Invasive Species survey of Six Mile Island State Nature Preserve

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Abstract

Six Mile Island is an 81 acre uninhabited island belonging to the Kentucky State Nature Preserves Commission. The most recent species list dates from 1985. In fall 2012, an invasive plant species survey was conducted. The purpose of the survey was to compare the old and current invasive species lists. The results show that two of the four invasive species recorded in 1985 are still present on the island and a new invasive species has become established on the north end of the island.

Introduction

Invasive species, on their properties, are of major concern to the Kentucky State Nature Preserves Commission. Invasives out-compete native species for resources and cause negative ecological impacts (Abernathy, et al. 2010; Packham & Harding, 1982). One of the most invasive plant species in Kentucky is the Bush Honeysuckle *Lonicera maackii*. Bush Honeysuckle grows at a rapid rate, producing a dense shrub layer, which decreases available natural light and shades out native plant species. It also depletes soil nutrients and is thought to alter soil's pH – reducing native plant growth (Hutchinson & Vankat, 1997).

Six Mile Island is a river island which is part of the Kentucky State Nature Preserves Commission (KSNPC). The 81 acre island was dedicated to KSNPC on June 24, 1979 and has

been protected to allow its return to its original natural state. A vascular plant species list was developed in 1985. The species list contains four commonly known invasive vegetation species, *Lonicera maackii, Alliaria officionalis, Morus alba,* and *Rosa multiflora.* In fall 2012, an invasive species survey was conducted on Six Mile Island. The objective of the study was to survey the island for the four previously known invasive plant species (see species list ca. 1985).

Methods

Six Mile Island, approximately 25 hectares in size, was delineated by tracing the island from satellite imagery using Google Earth. The map was imported into the computer program ArcGIS to randomly generate 51 survey points; approximately 1 point per every 2 hectares. A Garmin eTrex 10 handheld GPS was used to navigate to the survey points. We surveyed the island between October and November 2012. We recorded the presence of invasive species and the number of each species within a three meter radius of the survey point. The area of each survey point was 28.26 m^2. Invasive species that were 12 inches or taller were recorded. It was too difficult to survey plants less than 12 inches tall. The invasive plants and trees were identified using a handheld Sibley's Tree and Shrub Guide.

Results

A total of 44 points were accessible on the island and were successfully surveyed. Several points were either dangerously close to an eroded bank or located too close to or in the water. The invasive species that were present on the island include Bush Honeysuckle (*Lonicera japonica*), White Mulberry (*Morus alba*), and Japanese Knotweed (*Polygonum cuspidatum*). Bush Honeysuckle was observed in nine locations and was present in small but dense populations. The bushes were observed on the southeast side and mostly growing on the edges

and banks of the island, some directly on the water edge. The bushes in these locations were mature adults and growing out and away from the canopy of trees. The density of Bush Honeysuckle on the island is calculated as 3539 plants/hectare. The estimated abundance of Bush Honeysuckle on the island is 88,475 plants.

White Mulberry trees were only observed growing in three locations. The trees were all mature adults, reaching approximately 25-35 ft. in height and widely spread apart between their locations. At two of the three locations the trees appeared unhealthy due to being out shaded by the canopy trees. The total density measurement for White Mulberry is determined to be 354 trees/hectare. Estimated abundance for White Mulberry trees on the island is 8,850 total trees.

We recorded a new invasive species established on Six Mile Island, Japanese Knotweed (*Polygonum cuspidatum).* The species was well established only on the north end of the island and observed at two locations but had a larger distribution than indicated by our two survey points. The Knotweed plants on the island were over 6 foot tall and a dense monoculture. The methodology to calculate density and estimated abundance was not applicable to this species due to the dense thickets which were too numerous with stalks to count.

● Bush Honeysuckle ■ Japanese Knotweed △ White Mulberry

Discussion

Two invasive species were not observed which may be the result of the survey timing. Garlic Mustard (*Alliaria officionalis*) and Multiflora rose (*Rosa multiflora*) both flower in the spring and are more difficult to identify in the fall.

Compared to other KSNPC studies the density of invasive plant species on Six Mile Island are not in high measurements. It seems that most of the invasive plant species observed on the island are growing in localized areas. Of the plants which were observed, Bush Honeysuckle has the highest calculated density on the island but Japanese Knotweed showed the most habitat

destruction to the island's interior forest. It is unknown how long it has taken the Knotweed population to grow to its current size however with its ability to rapidly colonize it should be monitored closely. According to the Plant Conservation Alliance, "It poses a significant threat to riparian areas, where it can survive severe floods and is able to rapidly colonize scoured shores and islands. Once established, populations are extremely persistent".

To continue to monitor the invasive species with different flowering seasons future surveys should be conducted in the spring and summer months. Another valuable study to the island would be to examine the seed bank of the islands plant species. This can be done by clear cutting an area of land (ex. 1 hectare) to observe the regrowth of plants. This regrowth would indicate the generation of a seed bank which could lead to the regrowth of additional species not currently observed or the regrowth of a higher density of invasive plants.

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