Invasive Species Monitoring Approaches For Volunteer Programs

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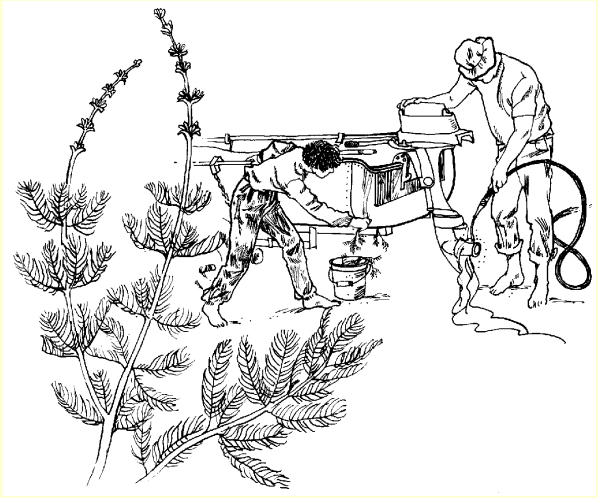
Volunteer Monitoring: Effective Prevention and Early Detection

- Prevention
  - > Awareness of the organism, problems, vectors
  - > Builds local stewardship
- Early detection
  - > Increased numbers looking and geographic coverage
  - > Significantly increases effort in areas most likely to be impacted

Monitoring Activities to Document Aquatic Nuisance Species (ANS)

Five basic types of monitoring activities:

- **Occurrence**
- **Abundance**
- **Expansion**
- **Biology**
- **Impact**



Necessary first step:

- **Building basic awareness**

http://eqb-dqe.cciw.ca/eman/ecotools/protocols/terrestrial/exotics/exotic6.htm

Monitoring Activities to Document Aquatic Nuisance Species (ANS)

Occurrence - determining the presence (or absence) of all exotics in a specific area and the recording of new exotic arrivals with time

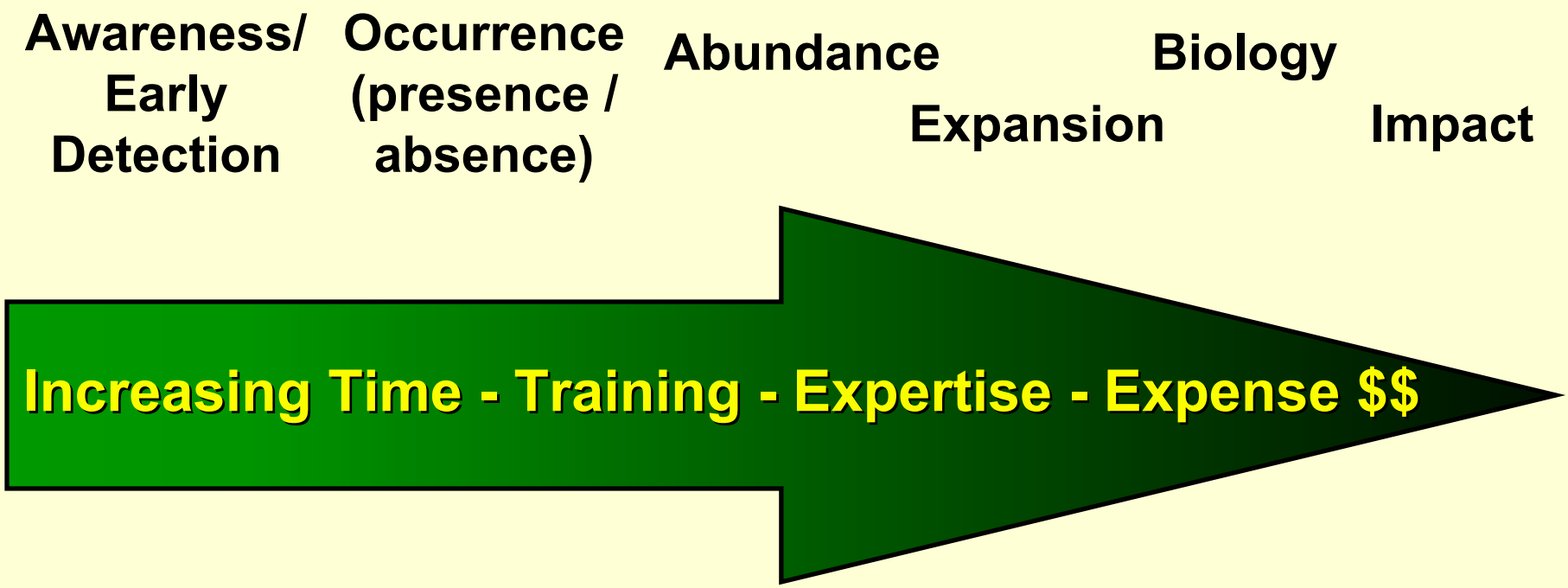
Abundance - recording changes in numbers, density or area covered

Expansion - measuring the rate of expansion of a clump or population within a site and to other sites

Biology - recording seasonal flowering events; longevity of a perennial exotic; seedling survival; seed production in different habitats; presence of herbivores/pollinators/predators

Impact – identifying replacement of native species; change in use of areas by animals as exotics becomes dominant; potential food web interactions

The Continuum of ANS Monitoring



Early Detection - Awareness Programs

- **Require:**
  - > Identification information through widely distributed materials (pamphlets, signage, etc.)
  - > No formal training program
  - > Confirmation system to respond to suspect sites
- **Provide:**
  - > Awareness building - very high
  - > Number of “volunteers” - very high
  - > Possibility of identifying new invasions early - very high
  - > Possibility of false identifications - high

Awareness Brochure Approach

Staff

- Develop / evaluate and distribute materials
- Respond to potential infestation calls
- Provide on-going educational outreach (optional?)

Volunteers

- Little effort – no training, and looking for ANS during their usual activities
- May have lower rate of discovery per person (ANS not focus)
- Quantity of watchers makes up for intensity of monitoring activity

Current Example…

- LA Giant Salvinia awareness

http://www.agctr.lsu.edu/news/december2001/headlines/GiantSalvinia.htm

- ✓ Newspaper articles
- ✓ Newsletter articles
- ✓ Extension agents
- ✓ Demonstration projects

ANS Occurrence Monitoring

- Volunteers are trained to:
  - > Identify ANS
  - > Collect and preserve samples
  - > Submit preserved samples for identification
  - > Survey sheets completed and returned (+ or -)
- Authorities confirm ID, and may follow up with management activities
- Effective for monitoring the movement and distribution of ANS, and eradication efforts through early detection

Occurrence Monitoring Approach:

Staff

- Develop / evaluate and distribute materials
- Respond to potential infestation calls
- Provide on-going educational outreach
- Provide training
- Provide on-going data management & program support

Volunteers

- Increased effort
- Training required
- Monitoring IS the activity
- Increased discovery per person
- Reduced numbers participating

Zebra Mussel Plankton Tow Sampling

http://www.wa.gov/wdfw/volunter/zebramitten.htm

- 30' to 100' drift tows from a boat
- Monthly sampling schedule
- Program supplies sampling equipment:
  - Plankton net
  - Sample bottles
  - Labels
- Netted material is condensed into a 12 ounce bottle and mailed for analysis

Other Examples…

- NH Weed Watchers
  http://www.des.state.nh.us/wmb/exoticspecies/survey.htm
- ME Plant Patrol
  http://www.state.me.us/dep/blwq/doclake/whatif.htm
- Invasive Plant Atlas of New England
  http://www.eeb.uconn.edu/invasives/ipane/
- MN Zebra Mussel Watch Citizen Network
  http://sgnis.org/publicat/mn-cit.htm

ANS Abundance

- ANS identified accurately (confirmed)
- Quantified (i.e. % density or coverage, population estimate)
- Mapped
  - > Approximately: Location drawn on map
  - > Precisely: Global Positioning System (GPS)
  - > Photographs, geo referenced

Abundance Monitoring Approach

Staff - Earlier requirements plus:

- Develop & provide quantification and survey technique training and support
- Increased data management

Volunteer – Earlier requirements plus:

- Increased training
- Increased time and effort to quantify and map
- Reduced numbers of volunteers

Expansion Monitoring

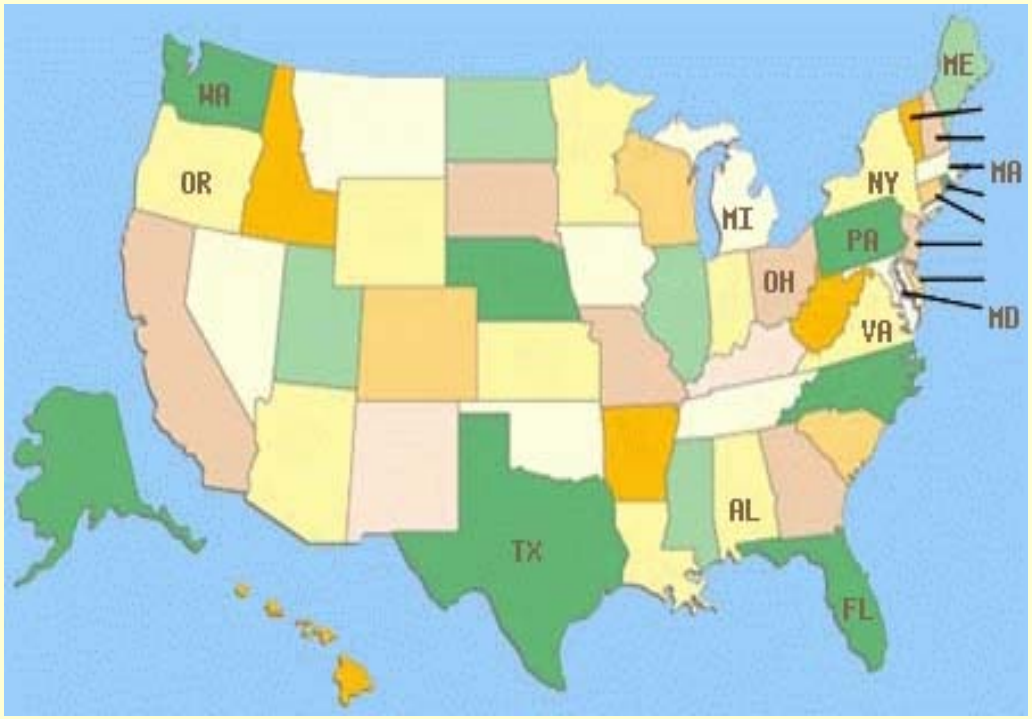
- Regular reassessment of populations (monthly, annually, etc.)
- Requires previously quantified and mapped populations
- Additional data management resources required (database and GIS)
- Provides valuable data on the rate and geographic direction of spread of ANS

Biology & Impact Monitoring

- Generally utilizes undergraduate and graduate student “volunteers”
- Citizen volunteer data may supplement specific research efforts
- Provides baseline or targeting information

Phragmites Biocontrol Research

- Long-term research project studying the insects living in and on *Phragmites australis*
- Schools in 13 states participate
- Providing data *and* building skills and understanding of scientific processes



Once you've found'em...

- Biocontrol agent rearing & release
  http://www.four-h.purdue.edu/staff.home/natalie/purple.htm
- Biocontrol agent identification
  http://edweb.cornell.edu/invasiveplants/phragmites/work/index.htm
- Cut and chemicals
  http://tncweeds.ucdavis.edu/success/ma001.html