Local Solutions to Landscape Level Problems

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CWMA Workshop 8 APR 2010
Pine Tree Arboretum, Augusta, Maine
Two New England Landscapes

Tewksbury, MA

Kennebunk, ME
Two New England Landscapes

Purple loosestrife
*Lythrum salicaria*

New England blazing star
*Liatris scariosa var. novae-angliae*
The Problem

The biological invasion of minimally managed habitats by nonindigenous species that proliferate rapidly, out-compete native species, threaten imperiled species, homogenize habitats, dominate and disrupt natural ecosystems and ultimately decrease biological diversity.
A thing of beauty, or…
…a big environmental problem
BIOLOGICAL POTENTIAL
Two New England Landscapes

Purple loosestrife
*Lythrum salicaria*

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*Liatris scariosa var. novae-angliae*
Purple loosestrife
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New England blazing star
*Liatris scariosa var. novae-angliae*
MONARCH

Danaus plexippus
Common milkweed  Asclepias syriaca
Just because it’s green, it doesn’t make it the same to a phytophagous insect!
BIODIVERSITY
BIOLOGICAL DIVERSITY = OUR NATURAL HERITAGE
FROM THIS…
…to this

Crawford Path
New England
Oriental bittersweet

_Celastrus orbiculatus_
Japanese barberry

Morrow’s honeysuckle

Burning bush

Oriental bittersweet
Japanese barberry
Burning bush
Morrow’s honeysuckle
Oriental bittersweet
Norway maple
Garlic mustard
Japanese honeysuckle
Japanese barberry
Forget-me-nots
Pond starwort
Autumn olive
Yellow iris
Slender bittercress
Multiflora rose
Dame’s rocket
Privet
New England

SIZE (SQUARE MILES)

71,992 mi$^2$

35,385

9,614

9,350

10,555

5,543

1,545
New England

POPULATION

1,317,207
621,254
1,315,828
6,449,755
3,502,309
14,264,185
4.67%
1,057,832
Aldo Leopold
“A Land Ethic”
Species are neither good nor bad; these are attributes of numbers, not species.

Aldo Leopold 1948

1 VS many
Assumption: Native is more preferable than Non-native
Koa haole
PARADISE???

The Garden of Eden
Planting native vs. non-natives
Planting native vs. non-natives

BE CAREFUL!
A big problem to remember...

Birds don’t read lists
CWMAs or CISMAs

New England has a lot of people
These can be your CWMA partners

- Conservation Groups
  - Land Trusts
  - Conservation Commissions
- Land Management Agencies and Organizations
  - Municipal, State, & Federal
- Botanical Clubs and Similar Organizations
- Colleges and Universities
- Organizational and Agency Professionals
- The Concerned Public
WELCOME
WE NEED
SCIENCE
SOCIETY
WELCOME
WE NEED
SCIENCE
SOCIETY
WELCOME
NE WEED
SCIENCE
SOCIETY
Why IPANE…

- We need to know…
  - What IAS are already on the landscape
  - Where they are
  - How abundant they are
  - About their biology in order to control them

- We also need to find new incursions before…
  - They become well established and spread
  - The cost or environmental damage of their eradication is prohibitive
The IPANE Equation for Invasives

**Early** Detection +

**Rapid** Reporting +

Reliable Data +

**Good Science** =

**Effective Strategic Response**
IPANE Primary Program Partners

- University of Connecticut
  - Ecology & Evolutionary Biology
- Silvio O. Conte National Fish and Wildlife Refuge, US F&WS
- New England Wild Flower Society
- National Biological Information Infrastructure
  - Invasive Species Node
  - Northeast Information Node
  - Center for International Earth Science Information Network
Federal Partners

- U. S. Geological Survey
  - National Biological Information Infrastructure
  - Biological Research Discipline
- U. S. Fish and Wildlife Service
  - Silvio O. Conte National Fish & Wildlife Refuge
- U. S. Department of Agriculture
  - CSREES
- National Park Service
- FICMNEW
And people...

- Professional Botanists
  - Colleges and Universities
  - Organizational and Agency Professionals
- Botanical Clubs and Organizations
  - New England Botanical Club
  - New England Wild Flower Society
  - Josselyn Botanical Society (Maine)
- Conservation Groups
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- Conservation Groups
  - Land Trusts
  - Conservation Commissions
- The Concerned Public
- CWMAs or CISMAs
IPANE's dedicated volunteers
IPANE Goals

- New England Early Detection Network
- Gather current & historic distributional data
- Make information available
- Conduct & encourage scientific research
- Increase public awareness
- Train volunteer spotters & citizen scientists
- Develop exportable protocols
- “Interoperability”
- Management and control capabilities
- Financial sustainability
IPANE Program Components

- Regional Early Detection Network
- On-line atlas of invasive or potentially invasive plants in New England
- Interactive website
- Herbarium search and data capture
- Volunteer training & data gathering
- Research and predictive modeling
- Outreach
  - State Technical Assistance
  - Public
  - Private
The Invasive Plant Atlas of New England’s (IPANE) mission is to create a comprehensive web-accessible database of invasive and potentially invasive plants in New England that will be continually updated by a network of professionals and trained volunteers. The database will facilitate education and research that will lead to a greater understanding of invasive plant ecology and support informed conservation management. An important focus of the project is the early detection of, and rapid response to, new invasions.
IPANE Catalog

- Scientific and common names
- Diagnostic & incursion photographs
- Descriptive text
- Historical information
- Similar species
- Hard copy references and hot links
- Management links
Invasive Plant Atlas of New England

Catalog of Species Search

Select at least one species. Select at least one common name.

Select species from the list
- Acer ginnala
- Acer platanoides
- Acer pseudoplatanus
- Aegopodium podagraria

Select common names from the list
- Reed sweetgrass
- Amur honeysuckle
- Amur maple
- Amur peppervine

Submit | Reset

Search by Keyword(s)

Search by Keyword(s)

Browse the Catalog of Species Form

Browse by Life

Browse by Species

Search TIPS: To conduct a search on a partial word, use an asterisk *. Example: To search for words beginning with *epid*, enter *epid* in the text box.

You may also use AND or OR or NOT. Example:
- Polygonum OR Lepidium.

Submit

Metadata Model
C. impatiens, C. parvillora and C. pensylvanica all look very similar. The most important distinguishing characteristic is the sagittate-auriculate leaf bases of C. impatiens. These can be seen with the naked eye, but is more clearly visualized with a hand lens. See detail in illustration below.

**Identification aids**

**Berberis spp.**

<table>
<thead>
<tr>
<th>Character</th>
<th>Berberis thunbergii</th>
<th>Berberis ×ottawensis</th>
<th>Berberis vulgaris</th>
</tr>
</thead>
<tbody>
<tr>
<td>Branch spines</td>
<td>1 (can have up to 3)</td>
<td>varies</td>
<td>3 (can be 1)</td>
</tr>
<tr>
<td>Inflorescence*</td>
<td>sessile umbel</td>
<td>Subumbellate-raceme</td>
<td>Raceme</td>
</tr>
<tr>
<td>Leaf margin</td>
<td>Entire</td>
<td>Most often entire**</td>
<td>Serrate</td>
</tr>
<tr>
<td>Berry consistency</td>
<td>Dry</td>
<td>Dry</td>
<td>Juicy</td>
</tr>
</tbody>
</table>

**Cardamine impatiens**
Incursion photos – informative, hard to challenge

Japanese stilt-grass

Burning bush

Water chestnut
IPANE Databases

- Herbarium Specimen Database
- Current Field Data Database
- People Database
- "Disparate Data Sets Database"
  - Non-IPANE group data
  - For mapping distributions (3rd color)
Thanks to:
NBII and CIESIN

Complete. Additional IPANE data is collected through opportunistic surveys and professionals in the field. See the maps below for information on available quads. Some quads that are currently blank may actually already have occurrence data either from previous volunteers or from herbarium records.

These maps represent a recent attempt to post the status of each quad online and we’d like to make sure they actually reflect the current status of the quadrangles. If you are an IPANE volunteer and have information regarding quad assignments or if you have completed a quad, contact us at ipane@uconn.edu.
Volunteer Network – primary data gathers

- Over 700 trained (Still active?)
- All volunteers
- Staff-run training workshops
- USGS quadrangle based
- Terrestrial and Aquatic species
- On-line reporting forms and support information
- Volunteer list serve
- Verification and Quality Control mechanisms being expanded
Unassigned – An available quad which is not assigned to anyone at this time.

USGS 7.5min Quad: Ct
IPANE Workshops & Training

- Basic IPANE volunteer training
- “Getting Started” workshops
- Advanced ID training
  - Taxonomic focus
  - Geographic focus
- Early Detection Species ID training
- Others
<table>
<thead>
<tr>
<th>Species (Common or scientific name as written in guidelines)</th>
<th>Habitat Type (# from table)</th>
<th>Abundance (Check one)</th>
<th>Distribution (Check one)</th>
<th>Percent Cover (Check one)</th>
<th>Reproduction (Check all that apply)</th>
<th>Documented if required (Check one)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single plant</td>
<td>Less than 20</td>
<td>20-59</td>
<td>More than 1000</td>
<td>Flowers</td>
<td>Fruiting</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Single path</td>
<td></td>
<td>Pods</td>
<td>Fruits</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Multipath</td>
<td></td>
<td>Seeds</td>
<td>Seeding resistance</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Vigas a lime</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Invasive</td>
<td></td>
</tr>
</tbody>
</table>

Associated vegetation:

__________________________________________________________

__________________________________________________________
Why CWMAs need to think about EARLY DETECTION & RAPID RESPONSE
No one questions the value of early detection…
EARLY DETECTION
In MEDICINE

Illustration courtesy of Atlantic Gastroenterology; image courtesy of Gastrolab

Tubular Adenoma
EARLY DETECTION
In MEDICINE

If it didn’t work, would we still be hearing about it?

Illustration courtesy of Atlantic Gastroenterology; image courtesy of Gastrolab
Perception of an Invasive Species

- Proactive
- Active
- Reactive

Action usually here

Abundance

Time

First Occurrence

Recognition by Experts

Awareness by Public
Perception of an Invasive Species

- Proactive
- Active
- Reactive

Action usually here

Action should be here

Awareness by Public

First Occurrence

Recognition by Experts

Abundance

Biological Potential

Time
Perception of an Invasive Species

- **Proactive**
- **Active**
- **Reactive**

**Abundance**

- **EDRR**

**Time**

- Action usually here
- Action should be here

Awareness by Public

First Occurrence

Recognition by Experts
CWMAs and Early Detection
Oplismenus undulatifolius (Ard.) Roem. & Schult subsp. japonicus

Seven burning Early Detection questions that keep land managers up at night

Is this species going to get here?
Where will it first show-up?
Will it become naturalized?
Who will discover it?
Will they report it?
Will we identify it correctly?
Will it become invasive?

Chizimizaso

Woods near Ito Bog, Toyohashi, Aichi Prefecture, Japan 2005
Types of Early Detection Species

- Site specific ED species
*Fallopia japonica*

Syn.: *Polygonum cuspidatum*

Japanese knotweed
Types of Early Detection Species

- Site specific ED species
- Species already “here” in low numbers of occurrences
Types of Early Detection Species

- Site specific ED species
- Species already “here” in low numbers of occurrences
- Species not yet “here” but reasonably anticipated
Oplismenus hirtellus subsp. undulatifolius (Ard.) U. Scholz
Little Paint Branch Park, Maryland
Types of Early Detection Species

- Site specific ED species
- Species already “here” in low numbers of occurrences
- Species not yet “here” but reasonably anticipated
- Anybody’s guess
What if we don’t respond rapidly?
Jockey Hollow, Morristown Nat’l. Historic Park, New Jersey
Oplismenus hirtellus subsp. undulatifolius (Ard.) U. Scholz

Little Paint Branch Park, Maryland
CWMAs as Local Early Detection sites
• Citizen scientists, organization members, & agency staff
• No or very little training
• Easy reporting mechanism
• Localized strategic response
IMPACT: that year – direct, 55 bags removed

IMPACTS: future – public awareness, more volunteers, public participation
“NO NEW INVASIONS”

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