Invasive Plant Management in Rights of Way

Blake Moore
Natural Resources Agent
University of Delaware Cooperative Extension
Chair, Delaware Invasive Species Council

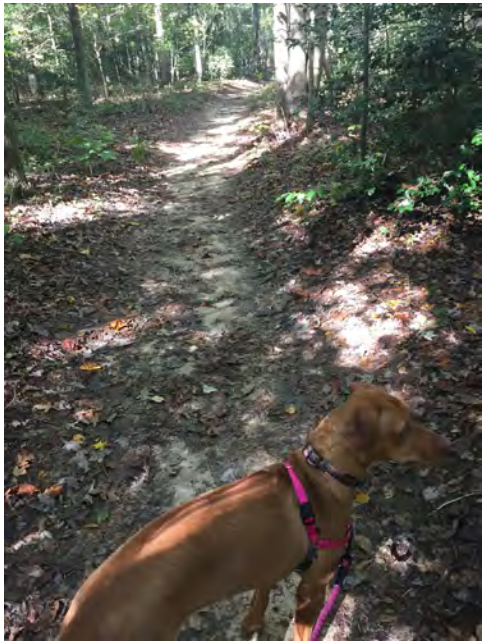
UNIVERSITY OF DELAWARE

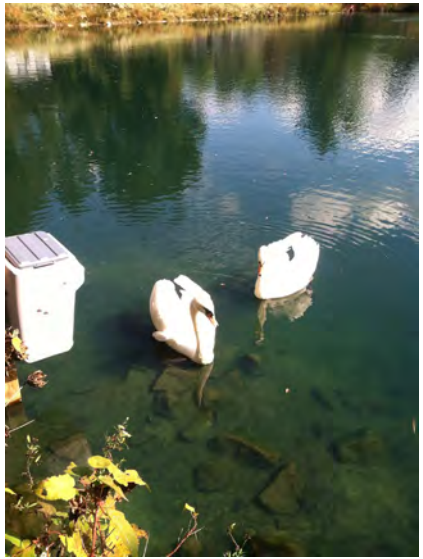
The Foundation of Invasive Species Management

- Set the overall goal of management site
- Site assessment
- Select control methods (integrated vegetation management) and set expectations
- Design and implement control program
- Ensure long term monitoring and management plans are in place

Overall Goal

- What is the desired usage of the site?
  - conservation area
  - interactive educational conservation area
  - wildlife habitat
  - community open space
  - Stormwater management
  - Right of way





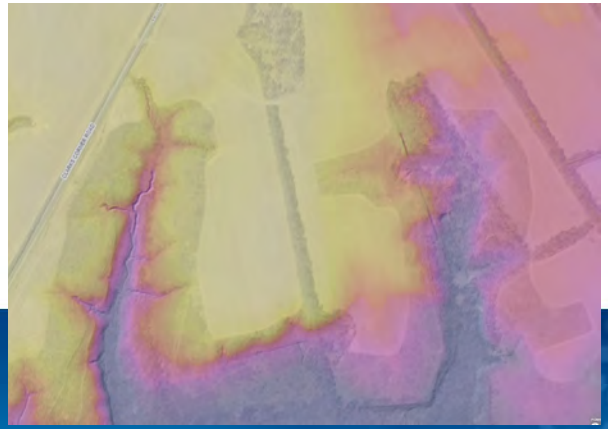
Pictures from Delaware Online and Delaware Wildlands

Site Assessment

current

2007

- Site history
  - Previous usage
    - farm field
    - old growth forest
    - homestead
    - industrial
    - fallow land
    - wetlands
    - etc
  - Previous management of invasive species?
  - Other stressors
    - flooding
    - invasive vertebrate or invertebrate infestation
    - human interaction



Site Assessment

- Current state
  - Break down site into particular ecosystems
    - Aquatic
      - salt marsh
      - fresh marsh
      - pond/lake
      - stream, riparian buffer
      - wooded wetland
    - Terrestrial
      - meadow
      - forest
      - right of way

Site Assessment

- Are soils in the treatment areas at risk of erosion?
  - Water quality will be negatively impacted if erosion is not prevented
    - Excess nutrient loss
    - Turbidity
    - Pollutants move with soil
- Is the treatment area involved with drainage or stormwater management
  - Some areas may need immediate attention to ensure proper functionality

Site Assessment

- Determine invasive plant populations
  - Determine target plant populations for each ecosystem and rank them based on threat to the site and ability to spread quickly to other non infested areas.
  - Investigate surrounding areas to determine the possibility of new introduction of invasive plant species.

Usual Suspects

BOLO

Site Assessment

- Once the top targets for control are determined, profile the plants to determine control methods.
  - Type of plant
    - herbaceous, woody
    - dicots, monocots
    - perennial, annual, biennial
  - Method of dispersal
    - seed
      - wind, water, animal, etc.
    - rhizomes, suckers, or stolons
    - fragmentation

Control Methods

- Chemical
  - herbicides
  - algaecides
- Mechanical
  - cutting and removing

Photo from augustfreepress.com

- Biological
  - insects
  - diseases
- Cultural
  - Site management techniques
    - burning versus cutting dormant meadows

Chemical Control

- Licensing
  - Some sites and situations require a certified applicators license through the Delaware Department of Agriculture.
    - 06 Right of Way
    - 5A Aquatic
    - 02 Forestry
- Permits
  - Some aquatic sites require permitting.
- The label is the law!
  - Very detailed application information on labels to include species controlled, timings, PPE, and restrictions.

Chemical Control

- Types of herbicides
  - Selective
    - Broadleaf-can be used on broadleaf invasive species while leaving most grassy species unharmed
      - triclopyr
    - Grass-can be used on grassy species while leaving most broadleaf plants unharmed
      - clethodim
    - There are a few herbicides that target a narrow list of species but tend to be very expensive
      - clopyralid
  - Non-Selective
    - Herbicide harms most species
      - glyphosate, diquat

Chemical Control

- Types of herbicides
  - Contact
    - Generally kills the contacted foliage. Works well for management of annuals.
    - Good coverage is necessary for control.
      - diquat
  - Systemic
    - Kills the foliage and moves through the plant to control the root systems as well.
    - Must be part of chemical control program for perennial species.
      - glyphosate

Chemical Control

- Application Timing
  - Plant profile and knowledge of the herbicide label will help determine best times for application.
    - Phragmites
    - Canada thistle
    - Japanese honeysuckle
  - Treatments for some woody species
    - basal bark treatments
    - hack and squirt treatments
    - cut and paint treatments

Chemical Control

- Differing strategies depend on the size of the invasion.
  - Site wide treatments
    - Phragmites
  - Localized treatments
  - Spot treatments
  - Aquatic treatments
    - flowing water
    - prevent dissolved oxygen depletion
- Determine acceptable level of collateral damage and stick to the long term vision to select for beneficial native species.

Mechanical Control

- Physical removal of plant material
  - Clear cutting
    - may be needed to access invaded areas
  - Mowing
    - colonized areas in riparian buffers and meadows could be mowed regularly until the targeted species are controlled
  - Hand pulling
    - good for small invasions
  - Clipping
    - cut the reproductive structures from the plant to prevent seed set
      - could be used on small population of invasive annual species

Biological Control

- Utilizing invertebrates, vertebrates, or diseases to control invasive species
  - Must be thoroughly researched before utilization
  - Must not harm or have the potential to harm any native or cultivated species
- Examples
  - Mile-a-minute weevil
  - Purple loosestrife weevil
  - Rust fungus on Canada thistle

Cultural Control

- Manage the site to increase native plant species vigor. A healthy and established native plant population is much more likely to resist invasion.
- Disturbed sites should be remediated to prevent introduction of invasive species.

Integrated Vegetation Management

- Use of multiple methods to achieve control of invasive plant species.
  - Bamboo control
    - mechanical and chemical
  - Canada thistle management
    - mechanical, cultural and chemical
- Most sites will require multiple species to be controlled at the same time and IVM will provide an efficient approach to be successful.

Design Control Program

- Determine control methods
  - Site conditions
    - Does the site need a complete restoration or will local remediation work?
  - Plant population
    - Type of plants targeted and how are they interspersed with beneficial species?
  - Timing
    - Schedule applications to target species at peak vulnerability when able.
  - Funding
    - What will the budget allow? Are additional funds needed for application equipment and supplies? What are the staffing needs? Identify resources for funding and volunteers.

Implement Control Plan

- Assess each phase to ensure control measures are working as expected.
  - check the next growing season for new growth or regrowth
- Make changes to the plan if the need arises.
  - management will be fluid

Post Treatment

- Is the volunteer plant population acceptable for the overall goal?
  - Many times, treatment of invaded areas will release the native population.
  - Determine whether seeding or plantings are necessary.
    - Plantings or seedings should be conducted during particular times of year depending on the types of native species being installed.
- Native plant Buffers in drainage ditches, stormwater management areas, and rights of way provide a variety of ecosystem services
  - Soil and bank stabilization
  - Nutrient uptake
  - Pollinator habitat

Long Term Management

- Once desired control levels are achieved and the area has been repopulated with native plant species, long term management is necessary to prevent new invasions.
- Scout the entire site 2-3 times per year if able
  - Scout hot spots regularly.
    - disturbed areas, transitional areas, property lines, rights-of-way, hedgerows
- Address invasive plant species when the populations are small.

Review the Process

- Was the goal achieved?
  - What challenges were encountered?
- Document the entire process for others to learn from and for the future land managers to reference.
  - Keep detailed information on control methods.
    - dates, weather, plant species treated, application method
- How can the process be improved?

In Summary

- Create a strong foundation for implementation of invasive plant management plan.
  - Set goals
  - Assess the site
  - Select methods
  - Design/Implement plan
  - Long-term management
  - Review and documentation

Additional Information

- Delaware Invasive Species Council
  - Education and outreach about invasive species and native plants
  - Maintains list of invasive species which have gone through a version of the Nature Serve protocol
  - Annual Conference – Tuesday October 24, 2023 at Harvest Ridge Winery
- Delaware Native Species Commission
- Delaware invasive plant law

Contact Us

- University of Delaware Cooperative Extension
  - www.udel.edu/academics/colleges/canr/cooperative-extension/
  - Email rbmoore@udel.edu for more details
- Delaware Invasive Species Council
  - www.delawareinvasives.net