On the Hunt for Invasives: 2012 Invasive Species Early Detection Report

Early detection is the key for controlling the spread of invasive/exotic pests and plants

Background

"Invasive species" are alien species that cause or are likely to cause harm to the economy, environment, and/or human health, and are considered to be one of the leading threats to the biodiversity and integrity of ecosystems worldwide. In broad terms, they are organisms that have been introduced deliberately or unintentionally into an environment where they did not evolve, are capable of establishing self-sustaining populations in "untransformed ecosystems", and have no natural enemies to limit their reproduction and spread. These are among the reasons why early detection of invasive species was identified as a priority vital sign by several Inventory and Monitoring networks including the Northeast Temperate Network (NETN).

Objectives and Methods

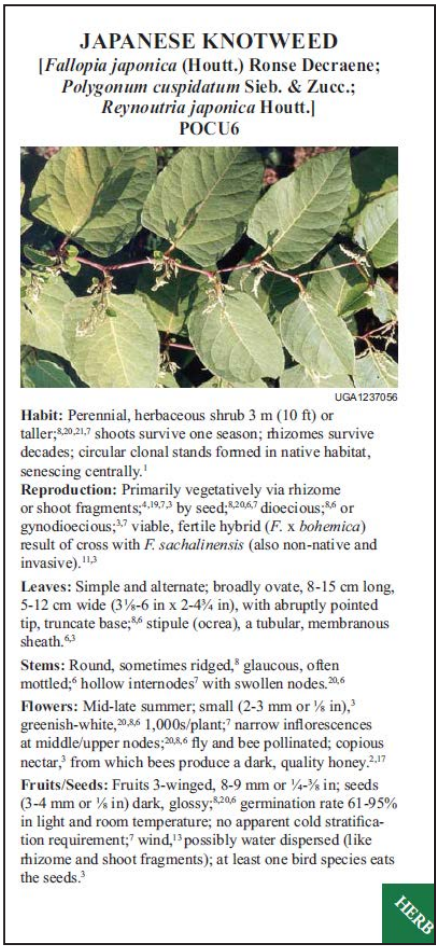
The main goal of this program is to detect invasive species while they are still in the early stages of establishment when the costs of eradicating them are still low. This is accomplished by first developing a modest list of target insect pest and exotic plant species specific to each park. Species on the list must be recognizable to non-experts. The target list includes species that are either present in the park at low levels and of concern if new populations are detected, or not present in the park, but that threaten ecosystem health and function in the region.To aid with identification, NETN makes available laminated field guides and annual trainings to field crews and network parks. As of the 2013 field season, field crews and even park visitors will be able to record sightings of invasive/exotic species into an off-the-shelf smartphone application (for Iphone and Android) called "What's Invasive?". The app includes updated target lists for each park, and automatically stores important data associated with the detection including GPS location, photographs, and extent of population. Prompt reporting is expected to increase with the use of this app in the field, which is capable of documenting invasive species directly to a web-based system immediately following a detection. This is considered to be the pilot year for using this app, and projects organizers are eager for feedback as to how it works in the field and ways it may be improved.

An important note is that if a target invasive species is found on an NETN forest health monitoring plot, the plot must not be specifically targeted for invasive species removal. In order not to skew forest health data, forest monitoring plots need to be treated the same as the surrounding area and invasive species removal should only occur when it is conducted in a larger management area that happens to include one or more plots.

Results and Findings

Early Detections

Several species on the target list were found and/or managed in the park by staff and cooperators in 2012. Winged burning bush, which was originally planted in the landscaping around the mansion, was found in fewer numbers (11 plants in three locations) outside the mansion grounds this year compared to previous years. Most of these locations were near the Elm lot, close to the overlook on the trail. The extent of oriental bittersweet was unknown in previous years because it was thought to possibly be the native species, American bittersweet. Now that a vine in the park has matured and fruited, a positive ID of oriental bittersweet has been made and it will be managed in future years. In late April, two common barberry shrubs were flagged to be pulled at a later date. A large stand of Norway maple was removed west of the Belvedere in 2005 and replanted with Norway spruce (a common, non-invasive plantation tree in the park). This area around the new plantation has seen explosions of Norway maple seedlings, either deposited as seed before the mature trees were removed, or blown in from neighboring trees just south of the park boundary. To date, an estimated 2,000 seedlings have been pulled from this area. Norway maple continues to crop up in other areas of the park, such as near the Bungalow on the hill west of the visitor center and west of the pasture near the horse shed on the Billings Park Link trail. An estimated 5,000 plants were removed from these areas in 2012. Autumn olive was found in three isolated patches near large hemlocks in Stand 5. Over 50 individuals in Stand 5 (re-sprouts from cut stumps) were treated with herbicide in July and November. Black swallow-wort continues to persist near the gravel parking lot across from the Billings Farm & Museum on Old River



JAPANESE KNOTWEED
[*Fallopia japonica* (Houtt.) Ronse Decraene; *Polygonum cuspidatum* Sieb. & Zucc.; *Reynoutria japonica* Houtt.]
POCU6

UGA1237056

Habit: Perennial, herbaceous shrub 3 m (10 ft) or taller;[8,20,21,7] shoots survive one season; rhizomes survive decades; circular clonal stands formed in native habitat, senescing centrally.[1]

Reproduction: Primarily vegetatively via rhizome or shoot fragments;[4,19,7,3] by seed;[8,20,6,7] dioecious;[8,6] or gynodioecious;[3,7] viable, fertile hybrid (*F.* x *bohemica*) result of cross with *F. sachalinensis* (also non-native and invasive).[11,3]

Leaves: Simple and alternate; broadly ovate, 8-15 cm long, 5-12 cm wide (3⅛-6 in x 2-4¾ in), with abruptly pointed tip, truncate base;[8,6] stipule (ocrea), a tubular, membranous sheath.[6,3]

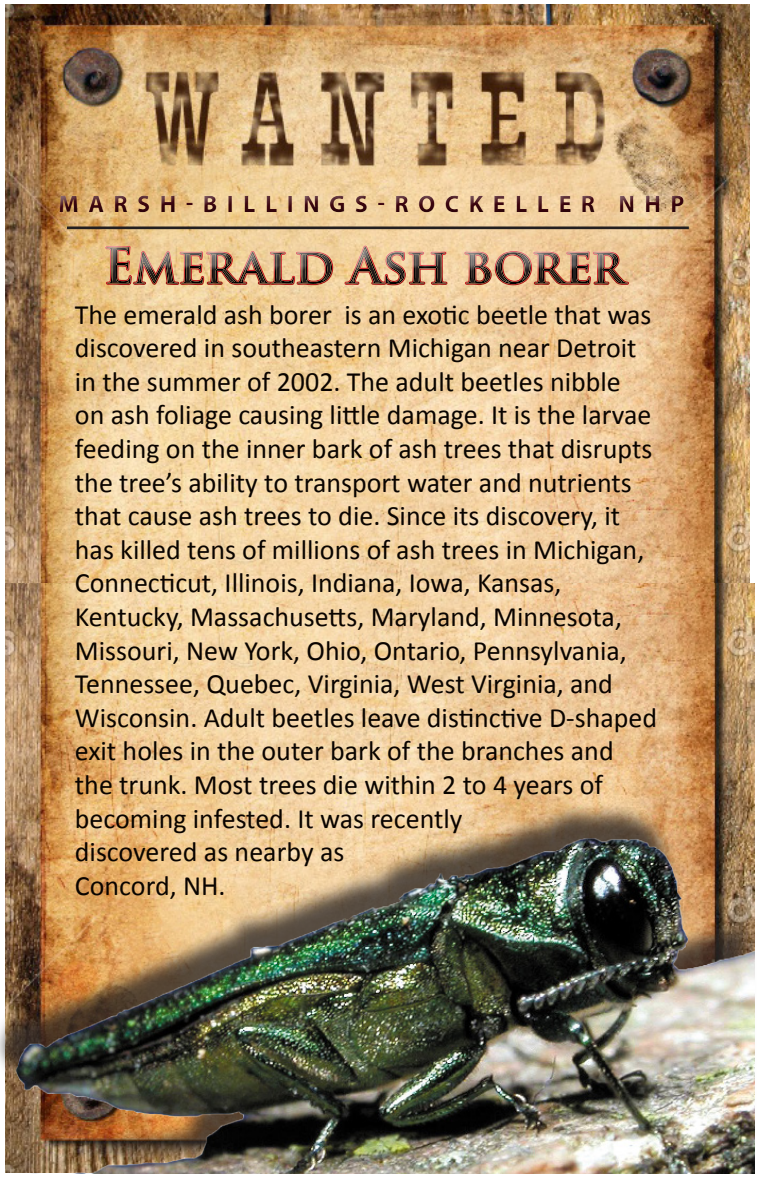
Stems: Round, sometimes ridged,[8] glaucous, often mottled;[6] hollow internodes[7] with swollen nodes.[20,6]

Flowers: Mid-late summer; small (2-3 mm or ⅛ in),[3] greenish-white,[20,8,6] 1,000s/plant;[7] narrow inflorescences at middle/upper nodes;[20,8,6] fly and bee pollinated; copious nectar,[3] from which bees produce a dark, quality honey.[2,17]

Fruits/Seeds: Fruits 3-winged, 8-9 mm or ¼-⅜ in; seeds (3-4 mm or ⅛ in) dark, glossy;[8,20,6] germination rate 61-95% in light and room temperature; no apparent cold stratification requirement;[7] wind,[13] possibly water dispersed (like rhizome and shoot fragments); at least one bird species eats the seeds.[3]

HERB

A look at the Japanese Knotweed field card for Marsh-Billings-Rockefller NHP.



Road as well as along roadsides surrounding the park. Redstart Forestry & Consulting has been treating these populations annually. There were no reports of invasive aquatic plants in the Pogue or elsewhere in the park.

Invasive Species Target List Review

Several of the species on the target list occur in the park at low levels or in manageable populations. These species include oriental bittersweet, Norway maple and winged burning bush. NETN decided to keep these and other species on the target list, as documenting their range and whereabouts in the interior forest sections of the park will encourage a rapid response if they are found there. Two species were added to the target list, tree of heaven because of its high invasive ranking and garlic mustard because it persists in isolated pockets of the park and it also has a high invasive ranking.

Invasive Species Management

Through cooperation between park staff, Student Conservation Association interns, Redstart Forestry & Consulting and the Ottauquechee Cooperative Invasive Species Management Area team, twenty invasive species were managed in 2012. The priority was to remove as many mature woody invasive plants and seedlings as possible, especially in areas slated for tree harvesting in the next year. Exotic bush honeysuckle plants were treated in one of the last known patches of the species in the park. Treatment involved a combination of hand pulling in the spring and treatment with herbicide on cut stumps in the fall. During the months of April and November, 185 honeysuckle plants were pulled in ten different locations throughout the park, which has adopted a strategy of gathering GPS waypoints to mark native honeysuckle species so as not to confuse them with the invasive ones during control efforts. Garlic mustard has been managed with some success for several years by hand pulling, and this has resulted in declining populations. More than 100 mature and many small garlic mustard plants were pulled in four sites, including modest populations in King Farm (72 plants) and a revisit in stand 5 (30 plants). The bulk of the removal was carried out by Redstart, which also treated a localized patch of common reed at the Prosper road parking lot and removed the seed pods from black swallow-wort prior to seed release. Another notable invasive that was managed and inventoried in 2012 was Japanese barberry, where 86 plants were either pulled or cut and treated with herbicide. Locations where Japanese barberry was treated include 30 large plants at the summit of the West Ridge trail and the Pogue, along the pasture edge surrounding the horse shed, and six plants in a large stand on the west end of the park. Mature individuals of this species are not known to occur inside the park boundary (a noteworthy achievement), though mature plants are commonly found just outside the park. Continued vigilance will be required.

What's Next

The invasives program, now in its third year, has entered the stage of reviewing the original species target lists based on the number of detections and updated species ranges. Feedback from park managers has indicated that the target lists and field guides have increased awareness of priority invasive species, and have made identification of these species easier. Continued feedback about the *What's Invasive?* app will help to further enhance the effectiveness of the invasive species early detection program.

More Information

Contacts and Websites

Jesse Wheeler	Phone/ E-mail
Project Lead Scientist	207-288-8722
	jesse_wheeler@nps.gov
Brian Mitchell	
NETN Program Manager	802-457-3368 ext. 37
	brian_mitchell@nps.gov

Full Report online at:
https://irma.nps.gov/App/Reference/Profile/2194335

"What's Invasive?" Website
http://whatsinvasive.com

Northeast Temperate Network
54 Elm Street, Woodstock, Vermont 05091
802-457-3368
http:/www.science.nature.nps.gov/im/units/netn/