



Artist Lake Inventory and Evaluation

Introduction

The following are the findings of the Suffolk County Soil and Water Conservation District's site visits to Artist Lake. The site visits were conducted from May to August of 2019. The site visits were conducted upon special request from Suffolk County Legislator Calarco of the 7th Legislative District to evaluate current environmental issues regarding the condition of the lake. Areas of the shoreline that are accessible to the public were inspected, which was primarily the boat launch on middle country road. Much of the southern and eastern shorelines are owned either by apartment complexes or private residences. The western shoreline is mostly wooded areas, which may likely serve as important habitats for birds, mammals, and insects. The lake water itself was tested at six locations to characterize the lake (see attached map of Artist Lake). Water quality samples were collected for turbidity, conductivity, temperature, and total dissolved solids (TDS). Additional sources and documents were also gathered, including DEC and USGS data from past studies conducted at Artist Lake.

Concerns

Eutrophication

The primary concern for the aesthetic and recreational uses of Artist Lake is eutrophication; a decline in water quality caused by pollution of nutrients, typically either nitrogen or phosphorus, into a waterway. eutrophication causes cloudy, muddy water that can also have a foul odor. In extreme cases, eutrophication can lead to fish kills and other loss of habitat due to insufficient dissolved oxygen.

What is Eutrophication? Eutrophication is a decline in water quality caused by nutrient pollution. Increased sources of nutrients into waterways provide resources for algae and phytoplankton to bloom, which decreases water clarity and blocks sunlight from reaching submerged plants. This causes submerged plants to die and disrupts the ecosystem. Submerged plants provide dissolved oxygen for fish and other organisms, their population decline eliminates a major source of oxygen for the ecosystem.. This leads to a condition called hypoxia; where no oxygen is present in the water that causes fish and other organisms suffocate.

Invasive Species

Invasive species are a major concern due to competition with native species for resources. Unmanaged invasive species will often out-compete native species, causing a decline in native populations and disrupting the balance of the ecosystem.

The following invasive species were observed at Artist Lake:

- 1.) Common Carp
- 2.) Mugwort
- 3.) Common Reed
- 4.) Tree-of-Heaven
- 5.) Oriental Bittersweet
- 6.) Fanwort

Of these species, Common Carp, Mugwort, Oriental Bittersweet, and Common Reed pose the most significant risk to the health of the lake and its shorelines.

Common Carp

Common Carp is an omnivorous fish native to Europe and Asia. It was first introduced to the Midwest as a game fish in the 1880's. It's often introduced to systems when used as live bait and discarded by anglers. Common Carp is a large omnivore, and is tolerant of degraded water quality conditions, such as pollutants and low dissolved oxygen. It commonly inhabits lakes, ponds, and the lower sections of rivers. It is also tolerant of brackish waters and inhabits marine ecosystems such as estuaries and bays. Common Carp feed aggressively, which tends to disturb benthic sediments and increase water turbidity that contributes to poor water quality. Common Carp tends to uproot submerged aquatic vegetation when feeding, which also furthers the problem of dissolved oxygen cycling and contributes to eutrophication.

Sources:

<https://nas.er.usgs.gov/queries/factsheet.aspx?speciesID=4>

<https://www.dnr.state.mn.us/invasives/aquaticanimals/commoncarp/index.html>

<https://www.dec.ny.gov/animals/94433.html>

Mugwort

Mugwort is a perennial that flowers in late summer/early autumn. It produces seeds approx. 1mm in diameter, which can stick to tires, mowers, and equipment. It is therefore commonly found along roadsides and other corridors. Nursery stocks of grasses and ornamental plants are also easily contaminated with root fragments and transported/spread to new locations. Mugwort can spread through rhizome (root) systems and out-compete native plants. Mugwort forms dense stands that exclude native species. Plants that are pulled as a means of removal can regenerate from remaining root fragments as small as 2cm, making it difficult to eradicate from a system. Mugwort was observed around the park and boat launch that provide the only public access point to Artist Lake as well as a opportunity for the further spread of the organism.

Sources:

<https://nystateparks.blog/2018/07/12/invasive-species-spotlight-mugwort/>

http://nyis.info/invasive_species/mugwort-draft/

Common Reed

Non-native Common Reed is a tall perennial that grows from 3 to 15 feet and forms dense stands of living and dead stems. Like mugwort, it can grow from underground root networks called "rhizomes" and displace native species. Common Reed grows in wetlands and thrives in disturbed soils, including ditches and roadsides. Invasive Common Reed stands are present in two locations in Artist Lake; one in the corner of the lake near Picasso Way, and one near Middle Country Road in the Western basin of the lake. The spread of either of these stands could threaten nearby native species. Common Reed stands present at the corner of Artist Lake near Middle Country Road and Picasso Way. It is important to note how the dense growth is excluding other plant species from thriving.

Sources: http://nyis.info/invasive_species/common-reed/

http://adkinvasives.com/species_of_concern/common-reed-grass/

Tree-of-Heaven

Tree of heaven is an invasive tree that often grows in dense colonies and can spread through its roots. Tree-of-heaven produces harmful chemicals in its leaves, roots, and bark, which prevent the growth of other plants nearby. Tree of heaven is completely intolerant of shade, so it primarily grows in open areas, such as roadsides, woodland edges, railways, fencerows, and disturbed areas. Like mugwort and common reed, Tree-of-Heaven can spread through root systems and form dense stands, which exclude native species. Tree-of-Heaven was observed around the park on Middle Country Road where the boat launch is located, as well as in other locations near Artist Lake along Middle Country Road. Many young shoots were observed, which are likely connected by the same root system. Note the quantity of young shoots all growing in the same location. They are likely connected by the same root system growing out from a “parent” tree. Tree-of-Heaven has a fast growth rate, and these trees are likely to out-compete native species present if they’re not removed.

Sources:

<https://www.ecolandscaping.org/05/invasive-plants/tree-of-heaven-an-exotic-invasive-plant-factsheet/>

https://www.thestar.com/news/gta/2010/07/15/the_heavenly_tree_with_a_seedy_side.html

https://www.oregonlive.com/hg/2014/11/invasive_tree-of-heaven.html

Oriental Bittersweet

Oriental Bittersweet is a perennial, deciduous vine that blooms from May to early June. It was first introduced to the United States in the 1860s as a decorative plant and for erosion control purposes. Oriental Bittersweet is a vine that grows on tall plants and smothers them as it grows. It can eventually uproot trees due to its weight. Oriental Bittersweet was observed growing among other vegetation near the boat launch on Middle Country Road. It was also observed along Middle Country Road near Picasso way, where it can be seen smothering other plant species. Oriental Bittersweet can be seen in Artist Lake along Middle Country Road choking out other plants. This will lead to a loss of native species unless it is removed.

Sources:

<http://ulster.cce.cornell.edu/environment/invasive-plants/oriental-bittersweet>

http://adkinvasives.com/species_of_concern/oriental-bittersweet/

Fanwort

Fanwort is a fully submerged plant with the exception of occasional floating leaves and emergent flowers. Parts of the plant can survive free-floating for 6-8 weeks. Fanwort is a perennial and grows from rhizomes with fibrous roots. Fanwort stems become brittle and break easily in late summer, facilitating its distribution. It is native to the southern states and is often shipped out from Florida for commercial use. Fanwort is an important aquarium plant and aquarists (aquarium release or escape) may be responsible for some introductions. Fanwort can be an aggressive weed and like other invasive species, it competes with and excludes native species. Due to the fact that vegetation from this species breaks easily in late summer, decaying vegetation can contribute to the seasonally eutrophic condition of Artist Lake

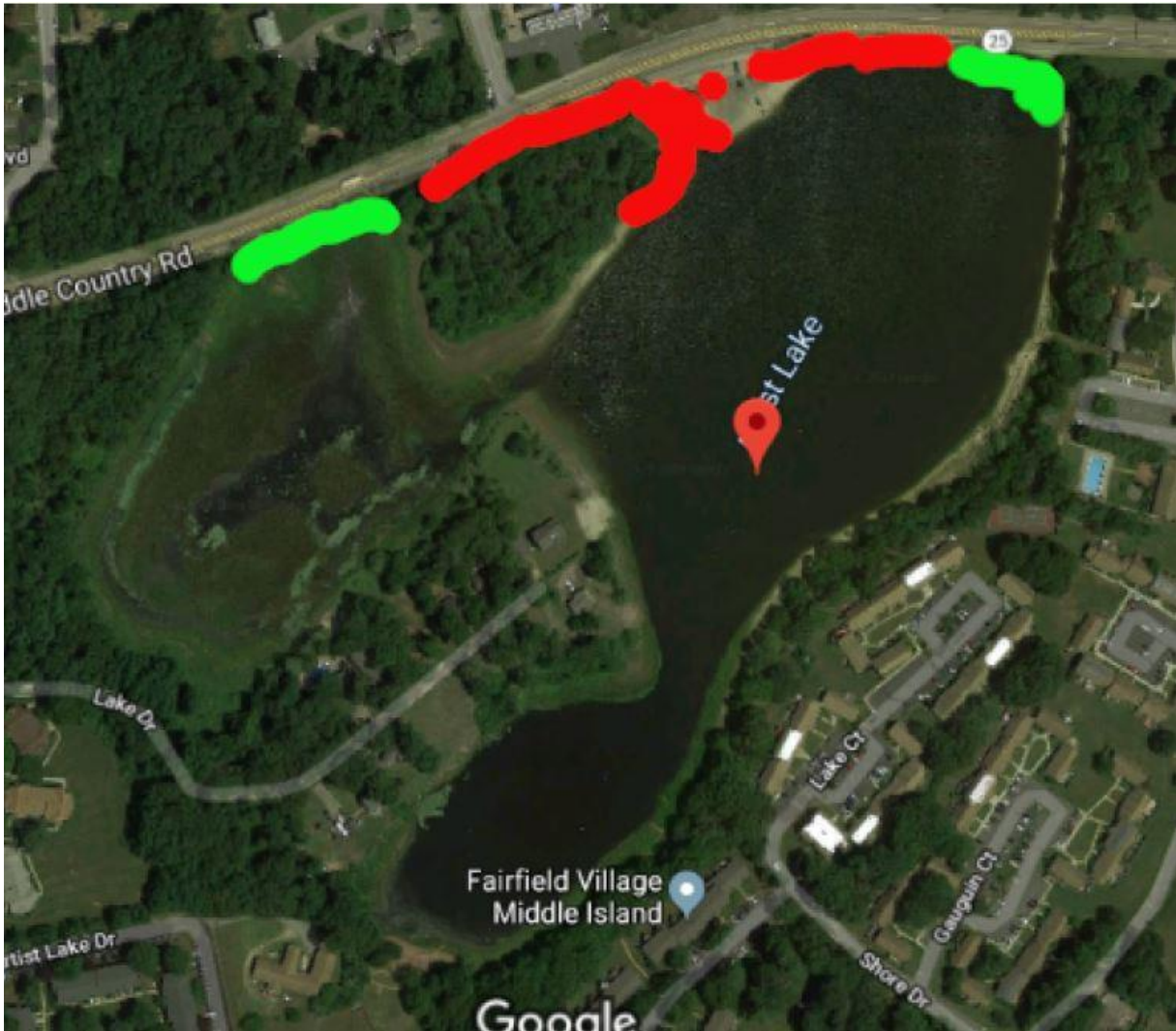
Source: <https://nas.er.usgs.gov/queries/FactSheet.aspx?SpeciesID=231>

Recommendations

Removal of Invasive Species

It is recommended that the invasive species found and listed above be removed and replaced with native species. The methods used to remove invasive species must be specific to the biology of each invader in order to be effective. Native plants should promptly be planted in place of the invasive species removed to prevent reestablishment of the invasive species. Continuous monitoring is also recommended to be sure that invasive plants do not re-emerge. It should also be considered that different methods of removal may vary in effectiveness, and some may come with unintended consequences. Each method of removal should be carefully considered. Planting Buffer Strips of desired vegetation should be planted and maintained along most of the shoreline of Artist Lake. The primary detriment to water quality in Artist Lake is pollutants conveyed by stormwater runoff that enters the lake. Buffer strips along the shoreline may help filter the stormwater that enters the lake and reduce the amount of nutrients it brings.

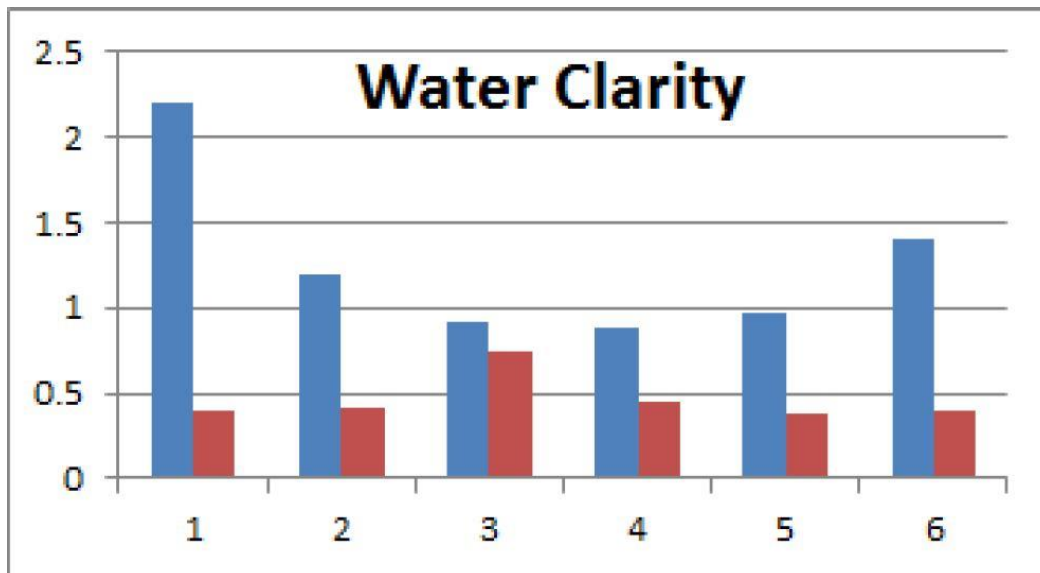
Attached are several documents with additional information regarding Artist Lake, as well as some information on invasive species management. If you have any questions about this report, or are looking for more information as conservation efforts move forward, please contact the Suffolk County Soil and Water Conservation District Office.



Key: Red = Areas of Concern regarding Mugwort, Tree-of-Heaven, and Oriental Bittersweet. Yellow = Locations of Common Reed stands.

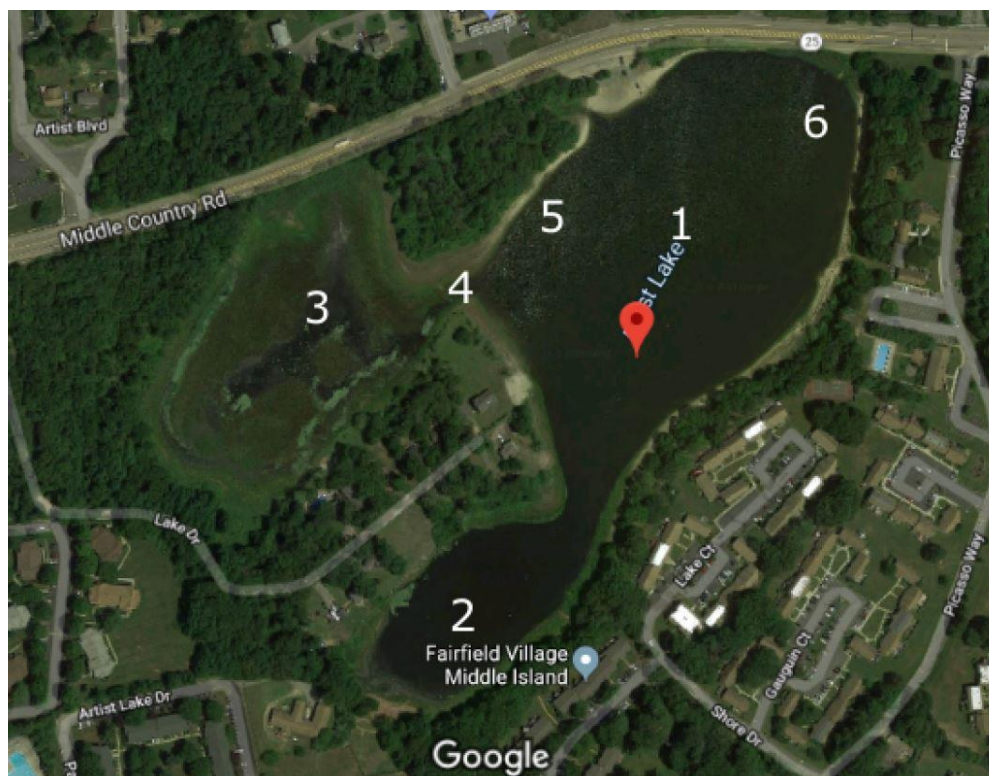
Note: This map shows the locations of invasive species observed by district staff. These locations may not be the full range of invasive species present at Artist Lake.

Material B
Water Quality Data and Sampling Map



Blue = Data collected on 7/3/2019, Red = Data collected on 7/26/2019. As summer continues water clarity decreases. This is one quality of seasonal eutrophication. The decrease in water clarity blocks sunlight from reaching submerged plants and disrupts the ecological balance of the lake.

Water quality sampling locations:



Integrated Pest Management for Woody Invasive Plants

New Hampshire
Department of Agriculture,
Markets & Food
Douglas Cygan
603-271-3488
doug.cygan@agr.nh.gov

| Integrated Pest Management Practices | Action | Description | Timing | Advantages | Disadvantages |
|--------------------------------------|--|--|---|---|--|
| Mechanical | <u>Repeated Cutting / Mowing</u> | Cutting or mowing seedlings, saplings or sucker sprouts during routine lawn maintenance or at least 4 times during a growing season. | Spring, summer, fall | Very effective if done on a routine basis. | Stems may be too large to mow. Cut stems can be sharp and may pose a safety issue. |
| | <u>Hand Pulling</u> | Up to 1/2" diameter seedlings, which typically have small rooting systems. Most invasive woody plants occurring woodland setting typically pull easier than those occurring in the open, even those with 3/8" caliper. | Pulling is easiest in the spring or fall after a rain event when the ground tends to be wetter making it easier to remove the roots. Pulling can also be done in the summer, but may be slightly more difficult if soils are dry. | Where plants are sparse it can be the most expedient and environmentally friendly course of action. | Pulling is not practical on large heavily colonized sites. |
| | <u>Flame Treatment</u> Generally NOT recommended , but has been effective on seedlings | Using a propane flame thrower/torch burning every year or every other year in established stands may be required for 5-6 years or more | Late March to early May or in the fall and done only when it's raining and the ground is wet to prevent fires from forming. | Effective at controlling seedlings or small saplings. | If not done properly when the environment isn't sufficiently damp/wet, fire can escape. Propane is a very costly fuel. |
| | <u>Cutting at the base</u> | For stems greater than 1 1/2" diameter use a hand saw or chainsaw and cut the stem at the base close to ground level to inhibit sucker sprouts from forming. | Anytime, but generally the efficacy increases if done in the late fall through late winter. | Cutting large shrubs at the base allows the plant material to be removed from the landscape allowing native or alternative species to regenerate. | Stumps may resprout profusely. Resprouting stumps can also be treated with foliar sprays applied after a month of regrowth has formed. |
| | <u>Weed Wrench or Forked Spade</u> | Up to 1 1/2" diameter saplings. | Spring, summer, fall | Effective at pulling small to medium sized woody plants from most sites. | The tool is somewhat heavy and cumbersome to move over long distances. Requires two or more attempts to remove some plant/roots. |
| | <u>Smothering</u> <u>Interplanting</u> | Create shaded environments by planting trees or large shrubs within the invaded site to reduce available sunlight exposure to invasives. | Spring, summer, fall | Maintains wildlife habitat characteristics of site. | Requires an investment in time and money to establish a dense overstory. |
| Cultural | | | | | |

Common Carp

Background

Common Carp is an omnivorous fish native to Europe and Asia. It was introduced to the midwest as a game fish in the 1880's. It's often reintroduced when used as live bait and discarded.

Species Profile

Common Carp is a large omnivore, and is tolerant of degraded conditions. It inhabits lakes, ponds, and the lower sections of rivers. It is also tolerant of brackish waters and can inhabit estuaries and bays.

In its larval stage, it feeds primarily on zooplankton. In juvenile and adult stages, it feeds on detritus, small crustaceans, and gastropods.

Notable Properties

- Feeds aggressively, which tends to disturb sediments and increase water turbidity
- Often uproots submerged aquatic vegetation when feeding
- Tolerant of degraded conditions

Habitat

Freshwater lakes, ponds, and rivers, can also be found in bays and estuaries.

Impacts

Aggressive feeding behavior can decrease water clarity and worsen eutrophic conditions. Their feeding behavior can also uproot submerged plants that are important habitats for native fish.

Relevance to Artist Lake

Common Carp is present in Artist Lake, according to the New York State Department of Environmental Conservation. The impact that Common Carp can have on water quality is likely to worsen the already eutrophic condition of the lake.

Sources

<https://nas.er.usgs.gov/queries/factsheet.aspx?speciesID=4>

<https://www.dnr.state.mn.us/invasives/aquaticanimals/commoncarp/index.html>

<https://www.dec.ny.gov/animals/94433.html>

Common Reed

Background

There are native and invasive strains of Common Reed present in New York. The invasive strain, *Phragmites australis*, was accidentally introduced from Europe in the 18th or 19th century. The invasive Common Reed is now the most common strain in New York.

Species Profile

Non-native Common Reed grows in dense stands of living and dead stems. It is a tall perennial that grows from 3 to 15 feet. It can grow from underground networks called "rhizomes" and displaces native species.

Habitat

Common Reed grows in wetlands and thrives in disturbed soils, including ditches and roadsides.

Notable Properties

- Salt tolerant
- Spreads through rhizomes

Impacts

- Displaces Native Species

Relevance to Artist Lake

Invasive Common Reed stands are present in two locations in Artist Lake; one in the corner of the lake near Picasso Way, and one near Middle Country Road in the Western basin of the lake. The spread of either of these stands could threaten nearby native species.

Sources

http://nyis.info/invasive_species/common-reed/

http://adkinvasives.com/species_of_concern/common-reed-grass/

Fanwort

Background

Fanwort stems become brittle and break easily in late summer, facilitating its distribution. It is native to the southern states and is often shipped out from Florida for commercial use. Fanwort is an important aquarium plant and aquarists (aquarium release or escape) may be responsible for some introductions.

Species Profile

Fanwort is a fully submerged plant with the exception of occasional floating leaves and emergent flowers. Parts of the plant can survive free-floating for 6-8 weeks. Fanwort is a perennial and grows from rhizomes with fibrous roots.

Underwater leaves are divided into fine branches, creating a fan-like appearance. Leaves are 5cm across and secrete a mucus which covers the submerged part of the plant. The floating leaves are small, diamond shaped, and grow from flowering branches. The flowers are less than 2cm across and are white to pale yellow possibly with a pink or purplish tinge.

Notable Properties

- Sensitive to drying out
- Prefers silty substrates over harder substrates
- Can grow well in turbid water
- Prefers low pH
- High calcium inhibits growth

Locations

Slow moving or stagnant water: Lakes, slow streams, canals, ditches, reservoirs, etc.

Impacts

- Can be an aggressive weed
- Excludes native plants
- When vegetation dies, the decomposition can cause hypoxia and foul smelling water

Relevance to Artist Lake

A 2009 water quality summary by the DEC reported that fanwort was one of the two dominant submergent species found at Artist Lake. The potential impacts of fanwort are therefore likely to be of significant interest to the ecological condition of Artist Lake. Considering the potential that dead fanwort vegetation has to worsen eutrophication, it is in the best interest of those who wish to fish in Artist Lake that the fanwort be removed and controlled. Dead vegetation should be removed and disposed of promptly for the duration of the summer.

Sources

[USGS - Nonindigenous Aquatic Species](#)

Mugwort

Background

Mugwort is an invasive plant native to Europe and Asia, where it had medical and culinary uses, and creates a pungent odor when crushed. It was originally introduced to North America through the Ballasts of ships.

Species Profile

Mugwort is a perennial that flowers in late summer/early autumn. It produces seeds about 1mm in diameter, which can stick to tires, mowers, and equipment. It is therefore common along roadsides. Nursery stocks of grasses and ornamental plants are also easily contaminated with root fragments and carried to new locations. Mugwort can spread through rhizome (root) systems and outcompete native plants.

Notable Properties

- Plants can regenerate from root fragments as small as 2cm
- Seeds are small and wind dispersed, though populations mostly spread through vegetative expansion
- Root system is extensive but shallow (20cm in depth)

Typical Locations

Found in nurseries, turfgrass, vineyards, waste areas, forest edges, and roadsides.

Impacts

- Mugwort displaces mainly native plants that thrive in sunny, open areas.
- Mugwort produces allelochemicals, and decaying mugwort stands have prevented the growth of red clover in laboratory experiments
- Mugwort pollen is a common cause of hay fever

Relevance to Artist Lake

Mugwort is very common around the park and boat launch that give public access to Artist Lake. It appears to be spreading toward the water in one area and existing stands among other plants appear to be in the process of excluding native plants.

Sources

[New York State Parks and Historical Sites](#)

[New York Invasive Species Information](#)

Oriental Bittersweet

Background

Oriental Bittersweet was first introduced to the United States in the 1860s as a decorative plant and for erosion control. It's a vine that grows on tall plants and smothers them as it grows. It can eventually uproot trees due to its weight.

Species Profile

Oriental Bittersweet is a perennial, deciduous vine that blooms from May to early June. It's a troublesome invasive vine that can choke out many plants where it grows. It grows best in the sun but is tolerant of shade.

Notable Properties

- Shade tolerant
- Able to eventually uproot trees due to its weight

Impact

- Chokes out trees and other plants, displacing native species

Relevance to Artist Lake

Oriental Bittersweet is growing in several locations on the North side of Artist Lake. It is clearly in the process of choking out several native species and dominating the area.

Sources

<http://ulster.cce.cornell.edu/environment/invasive-plants/oriental-bittersweet>

http://adkinvasives.com/species_of_concern/oriental-bittersweet/

Tree-of-Heaven

Background

Tree-of-heaven was introduced to the United States around Philadelphia in 1784. There, it sparked the interest of horticulturalists as a shade and ornamental tree. It was desired in towns and cities for its ability to grow in poor conditions. Another introduction occurred in 1820 in Flushing, Long Island. The Tree was desired for gardening and shade, though it later fell out of favor due to its odor and weedy nature.

Species Profile

Tree-of-heaven gets its name from its ability to grow rapidly toward the sky. It is dioecious, meaning that individual trees are either male or female. It often grows in dense colonies and can spread through its roots. Seeds are wind dispersed. Tree-of-heaven produces allelopathic chemicals in its leaves, roots, and bark, which prevents the growth of other plants nearby. Tree-of-heaven is intolerant of shade.

Notable Properties

- Allelopathic chemicals prevent competition with other plants and can help Tree-of-heaven exclude native plants
- Leaves and flowers of male plants can produce an undesirable odor
- Can spread through roots

Typical Locations

Roadsides, woodland edges, railways, fencerows, and disturbed areas

- Completely shade intolerant

Impacts

- Allelopathic chemicals can exclude native species
- Competes well in full sun, has a rapid growth rate, and can competitively exclude native species in full sun
- Foul odor

Relevance to Artist Lake

Tree-of-Heaven is common around Artist Lake. Male trees may produce a foul odor while flowering. The rapid growth rate and allelopathic properties of Tree-of-heaven may cause it to competitively exclude native species. The tree is shade intolerant so it is most common along roadsides and possibly some open areas around Artist Lake. Many young shoots and saplings are growing among other plants and will likely shade out native plants if they're not removed.

Sources

<https://www.ecolandscaping.org/05/invasive-plants/tree-of-heaven-an-exotic-invasive-plant-fact-sheet/>

https://www.thestar.com/news/gta/2010/07/15/the_heavenly_tree_with_a_seedy_side.html

https://www.oregonlive.com/hq/2014/11/invasive_tree-of-heaven.html