

January 2018 Graze

How to properly graze a woodlot

Silvopasturing in existing trees requires a three-step process

By Brett Chedzoy

As a forester trained in the 1980s, I learned that livestock should be kept out of woods. A variety of potential negative impacts — soil compaction, damage to tree roots and bark, loss of vulnerable young trees — can result when livestock are allowed unmanaged access to woodlots.

This was good advice for that time, as many small livestock farms and dairies here in the Northeast were inadvertently degrading their valuable hardwood forests by allowing too many animals to spend too much time in the woods.

But much has changed since then. Today's challenges, including farm viability, growing pressure from invasive forest plants and pests and efforts to do more with our farms, are why we now need to consider silvopasturing.

This management practice can address a number of forest health issues while also greatly expanding livestock production in areas where livestock and trees can benefit from each other.

A simple definition of silvopasturing is forest, forages and livestock production on the same land over a long period of time. In other words, silvopasturing is a sustainable and synergistic system where none of the resources are managed to the detriment of the others.

Management is the key

Let's start by looking at some key differences between silvopasturing and simply putting livestock into wooded areas.

Unmanaged woodland grazing gives livestock access to wooded areas that have not been significantly modified (thinned) to allow sufficient sunlight to reach the ground level, which is a crucial ingredient to grow both herbaceous and woody plants that are palatable and nutritious for animals.

Another characteristic of woodland grazing is that animals are usually not grazed through these areas for short durations separated by long rest intervals.

The worst examples of woodland grazing occur when the woods are used as sacrifice areas in soggy weather, or when stock have continual access for shade throughout the summer months.

The symptoms created by beating up on the soil and trees roots usually don't show up until years down the road, at which point the damage is done and the trees are not likely to recover. The losses may be significant considering the relatively high value of hardwood timber.

By contrast, silvopasturing is an intentional effort to grow quality trees and forages at the same time. Livestock become the main tool for managing what grows beneath the trees, and the trees in turn provide

valuable benefits including timber (lumber, firewood, posts), shade, food (browse and mast), and numerous “ecosystem services” that protect the soil and surrounding watershed.

In open pastures, the grazer can readily mow, spray or even till and re-seed to deal with noxious weeds and invasive brush. But livestock impact is often the only practical tool for managing vegetation in tree-covered silvopastures.

Consequently, silvopasturing relies on intensive rotation of higher livestock densities. When done correctly, the stock put enough pressure on plants in the silvopasture understory to avoid a blow-up of brush, brambles and other problematic plants.

This is paired with longer rest and recovery periods to allow forage plants to adequately mature in the partial shade of a silvopasture, and to minimize the potential negative impacts on valued trees. Bored or hungry animals become destructive in silvopasture settings, so move them in just long enough to do their job, and then move them out!

Silvopastures can be created either by adding “woods to pasture” or “pasture to woods”. The successful establishment of trees in sod environments full of hungry herbivores requires planning, skill and a commitment to doing things the right way. Anything less will likely be a waste of time and money. (I will address “woods in to pasture” in a future article.)

Three steps

Developing silvopastures from existing wooded areas can be distilled down to a three-step process:

- 1.** Redistribution of sunlight by changing the canopy from all trees and shrubs to just the best trees and shrubs.
- 2.** Edible plant establishment.
- 3.** Grazing management that will encourage the gradual expansion of “good” plants while discouraging growth of “bad” ones.

Viewed from a distance, silvopasturing is a hybrid system that melds the expectations of farmers who usually measure outcomes based on seasonal cycles, and foresters who seek desired results that can take decades to achieve.

Silvopasture practitioners may need to adjust the timeframe in which they normally expect to reach the desired conditions. Any of the above steps usually requires years instead of months to achieve full results, though more time and money can be invested up front for those needing instant gratification.

Our farm’s example

I’ll offer our family’s farm in Watkins Glen, New York, as an example. When we returned here in the early 2000s with a young family in tow, we had about 100 acres of fields that a tenant farmer had cropped to death for more than 20 years, and a similar acreage of woods growing on the same kinds of sites, soils and slopes.

Most of our woods was dominated by noxious understories of both native (beech brush and hop hornbeam) and non-native woody plants (you name it, we grew it!). I knew the ugly understory could persist for many years and carry a high opportunity cost until we did something about it.

Early (pre-silvopasturing) attempts to kill the bad plants by mowing, spraying and dozing were largely unsuccessful, and the voids we created were quickly refilled by even worse thickets.

But I had become familiar and comfortable with the concept of silvopasturing while working in South America in the 1990s, and soon started to see it as an effective and cost-effective strategy to rehabilitate our wooded areas and create a viable grazing farm business.

In a typical farm woodlot, half or more of the trees are only good for firewood. So in one way, silvopasturing can be thought of as a choice between growing firewood and growing forages.

With silvopasturing, Step 1 involves removing the firewood-quality trees and undesirable woody shrubs through a combination of harvesting, felling, girdling and crushing. This allows the sunlight that these trees and shrubs would have intercepted to reach the ground level.

We try to combine efforts to thin both the upper and lower strata of the forest into single operations, even if it means that some of the timber value is being traded away in exchange for removing non-merchantable trees and shrubs. So in 2003 we mowed 60 of the worst acres with heavy-duty machines at a cost of several hundred dollars per acre.

In 2015 we finally did our first “for profit” thinning across the entire 100 acres of woods, removing 1,000 tons of pulpwood and 20,000 board-feet of saw timber.

We required the loggers to remove most of the remaining non-merchantable, suppressed trees and shrubs in the lower strata. Most of this material was felled and then lopped down or crushed to reduce grazing obstructions.

As this is happening, it is necessary to create conditions for the existing seed bank or supplemental seeding to germinate and become established (Step 2). This means conducting the thinning operation in a way that will result in sufficient soil scarification (light disturbance) and good seed-soil contact during good growing conditions.

Grasses and forbs typically will not germinate beneath a thick layer of undisturbed leaf litter. Thinning (logging) on a snow pack in the winter may not create the necessary soil disturbance, nor will seeds germinate and persist well during hot, dry summers.

That said, thinning usually has to occur whenever time and contractor availability allow. Utilizing the expertise of a qualified consulting forester will make the job of tree selection and thinning implementation go smoother and avoid many of the common pitfalls associated with commercial timber harvests.

Once we’ve let the sunlight in and things start to grow, Step 3 is to practice intensive rotational grazing. Animal impact is the silvopastoralist’s main tool to promote the good plants while keeping the bad ones in check.

Animal impact is a combination of all the things you do out on pasture: duration, interval, frequency, density, stocking rate and stocking capacity. The grazer can manipulate all of them to achieve the necessary impact.

Impact is also influenced by vegetation quality and quantity, soil conditions, diet (example: the animal craves woody plant fiber due to a low-fiber ration), accessibility (inside a brushy area vs. outside) and season (ground conditions, forage maturity and more). As with grazing in any pasture setting, impact considerations should never take precedence over nutritional and welfare considerations, although some animals may tolerate a lower average quality of feed.

It’s unrealistic to think that livestock will make all of the bad plants disappear — especially the tall, woody ones — or eat and defoliate enough of what is being targeted to effectively weaken and kill the plants.

Thorny bushes are one example here. Chemical and mechanical treatments may be necessary to get conditions to the point where the four-legged workforce can do the rest.

And remember that like humans, animals will always go for the best stuff first, eating the rest only when forced. Density creates competition. Competition reduces selectivity. Baiting animals into brush patches with hay or a mineral feeder is also an effective way to increase impact on a micro-scale.

In our early years we were grazing mostly sheep and goats. Over time we found that beef cattle were the best fit for our situation, and that a single strand of hot wire was usually enough to control the

unwanted vegetation that wanted to regrow. Very high stocking densities are required — an issue I'll address in a future article.

More experience and research is needed to determine adequate levels of livestock impact for different conditions, and the best methods for achieving this impact.

If you are interested in following other experiences with silvopasturing grazing or sharing your own, visit Cornell University's silvopasture forum at www.silvopasture.ning.com