

Hopkinton Invasives Management Plan for Field Near 279 Wood St.

Focus Area: An approximately 0.5 acre open field on town owned land that previously had a house. At its closest point the field is about 100 ft from Whitehall Reservoir with a gravel road and a wooded vegetation buffer between. The field is about 250 ft from Wood St. There is a trail to the east with the first ~30 feet from the field edge to be included in this plan due to heavy abundance of invasives.

Habitat Description: The field previously had a house on it that has since been removed but there is evidence of landscaping remnants including lilacs, crabapple trees, barberry, and a large rhododendron. The field has a good mixture of native wildflowers including golden rod, yarrow, dewberry, sensitive fern, milkweed, cinnamon fern, Virginia creeper (starting to spread from wood edge into field), grape (starting to spread from wood edge into field), spiraea along wooded edge (most likely *S. tomentosa*), poison ivy, unknown white aster (potentially *Symphyotrichum sp.*). Bittersweet, multiflora rose, barberry and glossy buckthorn have all encroached into the field. This assessment visit was completed about a month after approximately half the field was mowed so the full extent of invasives in the field is unclear.

The wooded edge is primarily white pine, oaks, maples, and black birch with an understory of multiflora rose, bittersweet (also growing up the trees primarily on the northern edge and up the eastern trail), barberry, glossy buckthorn, and Japanese knotweed. These invasives spread up the trail to the east of the field where there was no canopy cover and is included in this assessment.

The interior of the woods to the north, east, and south appear to have little to no invasives present. Glossy buckthorn is abundant to the west between the reservoir and road.

Target Invasive Species Distribution and Abundance:

Oriental Bittersweet- This is the most abundant and impactful invasive in the field and adjacent wood line. It was present throughout the field with the most extensive amount near the lilac and crabapple trees. Due to the recent mowing it is unclear how large the bittersweet was but this area was completely covered as evidence of no vegetation growth other than bittersweet stems. The remaining area of the field has scattered single stems that have yet to ramble into mounds. Along the forest edge, particularly on the northern side and up the trail leading east, the bittersweet was well up the trees (~50 ft tall). Along the trail the bittersweet is taking over the rose and buckthorn.

Multiflora Rose- It is primarily along the forest edge on the north and east sides with individuals near 15 ft tall forming a dense thicket. Small stems were visible in the field near the northern edge. This area was recently mowed so it is unclear how extensive these individuals were before the cut.

Japanese Barberry- The barberry was fairly scattered with larger individuals in the understory to the south of the field and small stems scattered throughout the field, including the area mowed.

Glossy Buckthorn- This species was abundant between the Reservoir and road leading to the field. There were some individuals in the area that had been cut and were already showing multiple stems. It is also present along the eastern field edge and up the trail heading east.

Japanese Knotweed- There is a relatively small but established patch of knotweed on the northern edge of the property about 20 ft by 20 ft. It is just under the canopy edge where there appears to be a shallow depression.

Possible Treatments:

Hand Pulling/Mechanical Removal

Hand pulling is most effective when the plant is small and most of the root is able to be pulled. Larger plants can be removed with a weed wrench / tree pull especially if the soil is damp; however, pulling larger plants is time consuming and causes soil disturbance, leaving the ground open for more invasive plant establishment. Pulling multistem individuals is not an option, as they typically break at the base without removing any root.

This method is typically effective when an invasion is detected early and are primarily seedlings. When pulling, as much root as possible needs to be removed and all plant material should be bagged in dark plastic to prevent resprouting or piled in a designated invasives brush pile. The bags should be tied closed and left in direct sunlight to ensure the roots are completely dried out and dead before discarding the bags. The older the plant the more difficult it is to pull up the roots effectively and partially pulling a plant will most likely result in more growth through stress induced resprouting. To remove the most roots on older plants mechanical removal would most likely be needed and would cause extensive soil disturbance opening areas for future establishment. For small, young patches repeated pulling may be effective but must be done regularly during the growing season and will take several years to exhaust the roots and seed bank.

Hand pulling/mechanical removal is most effective on glossy buckthorn and barberry. Pulling could work for multiflora rose, though the thorns and size tend to make it difficult in practice to pull. Bittersweet when extremely small can be pulled (typically seedlings); however, the extensive and traveling root system makes it impossible to pull enough root by hand or mechanically. Bittersweet also pushes out more growth quickly if it is cut or pulled without impacting the root system.

Mowing/cutting

Mowing or cutting for control or eradication would need to occur frequently (every ~4-6 weeks) for several years to effectively carbon starve a larger patch of invasives. Carbon starving can in theory work with dedicated time because the frequent cuts force the plant to push out stress induced sprouts that rely on energy from the roots; however, in large patches especially for species like bittersweet and knotweed it is unclear just how extensive that root system is. In these instances you may never realize control, and may instead see no change or an increase in coverage even after years of dedicated mowing. The most effective mowing/cutting treatment for larger patches is to mow the area and follow up ~4-6 weeks later with a selective foliar spot spray.

Mowing or cutting is best used when the infestation is new and has little root establishment or as a tool to maintain the existing conditions.

Herbicide Control

Large infestations usually require herbicide or heavy equipment to effectively control the spread. The equipment (skidsteers or brush hogs) is primarily used to cut down dense stands of buckthorn or pull up trunks; however, many species can resprout from the cut without further treatment. Many researchers have recommended glyphosate or triclopyr herbicide treatment following mechanical removal or cut of both species. There are a few methods of herbicide treatment. For established infestations any treatment could need to be repeated over several years, ideally with each subsequent treatment requiring significantly less application.

Cut stem method:

Cut the trunk at 6" to 8" (leaving space for future cuts if retreatment is needed) above the ground and immediately (within several hours) apply herbicide directly to the stump. This can be done with a paint brush or spray bottle.

This approach has minimal impact on adjacent vegetation as it is a highly selective application and the herbicide is absorbed directly from the stem to the roots. This method is not as effective in early spring when there is heavy sap flow moving from the roots to the foliage. It is effective on all woody invasives.

Targeted Foliar Spray:

This is most common for large infestations where the invasive species are the dominant/only species present. This can be done with a backpack sprayer allowing for selectivity to reduce impacts to non-target plants. The herbicide is sprayed directly onto the leaf, just enough to coat but not drip, which is then absorbed and carried to the roots. For dense patches the area could be mowed early in the season then about one month later spray the compact new growth with a selective backpack sprayer. Triclopyr based herbicide is most effective early season (before July 15th). Glyphosate based herbicides are more effective after July 15th.

Basal Bark method: Cut a band in the bark a few feet from the ground and apply herbicide directly to the exposed stem. Of the target species on this property this approach is usually done on bittersweet or buckthorn. For bittersweet this is best used on large stems growing up a tree that are difficult to cut through completely. Buckthorn can also be treated by applying herbicide with penetrating oil directly to the stem, unexposed.'

Stem Injection: This method is only used on Japanese knotweed. The herbicide is injected directly into the stem of each knotweed cane. If the patch is large this will typically be a follow up treatment done after a cut and foliar spray.

Other Treatments

There are no known biological controls for any of the target invasives on the property and prescription fires will likely favor bittersweet and some other invasive growth due to openings in the canopy and

large nutrient flushes. Prescription fire to eradicate buckthorn seedlings has had varied results, ranging from a drastic population flush to control but only after repeated burns, continued over several years. Fire is not effective against mature buckthorn.

Suggested Treatment Plan:

Finish the planned brush hog mow that was started in spring 2020 before the end of the 2020 growing season. This will give the entire area a similar growth habitat next season, making it easier to treat the small area uniformly. In spring 2021 allow the plants to emerge and flush out.

June 2021: Before treatments take photos and do an assessment of species percent cover, abundance and locations using the CISMA Project Form. Any bittersweet growing up the trees should be cut and painted with herbicide. Large barberry shrubs should be pulled/dug up. The field, trail edge, and knotweed should be mowed.

July/August 2021: ~4-6 weeks after the mow all invasives that flushed out should be spot sprayed with a targeted triclopyr based herbicide. Herbicide applications must be done by a certified applicator.

September 2021: Assess species abundance

June 2022: Assess species abundance. If treatments have reduced abundance/coverage continue with the proposed plan for 2021. You will not need as much herbicide as previously used. If the treatment did not have an impact then the plan will need to be reassessed.

Annual mowing (spring or fall) will be essential to maintain any success gained through treatments and to keep the area open as a field. If you would like the area to convert to forest to reduce your long term treatment needs, mow around any tree seedlings or plant larger natives trees/ shrubs to assist the succession.