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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 an alien species that causes 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. 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 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

SPOTTED KNAPWEED [*Centaurea stoebe* L. ssp. *micranthos* (Gugler) Hayek] CESTM



Problem: Native to Europe, spotted knapweed (SK) readily colonizes disturbed soils.^{1,2,3} Once it is established SK slowly begins to move into nearby undisturbed areas.¹ SK decrease local plant diversity through competition and by exuding an allelopathic compound from its roots to disrupt the growth of neighboring plants.¹ The roots contribute to erosion as a result of their poor soil holding capabilities.^{1,2}
Habit: Erect, shade intolerant, biennial or short-lived perennial (Fig. 2).^{1,3}

Reproduction: Prolific seeder.^{1,3} Seeds commonly stick to animals and vehicles, and can be dispersed by wind.¹

Leaves: The seedling produces a basal rosette of deeply lobed leaves which are deeply lobed, petiolate and approximately 10-20 cm long (Fig. 4).^{1,2} On full grown plants, leaves are alternate and narrowly pinnatifid, being larger near the base of the stem and smaller near the top (10-20 cm x 3 cm and < 1 cm long respectively) (Fig. 3).¹



A look at the spotted knapweed early detection field guide card for Minute Man NHP.

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.

WANTED

AT MINUTE MAN NHP

SIREX WOODWASP

In its native range, spanning from Europe and northern Africa to Mongolia and southern Russia, the Sirex woodwasp is generally considered a minor pest. In other parts of the world where it has been introduced and since spread, it is a major pest and has caused great damage to forests in places like New Zealand, Australia, South Africa and South America. It was relatively recently detected in New York in 2004, which was the first North American discovery of what is considered to be one of the top 10 most serious forest insect pest invaders worldwide. The species feeds primarily on pines, including jack, eastern white, red, Scots, and Austrian pines. It also infrequently attacks spruce, larch, fir and Douglas fir. It prefers stressed trees, but can kill apparently healthy trees as well. The female Sirex woodwasp injects a toxic mucus and fungus into the bark of susceptible pine trees while she is laying her eggs. The mucus quickly kills tree cells from the egg-laying site upwards. The fungus feeds on the killed wood, and the insect larva then feed on the fungus. As they grow, the larvae bore galleries deep into and throughout the wood. This is unlike bark beetles, which typically confine themselves to the cambium layer, just under the bark. This makes them more difficult to detect and eliminate. The affected tree species are often used to make solid wood packing material, and since the insects life cycle can take a year or more, it is easily transported in pallets or other wood packing material. Based on its native range in Europe and Asia, it could establish itself in any climatic zone of North America where pine occurs. Infestations have been documented causing up to 80% tree mortality. It has no known, native natural controls.



Results and Findings

Early Detections

There was one target species detection in the park during 2012. For the second visit in a row (2010 was the first), the NETN forest health monitoring crew observed a few eastern hemlock trees infested with hemlock woolly adelgid (HWA). The 2012 observations were on the east side of the John Nelson house, west of the visitor center parking lot. Unfortunately, HWA appears to be well established in the park and may require substantial treatment efforts if managing this pest is desired within park boundaries.

Invasive Species Target List Review

Two species were removed from the target list: hemlock woolly adelgid and Japanese knotweed. As noted earlier, hemlock woolly adelgid now appears to be well-established in the park. Japanese knotweed, however, has had significant populations managed in the park in recent years. A new candidate species was added to the target list, perennial pepperweed, which is capable of invading natural ecosystems in riparian areas and other wetlands. It is known to be spreading within Middlesex county and has a high invasive ranking from NatureServe. The stream alga species, didymo (also known by the endearing term "rock snot") was added to the aquatic invasive list for 2013.

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

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Full Report online at:

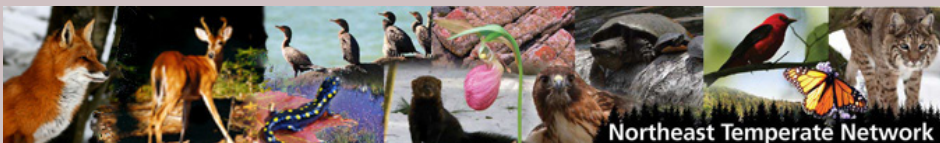
<https://irma.nps.gov/App/Reference/Profile/2194335>

"What's Invasive?" Website

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