leafy spurge	H	<i>Euphorbia esula</i> L.		Y
Glossy buckthorn	S	<i>Frangula alnus</i> Mill.	<i>Rhamnus frangula</i> ; European buckthorn	N/A
Slender snake cotton	H	<i>Froelichia gracilis</i> (Hook.) Moq.	Cottonweed	Y
Ground ivy (P)	H	<i>Glechoma hederacea</i> L.	Gill-over-the-ground; Run-away robin	Y
Reed mannagrass^ (P)	G	<i>Glyceria maxima</i> (Hartm.) Holmb.	Tall mannagrass	Y
Giant hogweed (P)	H	<i>Heracleum mantegazzianum</i> (Sommier & Lavier)		Y
Dame's rocket	H	<i>Hesperis matronalis</i> L.		Y
Japanese hops (P)	H	<i>Humulus japonicus</i> Sieb. & Zucc.		Y

Hydrilla	A	<i>Hydrilla verticillata</i> (L.f.) Royle		Y
Ornamental jewelweed (P)	H	<i>Impatiens glandulifera</i> Royle	Tall impatiens	Y
Yellow iris	A	<i>Iris pseudacorus</i> L.	Yellow flag iris	Y
Perennial pepperweed	H	<i>Lepidium latifolium</i> L.	Tall pepperwort	Y
Border privet (P)	S	<i>Ligustrum obtusifolium</i> Sieb. & Zucc.		Y
California privet (P)	S	<i>Ligustrum ovalifolium</i> Hassk.		N/A
European privet (P)	S	<i>Ligustrum vulgare</i> L.		N/A
Japanese honeysuckle*	V	<i>Lonicera japonica</i> Thunb.		Y
Amur honeysuckle	S	<i>Lonicera maackii</i> (Rupr.) Herder		Y
Morrow's honeysuckle	S	<i>Lonicera morrowii</i> A. Gray		Y
Tatarian honeysuckle (P)	S	<i>Lonicera tatarica</i> L.		Y
Belle honeysuckle	S	<i>Lonicera x bella</i> Zabel	Bell's honeysuckle (misapplied)	Y
Dwarf honeysuckle^ (P)	S	<i>Lonicera xylosteum</i> L.	European fly-honeysuckle	Y
Ragged robin (P)	H	<i>Lychnis flos-cuculi</i> L.		Y
Moneywort* (P)	H	<i>Lysimachia nummularia</i> L.	Creeping jenny	N/A
Garden loosestrife* (P)	H	<i>Lysimachia vulgaris</i> L.		Y
Purple loosestrife	A	<i>Lythrum salicaria</i> L.		Y
European waterclover (P)	A	<i>Marsilea quadrifolia</i> L.	Water shamrock	Y
Japanese stilt grass	G	<i>Microstegium vimineum</i> (Trin.) A. Camus		Y
Eulalia* (P)	G	<i>Miscanthus sinensis</i> Andersson	Chinese or Japanese silvergrass	N/A
Forget-me-not	A	<i>Myosotis scorpioides</i> L.	True forget-me-not; Water scorpion-grass	Y
Parrotfeather (P)	A	<i>Myriophyllum aquaticum</i> (Vell.) Verdc.		Y
Variable-leaf watermilfoil	A	<i>Myriophyllum heterophyllum</i> Michx.		Y
Eurasian watermilfoil	A	<i>Myriophyllum spicatum</i> L.		Y
Brittle water-nymph (P)	A	<i>Najas minor</i> All.	Eutrophic water-nymph	Y
Onerow yellowcress (P)	A	<i>Nasturtium microphyllum</i> (Boenn. ex. Rchb.)	<i>Rorippa microphylla</i>	Y
Watercress (P)	A	<i>Nasturtium officinale</i> W.T. Aiton	<i>Rorippa nasturtium-aquaticum</i>	Y
American water lotus (P)	A	<i>Nelumbo lutea</i> (Willd.) Pers.	American water lotus	Y
Yellow floating heart (P)	A	<i>Nymphoides peltata</i> (S.G. Gmel.) Kuntze		Y
Scotch thistle (P)	H	<i>Onopordum acanthium</i> L.		Y
Star-of-Bethlehem (P)	H	<i>Ornithogalum umbellatum</i> L.		N/A
Princess tree (P)	T	<i>Paulownia tomentosa</i> (Thunb.) Siebold & Zucc. ex Steud.	Empress-tree	Y
Reed canary grass	G	<i>Phalaris arundinacea</i> L.		N/A
Common reed	G	<i>Phragmites australis</i> (Cav.) Trin. ex Steud.	Phragmites	Y
Water lettuce^ (P)	A	<i>Pistia stratiotes</i> L.		N/A
Canada bluegrass (P)	G	<i>Poa compressa</i> L.		Y
Bristled knotweed	H	<i>Polygonum caespitosum</i> Blume	<i>Persicaria longiseta</i> ; Oriental lady's thumb	Y
Japanese knotweed	H	<i>Polygonum cuspidatum</i> Siebold & Zucc.	<i>Fallopia japonica</i>	Y
Mile-a-minute vine	H	<i>Polygonum perfoliatum</i> L.	<i>Persicaria perfoliata</i>	Y
Giant knotweed (P)	H	<i>Polygonum sachalinense</i> F. Schmidt ex. Maxim.	<i>Fallopia sachalinense</i>	Y
White poplar (P)	T	<i>Populus alba</i> L.		Y
Crispy-leaved pondweed	A	<i>Potamogeton crispus</i> L.	Curly pondweed or Curly-leaved pondweed	Y
Kudzu (P)	V	<i>Pueraria montana</i> (Lour.) Merr.	<i>Pueraria lobata</i>	Y
Fig buttercup	H	<i>Ranunculus ficaria</i> L.	Lesser celandine; <i>Ficaria verna</i>	Y
Common buckthorn	S	<i>Rhamnus cathartica</i> L.		Y
Black locust*	T	<i>Robinia pseudo-acacia</i> L.		N/A
Multiflora rose	S	<i>Rosa multiflora</i> Thunb.		Y
Rugosa rose* (P)	S	<i>Rosa rugosa</i> Thunb.*	Beach, Salt spray, Japanese, or Ramanas Rose	N/A
		*Note: This plant is especially aggressive in coastal areas		
Wineberry	S	<i>Rubus phoenicolasius</i> Maxim.		Y
Sheep sorrel (P)	H	<i>Rumex acetosella</i> L.		Y
Giant salvinia^ (P)	A	<i>Salvinia molesta</i> Mitchell		Y
Tansy ragwort^ (P)	H	<i>Senecio jacobaea</i> L.	Stinking Willie	Y
Cup plant (P)	H	<i>Silphium perfoliatum</i> L.		Y
Bittersweet nightshade (P)	H	<i>Solanum dulcamara</i> L.	Climbing nightshade	Y
Water chestnut	A	<i>Trapa natans</i> L.		Y
Coltsfoot	H	<i>Tussilago farfara</i> L.		Y
Garden heliotrope (P)	H	<i>Valeriana officinalis</i> L.	Valerian	Y

2012 Running Bamboo Update

The Invasive Plants Council has been collecting information on various species of “running bamboo”, particularly golden bamboo (*Phyllostachys aurea*) and yellow-groove bamboo (*Phyllostachys aureosulcata*), since 2010. After much discussion and visits to sites where bamboo is growing in the state by Council members and state from various state Agencies, the Invasive Plants Council took the following actions:

At the September 18, 2012 meeting, the Council decided by a vote (2 for and 6 against) that yellow-groove bamboo (*Phyllostachys aureosulcata*) did **not** meet the criteria for listing as a potentially invasive plant in Connecticut.

At the October 9, 2012 Invasive Plants Council meeting, the Council voted on a motion to recommend action on this species to the legislature. The text of the full motion is provided below.

Sutherland moved (second: Silander) that the Council adopt the statement as follows:

The Connecticut Invasive Plants Council, while recognizing in a split vote on Sept. 18, 2012, that yellow groove bamboo (*Phyllostachys aureosulcata*) and other species of running bamboo in the genus *Phyllostachys* do not meet the criteria for invasive or potentially invasive plants as set forth in CGS §22a-381b, does recognize that said species have demonstrated the potential to cause significant damage to residential properties when not properly installed and maintained. The Council is therefore supportive of legislation that 1) requires sellers and installers of bamboo in the genus *Phyllostachys* to provide to the retail customer educational material on the growth habit of the plant and how to properly contain the plant, 2) requires property owners to install proper containment for any planting of bamboo in the genus *Phyllostachys* when such planting is within 100 feet of any abutting property or public right-of-way, and 3) addresses situations in which property owners fail to prevent the spread into neighboring properties.

The vote was taken by roll call. The motion passed unanimously.

CONNECTICUT DEPARTMENT OF ENERGY and ENVIRONMENTAL PROTECTION

Invasive Plant Program 2012 Year End Report

Connecticut Invasive Plant Coordinator

For the third year, DEEP was able to fund and implement a one-year Project Amendment to the existing Cooperative Agreement with the University of Connecticut Department of Plant Science and Landscape Architecture. This amendment allowed DEEP to extend the Invasive Plant Coordinator contract until July 30, 2012. Logan Senack, the Invasive Plant Coordinator, reported jointly to DEEP and the University of Connecticut. Nancy Murray, DEEP Inland Fisheries and Donna Ellis, UConn Department of Plant Science and Landscape Architecture supervised Mr. Senack and provided oversight for the Cooperative Agreement. Funding from the CT State Legislature was allocated in the 2013 budget for Invasive Plant Coordinator salary and operating expenses. These funds are essential for the state to be able to prevent new invasive plants from entering CT and providing educational outreach on the significant damages caused by invasive plants.

2012 Accomplishments: Invasive Plant Coordinator

Provided administrative support to the Invasive Plants Council

Assisted the Invasive Plants Council (IPC) with various administrative functions, including preparing and posting meeting minutes for the nine Invasive Plants Council meetings, organizing agendas, handling attendance logistics, and scheduling field trips. Also responded to several IPC requests for information regarding plants such as running bamboo (*Phyllostachys* species) and wavy-leaf basketgrass (*Oplismenus hertellus*). Conducted site visits to collect data on running bamboo for the Invasive Plants Council. Gathered information from other northeast states regarding invasive status of bamboos.

Conducted site visits to multiple towns and coordinated invasive plant removal events

Conducted site visits throughout the state to collect information on mile-a-minute vine and other invasive plants. Towns visited included Bozrah, Coventry, Groton, Madison, Middlefield, Milford, New Milford, Newtown, Old Saybrook, Orange, Prospect, Roxbury, Sprague, Southbury, Waterbury, Waterford, Woodbury, and other locations. Also assisted towns and other groups in their removal efforts for invasive plants. This included updating the mile-a-minute control plan, assisting with the organization of four invasive plant removal events in eastern Connecticut, and working with local volunteers or with staff from DEEP to reduce populations of mile-a-minute vine and other invasive plants. Responded to reports of invasive plants from the public, which led to the discovery of mile-a-minute in new locations in the state.

Co-Chaired 2012 Invasive Plant Symposium Planning Committee for the CT Invasive Plant Working Group (CIPWG)

Served as co-organizer to coordinate the CIPWG planning committee to develop and present the biennial invasive plant symposium. The event was sold out, with record attendance (475 registered attendees) and an additional 60 people turned away when the event filled to capacity. Deputy Commissioner Susan Whalen of the Department of Energy and Environmental

Protection delivered opening remarks. The keynote speaker was Dr. Elizabeth Farnsworth of the New England Wild Flower Society. Research posters, other educational exhibits, and live invasive plant specimens were featured throughout the day. The 2012 Invasive Plant Symposium was held at the University of Connecticut on October 25.

Engaged public and conducted public outreach

Provided material and presentations about invasive plants to a variety of groups at several outreach events, including meetings of the CT Association of Wetland Scientists, CT Association of Conservation and Inland Wetlands Commissions, and events including CT Agricultural Experiment Station Plant Science Day in Hamden, CT, Connecticut Nursery and Landscape Association Summer Field Day, the Eastern States Exposition (Big E), and workshops in Hampton, Ridgefield, and other towns. Developed press releases to inform public of relevant invasive plant issues in Connecticut.

Contributed information to Invasive Species Database project

Collected records of invasive plant occurrences in Connecticut and shared those records with the Invasive Plant Atlas of New England (IPANE) and the nationwide Early Detection and Distribution and Mapping System (EDDMapS), two publicly available online databases for tracking invasive plants.

Continued website development

Assisted with the development of Connecticut websites about invasive plants and worked closely with the DEEP and CIPWG webmasters to update sites, improve navigation, and add new materials including plant photographs, species distribution information, conference update information, and other items.

Connecticut Aquatic Nuisance Species (ANS) Program

Nancy Murray, DEEP-Inland Fisheries Division program lead oversees the CT Aquatic Nuisance Species Program using United States Fish and Wildlife ANS Task Force funds. Nancy Murray and Nancy Balcom, UCONN Sea Grant, are the CT ANS Coordinating Committee. Maura Robie was hired as the part-time ANS Coordinator in November 2012. She will assist with organizing a CT ANS Panel meeting; updating the DEEP and Sea Grant invasive species websites; finalizing the Draft Early Detection Rapid Response Plan and researching options for preventing the sale and importation of prohibited aquatic plants and animals. (Please see following pages 8-13 of this DEEP section).

DEEP Connecticut River Water Chestnut Control

Water chestnut (*Trapa natans*)

DEEP Inland Fisheries Division (IFD) staff and U.S. Fish & Wildlife Service (USFWS) completed their annual water chestnut surveys of the Connecticut River and several tributaries. DEEP surveyed the main stem of the CT River and associated coves from Hartford downstream to Haddam. USFWS staff coordinates and leads water chestnut control activities from Hartford north into Massachusetts, including major infestations on the Hockanum River and several other sites in the Hartford area. In 2012, both DEEP and USFWS generally found plants at fewer sites along the river, and less plants at those sites with plants. There were several exceptions, most notably a significant (and surprising) increase in the population at one site on the Hockanum

River (East Hartford) that required a fairly rapid late season deployment of USFWS and DEEP staff and volunteers to control. The Tidewater Institute (with coordination/funding from USFWS) returned for a second year of surveying portions of the lower river, locating and removing plants at several sites with known infestations in Deep River and Lyme (less plants were found than in 2011 at both sites).

In eastern CT, DEEP staff collaborated with the Army Corp of Engineers (USACE), hand pulling water chestnut throughout the summer at West Thompson Reservoir on the Quinebaug River in Thompson. Just reported for the first time in September, 2011, one moderately sized dense patch and numerous individual plants scattered throughout the 240 acre impoundment were found and removed in 2012. This site will need ongoing removal for several years to meet the goal of eradication. A new report was confirmed in a small area at Mansfield Hollow Reservoir (another USACE flood control impoundment). While sampling fish, DEEP IFD staff found and removed a small patch of water chestnut. Surveys will be needed annually here.

We also confirmed two new locations at private ponds, also located in eastern CT. These two ponds have no public access and have very dense infestation. Landowners don't know how the plants got there. Options for removal are being considered.

In western CT, IFD staff did not find any plants at the confluence of the Still River and Lake Lillinonah for the second consecutive year. Plants had been found and removed annually from this location from 2006 through 2010, inclusive. However, while sampling fish, IFD staff found and removed several plants from a new area within the lake, the Shepaug Arm. IFD staff also removed several patches of water chestnut from Mudge Pond (Sharon) where a small, but persistent infestation has been pulled for a number of years.

Didymo (*Didymosphenia geminata*), an invasive microscopic diatom

This year in June during fish community surveys DEEP Inland Fisheries staff was able to make observations at several locations along the West Branch Farmington River Hartland to Farmington. As with the prior observations made January through May there was no visible evidence of Didymo-anywhere where initially found. A small patch of *Cymbella* species, a similar species, also called rock snot in some circles was observed in the "boneyard" portion of the river in Barkhamsted in the same reach where *Didymo* was first collected by an angler. Subsequent to this location other small isolated patches of *Cymbella* were observed at Blacks Bridge crossing in New Hartford.

A UConn PhD student, Diba Kahn-Bureau is looking at periphyton and has a specific interest in DNA typing of the both *Didymo* and *Cymbella* species. We are collaborating together and with other Northeast states on a small *Didymo*- DNA sequencing project.

DEEP Boating Division Report on Invasive Investigators Program

Wendy Flynn/ Eleanor Mariani

The DEEP Boating Division hired two additional Aquatic Nuisance Species Boating Education Assistants (BEAs) as seasonal staff, bringing the total number of BEAs to 22. The two positions funded with ANS money focused their time at water bodies in western CT where the water chemistry is suitable for zebra mussels. BEAs visit boat launches to educate boaters on ways they can help prevent the spread of aquatic invasive species. The two new hires attended the Invasive Investigator training and had on-site training. The BEAs visited numerous lakes and ponds in western CT, and many boaters have reported that they learned how to “clean, drain and dry” equipment to prevent the spread of invasive plants and animals. The BEAs season ended on October 10, 2012. The state wide BEA Program, including the two new positions funded with Federal ANS funds collected 755 Clean Boater Pledges and conducted 652 ANS vessel inspections.

2012 DEEP Wetland Habitat Restoration and Mosquito Management (WHAMM) Program

WHAMM Program 2012 Invasive Plant Control

The DEEP WHAMM Program started spraying in mid July and will continue until the first killing frost along the coast. The DEEP is using three crews with our two Marsh Master II and an ARGO. We are using two different herbicides: glyphosate and imazapyr. We have sprayed several Phragmites sites this year. The sites are the following:

NRCS WHIP Funded Projects for Phragmites control

Pomfret, CT Audubon – 10 acres

Verkades in Waterford – 1 acre

Pandolpho site in Ashford – 1 acre

Killingworth Bog for Land Trust (Lip Funds), Phragmites and other plants- 5 acres

DEEP LIP Funded Projects for Phragmites control

Sharon, CT Audubon – 1 acre

Joshua Creek LCT, Lyme – <.5 acres

DOT Funded for invasive control

West River in West Haven, Phragmites – <.5 acre

Kent, Wyantnock State Forest, 2 Projects, Phragmites -<1 acres

Flatbush Ave., Hartford – <.5 acres

Other funded Phragmites control

Laurel Marsh, Manchester – 100 acres

Little River, New Haven, North Haven-25 acres
 Silver Sands SP, Milford-25 acres

USFWS McKinney Refuge Funded Phragmites control
 Town of Old Saybrook Land-<2 acres

Housatonic River Phragmites project update
 Vendors have been hired and property owners notified. The spraying of Phragmites began in July and 500 acres were completed. We are planning to mow in the winter of 2012-13.

2012 DEEP Wildlife Division- State Land Habitat Management Program and Landowner Incentive Program

The Wildlife Division's Landowner Incentive Program (LIP) provides technical advice and cost assistance to private landowners for habitat management that will result in the protection, restoration, reclamation, enhancement, and maintenance of habitats that support fish, wildlife, and plant species considered at-risk. Activities include invasive plant control projects. This program has been made possible through grants from the U.S. Fish and Wildlife Service, which recognized the need to help states with the stewardship of their at-risk species.

Invasive Plant Control Projects

Site	Town	Treatment	Acres	Date	Invasives Present	MGT Intent
Quinnipiac River SP	North Haven	Spray/manual	12	summer 2012	mile-a-minute, autumn olive, multiflora rose & bittersweet	Cedar/forest understory
West Rock SP	Hamden	Spray/manual	12	summer 2012	autumn olive & multiflora rose	Cedar/forest understory
Sessions Woods WMA	Burlington	Spray	19	summer 2012	black locust	Forest understory
Tunxis SF	Hartland	Spray	4.2	summer 2012	autumn olive and multiflora rose	Old fields
Housatonic River WMA	Kent	Spray fields & forest regeneration	71	Sep-12	bush honeysuckle, wormwood, barberry, autumn olive	Old fields
Bear Hill WMA - 06	Bozrah	Spray fields & forest regeneration	46	Sep-12	autumn olive, barberry & multiflora rose	Old fields & forest understory
Belding WMA-6080br	Vernon	Mow	16	Aug-12	barberry & multiflora rose	Grasslands
Aircraft Rd	Middlefield	Manual & spray	2	Aug-12	barberry & multiflora rose	Grasslands
Talbot WMA	Scotland	Spray	4.2	Aug-12	Control barberry, autumn olive & multiflora rose	Old fields
Spignesi WMA	Scotland	Spray fields & forest regeneration	10	summer 2012	barberry & autumn olive	Grasslands & forest understory
FFTA	East Windsor	Mow fields	150	Aug-12	autumn olive & multiflora rose	Grasslands
FFTA	East Windsor	Spray alder regeneration site	8	Sep-12	multiflora rose and bittersweet	Alder enhancement
Mad River FCA	Winsted	Mow	19	Aug-12	autumn olive, barberry & multiflora rose	Meadow/old field

Mad River FCA	Winsted	Spray	19	Aug-12	autumn olive, barberry & multiflora rose	Meadow/old field
Centennial SF	Easton	Mow	54	Oct-12	autumn olive, barberry & multiflora rose	Grasslands
Barn Is. WMA	Stonington	Spray grasslands	28	Sep-12	autumn olive, barberry & multiflora rose	Grasslands
Machimoodus SP	Moodus	Spray grasslands	32	Aug-12	autumn olive, barberry & multiflora rose	Grasslands
Naugatuck SF	Naugatuck	spray fields	14	Jul-10	barberry & autumn olive	Old fields
Goshen WMA	Goshen	Spray fields	133	Sep-12	autumn olive, barberry & multiflora rose	Grasslands
Roraback WMA	Harwinton	Spray fields & forest regeneration	17	Aug-12	autumn olive, barberry & multiflora rose	Forest understory & old fields
Camp Columbia	Morris	Spray fields & forest regeneration	5	Aug-12	autumn olive, barberry & multiflora rose	Forest regeneration
Zemko Pond WMA	Salem	Spray fields	13	Sep-12	autumn olive, barberry & multiflora rose	Old fields
Bartlett Brook	Colchester	Mow	35	Sep-12	autumn olive, barberry & multiflora rose	Old fields
Babcock Pond WMA	Colchester	Mow	10	Aug-12	autumn olive, barberry & multiflora rose	Old fields
Pachaug SF	Sterling	Spray old fields	42	Sep-12	autumn olive	Old fields
Simsbury WMA	Simsbury	Spray tree of heaven/old field	3.5	Sep-12	tree of heaven & multiflora rose	Forest regeneration
Enders SF	Granby	Grassland spraying	10	Sep-12	autumn olive, barberry & multiflora rose	Grasslands
Suffield WMA	Suffield	Grassland mowing	90	Jan-12	autumn olive, barberry & multiflora rose	Grasslands
Skiff Mtn	Kent	Grassland mowing	60	Jan-12	autumn olive, barberry & multiflora rose	Grasslands
Spignesi WMA	Scotland	Grassland mowing	30	Jan-12	autumn olive, barberry & multiflora rose	Grasslands
Nipmuck SF	Union	Mow old field	8	Sep-12	autumn olive, barberry & multiflora rose	Old fields
Pease Brook WMA	Lebanon	Mow old fields	21	Aug-12	autumn olive, barberry & multiflora rose	Old fields
Griggs pond	Union	Mow old fields	10	Aug-12	autumn olive, barberry & multiflora rose	Old fields
		Total acres treated				
		1,008				

DEEP Forestry Division

The “2010 Connecticut Forest Resource Assessment and Strategy” document includes actions to stop the spread of invasive plants in State Forests. The Forestry Division is using prescribed burns for ecosystem maintenance and restoration to control or eradicate invasive plants, improve wildlife habitat and prepare stands for regeneration of the forests.

In addition, Public Act 11-192 established a Timber Sale Revolving Account to cover some of the costs of state forest management, including invasive species control. To date it has provided for 56 acres of contracted invasive plant control and tools for invasive control (red dragon flame throwers), especially effective on barberry.

Natural Resources Conservation Service

The Connecticut Natural Resources Conservation Service (NRCS) provides educational materials and expertise on invasive plant identification and management approaches/techniques for the benefit of the general public, town commissions and partner groups working to control the spread of invasive plants. They also hold workshops, create invasive plant fact sheets and provide technical and financial assistance for control projects.

In 2012, NRCS has provided an estimated \$365,000 to implement invasive plant control on 425 acres of private lands.

Connecticut ANS Management Program

A Report to the Aquatic Nuisance Species Task Force for State Fiscal Year 2012

FY 2009 Funds \$34,677

1 Summary

Funds will be used to hire and fund a part-time Connecticut Aquatic Nuisance Species Coordinator (ANS) to assist the DEEP CT ANS Program. Interviews have been completed and the Coordinator will start on November 9, 2012.

2 Major Accomplishments

Connecticut DEEP Bureau of Natural Resources, Inland Fisheries Division, Aquatic Nuisance Species Program has fully executed a Project Agreement with the University of CT to fund a part time Aquatic Nuisance Species coordinator. Detailed tasks to be completed include, but are not limited to: organize one full CT ANS Panel meeting; review and revise the Early Detection-Rapid Response species list; Finalize the draft CT Early Detection Rapid Response Plan; update the DEEP and University of CT ANS websites; and participate in major boating and fishing events to educate the public on preventing spread of ANS.

3 Program Expenditures

All \$34,677 has been committed through a Project Agreement with the University of Connecticut to hire a part time Aquatic Nuisance Species Coordinator. Start date is expected to be in November 2012 and will run through August 31, 2013. An initial \$9,000 payment will be paid upon receipt of first invoice. Remaining funds will be transferred quarterly upon receipt of invoice.

4 Programmatic Needs

Fund a full time ANS Coordinator – Environmental Analyst 1 at 78,197 annually, including salary, fringe and benefits and \$30,000 for budget

Implement Early Detection and Rapid Response Program (including cost of contractors to conduct control invasive species) \$150,000/year

Federal Agency ANS Estimated Expenditures

Prevention	\$10,677
Detection & Monitoring	\$ 0
Early Detection	\$10,000
Control & Management	\$ 0
Rapid Response	\$ 9,000

Restoration	\$ 0
Education	\$ 5,000

FY 2010 Funds \$33,593

1 Summary

The original funding award was to hire a part time ANS Coordinator. Unfortunately these funds will expire in 2013, before they can be used for an ANS Coordinator. We would like to redirect these funds for purposes of non-chemical control work for *Trapa natans* (water chestnut) and other early detection/rapid response species and conduct surveys of known *Hydrilla verticillata* sites. DEEP would hire two seasonal staff to do *Trapa natans* pulling in the Connecticut River, West Thompson Reservoir, and Mansfield Hollow and the hydrilla surveys. DEEP will submit a revised 2010 Request for funds to the ANS Task Force approval if this re-direction of funds is approved.

2 Major Accomplishments

No work has been completed to date. Please see Summary above requesting allocation of funds for new tasks.

3 Program Expenditures

No funds have been expended to date.

4 Programmatic Needs

Fund a full time ANS Coordinator – Environmental Analyst 1 at 78,197 annually, including salary, fringe and benefits and \$30,000 for budget \$98,197

Implement Early Detection and Rapid Response Program (including cost of contractors to conduct control of invasive species) \$150,000

Federal Agency ANS Estimated Expenditures (if funds can be reallocated)

Prevention	\$ 0
Detection & Monitoring	\$ 13,000
Early Detection	\$ 0
Control & Management	\$ 20,593
Rapid Response	\$ 0
Restoration	\$ 0
Education	\$ 0

2010 Zebra mussel funding \$26,455

1 Summary

Two zebra mussel projects were funded with allocated funds.

Project 1

A final report has been submitted for the **“Early Detection/Monitoring of Zebra Mussel Introductions from the Housatonic River in Lakes Candlewood, Lillinonah and Zoar”**. Zebra mussel veligers can be detected by using cross-polarized light microscopy (CPLM) and the polymerase chain reaction (PCR). By the completion of this project the Western CT State University researchers became confident with the two methods of zebra mussel veliger detection. The CPLM method allows for examining and identifying samples rapidly. By the end of this study, Western CT State University researchers also identified the best DNA primers for the PCR veliger detection

Project 2

The **“Connecticut Zebra Mussel Inventory and Comprehensive Risk Assessment”**
The objective for this project is to conduct biological surveys in northwest Connecticut, including the upper Housatonic River to determine the presence or absence of zebra mussels and provide a Risk Assessment that indentifies the potential for zebra mussel colonization in these waters. Phase two tasks include deployment of settling plates to determine the distance and rate of juvenile settlement.

2 Major Accomplishments

The Final Report for the **“Early Detection /Monitoring zebra mussel** project has been submitted to DEEP. Please see Attachment A.

The **“Zebra Mussel Inventory and Risk Assessment”** project has submitted the 2011 summary report. They will also submit an interim report on field work conducted during March 2011 through October 2012. The final report is due by December 15, 2012.

3 Program Expenditures

\$6,042 has been paid out for the **Early Detection /Monitoring zebra mussel project** and is closed out.

\$7,500 has been paid out on the **Zebra Mussel Inventory and Risk Assessment project**. The final payment of \$12,500 will be paid when DEEP receives and accepts the final report. Total cost will be \$20,000 (\$413.00 of funding was not allocated)

4 Programmatic Needs

Additional funding would be used to conduct annual zebra mussel and veliger surveys in high risk water bodies in Connecticut and spread prevention education. Estimated cost of \$60,000/year

Federal Agency ANS Estimated Expenditures

Prevention	\$ 0,000
Detection & Monitoring	\$ 20,000
Detection	\$ 6,042
Control & Management	\$ 0
Rapid Response	\$ 0
Restoration	\$ 0
Education	\$ 0

FY 2011 Funds \$29,861

1 Summary

“The Continued Monitoring of Zebra Mussel Introductions from the Housatonic River in lakes Candlewood, Lillinonah and Zoar: A pilot Program Veliger Detection Part 2 is in progress and the Boating Educational Assistants (BEAs) project is completed. The educational Vector Display funding will be transferred to the 2013 Project Agreement with the University of CT

2 Major Accomplishments

Veliger Detection Part 2

A DEEP Project Agreement was awarded to Western Connecticut State University to continue the zebra mussel veliger project initiated in 2010 with the dedicated Federal ANS zebra mussel funding. DEEP has received the Phase 1 Interim Report that indicates they have determined the genomic DNA information that allows for confirmation of zebra mussel veligers. The final report is due on January 30, 2013.

Boating Educational Assistants

The DEEP Boating Division hired two additional Aquatic Nuisance Species Boating Education Assistants (BEAs) as seasonal staff, bringing the total number of BEAs to 22. The two positions funded with ANS money focused their time at water bodies in western CT where the water chemistry is suitable for zebra mussels. BEAs visit boat launches to educate boaters on ways they can help prevent the spread of aquatic invasive species. The two new hires attended the Invasive Investigator training and had on-site training. The BEAs visited numerous lakes and ponds in western CT, and many boaters have reported that they learned how to “clean, drain and dry” equipment to prevent the spread of invasive plants and animals. The BEAs season ended on October 10, 2012. The state wide BEA Program, including the two new positions

funded with Federal ANS funds collected 755 Clean Boater Pledges and conducted 652 ANS vessel inspections.

Educational Vector Display(s)

The design and production of a portable display on vectors to educate the public on preventing spread.

3 Program Expenditures

Zebra mussel veliger study-part two Western CT State University has received \$5,000 to date, and the remaining \$1,000 will be released when DEEP receives and accepts the Final Report.

\$20,000 has been spent funding two DEEP Boating Education Assistants.

Educational Vector Display UCONN

\$3,861 will be transferred to the fully executed 2013 Cooperative Agreement with UCONN

4 Programmatic Needs

Environmental Analyst 1 at 78,197 annually, including salary, fringe and benefits and \$30,000 for budget \$98,197

Implement Early Detection and Rapid Response Program (including cost of contractors to conduct control invasive species) \$150,000/year

Federal Agency ANS Estimated Expenditures

Prevention	\$ 20,000
Detection & Monitoring	\$ 6,000
Early Detection	\$ 0
Control & Management	\$ 0
Rapid Response	\$ 0
Restoration	\$ 0
Education	\$3,861

FY 2012 Funds \$29,861

1 Summary

This *Clavelina ledadiformis*, a non-native tunicate research project will include an organism Risk Assessment that follows the ANSTF recommended format; diver surveys to map and photograph the two existing populations in Stonington Harbor and the Thames River and collect substrate samples. Part 2 will conduct in situ experiments to

determine *Clavelina ledadiformis* recruitment distance and ability to recruit on algae and eelgrass and the ability to grow reproductive adults on algae and eelgrass.

2 Major Accomplishments

Funds will be used in 2013 to survey the *Clavelina ledadiformis* population documented in Stonington Harbor and the Thames River.

3 Program Expenditures

DEEP has drafted a Project Agreement with the University of Connecticut using \$29,861. Once the Federal approval is received, we will initiate the approval of the Project Agreement.

4 Programmatic Needs

Environmental Analyst 1 at 78,197 annually, including salary, fringe and benefits and \$30,000 for budget \$98,197

Implement Early Detection and Rapid Response Program (including cost of contractors to conduct control invasive species) \$125,000

Federal Agency ANS Estimated Expenditures

Prevention	\$ 0
Detection & Monitoring	\$ 20,000
Early Detection	\$ 0
Control & Management	\$ 9,861
Rapid Response	\$ 0
Restoration	\$ 0
Education	\$ 0

Activities of Connecticut's Green Industry in 2012

The state's retailers and landscapers continued to educate their customers about the proper methods for containing varieties of running bamboo plants. The Connecticut Green Industries associations (CFA, CGGA, CNLA) prominently featured issues concerning invasive plants in all of their printed and digital communications to their members. In addition, these groups also hosted educational programs for horticulturists on handling invasive plants. The guidelines for disposal of invasive plants have been published for the benefit of the state's estimated 3,000+ horticultural companies.

Connecticut's nursery growers continue on track with their voluntary phase-out of 25 cultivars of barberry plants deemed at the higher end of invasiveness. The phase-out is due to be completed by June 30, 2013.

Additionally, the state's plant growers made an important announcement and decision this fall: as soon as sterile cultivars of burning bush (*euonymus*) are ready for commercial production, the growers have agreed to switch all production to these new plants. Scientists at the University of Connecticut have developed such a sterile version of the plant, and is currently testing it in the field. It's estimated the sterile versions may be ready in three to five years.



STATE OF CONNECTICUT

DEPARTMENT OF AGRICULTURE
OFFICE OF THE COMMISSIONER



Steven K. Reviczky
Commissioner

Tel: (860) 713-2500
Fax: (860) 713-2514

November 30, 2012

Mr. William Hyatt, Chair, Invasive Plants Council
Department of Energy & Environmental Protection
79 Elm Street
Hartford, CT 06106

Re: Input for Invasive Plants Council 2012 Annual Report

Dear Chairman Hyatt:

Thank you for the opportunity to provide input to the Invasive Plants Council (IPC) 2012 Annual Report. Some items of interest in the realm of invasive plants accomplished this year include:

No reports of prohibited aquatic invasive plants have been made during this year's routine inspections of DoAg-licensed facilities.

In its *Connecticut Weekly Agricultural Report*, DoAg published announcements for the October 25th CIPWG Invasive Plant Symposium, in addition to conservation cost-share programs of the U.S. Department of Agriculture – Natural Resources Conservation Service. DoAg's website features a link to the IPC website under *Collaborative Initiatives*.

At the Governor's initiative, the Farmland Restoration Program was launched this year. DoAg received over 50 applications on over 700 acres to date; many involve the removal of hedgerows and other vegetation that contain invasive plants.

If you have any questions, please contact Katherine Winslow of my staff at 860.713.2589.

Sincerely,

A handwritten signature in black ink that reads "Steven K. Reviczky".

Steven K. Reviczky
Commissioner

cc: Logan Senack, CT Invasive Plant Coordinator

University of Connecticut

Department of Plant Science and Landscape Architecture

2012 Invasive Plants Council Update

Dr. Mark Brand, Professor in the UConn Department of Plant Science and Landscape Architecture (PSLA), has produced numerous tetraploid lines of Japanese barberry, *Berberis thunbergii*, in an effort to develop non-invasive sterile selections of this popular ornamental. These selections are in the final stages of evaluation and many appear to be sterile or exhibit very reduced levels of fertility. A final round of field evaluation will be concluded by the end of the 2013 growing season. Dr. Brand reports that he has also developed triploid lines that are likely to be sterile or nearly so. They are still young and have yet to be evaluated. An abstract for an article on fecundity of Japanese barberry cultivars that is currently in press is provided on the next page.

Dr. Yi Li, also a Professor in PSLA, reports that sterile triploid lines of winged euonymus (*Euonymus alatus*) should be ready for commercial introduction in 3-4 years.

An additional article relating to winged euonymus cultivars by Dr. Brand is attached.

Fecundity of Japanese barberry cultivars and their ability to invade a deciduous woodland

Mark H. Brand¹, Jonathan M. Lehrer², and Jessica D. Lubell³

^aUniversity of Connecticut, Department of Plant Science and Landscape Architecture, University of Connecticut

^bFarmingdale State College

^cUniversity of Connecticut

Abstract

Japanese barberry is an important landscape shrub that has a demonstrated potential to be invasive in ~30 states across the central and northern United States. Forty six cultivars were evaluated for their potential to produce fruits and seeds in a randomized, replicated field planting. Seeds from a subset of cultivars were evaluated for their ability to germinate and survive as seedlings in a deciduous woodland. Seed production for cultivars varied from no seeds to over 12,000 seeds per plant and the number of seeds per fruit ranged from 0.1 to 1.8. Five cultivars produced fewer than 100 seeds per plant and two cultivars failed to produce fruit. When plants were allowed to mature for 4 to 5 years beyond the first evaluation time, cultivars exhibited significant increases in fruits per plant, producing as much as 35,000 fruits per plant ('Sparkle'). 'Golden Devine' and 'Red Chief', fruitless cultivars at the first evaluation, produced 165 and 20 fruit per plant, respectively at the follow-up evaluation demonstrating that long term evaluation of cultivars is necessary to accurately assess sterility. Cultivar seed sown in a deciduous woodland germinated between 12.5% and 31% and seedlings survived at rates between 5.6% and 29.3%. Coupling cultivar seed production data with germination and survival data in a deciduous woodland suggests that even cultivars producing as little as 100 seeds annually have the potential to contribute a few seedlings each year to a natural area.

Keywords: ornamentals, landscape, invasive, *Berberis thunbergii*

Received: April 5, 2012; Revised: July 23, 2012; Accepted: August 7, 2012

Fecundity of Winged Euonymus Cultivars and Their Ability to Invade Various Natural Environments

Mark H. Brand^{1,4}, Jessica D. Lubell², and Jonathan M. Lehrer^{2,3}

Department of Plant Science and Landscape Architecture, 1376 Storrs Road, Unit 4067, University of Connecticut, Storrs, CT 06269-4067

Additional index words. ornamentals, landscape, invasive, *Euonymus alatus*

Abstract. Winged euonymus [*Euonymus alatus* (Thunb.)] is an important landscape shrub that has demonstrated its potential to be invasive in numerous states across the central and northern United States. Nine cultivars were evaluated for their potential to produce fruits and seeds in a randomized, replicated field planting. Seeds from all cultivars were evaluated for germination rate and initial survival in a deciduous woodland. Seeds collected from ‘Compactus’ were also sown in five natural environments (full sun meadow, edge of woods, moist woods, dry woods, pine woods) to determine which habitat types support its germination and establishment. Seed production for cultivars varied from 981 to 6090 seeds per plant. The dry deciduous woods and pine woods were the only environments that supported significant germination rates that could be as high as 37.8%. Seedling survival was at least 77% in the deciduous dry woods and at least 55% in the pine woods. In the first replication, establishment rates for cultivars in the dry deciduous woods ranged from a low of 6.5% for ‘Odom’ Little Moses™ to a high of 42.5% for ‘Monstrosus’. In the second replication, all cultivars achieved over 30% establishment and most exceeded 40% establishment. An estimate of the annual seedling contribution per plant per cultivar was calculated by combining seed production data with establishment data for each cultivar. This estimate was predicted to range from 588 to 3763 and therefore none of the nine cultivars evaluated should be considered non-invasive based on our findings. Our findings show that germination and seedling survival rates are high for *E. alatus* and because the species is long-lived, cultivars will likely have to be completely seed-sterile to be considered non-invasive according to demographic models.

Euonymus alatus (Thunb.) Sieb. is a deciduous shrub that is a member of the celastraceae family. It is commonly called winged euonymus as a result of corky ridges found on the stems or burning bush as a result of its brilliant red fall foliage color. In 1860, this plant was brought from Asia to the United States for ornamental landscaping purposes (Dirr, 2009). *E. alatus* has many positive ornamental attributes including a dense, symmetrical habit, high-quality summer foliage, interesting corky ridged stems, orange aril fruits, and exceptionally brilliant and dependable red fall foliage color (Dirr, 2001). Historically, *E. alatus* has been popular as an ornamental shrub for challenging landscape situations because of its tolerance to many environmental conditions, overall hardiness, and longevity. It has commonly been planted around highways, shopping malls, commercial landscapes, and residential homes. Dirr (2001) estimated annual U.S. production of

E. alatus plants to be at least in the hundreds of thousands and more likely in the millions. In Connecticut alone, sales of just the cultivar Compactus represent \$5 million annually (Heffernan, 2005).

Unfortunately, many of the same characteristics that make *E. alatus* a successful ornamental in challenging planting locations also makes it potentially aggressive in natural environments. Although *E. alatus* is grown primarily for its dependable red fall foliage, its orange aril fruits are considered another important ornamental feature. Mature *E. alatus* plants can produce thousands of seeds annually that may be dispersed by birds, small mammals, and surface water runoff. Seeds may establish feral populations in areas located a considerable distance from the original plantings. *E. alatus* is currently considered invasive in many states in the eastern United States (Ding et al., 2006; Mehrhoff et al., 2003). Concern over the detrimental ecological effects of *E. alatus* has prompted many states to consider banning the sale of this species. Both Massachusetts (Anonymous, 2005) and New Hampshire (Anonymous, 2004) have passed legislation banning the sale of all *E. alatus*. Two counties in Long Island, NY, have legislation in place that will ban *E. alatus* in 2016 (Anonymous, 2009a, 2009b).

For several woody plants, including *Acer*, *Berberis*, *Buddleja*, and *Rhamnus*, studies have

revealed that certain cultivars may produce significantly fewer seeds than the species or other cultivars (Anisko and Im, 2001; Conklin and Sellmer, 2009; Lehrer et al., 2006; Wheeler and Starrett, 2001). These low-fruited genotypes are often considered to represent a smaller environmental threat than the more prolific genotypes of the same species (Knight et al., 2011). In Connecticut, 25 cultivars of Japanese barberry that produce high seed yields were voluntarily banned by the Connecticut Nursery and Landscape Association and only lower fruiting cultivars may be sold after 2013 (Connecticut Nursery and Landscape Association, 2010). In Oregon, where there is a ban on *Buddleja davidii*, cultivars that produce less than 2% viable seeds are exempt from the ban (Oregon Department of Agriculture, 2010).

Because *E. alatus* is a popular commercial species, there is considerable pressure to avoid a complete ban of the species and allow the sale of “safe” genotypes that are less prolific seed producers (Knight et al., 2011). Preliminary research suggests that substantial differences in seed production may exist between *E. alatus* cultivars. Ranney et al. (2007) found that ‘Odom’ Little Moses™ produced only 3% of the fruit set observed on ‘Compactus’, the most important commercial cultivar. Finneseth et al. (2009) found that ‘Rudy Haag’ produced extremely low amounts of seeds in comparison with ‘Compactus’. Both studies suggest that use of the low seed-producing cultivars may reduce the risk of invasion.

Nineteen *E. alatus* cultivars are known (Dirr, 2009), ≈12 of which are available in commerce in the United States and are prominent in the nursery and landscape arena. This study was conducted to broadly examine *E. alatus* cultivars to determine if any may be promoted as non-invasive. We studied cultivar seed production as well as germination, establishment, and survival in a deciduous woodland. In a separate study we investigated which types of natural environments were most conducive to *E. alatus* seedling establishment. Because most trees and shrubs are both heterozygous and cross-pollinated (Hartmann et al., 2011), our experimental design included significant opportunity for cross-pollination by many genotypes. Previous studies on *E. alatus* fruiting potential may have produced low fruit set results as a result of inadequate cross-pollination or immaturity of experimental plants.

Materials and Methods

Cultivar seed production. Nine winged euonymus cultivars were evaluated: ‘Compactus’, ‘Grove Compact’, ‘Monstrosus’, ‘Nordine Strain’, ‘Odom’ Little Moses™, ‘Pipzam’ Pipsqueak®, ‘Rudy Haag’, ‘Select’ Fire Ball®, and ‘Timber Creek’ Chicago Fire®. Plants were obtained from eight nurseries. All plants were maintained at the University of Connecticut, Department of Plant Science Research Farm, Storrs, CT (lat. 41.794415°; long. -72.227320°) in USDA hardiness zone 5, in Paxton and Montauk fine sandy loam,

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with full sun exposure. The corridor between New York, NY, and Boston, MA, has been heavily invaded by *E. alatus*, so the study location in Storrs, CT, is ideally situated in an area where *E. alatus* grows well (Mehrhoff et al., 2003). Plants were installed in the field in May 2004 with three replications of each cultivar. Cultivars were arranged in a completely random design. At the time of field establishment, plants were 3 years old from rooted cuttings. Spacing within rows was 3 m on center and spacing between rows was 4.5 m on center. Clean cultivation was maintained within rows using hand-weeding and early summer application of glyphosate herbicide. Grass alleyways were mowed between rows.

Plants were allowed to establish in the field for three growing seasons and were 6 years old when first evaluated for seed production. Seed data were collected in Oct. 2006 and 2007 when capsules ripened and orange-red arils were visible. Plants were harvested completely with all fruits present removed by hand. Each capsule produces a single aril/seed, so fruit counts are equivalent to seed counts. Data were subjected to analysis of variance (PROC MIXED) and mean separation using Fisher's least significant difference ($P \leq 0.05$) using SAS for Windows Version 9.2 (SAS Institute Inc., Cary, NC).

Germination and establishment of E. alatus 'Compactus' seeds in five environments. Germination, survival, and seedling growth of *E. alatus* 'Compactus' were studied in five natural environments. The environments were full sun meadow, edge of woods, dry deciduous woods, moist deciduous woods, and

pine woods. We selected these environments, which differed in sunlight exposure, soil moisture, nutrient content, and vegetation (Table 1), because they represent a broad range of environments found in southern New England. All five environments were located on unmanaged University of Connecticut properties in northeastern Connecticut. The first round of this study was initiated in 2003 and a second round was initiated in 2004.

On cloudless days in April and July of 2004, sunlight ($\mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$) was measured at all five environments with a LI-191 line quantum sensor connected to a LI-189 quantum meter (LI-COR Inc., Lincoln, NE). Readings were taken between 1200 and 1300 HR. We considered the light measurement at the full sun meadow site to represent 100% sunlight and the sunlight level for the four other environments was determined relative to the full sun environment. In Nov. 2003, four soil samples (15-cm cores) were extracted from each site. The samples were homogenized into one composite sample for each site and a subsample was removed from each composite sample for soil moisture analysis. Subsamples were weighed, dried overnight at 25 °C, re-weighed, and the percent soil moisture calculated. The remaining composite samples were sent to the University of Connecticut Soil Nutrient Analysis Laboratory, Storrs, CT, for analysis of: 1) nutrients, using a Modified Morgan Extractable test; 2) organic matter, as determined by loss on ignition; and 3) soil texture.

E. alatus 'Compactus' seeds were collected from a cultivated planting located on

the University of Connecticut campus in Storrs, CT. Seeds were sown in 1 m × 1-m plots at each of the five environments. One hundred seeds, with their orange aril coverings left intact, were sown per plot and there were four replicates per environment. Seeds were broadcast over the plot surfaces by hand in early November and all existing leaf litter, twigs, and vegetation were left in place. A 3-ft tall, 5-cm grid wire mesh fence was installed around the perimeter of the plots to deter disturbance by wild turkeys.

Experimental plots were evaluated for 3 years to satisfy the complex dormancy of *E. alatus* seeds and allow sufficient time for germination and establishment. Germination and survival data were taken in June of each year. Surviving plants were harvested in Sept. 2006 for the first replication of the study and in Sept. 2007 for the second replication of the study. At harvest, the number of branches, total branch length (summed for the entire plant), and dry weight were recorded for each plant. Analysis of variance was conducted using the PROC MIXED procedure of SAS for Windows Version 9.2 (SAS Institute Inc.).

Germination, survival, and growth of seeds from E. alatus cultivars in deciduous woods. Seeds from nine *E. alatus* cultivars were evaluated for their ability to germinate, survive, and grow in the previously described dry deciduous woods site. The goal was to observe any differences in the ability of seeds from different cultivars to establish in the same natural environment. The dry woods site was chosen because the study measuring *E. alatus*

Table 1. Descriptions of the five natural environments.

Exposure and vegetation			
Site	Full sunlight (%)		Primary vegetation
	April	June	
Dry woods	51	1	Maple (<i>Acer</i> sp.), oak (<i>Quercus</i> sp.), ash (<i>Fraxinus</i> sp.), birch (<i>Betula</i> sp.), white pine (<i>Pinus strobus</i>), hemlock (<i>Tsuga canadensis</i>)
Edge of woods	74	39	Hickory (<i>Carya</i> sp.), oak (<i>Quercus</i> sp.), poison ivy (<i>Toxicodendron radicans</i>), oriental bittersweet (<i>Celastrus orbiculatus</i>), multiflora rose (<i>Rosa multiflora</i>), bramble (<i>Rubus</i> sp.)
Full sun meadow	100	100	Orchard grass (<i>Dactylis glomerata</i>), timothy (<i>Phleum pratense</i>), red clover (<i>Trifolium pratense</i>)
Moist woods	55	1	Maple (<i>Acer</i> sp.), oak (<i>Quercus</i> sp.), american hornbeam (<i>Carpinus caroliniana</i>), spicebush (<i>Lindera benzoin</i>), interrupted fern (<i>Osmunda claytoniana</i>), jewel weed (<i>Impatiens capensis</i>), skunk cabbage (<i>Symplocarpus foetidus</i>)
Pine woods	50	4	White pine (<i>Pinus strobus</i>); scattered individuals of American hornbeam (<i>Carpinus caroliniana</i>), maple (<i>Acer</i> sp.), and oak (<i>Quercus</i> sp.)

Soil texture, organic matter, and moisture

Site	Soil texture (%)			Soil classification	Organic matter content (%)	Organic matter classification	Soil moisture (%)
	Sand	Silt	Clay				
Dry woods	52.9	34.6	12.5	Sandy loam	7.3	Medium	35
Edge of woods	53.9	37.4	8.7	Sandy loam	9.0	High	63
Full sun meadow	65.4	32.0	2.6	Sandy loam	6.5	Medium	35
Moist woods	47.0	37.6	15.4	Loam	13.4	High	75
Pine woods	59.2	30.0	10.8	Sandy loam	9.6	High	35

Soil pH and nutrients

Site	Soil pH	Soil nutrients (lbs/acre) (rating)			
		Calcium	Magnesium	Phosphorus	Potassium
Dry woods	5.3	545 (low)	82 (low)	1 (very low)	183 (medium)
Edge of woods	5.2	1370 (medium)	186 (medium high)	1 (very low)	285 (medium high)
Full sun meadow	5.7	1118 (medium)	216 (medium high)	1 (very low)	358 (medium high)
Moist woods	5.6	3057 (high)	311 (high)	1 (very low)	155 (low)
Pine woods	4.4	85 (very low)	12 (very low)	1 (very low)	78 (very low)

'Compactus' seed growth in five environments showed that the dry deciduous woods was the most favorable for establishment. The study was conducted twice with one-time replication beginning in 2006 and the second beginning in 2007.

Seeds used in this study were collected fresh each year from the replicated cultivar planting at the University of Connecticut, Department of Plant Science Research Farm, Storrs, CT. Seeds of each cultivar were sown in early November into 30 cm × 60-cm wooden frames that were 8 cm tall. The wooden frames were recessed halfway into the soil and all forest floor litter was left in place. Forty seeds were sown per frame by hand-broadcasting over the plot surfaces. The orange aril coverings were left intact on seeds used in this study. There were five replications of each cultivar treatment arranged in a randomized complete block design. After seed sowing, frames were covered with hardware cloth with 6-mm mesh openings to protect the seeds from disturbance by birds and small mammals. Experimental plots were harvested in early September, 3 years after the seeds were sown. The number of seedlings present was counted and all seedlings were harvested at the soil line and dry weights were determined. Data were subjected to analysis of variance (PROC MIXED) and mean separation using Fisher's least significant difference

($P \leq 0.05$) using SAS for Windows Version 9.2 (SAS Institute Inc.).

Results and Discussion

Cultivar seed production. All cultivars of *E. alatus* produced seeds with no cultivar yielding consistently low production (Table 2). Two cultivars, Compactus and Nordine Strain, produced over 8000 seeds per plant. 'Monstrosus' had the lowest 2-year average seed production (981) but was not statistically different from the other cultivars except 'Compactus'. Seven of nine cultivars produced more seeds in 2007 than in 2006, suggesting that larger plant size and maturity may be important considerations when evaluating the potential seed production of *E. alatus* cultivars.

Ranney et al. (2007) found that 3- to 4-ft tall by 2- to 3-ft wide plants of 'Odom' Little Moses™ produced only seven fruits per plant, whereas plants of 'Compactus' produced 270 fruits per plant. They suggest that the lower fruit set on 'Odom' Little Moses™ may have been the result of denser foliage and branching of this cultivar in comparison with 'Compactus', which reduced pollinator access. Hand pollinations produced similar fruit set on 'Odom' Little Moses™ and 'Compactus', which was provided as further evidence in support of reduced pollinator access. In 2007,

we found that 'Odom' Little Moses™ produced 1786 seeds per plant and 'Compactus' plants produced 8086 seeds (Table 2). The significantly higher seed production we observed for both cultivars may be attributed to larger, longer established plants with wide cross-pollination by nine genotypes rather than just two. With *E. alatus*, like with many woody species, it is important that studies evaluating cultivar seed productivity use plants that are old enough and sufficiently established to fully express their reproductive potential. Ample opportunity for cross-pollination with many other unrelated genotypes may also be important to accurately assess seed set potential in a manner that is representative of typical landscape settings.

Another study in Kentucky examined seed production by 'Compactus' and 'Rudy Haag' (Finneseth et al., 2009). Over a 3-year evaluation period, 'Compactus' produced on average 1238 seeds per plant, whereas 'Rudy Haag' produced only 12 seeds per plant. This seed production again falls well below what we observed for 'Compactus' and 'Rudy Haag' (Table 2). Both the Ranney et al. research (North Carolina) and the Finneseth et al. work were conducted in locations much further south than Connecticut and it is possible that *E. alatus* sets seed better in cooler regions, although there is no published evidence to support this theory.

Germination and establishment of *E. alatus* 'Compactus' seeds in five environments. No seeds of *E. alatus* 'Compactus' germinated in any environment in the first spring after fall sowing (Table 3). Substantial germination was observed, however, in the second spring with a small amount of additional seed germination occurring in the third spring. This germination pattern suggests that *E. alatus* seeds have a complex dormancy that requires one or more cycles of warm stratification followed by cold stratification to stimulate germination. Our results contradict most references, which state that *E. alatus* seed dormancy can be relieved by 90 d of cold stratification and not warm stratification (Dirr and Heuser, 1987; USDA,

Table 2. Seed production per plant for *Euonymus alatus* cultivars for 2 consecutive years.

Cultivar	Seeds/plant		
	2006	2007	Combined 2-year avg
Compactus	4094 a ^z	8086 a	6090 a
Grove Compact	487 b	1928 b	1208 c
Monstrosus	1597 b	365 b	981 c
Nordine Strain	857 b	836 a	4609 ab
Odom Little Moses™	308 b	1786 b	1047 c
Pipzam Pipsqueak®	850 b	3532 ab	2191 bc
Rudy Haag	986 b	2186 b	1586 bc
Select Fire Ball®	275 b	2020 b	1148 c
Timber Creek Chicago Fire®	3596 a	2660 b	3128 abc
Average for all cultivars	1450	3436	

^zMean separation of cultivars within columns by Fisher's least significant difference test at $P \leq 0.05$.

Table 3. Germination, survival and growth of *Euonymus alatus* 'Compactus' seeds in five natural environments.

Time replication 1							
Environment	First year germination (%)	Second year cumulative germination (%)	Third year cumulative germination (%)	Seedling survival (%) ^y	Seedling dry wt (g)	No. of branches per plant	Total branch length (cm)
Dry woods	0 a ^z	34.8 a	37.8 a	80.7 b	0.13 a	1.1 a	6.8 a
Edge of woods	0 a	0.3 b	1.0 b	100.0 a	0.05 b	1.0 a	4.6 a
Full sun meadow	0 a	0 b	0 b	N/A	N/A	N/A	N/A
Moist woods	0 a	0.3 b	0.3 b	100.0 a	0.03 b	0.3 b	1.5 b
Pine woods	0 a	28.5 a	32.3 a	55.2 c	0.15 a	1.2 a	7.3 a
Time replication 2							
Environment	First year germination (%)	Second year cumulative germination (%)	Third year cumulative germination (%)	Seedling survival (%)	Seedling dry wt (g)	No. of branches per plant	Total branch length (cm)
Dry woods	0 a ^z	31.0 a	31.8 a	77.1 a	0.13 a	1.2 a	8.7a
Edge of woods	0 a	0 b	0 c	N/A	N/A	N/A	N/A
Full sun meadow	0 a	0 b	0 c	N/A	N/A	N/A	N/A
Moist woods	0 a	0 b	0 c	N/A	N/A	N/A	N/A
Pine woods	0 a	9.5 b	13.0 b	83.3 a	0.13 a	1.1a	8.4a

^zWithin time replication mean separation in columns by Fisher's least significant difference test ($P \leq 0.05$). Data were subjected to arcsine transformation before analysis. Untransformed data are presented.

^ySurvival after 16 months for seedlings, which germinated in the second year.

N/A = not applicable.

Forest Service, 1974). However, Ranney et al. (2007) reports using a sequence of cold moist–warm moist–cold moist stratification to accomplish greenhouse germination of *E. alatus* seeds.

The dry deciduous woods and pine woods were the only two environments that supported significant germination. A maximum cumulative germination of 37.8% occurred in the dry deciduous woods. In time replication 1, the pine woods produced a statistically similar germination percentage to the dry deciduous woods, but in time replication 2, the pine woods produced only one-third the germination observed for the dry deciduous woods. No seeds germinated in the full sun meadow environment in either time replication. The moist deciduous woods and the edge of woods environments produced less than 1% germination in the first time replication with no seeds germinating in the second time replication.

Lubell and Brand (2011) found that Japanese barberry, another invasive woody shrub, also germinated well in a dry deciduous woods environment. Unlike *E. alatus* ‘Compactus’, however, barberry also germinated well in a full sun meadow environment and failed to germinate in pine woods. Because barberry seeds require only a single winter stratification period to break dormancy and germinate, seeds that land on top of the thick layer of needle duff typically found in pine woods are very vulnerable to desiccation when they germinate in the first spring after fall sowing or natural deposition (Lubell and Brand, 2011). *E. alatus* ‘Compactus’ seeds that land on the thick layer of needles, however, do not germinate until the second spring as a result of a complex dormancy requiring alternating warm moist and cold moist stratification. This time delay allows the euonymus seeds to be sheltered with two annual layers of cast needles, which provide a more uniformly moist environment than that experienced by the quick germinating barberry seeds. Ellis and Manley (2003) documented an 8-acre *E. alatus* invasion in mid-coast Maine found beneath an Eastern white pine canopy. Feral establishment of *E. alatus* in a natural pine woods setting supports our findings about establishment in coniferous areas.

The failure of *E. alatus* ‘Compactus’ seeds to germinate in the moist deciduous woods site is understandable, because *E. alatus* is considered to be intolerant of water-logged soils. It is less clear why *E. alatus* ‘Compactus’ seeds failed to germinate in the edge of woods or full sun meadow environments because *E. alatus* incursions are documented in these types of environments (Mehrhoff et al., 2003). Perhaps in the full sun meadow there was too much competition from the very dense grass vegetation, which rapidly developed in the spring and would have shaded and smothered small seedlings developing at the soil surface. Finneseth et al. (2009) reported no germination of *E. alatus* ‘Compactus’ in a simulated understory seed bank study, although the conditions of the simulated

understory environment were not provided. Finneseth et al. (2009) also reported limited persistence (only 2%) of *E. alatus* seeds in the soil after 12 months, which is in contrast to our study in which germination did not occur for 2 years and then reached as high as 37.8%.

Survival of *E. alatus* ‘Compactus’ seedlings in environments that supported germination (dry deciduous woods, pine woods) was generally high, reaching up to 80.7% (Table 3). Seedling dry weights were between 1 and 1.5 g and plants were mostly unbranched with a total stem length of as much as 8.7 cm. Overall, *E. alatus* seedling survival in these two sites was much higher than the 18.1% survival rate attained by *Berberis thunbergii* in a dry deciduous woods site (Lubell and Brand, 2011). *E. alatus* seedlings appear to be significantly more resilient than *B. thunbergii* seedlings when they germinate in favorable environments and their persistence seems to be more probable.

Germination, survival, and growth of seeds from E. alatus cultivars in deciduous woods. Overall, cultivar seedling establishment was higher in the 2007 to 2010 time replication than the 2006 to 2009 time replication (Table 4). In the 2006 to 2009 replication, seedling establishment rates ranged from a low of 6.5% for ‘Odom’ Little Moses™ to a high of 42.5% for ‘Monstrosus’. In the 2007 to 2010 replication, all cultivars exceeded

30% seedling establishment with the majority establishing at levels exceeding 40%. Seedling dry weights for cultivars were higher in the 2007 to 2010 time replication than in the 2006 to 2009 time replication (Table 4). Seedlings of most cultivars had an average dry weight of ≈1 g.

The level of seedling establishment for *E. alatus* cultivars is dramatically higher than the seedling establishment rate of 3% to 5% reported for Japanese barberry, a comparable invasive ornamental shrub (Lubell and Brand, 2011). In addition, euonymus seedling dry weights are roughly double those reported for Japanese barberry seedlings of the same age (Lubell and Brand, 2011). Winged euonymus may be a more aggressive invader than Japanese barberry because euonymus cultivars produce at least as much seed as barberry cultivars and have greater ability to establish in natural areas and then grow vigorously.

By combining the highest seed set value with the best establishment rate for each cultivar, it is possible to estimate the potential number of seedlings that a medium- to large-sized specimen could contribute each year to a natural environment (Table 5). Using this estimate, large individual plants of cultivars such as ‘Compactus’ and ‘Nordine Strain’ could contribute over 3500 seedlings annually. ‘Compactus’ is the primary *E. alatus* cultivar sold for landscaping and millions of these plants have been planted across the United

Table 4. Germination and growth of seeds from *Euonymus alatus* cultivars in a dry, deciduous woods natural environment.

Cultivar	2006–2009 time replication		2007–2010 time replication	
	Establishment (%) ^z	Dry wt (g)	Establishment (%)	Dry wt (g)
Compactus	20.5 bc ^y	0.90 a	45.5 ab	1.40 a
Grove Compact	28.5 ab	0.65 a	30.5 d	1.03 a
Monstrosus	42.5 a	1.09 a	47.5 a	1.14 a
Nordine Strain	41.5 a	0.97 a	45.0 abc	0.90 a
Odom Little Moses™	6.5 c	0.20 a	36.0 bcd	1.09 a
Pipzam Pipsqueak®	40.0 a	1.26 a	43.5 abc	1.13 a
Rudy Haag	20.0 bc	0.66 a	40.5 abcd	1.14 a
Select Fire Ball®	16.0 bc	0.41 a	48.5 a	1.51 a
Timber Creek Chicago Fire®	25.5 ab	0.62 a	30.0 d	0.91 a

^zEstablishment percent is the number of seedlings present at harvest and is a combination of germination and survival rates. Forty seeds sown per five replications; total seeds = 200.

^yMean separation of cultivars within columns (lowercase letters) by Fisher’s least significant difference test at $P \leq 0.05$.

Table 5. Estimated contribution of established seedlings to a deciduous woodland from landscape plants of *Euonymus alatus* cultivars.

Cultivar	Estimated seed production per plant ^z	Estimated establishment rate ^y	Estimated annual contribution per plant ^x
Compactus	8086	0.455	3679
Grove Compact	1928	0.305	588
Monstrosus	1597	0.475	750
Nordine Strain	8362	0.450	3763
Odom Little Moses™	1786	0.360	643
Pipzam Pipsqueak®	3532	0.435	1536
Rudy Haag	2186	0.405	885
Select Fire Ball®	2020	0.485	980
Timber Creek Chicago Fire®	3596	0.300	1079

^zEstimated seed production is the greatest seed production values exhibited by each cultivar in either of the evaluation years. Data from Table 2.

^yEstimated establishment rate is the greatest rate exhibited in either year for each cultivar and combines germination and survival rates. Data from Table 4.

^xEstimated annual seedling contribution per plant is calculated as the product of the estimated seed production per plant and the estimated establishment rate for each cultivar.

States over the last few decades. Our analysis shows that when considered collectively, these plants represent a potent reproductive entity. Although more modern cultivars such as ‘Grove Compact’ and ‘Odom’ Little Moses™ may contribute fewer seedlings to natural environments than ‘Compactus’, they still can be expected to contribute over 500 seedlings per plant per year (Table 5).

This research explored whether any *E. alatus* cultivars possess a reduced invasive risk as has been suggested for ‘Odom’ Little Moses™ (Ranney et al., 2007) and ‘Rudy Haag’ (Finneseth et al., 2009). Although we found that some cultivars produce significantly fewer seeds than others, our data suggest that all cultivars have the potential to produce large amounts of seed if the plants are allowed to mature and are exposed to cross-pollination with different genotypes. Seeds of all *E. alatus* cultivars we studied also display the ability to germinate and survive in at least some natural environments. Because *E. alatus* is a long-lived woody shrub, it is important to consider seed production of a cultivar in the landscape over the course of its reproductive life. Matrix population models show that for long-lived plant species, large changes in fecundity result in relatively small changes to population growth rates (Knight et al., 2011). It is likely that even low levels of seed production on *E. alatus* cultivars will produce positive population growth. Further research on how pollen movement, pollen availability, and pollen genetic source influence seed set in invasive plants would provide additional insight into the risks associated with continued use of specific genotypes that appear to set limited numbers of seeds.

After considering long-term reproductive potential, we do not believe that any of the cultivars evaluated are non-invasive or should be considered a minimal invasive risk. Cultivar exemptions for these genotypes in areas where *E. alatus* has been banned cannot be recommended. Recently, triploid *E. alatus* plants have been produced from seed endosperm tissue (Thammina et al., 2011). If these plants prove to be sterile and possess desirable horticultural characteristics, they should be

recommended as the safe alternatives of choice to replace older, seed-producing cultivars.

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Connecticut Invasive Plant Working Group (CIPWG) 2012 Annual Report

The Connecticut Invasive Plant Working Group (CIPWG) is a consortium of individuals, members of environmental organizations, and affiliates of municipal and state agencies whose mission is to promote awareness of invasive plants and their non-invasive alternatives. Formed in 1997 as an ad-hoc group, CIPWG is now in its 15th year of operation. The working group meets 1 to 2 times per year to collaborate and share information on the presence, distribution, ecological impacts, and management of invasive plants affecting Connecticut and the region and to promote uses of native or non-invasive ornamental alternatives. The working group includes federal, state, and town agency staff, non-governmental agencies (NGOs), researchers, nursery growers, educators, master gardeners, community members, and interested citizens. Donna Ellis (University of Connecticut Department of Plant Science & Landscape Architecture) and Penni Sharp (Connecticut Botanical Society) serve as Co-chairs.

Since 2002, CIPWG has hosted biennial invasive plant symposia. The sixth biennial symposium was presented on October 25, 2012 at the University of Connecticut in Storrs, CT. The theme of the all-day conference was: *Getting Real about Invasive Plants: Prioritize, Strategize, Mobilize*. Previous symposia have typically attracted 300 to 400 people, but this year's conference was sold out at 475 registered attendees, and an additional 60 people were turned away when the event reached full capacity. Deputy Commissioner Susan Whalen of the Department of Energy and Environmental Protection (DEEP) delivered opening remarks, and Keynote speaker Dr. Elizabeth Farnsworth of the New England Wild Flower Society presented, "Twenty-first Century Tools for Tackling Invasive Plants: Identify, Prioritize, Mobilize". Susan Parr (Federated Garden Clubs of Connecticut; CIPWG) was the first recipient of the Leslie J. Mehrhoff Award. Concurrent afternoon sessions addressed decision tools for management projects, invasives 101 (general information on invasive plants), aquatic invasive plants and clean boating, economics, restoration with native plants, and other topics. Research posters, other educational exhibits, and live invasive plant specimens were featured throughout the day.

CIPWG's news and events list serve has approximately 730 members. The CIPWG website has been moved to a newer server and is now accessible at www.cipwg.uconn.edu. The website provides information on invasive plant topics that include identification, management, the Connecticut list of invasive plants, photos of invasive plants, invasive alternatives, resources, legislative updates, and much more. The CIPWG list serve and website reside on a University of Connecticut Department of Plant Science and Landscape Architecture server. Online reporting forms for mile-a-minute weed (*Persicaria perfoliata*), giant hogweed (*Heracleum mantegazzianum*), and purple loosestrife (*Lythrum salicaria*) allow website visitors to provide distribution information on these species. CIPWG provides links to the Early Detection and Distribution Mapping System (EDDMapS; www.eddmaps.org) to accept additional reports of any other invasive plant. During 2012, several new features were added to expand the CIPWG website, including a scrolling photo gallery of Connecticut invasive plants, early detection information, an event calendar, and new links to invasive plant fact sheets and management information. The design and layout of the site also underwent significant updates.

The Connecticut Invasive Plant Working Group maintains the following subcommittees:

- Education and Outreach (educational outreach about invasive species and their alternatives)
- Management (develop and disseminate information on invasive plant control options)
- Native Alternatives (explore and promote use of native plant species as alternatives to invasives)
- Volunteer (organize and provide assistance for pulling parties and other invasive plant activities where volunteers are needed).

Three invasive plant pulling parties for control of mile-a-minute weed were conducted in Sprague, CT on May 31, June 13, and July 12, 2012. Approximately 25 volunteers and project coordinators attended the three events, which were co-sponsored by CIPWG, DEEP, the University of Connecticut, and the Connecticut Agricultural Experiment Station.

On September 26, 2012, Penni Sharp from CIPWG and Bill Hyatt from the Connecticut Invasive Plants Council appeared before the Council on Environmental Quality (CEQ) to discuss the problems of invasive species in Connecticut. CEQ members showed interest in the issue and asked a number of questions regarding invasives. The CEQ included the following in its draft list of Recommendations for Legislation on November 14, 2012:

“Appropriate sufficient funds to mount an effective defense against the largest ecological threat to Connecticut’s native habitats: invasive species.

Also require an appropriate agency (the Connecticut Agricultural Experiment Station, DEEP, Agriculture, or all three) to prepare a plan for rapid detection and eradication of newly discovered terrestrial invasive species (to complement the existing state plan for aquatic species).”

CIPWG maintains a list of speakers who are available to give presentations on many aspects of invasive plants, including identification, control, and non-invasive alternatives. These speakers and other CIPWG members presented many lectures, workshops, demonstrations, and guided field walks during 2012. Two CIPWG exhibits developed in 2011 that feature terrestrial plants and aquatic species continue to be displayed at many public events.

The CIPWG exhibits were displayed and/or invasive plant educational materials were provided at the following local, statewide, and regional events during 2012:

- Bethel Garden Fair, Bethel (500 attendees)
- Bethlehem Fair (10,000 attendees)
- Branford Land Trust meeting (15 attendees)
- CIPWG Symposium, Storrs (475 attendees)
- CT Agricultural Experiment Station Forest Health Monitoring Workshop, New Haven (60 attendees)
- CT Agricultural Experiment Station Plant Science Day, Hamden (2 exhibits) (1,000 attendees)

List of 2012 outreach events, continued:

- CT Association of Conservation and Inland Wetlands Commissions Annual Meeting, Cromwell (250 attendees)
- CT Association of Wetland Scientists Annual Meeting, Meriden (27 attendees)
- CT Conference on Natural Resources, Storrs (200 attendees)
- CT DEEP Headquarters, Hartford
- CT Flower and Garden Show, Hartford (37,000 attendees)
- CT Nursery and Landscape Association Summer Field Day, Hamden (360 attendees)
- CT Nursery and Landscape Association Winter Symposium and Expo, Manchester (570 attendees)
- CT River Watershed Invasive Species Initiative (18 attendees)
- DEEP Vegetation Management Training Program, North Haven (45 attendees)
- Eastern States Exposition (Big E), West Springfield, MA
- Fall Garden Day, Norwich (80 attendees)
- Farmer's Markets in Monroe, Norfolk, Norwalk, Watertown, Westport, and Wilton (500 attendees)
- Federated Garden Clubs of CT, Inc. Environmental Studies School, Derby (22 attendees)
- Flanders Nature Center, Woodbury
- Floating Workshop, Mansfield
- Food, Land, and People Annual Conference, Madison (50 attendees)
- Gillette Castle, Haddam (210 visitors)
- Goshen Fair (30,000 attendees)
- Greenwich Audubon Hawk Watch (200 attendees)
- Hamden Earth Day Celebration (3,500 attendees)
- Harwinton Fair (26,000 attendees)
- Hilltop Farm Fest, Suffield
- Invasives 101 Forum, Newington (40 attendees)
- Invasive Plant presentation, Hampton (35 attendees)
- Invasive Plant Workshop, Woodbury (50 attendees)
- Invasive Species Workshop, Ridgefield (25 attendees)
- Invasive Workshop, Lebanon (48 attendees)
- Joshua's Trust and MassConn Sustainable Forest Partnerships Workshop, Mansfield (35 attendees)
- K-8 School Grounds Ornamental Plant Management Workshop, Hebron (outdoor component) (65 attendees)
- K-8 School Grounds Ornamental Plant Management Workshop, West Hartford (indoor component) (125 attendees)
- Killingworth Woodland Fair (14 attendees)
- Lebanon Town Fair (8,000 attendees)
- Legislative Reception, State Capitol Building, Hartford (150 attendees)
- Mad Gardener's Symposium, Falls Village (30 attendees)
- Mile-a-minute Weed Biological Control Cooperators' Meeting, Trenton, NJ (80 attendees)
- Mile-a-minute Workshop, Madison
- Native Plants Workshop, Vernon (16 attendees)

List of 2012 outreach events, continued:

- Nature Festival, West Hartford (200 attendees)
- New England Grows Great Ideas Pavilion, Boston, MA (15,000 attendees)
- Riverton Fair (15,000 attendees)
- Sierra Club of Greater Hartford meeting, West Hartford (20 attendees)
- Southern Connecticut State University, Institute for Science Instruction and Study program, New Haven (8 attendees)
- Suffield High School field walks with science students (60 attendees)
- The Living Earth Environmental Studies School (Federated Garden Clubs of CT, Inc.), New Haven (20 attendees)
- Town of Coventry (CIPWG exhibit displayed in Town Hall)
- Town of Marlborough event
- Trout Unlimited regional meeting, Bozrah (40 attendees)
- University of Connecticut Climate Change Forum, Storrs (74 attendees)
- University of Connecticut Cornucopia Fest, Storrs (5,000 attendees)
- University of Connecticut Garden Conference, Storrs (320 attendees)
- University of Connecticut Haddam County Cooperative Extension, Haddam
- University of Connecticut New London County Master Gardener Office, Norwich
- University of Connecticut New London County Master Gardener Plant Sale, Norwich (150 attendees)
- University of Connecticut Perennial Plant Conference, Storrs (325 attendees)
- University of Hartford, West Hartford (30 attendees)
- University of New Hampshire Cooperative Extension Weed Management program, Goffstown and Manchester, NH (72 attendees)
- West Hartford Garden Club meeting (80 attendees)
- Wild Ones presentation, New London (13 attendees)
- Windsor Garden Club (40 attendees)

Submitted by Donna Ellis (University of Connecticut Department of Plant Science and Landscape Architecture; CIPWG Co-chair), with contributions from Todd Mervosh (Connecticut Agricultural Experiment Station), Charlotte Pyle (USDA Natural Resources Conservation Service), Logan Senack (University of Connecticut and Department of Energy and Environmental Protection), Penni Sharp (Connecticut Botanical Society; CIPWG Co-chair), and University of Connecticut Master Gardener Coordinators Jackie Algon, Regina Campfield, Patricia Eldredge, and Susan Munger.

- 30 November 2012