



W I L H E L M F A R M F A C T S H E E T

Silvopasture Systems Beginning with Woods and Brush: Using Goats to Control Vegetation

Open or cleared land in most of southern New England, unless deliberately kept open, quickly moves into an ecological succession of weeds and brush. Native and invasive brush species often dominate sites after a few years without mowing or grazing. Even after trees overtop the brush, many plants remain in the understory and can once again spread rapidly after a timber harvest opens up the forest floor to sunlight.

On Wilhelm Farm, this ecological succession is observed in our woods. Our forest stands dominated by white pine usually achieve crown closure a few years after harvest because we use a selection system that leaves many mature and sapling size trees. However, we have an area with wetter soils that favor birch, red maple and various low-quality hardwoods and dense brush, and which experienced much greater light following removal of pine and more valuable hardwoods. In 2014, we decided to convert this area into a silvopasture unit.

Previous methods used – Mechanical and Herbicides

Our starting point was dense stands of mixed brush that included native species like wild grape, berry brambles, poison ivy, and mountain laurel. The mix also included exotic invasive like multiflora rose (introduced in by farmers for live fencing), and Japanese barberry (introduced as a landscape plant). In places, the brush was so dense that we could not penetrate it on foot or with our diesel tractor.



Control methods are necessary to ensure that exotic invasives do not become a permanent part of the landscape, which would make it non-productive in terms of economic, environmental or social values. To speed up the process of regenerating forest trees or creating open spaces for grass we began with mechanical methods. Shears, a brush trimmer and a DR Field Machine were used at first, but all the brush species resprout, so that mechanical means only work if they can be repeated several times in a season. Therefore, haying is an effective process for reducing brush and providing animal feed

With partial support from a Natural Resource Conservation Service EQIP grant, we hired a contractor who specialized in mechanical brush removal using a Tigercat with a mulcher head. Ted

D'Onofrio, TD Landworks, cleared 7 acres, 5 of which we are converting to our silvopasture unit. The other two acres of brush were created by a pine regeneration failure following a 2007 timber harvest.¹

We have never used broadcast spraying of herbicides but used spot sprays before using mechanical and introduction goats. We still use spot spray of fresh stumps of brush species, like Japanese Burberry, to kill the root system.

Goats for Brush Control – Why Goats?

When it comes to clearing unwanted vegetation, goats can provide an ideal alternative to machines and herbicides. They graze in places that mowers can't reach and humans don't want to go (yes, they love Poison Ivy). In fact, goats eat a wide range of unwanted vegetation, which on the East Coast – Oriental Bittersweet... Multiflora Rose... and more.²



Goats were one of the first animals to be domesticated by humans about 9,000 years ago. Today, there are some 200 different breeds. Among the beneficial traits noted by Eco-Goats are:

- Goats are used by the US Fish & Wildlife Service, the Bureau of Reclamation, the Bureau of Land Management, and Forest Service. States, counties and utilities also use goats for weed and invasive species control.

¹ These two acres was replanted with white pine seedlings. Pine seedlings also were planted in open gaps in the forest stand.

² Source see Eco-Goats at work - eco-goats.com/ecogoat-videos.shtml.

- Goats love broad leafed material, which means brush and invading field vegetation are consumed. But they don't prefer grass, so it is left to flourish.
- Goats respect electric fences, making this an easy and effective source of mobile containment; while sometimes stubborn, they are docile will go only where you want them to go, if effectively led. And goats don't like water, so it is a natural fence.
- Goats fertilize as they graze, then trample the fertilizer, so that the wanted grasses and other vegetation left behind are given a natural boost!
- Goats can climb, allowing them to reach invasive vegetation that grows in hard to reach places. They eat vines and stems on lower levels of a tree, either killing the vines that reach higher into the trees or revealing them so that they can be cut.



*Goats work well with vines, rock walls and other setting that are difficult for mechanical equipment.
Adult goats lead and train kids to eat from edge into brush patches*

We first had goats grazing brush in 2014 and 2015, which provided an opportunity to learn how to manage them with electric fencing and a movable trailer. In 2017, we purchased two goats – a nanny and her kid – and grazed our barnyard intensively, clearing out the substantial multiflora rose, berries and other brush. The experience convinced us that the techniques worked and that we could manage more goats over the barnyard and adjacent silvopasture unit.

Over the winter, we developed an arrangement with nearby Sweet Pea Goat Dairy, which is nearby, to graze 6 of their goats for much of summer 2018. In June five new kids and a young doe joined our two goats. They started with re-browsing the barnyard, giving them time to become acquainted with one another and for the kids to take up proper browsing. The next step was an intensive grazing of the hedge row and lane leading up to the brush covered portion of the silvopasture unit. The last two months were spent grazing in the silvopasture unit proper.

Portable electric fencing was used to keep the goats contained and guide them to the next batch of brush. The kids adapted readily, led by adults who were used to electric fencing. We had only a couple of “escapes” and fortunately the kids wanted to be in sight of the adults, so, did not wonder far.

The fencing was moved every 7 to 14 days, depending on how rapidly the goats worked through the available browse. Moving the fence required blocking the goats’ access to the area being re-fenced, taking down the wires and moving posts. Where the brush was thick and tall, the DR Field Machine or gas clippers with an old lawn mower were used to clear a path. The path was necessary to avoid the fencing shorting out on contact with vegetation, especially grass and low brush made wet by early morning dew or rainstorms. Moving the fence was the most time-consuming part of the goat management, often taking a half day.

Summarizing the Spring to October 2018 results

In 2018, we had 3 adult goats and 5 kids (about 3 months old) grazing full time for over 4 months reduced the brush on 1 acre, plus follow up in the barnyard for a total of about 1.2 acres. We mowed the remaining defoliated stems in an early spring follow up.

A technical summary_for 2018 is:

- The designated silvopasture unit has expanded from the original plan of nearly 3 acres to a new target of 7 acres; 5 acres of low-quality woods and 2 acres of wet pasture will be integrated into the 7 acre silvopasture unit.
- We used approximately 22 goat months of grazing in 2018 (3 adults and 5 kids for 4 months)
- We need over 110 goat months in 2019 for follow-up and initial grazing of rest of silvopasture area.
 - The most effective grazing time is June through August when brush is growing most rapidly
 - Growth begins to slow down about July 15 when more photosynthate goes to root systems for storage. Grazing mid to late-summer forage hastens the demise of brush plants. In some species, we can speed up the process by trimming and painting stumps with herbicide.

The Summer 2018 costs were:

- 2 goats -- \$175; other goats loaned in exchange for feeding care (\$0)
- Goat care when we traveled -- \$300
- Supplemental grain -- \$160; hay – \$180
- **Total ~ \$650**

Plans for 2019, 2020 and beyond

About 5 acres are woods and brush that are being converted into silvopasture, plus another fraction of an acre in the barnyard and path to the silvopasture unit. We are working with Sweet Pea Goat Dairy to provide goats in 2019, 2020 and beyond to heavily graze the unit from June through early September. The general arrangement is that we will purchase kids and adult does in the late spring. In the fall, Sweet Pea Dairy will select the animals it wants for the next year's herd and buy them back from us. We will sell all but 2-3 goats for meat, which greatly reduces the cost and time for carrying animals through the winter.



The silvopasture unit includes both conversion of brush and trees to silvopasture and wet pasture grass to silvopasture. The grass to silvopasture conversion is easier, which is true for about 3 acres on Wilhelm Farm. Once conversion is complete, the unit will be managed with several paddocks of roughly 1/4 acre each. Animals will be moved frequently from paddock to paddock with intense grazing followed by longer periods of rest.