Removal of Invasive Brush Species from Chaumont Barrens Preserve

August-October, 2015

Project Report by Brian Roat

Chaumont Barrens Preserve alvar community

Introduction and Background

The Nature Conservancy's Chaumont Barrens Preserve (Figure 1), located in Jefferson County, NY, features alvar grasslands that contain globally rare native plant communities. Adjacent to each of these meadows are cedar and hardwood forests where glacial action left deeper layers of soil than the near-bare limestone that characterize the alvars. The aerial preserve map in Figure 2 illustrates the striation of these adjacent community types. Invasive brush species, namely *Rhamnus cathartica* (common buckthorn) and *Lonicera periclymenum* (European honeysuckle), dominate the boundaries and are steadily encroaching onto the grasslands, outcompeting and shading-out native species and overconsuming nutrients that are scarce in this environment. Several smaller meadows on this property have been entirely closed in by brush and, as buckthorn and honeysuckle don't seem constrained in their spread by the shallow soils, it is likely that without intervention it is just a matter of time before all of the grasslands are covered by brush. For the meadows that are being encroached upon, treatments in the present could avoid the need for large-scale restoration efforts in the future.

Figure 1

SLELO-PRISM
c/o The Nature Conservancy
269 Ouderkirk Road. Pulaski, NY 13142
Rob Williams Coordinator

Objectives

An 80 acre target area of the preserve was chosen for suppression efforts (Figures 2 and 3). The area was chosen based on the documented presence of rare plant species (e.g. *Geum triflorum* (Prairie Smoke) and *Spiranthes magnicamporum* (Great Plains Ladies' Tresses)), and because a public hiking trail runs through it and features the meadow and its flora in the interpretive materials associated with the trail.

The target area is ringed by patches of buckthorn, 40-50 feet deep in places (i.e. distance from forest edge of patch to meadow edge), and contains smaller interior patches of buckthorn and honeysuckle. The goal was to chemically treat around the entire edge and then focus on treating the interior brush.

Follow-up treatments would be ideal to suppress seedlings, but the hope is that a one-time kill-off of these patches is an effective standalone project; it may give native vegetation an opportunity to compete, and will at least delay the encroachment of brush into the grasslands by several years.

Figure 2

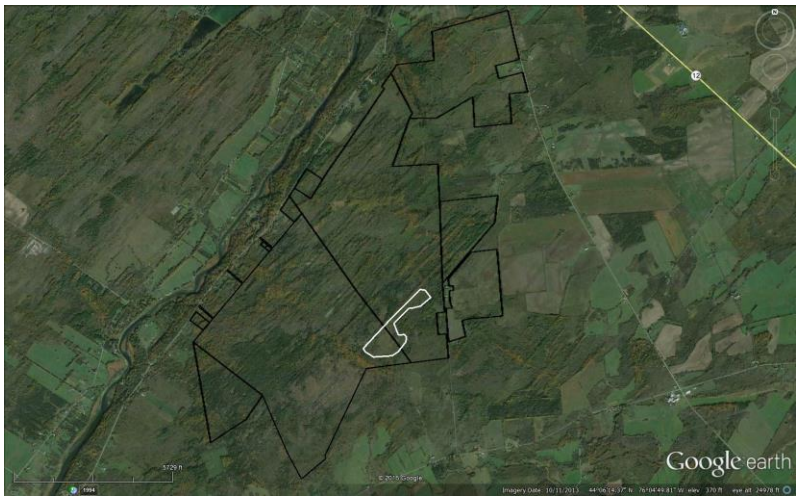

Figure 3

Methods

Though stump treatment yields a high mortality rate with these species, it was deemed too time and cost ineffective for the scope of this project. The foliar application of a 2% mix of glyphosate was used. Because glyphosate is a broad-spectrum herbicide, careful spot-spraying was used on the interior patches while broadcasting was allowed on the deeper monoculture patches around the perimeter of the target area.

Miller's Turf was awarded the contract to perform the treatment. The primary application was performed in early September, 2015, and then a follow-up application occurred later that month. An ATV with a 30 gallon tank and pressure sprayer was used for application around the perimeter, while the interior patches were treated with backpack sprayers on foot (due to the fragility of the alvar ecosystem).

The entirety of the target area was covered, with the contractor putting in 128 total work hours. Ten gallons of glyphosate concentrate (41%) was used, which amounts to 205 gallons of mix at 2% concentration.

Expenses

SLELO awarded a $10,000 grant for this project, which went to paying Miller's Turf for their services. The Nature Conservancy paid the difference.

Contractor Services (SLELO)	-- $10,000
Contractor Services (TNC)	-- $160.00
Herbicide (TNC)	-- $299.95
Misc. Supplies (TNC)	-- $41.96
Total Project Cost	-- $10,501.91

Results

Preliminary monitoring was performed in late September/early October. Due to the varying rates of die-off and the onset of autumn, it was not possible to entirely differentiate between plant mortality and seasonal leaf dropping as there was overlap between these periods. More accurate mortality rates will be determined in the spring.

That said, preliminary monitoring suggested a 70-90% mortality rate amongst the perimeter patches of buckthorn, and a 60%-80% mortality rate amongst the interior patches of buckthorn and honeysuckle. The ranges represent the inclusion of plants showing partial die-off--these plants may or may not show regrowth next spring—as well as possible seasonal dormancy. The difference in rates between perimeter and interior patches are probably due to the difference in equipment used (i.e. pressure sprayer versus backpack sprayer) causing a difference in the volume of herbicide applied.

Figures 4 through 6 show certain locations within the target area before and after treatment.

Figure 4a

Figure 4b

Figure 5a

Figure 5b

Figure 6a

Figure 6b

SLELO-PRISM
c/o The Nature Conservancy
269 Ouderkirk Road. Pulaski, NY 13142
Rob Williams Coordinator

Lessons Learned

The plants showing partial die-off were those that did not receive a total treatment of herbicide (i.e. the leaves and limbs that died were those that were sprayed directly). Though we don't yet know the mortality rate for these, it is clear that the best results occurred when the entire crown (i.e. every leaf) was covered with herbicide.

The foliar application of a low concentration of glyphosate is highly effective in treating common buckthorn and honeysuckle in the size classes from sapling to two inches in diameter. The size range may be more extensive, but two inches is about as large as they grow in the shallow soils of the alvars.

A one-time treatment of invasive brush species is effective at suppressing a population. Follow-up treatments would be ideal to eradicate, i.e. to treat seedlings until the seed bank is exhausted, but the mature plants do not require multiple treatments to achieve high mortality rates.

More will be known in the spring and summer of 2016 when accurate mortality rates can be determined. It will also be interesting to see what vegetation grows into the treated sites. It will be great to know which native species are able to compete with the invasive brush seedlings and establish a foothold, as these species can be used (via planting) in post-suppression restoration efforts in the future.

Chaumont Barrens alvar post-treatment