

Surveying and Mapping Invasive Plants on Northeast Refuges

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Invasive common reed on the Edwin B. Forsythe NWR, NJ

Photos Gene Nieminen / USFWS, NJFO

Throughout the National Wildlife Refuge (NWR) System, invasive species are increasing in number and frequency, causing widespread damage to native ecosystems. In New Jersey's NWRs alone, Edwin B. Forsythe battles cheatgrass (*Bromus tectorum*), Canada thistle (*Cirsium arvense*), and spotted knapweed (*Centaurea maculosa*), to name a few. Besides purple loosestrife (*Lythrum salicaria*), Great Swamp struggles with Japanese knotweed (*Polygonum cuspidatum*) and Japanese barberry (*Berberis thunbergii*). Garlic mustard (*Alliaria petiolata*) and multiflora rose (*Rosa multiflora*) are among the invasives troubling Wallkill River. Supawna Meadows is attempting to control mile-a-minute (*Polygonum perfoliatum*) and Japanese stiltgrass (*Microstegium vimineum*), among other invasives. Cape May deals with Japanese honeysuckle (*Lonicera japonica*), tree-of-heaven (*Ailanthus altissima*), and Japanese wisteria (*Wisteria floribunda*). Controlling invasives is draining time, energy, and resources. If the NWR System is to fulfill its mission, each refuge needs to prevent the introduction and spread of invasive species.

While refuges in New Jersey have been active in the battle to control large, invasive monocultures such as those of common reed (*Phragmites australis*) and purple loosestrife, until recently little effort has been given to early detection and prevention methods. The U. S. Fish & Wildlife Service's (Service) Northeast Region has begun to eliminate this gap by

initiating a region-wide, systematic effort to identify, locate and map invasive plant species on refuge lands. A standardized inventory and mapping protocol was developed in 2001. Since 2002, twenty-three northeastern NWRs have participated in this ongoing inventory. The data from this inventory are essential for prioritizing initiatives for species control, monitoring rate of species spread, and evaluation. The Region has also held workshops on plant identification as well as on new survey techniques. The Service has coordinated the inventory with the



Uplands at Supawna Meadows NWR, NJ

on-going initiatives of other agencies and organizations so that the information can be shared to further the control of invasives on as much acreage as possible.

Refuge staff, volunteers, and contractors are using a walking survey method which begins by laying out a grid system on a refuge area to be surveyed, and then walking line transects to cover as much of the refuge as possible. The spacing between transect lines is based on visibility in the area being surveyed and can vary throughout the refuge. Also, areas in which few invasives are expected may have wider spaced grid/transects, while heavily managed sections and areas with a high potential for invasives may require more intensive surveys.

Inventory personnel use Global Positioning System technology to record invasive plant locations, entering that information into a computer-based Geographic Information System to generate refuge-specific as well as regional maps. Mapping information is then interpreted to determine the size of invasive colonies, the direction and rate of spread, and other relevant information. Using maps and inventory information, managers can develop strategies focused on removing new and isolated infestations while containing the principle infestation.

The information generated from this inventory and mapping work will not only be instrumental in refuge management planning but will also be used to secure funding for prevention and control as well as to initiate research for new treatment methods. The data may require the NWR

System to rethink routine operations and, in some cases, to reset funding priorities. Initially this could entail considerable effort and some additional expense. However, the price of preventing infestation is fractional compared to the cost for restoring wildlife habitat already

degraded by invasive species. Already more than 8 million of the almost 94 million acres within the NWR System are infested with nonindigenous, aggressive plants. The Northeast Region's Invasive Species Survey and Mapping Initiative is helping to turn back the tide.



In the foreground Canada thistle (*Cirsium arvense*) competes with multiflora rose (*Rosa multiflora*) for a patch of ground beside the Supawna Meadows NWR impoundment