ARTICLE

Removing Invasive Plants from the Great Meadow

Acadia National Park (https://www.nps.gov/acad/)

When you picture Acadia, what comes to mind? Mountains, ocean, forest, lakes? These are the features Acadia is known for, yet there is another, often unnoticed world that makes up 20% of the park. Wetlands may not be on the postcard, but they rank among the most biodiverse ecosystems in the world and provide essential environmental functions.

Wetland vegetation slows the flow of water and filters the world's freshwater resources, allowing sediment, nutrients, and pollutants to settle. Healthy wetlands act as buffers that moderate the effects of flooding and drought; one acre of wetland can hold over a million gallons of water. While wetland ecosystems make up only 5% of the earth's surface, the partially decayed organic matter in wetland soils holds 25% of the carbon found in earth's soil. In Acadia, wetlands support a diverse array of wildlife and plant species, including most of the park's rare plants that have disappeared from other parts of Maine. These benefits are due in large part to the native plant communities that have adapted to local conditions
over thousands or millions of years.

Yet wetlands have long been seen as wastelands. Many of Acadia's wetlands were dredged, ditched, or filled in before the national park was established. Roads and development continue to cause runoff and restrict the flow of water. When human actions fragment habitat, pollute air and water, and compact soil, existing plant communities struggle to survive. Invasive species, which are introduced by people to areas where no relationships with pests or predators exist to keep populations in check, thrive under these conditions.

Each year, a team of seasonal NPS employees takes on the challenge of finding, removing, and researching invasive species in Acadia. In 2022, this four-person crew covered almost 1000 acres of ANP in search of invasive plants. Out of 25 target species, one accounted for far more time, area surveyed, and plants treated than the others combined: glossy buckthorn, Frangula alnus.

Reducing invasive plant cover takes patience and endurance, and Great Meadow is just one of over 150 field sites the IPMT revisits year after year. Acadia National Park began managing invasive species in 1989, when purple loosestrife, Lythrum salicaria, became a threat to wetland ecosystems. Twenty years later, the park established a dedicated invasive plant management program. When the IPMT's work began in Great Meadow, dense thickets of mature glossy buckthorn shrubs had been producing large quantities of fruit for a long time. The seeds remain viable in the soil for several years, and even first-year shoots
that emerge from this seed bank can produce fruit, so removing the canopy of mature plants once is not enough to manage glossy buckthorn populations.

IPM, or integrated pest management, is a way of using many tools and treatment methods in combination. The crew uses hand saws and pruners to cut mature buckthorn shrubs, but cutting alone actually encourages regrowth. For this reason, the crew applies herbicide to the stump or covers it with a black bag to prevent new growth. Once

the canopy has been removed, seedlings can be pulled by hand or treated by applying herbicide to the leaves. Both methods have advantages and disadvantages. When applying herbicide, the team must carefully evaluate the site, seasonal timing, and weather conditions to minimize
to native plants and other resources. Hand pulling works well with a large group of volunteers, but it is time-consuming for such a small crew, disturbs the soil, and could leave part of the plant behind to regrow. While there are many ways to remove invasive plants, removal is only one part of the overall management strategy.

The IPMT surveys large areas of the park in search of new infestations, monitors regrowth of invasive species at established study plots each year and collects spatial data in the field for every plant treated. This data informs the team's efforts for years to come, but it also shows the long-term positive impact of dedicated efforts to remove invasive species. The IPMT estimates the size of each individual invasive plant they treat and calculates how much area the team surveys during each site visit. In 2016, glossy buckthorn plants treated by the IPMT in Great Meadow would cover .54 acres or about 23,000 square feet. In 2022, the crew surveyed an area similar in size but found only .05 acres or 2,200 square feet of glossy buckthorn. The IPMT aims to survey and treat all 116 acres of Great Meadow during the 2023 field season as part of the Wild Acadia project and larger effort to restore Great Meadow. This is an ambitious goal today, but it wouldn't be possible if years of previous treatments hadn't significantly reduced invasive plant cover.

Invasive species are never going to be eradicated—they are part of the human-altered world we live in. The goal of invasive plant removal, then, is really to restore native plant communities. When native plant communities are displaced from wetlands, the benefits of water filtration, soil formation, and wildlife habitat decline as well. In the context of rapid loss of wetlands worldwide and the continuing impacts of climate change, healthy wetland ecosystems are both more vulnerable and more important than ever.

TAGS

acadia national park | wild acadia | great meadow | great meadow wetland | invasive plants | restoration | sieur de monts | botany | resource management | changing acadia