



Smith Conservation Land Update for Neighbors and other Stakeholders

10/14/20

Tackling the Invasives

Sudbury Valley Trustees (SVT) is appreciative that its neighbors and friends requested that SVT reconsider the initial invasive plant management plans at the Smith Conservation Land in order to ensure that the methods proposed will not harm human health and safety and that they are the most effective tools and best management practices. SVT provides this update to all interested parties on the work that has been completed since the project was paused last September.

- Neighbor outreach and meetings. Several email communications and meetings were used to share SVT's strategies and process, and to listen to neighbors' concerns last fall.
- Investigation of mechanical controls. One of the neighbor meetings included input from Mike Bald of Got Weeds, a consultant who a few of the neighbors hired to conduct a site assessment of the property. SVT also had several additional phone conversations with Mike to assess his experience with Oriental bittersweet. Mike shared his methods of manual control, comprised of repeatedly cutting the bittersweet to starve the plant of carbon. Mike shared that he did not have experience with large infestations of bittersweet.

SVT staff also spoke to Gerry Hawkes of Forest Savers, a firm that specializes in mechanical management of vegetation, as recommended by Mike Bald. Gerry uses a specialized machine that pulls, cuts, and mulches, as well as tills the top inch or two of soil. He uses this technique to clear brush in an area that can then be mowed. Gerry checked back on one of the bittersweet sites that he had worked on. The landowner reported the following: *"It was pretty intense year one with sprouts and we hit it with a hot cocktail containing both glyphosate and Escort XP, but that one treatment was pretty good. Your work certainly reduced our labor and herbicide, but I think it was necessary to have that herbicide follow up. I think overall that was the best approach we could have used."*

Other practitioners have used machinery to uproot invasive plants. This type of extraction can work well with invasive shrubs whose roots are more discrete, less expansive and fibrous than is the case with bittersweet roots. This type of work creates tremendous soil disturbance and is difficult to implement in wooded areas, and any areas so treated must subsequently be reseeded with desired vegetation.

SVT contracted with DeRosa Environmental, an ecological restoration firm, to conduct a site assessment and provide an estimate for invasive plant control using mechanical and/or organic herbicide. DeRosa primarily recommends whole plant removal with big

machinery – roots and all, followed by reseeded. DeRosa suggested that he might also try Nature’s Avenger (clove oil) in a cut and dab treatment but was uncertain of success for that method. DeRosa estimated a cost of \$26,000 to treat the 4.7-acre red pine area, including spot seeding.

- Investigation of use of fire. Jeffrey Ward of the University of Connecticut Agricultural Experiment Station has tested the effectiveness of using a flame torch on invasive plants. He found it to be effective on barberry, multiflora rose and honey suckle, but not on Oriental bittersweet or glossy buckthorn. One scientific reference found that fire will increase growth of plants like bittersweet that have extensive root systems.
- Investigated organic herbicide alternatives. One reference indicated that the organic herbicides do not work well on plants with extensive roots systems, but do work well on annuals. SVT staff contacted several practitioners for additional information concerning the use of organic herbicides. One practitioner (Nadeau) who only uses organic methods in his practice, recommended the use of triclopyr, primarily cut-stump treatment, for control of Oriental bittersweet because of its aggressive growth (he does NOT use synthetic chemicals himself). More practitioners are testing the cost and effectiveness of the organic products; thus far, it seems they can be somewhat effective but require repeated treatments and are much more expensive. SVT found one peer-reviewed article on a study that tested the effectiveness of WeedZap (a clove and cinnamon oil mixture) on four woody vines (**not** including bittersweet) in the Midwest that had good results as long as three applications were used in a season. The article indicated that the cost was 5 to 6.5 times more expensive than glyphosate.

It should be noted that the organic herbicides are topical; therefore, they work by killing the leaves and require more frequent applications than a systemic herbicide. Importantly, **organic herbicides are chemicals that are not regulated and are not tested for toxicity and/or environmental harm.** Hence, the designation of “organic” should not be presumed to imply environmental or health safety.

- Further investigated potential to use goat grazing. SVT staff attended additional webinars and presentations on the effectiveness of goat grazing and subsequently met with a local goat grazing company representative. Unfortunately, goat grazing is only useful for initial mechanical control and is quite expensive compared to standard herbicide treatments (approximately \$600 per 1/3 acre per treatment). MassAudubon uses goats to maintain grassland habitat at their Habitat Sanctuary by carefully rotating its own herd of goats and keeping the goats from grazing sensitive plants. Goats are generally indiscriminate in their grazing. SVT is interested in working with a neighbor to use goats to maintain a few small areas abutting their property.
- Revisited the science and literature on glyphosate and triclopyr. SVT staff attended a full-day Northeast Organic Farming Association (NOFA) workshop on glyphosate. Staff contacted UMass Amherst toxicology and weed science experts for updated

information. Additionally, staff reached out to conservation land management colleagues for additional input and information. These initial investigations led to larger efforts detailed below.

- SVT convened an Invasives Management Working Group with its peers in conservation land management. This working group includes representatives from The Nature Conservancy, The Trustees, Mass Audubon, the Massachusetts Division of Fisheries and Wildlife (MassWildlife), the Massachusetts Natural Heritage & Endangered Species (MNHESP) program, the Massachusetts Department of Conservation and Recreation (DCR) Water Supply Division, the US Fish & Wildlife Service Eastern Refuge Complex and the Suasco Cooperative Invasive Species Management Area (CISMA). All of these entities actively manage invasive species to achieve their conservation goals. The Massachusetts Invasive Plant Advisory Group (MIPAG), (which has similar representation) was also consulted.
 - SVT staff reviewed herbicide-use policies and practices of these and other national organizations.
 - SVT hired a consultant to provide an updated literature and research review on potential impacts of glyphosate and triclopyr on human and environmental health. This review concluded that if these chemicals are used according to label specifications in the limited manner that is used for invasive plant control, they pose a very low risk to human and environmental health.
 - This consultant also prepared an annotated bibliography. SVT will continue to update this bibliography.
- SVT reviewed additional projects that had used chemical treatments on conservation land for habitat restoration purposes in order to evaluate methods, successes and challenges as they might inform its work. SVT found a number of projects that have had excellent results for habitat, plants, and pollinators without any known damage to the environment.
- SVT hired a wetlands scientist to delineate and flag all wetlands on the Smith property.
- SVT Summer Interns were trained in invasive plant identification and control. They spent several sessions at Smith, manually removing invasive plants along the woodland border, to the west of Whitcomb Ave. The goal here is to prevent Oriental bittersweet and other invasive plants from invading those intact forests.

SVT has begun a new program, “Weed Warriors”, training more volunteers in invasive plant identification and removal. Twenty volunteers have registered for the program, including three who will dedicate time to manual removal at Smith. More details on this program can be found here: <https://www.svtweb.org/join-our-weed-warrior-volunteer-program>. We are working with the CISMA (Cooperative Invasive Species Management Area) to expand this program in our service area.

- SVT met with USDA Natural Resources Conservation Service (NRCS) staff a second time last month at the site to re-evaluate the site and treatment options (following up on their initial site assessment conducted in February 2019). The NRCS is partially funding the habitat management activities. NRCS has not found goat-grazing to be an effective solution to invasive plant management and does not support the use of “organic” herbicides as they are deemed a topical treatment, not systemic, and therefore less effective.

Given the extremely pervasive and daunting problem of controlling invasive plants, SVT carefully tailors its management program to the conditions and characteristics of the particular property. SVT focuses its work on those reservations that have particularly high ecological values and at which it will be able to dedicate resources over the long-term to control invasive plants. Over time, SVT has employed a combination of mechanical, biological, and chemical control methods. In some cases, SVT has effectively used mechanical removal alone where the invasive infestation is new and covers a small area or the plant is easily and effectively removed with hand-pulling. In other cases, SVT has been able to greatly minimize the use of chemicals by utilizing initial manual and mechanical treatments followed by the use of specified herbicides. In these cases, the first tactic is to cut larger stems and dab or paint the surface with an herbicide. This method is most preferred because it specifically targets the invasive plant, minimizes application rates and avoids impacts to non-target species. The second method is to mow or cut plants, wait for low and dense foliage to regrow and then apply a low volume foliar spray – a spray applied directly to the leaves. In order to prevent drift, this method is only used in low wind conditions and with no precipitation. Use of backpack sprayers and newer surfactants further limit drift. Chemical applications are most intensive in the first year and are followed by much reduced applications in the following two years. Follow-up spot treatment may be needed in subsequent years. Herbicide amounts used in these situations are magnitudes less than those used in industrial agriculture. Continued monitoring and mechanical removal is always necessary.