

November 28, 2014

Forest Management Committee
Town of Haverhill – Conservation Dept.
City Hall Room 310
4 Summer Street
Haverhill, MA 01830

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Introduction:

I was contacted by Rob Moore of the City of Haverhill, Conservation Department. He informed me the City was seeking out a forester to complete a peer review of the remaining hemlock salvage area within Winnekenni Park Conservation Area. He believed I was a good fit for the review because I am employed full time by the City of Worcester as their Watershed Forester for the drinking water supply. I have previous consulting experience and still consult on a part-time basis. I am not a major competitor of New England Forestry Consultants, Inc. I have also never worked for or on a project in conjunction with NEFC, Inc.

I have been working as a forester for thirteen years and I am licensed in Massachusetts. I graduated in 2001 from the University of Massachusetts-Amherst with a Bachelor of Science Degree in Forest Management. Immediately, after graduation I began working for Glenn Freden Forestry, Inc. in Royalston, Massachusetts managing over 20,000 acres of private forest land. During this time I also worked for Mount Grace Land Trust in Athol, Massachusetts as a forester. In 2005, I accepted my current position as the City of Worcester's Watershed Forester. In this position, I am responsible for the management of 8,000-acres of forestland surrounding the drinking water supply.

Site (History/Background):

In 2012, a forest management plan was developed and approved by the Department of Conservation and Recreation. In the plan it is noted that Hemlock Woolly Adelgid had infested many of the hemlock trees. In 2013, further decline in hemlock health was noted by the Committee and the management plan was revised proposing the salvaging of hemlock. In the winter of 2014, the salvage began and was 75% completed before spring conditions halted operations. It was decided to postpone harvesting until the winter of 2014-2015, to allow for stable, frozen conditions. The City received several complaints and questions from park users about the amount of logging which took place despite its efforts to inform them of this procedure.

Purpose:

To confirm whether the harvesting of the remaining uncut area, covered under the current Forest Cutting Plan, aligns with the goals of the City's Forest Management Committee, namely "the healthy preservation, protection, and perpetuation of actively managed forests, with particular focus on water quality, wildlife habitat, recreational opportunities, and renewable resources of timber through the use of proper forest stewardship."

My interpretation of the above stated goals, for purposes of this review, is water quality is the primary goal for this particular area of forest. I came to this conclusion due to the fact that it is adjacent to a drinking water body and is within the jurisdiction of the City's Water Authority. It is widely accepted that healthy, well-managed forestland offers higher-quality drinking water. The forest acts as a giant filtration system, helping reduce turbidity by regulating soil erosion and reducing sediment load. Forests absorb water and reduce overland flow preventing impurities from entering streams. Bacteria in the soil utilize nutrients and absorb heavy metals from acid rain.

There are many threats that can disturb the forest including wind, fire, drought, ice storms, insects and disease, climate change, air pollution, intense precipitation, etc. The purpose of managing a watershed forest is to maximize its resistance and resilience to these disturbances. That the forests surrounding Kenoza Lake will be regularly and at times catastrophically disturbed is without question.

Ideal Conditions:

The following are some stand conditions that will help maximize resistance and resilience to disturbances and preserve/protect the forest:

- A multi-aged condition. Stands that contain at least three distinct age classes.
- Diverse species composition.
- Young vigorous tree growth (regeneration).
- Lack of disease and insect infestations.
- Lack of non-native invasive species.
- Individual trees that have been grown in more open conditions (resist wind better).

Observations:

I visited the site on November 22nd, 2014 to conduct my assessment, specifically the uncut southern portions of stands 9 and 12 of the current forest management plan. I observed a stand in poor health. Age class diversity is poor. Most of the trees are of similar age with a lack of young vigorous growth. Hemlock Woolly Adelgid has infested most hemlock trees with mortality noted. Stand density is high and has resulted in low vigor and slow growth rates. Canopy and root growth are inadequate to withstand a large wind event. There is inadequate regeneration growth established if a natural disturbance were to occur that damaged a large percentage of the overstory. Multiple species of invasive plants are present.

Conclusions:

It is my recommendation that this stand be managed to improve current conditions. In my opinion, managing the remaining uncut area aligns with the goals of the Forest Management Committee. The following are my comments and recommendations on how to manage the area in question:

- Remove at least 50% of the basal area to encourage the establishment of regeneration. When harvesting to establish regeneration I would remove 50% of the basal area to provide enough light to the forest floor to stimulate growth. If less than 50% of the overstory is removed you will get less diverse regeneration, mostly shade tolerant species. Generally, removing a third of the basal area (the current suggestion) is used when trying to improve growth in the overstory.
- After this harvest is completed and once regeneration has become established (5-10 years) a second harvest is going to be crucial. The second harvest will release the newly established regeneration

and continue the process of removing unacceptable growing stock. This is imperative to encourage vigorous tree growth.

- Retain as much species diversity as possible.
- Consider retaining scattered hemlock for aesthetic and wildlife habitat purposes. Retained hemlocks should be located away from main hiking trails for public safety. As these hemlock retention trees die they will provide coarse woody debris, cavity nesting sites, roosting sites, and feeding sites for woodpeckers and other birds. However, a majority of the hemlock should be removed to encourage regeneration growth.
- Do not harvest the remaining area of stand 3 along Kenoza Lake. Access and operability are extremely limited. The heavily used Shoreline Trail runs through this area. Hemlock is not the predominant species and mortality will not result in erosion issues. Hazard trees could be dealt with on an individual basis.
- Non-native invasive species are established within the stand. Most likely these invasive species will spread after the harvest due to scarification of the forest floor and increased sunlight. It is possible that invasive species growth could create conditions that inhibit regeneration. A plan of action is needed to deal with this possible scenario before harvesting. Furthermore, the use of herbicides to control invasive species adjacent to a drinking water supply is not an accepted practice. Although, science shows that it is safe and I personally know of water suppliers outside of Massachusetts using herbicides with no negative effects. The consensus among foresters is that it is safe but there is a public perception issue that is difficult to overcome.
- In the harvested area of stand 1, American Pokeweed has become well established in many areas. Although this is a native plant it is a nuisance species. I am concerned that if it continues to spread it will inhibit regeneration growth. A plan of action is needed to deal with this possible scenario.
- I do not recommend extensive replanting. It would be labor intensive and expensive. Surrounding sapling and herbaceous growth would need to be trimmed back annually until the trees were approximately 4-feet tall. If hemlocks were planted they would succumb to the Hemlock Woolly Adelgid (HWA). Given time, 4-8 years, the stand will regenerate naturally. Planting would merely be for aesthetic purposes. Some replanting of native trees (Spruce would mimic hemlock well.) by local groups willing to care for them would be appropriate, but I would not recommend investing large amounts of City funds for planting.
- At this time, using biological controls to control the HWA is not an option. There are a few ladybug beetles from Japan that are being researched for their potential in controlling the HWA. Currently, it is not available to the general public. The cost of producing these for research purposes has been as high as one dollar per beetle and many thousands of beetles may be needed per tree. Managing landscape and nursery trees infested with the HWA is possible if found early and treated with chemicals. Horticultural oil sprays and an injected chemical called Imidacloprid have been proven affective. However, forest trees are almost impossible to treat effectively or economically. Horticultural oils need to be sprayed throughout the entire tree and Imidacloprid is expensive and both methods require multiple treatments. Also, research would be needed to find out if Imidacloprid can be applied next to a drinking water supply.

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