Negative Effects of Invasive Plant Species in Prospect Park on the General Native Plant, Insect, and Animal Species

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Abstract

Located in Brooklyn, New York, Prospect Park spans 526 acres. We examined four of the most invasive plant species and the affected native species in Prospect Park. We focused on each plant's role and how the ecosystem is affected from the prevalence of invasive plant species. We also analyzed an in-progress solution issued by Prospect Park in recent years to target these invasive species.

Introduction

Within parks in the United States, many invasive species have found a home and contributed negatively to the ecosystem within the park. This has been combated in previous years by replanting - but the effects of these plants are long lasting.

- Invasive plant species are capable of wiping out native plant species that contribute to the biodiversity of the ecosystem in a green location
- Animals and insects that live within an ecosystem are also greatly affected by the decline in native plant concentrations, which they rely on for food and shelter

Methods

We chose to perform a qualitative and observational analysis of the populations of the most common invasive plant species in Prospect Park and analyze their effects on the most common native plant and animal species in the area.

Threatened Native Species

Common Trees (Maple, Oak, Pine, etc) with Bird Populations

- The increase of lanternfly hosts are causing the physical degradation of trees in the area [4]
- Amur honeysuckle tendency to form dense clusters of dead stems causes tree seedlings to have a 41% lower richness in tested areas [3]
- Threatened bird population relocated, lack of shelter when their current homes are affected

Marsh Animals (Duck, Turtle, Fish species): Phragmites causes an ecosystem to become monoculture, which creates an environment devoid of nutrients for necessary marsh vegetation to grow and feed animal populations

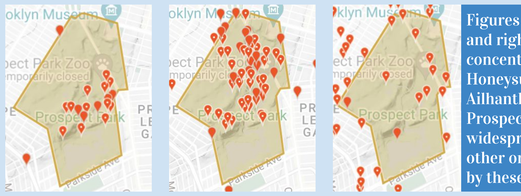
Invasive Plant Species Prevalence

Amur Honeysuckle(Lonicera maackii) - originates from Eastern Asia and is notorious for its formation of dense thickets [5]

Goutweed(Aegopodium podagraria) - Native to Europe and Asia, it is a perennial plant that spreads via rhizomes to form thick mats that overtake shaded areas like forests [5]

Common Reed(Phragmites australis) - the European strain forms dense stands that compete with native marshland vegetation

Ailhanthus Altissima - Also known as tree of heaven, this plant generates excessive pollen and is the main host of the spotted lanternfly



Figures 1, 2, 3: The left, middle and right pictures show the concentrations of Amur Honeysuckle, Goutweed, and Ailhanthus Altissima in Prospect Park. These are widespread locations where other organisms lie threatened by these invasive spreads. [5]

Environmental Impacts and Solutions

Fig. 4 solarization (2023), Mary Keehbauch

Competition of invasive plants

- Invasive plants will harm native plants for resources.
- Can become aggressive and grow at a faster rate in unmaintained areas, pushing out native plant species and quick to disrupt an ecosystem and must be carefully removed. [2]

Prospect park invasive species

- Amur Honeysuckle (*Lonicera maackii*), Goutweed (*Aegopodium podagraria*), Common Reed (*Phragmites australis*), and Alihanthus Altissima spread quickly and form dense clusters that can outcompete and eventually replace the park's native plants if not removed.

Solar innovations

- In order to combat the fast spreading of invasive plants, a new environmentally friendly and innovative technique was created, called solarization.
- Keeps the park's landscape healthy and resilient with strategically placed sheets of plastic. [6] (see Fig.1)

Conclusion

Figures 5: Map of threatened species within Prospect Park - noticeable conglomeration of species south, where invasive species are less common [5]

We found that the prevalence of invasive plant species in Prospect Park has the potential to disrupt and even destroy the ecosystem if not maintained. Prospect Park keeps invasive plants from affecting the area by employing a environmentally friendly and innovative technique called solarization (see Fig.1). This slows down the growth of invasive plants and over a period of time will eliminate them.

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