

# A Decision Support Tool for AIS Management: Building Blocks from Manager, Stakeholder, and Policy Analysis

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# Why is a tool needed?

- Managers are having trouble dealing with invasive species
  - Decisions are often *ad hoc* or in response to public pressure
  - Multiple groups, jurisdictions, and priorities
  - Inadequate funds and personnel

# Benefits of a decision support tool

- Allows for most effective use of available resources
- Allows for decisions to be made systematically and uniformly



# Benefits of a decision support tool

- Prioritize competing management needs
- Allow information from a variety of sources to be integrated and viewed together



# Dissertation Research

- Chapter 1: Manager Interviews
- Chapter 2: Focus Groups
- Chapter 3: Policy Analysis
- Chapter 4: DST Blueprint

# Chapter 1 - Manager Interviews

- Qualitative, semi-structured interviews
- Explore current decision-making environment
  - Factors considered in decisions
  - Current process



# Management Priorities

<b>Priority</b>	<b>Number Identified</b>
Prevention	15 (n=11)
Management	12 (n=10)
Containment	9 (n=8)
Coordination	8 (n=5)
Legislation	8 (n=7)
Research	6 (n=5)
Outreach	6 (n=6)
Reduce Impacts	4 (n=4)
Funding	2 (n=2)

# Ecosystem Services

<b>Ecosystem Services</b>	<b>Frequency Chosen</b>
Biodiversity	25
Water quality	23
Recreation	16
Game species abundance	14
Non-game species richness and abundance	9
Nutrient cycling	9
Commercial and industrial services	8
Aesthetics	7
Cultural values	7



# Strengths of Current Process

- Diverse and knowledgeable people
- Coordination between various agencies and interest groups
- Communication with public

# Weaknesses of Current Process

- Unclear leadership
- Overlapping jurisdictions
- Insufficient information
- Time-consuming and slow
- Not adaptive
- Not documented

# Issues for a DST to address

<b>Issue (# of suggestions)</b>	<b>Examples</b>
Decision making guidance (25, n=14)	Stepwise guidance for less experienced managers, which strategies should be used at which locations
Prediction (16, n=12)	Ranking new species for invasiveness, likelihood of damage resulting from an invasion
Prioritization (13, n=11)	Where to put money across a landscape, how to use limited funds
Information storehouse (13, n=7)	What are the available control options? What is surrounding the affected area?
Go/No-go determinations (10, n=7)	Costs of actions vs. no action, feasibility questions
Risk assessments (3, n=2)	Risk assessments for agencies working in an infested area

# Desired DST Characteristics

- Easily understood and communicated
- Transparent
- Inclusion of a knowledge repository
- Flexibility
- Consistency and repeatability
- Documentable
- Efficient
- Spatially explicit
- Deals with uncertainty

# Chapter 2 - Focus Groups: Perspectives on AIS Control, Emphasizing Genetic Biocontrol

- Support the importance of
  - Stakeholder involvement
  - Transparent process
  - Clear, documented reasoning
  - Methods for dealing with uncertainty



International Symposium on  
**Genetic Biocontrol of Invasive Fish**  
June 21-24, 2010



# Chapter 3 - Policy and Legal Analysis

- Focus on the National Invasive Species Act
- Currently prevention of spread and control of existing populations have been under emphasized
- Take advantage of the ANSTF and its regional panels is an opportunity for having a major impact

# What makes an effective DST?

- Useful for managers
- Trusted by public
- Consistent with policy and regulatory mechanisms
- *Responsive to manager and public needs*

# Suggested Decision Support Tool

- Spatially explicit tool
- Link GIS data with an expert system shell
- Ranking component to allow prioritization



# Suggested Decision Support Tool

- Allow managers to determine where in the geographical area management actions should be taken

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# GIS Component

- Areas important for:
  - Recreation
  - Commercial/Industrial services
- Species distributions
  - Game species

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# GIS Component

- Management/legal jurisdictions
- Pathways/connections

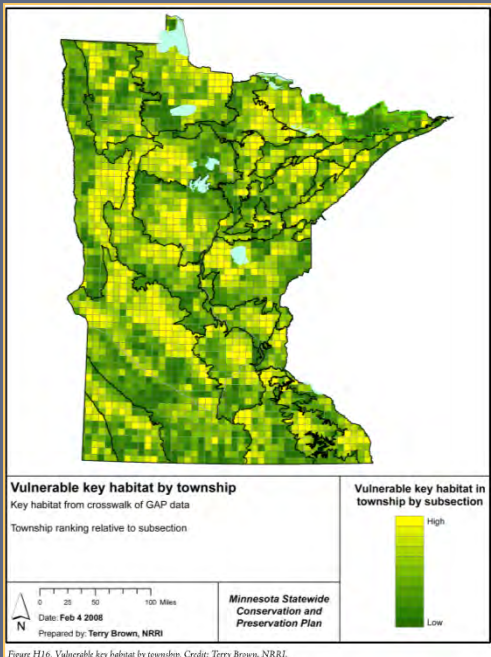
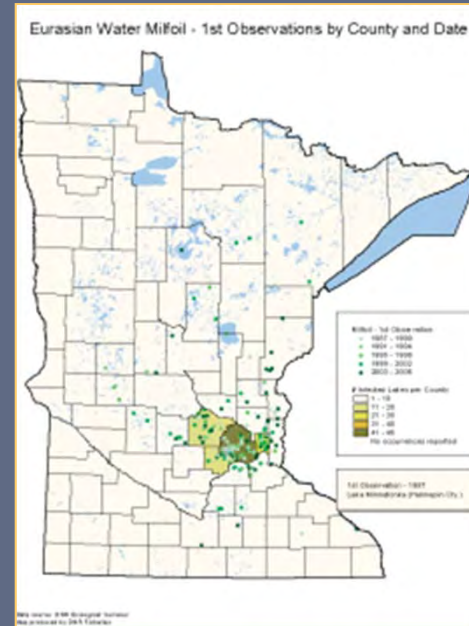
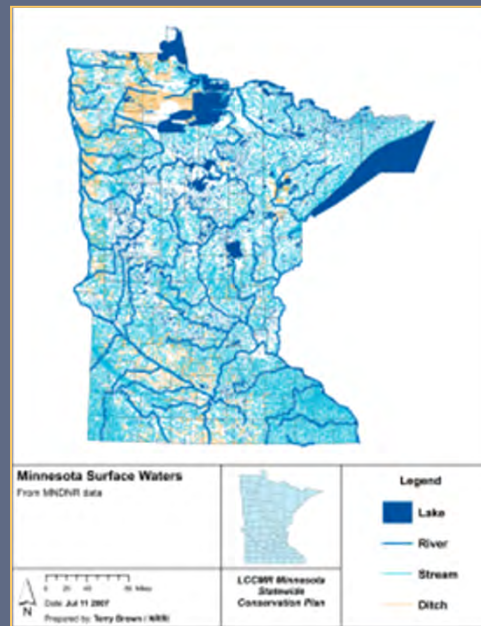
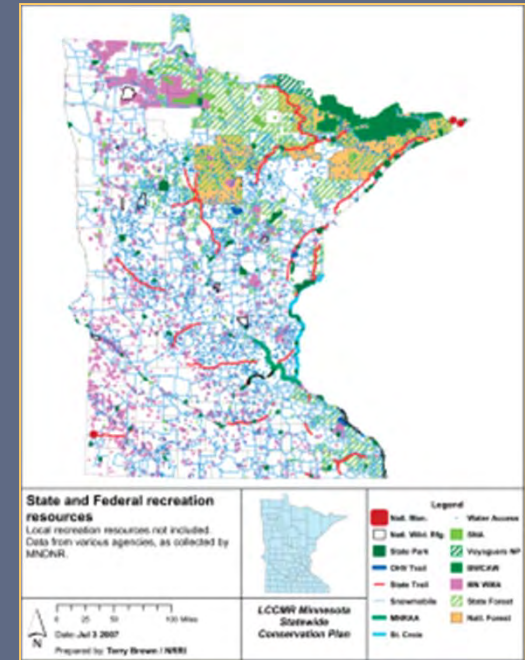
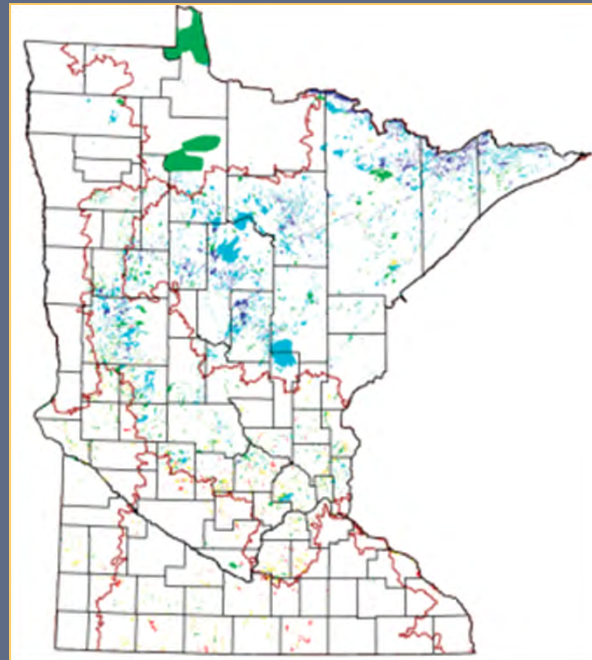
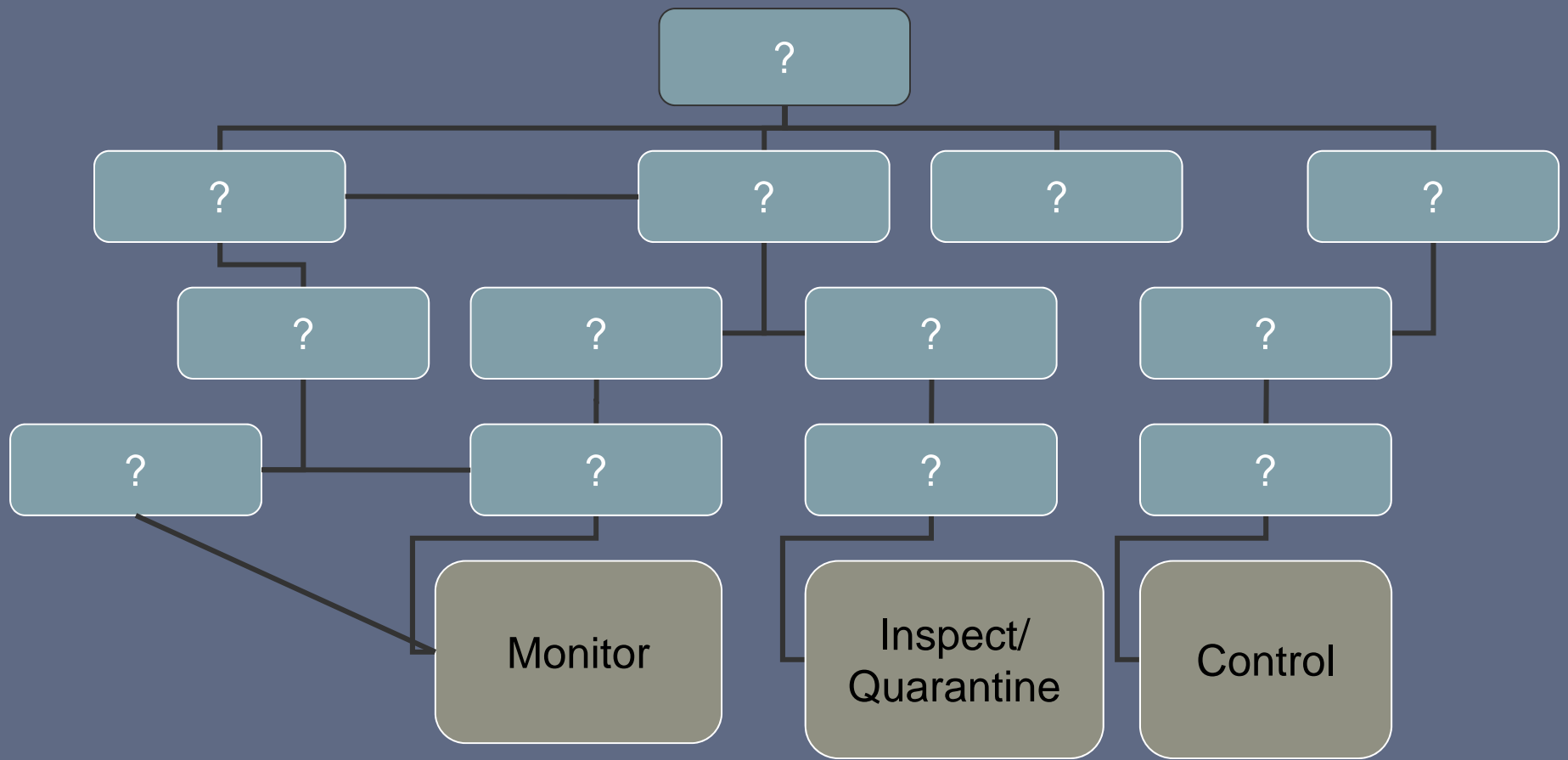


Figure H16. Vulnerable key habitat by township. Credit: Terry Brown, NRRI.

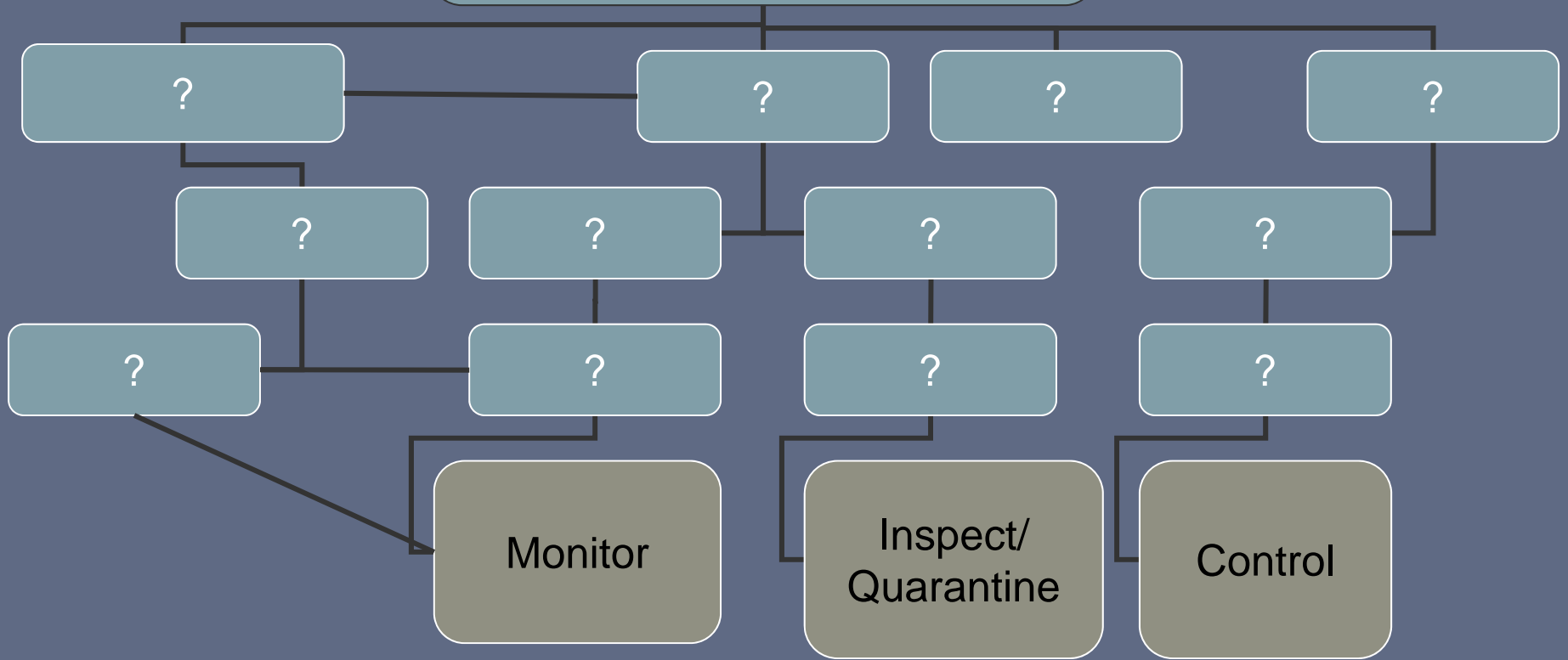


# Expert System

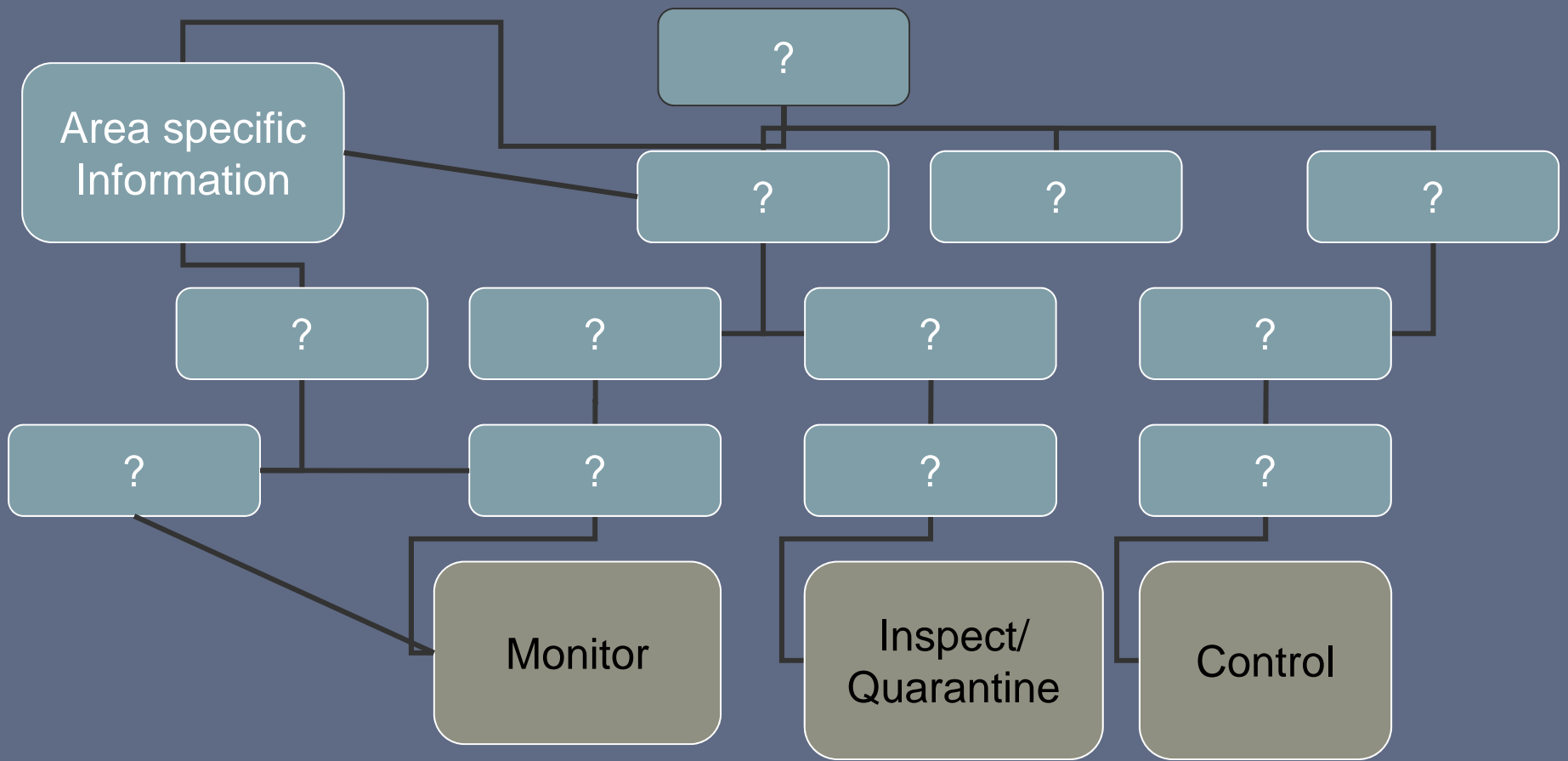


# Expert System

Information to help weight GIS layers

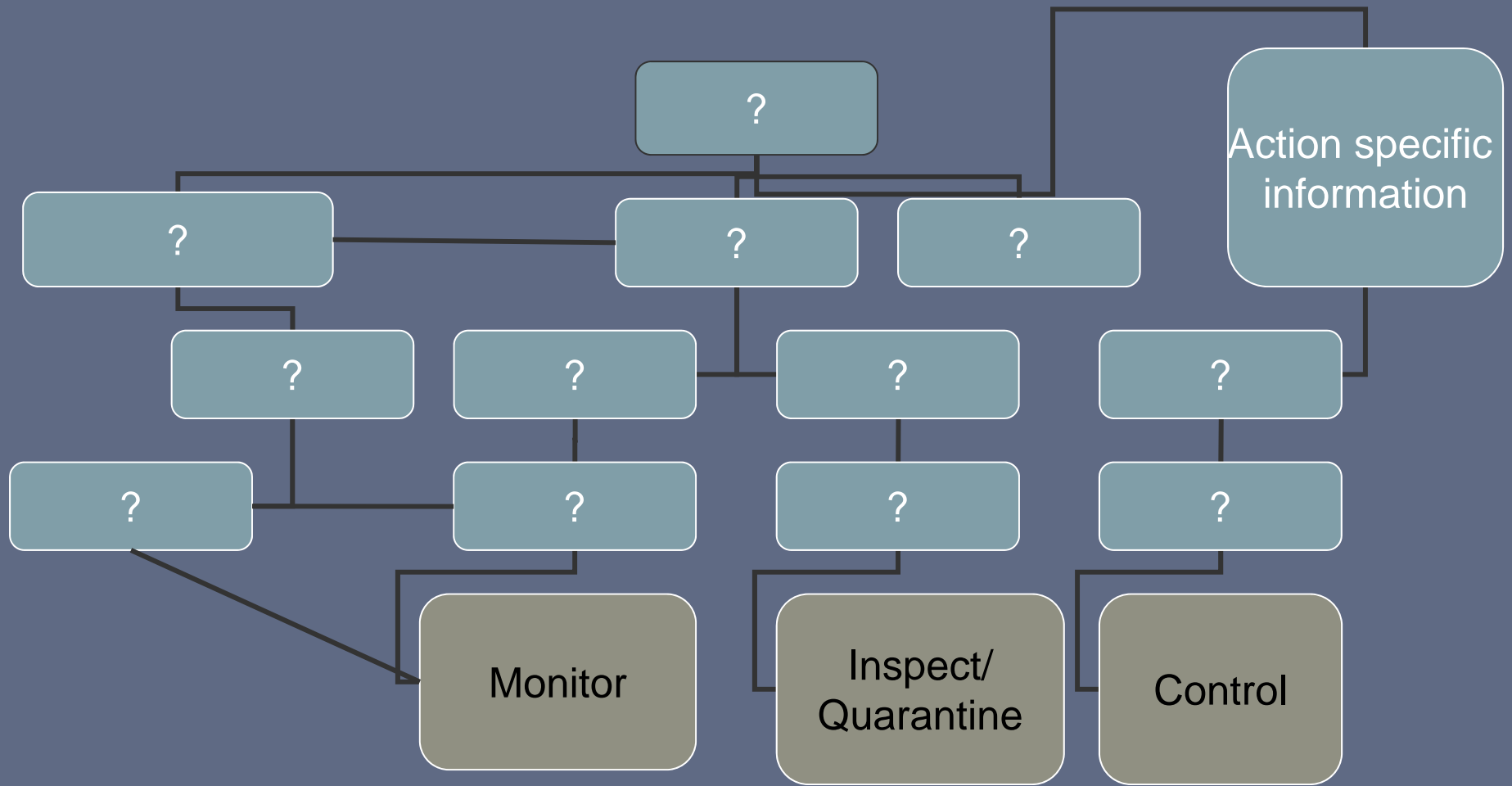


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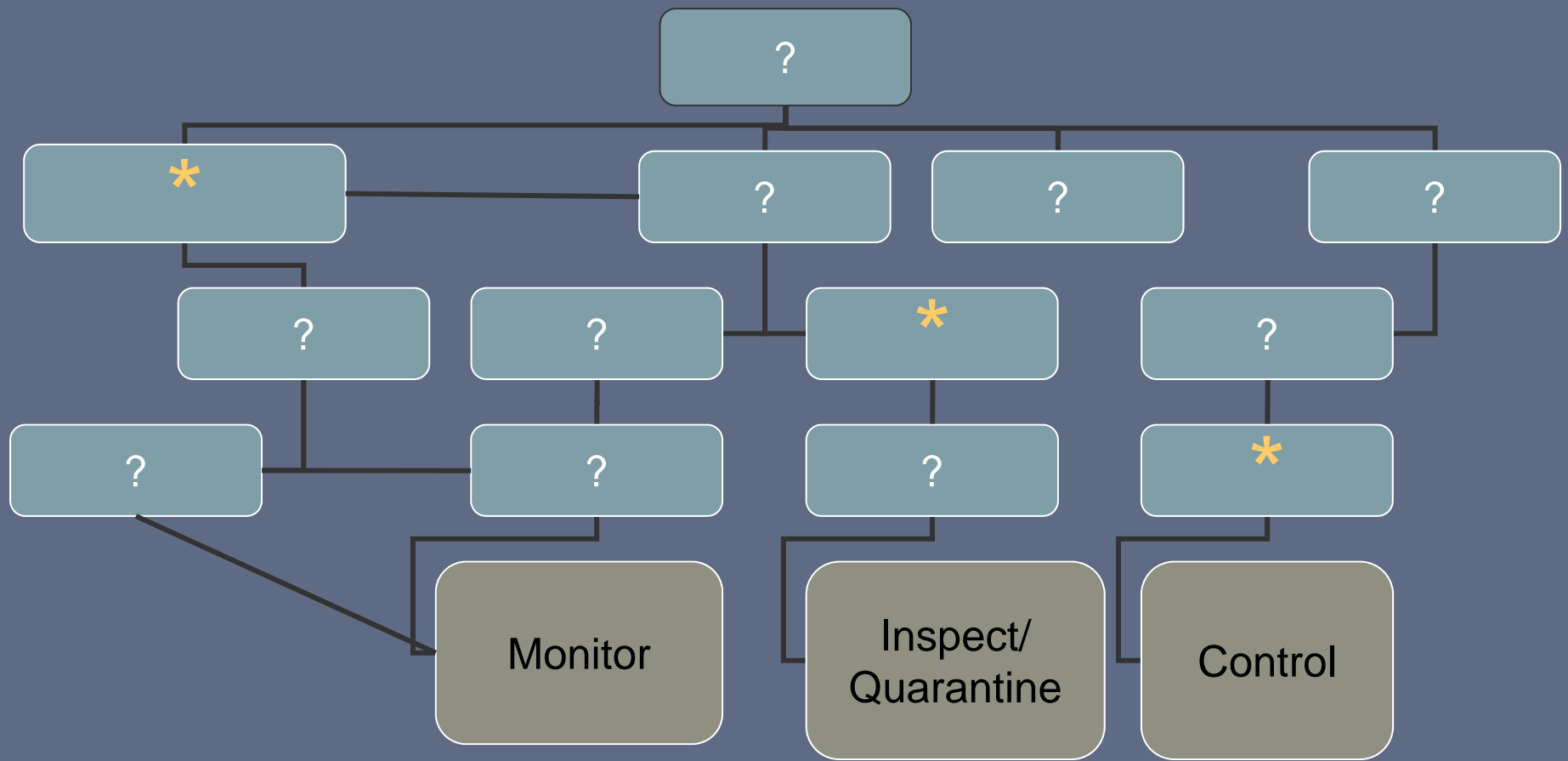




# Expert System



# Expert System

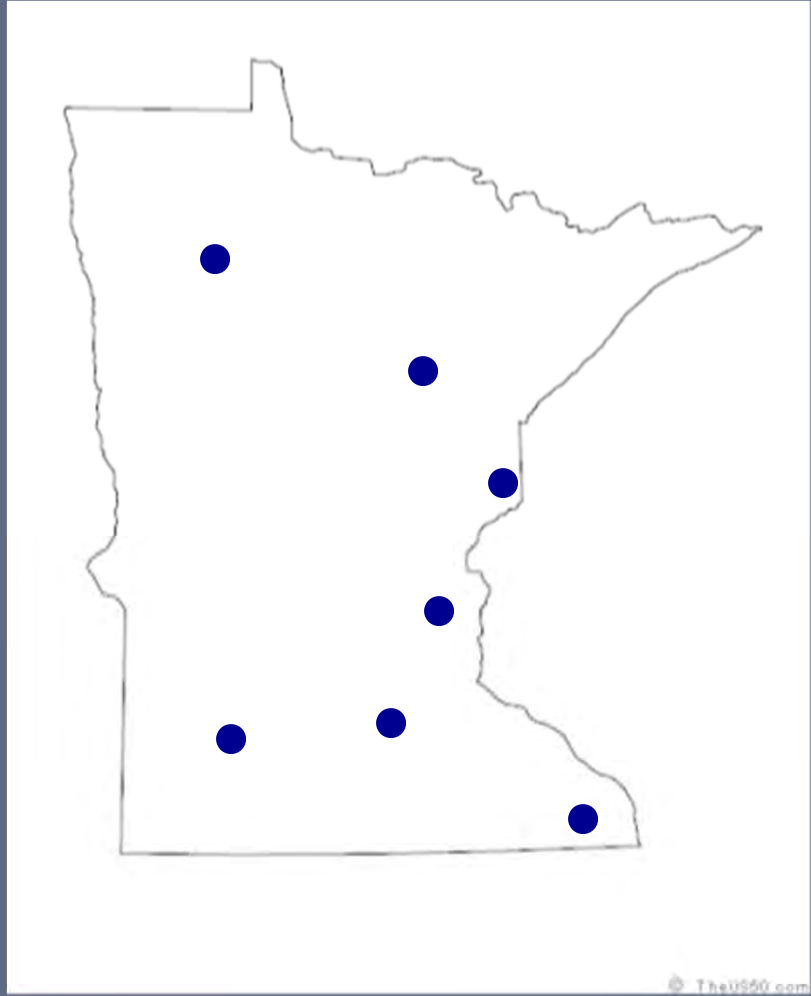


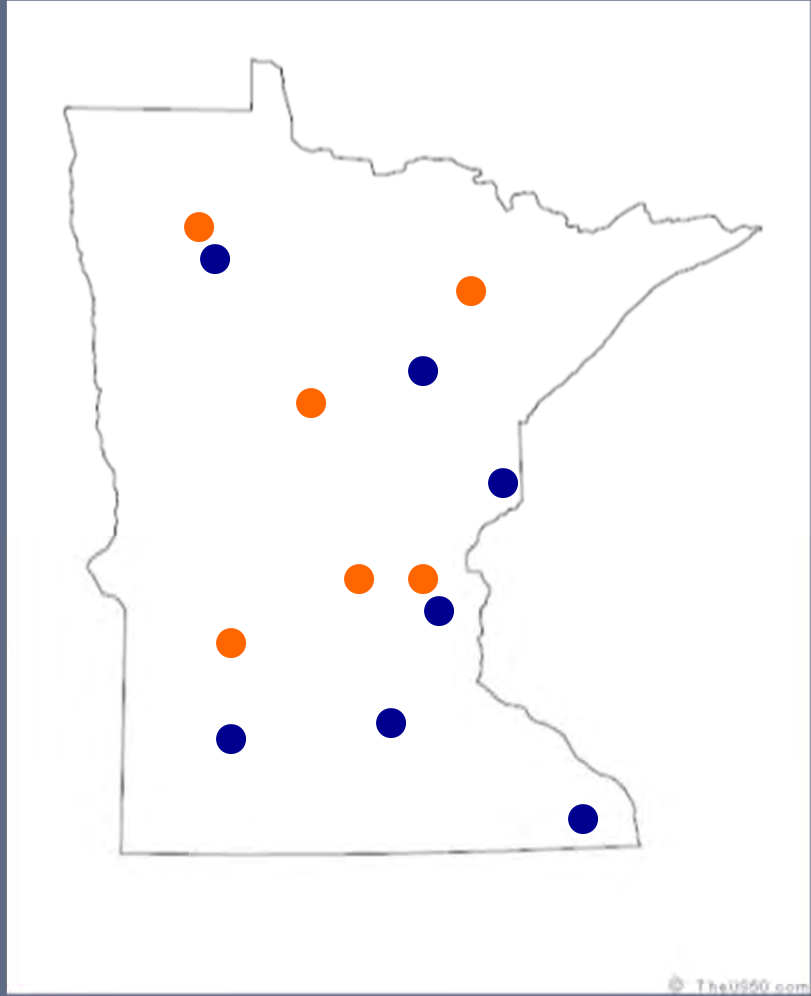
\* - identified uncertainty

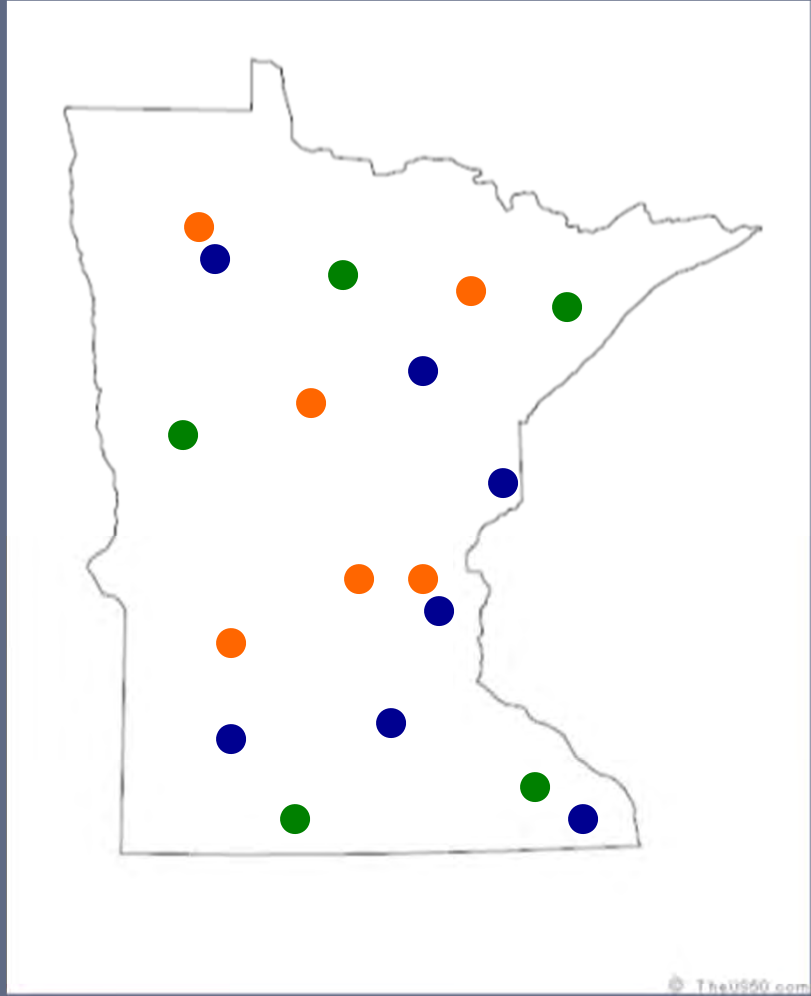
# Dealing with Uncertainty

- Expert system will produce a list of all identified sources of uncertainty
- Categorize
- Suggest methods for dealing with the uncertainty



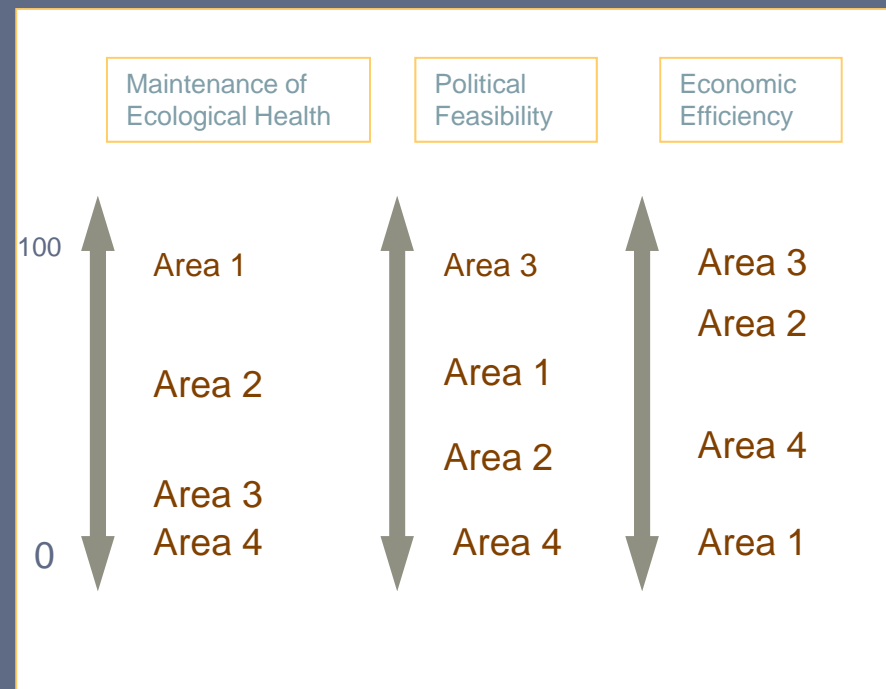






# Prioritizing Areas

- SMART framework
  - Users rank the relative importance of a variety of criteria
  - Evaluate the areas for how well they meet each criterion





# Benefits

- Tool addresses many needs articulated by managers and stakeholders:
  - Transparent, participatory process
  - Adaptive
  - Documented
- Tool also acts as an information repository
- Takes advantage of existing strengths and helps to address weaknesses



Great Lakes  
Protection Fund

# Funding Sources



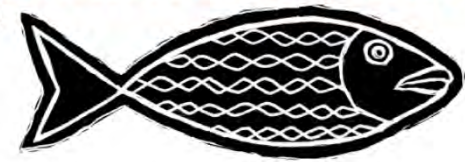
Dartmouth



**MRBP**

The MISSISSIPPI RIVER BASIN PANEL  
On AQUATIC NUISANCE SPECIES

International Symposium on  
**Genetic Biocontrol of Invasive Fish**  
June 21-24, 2010



**IGERT**



Graduate Training Grant for  
Risk Analysis for Introduced Species & Genotypes



<http://www.seagrants.umn.edu/ais/bio>



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## International Symposium on Genetic Biocontrol of Invasive Fish

June 21-24, 2010  
Doubletree Hotel, Minneapolis,  
Minn.

- [Agenda](#) (Updated 6/18/10)
- [Information Flyer](#) (Updated 5/19/10)
- [Registration](#) (for attendees)
- [Registration](#) (for speakers)
- [Hotel Reservation](#)

### Keynote Speaker

**Daniel Simberloff**

Daniel Simberloff will be the keynote speaker

International Symposium on  
**Genetic Biocontrol of Invasive Fish**



[Agenda \(PDF\)](#)

[Keynote Speaker](#)

[Purpose](#)

[Objectives](#)

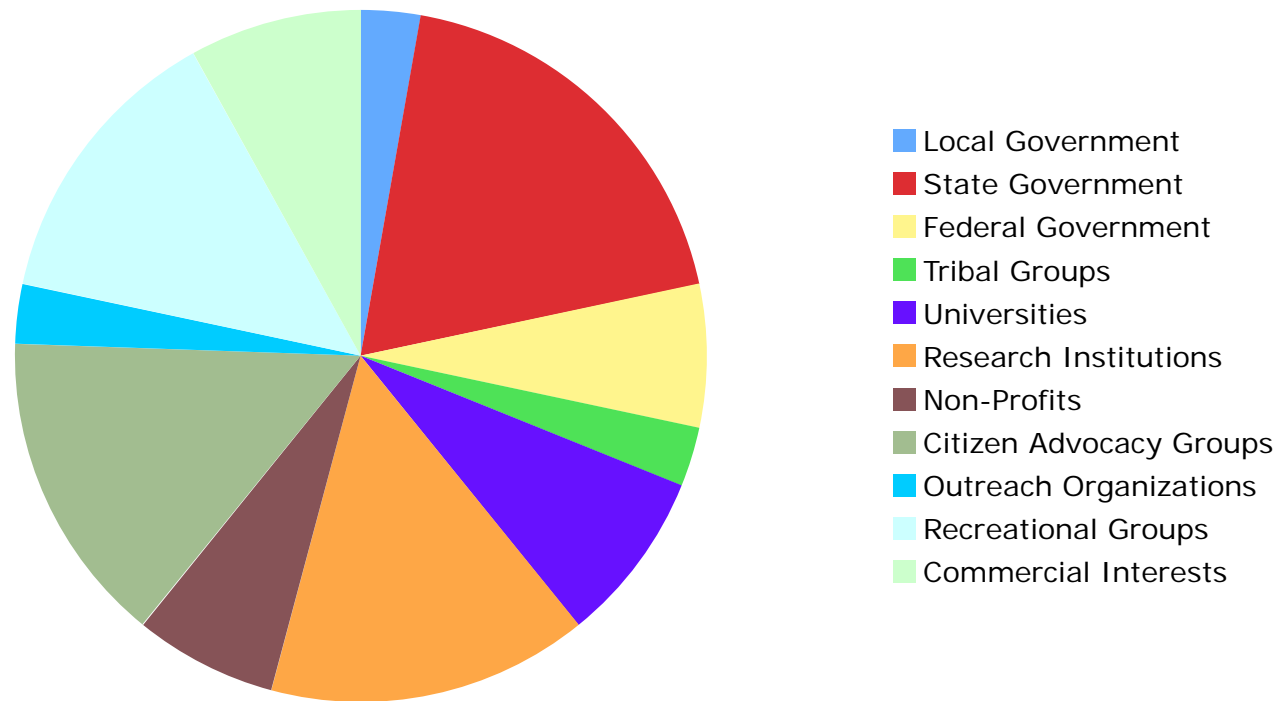
### Aquatic Invasive Species:

- [Overview](#)
- [Articles](#)
- [Publications](#)
- [Links](#)

### Species Profiles:

- [Eurasian Ruffe](#)
- [Eurasian Watermilfoil](#)
- [Fishhook Waterflea](#)
- [Flowering Rush](#)
- [New Zealand Mudsnail](#)
- [Purple Loosestrife](#)
- [Rainbow Smelt](#)
- [Round Goby](#)
- [Rusty Crayfish](#)
- [Sea Lamprey](#)

# Focus Group Participants



# SMART Technique

