Data-Driven Management: The Fort Bragg Non-native Invasive Plant Management Program
- XVIII Airborne Corps
- Army Special Operations Command
- 82nd Airborne Division
- 34,000 enlisted soldiers
American chaffseed
(Schwalbea americana)

Rough-leaf Loosestrife
(Lysimachia asperulifolia)

Michaux’s sumac
(Rhus michauxii)

Red-cockaded Woodpecker
(Picoides borealis)

ENDANGERED SPECIES

DEPT. OF THE ARMY
Chinese privet infestation

*Rhus michauxii*

Federally-listed rare plant
Fort Bragg Non-native Invasive Plant Species Management Program
Approach

- Integrated planning
- Data-driven management
- Proactive rather than reactive
- Continuous monitoring
- Regional management
## Management timeline

<table>
<thead>
<tr>
<th>Year</th>
<th>Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Initiation</td>
</tr>
<tr>
<td></td>
<td>Planning phase</td>
</tr>
<tr>
<td>2-5</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Control &amp; monitoring</td>
</tr>
<tr>
<td>5-10</td>
<td>Update plan</td>
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<tr>
<td></td>
<td>Control &amp; monitoring</td>
</tr>
<tr>
<td>50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control &amp; monitoring</td>
</tr>
</tbody>
</table>

- **Contractor**
- **New contractor**
- **In-house coordinator**
- **New in-house coordinator**

**Plan + Monitoring Builds Institutional Knowledge!!**
Program Outline

- Collect and Summarize Data
- Review existing land management goals
- Identify impacts
- Establish priorities
- Develop management plan
- Implement plan
- Monitor distributions
- Adaptive management
Installation-wide Surveys

- 5,005 plots surveyed in 2003/2004
  - 25 x 50 meter plot
  - Percent cover estimated
- Plots randomly stratified to focus where plants were likely to occur and cause most harm
  - Endangered species sites
  - Wildlife food fields
  - Training areas
  - Plant communities
- Roadside survey
Mapping

- All data stored in a geodatabase
- Maps were developed using kriging
- Point observations recorded
- Used as baseline to compare spread and control success
Initial Results

38 species identified

aneilima 24
bristled knotweed 3
Chinaberry 101
Chinese privet 341
Chinese tallowtree 10
Chinese yam 51
crown vetch 1
giant reed 24
Japanese barberry 128
Japanese honeysuckle 113
kudzu 188
mimosa 177
multiflora rose 21
parrot feather 6
tree of heaven 30
white poplar 10
wisteria 10
white mulberry 3
winged burningbush 22
Management Plan Development

Summarize data collection
  – Document methods
  – Analyze results

Review Land Management Goals
  – INRMP
  – Stand-alone management plans
  – Stakeholder meetings
Management Plan Development

Document Management Prioritization

- Methods
- Results

Identify control methods

- Biological
- Mechanical
- Chemical
- Restoration
- Cultural/Preventative
- Early Detection/Rapid Response Program
Land Management Goals

- Maintain stable and expanding populations of rare plants
- Preserve Red-cockaded Woodpecker foraging habitat
- Ensure realistic training environments
- Provide wildlife and recreation programs
Need to Prioritize Management
Management Complexities

Multiple Invasive Plants

Multiple Threatened and Endangered Species

Multiple Land Uses
Identify Impacts

Direct
Short-term

Lespedeza,
lovegrass

In-direct
Long-term

Nodding thistle
deer
Decision Support

• Solve complex problems
• Compiles data, personal knowledge
• Past/Current Application of DS
  – Transportation planning
  – Hazardous waste
  – Real estate
  – Natural resource management
  – Environmental planning
Decision Support

- Objective, transparent, consensus-forming
- Incorporate relevant data
- Management strategies
- Utilize stakeholder knowledge
Prioritize Management

- Prioritize where management should occur
- Use GIS data to create a priority map
- Document methods and results in management plan
- Update as more data is available and datasets are updated
Implementation

- **Species-specific approach**
  - Early Detection/Rapid Response

- **Site-specific approach**
  - Highest priority sites
Monitoring and Adaptive Management

- Updates species distribution database
- Control actions recorded
- Control success evaluated
North Carolina Sandhills Weed Management Area

• DoD Legacy Program funded development of a Weed Management Area
• Partnership of federal, state, local agencies, NGOs, and private landowners cooperatively managing non-native invasive plant species in a defined area
NCSWMA Participants

LOCAL

STATE

NGO

FEDERAL

PRIVATE
## Potential Invaders

### Highly Invasive Species Not Identified in the Sandhills

<table>
<thead>
<tr>
<th>Species</th>
<th>Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Cayratia japonica</em></td>
<td>bushkiller</td>
</tr>
<tr>
<td><em>Centaurea dubia</em></td>
<td>short-fringed knapweed</td>
</tr>
<tr>
<td><em>Centaurea maculosa</em></td>
<td>spotted knapweed</td>
</tr>
<tr>
<td><em>Cytisus scoparius</em></td>
<td>scotch broom</td>
</tr>
<tr>
<td><em>Hydrilla verticillata</em></td>
<td>hydrilla</td>
</tr>
<tr>
<td><em>Imperata cylindrica</em></td>
<td>cogon grass</td>
</tr>
<tr>
<td><em>Lonicera morrowii</em></td>
<td>Morrow’s honeysuckle</td>
</tr>
<tr>
<td><em>Lonicera standishii</em></td>
<td>Standish’s honeysuckle</td>
</tr>
<tr>
<td><em>Lygodium japonicum</em></td>
<td>Japanese climbing fern</td>
</tr>
<tr>
<td><em>Lythrum salicaria</em></td>
<td>purple loosestrife</td>
</tr>
<tr>
<td><em>Myriophyllum spicatum</em></td>
<td>European water-milfoil</td>
</tr>
<tr>
<td><em>Phragmites australis</em></td>
<td>common reed</td>
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<tr>
<td><em>Polygonum perfoliatum</em></td>
<td>mile-a-minute</td>
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<tr>
<td><em>Ranunculus ficaria</em></td>
<td>lesser celandine</td>
</tr>
<tr>
<td><em>Rubus phoenicolasius</em></td>
<td>wineberry</td>
</tr>
<tr>
<td><em>Salvinia molesta</em></td>
<td>giant salvinia</td>
</tr>
</tbody>
</table>
Japanese knotweed (*Polygonum cuspidatum*)
golden bamboo (*Phyllostachys aurea*)

- 16 – 40 feet tall
- spreads rapidly
- dense monoculture
- introduced as ornamental
Questions??