Insecure Forest Regeneration Needs Sustained Management in National Capital Parks-East

Introduction

Forests are a key part of the landscape and visitor experience in several of the sites cared for by National Capital Parks-East (NACE). NACE's forest ecosystems are facing many stressors, including non-native plants, invasive tree pests, overabundant deer, lack of fire, and adjacent development affecting incoming water levels and wind exposure. These stressors diminish forest resilience, defined as the ability of an ecosystem to experience disturbance and rebound to similar functions, structure, and composition. A lack of tree regeneration—seedlings and saplings of canopy-forming trees—is an early indicator of reduced resilience and potential for future forest loss.

A recent study by several NPS Inventory and Monitoring networks assessed regeneration metrics in 39 parks from 2008 to 2019, including at NACE. Parks were placed in one of four regeneration categories (Secure, Insecure, Probable Failure, and Imminent Failure), based a variety of metrics that represent the amount and diversity of tree regeneration. Forests in 27 of 39 parks were classified in either imminent or probable failure categories due to a lack of seedlings and saplings in the understory. ***The study identified overabundant white-tailed deer and invasive plants as the leading causes of concern for forest regeneration***. For more detailed information on the full study, see the source publication in the Resources section below.

Hungry white-tailed deer can eat much of the vegetation in a forest that is within their reach.
NPS

Main Findings

As of data collected through 2019, on a four-category scale (Secure, Insecure, Probable Failure, and Imminent Failure), NACE has a forest regeneration status of **Insecure**. This designation means that all NACE park sites currently lack adequate saplings and seedlings, and generally have moderate deer browse impacts. Forests in all NACE sites have poor seedling composition and moderately poor sapling composition due to deer browse and an abundance of invasive species, particularly Amur honeysuckle (*Lonicera maackii*) and Japanese honeysuckle (*Lonicera* japonica). As these forests mature and overstory trees die, the increasing dominance of nonnative species in the understory may limit the ability of canopy tree seedlings to regenerate, eventually altering the composition and structure of the forests.

The nonnative shrub, Amur honeysuckle (*Lonicera maackii*), is a common invasive species at NACE and can crowd out native tree seedlings in a forest.
Credit: Chris Evans, University of Illinois, Bugwood.org

Management Recommendations

Eastern national parks need sustained, integrated forest management to secure sufficient regeneration and avoid future forest loss. We suggest that managers at NACE:

- Move forward with implementing deer population reductions to protect forest regeneration from browse impacts and allow seedling and sapling recovery.

- Continue to remove invasive plants through methods including early detection and rapid response and strategic invasive plant management in high priority habitats. Also consider release of approved biological controls.
- While likely not feasible in any urban park setting, consider prescribed burns in dry, fire-adapted forest to promote tree regeneration if ever possible.
- Consider tools available to address forest insect pests and pathogens. Assess forest stands at risk or already impacted (such as those damaged by emerald ash borer) and prioritize invasive plant management where canopy gaps have increased or may increase soon.
- Consider tree planting in areas of severely degraded forests.

Continuing and expanding these management efforts are especially important for NACE as the park is at risk of losing forest cover without intervention. With conditions changing rapidly, NPS park and regional staff should continue to use an adaptive management lens, by frequently re-assessing forest conditions and assessing management effectiveness using long-term ecological monitoring data collected by the park and the Inventory and Monitoring program. Please refer to the source publication for more information on management strategies and reach out to the contact below for further assistance.

Resources

Source Publication: Miller K., Perles S., Schmit J.P., Matthews E., Weed A., Comiskey J., Marshall M., Nelson P., Fisichelli N. (2023). Overabundant deer and invasive plants drive widespread regeneration debt in eastern national parks. Ecological Applications. https://doi.org/10.1002/eap.2837

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Links:

Managing Resilient Forests Initiative for Eastern National Parks

To see more park briefs, visit this link: https://schoodicinstitute.org/park-forests

NPS News Release: Reducing deer numbers and removing invasive plants are key to long-term forest health - Catoctin Mountain Park (U.S. National Park Service) (nps.gov)