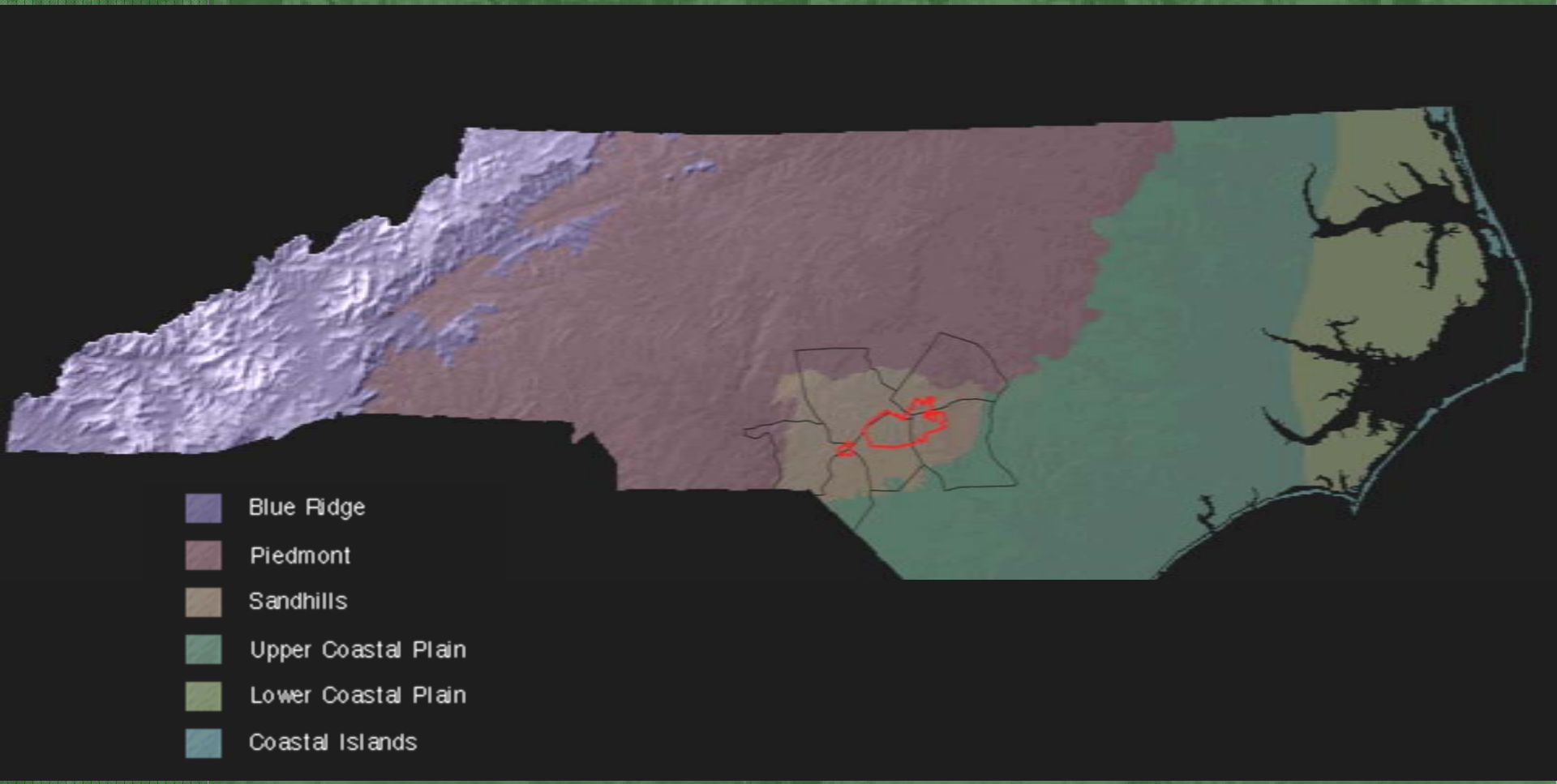
May 15, 2009

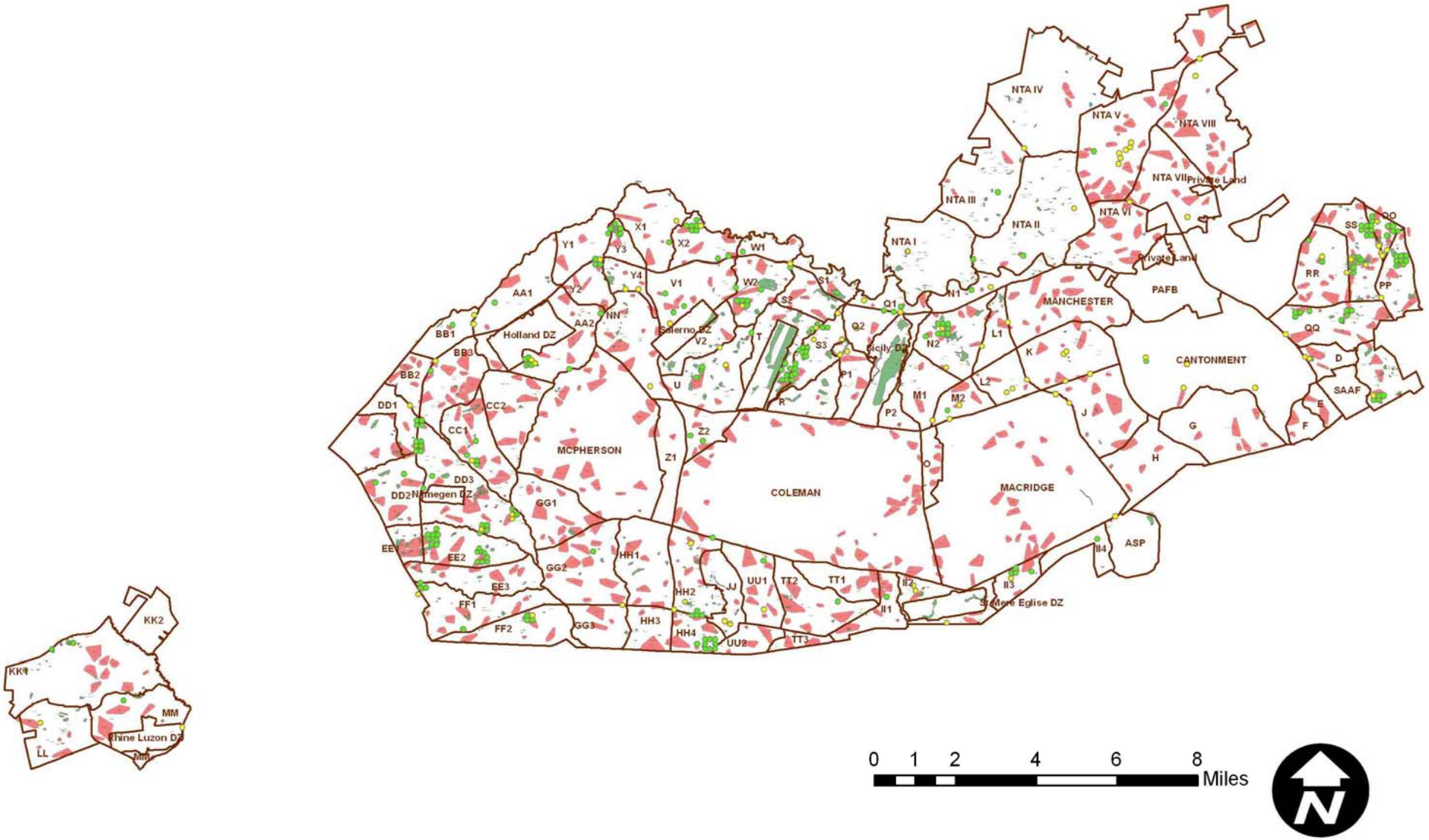
Data-Driven Management:
The Fort Bragg Non-native Invasive Plant Management Program

ENDANGERED SPECIES
FORT BRAGG
DEPT. OF THE ARMY

ERDC
Engineer Research and Development Center

Invasive Species Management, Inc.


Blue Ridge
Piedmont
Sandhills
Upper Coastal Plain
Lower Coastal Plain
Coastal Islands


NTA IV
NTA V
NTA VIII
NTA VII
Private Land
NTA III
NTA VI
NTA II
NTA I
Private Land
PAFB
MANCHESTER
CANTONMENT
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UU1
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Holland DZ
Salerno DZ
Sicily DZ
Nijmegen DZ
Shine Luzon DZ
St Mere Eglise DZ
MCPHERSON
COLEMAN
MACRIDGE
ASP
0 1 2 4 6 8
Miles
N

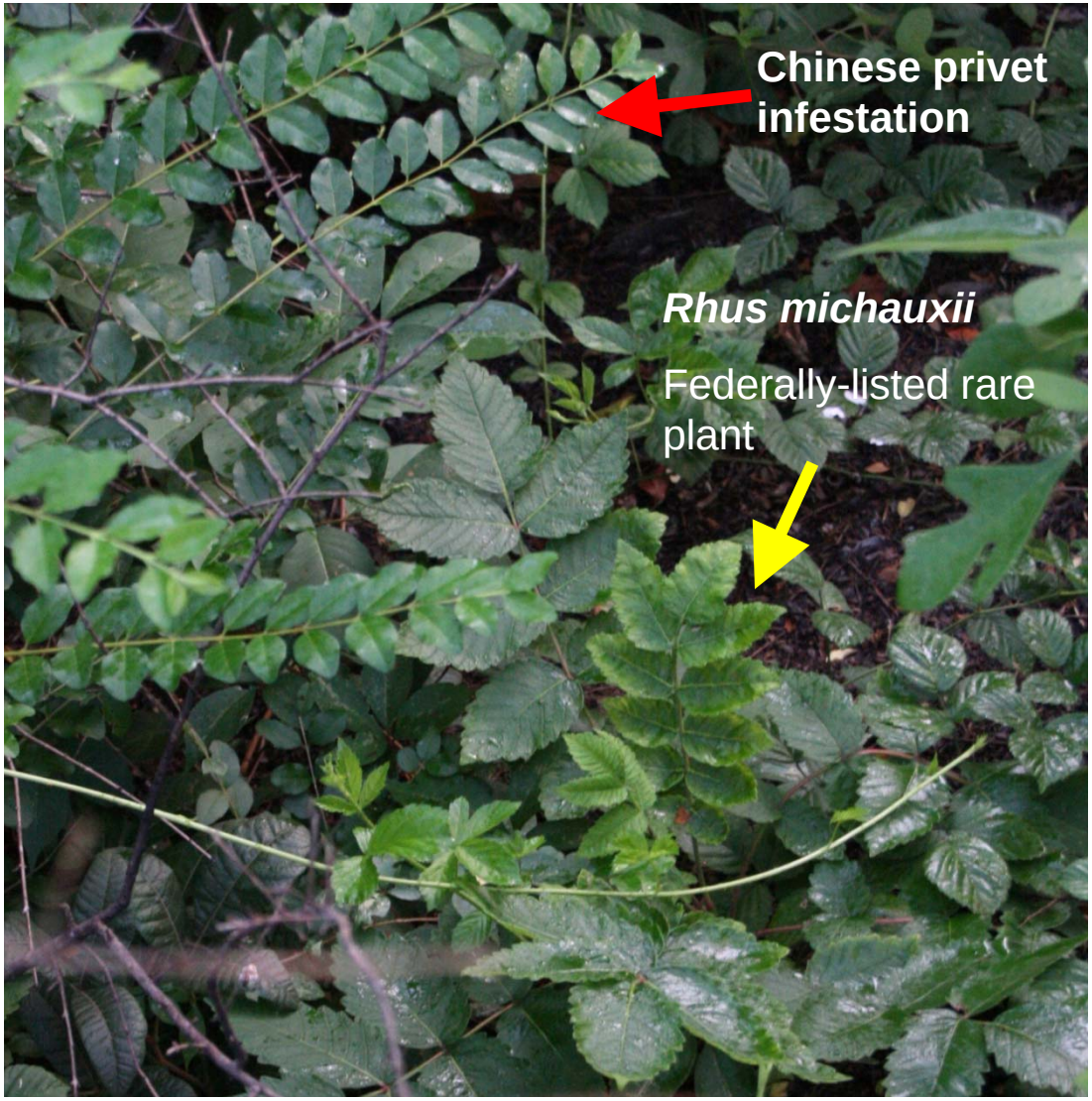
- XVIII Airborne Corps
- Army Special Operations Command
- 82nd Airborne Division
- 34,000 enlisted soldiers
- National Guard, U.S. Air Force, U.S. Marine Corps, and U.S. Army Reserve

American chaffseed
(*Schwalbea americana*)

Rough-leaf Loosestrife
(*Lysimachia asperulifolia*)

Michaux's sumac
(*Rhus michauxii*)

Red-cockaded Woodpecker
(*Picoides borealis*)


Chinese privet infestation
Rhus michauxii
Federally-listed rare plant

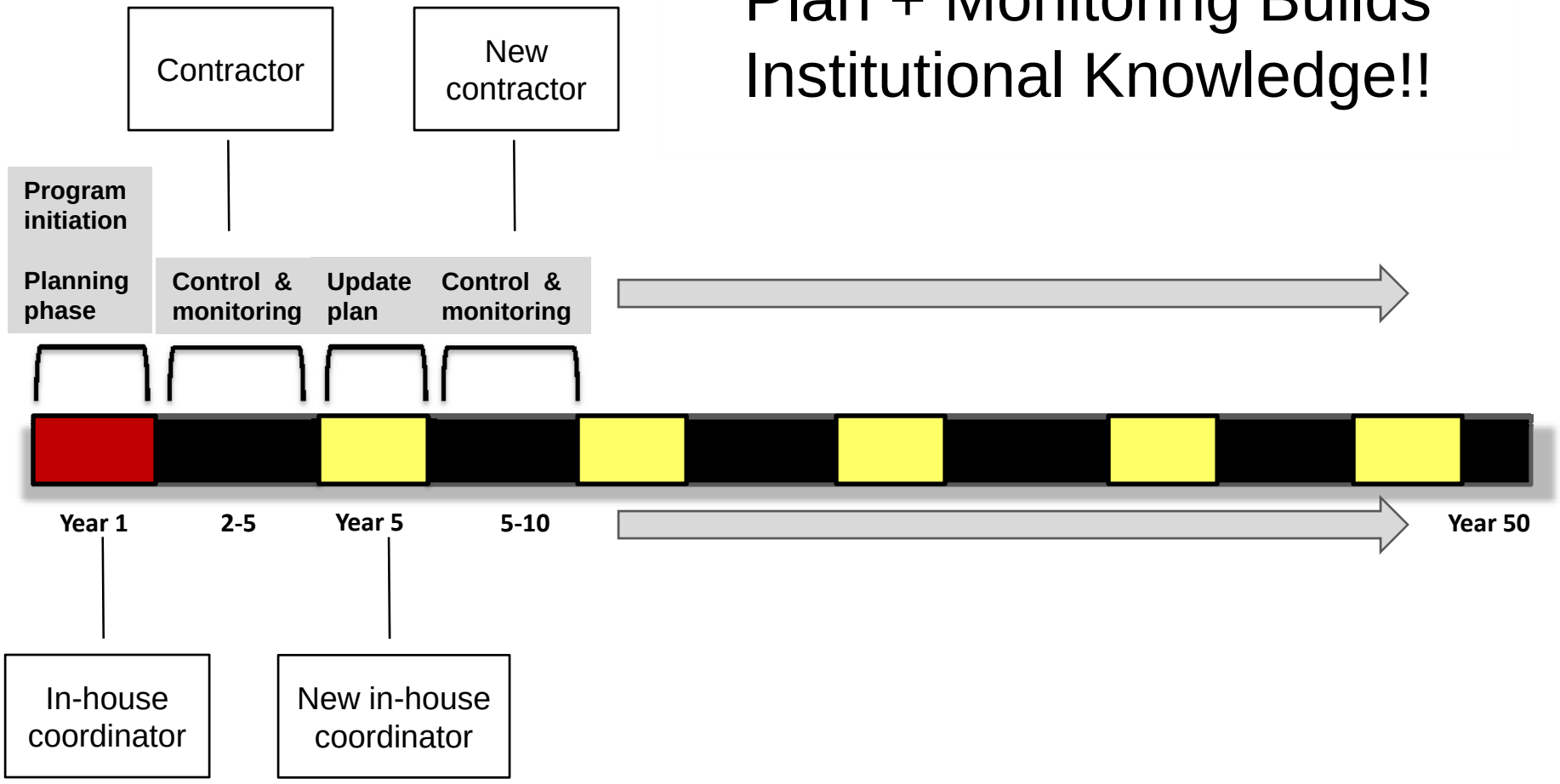
Fort Bragg Non-native Invasive Plant Species Management Program

Approach

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

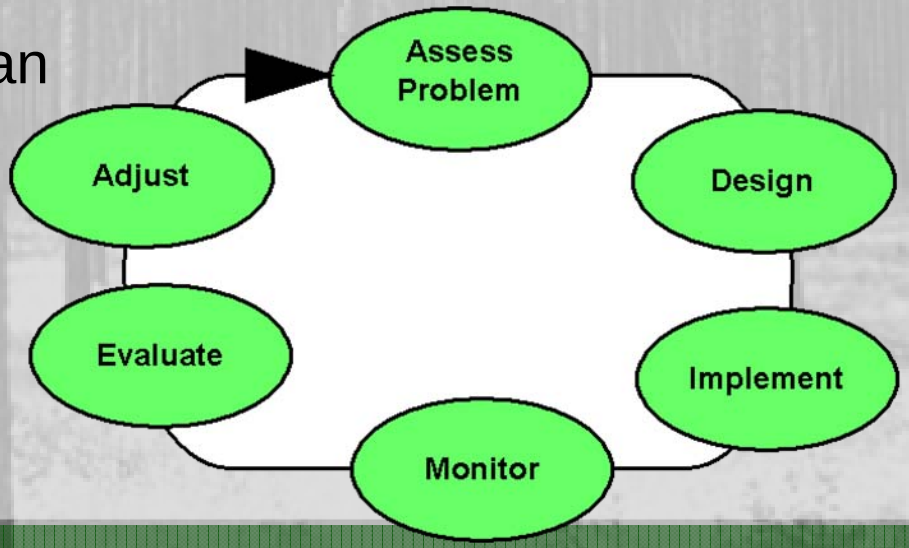
Management timeline

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

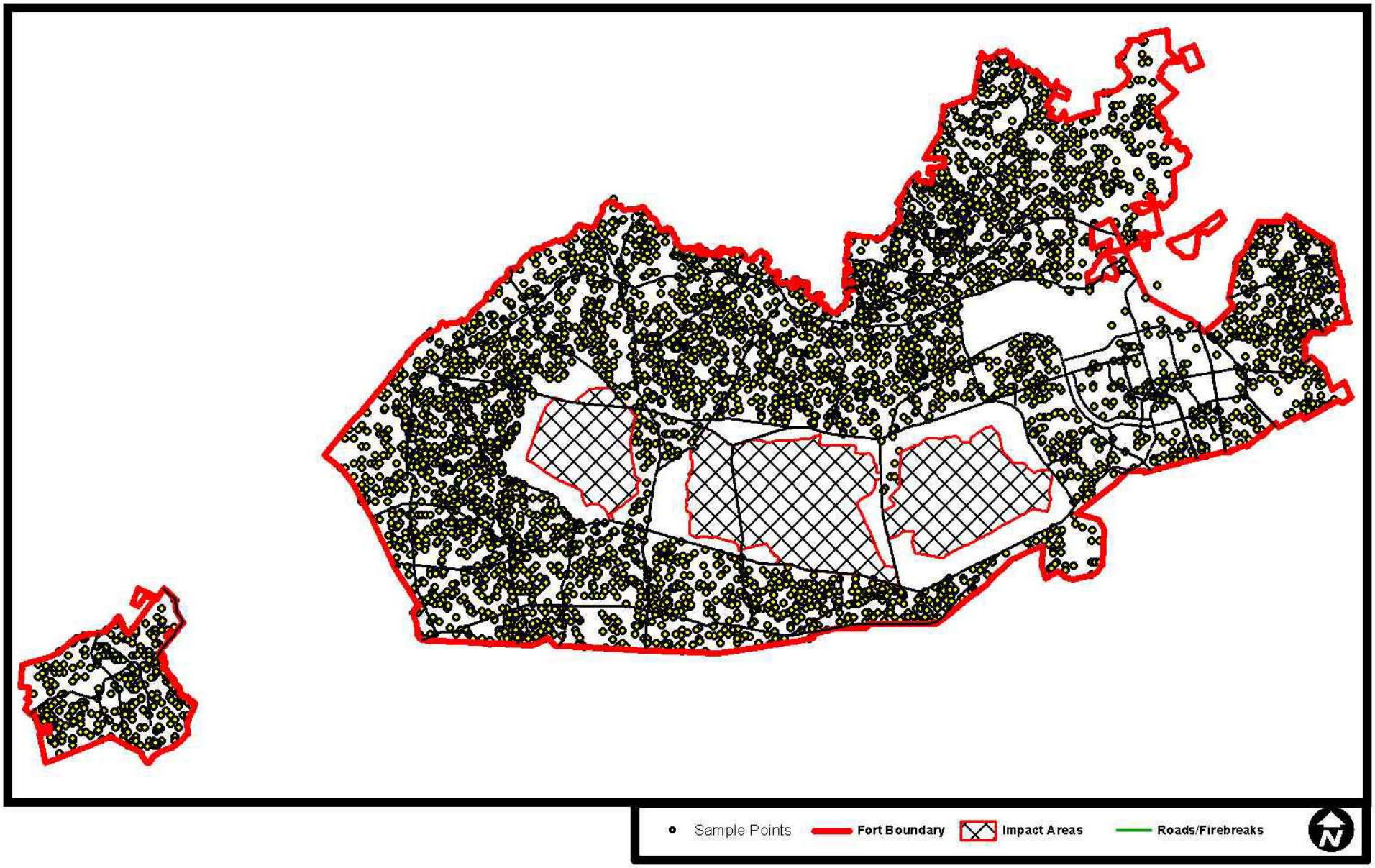
  Endangered species sites

  Wildlife food fields

  Training areas

  Plant communities

- Roadside survey


Sample Points
Fort Boundary
Impact Areas
Roads/Firebreaks
N

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

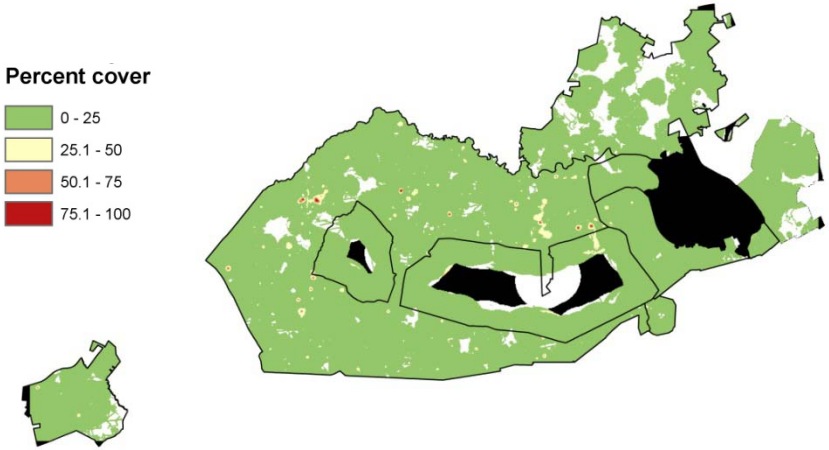
Identify control methods

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

Land Management Goals

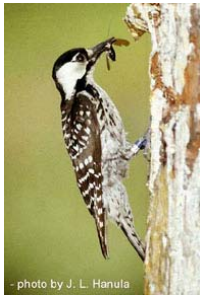
- Maintain stable and expanding populations of rare plants
- Preserve Red-cockaded Woodpecker foraging habitat
- Ensure realistic training environments
- Provide wildlife and recreation programs

Need to Prioritize Management



Management Complexities

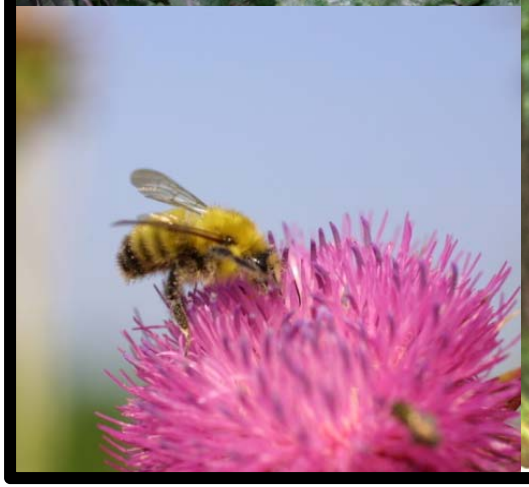
Multiple Invasive Plants



Multiple Threatened and Endangered Species

Multiple Land Uses

Identify Impacts

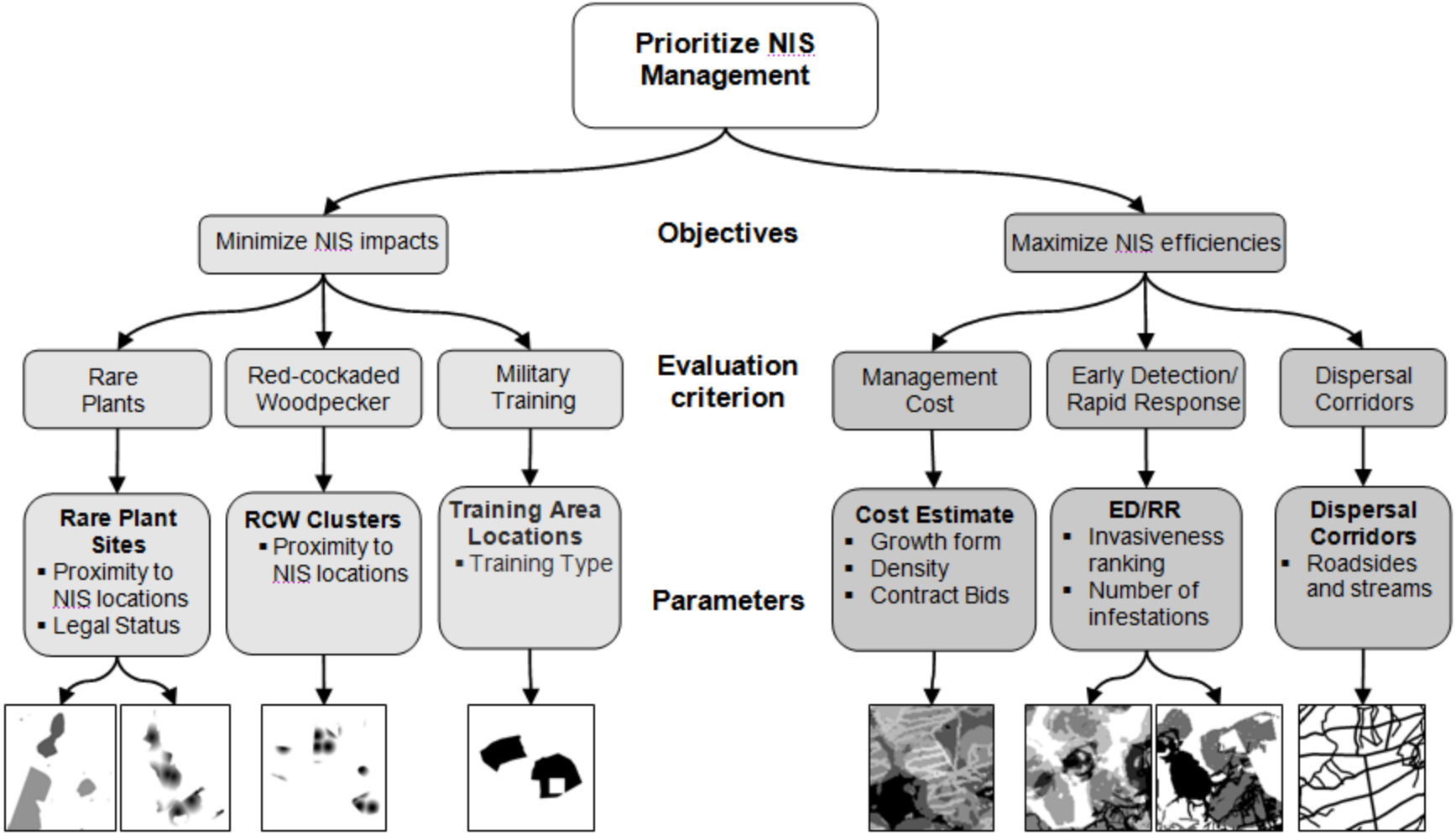
	Short-term	Long-term
Direct		
In-direct		

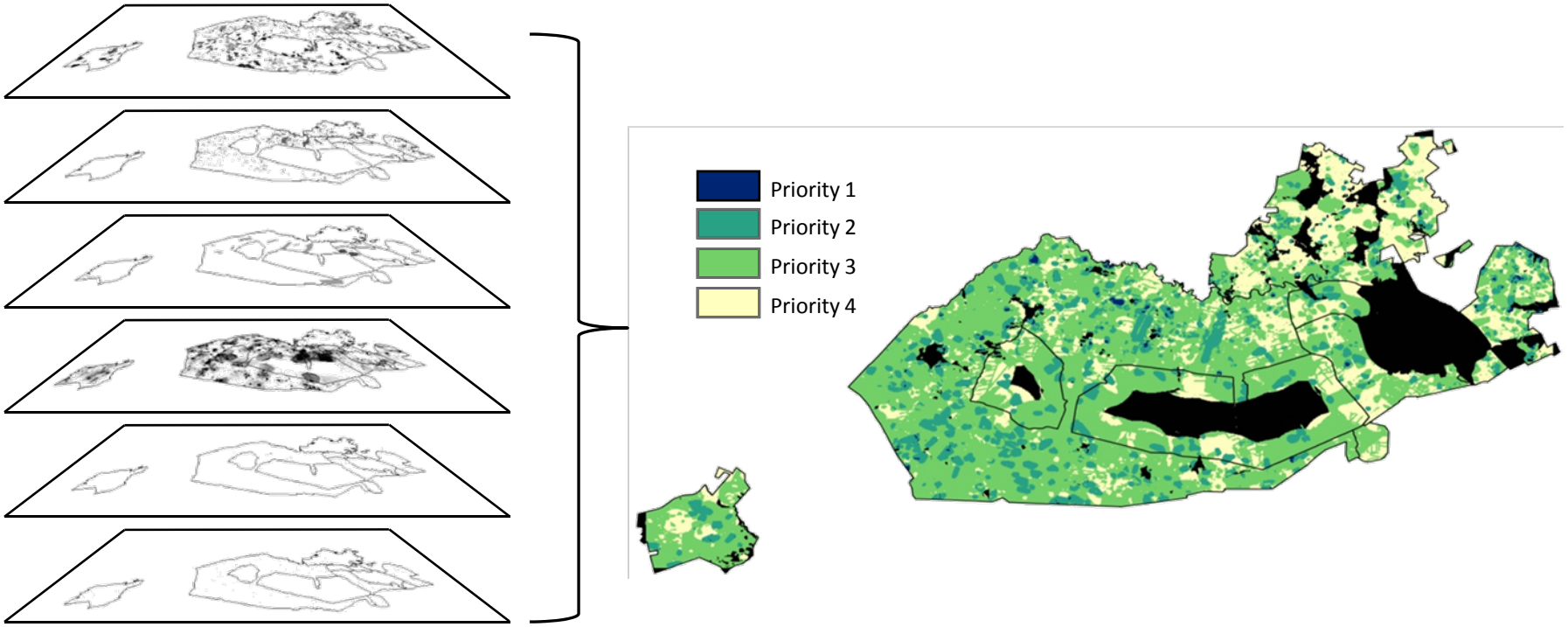
Decision Support

- 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 NIS Management
Objectives
Minimize NIS impacts
Maximize NIS efficiencies
Evaluation criterion
Rare Plants
Red-cockaded Woodpecker
Military Training
Management Cost
Early Detection/ Rapid Response
Dispersal Corridors
Parameters
Rare Plant Sites
▪ Proximity to NIS locations
▪ Legal Status
RCW Clusters
▪ Proximity to NIS locations
Training Area Locations
▪ Training Type
Cost Estimate
▪ Growth form
▪ Density
▪ Contract Bids
ED/RR
▪ Invasiveness ranking
▪ Number of infestations
Dispersal Corridors
▪ Roadsides and streams

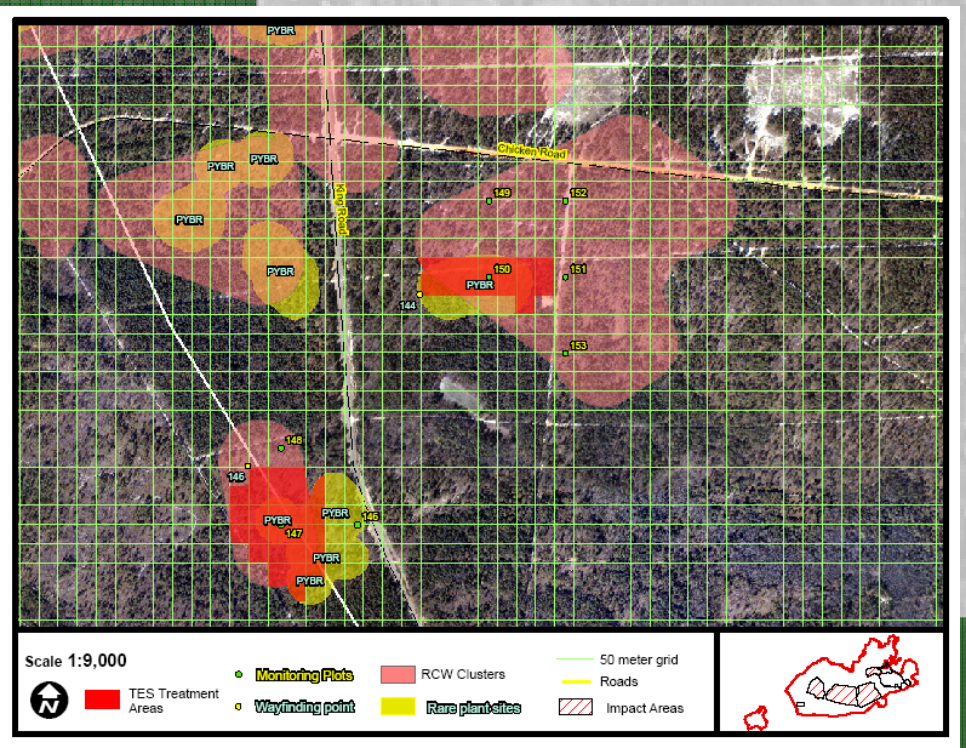

Priority 1
Priority 2
Priority 3
Priority 4

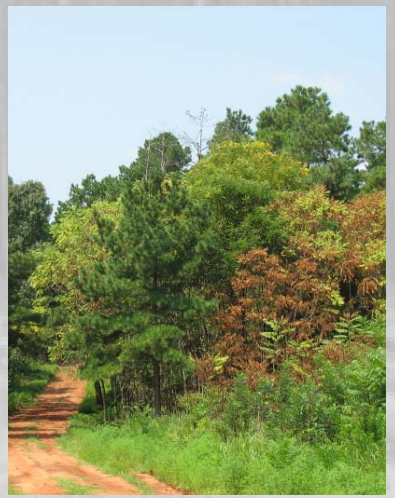
Prioritize Management

- 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





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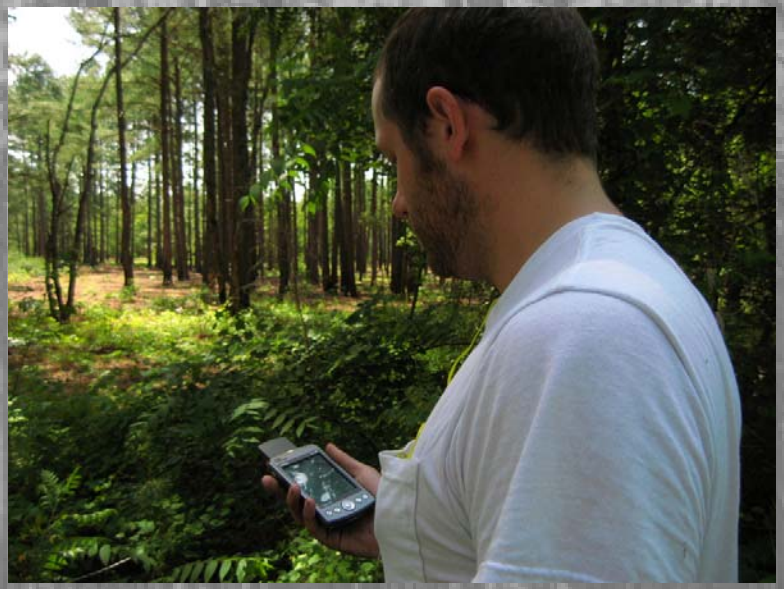
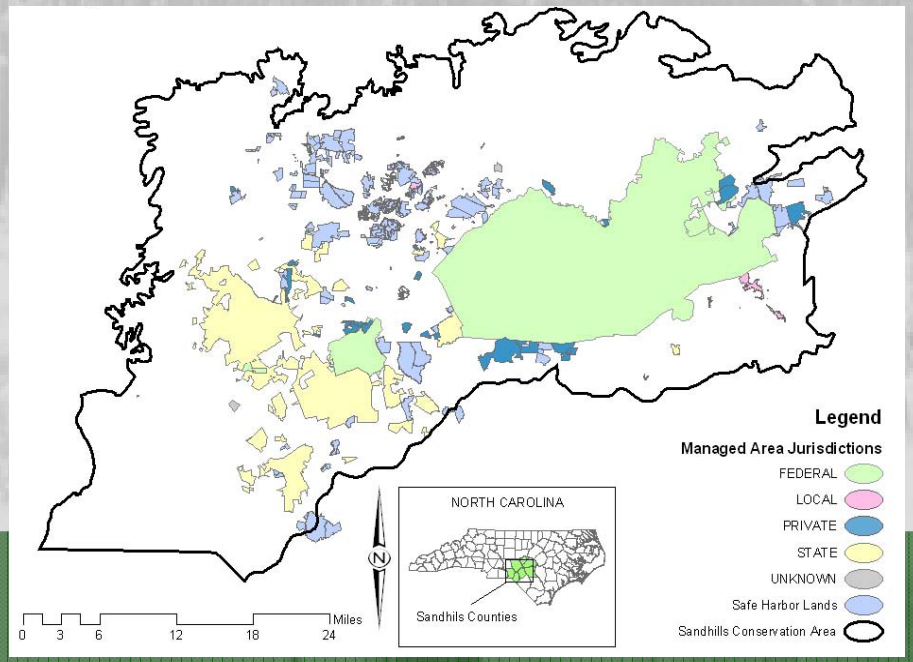
Monitoring and Adaptive Management



- 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

Potential Invaders

Highly Invasive Species Not Identified in the Sandhills	
Cayratia japonica	bushkiller
Centaurea dubia	short-fringed knapweed
Centaurea maculosa	spotted knapweed
Cytisus scoparius	scotch broom
Hydrilla verticillata	hydrilla
Imperata cylindrica	cogon grass
Lonicera morrowii	Morrow's honeysuckle
Lonicera standishii	Standish's honeysuckle
Lygodium japonicum	Japanese climbing fern
Lythrum salicaria	purple loosestrife
Myriophyllum spicatum	European water-milfoil
Phragmites australis	common reed
Polygonum perfoliatum	mile-a-minute
Ranunculus ficaria	lesser celandine
Rubus phoenicolasius	wineberry
Salvinia molesta	giant salvinia

Japanese knotweed (*Polygonum cuspidatum*)

golden bamboo (*Phyllostachys aurea*)

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

Questions??