Cornell University
Cooperative Extension

Forest Connect

College of Agriculture
and Life Sciences
Department of Natural Resources
214 Fernow Hall
Ithaca, NY 14853
t. 607-255-2115
www.ForestConnect.info

A Framework for Successful Planning and Implementation of Silvopasture Projects

The Silvopastoralist's Quiz…

I am willing and able to:

- Intensively manage both *livestock* and *timber* on my property in a way that is not detrimental to either resource over the long-term?
- Accept significant and continual visual changes in my woods and pastures?
- Invest in sufficient grazing infrastructure to allow full rest and recovery of each silvopasture paddock?
- Adapt management to changing conditions in plant composition (overstory and understory), site carrying capacity for different numbers and types of livestock, weather, and other dynamic factors?

These are just a few of the questions that require an unequivocal "YES" response to move forward with silvopasturing as a management system on your land, or the land that you manage for others.

Mistakes in agriculture can often be corrected quickly: a reseeded field; a herd liquidation; or the sale of a piece of equipment that didn't meet expectations. Mistakes in forest ecosystems, by comparison, can take many decades to correct. Therefore, it is important to carefully consider all aspects of a silvopasture project *before* initiation to avoid mistakes that are both costly and enduring.

The following list of questions can be used to help initially gather data to be used in the planning process. This is not meant to be an exhaustive list of all considerations that one should take into account, and responding to the questions may require detailed thought and diligence.

1. **Why?** State the purpose or goals of the proposed silvopasture project

2. **Where?** Describe the location, physical boundaries and why this site was chosen. Include a detailed drawing that shows access, water sources, gates, hazards, etc.

3. **What?** Describe the proposed actions and desired end conditions

4. **When?** State when work will commence and be completed for major project phases.

5. **Who?** List activities to be done in-house and those that will be contracted. Do you have the time and ability to perform the tasks listed as in-house and what is the opportunity cost?

6. **Will it pay?** Prepare a budget for the project and compare to the estimated benefits. Know what it will cost going into the project to do things right, and make sure that it is a sound investment.

7. **What did I forget?** List potential pitfalls and contingency plans. Are the assumptions realistic?

Cornell Cooperative Extension provides equal program and employment opportunities.

Creating Quality Silvopastures in Forested Areas

Silvopastures are only as good as the ***quality*** and ***quantity*** of food that is available for livestock. Consequently, unthinned and overstocked forest stands with barren understories are not silvopastures!

There are three keys to establishing quality food (primarily forages and browse) in silvopastures:

1. *Reduce stand density to allow adequate solar energy to reach the ground level*
2. *Meet the germination requirements of the target species*
3. *Manage the system to encourage the growth of desirable vegetation, once established*

Key Number 1 – Reducing Stand Density

All trees and shrubs in silvopastures intercept valuable sunlight from reaching the ground. Therefore, thinning in silvopastures should consider trees and shrubs in every strata and location - even if they do not apparently compete with the growth of the best timber trees in the upper canopy. One measurement that can be used to assess forest stocking, or density, is "basal area". Basal area is the surface area of all tree stems per acre at "diameter breast height" (4.5' above ground). Basal area can be correlated to the "porosity" – or "relative density" - of the upper canopy and the amount of sunlight reaching the ground. The lower the basal area, the higher the sunlight levels at the ground level. Simple instruments used to measure basal area are the angle gauge and prism. Limited research in the East suggests that acceptable growth of the more shade-tolerant cool season forages occurs at BA levels of < 60 ft2/acre. This stocking is also consistent with target thinning levels for optimal timber growth. Frequent, light thinnings of the main canopy may be needed to maintain sufficient sunlight at ground level

Key Number 2 – Meet Germination Requirements

Woods that are adjacent to fields and pastures will normally have sufficient seed banks of forbs and grasses to provide adequate volunteer forage establishment - once there is sufficient sunlight at the ground level. Use species and varieties that have reputed tolerance to modest shade when investing in supplemental seeding. Seed germination and establishment will also depend on numerous factors such as: soil contact, soil moisture, seed quality, soil pH and fertility, pests, sunlight levels, temperature, and disturbances such as grazing during vulnerable stages of early growth. Scarification of the duff (leaf) layer may be necessary to achieve germination.

Key Number 3 – Manage the System to Encourage the Growth of Desirable Vegetation

Silvopastures should be managed with "Management Intensive Grazing" (MIG) principles. Longer than normal rest periods may be needed to allow plants in the understory to fully recover since they are generally growing in lower sunlight levels. Woody plants are generally more sensitive to the timing, frequency and intensity (level of defoliation) of grazing than grasses and forbs, so care should be used if preserving woody plants in the understory is a goal. Silvopastures should be developed at a rate that is synchronized with herd growth to avoid having the area become overgrown with undesirable vegetation following thinning due to inadequate grazing pressure.

Cornell Cooperative Extension provides equal program and employment opportunities.