



Narragansett Bay

Research Reserve

Technical Report

2011:5

Prudence Island Cooperative Weed Management Area: Scope and Activities through 2011

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Prudence Island Cooperative Weed Management Area:
Scope and Activities through 2011

Individuals and Agencies Represented in the PI CWMA at its Inception

Nate Bacon, Property Owner

Butch Collamati, Property Owner

Beth Correira, Stewardship Committee Chair and Board Member, Prudence
Conservancy

Evie Malm, Board Member, Prudence Conservancy

Larry Mouradjian, Chief, RI DEM Div. of Parks and Recreation

Gene Rinker, Supervisor, Prudence Island Utility Corporation

Pat Rossi, Chair, Prudence Improvement Association

Scott Ruhren, Director of Conservation, Audubon Society of Rhode Island

Alan Souza, Maintenance Crew, Portsmouth Department of Public Works

Catherine Sparks, Acting Chief, RI DEM Div. of Forest Environment

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Abstract

A cooperative weed management area (CWMA) for the entire geographic extent of Prudence Island (PI) was established in 2007 and efforts to implement PI CWMA designated tasks are ongoing. Successfully in use throughout the western states, CWMAs are local organizations that provide a mechanism for sharing invasive plant management resources across jurisdictional boundaries in order to achieve widespread invasive plant prevention and control. The organization of a CWMA for Prudence Island builds on an earlier partnership between the Narragansett Bay National Estuarine Research Reserve (NBNERR or Reserve) and the local conservancy group (Prudence Conservancy) which resulted in an informational workshop regarding invasive plant impacts, identification, and methods of control as well as the organization of a volunteer Weed Whacker group. Since its inception, the Prudence Island CWMA has adopted an island-wide control plan for autumn olive (*Elaeagnus umbellata* Thunb.), organized a series of volunteer Weed Whacker Workdays, hosted an alternative spring break program, promoted an Adopt-a-Spot volunteer effort, and provided educational materials to landowners in a variety of formats (i.e. e-alerts, newsletter articles, brochures). Future efforts are likely to involve: expanding the partnership to include additional private landowners; the acquisition of additional access permissions for the purpose of invasive plant control; the development of control plans for one or more additional target species; and, additional public education and outreach.

Introduction

As non-native, invasive species do not respect property boundaries it is imperative that they are addressed more broadly than can generally be accomplished by any single property owner or land manager. Recognizing this need, land owners and managers in the western United States formalized what had previously been loose associations of state, federal, and private land managers into CWMA's to allow for the sharing of invasive plant management resources across jurisdictional boundaries. These local organizations are able to achieve widespread invasive plant prevention and control in a broader geographic context. Due to the success of these organizations, the concept has been adapted by the Midwest Invasive Plant Network (MIPN) to apply to eastern states and guidance for CWMA establishment is provided by that organization in a document entitled "CWMA Cookbook: A Recipe for Success – A Step-by-Step Guide on How to Develop a Cooperative Weed Management Area in the Eastern United States". This guidance document, as well as other support materials, is available for download on the MIPN website (<http://www.mipn.org>).

By definition, CWMA's are local organizations that integrate all invasive plant management resources across jurisdictional boundaries in order to benefit entire communities. They may be comprised of local citizens, landowners, and not-for-profit groups as well as city, county, state, tribal, and federal agencies as appropriate. Although specific compositions of partnerships may vary, these organizations are considered to be a CWMA if they have the following elements:

- Is a local weed management organization
- Is led by a steering committee
- Is formally organized under an agreement
- Facilitates cooperation and coordination
- Networks across all jurisdictional boundaries

The establishment of CWMA's in western states has been responsible for improving monitoring, prevention, and control of invasive plants, as well as raised public awareness. It has been anticipated that the same successes will occur through the application of this concept throughout the eastern states and it was to advance that goal that a Prudence Island CWMA was formed.

PI CWMA Foundational Efforts

An initial informal cooperative effort to address concerns about invasive species involved Reserve staff and board members of the Prudence Conservancy (PC) who were concerned with stewardship of their collective properties. NBNERR manages properties owned by the State of Rhode Island which includes approximately 60% of Prudence Island while the PC owns fee simple or holds conservation easements on an additional 17% (which includes an easement on property owned by the Audubon Society of Rhode Island). Jointly these agencies began to solicit Island resident participation by hosting a public workshop and establishing a stewardship volunteer program.

Public Workshop

A public workshop was held on Oct. 8, 2006 at the Hope Brown Center (Farnham Farm) to provide training for invasive plant species identification, early detection, and methods of control. The workshop was fairly well attended but it was arguably too ambitious in content for a single scheduled event. [A much abbreviated presentation on identification and control was provided immediately prior to the first scheduled Weed Whacker workday in 2007.] Specific workshop content included: impacts of invasive species; overview of botanical terms for characteristic plant attributes; species identification; management issues; survey and monitoring methods; and, control. One anticipated outcome of the workshop was the identification of volunteers to assist with early detection efforts; however, that program did not develop. Workshop participants did however express concern about the issue of non-native species and indicate a willingness to support control efforts.

Weed Whacker Workdays

Weed Whacker is the name adopted for Prudence Island stewardship volunteers when the group was established in 2006 and includes all those who commit to giving some of their free time for the removal of unwanted, invasive vegetation. Workdays were scheduled to take place during a variety of seasons over a period of three years and generally lasted between two to four hours on scheduled dates. Prior to the establishment of the PI CWMA, volunteers were tasked with the removal of multiple invasive species at a particular location (see Appendix 1 for first workday announcement). After the PI CWMA selected a targeted species for control, Weed Whacker Workdays were conducted to advance that control effort over a wide geographic area. Although workdays attracted a few (generally 6-10) dedicated volunteers, the organization of this activity, which had been jointly organized between NBNERR and the PC, became more difficult over time and these workdays were discontinued. It is possible that this particular focused effort would be better attended if it were scheduled for the same weekend annually (for example, on Earth Day).



Figure 1: Symbol adopted for Weed Whackers.

Weed Whacker effort was not restricted to scheduled workdays. A few volunteers contributed additional time working at their convenience on the removal of non-native, invasive species either on their own properties or on publicly held lands. This volunteer support can be largely attributed to the public outreach efforts both pre- and post-establishment of the PI CWMA.

Stakeholder Meetings

While the properties managed by the two agencies involved in the initial informal cooperative effort (NBNERR and PC) account for a large percentage of the island, there remained a need to

involve additional stakeholders to avoid the persistence of invasive plant refuge populations on neighboring properties. It seemed appropriate to formalize an agreement among Island stakeholder groups and establish a CWMA for the entire geographic extent of Prudence Island to make it possible to effectively control invasive species across jurisdictional boundaries and share generally limited resources. Using the CWMA guidance document (“CWMA Cookbook: A Recipe for Success – A Step-by-Step Guide on How to Develop a Cooperative Weed Management Area in the Eastern United States”) and other materials available from the MIPN, NBNERR staff developed appropriate introductory materials on the CWMA concept (to include examples of successful programs) and draft agreements for review.

Invitations to the initial informational meeting were sent to all Prudence Island property owners and land managers with greater than 5 acres owned/managed (Table 1) as well as to agencies with a potential historic impact such as National Grid and the U.S. Army Corp. of Engineers. The goals of the meeting (held May 23, 2007) were to: inform potential participants about the need and mechanisms for addressing the issue of non-native, invasive species; present an overview of CWMA’s to include examples of successful programs and benefits; provide an overview of invasive species known to occur on PI and their relative impact; and, discuss logistics for establishing a CWMA for Prudence Island.

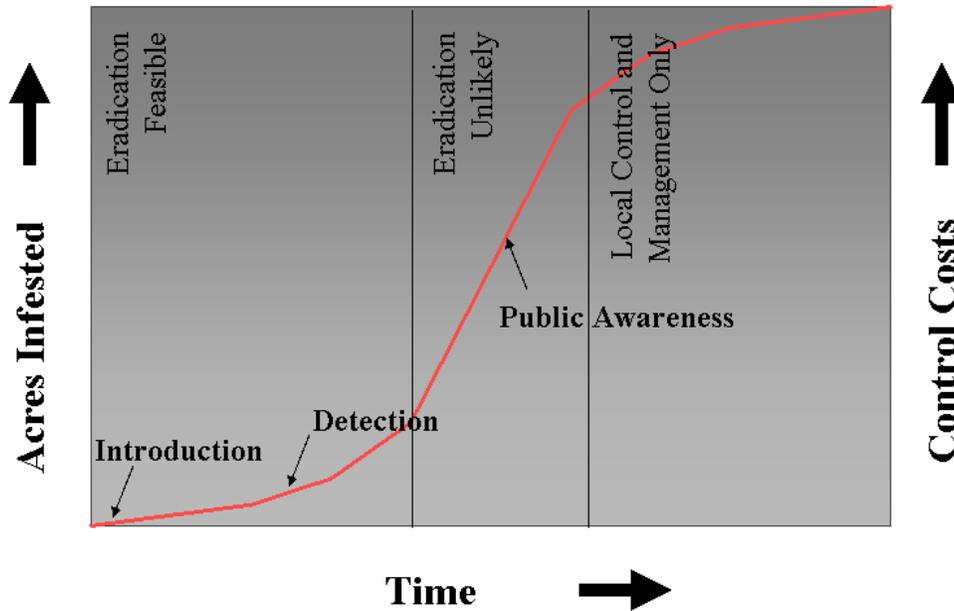
Table 1: Prudence Island property owners / land managers with greater than 5 acres

| | |
|---------------------------------|--|
| Audubon Society of Rhode Island | Portsmouth Department of Public Works |
| Blount Prudence Preserve LLC | Prudence Conservancy Stewardship Committee |
| Bacon Family | Prudence Improvement Association |
| Ballard Family | Prudence Island Utilities Corp. |
| Barrett Family | RIDEM Div. of Fish and Wildlife |
| Caruolo Family | RIDEM Div. of Forest Environment |
| Collamati Family | RIDEM Div. of Parks and Recreation |
| Little Family | Rossi Family |
| McLellan Family | |

Although attendance at the initial meeting was very limited, participants did agree that there was a need to address invasive species and were able to discuss potential next steps. It was agreed that the PI CWMA would adopt a single species for targeted control efforts with a large component of that effort to involve an educational campaign to promote control efforts and increase program success.

Critical to the selection of a single species for targeted control was an understanding of how invasive plant species increase over time and the likelihood of control at various stages of population growth (see Figure 2). Generally speaking, once the public becomes aware of a species on the landscape, efforts to completely remove them (eradication) become unlikely and the only option for management is control to avoid significant increase in population numbers or geographic extent. It is far better in terms of control costs to manage invasive plant species immediately or shortly after introduction. Better still to raise public awareness about the impacts of invasive species to help prevent their introduction.

Figure 2: Invasive plant species increase over time and control potential



Following a discussion of the non-native, invasive species known to be present on Prudence Island both Black swallowwort (*Vincetoxicum nigrum*) and Japanese knotweed (*Polygonum cuspidatum*) were considered for targeted control because of their relatively recent introduction and limited distribution at the time. Upon further consideration, both species were rejected: swallowwort due to its potential for rapid increase and limited access to infestation sites and knotweed because its primary infestation site is on an embankment on the shore which is highly susceptible to erosion.

NatureServe’s Invasive Species Assessment Protocol and resulting impact ranks (I-Ranks), though not available for all species known to occur on islands in Narragansett Bay, was used to select a target species (see Table 2). This tool, which is used to assess and categorize non-native invasive plants based on their potential to impact native species and natural biodiversity, is intended to be applied over a large geographic area (Morse et. al., 2004). As such, it may have been more appropriate to apply a ranking system designed to be suitable at smaller scales such as that described by Hiebert and Stubbendieck (1993). However, as only generalized information about current extent and rate of spread for individual species was available at the local scale and the protocols apply similar criteria to assign ranks, the use of either was considered reasonable for the purpose of selecting a target species.

Autumn olive (*Elaeagnus umbellata*) was considered the most appropriate choice due to its high national I-Rank (reflecting high ecological impacts and low management difficulty). The PI CWMA stakeholder members agreed that their first efforts at island-wide control should be assigned to a species for which control was likely to be successful so a weed control plan for autumn olive was developed, reviewed, accepted and implemented (see Appendix 2).

Table 2: Invasive plants known to be present on Narragansett Bay Islands and Invasive Species Impact ranks (I-Ranks) developed by NatureServe (if available, otherwise listed as unknown).

| Scientific Name | Common Name | National I-Rank | Ecological Impacts | Current Distribution And Abundance | Trend in Distribution And Abundance | Management Difficulty |
|-------------------------------------|------------------------------------|----------------------|----------------------|------------------------------------|-------------------------------------|-----------------------|
| <i>Bromus tectorum</i> | Cheat Grass (Drooping Brome Grass) | High | High | High/Medium | Medium | High/Medium |
| <i>Elaeagnus umbellata</i> | Autumn Olive | High | High | High | High/Medium | Low |
| <i>Acer platanoides</i> | Norway Maple | High/Medium | Medium | High/Medium | High/Medium | Medium/Low |
| <i>Berberis thunbergii</i> | Japanese Barberry | High/Medium | High/Medium | High | Medium/Low | Insignificant |
| <i>Celastrus orbiculata</i> | Oriental Bittersweet | High/Medium | Medium/Low | High | High/Low | Medium |
| <i>Ligustrum vulgare</i> | European Privet | High/Medium | High/Low | High/Medium | High/Medium | High/Medium |
| <i>Lonicera japonica</i> | Japanese Honeysuckle | High/Medium | Medium | High | High/Medium | High/Medium |
| <i>Lonicera morrowii</i> | Morrow Honeysuckle | High/Medium | Medium/Low | High | High/Medium | Medium |
| <i>Rhamnus cathartica</i> | Common Buckthorn | High/Medium | Medium | High | High/Low | Medium |
| <i>Euphorbia cyparissias</i> | Cypress Spurge | High/Low | Medium/Low | High/Low | High/Low | High/Medium |
| <i>Ailanthus altissima</i> | Tree-of-Heaven | Medium/Low | Medium/Low | High | Medium/Low | Medium/Low |
| <i>Lotus corniculatus</i> | Birds-foot Trefoil | Medium/Low | Medium/Low | High/Medium | Medium/Low | Medium/Low |
| <i>Rosa multiflora</i> | Rambler Rose (Multiflora Rose) | Medium/Low | Low | High | Medium/Low | Low |
| <i>Acer pseudoplatanus</i> | Sycamore Maple | Medium/Insignificant | Medium/Insignificant | Medium/Low | Medium/Low | Low/Insignificant |
| <i>Rosa rugosa</i> | Rugosa Rose (Beach Rose) | Low | Low | High/Medium | Unknown | Insignificant |
| <i>Centaurea nigra</i> | Black Starthistle (Black Knapweed) | Low/Insignificant | Insignificant | Medium | Unknown | Unknown |
| <i>Berberis vulgaris</i> | Common Barberry | Unknown | Unknown | Unknown | Unknown | Unknown |
| <i>Glaucium flavum</i> | Horn-poppy | Unknown | Unknown | Unknown | Unknown | Unknown |
| <i>Phragmites australis</i> | Common Reed | Unknown | Unknown | Unknown | Unknown | Unknown |
| <i>Polygonum cuspidatum</i> | Japanese Knotweed | Unknown | Unknown | Unknown | Unknown | Unknown |
| <i>Rubus phoenicolasius</i> | Wineberry | Unknown | Unknown | Unknown | Unknown | Unknown |
| <i>Rorippa nasturtium-aquaticum</i> | True Watercress | Unknown | Unknown | Unknown | Unknown | Unknown |
| <i>Vincetoxicum nigrum</i> | Black Swallow-wort | Unknown | Unknown | Unknown | Unknown | Unknown |

*Invasive Species Impact Ranks (I-Ranks) developed by NatureServe using "An Invasive Species Assessment Protocol: Evaluating Non-Native Plants for Their Impact on Biodiversity." (Morse, et. al., NatureServe, 2004). Table contents are based on evaluations completed through January 10, 2005. See <http://www.natureserve.org/getData/plantData.jsp>

The goals of a second stakeholder meeting (held June 18, 2008) were to review materials generated for PI CWMA partners and landowners and to consider mechanisms for advancing PI CWMA efforts. Specific discussion topics included: estimated infestation levels of invasive plants present on Prudence Island, early detection species to watch for, management priorities, funding opportunities, and potential next steps.

During this meeting it was agreed that the PI CWMA would formally adopt two previously draft documents: a Statement of Intent to Cooperate for PI CWMA partners and a Hold Harmless Agreement for partners and landowners to allow trespass for the purpose of invasive plant control (see Appendix 3). Once adopted, these documents were forwarded to the appropriate agency representative (if absent from the meeting) and/or private landowner in areas with known infestations of autumn olive for signatures (see Appendix 4).

In keeping with the groups' intent to implement an educational campaign to promote control efforts and increase program success, meeting participants conceived of and developed an Adopt-a-Spot volunteer program to supplement Not Wanted posters already on display around the Island (see Appendix 5). It was hoped that this program would not only increase awareness but also attract volunteer support for control efforts. Unfortunately, this program was not as successful at attracting volunteers as hoped. The need for broader public awareness was recognized and it was determined that an appropriate article should be generated for the widely distributed Prudence Conservancy newsletter. An added benefit was that this subject was then picked up by the Rhode Island Wild Plant Society for inclusion in their newsletter as well, thereby reaching an even broader audience (see Appendix 6).

Additional discussion related to the possibility of using convict labor (on loan from the state prison and applied elsewhere throughout the state for stewardship projects) to carry out the autumn olive control plan, the need to buy or borrow a chipper to be more efficient at autumn olive slash removal, and the use of Weed Whacker workdays to support the PI CWMA. With the exception of the Weed Whacker workday transition to exclusively target autumn olive, the other two discussion items were found to be unfeasible upon further investigation.

At neither of the stakeholder meetings, or at any time during follow-up correspondence, did the PI CWMA partners agree to establish a formal organizational structure such as a steering committee. Although this lack arguably makes the organization something other than a CWMA and reduces the potential for acquiring outside funding, it was felt that the group would be best served to limit formal participation requirements until such time as the efforts of the PI CWMA were demonstrated to be successful by either raising public awareness or noticeably reducing the targeted control population. According to the MIPN Coordinator this is a fairly common occurrence, where on-the-ground work and measurable progress is often the precursor needed to develop sufficient motivation for tackling more complex tasks such as organizational structure and management plans (personal communication).

Associated Efforts in Support of the PI CWMA

The NBNERR and, to a somewhat lesser extent the PC, has attempted to support PI CWMA efforts since its inception through both paid assistance and volunteer programs. Volunteer efforts including Weed Whacker workdays, individual volunteer support, and other stewardship program activities hosted by both of these agencies represent by far the greatest contribution to the control of autumn olive to date. In keeping with the control plan strategy, efforts to remove autumn olive are not restricted to a single location but preferentially target outlying populations when possible to prevent the establishment of new colonies away from the primary source population. See Figure 3 for locations of targeted control efforts.

Alternative Spring Break

In 2008 NBNERR developed and implemented an alternative spring break program to attract volunteer support from college level students at local universities. The emphasis of the program in each of the four years since its start has been the removal of autumn olive in support of PI CWMA goals while also raising the visibility of the Reserve. For a complete overview of the program, visit <http://www.nbnerr.org/springbreak.htm>. Over a period of four years the alternative spring break program has attracted dozens of volunteers from eight educational institutions and contributed literally hundreds of hours to this targeted control effort; including meal preparation support by local residents.

On-Line Posted Volunteer Opportunities

NBNERR registered for an on-line volunteer support service (Volunteer Center of RI [later renamed Serve RI]) in 2009 to expand its ability to post volunteer opportunities to a larger audience. Although not exclusively related to PI CWMA efforts, two positions were associated: invasive species monitoring and mapping; and, invasive species control. In two years there were a number of inquiries regarding these posted opportunities but generally the Reserve's limited access via ferry was a deterrent for both individuals and groups. Since volunteers from off-island must commit to spending a minimum of 6 to 8 on-island and traveling, only two individuals made a commitment to volunteer at the Reserve for multiple days resulting in less than fifty hours of combined volunteer effort. As this on-line service is no longer offered free of charge NBNERR stopped posting positions in 2011. Updates to the NBNERR website in 2009 incorporated a revised Call for Volunteers page to include these volunteer positions but with no discernable results to date.

Paid Seasonal Workers

In 2009 and 2010, NBNERR and the PC jointly hired two general stewardship / land management seasonal workers to assist with various stewardship program activities conducted by both agencies. Workers contributed comparable time and effort on tasks assigned by both agencies. Although tasks varied, the Reserve allowed the workers to contribute to the autumn olive removal effort as their schedules permitted. In total, approximately forty hours of effort



Figure 3: Targeted control sites. Circles depict effort where white = 3 to 10 hours, orange = 10 to 20 hours, and red = 20+ hours.

each year were associated with autumn olive removal. Unfortunately it was not possible to continue hiring seasonal workers due to budget limitations in subsequent years.

Community Service

While not an overly common occurrence, Reserve staff is occasionally approached by individuals who need to meet requirements for community service. As the appropriate tools and a description of the program are ready to hand, assigning the task of autumn olive removal to fulfill community service hours is a first choice assuming the individual is of an appropriate age to handle this strenuous activity and/or to handle herbicide. Less than thirty community service hours have been applied to advance PI CWMA goals to date.

Discussion

Although the PI CWMA has made significant strides in implementing initial program tasks, it is fairly safe to say that the primary goal of controlling autumn olive has proven far more difficult than expected. The belief that we could collectively act to control this selected species as an unspoken, yet presumed, prerequisite for continued PI CWMA development may have been entirely too ambitious. Many locations where autumn olive control has occurred

need to be revisited to address re-growth and only a modest percentage of the primary population center on the South End of Prudence Island has been targeted for control efforts. The absence of designated funds for the PI CWMA and the limited ability to attract volunteer support for this effort may ultimately make control of autumn olive unrealistic. Autumn olive plants at new infestation sites are maturing to produce seed and spreading, even as plants at previously targeted sites are rebounding, resulting in only a moderately lesser geographic extent than when the control plan was adopted and implemented.

The general expectation of the PI CWMA partners was that we would next need to meet as a group when, as the result of successful autumn olive control, we would be required to select and develop a control plan for one or more alternate target species. At that time presumably we would also discuss the following: revised or new public outreach material; potential mechanisms for boosting volunteer contribution; and, ideas for attracting additional support from previously uninvolved stakeholder groups and private landowners. Unfortunately, as the expected timeline for implementing the initial tasks has been somewhat extended, the continued development of the PI CWMA has been delayed. At this time, it is perhaps appropriate to coordinate another stakeholder meeting to discuss the delay and potential next steps for moving forward in spite of the limited success in controlling our selected target species.

References

- Hiebert, R. D. and J. Stubbendieck. 1993. Handbook for Ranking Exotic Plants for Management and Control. U.S. Dept. of the Interior, National Park Service, Natural Resources Publication Office – Report NPS/NRMWRO/NRR-93/08, Denver, CO.
- Midwest Invasive Plant Network. 2006. CWMA Cookbook: A Recipe for Success – A Step-by-Step Guide on How to Develop a Cooperative Weed Management Area in the Eastern United States. Northern Initiatives, U.S. Forest Service, and National Fish & Wildlife Foundation.
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**Join Us for Spring Cleaning
at the Farnham Farm**

**Weed Whacker
Workday**



Please join us for our first Weed Whacker event of the season. The area surrounding the Farnham Farm is being overrun by a number of non-native invasive plant species. We need your help to address this problem. Our work will be ongoing throughout the day, please plan to volunteer some of your time to help out.

Where: Farnham Farm

When: Saturday April 21
9 am to 3 pm

What to Bring:

- ✓ Garden / Work Gloves
- ✓ Pruning Shears
- ✓ Hand Saws / Chainsaws
- ✓ Rakes
- ✓ Wheelbarrows, etc.



Appendix 2: CWMA Control Plan for Autumn Olive

Prudence Island CWMA Weed Control Plan for Autumn Olive

[Adopted in 2007]



Growth Form



Seeds



Distinct silver scales on leaves

Overview

Although many non-native plant species occur on Prudence Island, Autumn olive (*Elaeagnus umbellata* Thunb.) is considered a high priority species for targeted control and removal efforts. Autumn olive was introduced to the United States from East Asia in the 1830s. It has been used widely to revegetate heavily disturbed areas and it is likely that Autumn olive was first introduced to Prudence Island by the Navy to beautify lands adjacent to fueling stations and dump sites. Autumn olive is capable of rapid growth and will form dense thickets which effectively shade out native plant species. Nitrogen-fixing root nodules make it possible for these plants to thrive in poor soils and typical habitats are disturbed areas, roadsides, pastures, and successional fields, although they may also invade grassland and sparse woodland.

Autumn olive plants are most often located within ten feet of the vegetated edge along the roads, shoreline, and wetland. Every effort will be made to reduce disturbance during this control effort. Cut stumps of mature plants will remain in place to limit the potential for disturbance and increased erosion in vulnerable areas. In some instances where Autumn olive plants are entwined with other non-native plant species (e.g. Asiatic bittersweet [*Celastrus orbiculatus*], Multiflora rose [*Rosa multiflora*], Japanese barberry [*Berberis thunbergii*]), the same control method (hand cut and apply herbicide to cut stems) will be employed on these species to avoid duplication of effort at some later date. By limiting disturbance and removing non-native species within the target areas, we are hoping to promote the replacement of non-native species by existing native grasses and herbaceous plants.

Consistent effort over a period of years is necessary to control Autumn olive since mature plants produce a large quantity of fruit which are widely dispersed by birds and other wildlife. Locations of control efforts in initial and subsequent years will be recorded and mapped so that follow up treatment and seedling removal efforts are more efficient. Plants do not produce fruit until they are three years old so it is critical that seedlings are removed in subsequent years to prevent later infestation. In the initial year of effort, larger established plants will be hand cut and an herbicide containing glyphosate will be applied to the cut stumps. The herbicide will be of commercial quality (e.g. Roundup) since professionals are not being employed for the program. The application of herbicide is necessary since cutting alone would result in thicker, denser regrowth. In subsequent years landowners / volunteers will continue to remove larger established plants (if present), regrowth (if this occurs), and young seedlings. The seedlings will be hand pulled provided there is sufficient soil moisture for the root system to be readily extracted, otherwise the seedlings will be cut and herbicide will be applied to the cut stems. All cut plant material will be removed (if possible) to an open site which is appropriate for chipping and / or brush burning.

Appendix 2: CWMA Control Plan for Autumn Olive

Elaeagnus umbellata (Autumn Olive)

Priority

High - Autumn olive are commonly found in disturbed areas: roadsides, pastures, and successional fields; as well as grasslands and sparse woodlands. On Prudence Island, coastal shrub communities may also be heavily infested.

Description

Autumn olive may be either large multi-stemmed shrubs or small trees and grow to 20 feet. They have distinctive silvery scales that cover young stems, leaves, flowers, and fruit. Their nitrogen-fixing root nodules allow them to thrive in poor soils.

Current Distribution on Prudence Island

Infestation levels suggest that Autumn olive was originally planted by the Navy in two locations (near the T-Wharf and the DOD landfill along the eastern shore) at the southern end of the island. The greatest numbers of plants still exist in these areas. In recent years, the range of Autumn olive has expanded northward and may now be found in increasing numbers north of Broadway. The distribution of plants is still scattered throughout much of the island with a clear south to north gradient in numbers.

Measurable Objectives and Goal

Goal: Control or eradicate Autumn olive on Prudence Island.

- (1) Locate and remove all Autumn olive plants north of Nag Creek in Year 1 and 2.
- (2) Locate and remove all Autumn olive plants found north of the NBNERR South End Unit (the old Navy base) in Year 1 and 2.
- (3) Locate and remove widely dispersed Autumn olive plants within the NBNERR South End Unit in Year 2.
- (4) Eradicate the original Autumn olive infestations in the vicinity of the T-Wharf and the DOD landfill within three years.
- (5) Survey for new infestations and remove seedlings as they appear until Autumn olive has been eradicated from Prudence Island.

Control Options

Note: Control options may only be used with the permission of the appropriate landowner and compliance with applicable environmental regulations.

- (1) Mechanical - Seedlings may be pulled by hand if the soil moisture is sufficient to insure the removal of the root system. On larger plants, cutting alone typically results in a thicker, denser growth upon resprouting and should be avoided.
- (2) Chemical - A foliar application of glyphosate is effective at control. Glyphosate may also be directly applied to freshly cut stumps to minimize the impact on adjacent vegetation. Foliar and cut stump treatment is particularly effective late in the growing season (July - September) so efforts should be conducted during these months if possible. Basal applications of triclopyr alone or in combination with 2,4-D applied in March (dormant season) will also provide effective control.

Schedule

Note: Survey activities are appropriate at any time since some leaves typically persist on the plant throughout the year, making positive identification possible. Cut plant materials bearing viable seed should not be transported from the treatment site, to avoid further dispersal.

Year 1: Generate a map of existing plants or infestations across Prudence Island. Educate landowners and request permission to remove plants from private property. Cut and apply herbicide to stumps of all known Autumn olive plants beginning at the northern end of the island and progressing south.

Year 2: Continue the removal of scattered plants to prevent additional localized infestations. Revisit sites of previous season Autumn olive removal to re-treat adult plants if necessary and remove seedlings if found. Begin targeted removal of original infestations on the NBNERR South End Unit.

Year 3: Revisit sites of first and second year Autumn olive removal to re-treat adult plants if necessary and remove seedlings if found. Complete targeted removal of original infestations on the NBNERR South End Unit.

Year 4-6: Survey for the presence of new growth and remove if found.

Cost Estimates

The greatest costs associated with this program will be the labor associated with survey and control efforts. To the extent possible, volunteer effort will be utilized to minimize cost. Volunteer hours should be tallied so that they may serve as match if it becomes necessary to seek grant funding for this or future projects. The expense of herbicide treatments (approximately \$25 to \$100 annually) will be carried by NBNERR in initial program years as necessary. However, landowners will be encouraged to purchase sufficient herbicide to treat plants on their own properties.

Prudence Island Cooperative Weed Management Area

Statement of Intent to Cooperate

This Statement serves as the inaugural document seeking to organize and implement a “Weed Management Area” throughout the entire geographic extent of Prudence Island, Rhode Island. The undersigned recognizes the degrading negative threats to native aquatic, wetland, and terrestrial systems posed by invasive plant species and the existing negative impacts currently altering natural ecosystem function due to their proliferation.

The primary goal of this document is to provide a mechanism for organizing efforts to protect the natural ecosystem biodiversity of Prudence Island from invasive species impacts by minimizing the spread and distribution of invasive plant species and rehabilitating natural systems already impacted. As a cooperator, the undersigned individual or agency agrees to make a personal, financial, or personnel commitment for the continued protection and management of Prudence Island from invasive plant species. Cooperators acknowledge that participation may include one or more of the following activities: providing access to property for control or monitoring efforts, reporting locations of targeted plants, conducting active control of targeted species in accordance with an approved weed control plan, maintaining records of time and costs associated with invasive plant control efforts to serve as potential match for grants, and promoting an increased awareness of the threat posed by invasive species.

This Cooperative Agreement shall be in effect for two years from the date of signing.

PRUDENCE ISLAND COOPERATIVE WEED MANAGEMENT AREA COOPERATOR

Cooperator Name, Title: _____

Organization Name: _____

Mailing address: _____

E-mail Address: _____

Signature: _____ Date: _____

Prudence Island Cooperative Weed Management Area

Hold Harmless Agreement

I, _____, do hereby agree to allow members of the Prudence Island Cooperative Weed Management Area (PI CWMA) and volunteers engaged in Autumn Olive control efforts on their behalf to enter my property located at _____ (address or Map/Lot) for the purpose of controlling Autumn Olive using control options identified in the accepted PI CWMA Weed Control Plan for Autumn Olive.

I agree to hold harmless from any liability, the above named groups or individuals while they are applying invasive plant control treatments for the management of Autumn Olive on my said property. I understand that the intention for this weed control is for the benefit of myself and my property, as well as the natural ecosystems of Prudence Island in general, and that in granting permission to access my properties I am participating in said project in some capacity.

Signed _____ Date _____
Landowner or his/her representative

or

Signed _____ Date _____
Agency representative

[Title] _____ of [Agency] _____

Appendix 4: Private landowner signature request



Narragansett Bay National Estuarine Research Reserve
55 Reserve Drive
Prudence Island, RI 02872

August 12, 2008

Dear Prudence Island landowner,

I am writing to you on behalf of the Prudence Island Cooperative Weed Management Area (PI CWMA). If you are not yet familiar with this cooperative partnership, it was formed to address specific concerns about non-native, invasive species and currently includes a number of Prudence Island organizations and private landowners such as the Prudence Conservancy, Audubon Society of Rhode Island, Prudence Improvement Association, Town of Portsmouth Dept. of Public Works, NBNERR, and a number of private landowners.

In addition to developing public outreach materials, the PI CWMA has initiated an Adopt-a-Spot program and organizes Weed Whacker Workdays (a volunteer effort established as the product of the original Prudence Conservancy and NBNERR partnership). The PI CWMA has adopted a control plan for autumn olive and we are actively targeting this species beginning at the north end of the island and moving south along the eastern shore. Plans for a scheduled Weed Whacker Workday on Aug. 23rd are to begin work at Town of Portsmouth and state property near the transfer station, move to PIA property between Homestead and Sandy Point, and then move to Prudence Conservancy property near the junction of Broadway and Narragansett Ave. If possible, we would like to also target autumn olive on private properties along Narragansett Ave., Broadway, and near the Bristol Colony beach. If time permits, we will then continue south of the gate onto NBNERR managed lands along East Shore Drive.

As your property is known or presumed to have autumn olive present, the PI CWMA would like permission to your property for the purpose of removing this targeted species. Enclosed are a few PI CWMA documents for your review. In addition to the Weed Control Plan for Autumn Olive and description of the Adopt-a-Spot program, I have included a copy of the PI CWMA Hold Harmless Agreement (which provides access permission) and a Statement of Intent to Cooperate (which indicates your interest in becoming a PI CWMA partner). Please join this island-wide effort and return the enclosed formal documents (as appropriate) at your earliest convenience. Thank you in advance for your cooperation and support.

Sincerely,

Robin Weber
NBNERR, Natural Resources / GIS Specialist



Not WANTED

Elaeagnus umbellata
[alias: Autumn Olive]



Shrubs: Alternate, Untoothed Leaves

Autumn Olive (*Elaeagnus umbellata*) Oleaster family (*Elaeagnaceae*)

Fruit



Leaves & Bark



Flowers



Habit

KEY IDENTIFIERS:

Deciduous shrub growing to 20' tall. Alternate leaves are green above, silvery below, creating a shimmering effect on windy days. Branching pattern often gives specimen a "titled" appearance. Fragrant, tubular flowers in spring followed by a red juicy berry appearing as if sprinkled with silver glitter.



THREAT

Autumn olive's ability to fix nitrogen in its roots gives it a competitive advantage over native plants in habitats with nutrient-poor soils. Shrubs form dense thickets, invading disturbed areas, roadsides, pastures, and successional fields.

REWARD!

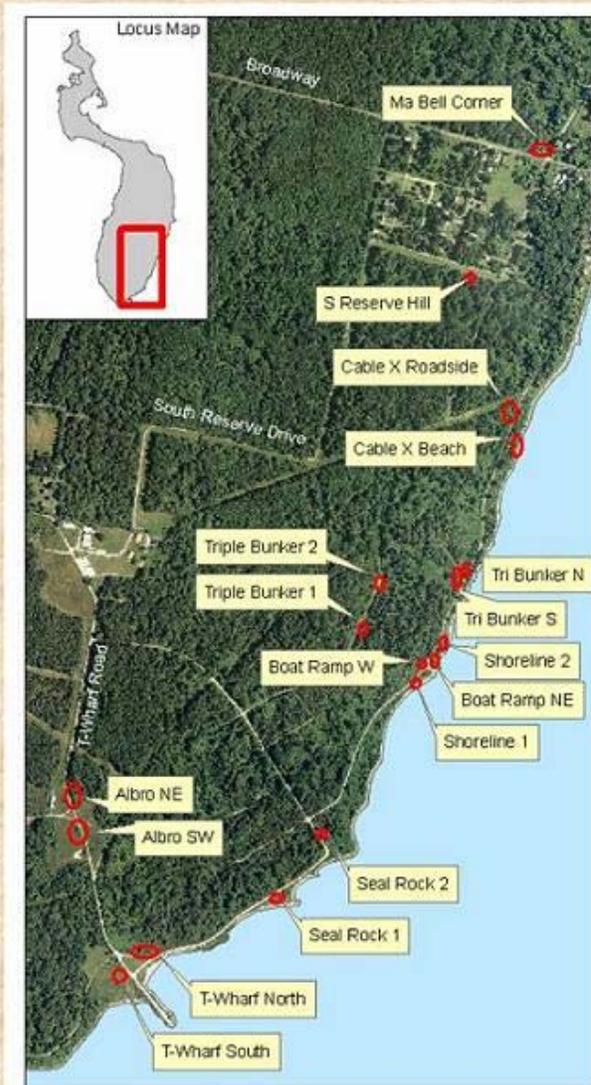
For contributing volunteer hours toward the control of this invader. Contact Robin Weber (683-7369; robin@nbner.org) to report your volunteer effort and claim your reward.

*Photo reprinted with permission from the New England Wild Flower Society.

Adopt-a-Spot

The Prudence Island Cooperative Weed Management Area (PI CWMA), a partnership of island community groups and land owners established to address concerns about invasive species, is currently implementing a control plan for autumn olive.

WE NEED YOUR HELP!



Efforts to control this invasive shrub have been underway since August 2007, with the removal of many plants from the north end and 'neck' of the island as well as targeted removal from original infestation sites.

Widely scattered plants are distributed across the island and all are valid targets for removal (with the permission of the appropriate landowner). However, the heaviest infestations occur on the southern end of the island.

Please join this island-wide effort.

There are a number of ways that you can help:

- **Adopt-a-Spot** - Choose a target area from many localized infestations shown on the map at left for targeted autumn olive removal at your convenience
- **Weed Whacker Workdays** - Join other volunteers during scheduled workdays for localized, targeted control
- **Provide Access** - Allow trespass on your property for the purpose of autumn olive control
- **Join the PI CWMA** - Become a partner and help direct current and future weed control efforts

Note: Effective control requires that herbicide (specifically glyphosate, a component of Round-Up) is applied to the cut stumps of individual plants.

Prudence Island Cooperative Weed Management Area Formed

By Beth Correia

Prudence Island has a big and growing problem – the out-of-control spread of invasive plants. Some of our most unwanted species on the island include: Autumn Olive (*Elaeagnus umbellata*), Black Swallowwort (*Cynanchum louiseae*), Multiflora Rose (*Rosa multiflora*), Asiatic Bittersweet (*Celastrus orbiculatus*), Tree of Heaven (*Ailanthus altissima*), and Japanese Barberry (*Berberis thunbergii*).

In an effort to address this growing problem, Prudence Conservancy has teamed up with the Narragansett Bay National Estuarine Research Reserve (NBNERR), Audubon, Rhode Island Department of Environmental Management (RIDEM), Prudence Improvement Association (PIA), Town of Portsmouth, Prudence Island Utility Corp., and various land owners on the island to establish the Prudence Island Cooperative Weed Management Area (PI CWMA). The goal is to monitor, prevent, and control invasive plants of Prudence Island by pooling together resources to achieve a common goal.

The term CWMA refers to local organizations that provide a mechanism for sharing invasive plant management. This is critical since invasive plants, unfortunately, know no boundaries. Through education, early detection, monitoring, and control, we are working to identify and control the invaders.

Prudence Conservancy and NBNERR established a volunteer Weed Whacker group in 2006, which included training for identification and early detection, and methods of control. After the adoption of a control plan for Autumn Olive by the PI CWMA in its initial year (2007), the Weed Whackers began focusing their weed control efforts on this non-native species. Autumn Olive is considered to be a high priority species and is widespread on the southern portion of the island, suggesting that it was planted by the Navy. Over the years, the Autumn Olive has spread north of Broadway and has even been found on the north end of the island.

All Prudence Island residents and organizations are encouraged to participate in some way to ensure the success of the PI CWMA. Participation levels can vary greatly but may include one of the following: allowing access to property for control or monitoring efforts, attending meetings held to direct island-wide control efforts, active control (either on your own or during an organized Weed Whacker workday), and becoming a formal partner. If you elect to control autumn olive on your own, please apply the same management strategy as outlined in the PI CWMA Weed Control Plan for Autumn Olive (apply herbicide to cut stems of mature plants) as cutting alone has been proven ineffective and actually results in stronger growth.

Control efforts are currently underway but more work is needed. All interested in monitoring and/or volunteering with the Weed Whackers to take con-



Autumn Olive



Black Swallowwort



Bittersweet



Multiflora Rose



Tree of Heaven



Barberry

rol of the invasive plants, please join us at our upcoming work day on Saturday, August 23 @ 10:30 a.m. at the ferry landing. Our goal will be the continued removal of Autumn Olive. For more information, check out our "Not Wanted" posters posted at the ferry landing, library, NBNERR, and the PIA. Hand and power tools, especially chain saws, are welcomed!



Elaeagnus umbellata
Autumn Olive

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Cultivation Note: *Dicentra eximia*

Prudence Island versus the Invaders

by Debbie Van Dam and Robin L. J. Weber

Prudence Island is home to the Narragansett Bay National Estuarine Research Reserve (NBNERR), one of 27 reserves in the National Estuarine Research Reserve System (NERRS) established by the National Oceanic and Atmospheric Administration. NBNERR is supported by NOAA, the RI Department of Environmental Management (RIDEM), and the Audubon Society of Rhode Island (ASRI) and manages 2400 acres of land on Prudence, Patience, and Hope Islands owned by the State of Rhode Island and the 1780 acres of the waters around them.

The mission of the NERRs is to protect, restore and manage estuarine resources through an integrated, ecosystem approach. All of the Reserves are participating in the effort to develop long-term data sets tracking changes in water quality, weather, and biological indicators such as submerged aquatic vegetation (seagrasses, algae) and emergent vegetation (marsh plants). They all follow the same protocols for data collection, which means that their data have great reliability and can be compared usefully across the country. This will allow documentation of environmental quality and trends over time.

In addition to its research and education programs, NBNERR provides stewardship for many species of native animals and plants on Prudence Island. The stewardship program utilizes various tools to create, maintain, or enhance specific habitats in the Reserve. It has used controlled burns to maintain the locally rare pine barrens on the island. These include a mosaic of pitch pine forest, dune-like semi-barren areas and dry meadows. Volunteers have selectively cut trees to open the canopy and prevent progression to a closed canopy hardwood forest. Meadow and old field complexes have been restored or maintained by mowing to retain critical early successional habitat.

In an effort to address the issue of invasive plants, NBNERR has partnered with the Prudence Conservancy, RIDEM, ASRI, Prudence Improvement Association, Portsmouth Dept. of Public Works, Prudence Island Utility Corp., and various land owners on the island to establish the Prudence Island Cooperative Weed Management Area (PI CWMA). The PI CWMA is an expansion of an early partnership between NBNERR and the Prudence Conservancy, which established a volunteer Weed Whacker group and provided training for the identification and control of invasive plants. The PI CWMA was initiated to integrate plant management resources across jurisdictional boundaries to benefit the entire community.

The PI CWMA opted to focus first on Autumn Olive (*Elaeagnus umbellata*), because it poses a great risk to sensitive coastal habitats. Probably planted on Prudence by the Navy to revegetate severely disturbed areas, it has formed dense stands that have displaced native species and closed up formerly open areas. The trees have grown up to 15 feet tall with trunks up to six inches in diameter. In the fall of 2007 volunteers cut large stands of this invader located on both public and private lands on the north end of the island, sprayed the cut trunks with Roundup, and carted away the brush. During spring break of 2008 a group of student volunteers continued the struggle at the south end of the island formerly occupied by the old navy base. So far there has been no sign of regrowth of the cut and treated trees. The cut areas are beginning to grow a maritime grassland mix, which is more desirable for the area.

Cooperative Weed Management Areas (CWMAs) have become an important part of an overall weed management effort in the western part of the United States and the success of this concept has generated heightened interest and establishment in other parts of the country. CWMAs work through a combination of the efforts and resources of government agencies, conservation organizations and private individuals. Each one targets a defined area with a common geography, weed problem, community, climate or land use. Since invasives do not respect property boundaries, public understanding and cooperation are necessary to deal with them.

Stakeholders on Prudence initiated a CWMA to share limited resources, expertise and control efforts across the island. Individual landowners can join Weed Whacker Workdays, work on their own properties, or allow access to them for crews controlling targeted species. Many different people and organizations involved with Prudence have been willing to sign on to this effort, which

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Book Review

by Chris Kalina,
RIWPS Education Coordinator

"I like to play indoors better 'cause that's where all the electrical outlets are."

A Fourth Grader in San Diego

Richard Louv is the co-founder and chairman of the Children & Nature Network (www.childrenandnature.org), which was created to encourage and support people and organizations working to reconnect children with nature.

"Ah, the simple joy in a summer's day spent exploring in the woods and returning home just as the sun sets with tales of all the treasures discovered; perhaps a small cache of blue eggs in a bird's nest, the tiniest of blooms of a wildflower, a bull frog catching bug... or a butterfly newly hatched from its cocoon stretching its wings. As commonplace as this memory may be for many of us, America is raising an entire generation of children who have not had these experiences. Outdoor play, particularly outdoor play that is unstructured and unsupervised, has become a thing of the past for today's children."

Richard Louv examines this cultural phenomenon in *Last Child in the Woods: Saving our Children From Nature Deficit Disorder*, (Algonquin Books of Chapel Hill, 2005, second edition, 2008).

His research began in the 1980s while writing a book on the new realities of family life (*Childhood's Future*, Anchor Books, 1992.) He interviewed nearly three thousand children and parents across the country in a variety of settings: rural, urban and suburban. His conclusions are clear: today's child is more restricted, more sedentary and has little or no relationship with the outdoors and nature. Fifth graders interviewed by the author commented: "My parents don't feel real safe if I'm going too deep into the woods" and "Computers are more important because that's where the jobs are." He cites numerous studies that suggest "direct exposure to nature is essential for physical and emotional health," and that time spent in nature "improves all children's cognitive abilities and resistance to negative stresses and depression." Yet our children are reluctant to spend unstructured time out of doors and in the woods.

This book is a call to action. Louv presents a very easy-to-read and thought-provoking book on the importance of nature in the development of a child. The 2008 updated and expanded release of this book provides an appendix that details "100 Actions We Can Take." An extensive bibliography recommends titles for families and children to spark curiosity about the natural world around us.

RIWPS has taken one action by placing letterboxes in natural areas throughout Rhode Island. Letterboxers hide small, weatherproof boxes in publicly accessible places (like parks and nature preserves) and distribute clues to finding the boxes on a letterbox ring website. These boxes are a way to encourage families to explore the outdoors and observe the wild plants growing in our state. For information on this great activity visit <http://www.letterboxing.org>. To learn the details about the RIWPS letterboxing project visit our website, www.riwps.org. If you would like to place a letterbox in your favorite natural area, please contact Chris Kalina at cmkalina1@cox.net or 401-667-0012.

2008 Plant Sale: A Very Special Event

What is special about the RIWPS Plant Sale is that it is not only a successful fundraiser, but also a fun event. As Bob and Shirley Anderson said "It is more like a fair than a fund raiser." Not only do people come to buy great plants, but they also meet old friends and share the pleasure of being part of the wild plant world.

There are a lot of folks to thank. Jules Cohen and Marcia Pena, co-chairs of the plant sale, were the major forces propelling the event. Their long hours and hard work produced a well-run, well-attended event. The monetary results of their hard work added eleven thousand dollars to the RIWPS treasury.

Bob and Shirley Anderson's work in organizing the volunteers and on-site activities may have been exhausting for them but made the event a pleasure and a great success.

A very special thanks to the SeedStarters without whose efforts there would have been no event. Thanks to the chairs Sarah Keisling, Cathy King and Dorothy Swift and all their energetic volunteers.

The Plant Sale Committee wants to thank the dozens of volunteers whose support added to the success. With special thanks to the coordinators: Lou Cadwell, Pat Cahalan, Dick Donnelly, Rick & Rosemary Harrison, Cathy King, Joan Pilson and Isabel Pollock.



Newport Flower Show Award

Sylvia Hampton and Deb van Dam were judges at the 2008 Newport Flower Show. They were pleased to present the RIWPS ribbon for the best native plant specimen of a wild plant to Jean Wood of Newport. They chose her entry, which consisted of a collection of native ferns: *Osmunda claytoniana*, *Onoclea sensibilis*, and *Dryopteris filix-mas*, because of the variety, grace and strength of its presentation.



Cathy King, coordinator of the Perennial section of the Plant Sale, checking the plants with Isabel Pollack.



Loading native azaleas for the Plant Sale at SeedStarters East: Cynthia Welch, Kay Kosinski, and Jean Vass.

Continued from page 1

will certainly need to be a long and unrelenting one.

As we all know, invasives do not give up easily. Government/citizen cooperation, management, stewardship and lots of funds will be needed to deal with them effectively. Due to the nature and importance of this program, all the groups involved are to be commended for their positive efforts.

Robin L. J. Weber is a GIS Specialist, Narragansett Bay National Estuarine Research Reserve. Debbie Van Dam, writes for WildfloraRI.