CITY OF SOMERVILLE, MASSACHUSETTS
URBAN FORESTRY COMMITTEE

July 27, 2020

To the Somerville City Council,

We appreciate the council considering an update to the Tree Preservation Ordinance (TPO). We believe the TPO to be a living document that requires review and revision to ensure it functions as intended, which is to support the goal of growing our urban canopy and maintaining a healthy urban forest in Somerville. Below are comments from the Urban Forestry Committee (UFC) with regard to a proposed change to the definition of 'Significant Trees'. These comments were unanimously approved at the committee's meeting on July 16, 2020.

Proposed change to the TPO:

Current Section 12-102

Significant Tree: Any living tree that is not an Invasive Plant and is 8 inches or more in DBH.

Change to:

Significant Tree: Any living tree that is not an Invasive Plant and is 8 inches or more in DBH, or any living tree that is 24 inches or more in DBH, regardless of species.

Introduction

Invasive plant species are those that are not native to a specific area. Rapid growth and reproduction, often coupled with lack of natural pests, results in these plants causing damage to the native ecosystem by outcompeting other plant species. In natural areas, ecosystems are almost always improved by removing invasive species and allowing native plants to re-populate. However, in urban areas the situation is more complicated. In the cityscape, when an invasive plant is removed it will not necessarily be replaced by another plant - it may be removed to make room for a new driveway, a concrete patio, or a condominium expansion.

Norway Maple, for example, is an invasive tree species commonly found in urban areas. Norway Maples grow well in restricted areas and have a reputation for tolerating a wide range of environmental stressors, so for decades they were widely planted in urban areas. These plants grow and reproduce quickly (for trees), have a dense canopy that blocks sunlight from

understory species, and have the potential to contribute to suppressing growth and vigor of neighboring plants.

There is much to consider. If an invasive tree is removed and replaced with a driveway or other structure, will that lead to a net gain or loss of ecosystem benefits for the neighborhood? Also, what practical impacts will this amendment have, will it stop homeowners and/or developers from cutting down a mature invasive tree? After careful deliberation, the Urban Forestry Committee could not come to a consensus on the likely ecological outcomes of making the proposed amendment to the TPO. Therefore, we wish to present a balanced document that addresses both possible outcomes, In addition, we offer suggestions for dealing with invasive vs. non-native vs. native trees in the TPO.

Arguments in favor

Having invasive trees in our community is not ideal, but they still have far more ecological value than concrete.

The aim of this amendment is to place large invasive trees in the same category of 'Significant Tree' that the city gets compensation for, per section 12-112 of the TPO. This is in recognition that losing a mature invasive tree without replacing it with a more beneficial tree species means a loss of important ecological and health benefits to the local community. Larger trees increase CO_2 sequestration, provide habitat, add to structural stability on sloping areas, and contribute to aesthetic appeal of our streets and neighborhoods. Moreover, these trees provide much-needed shade, which is vital in a time of climate uncertainty and inequitable access to cooling.

In a dense urban area like Somerville, where mature trees are particularly scarce, the loss of a large Norway Maple or other invasive tree species will negatively impact the community, just as any other large tree would, and that impact should be recognized by the TPO. For example, in Somerville, a 24 inch DBH Norway Maple planted near a residential home provides $232/year in benefits; including reduction of harmful air pollutants, reduced cooling costs, collection of stormwater runoff, and carbon storage (iTree).

We do not know how many large, invasive tree species are currently located on private property. We can look at available data on public trees to get an idea of the proportion that fall into this category. According to Treekeeper, the city currently has only 587 trees with a DBH greater than or equal to 24 inches, comprising 4% of the total number of trees in the city. Of these, the most highly represented invasive species is Norway Maple, with 97 individuals (16%). If we make the assumption that private trees reflect a similar population distribution, then we can extrapolate to qualify the ratio of invasives on private property.

We do not believe that this amendment will result in any hindrance to people removing large invasive species from their property should they wish to do so. Owner-occupants can already request a waiver for removing significant trees, so this change will not cause them to incur any additional costs. A developer who applies for a permit to remove an invasive tree of substantial size can still do so, with the option of donating to the tree fund or replacing the removed tree, on that same site, with non-invasive species, which is the strategy preferred by this committee.

To date, the TPO process has not stopped anyone from removing a tree, regardless of species. We think it is unlikely that developers will decide not to remove an invasive tree due to this change. The more likely outcome is that large invasive trees will still be removed and now also be replaced by non-invasive trees or donations to the tree fund, causing an overall ecological improvement.

Arguments against

If this amendment leads to large, reproductively mature invasive trees NOT being removed, that will have negative ecological consequences.

Invasive plants are highly damaging species. Despite that fact that many can be aesthetically pleasing and fare well in urban environments, they cause enormous ecological damage by outcompeting native species. Native plants are key to restoring and conserving biodiversity in urban ecosystems. Native plants provide food to insects, birds, mammals and reptiles, so having a healthy population of native species is fundamental to preserving all of our urban wildlife and underpins a healthy environment for the entire community. As invasive species are generally quick to grow and spread, an important goal for a city is to completely eliminate invasive species. Leaving even a small number of individuals, especially large, reproductively mature trees, can make it impossible to eliminate the population.

Continuing with using the Norway Maple as an example, a mature maple tree of >24 inches DBH can produce several hundred seeds per year in winged-fruits, which are readily dispersed by wind. They easily sprout in most any condition, including poor soils and shade (Morton Arboretum). While the role of allelopathy has not been confirmed (Rich, 2002), there is evidence of other mechanisms that create an inhospitable environment around Norway Maples. A recent study of a native forest ecosystem showed that biomass of a competing native species, Red Maple, was reduced under the canopy of Norway Maple. The authors concluded that this was likely due to the capacity for Norway Maple to limit nutrient availability, thus paving the way for restructuring of that ecosystem (Fang and Wang, 2020).

Young Norway Maples reach reproductive maturity within 10-20 years, so maintaining even a few mature Norway Maples in Somerville would effectively prevent us from eliminating this invasive species. The spread and growth of Norway Maples are difficult to manage. They are susceptible to some common fungal diseases that afflict maples (Bartlett Tree Experts), but there appear to be few associated insect pests. In fact, it is reported that Norway Maples provide food to very few species, and these are mainly invasive insects (Maryland Biodiversity Project), bringing into question the ability of these trees to provide critical foundational support for the ecosystem.

With climate change, the impact of invasive species is expected to be greater (Simberloff 2000). What makes them successful, tolerance to a broad range of environmental conditions, lack of predators, leafing out earlier than our native plants, fast growing, prolific seeding ability and quicker rate of maturity will only increase their numbers. Ironically, the diseases and pests that exotic species bring in that devastate our native trees (such as the emerald ash borer, wooly adelgid and others) will create even more opportunity for invasive plants to succeed during climate change

An example of the unintended consequence of this law is the Tree of Heaven. This invasive species is host to the spotted lantern fly, an invasive insect that is decimating grape

crops. If this tree is given protection it will continue to host this insect and help to destroy crops and livelihoods. The yearly damage in Pennsylvania is $50 million dollars and over 500 jobs lost (Pittsburgh Post Gazette). A living spotted lanternfly has not been spotted in Massachusetts yet: but it is only a factor of time.

Large significant invasive trees will only ever create more invasive trees. Because a majority of property owners in Somerville do not reside on the property, landscaping often falls to the bottom of the list of priorities. When not paid attention to a sapling of an invasive tree can turn into a 20ft tree in a few short years. If seeded in the right place, these trees might be welcome thereby continuing the cycle of invasive species.

It is important that the legislative matters committee ask the law department to investigate the legality of giving protections to invasive species. Since it is illegal to sell, grow or distribute invasive species in the state (mass.gov) and since the state and federal government are creating programs and incentives to remove invasive plants, providing them protections may be unlawful.

The removal of Norway Maples and other such invasive tree species should always be encouraged, regardless of size, therefore creating any barriers to their removal goes against good ecological practices.

Closing remarks

A native tree will always be better than an invasive tree, and removing an invasive in order to replace it with native trees should certainly be encouraged, no matter the size of the tree. The UFC agrees that protecting or promoting invasive tree species is a poor ecological practice, however we disagree on the effects this amendment will actually have on our invasive tree population and whether those effects will be overall beneficial or detrimental to our urban forest ecology.

In our discussions, we also developed a few additional recommendations with regard to dealing with invasive species within the TPO:

1.) If this amendment is adopted, consider a scaled approach to the requirements for replacement trees or contributions to the trees fund that would acknowledge that the ecosystem benefits are not equal between different categories of trees. For example, since native trees provide the most benefits, cutting down a native tree might require a 1.5X DBH replacement cost, whereas a non-native but non-invasive tree might be 1X DBH and an invasive tree might only require a 0.5X DBH.

2.) Using Treekeeper, we can obtain rough estimates of public trees that are greater than 24 DBH (as discussed above). We cross-referenced that with 7 tree species that are currently on the Prohibited Plants List: there are (roughly) between 107-115 trees greater than 24 DBH. Again, it is important to note that these values reflect public trees, not those that are on private property, so we use this data as an indicator. If there are not that many >24 inch DBH trees the TPO could be amended to consider the removal of >24 inch invasive trees on a case-by-case basis.

Currently, we are making the assumption that all invasive species are equally harmful. Do all invasive tree species listed on the Massachusetts Prohibited Plants list pose the same threat to our ecosystem? These species cannot be planted, but homeowners are not under any obligation to remove them. We want to be cognizant of those species that may potentially be more acceptable than others. For example, Tree-of-Heaven can be deemed unacceptable to have 'Significant Tree' status, regardless of size, because of the serious implications with it being a host for Spotted Lanternfly, a significant pest whose presence results in devastating effects on various plants, including agricultural crops.

Similarly, a case-by-case basis may be helpful when addressing specific situations where a tree is seriously diseased or has an insect infestation with high potential for spread (in instances where several of the same species are planted in close proximity to one another or if the host range of the pest is broad). The potential for this indicates that an invasive tree, even if large, should not be protected (for example, Tree-of-Heaven is an important host for the Spotted Lanternfly, as noted above).

The UFC could potentially assist city forestry staff with making species identifications and providing recommendations that take into consideration the ecological benefits/costs of removing an individual invasive tree given its species, location and replacement recommendations.

3.) The ideal situation from an ecological standpoint would be removing invasive trees and replacing them with native species. Right now the cost of the actual tree removal is a larger hindrance to homeowners who may want to do this to their property (as opposed to developers who are likely cutting invasive trees as part of large money-making projects). Could the city create a financial incentive for homeowners who might want to restore their property with native species?

4.) We propose a change in language in section 12-112 3a to clearly specify that replacement trees should be "non-invasive trees, preferably native species".

5.) We recommend that the council seeks legal advice from the city solicitors to ensure that providing protection of any kind is not in violation of any state laws or other regulations pertaining to prohibited plant species.

We would like to be unambiguous: These proposed revisions to the TPO are not to be interpreted as support for the presence, or any re-planting, of invasive species. The Massachusetts Prohibited Plant List clearly states which species are not allowed to be planted in the state and must be referenced. The new planting of any invasive species on this list is prohibited and therefore not recommended.

References

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Mass.gov. Invasive Plants: A great threat to our native species and natural communities. https://www.mass.gov/service-details/invasive-plants

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