Invasive Plant Management in Rights of Way

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

- 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

current

2007
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.
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

- **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