Madeleine DeManche
5/17/10
Hudson Crossing Park Invasive Species Management Plan

Bush Honeysuckle (*Lonicera spp.*)

Natural History of Bush Honeysuckle:

Bush honeysuckle is native to Eurasia. There are multiple species that make up bush honeysuckles including *Lonicera maackii*, *L. tatarica*, *L. morrowii*, and *L. x bella* (a hybrid of *L. tatarica* and *L. morrowii*). These species were introduced to the U.S. as ornamentals and to aid in soil erosion. Bush honeysuckles are shrubs that grow from 6-15 feet tall. All species have opposite leaves, paired berries and hollow branchlets. All species also have paired tubular flowers that can range in color from white to red depending on the species.

Bush honeysuckle ranges from the central Great Plains to New England and south to Tennessee and North Carolina. These species are mostly shade-intolerant so their optimal habitat is on forest edges, disturbed areas and open wetlands. Bush honeysuckle is spread by birds and mammals eating the berries honeysuckles produce every fall.

Bush honeysuckles are a problem because they are effectively outcompeting and reducing native vegetation wherever they grow. It has been hypothesized that bush honeysuckle may produce allelopathic chemicals and reduce the germination and growth of surrounding vegetation. Additionally, bush honeysuckle leaf out earlier than many native species and hold their leaves longer than most native vegetation (until November), which effectively shades out surrounding plants. According to the Invasive Plant Species Assessment Working Group, Asian bush honeysuckle has high ecological impact, high potential for expansion and high difficulty of control.

Past Management Plans and Actions:

A combination of mechanical and chemical methods is the most common and, seemingly, the most effective way to control or eradicate bush honeysuckle. In many cases the bushes are cut (using a hand lopper or handsaw) to the stem as close to the ground as possible and then a solution of 20% glyphosate. Subsequent pulling of seedlings is required for three to five years after cutting and applying glyphosate.

Chemicals can be avoided by using a "smothering" method. To do this you cut the honeysuckle leaving a little bit of the stem exposed then you cover the stem and a three foot buffer around the stem with black, construction grade garbage bags or tarps. The garbage bags can be wrapped around the stem with heavy rope or string and staked around the ground with nails. It is important that none of the plant is exposed to sun. This is usually done at the beginning of the growing season and the plant will eventually (after a couple months) die underneath the garbage bag.

Forest Park in St. Louis had a unique way of dealing with their bush honeysuckle problem. They partnered with the St. Louis Zoo and brought five goats into the forest to browse on the new honeysuckle shoots. The year before, over 16 acres of forest land were cleared of bush honeysuckle; the goats were used to control the honeysuckle regrowth. Goats were effective in this management plan because they preferably feed on woody vegetation and honeysuckle was the only woody vegetation remaining in Forest Park was bush honeysuckle.

Suggested Management Plan for Hudson Crossing Park Pocket Wetland:

Bush honeysuckle, specifically *Lonicera tatarica,* has invaded Hudson Crossing Park. Because the park has many open areas, forest edges, and disturbed edges it is unrealistic to try to eradicate honeysuckle, more would colonize or a different invasive would move in. However, bush honeysuckle could be controlled in certain parts of the park to demonstrate what a pristine environment would look like in the area and to educate visitors about invasive species and eradication. I believe that the Pocket Wetland next to the Play Garden would be a perfect location for honeysuckle management.

I suggest that the first method tried for honeysuckle control be smothering. Because smothering does not employ the use of herbicides, it would be the best method for areas around water (like a wetland). The honeysuckle should be clipped during the growing season leaving about 2 feet of stump. The stump should be completely covered with black garbage bags and left for a few months to die.

If smothering is proven unsuccessful then chemical methods should be used in conjunction with mechanical methods. The shrubs should then be cut twice annually (avoiding winter clippings) and 20% glyphosate (Roundup) can painted directly on the cut stumps. Herbicide should be applied to the stems directly after cutting for it to be most effective. This method should be executed in the late summer and early fall, before the honeysuckle fruits.

There are two options for disposal of the honeysuckle clippings. The plant material can be bagged and left to sit in the sun to dry kill the plant material. Then the bags may be taken to a trash dump. The clippings could also be burned.

It is suggested that monitoring and mechanical pulling of new sprouts of honeysuckle should continue for 3-5 years after the initial control methods. At HCP, because there is an abundance of honeysuckle as close as 10 meters from the Pocket Wetland, monitoring should continue every year. The community can and should be used for yearly pulling and management of honeysuckle. It would be a great opportunity for invasive species education and community conservation.

After eradication, native species should be planted in the newly opened areas to reduce chances of future invasion by weeds.

How to Identify Bush Honeysuckle for Eradication:

The bush honeysuckle found on HCP is mostly *Lonicera tatarica*. Tartarian honeysuckle has ovate, opposite, blue-green leaves. It is multi-stemmed and can grow up to 3 meters. The flowers develop in pairs in the axils of the leaves in May and are tubular with colors ranging from white to pink to red. Bush honeysuckles leaf out before other plants, which is another useful way to identify these species.

Figure 1. *Lonicera tatarica* identification illustration

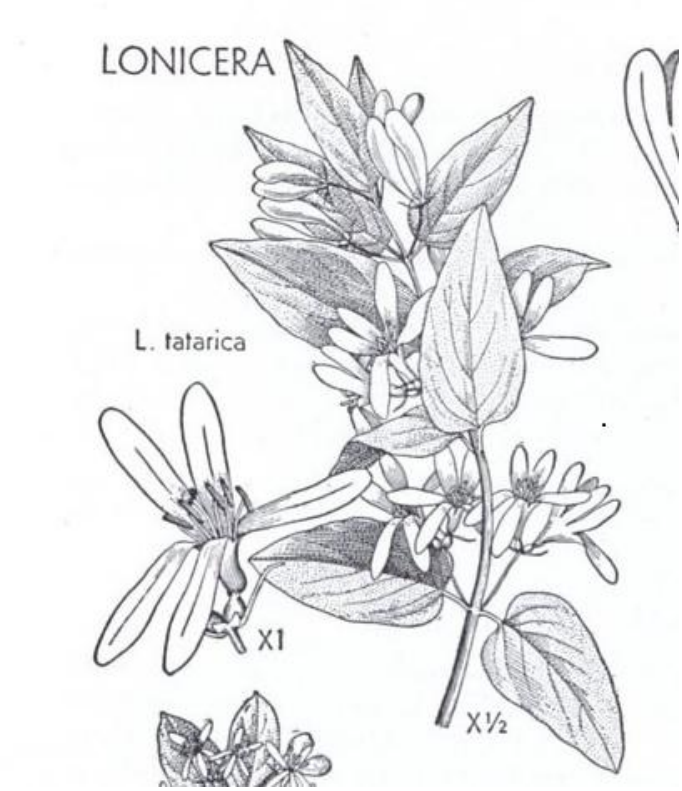

Image by Gleason, 1952.

Figure 2. *Lonicera tatarica* flowering

Photograph by Juliet Kaye

Figure 3. *Lonicera tatarica* fruiting

Photograph by Chris Evans.

Garlic Mustard (*Alliaria petiolata*)

Natural History of Garlic Mustard:

Garlic mustard is native to Eurasia. This species was first discovered in the U.S. in 1868 on Long Island, NY. It is hypothesized that the plant was introduced for food or medicinal purposes.

Garlic mustard has effectively colonized the United States. Garlic mustard ranges from eastern Canada down to Virginia and as far west as Kansas and Nebraska. This species is mostly found habitats with very moist soils such as floodplains and edges of forests. This plant is biennial and in the first year has just a rosette of leaves. The following spring the garlic mustard plant develops flowers, fruits, and dies by late June. Garlic mustard seeds are wind dispersed and have probably developed such a large range with human aid.

Garlic mustard is a problem because it can colonize mature second-growth forest and displace native vegetation. This invasive, unlike most other invasive plants, is shade-tolerant and can thrive in forest understory. Garlic mustard also does not need ecosystem disturbance to establish or proliferate.

Garlic mustard also contains a number of mechanisms and characteristics that help make it a successful competitor to native vegetation. It is hypothesized that the secondary compounds produced in garlic mustard affect the germination and growth of surrounding native plants. Garlic mustard also has no native predators in the U.S. whereas there are many insects in Europe that each this plant species. There are also differences in phenology when comparing garlic mustard and native plants that may serve as an advantage to garlic mustard. One such difference is that garlic mustard reaches its photosynthetic maximum when many native plants are still dormant (Rodgers et al. 2008).

Past Management Plans and Actions:

There are a few methods for eradicating garlic mustard and which method is employed usually relies of extent of infestation. If there is only a light infestation then hand pulling is often used. When hand pulling you must remove the entire root to ensure that there will not be

resprouting. Garlic mustard seeds can remain in the seed bank for up to five years it is important to continue pulling plants.

If there is a larger infestation there are a few other methods used. One method is to cut the garlic mustard stem as close to the ground as possible. Multiple cuttings will probably need to be done because the roots remain intact and there will probably be resprouting. Because garlic mustard is a cool season herb and continues to grow in the winter, herbicides can be used to selectively treat garlic mustard. Herbicide that is commonly used is 1-2% glyphosate. For herbicide to work most effectively, it should be applied in temperatures above 32 ^{o}F. Herbicide should be applied in early spring, when garlic mustard is one of the few plants actively growing and therefore will absorb the glyphosate.

There has also recently been research surrounding the investigation of possible biological control methods. Because Europe has 69 effective predators of garlic mustard some insects could be introduced to control garlic mustard in the United States. One of the most effective predators of garlic mustard and the most promising biological control agent is the root-feeding weevil (*Ceutorhynchus scrobicollis*).

Suggested Management Plan for Hudson Crossing Park Pocket Wetland:

The Pocket Wetland at HCP only has a light infestation of garlic mustard. I believe hand pulling is the most effective method for garlic mustard eradication in this location. Garlic mustard should be pulled on sight to prevent the establishment of a seed bank, which can last up to five years. It is important to remove as much of the root system as possible to avoid resprouting. Because garlic mustard seeds can last for up to five years there should be continual monitoring in the Pocket Wetland.

The Friends of the Lakeshore Nature Preserve have an annual "Pull-A-Thon" to eradicate the garlic mustard in the preserve. I suggest having an annual event such as this so this invasive can be controlled and the local community can be educated about garlic mustard.

How to Identify Garlic Mustard for Eradication:

Garlic mustard is a 12-40 inch forb. The basal leaves of garlic mustard are kidney shaped and have scalloped edges. The stem leaves are alternate, sharply toothed, and triangular. The leaves, when crushed, smell distinctly like garlic. Garlic mustard produces a single flower stalk. Flowers are terminal racemes (see image below) and bloom in April to June. The flowers have four white petals and are 6-7 mm in diameter. Fruits are linear siliques. A silique is a fruit made up of two fused carpels. This type of fruit also has the characteristic of its length being more than twice its width.

To dispose of the garlic mustard place the pulled plants in sealed garbage bags labeled "garlic mustard." Then you may put them in regular garbage containers to go to a landfill.

Figure 4. Different types of flower inflorescences

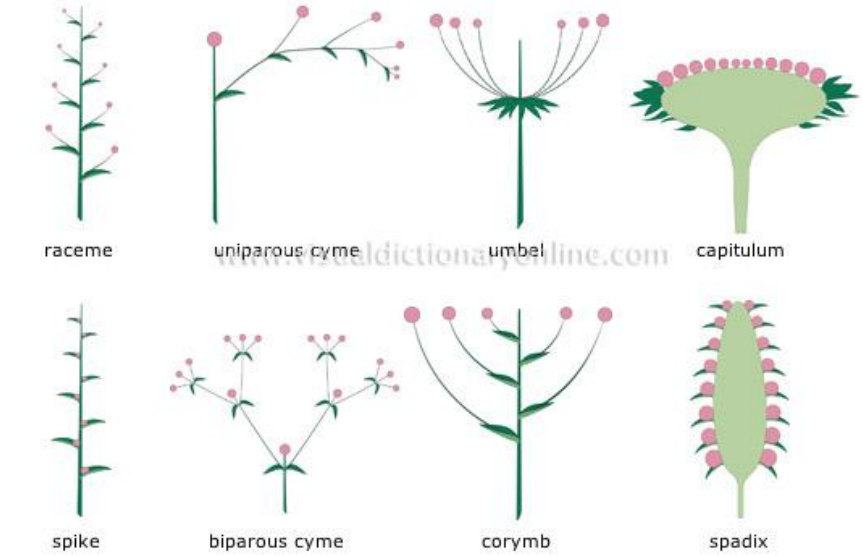

Image from Merriam-Webster Visual Dictionary Online, 2010.

Figure 5. Garlic mustard leaf rosette and flowering

Image from Plant Conservation Alliance's Alien Plant Working Group, 2000.

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