

Composite Strategies- Non-native Invasive Plants:

- **D- Integrated pest Management Approaches** for invasive plants
- **E- Maintaining Resiliency and Restoring** impacted ecosystem services and processes
- **F- Monitoring** invasive plants

Overview:

A variety of methods and tools have been used to address non-native invasive plants on the ANF:

- Treatments for large scale infestations: mechanical, chemical, biocontrol, cultural (burning),
- Limiting and preventing the spread of invasive plants,
- Reforestation post-treatment – planting with natives,
- Monitoring: utilize forest users to monitor for invasive plant species, citizen scientists to track invasive plant locations and spread.

What We Have Done:

- The ANF Land and Resource Management plan (Forest Plan) was revised and signed in 2007, allowing the use of glyphosate and sulfometuron methyl (see Forest Plan for approved formulations) for herbicide treatment.
- The Forest Plan would need to be updated for the use of bio-controls for non-native invasive plant species.
- Site specific environmental analysis for invasive plant treatment using glyphosate only has occurred on approximately 80% of the ANF (see map).

Treatments for large scale infestations: mechanical, chemical, biocontrol, cultural (burning)

1. Invasive plant treatment on the ANF began in earnest in 2001:
 - Manual/mechanical means (hand-pulling, cutting) with herbicide treatment beginning in FY11.
 - Species treated to date include, but not limited to:
 - garlic mustard (*Alliaria petiolata*),
 - Japanese knotweed (*Fallopia japonica*),
 - Japanese barberry (*Berberis thunbergii*),
 - purple loosestrife (*Lythrum salicaria*),
 - spotted knapweed (*Centaurea stoebe* ssp. *micranthos*),
 - bull thistle (*Cirsium vulgare*)
 - giant hogweed (*Heracleum mantegazzianum* - chemically treated by the PA Dept. of Ag.)
 - goats rue (*Galega officinalis* L.)
 - Since 2001, over 1,900 acres of invasive plant treatment have been accomplished either manually/mechanically or through chemical treatment for several different species.

2. The ANF has developed a Non-Native Invasive Plant Species of Concern list
 - Updated prior to each field season.
 - The 2017 field season list contained :
 - 20 species identified as ‘Early Detection/Rapid Response Species (EDRR)’,
 - 62 species with documented occurrence within the ANF
 - All 82 species are categorized for treatment based on their PA Noxious Weed List Status and site characteristics (e.g. new infestations, threatened resource values, risk for spread)
3. Stewardship contracting authority has increased the amount of acres treated and without it, limited appropriated funding is insufficient to make much headway.
4. Limiting and preventing the spread of invasive plants:
 - Equipment cleaning is required in timber sale and other service contracts.
5. Reforestation post-treatment – planting with natives:
 - ANF Forest Plan has guidelines when revegetating areas on species/genotype considerations.

Monitoring invasive plants

1. Utilize forest users to monitor for invasive plant species, citizen scientists to track invasive plant locations and spread.
2. Reinvigorate prior efforts such as developing volunteer ‘Certified Weed Warriors’.
3. Current efforts are working with The Allegheny Plateau Invasive Plant Management Area to utilize iMapInvasives. The iMapInvasives Partnership facilitates the management and sharing of invasive species information, including the extent of infestations, search efforts, and treatment outcomes.
<https://www.imapinvasives.org/pennsylvanialogin>

What We Are Doing:

Potential to collaboratively increase monitoring, develop and test treatment effectiveness, and improve effectiveness and capacity across ownership boundaries-

- Good Neighbor Agreements (<https://www.fs.fed.us/managing-land/farm-bill/gna>)
- Citizen scientists
- University partnerships and agreements
- Conservation organization partnerships and agreements

Future Considerations:

- There is a need to update the ANF Forest Plan to add additional chemicals and techniques for treating non-native invasive plants.
- There is a need for leadership/coordination of efforts across the Plateau for monitoring, citizen scientist coordination, information sharing, and cooperative treatment strategies.
- Needed greater consistency in seed mixes for site restoration following soil disturbance, across all agencies and ownerships- we work with many of the same contractors.
- Need exists to develop and test landscape non-native plant treatment and long-term revegetation and restoration strategies across ownerships.