



ACADIA NP • APPALACHIAN NST • BOSTON HARBOR ISLANDS NRA • MARSH-BILLINGS-ROCKEFELLER NHP • MINUTE MAN NHP
MORRISTOWN NHP • ROOSEVELT-VANDERBILT NHS • SAINT-GAUDENS NHS • SAUGUS IRON WORKS NHS • SARATOGA NHP • WEIR FARM NHS

Park Invaders: 2013 Invasive Species Early Detection

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 environment, economy, 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 controls 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).



Fig. 1 UGA1241011 Fig. 2 UGA 5016058

Problem: A native of Asia,^{1,2,4} emerald ash borer (EAB) infests and kills North American ash species (*Fraxinus* sp.) including green, white, black and blue ash. Damage is caused by the larvae, which feed in the cambium between the bark and wood, producing galleries that eventually girdle and kill branches and entire trees.^{1,2}

Identification: Adults are roughly 7.5 to 13.5 mm long (3/8 to 1/2 in)^{3,5} with metallic green wing covers (Fig. 1) and a coppery red or purple abdomen (Fig. 2).^{2,4} Larvae reach a length of 26 to 32 mm long (1 to 1 1/4 in),³ are white to cream-colored and dorso-ventrally flattened.²

Signs and Symptoms: Irregular holes excavated by woodpeckers feeding on pre-pupal larvae (Fig. 3) may be the first sign of infestation.^{1,2} After at least one year of infestation, D-shaped exit holes (3–4 mm in diam., ~1/8 in.) in the outer bark of the branches and trunk (Fig. 4) indicate adult emergence.^{1,2} Adults may be visible from late May through September,³ but are most common in June and July.^{2,3} Vertical bark fissures (Fig. 5), crown dieback (Fig. 6) and epicormic



Fig. 3 UGA 1372003 Fig. 4 USDA Forest Service, Deborah McCullough, MSU

2013 was the 4th year of the invasive species early detection (ISED) program and, for many parks, the second visit from the NETN forest health monitoring crew since the protocol was adopted. In many cases, having the presence of field crews that venture beyond the front-country paths and roads has resulted in new detections of target invasive species. Program wide, early detection species were found in 29 different locations among all but two NETN parks during 2013. The numbers of reports have steadily increased in the last several years, compared with only six sightings in 2011 and 12 in 2012. In and of itself, this increase may not necessarily indicate

higher prevalence of invasive species in NETN parks, but could be a reflection of higher skilled field crews that are using more efficient reporting tools.

Support of the ISED program from park staff and volunteers continues to enhance its efficiency and relevance. Successful rapid response when invasives are found remains crucial to maintaining its effectiveness within network parks.

Objectives and Methods

The main goal of this program is to detect invasive species in the early stages of establishment when the cost of eradicating them is still low. This is accomplished by first developing a modest list of target insect pest and exotic plant species that are specific to each park and 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 yet present in the park but 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. The field guides contain each park's target list, identification cards for each species on the target list, and laminated pest and plant detection forms. As of the 2013 field season, field crews have been experimenting with smartphone apps to record sightings of invasive/exotic species. The apps include 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 also available for use by park staff, volunteers, and the visiting public.

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

Six species on the target list were found and/or managed by park staff and cooperators in 2013. Winged burning bush continues to be found in low numbers outside of the mansion grounds with 19 plants in three forest stand locations in 2013. Fortunately, most of the early detection species continue to be

WANTED

CYPRESS SPURGE

Cypress spurge is a herbaceous European perennial introduced into North America as an ornamental plant in the 1860's. It was often planted in cemeteries and was sometimes referred to as graveyard weed. It eventually escaped cultivation and became established on open ground, particularly in pastures. All parts of cypress spurge contain a toxic latex that irritates the eyes, mouth, and gastrointestinal tract and causes dermatitis upon contact in some people. Sheep can seemingly browse the plant with no ill effects, but cattle that ingest it become weak, collapse, and sometimes die. Cypress spurge is primarily found on limestone, sandy, or gravelly soils and can form almost pure stands at open sites and displace native species. It does not generally occur on intensively cultivated soils, nor is it found in heavily forested areas.



outside the interior forest areas of the park. 2013 marked another solid year in attacking garlic mustard, with more than 300 plants pulled and control efforts covering many locations in the park. Small populations continue to crop up in the park and suggest that vigilance is necessary to stay on top of this spreading weed. From June to October, about 80 common barberry shrubs were pulled or had stumps cut. These stepped up control efforts are designed to stall this species' intrusion into forested areas of the park. A small section of a larger population of Norway maple was removed from the eastern part of the park, which was close to old stands that were eradicated starting in 2005-2006. The remaining seed bank is likely to blame for persistent seedlings

that are occasionally found in mixed-forest areas, however, no mature, seed-bearing trees are known to exist anywhere within park boundaries. Autumn olive was found in great numbers in Stand 5, an old field successional stand, for another consecutive year. More than 80 individuals were pulled or wrenched out of the ground in July at that site. More than a dozen others were pulled in five different locations. As part of recent annual efforts, black swallow-wort reproductive pods were pulled near the gravel parking lot across from the Billings Farm & Museum on Old River Road. Two new populations were found and treated as well. Reproductive pods and flower buds were pulled in Stand 5 and along the North Ridge Trail. There were no reports of invasive aquatic plants in the Pogue or elsewhere in the park.

Invasive Species Management

Through cooperation between park staff, Student Conservation Association (SCA) interns, Redstart Forestry, and George Perkins Marsh interns, 22 invasive species (including some target list species) were managed in 2013. Six invasive plant species were heavily targeted in Stand 5 including Japanese and common barberry, common buckthorn, exotic bush honeysuckle, autumn olive and black swallow-wort. The compost area saw some invasive management activity on burdock, common buckthorn and Dutchman's pipe. As a potential penetration point for incoming invasive seeds and vegetation fragments, the compost area needs ongoing surveillance for new invasives. There were a few new species being managed in 2013 that are currently at low levels, including wild parsnip, Cypress spurge and European ginger. Cypress spurge should be monitored closely in the future because of its high invasive potential in the northeast. Redstart Forestry conducted additional invasive plant management work within the park, focusing on European alder, oriental bittersweet, garlic mustard, black swallow-wort, and chemical treatment of invasive plants on abutting properties.

More Information

Contacts and Websites

Jesse Wheeler
Project Lead Scientist

Phone/ E-mail
207-288-8722
jesse_wheeler@nps.gov

Brian Mitchell
NETN Program Manager

Phone/E-mail
802-457-3368 ext. 37
brian_mitchell@nps.gov

Marsh-Billings-Rockefeller NHP Invasives Field Guide:

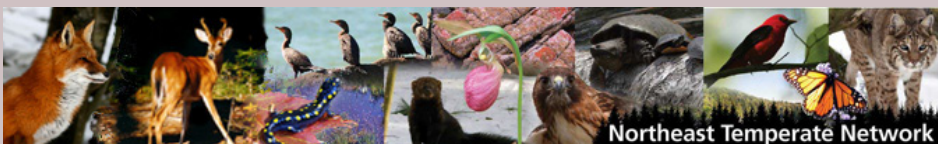
http://science.nature.nps.gov/im/units/netn/monitor/programs/invasiveSpecies/earlydetection_guides.cfm

Full Report online at:

<http://irmafiles.nps.gov/reference/holding/493069>



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



Northeast Temperate Network