



Invasive plant management and habitat restoration at Hartshorne Woods Park

NEW JERSEY INVASIVE SPECIES STRIKE TEAM CONFERENCE

APRIL 17, 2024

Hartshorne Woods Park

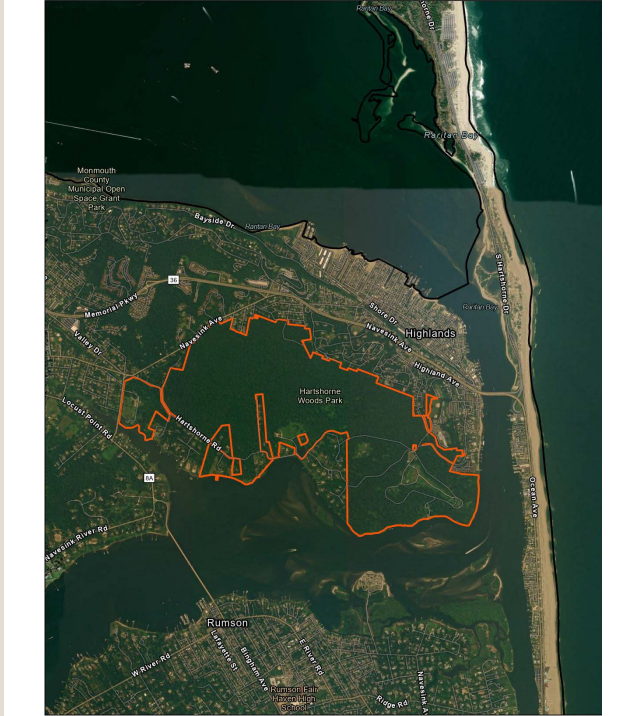
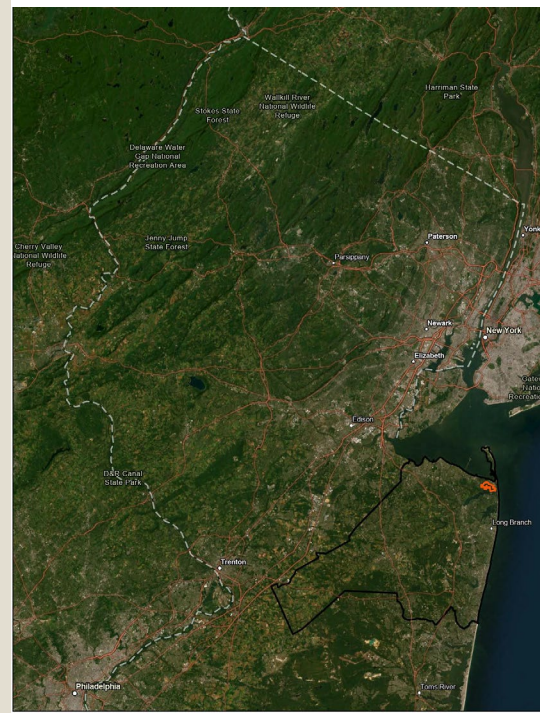
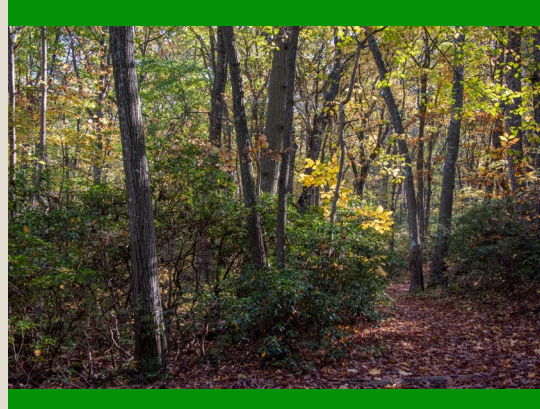
- Hilly, forested 812-acre site overlooking the Navesink River and Atlantic Ocean, acquired 1974

- Popular for hiking, biking, and fishing

- Some of the highest natural elevation on the eastern seaboard

- Many areas of high quality “century forest”

- Forest areas dominated by oaks, hickories, beech, and tulip poplars





Site history

- Southern portion cleared for agriculture and military use in the 19th and 20th centuries
- Areas that are post-ag tend to have higher invasive species densities (Kelly and Ray, 2023)





Monmouth Hills Section – initial conditions

Porcelain berry covering tree-of-heaven, Japanese angelica tree, multiflora rose, Japanese knotweed, and others



Project background and funding

- The forest surrounding this invaded area was identified as Priority Forest Area for invasive species removal by the NJISST
- NJISST received a U.S. Forest Service grant for 2018-2021, funding the creation of an invasive species management plan and treatments on kudzu, chocolate vine, and other invasives
- As the Park System's matching contribution to the grant, this large-scale invasive species removal project was initiated in 2022 to help protect this significant forest

Restoration Timeline

1. Forestry mow contract
March 2022

2. Herbicide contract
June 2022

3. Debris and downed
material cleanup and
mulching contract
March 2023

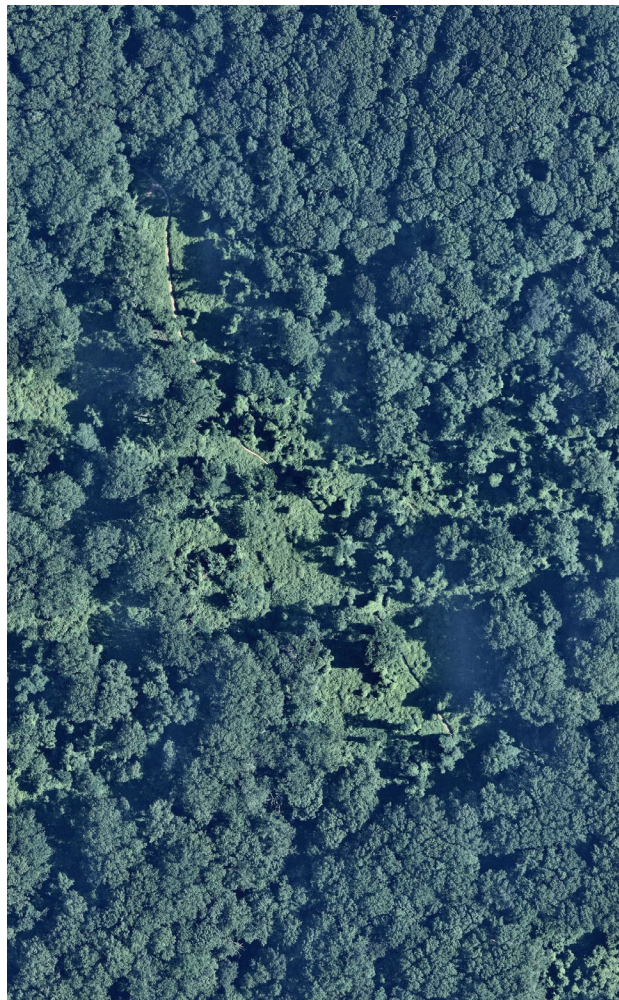
4. Seeding with native
grasses
April 2023

5. Herbicide spot treatments
September 2023

6. Mowing and seeding
April 2024



June 2021



Initial conditions

July 2022



Post forestry mow
& herbicide

May 2023



Post debris clean-up, tree
removal, & mulching

Sept 2023



Post seeding



Step 1: Forestry Mowing

- March 2022
- Contracted 9 acres, but only able to get to about 7.5
- Many obstacles due to downed trees underneath invasives



Step 2: Herbicide application

- June 2022
- FS-1 (3.75% glyphosate + 2.5% triclopyr amine + surfactant)
- Applied broadcast across site
- Edges sprayed



Step 3: Debris clean-up, mulching

- March 2023
- Removal of approximately 80 standing tree-of-heaven and black locust, princess tree
- Removal of vines on the ground
- Chipping of downed trees, mulch spread over site



Step 4: Seeding

- Drill seeding April 2023
- Eastern native habitat mix 15 lb/acre
 - Big bluestem
 - Virginia wild rye
 - Switchgrass
 - Indiangrass
 - Removed herbaceous component



Step 5: Herbicide spot treatments

- September 2023
- Applied FS-1 to porcelain berry throughout grassy field and along restoration area edges as needed
- Applied 5% glyphosate to emerging Japanese knotweed

RESTORATION IN PROGRESS

PROJECT DESCRIPTION

The Monmouth County Park System has partnered with the U.S. Forest Service and the NJ Invasive Species Strike Team (NJISST) to remove invasive species throughout Hartshorne Woods. This area is heavily infested with detrimental invasive species called porcelain-berry (*Ampelopsis brevipedunculata*), multiflora rose (*Rosa multiflora*), and Japanese knotweed (*Reynoutria japonica*). When an invasion of this degree occurs, stewardship is required to restore healthy habitat conditions, including the mechanical removal of several plant species. Selective land clearing took place on a 9.7-acre portion of Hartshorne Woods Park during early 2022. Subsequent work planned includes herbicide applications to control any regrowth of the invasives, followed by seeding of native species. This process is repeated over many years.



Initial site conditions: Invasive vines blanket the forested landscape.

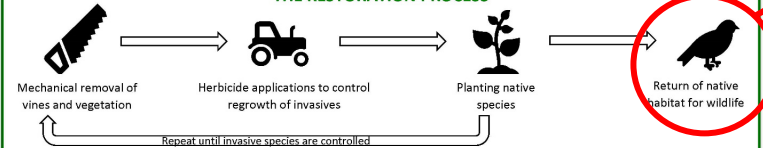
REASON FOR PROJECT

Invasive species are plants and animals that are non-native to an ecosystem and whose introduction causes environmental harm. Invasive plant species degrade native ecosystems by outcompeting native plants for resources such as habitat, water, nutrients, and light. Native plants are important to an ecosystem because native animals depend on them for survival. In the case of porcelain-berry, this invasive species is a climbing vine that can topple large trees if left unmanaged. Additionally, porcelain-berry spreads quickly and creates dense mats of vegetation that cover and prevent the growth of native vegetation. Hartshorne Woods was identified as a Priority Forest Area for invasive species removal by the NJISST and the U.S. Forest Service. After removal of the invasive species, native plants and animals can be restored to the area to protect and improve forest health.



Initial site conditions around the Grand Tour Trail.

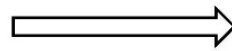
THE RESTORATION PROCESS



Please excuse the unsightly conditions of this area while the restoration is in progress. Landscape restorations are labor-intensive and full results may not be obvious for many years. The Monmouth County Park System apologizes for any inconvenience throughout the restoration period but expects that the final results will greatly improve the park for both visitors and wildlife.



Improve forest health.



Return of native habitat for wildlife

progress. Landscape
years. The Monmouth
ation period but expects that



Step 6: Maintenance & Monitoring

- Annual mowing and spot treatments
- Vegetation evaluation
- Monitoring edges and encroaching invasives (black jetbead, Japanese Angelica tree, porcelain berry)
- Spots for improvements
- Wildlife observation for interactions with site

Benefit of transitional habitat



Return of the natives!

Pioneer species like white snakeroot and various goldenrods tolerated the herbicide and emerged from the grassy field.



Benefits of transitional habitat

Benefit of transitional habitat



Several unique bird species that had not been frequently sighted in this area began showing up in Fall 2023

Benefit of transitional habitat



Indigo bunting



Blue Grosbeak

Benefit of transitional habitat



Common Yellowthroat



R.T. Hummingbirds

Benefit of transitional habitat



Additional unique open-
woodland species arrived
Spring 2024



What's next?



The long-term goal: reforest the site with native trees



Short term goal: manage as open-woodland field with annual mow in March (~5 years)



Continue to spot treat invasives



Survey for native trees regenerating and tube them




Continue and repeat invasive control process beyond restoration area



Project difficulties

- Too many wood chips!
 - Areas that were not raked thin enough didn't have successful seed germination
 - Challenging to write and hold contractor to specific depth specs

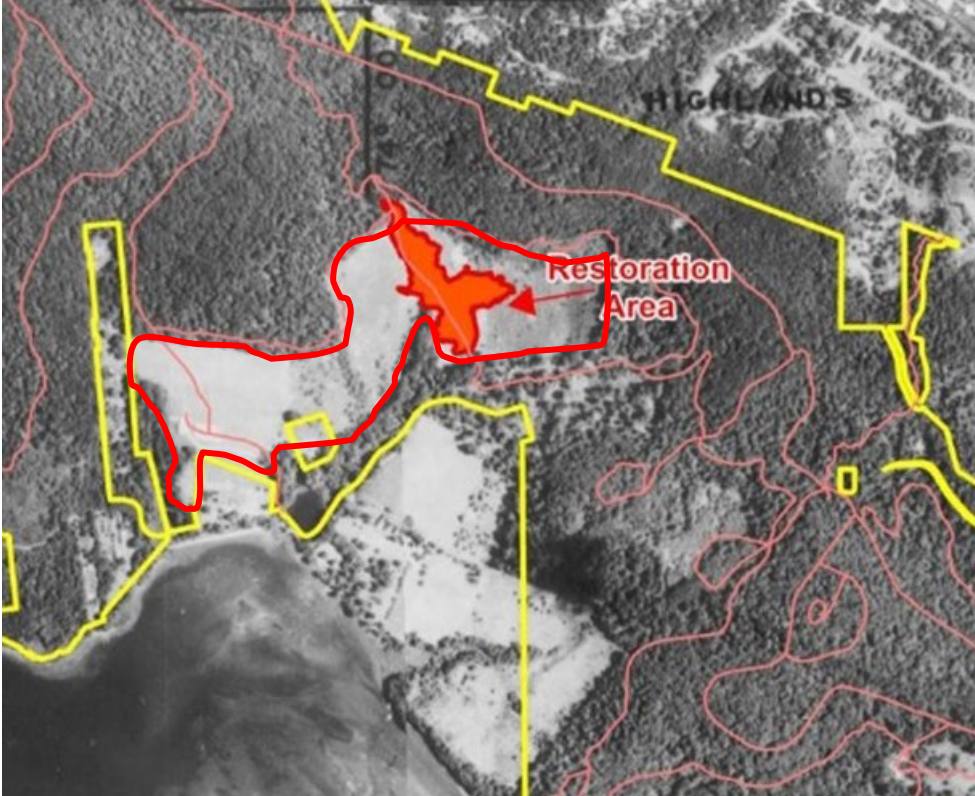


Bare spots with no seed germination in areas where woodchips were too thick



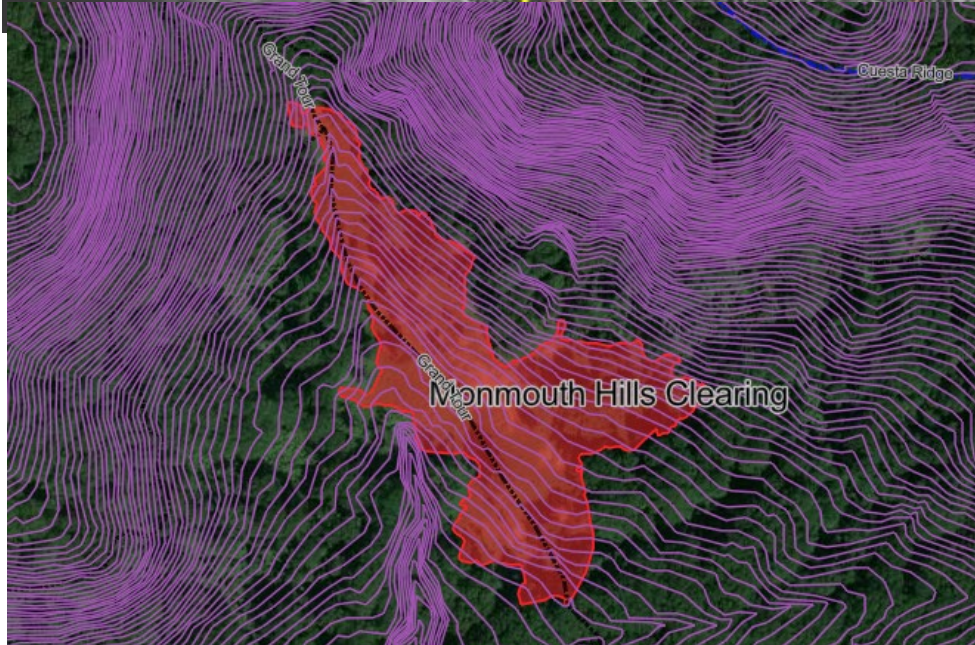
Project difficulties

- Change seed mix for different light conditions?
 - Shady areas became dominated by Japanese stiltgrass



Project difficulties

- Surrounding area, especially northeast of site, is invaded
- Significant contour adds to challenge





Project difficulties

- Re-emergence of particularly difficult invasives

Successes

- Herbicide works!
- About 90% reduction in porcelain berry



Successes

- Investment in site lead to increases in efforts to monitor and address issues early on



Identifying emerging grasses

Successes

Intervened early enough to protect desirable seed trees



American Holly in shaded areas



Tulip Poplar in sunny open field

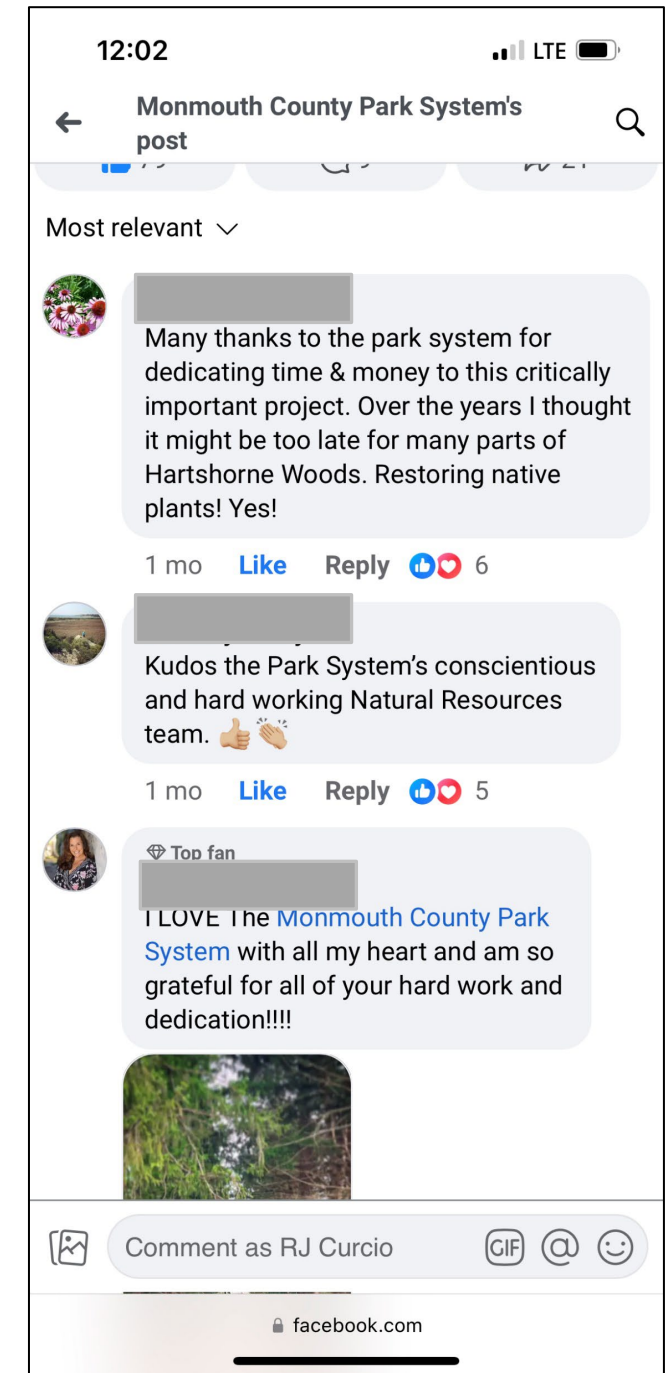


Shadbush on forest edges

Successes

- Elevating natural resource issues through public education:

- Social Media post on park's page
- On-site poster
- Story Map on webpage
- Planned Native Plant Society walk-through
- Environmental Commission/
Garden Club walk-throughs



Successes

- Engaging and educating staff for staff investment projects



Questions?

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[Story Map](#)

