## A New Frontier for Arborists – Urban Silviculture

**For the IAA Spring 2023 Newsletter by BC Fischer**

Introduction

Urban silviculture is a developing/new concept being talked about by urban foresters that arborists also need to understand. It is the adaption of the forestry practice of silviculture to urban natural forest areas, forested patches, or woodlots (hereafter urban forested patches). Silviculture is the theory and practice of controlling the establishment, composition, structure, and condition of forest stands to meet landowner objectives. Historically, it focuses on timber production and other economic and environmental benefits of forests. By definition a forest stand is a contiguous community of trees sufficiently uniform in composition, structure, age, size-class(es), spatial arrangement, site quality, condition, or location to distinguish it from adjacent stands. Larger forests are collections of forest stands.

The practice of silviculture has broadened over the past couple of decades to address a broader range of management objectives rather than focusing primarily on timber with the introduction of ideas such as management for complexity, sustainability, and resilience, as well as management for specific non-timber objectives such as carbon storage, biodiversity, watershed protection, wildfire protection, etc. (1, 2, 3)

Let us examine briefly how urban silviculture may differ from traditional silviculture practices. Urban forest patches are an important component of the tree canopy in cities but are often overlooked by city leaders and decision-makers, and often lack formal management frameworks. One approach to addressing this deficiency may be to borrow from traditional forest management frameworks and practices. Although urban forested patches share similarities with rural forests, the impacts of urbanization on forest stand dynamics may require modification of these methods and in some cases development of novel silvicultural guidelines.

Examples of how urban silviculture differs from traditional silviculture thinking includes the following:

*Stands vs patches* - Rural forests are typically divided into forest stands to distinguish separate units based upon forest condition and differing site characteristics. Figure 1 is an example forest stand delineation. In urban areas forested areas are small and separated from other forested areas by non-forest spaces, thus each urban forest area is considered a single forest stand. Figure 2 is an example of urban forested patches across several neighborhoods within a city.

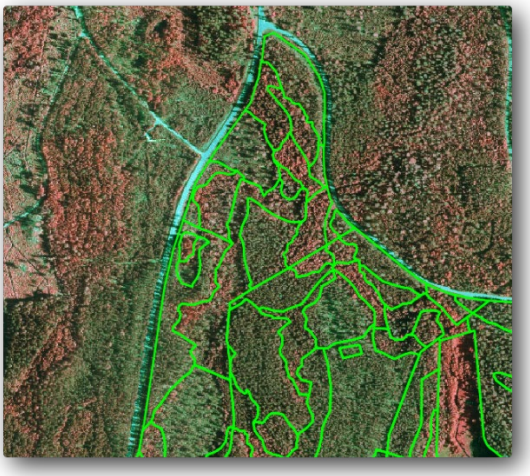

Figure 1. A forest with separate stands delineated.

Figure 2. Urban forested patches in a city.

*Establishment* of rural forest stands relies on either artificial (planting tree seedlings) or natural regeneration from seeds, and these regeneration efforts are coordinated with tree harvesting – partial or complete canopy removal. In urban forests tree planting may include seedlings or larger trees (saplings, etc.) in specific targeted locations to increase canopy cover.

Why do arborists need to know about silviculture? Especially in urban forest areas?
I am a forester and specifically a silviculturist by training (forest oriented) and I never think as an arborist (tree oriented) even when I am in the city. So, I think in terms of groups (stands) of trees whether they are in a natural setting, or a park or even just a neighborhood of street and yard trees. In any of these settings I mentally think about the current species composition, structure (one size class, a few size classes, or all size classes), and the condition of the forest. Additionally, what should be addressed next in terms of regeneration (both natural and human-planted), thinning (density management), and structural shifts to better meet the management goals of tree owners or managers moving forward.

A recent article (4) highlights silvicultural thinking about urban forested natural areas and represents a new twist to urban forest management. The article refers to European urban silviculture thinking back to the about 2000 (5), which did not surprise me. There is a long history of urban ecology in Europe focused on urban forested natural areas dating to at least the 1970s.

<u>Simple take home messages for an arborist</u>

1) *Recognize that urban silviculture creates a better connection with urban foresters*. This can result in collaborative planning, and better communications with the public on benefits of urban forested patches.

2) *Identify when urban silviculture needs to be applied.* Whether it is an actual urban forested patch, or a neighborhood of trees, managing for species and structural diversity is important to create an urban forest that is resilient to climate change, or whatever other challenges arise.

Various roles an arborist might perform in urban silviculture are numerous. Arborists know how to plant trees, whether small or big. There are also tree management tasks arborists address on a regular basis such as pruning and plant health care. Individual or small groups of tree removals to create spaces to plant new tree species to enhance diversity. General tree care to maintain tree/forest quality. Inventory systems and

tree inspection systems to monitor the urban forest from a health and risk management perspective. There are many roles for an arborist to play in urban forest management and thinking like a silviculturist can create a positive influence how one addresses the management of a neighborhood's tree population.

References

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