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Planting Plan

Plan Date:

Project ID:

Note: This is Trees For Graziers Planting Plan but with additional explanations for TSPs and other silvopasture professionals to give some insight into thought processes. Explanations are formatted in italics and begin with an * (asterisk .

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NRCS Silvopasture Practice Definition

Establish and manage trees on the same land unit as forages and livestock

Purpose

- Provide forage, shade, and/or shelter for livestock.
- Improve the productivity and health of trees/shrubs and forages.
- Increase carbon sequestration and storage.
- Improve soil quality.
- Improve water quality.
- Reduce soil disturbance and erosion.
- Enhance wildlife habitat.
- Improve biological diversity.
- Provide for beneficial organisms and pollinators.

****Insert Maps here (soil types, topography)**

Planning Step 1: Questionnaire

This section will be filled out by the farmer prior to meeting with TFG staff so that we can more fully understand their unique context and goals. The farmer should first read through "The Grazier's Guide to Trees" to develop a basic knowledge of silvopasture and how it can be applied to their farm. Before their first visit, a TFG staff will review this section, and can address any unanswered questions together with the farmer.

**Note: TFG maintains a pdf version of the questionnaire as well as a Google form version. When working with those who do not use the internet regularly, we print and offer paper questionnaires.*

Primary Questions

**These questions allow us to quickly assess if the client is ready to move forward with a consultation. Understanding their knowledge, willingness, interest and skill set from the beginning can prevent us from finding out later that the client may have needed more time, or even wasn't a good fit for agroforestry practices, before continuing with a plan.*

- How familiar are you with silvopasture and other agroforestry practices?

- *Very familiar*
- *Somewhat familiar*
- *Not very familiar*

- What makes you want a silvopasture?

- Are you rotationally grazing your livestock?

**If a farmer or manager is not rotationally grazing their livestock, the livestock may need to be excluded from pastures during tree establishment. Alternatively, the farmer will need to be willing to learn some rotational grazing techniques in order to keep pressure off of young trees.*

- Are you currently practicing any of the 5 agroforestry practices?
    - Alley cropping—growing field crops between rows of trees
    - Silvopasture—grazing livestock in an intentional mix of trees and pasture
    - Riparian buffers—planted areas around waterways

    - Windbreaks—rows of trees planted to prevent erosion and provide other benefits.
    - Forest farming—raising shade tolerant crops in established forests

- Are you interested in incorporating any other agroforestry practices into your management plan besides silvopasture? List examples.

**If there are streams or wetlands on the farm, installing riparian buffers can often be a great way to access funding. In addition, alley cropping may be supported by USDA-NRCS in some states where silvopasture is not. Windbreak funding is available in almost all states, and can sometimes be used as a quasi-silvopasture where silvo funding is not available. To see which practices are funding through NRCS in which states, visit this link.*

Vision (What are you currently doing and where would you like to be?)

**Getting insight to the client's vision of their operation will act as our guide in creating the big picture patterns for their final plan. Their vision provides us with the foundation of their context.*

Describe your current farm operation in five sentences or less.

**The goal is to get a well-rounded understanding of their farm, so that we can view the farm through the farmer's eyes before we develop a plan.*

Describe where you would like your farm operation to be in five sentences or less.

**We want to listen carefully to changes farmers would like to make in terms of economics, ecology, aesthetics, etc. Again, the goal is to develop a plan that will align with the farmer's vision of what the farm could be.*

Values (What is important to you in farming and life?)

**The purpose of understanding the client's values helps us get background into knowing them on a personal level. These details explain the "why" behind their vision and goals, and can help us in our design with some of the details pertaining to social life and work environment.*

What motivates you to farm the way that you do?

How does silvopasture integrate into your major beliefs and values?

Goals (How are you going to get to your vision?)

**Outlining the clients goals gives us precise detailed benchmarks of which to achieve in our design process. These will allow us, the client and others to know that the plan is succeeding or not, as well as leading us to properly plan for differences in design, management and species selection. Creating a "goals articulation" together with the client can be extremely beneficial for them as well. Oftentimes putting clear, definitive and achievable goals down on paper is a very empowering step, organizing and distilling thoughts into a list of tasks in which to accomplish in order to reach their vision.*

Economic Goals

- What goals do you have regarding decreasing your expenses through silvopasture? For example, reducing feed costs, reducing heat-stress related vet bills, reducing cost of spreading manure because animals spend more time on pasture, becoming more self-sufficient in growing more of your own food (through tree crops) and fuel (fire wood from pruning), etc.

- What goals do you have around increasing or diversifying your farm income through silvopasture? For example, adding new tree crops for sale, increasing the carrying capacity of your land, creating new opportunities to bring more people on the farm, etc.

- Do you expect silvopasture to unlock business opportunities for you? For example, transitioning to grass-fed milk, getting certifications like Regenerative Organic or Certified Humane, strengthening your brand for customers, etc.

Ecological Goals

- What goals do you have about wildlife habitat? For example, creating food and shelter for bees, pollinators or birds, increasing habitat for hunting, etc.

- What goals do you have for soil health? For example, increasing soil life, increasing soil mycorrhizal fungi, increasing soil carbon and organic matter, nutrient cycling from deeper soil horizons, etc.

- What goals do you have for water quality? For example, reducing overland runoff into water bodies, having shade in the pastures that gives an alternative cooling strategy for cows who would otherwise stand in a creek for cooling, etc.

Other goals. Describe other goals you might have. Others have mentioned having a visual barrier from neighbors, a barrier to prevent pesticide drift, the simple ability to have a picnic in the shade, the opportunity to leave a physical legacy, etc.

Social Context

Who are the key stakeholders involved with your farm or in the establishment of silvopasture? Can be landowners, family members, employees, etc.

**Farms are complicated entities. Often multiple generations live on or have shares in a farm. Hired managers and staff may also play a prominent role in decision-making. The consultant needs to be aware of who might be involved to anticipate the need for more education to get buy-in and to work toward full participation.*

Who is the final decision maker?

**Ultimately, the consultant needs the final decision maker to be on board with the plan. Discovering who this person is early in the planning process can only be advantageous to the planner.*

Who will be most actively involved in the establishment and aftercare of the silvopasture system?

**Over the long haul, those involved with the silvopasture on a daily basis will be the ones who make it successful. Planners may need to work with the aftercare team to allow them to bring thoughts and concerns to the planning process so that they feel included and understand their valuable role to the success of the project.*

Who Is the primary grazing manager and how many others are involved?

**The grazing manager(s) need(s) to have input because the silvopasture plan needs to work with the general grazing plan in terms of paddock layout, tree protection, etc.. The grazing manager ought to have some understanding of the areas of the farm that tend to be extremely wet in the spring, where the livestock do best in the hot months of summer, etc.*

What considerations would be made regarding your neighbors? For example, create a privacy border, spray barrier, keep trees away from their boundary, etc.

**Are there unsightly views that you might want to hide with trees? There are sometimes right of ways on property boundaries to consider as well as driveway and roadway lines of sight and other zoning ordinances.*

A spray barrier would be a planting of trees downwind from a neighboring farm that uses chemicals. The trees in theory could absorb the spray while acting as a windbreak.

Do you have any aesthetic concerns, wishes, or considerations with planting a silvopasture? Do you want the silvopasture to look a certain way?

Some potential negative considerations are the possibility of trees blocking certain views, having tree tubes in place for the early years after silvopasture planting and the potential for weeds to grow unchecked around plantings. In addition, the client may have a positive vision for the silvopasture when it is mature. These considerations can lead toward installing more mature trees for example or excluding livestock from certain areas to allow for successful establishment without tree tubes.

Land Context and Grazing Management

****These details give us a picture of past and current land use before entering the consultation. Also it gives us an understanding of their stewardship and grazing management.***

Share what you know of the land use history, particularly how the land may be degraded from prior (mis)use.

Total farm acres

Acres grazed (not cropped)

Acres in crops (never grazed)

Acres in crops that are sometimes grazed (either grazing crops residues or cover crops)

Main crops grown

Acres in hay

Acres in woods

Acres in other usage

Would you be interested in converting some of your crop land to grazing land?

**Farmers converting cropland to grazing land could combine fencing and watering infrastructure and silvopasture from the beginning of the project.*

Do you keep or intend to keep bees?

**This question presents the opportunity to consider good pollinator species in the species selection. Beekeepers are often very fond of planting trees that will support their small winged livestock, like black locust, basswood or tulip poplar.*

What types of livestock are grazing in your future silvopasture areas? (Dairy cattle/beef cattle/sheep/hogs/broilers, etc.)

**The types of livestock that will be grazing silvopastures sets the course for how much protection the young trees will need. As a general rule, the larger the livestock that have access to the trees, the more protection will be needed. And we don't necessarily need to know all the animals on the farm in this case. Consultants need to know what animals*

will have access to the areas we are planting. For instance, many farmers have horses, but keep them in separate areas from their cattle, which take up the bulk of the farm.

What age classes have access to your future silvopasture areas? For example, only mature cows, or only heifers, or all age classes.

**Younger animals can be more rambunctious and more likely to damage trees than older livestock, meaning that protection needs to be especially thoughtful with younger stock. However, mature livestock often have the height to reach leaves emerging from tree tubes or hanging over fence lines.*

What breed(s) of livestock do you have in your future silvopasture areas?

**Cattle breeds vary significantly in terms of height, horns, and temperament. The planner needs to have some familiarity with livestock breeds.*

What, if any, livestock species do you plan on adding in the future?

Do you keep animals off pasture, like in barns, sheds, or feedlots?

If so, would you like to eventually incorporate them into your pastures, and what would be your main goals of doing so? For example, less manure management, making use of mast crops, better animal welfare.

Size of herds/flocks

Do you have a grazing plan?

If so, was your plan prepared professionally?

**Professionally prepared plans can be critical in unlocking cost-share funding, especially through conservation districts or the NRCS.*

Average size of paddock? Does your paddock size vary by season?

How often are livestock moved?

**In general, the longer livestock graze an area the more likely they are to damage trees. Graziers who move once per day or multiple times per day are more likely to have the skills to protect trees well.*

Do you currently use electric fencing in your pastures? If so, briefly describe your setup.

Main forage species

**Most pastures in the Northeast will have grass mixes. Fescue, orchard grass, timothy would be common as a the major component of the mix. Expect that the farmer might list a variety of grasses. Often legumes like red and white clover would be dotted through the pasture.*

Do your livestock currently have regular access to a wide variety of browse (tree or shrub) species? If so, explain.

**Browse is defined as "shoots, twigs, fruits, and leaves of trees and shrubs used by animals for food." Browse has inherent advantages, especially for small ruminants who are more susceptible to parasites, as parasite-free fodder. Farms with sheep and goats should be looking for more browse for their stock.*

Do you have trouble with forages that livestock don't like to eat, like toxic endophyte fescue or reed canary grass? If so, explain.

**Fescue can be toxic to cattle and sheep who tend to avoid it - especially during hot weather. Fescue toxicity can lead to poor stock performance and abortions in much of the eastern United States known as the fescue belt. Reed canary grass is an invasive grass especially common in wet areas that has been connected with toxicity to cattle as well but is less understood.*

Do your animals have significant parasite issues? If so, explain.

**Tree fodder from woody browse would be very unlikely to transmit parasites due to their height. Most parasites climb up the stems of grasses. Some tree species have antiparasitic compounds in the leaves, stems, and nuts.*

How many days do you graze per year on average?

**There are several things for the consultant to learn here. 1. Level of skill as a grazier. 2. Opportunities for spring and fall planting without needing to time plantings around grazing events. 3. The grazing season will determine when fodder and browse are most needed.*

How long are you able to graze stockpiled forages?

**Stockpiled forages are grasses grown during the growing season but left standing in the field and not grazed until the dormant season. Fodder trees have the potential to offset forage requirements during the growing season, and hence increase the amount of stockpiled feed available in winter.*

How do you currently avoid heat stress?

**Livestock performance can be drastically reduced in the heat of summer. If livestock are given access to small shady areas, they will congregate and as a result nutrients will collect there and soil compaction will occur.*

What shade options do you have?

What shelter/windbreak options do you have?

**Windbreaks can take the harsh edge off of winter storms for livestock. Windbreaks planted as living barns (as per Brett Chedzoy) are a low-cost alternative to built structures.*

How much hay do you feed during summers?

**Silvopasture can increase the quantity and quality of forage production during hot weather by reducing heat stress on forages and allowing morning dew to be more effectively taken up by plants, etc.*

How severe has drought been? What do you expect going forward?

**In areas where drought is a significant concern, fodder trees offer a resource to get through the drought.*

How do you plan for and manage in a drought? Destocking, buying hay, etc.

**Our goal is to see what strategies the farmer has available to them, and how flexible their management strategies are. The more expensive and painful droughts are to the farmer (for instance, if destocking would mean selling at a large loss, or there's no hay available to be purchased in the area), the more valuable fodder trees become.*

What issues do you experience with downpour or flooding events?

**Trees can help to stabilize highly erodible land, infiltrate more water into the soil, reduce runoff, and reduce the force of intense rain or hail on soils.*

What are your winter grazing protocols (i.e.sacrifice lot, keep them in the barn, bale graze, etc.)

**Since pasture forages are not growing significantly after November in the Northeast, ruminants are typically fed stored feed. There are several common types of stored feed and several methods of feeding.*

Types of stored feed for ruminants:

- *Dry hay can be bailed as small square bales, large square bales, or large round bales.*
- *High moisture hay (often called haylage) is bailed and wrapped while it is still wet. High moisture hay ferments and seals in much of the quality of the hay.*
- *Silage (more common on dairy farms) consists of fermented grasses or crops that are stored in silos or (more commonly now) in long plastic tubes on the ground. Silage is similar to high moisture hay but is stored in large quantities and could also be made of corn or other warm or cool season annuals.*

Feeding methods:

- *Sacrifice lots are areas where animals are fed stored feed for weeks or more at a time. These areas will be high in nutrients but typically will not regrow into quality perennial pasture due to significant animal impact in these areas. Hence the perennial pasture is "sacrificed."*
- *Feeding animals in the barn keeps animals drier but requires cleaning out the barn and hauling manure to pastures for spreading.*
- *Bale grazing is a method of rolling out round bales on the pastures to allow livestock to eat the forage directly off of the ground. Often the intent is to "waste" a portion of the bale in order to provide more organic matter to feed the soil biology.*

This is an important consideration when it comes to utilizing mast crops like honey locust pods or persimmons. If a producer keeps their livestock off of pasture all winter, they won't have access to mast drop. In that case, the producer may elect to change their practices once there's a substantial amount of mast for their livestock.

How do you provide water to your livestock?

**If there is a need for additional watering infrastructure, ideally it would be developed prior to silvopasture establishment. As much as possible the planner needs to consider other infrastructure needs while thinking through silvopasture planning. Water infrastructure is often fundable by NRCS and can be included in a funding application package for silvopasture.*

What efforts do you take to prevent damage to sensitive ecological areas? (This could relate to keeping them out of streams, out of wet areas unless it's a dry period, stream crossings, etc.)

**Shade offers an enticing alternative to streams especially for cattle who miss their summer stream time. There's a reason hot cattle will hang out in the water if they have access to it: they need to cool off. Hence silvopasture can be a tool to enhance water quality goals by creating a viable alternative to cattle standing in water bodies.*

Would you be open to excluding large livestock (cattle, horses and goats) from the planting area for a few years while the trees get established? If you plan on keeping large livestock away from the trees for several years while the trees get established (by haying or cropping in between, running smaller livestock that won't damage the trees, or keeping the large livestock several feet removed from the trees), it opens up options for protecting the trees inexpensively.

**Protecting trees from livestock comes with costs for tree tubes, polywire, and other measures.. If the farm were understocked by a large margin, areas planted in silvopasture could be excluded from livestock for a few years, to allow trees to be established.*

Are there major changes to grazing management coming up? If so, explain.

Is your farm organic, transitioning, conventional, etc?

**A requirement that trees coming to the farm be certified organic might put constraints on the approved sources for trees and potentially the budget.*

Infrastructure and Equipment Access

Do you have underground utilities/piping in your pasture?

**We want to be very aware of any existing infrastructure, so that we do not risk damaging it in our tree planting, and allowing the appropriate right-of-way from any utilities. If new water lines are to go in, they are best done before trees are planted.*

What is the width of the widest machinery that will be accessing your silvopasture area?

**This is a key consideration for determining between-row spacing and headlands (space for turning machinery at the edges of fields).*

Do you have any access considerations for your family or others such as walkways, picnic areas, etc.?

**Sometimes there are unwritten agreements allowing access for family, friends, and neighbors.*

What headlands (turn spacing at the edges of pastures) would you like to have at the end of each row of trees?

**Tractors and other machinery require significant distance for travel especially when turning at the end of a field. The headlands is the distance between the end of a row of trees and the field edge. The consultant needs to be generous with headlands in order to allow for ease of operation of equipment. Do not make things too tight!*

Do you use animal lanes or how do you move animals between fields?

**Animal lanes are permanent fenced paths or roadways for livestock to move from field to field, and are especially common in dairy systems, since cattle have to move back and forth from barns multiple times a day. Many times these paths require a series of gates to control livestock flow.*

Are there any other considerations of access or infrastructure (existing or planned for the future) that the consultant should be aware of?

**Sometimes the client may be working with another consultant or planner to change their grazing management or install infrastructure that you should be aware of. This open ended question also allows the client to think about any other issues that might not have been addressed.*

Tree context

How familiar are you with trees in general?

**We're gauging the clients knowledge and experience. Again this will help us in tailoring the design to the client as well as understanding how much educational resources we should share with them up front.*

What tree species already grow on your farm?

**This will be something to verify on the site visit, since not all clients are knowledgeable about the specific species of trees. The easiest place to start silvopasture is through thoughtful management of the existing trees.*

What tree species already grow in your area?

******Tree species found on neighboring farms and in surrounding areas are likely to do well on the client's farm as the soil types and landscape should be comparable.*

Have you planted trees in your pastures before? If yes, what has your experience been?

How do you currently use trees on your farm? (shade, fodder, windbreak, firewood, food etc)

Do you have existing woodlots? If so, would you like to convert any to silvopasture?

**Many farms have woodlots that are poorly grazed and under-managed. While outside the scope of this planning process, helping farmers improve the management of wooded areas is economically and ecologically important.*

Enterprises

Existing Enterprises

What types of enterprises do you currently have on the farm?

**It is common among farmers and ranchers to refer to each piece of the farm economy as an enterprise. For example, a farmer might have a sheep enterprise and a pastured egg enterprise. An additional term might be helpful: centerpiece, which refers to the main economic product of the farm.*

Where do you sell your products? (on-farm, farmer's market, wholesale, etc)

**The idea here would be to understand if there might be a marketing advantage to having silvopasture on the farm. Someone who sells their livestock through a sale barn won't have any marketing advantage through silvopasture, but someone who sells directly to an ecologically-conscious clientele might stand to attract greater loyalty through planting trees.*

Are you part of a larger brand or cooperative? (like Organic Valley, Vital Farms, etc.)

**Many brands and co-ops have funds or other support that are available to members. Knowing these connections can be a great way to access funding.*

New Enterprises

Do you want to add new tree crop enterprises to the farm? If so, which ones?

**If people have dreams, don't hold them back, but do put realistic labor and investment needs, time frames and return-on-investment expectations to these enterprises.*

Encourage farmers to establish new enterprises in a way that won't sink the farm if they don't turn out as expected.

When would you like those new enterprises to be creating revenue and the need for labor soon or down the road. For instance, just a few years from now, or 15 years from now when the kids are old enough to help.

**Some trees will take decades to bear while others can produce sooner. Labor requirements and income streams can also vary significantly across time.*

What scale would you like tree crop enterprises to be? Small retail, large wholesale, somewhere between?

**If someone already has a retail outlet for their farm products, like selling at a farmers market, adding a small amount of a new crop can be easy to sell. If looking for wholesale outlets, the producer will need to find some good connections.*

Are you interested in growing timber trees? If so, for what use? For instance, high quality hardwood veneer, fence posts, pine timber, on-farm lumber, etc.

**Hardwoods can produce quality logs in an open silvopasture, but will require more management and pruning. Species like black locust and osage orange can make great fence posts. Hybrid poplars are a great option if someone wants fast shade and an option for milling lumber for on-farm use.*

Would you like to plant trees as living fence posts?

**Living fence posts are a largely untried practice of installing fencing to trees in such a way that the trees do not grow around the fencing hardware. See link for details. If a client is interested in living fence posts, trees would need to be planted in existing fence lines or on planned fence lines.*

Would you like to use existing trees as living fence posts?

**If there are insufficient existing trees, additional trees can be planted to fill in the row.*

Are you interested in tree crops for home use? Like chestnuts, walnuts, fruits, etc.

**Tree crops for home use offer a solid way of increasing household resilience and self-sufficiency, without the need to commercially harvest, process or market tree crops.*

Silvopasture Goal Priorities

Of the following issues on your farm, rate in terms of your priority (Summer heat stress, Winter cold stress, lack of summer fodder, lack of winter fodder, Income diversification)

1. _____
2. _____
3. _____
4. _____
5. _____

Tree Species Selection

Check the tree species you're interested in:

- Honey locust
- Persimmon
- Black locust
- Hybrid Poplar
- Hybrid willow
- Mulberry
- Oaks
- Apples
- _____
- _____
- _____
- _____
- _____
- _____

- _____
- _____

Do you have preferred sources for seedlings?
Do you have any preferred varieties?

Plan Details

What are your priority areas? For example, south-facing slopes, day pastures, cold windy areas, saturated soils, etc.
When it comes time to divide the plan implementation into phases, priority areas can be addressed in the earliest phases.

What soil conditions are in the area to be planted? (Saturated, well-drained, dry, etc.)

**The drainage classes of soils will impact the tree species selection since drainage class preference is a species-specific trait.*

Explain the topography of the area to be planted.

**Topography is the slope of the land. Some typical responses might be bottom, slopes, shoulders, ridgetops, etc.*

Is any of the area to be planted in a floodplain?

**If planting into a floodplain, you'll need to account for the possibility of flood waters interfering with young trees, potentially knocking over shelters, washing away tubes, etc.*

What direction do winter winds and summer storms typically come from?

**Windbreaks and shelterbelts would be planned to counter the prevailing winds at the most critical times of year.*

How many acres would you like to plant with trees?

Do you have a sense of how many trees you would like to plant? Or the spacing you'd like between trees.

Are there things about your farm that make planting trees difficult? (really steep or rocky, wet or dry, etc.)

How would you rate your deer pressure? (None/Low/Moderate/High)

- None
- Low
- Moderate
- High

**Deer can be especially hard on young trees due to buck rubbing and browsing. If no deer are present and large livestock can be excluded, it opens up the option of planting trees without shelters, like what could be the case for some poultry silvopastures. Deer pressure will need to be accounted for when shelters are eventually removed, such that rubbing does not kill trees.*

Funding Sources and support

Indicate which of the following funding sources you are open to

- Self funding
- Loans
- NRCS (EQIP or CSP)
- Private grant funding
- Carbon credits

Have you used funding through NRCS (EQIP/CSP) before? If yes, what was your experience?

Are there groups in your area that might support silvopasture plantings? Whether through cost-share, free trees or shelters, volunteer labor, etc.

**Watershed groups, conservation districts, and tree planting initiatives may have resources available.*

Do you have a working relationship with your conservation district or NRCS?

**These are the groups that will be able to provide the most support for the most farmers, because every single farmer has access to support through these groups. Whether their local staff are supportive or knowledgeable of silvopasture is another story.*

If you are hesitant about using outside funding, please share.

**Some farmers are philosophically opposed to government funding of private businesses or wouldn't accept funding from groups with which they are not ideologically aligned.*

If you will bring your own money to this project, what is your rough budget?

**Many of the sources of funding are cost-share programs that require some cash or in-kind contribution to the project. In addition, clients often need to bring some money for projects even if they are reimbursed after the installation due to the cash flow structure of the program.*

How much, if any, of the labor do you plan on providing for this planting?

Will you be making a large investment in equipment or farm infrastructure in the near future? (Could be helpful if pursuing a loan for silvopasture)

Timelines

What timeline do you envision for planting? All at once, spread out over several years, etc.

**For those who really understand the potential of silvopasture, there can be a strong urge to see the project come about quickly. Since trees are a slow game, it can be wise to work in phases in order to learn along the way. In addition, there can be a narrow window of time for planting bareroot trees in the spring which can be a hectic time on many farms. Start now, start slow and work at it over time to succeed in the long game.*

Would you prefer spring or fall planting? What makes you prefer one over the other? Know that because of tree availability, it may not be practical to plant in your preferred time frame.

**Despite the response, many types of trees (e.g. bare root trees) need to be planted in the spring. The client's preference may indicate how busy their spring or fall seasons are.*

Do you plan on growing any of the planting stock yourself, like willow cuttings?

**There is significant cost savings to be had by developing or using on-site live stakes. For projects in phases, early plantings of willow and poplar may provide live stakes for later phases.*

Client Preparation for Consultation with planner

What other major factors should TFG be aware of to plan this project? (For example, major financial constraints, imminent farm transition, etc.)

What goals do you have for a consultation?

What are the main questions you would like to ask during consultation?

**Planning takes preparation by the planner and the client. We encourage clients to be as thorough and thoughtful as they can be to make the planning process more productive for the long-term goals of the client.*

Planning Step 2: Consultation

This phase of the plan development process will be completed by the planner after the above questionnaire is filled out by the farmer and reviewed. This section is designed to follow the outline of the questionnaire with space for jotting down questions to bringup with the client during the consultation. The meeting could be a call or in-person.

Clarifying Questions from Step 1

**The planner needs to approach the consultation with a thorough list of questions in order to clarify things that were unclear from the farmer's responses to the questionnaire or that require additional information.*

Vision, Values and Goals

Social Context

Land Context and Grazing Management

Infrastructure and Access

Tree Context

Enterprises

Silvopasture Goal Priorities and Tree Selection

Plan Details

Funding Sources and Timelines

Tree Protection

What size of tree shelter will you use?

- Short (ideally to protect from chickens, or in combination with electric fencing to keep livestock away)
- 5’ (works for deer and sheep, but not ideal for cattle or goats)
- 6’ (best for cattle and goats)
- 6’ + extender (horses and mules)
- None

How will you protect the tree shelters

- Electric fencing
- Barbed wire
- Other (explain)
- None

Will livestock need to move between rows of trees protected by electric fencing? If so, determine the fencing method (overpass, bridge or underpass).

Are you interested in being responsible for applying mulch to the planting or would you prefer TFG to complete this service?

Do you have access to any of the following mulch types?

- Wood chips
- Compost
- (Spoiled) hay
- Grass
- Other (explain)

Would you be open to TFG utilizing on-site grass as mulch if applicable?

**This is a strategy that hasn't yet been practiced much, but seems to have advantages in the right context. Since all pastures grow grass, there is potential for free and abundant mulch material.*

Do you have machinery for loading and/or spreading mulch? If so, are you comfortable with allowing a TFG machine operator access to that machinery so that we don't need to rent equipment?

Where would you prefer to have mulch staged that is easily accessible?

Planning Step 3: Design

**Now that you have collected the clients vision, values, goals and details of their context, we can move forward with creating a design. The information you detail in Planning Steps 2-4 are your "planting plan". Creating a map design can be done either on paper or with your software of choice. Design process is outlined as:*

- *Plan/Design Phase (estimated 20-30 hrs including Site A+A (Assessment and Analysis). (Not including travel)*
    - *Site Assessment and Analysis (2-4 hrs on-site or remote)*
        - *Identify environmental factors and niches through notes and/or map using the "scale of permanence", their resources, characteristics and concerns: landform, water supply, access/roads, vegetation and wildlife, climate, buildings and infrastructure, soils, areas of use, aesthetics*
        - *Dig a few test holes if possible*
        - *Tease out additional questions*

- *Begin “Planting Plan”- fill out as much as possible, especially…*
  - *Plant spacing and distances- make note of physical anchor points to begin measurements from*
  - *Desired plant species, uses and diversity*
  - *Tree protection plan*
- *Research: Soil types (use web soil survey or similar), tree species, etc.*
- *Develop map.*
- *Find cost-share funding for the project, if applicable.*
- *Develop budget estimate*
  - *Finish “Planting Plan”*
  - *Calculate materials*
  - *Estimate labor*

Tree Selection

Tree species	Generic seedling	Improved seedling	Grafted/Clone	Cutting

Tree species pattern										
Layout 1										
Layout 2										
Layout 3										
Layout 4										
Layout 5										
Layout 6										
Layout 7										
Layout 8										
Layout 9										
Layout 10										

Tree Species Pattern Notes

Number of each species/type

Tree species	Generic seedling	Improved seedling	Grafted/Clone	Cutting
Total Number of Trees				

Responsibilities	
Task	**Party Responsible**

Developing Plan	
Acquiring supplies	
Laying out site	
Site Prep	
Installation Labor	
Mulch installation	
Verification	
Funding	
Follow-up care	
Tree Replanting as needed to maintain minimum survival rate	

**Clear understanding and agreement of responsibilities is critical to executing a job successfully.*

Planning Step 4: Design Finalization

Onsite Planning Checklist

- Verify with landowner
    - boundaries of project on the map
    - # of trees
    - species of trees
- Identify which line(s)/contours will be used as starting point for laying out rows
- Determine where the first row(s) start

- What is the width of the turnaround area at the end of tree rows?
- What is the width of the area from the fence lines to the tree rows that run parallel?
- Verify specific tree pattern
- Determine whether any tree rows need to be skipped to grant machinery access
- Determine whether there are any water lines or buried infrastructure to avoid
- Verify whether trees will be protected with electric fencing or barbed wire.
    - If electric fencing, do we need to run fencing underground to allow for machinery access?
    - Will livestock need to move between rows of trees protected by electric fencing? If so, verify fencing method to use.
- What will be used to dig the holes? Shovel/hand auger/machine auger
- What side of the tree does the landowner want the stake?
- Find out from landowner what part of the pasture will grazed first so this section can be prioritized during the project
- Verify which type of mulch to use (grass, woochips, or other)
    - What mulch, if any, does the landowner have on hand or have easy access to?
    - Does the landowner have a means of transporting bulky mulch?

Project Plan Summary

Projecting the phases of planting				
Phase	Season	Year	Focus areas	Rough acreage

1				
2				
3				

Important Site Conditions to Consider

**Consider if there are any wet areas that are not accessible during wet weather. Are there crops not yet harvested or livestock that need to be moved through the planting sites?*

Site Prep Required

Planting

- Total Acres planted
- Number of trees:

Tree Protection

- Shelter Type
- Shelter Protection
- Vole Guard
- Mulch type

Proposed Planting Season

Projected planting date range

Project Costs			
Item	**Rate Per Item**	**Number of Items**	**Total**
Planning			
Hershey Honey Locu			
Black Locust			
Hybrid Willow			
Hybrid Poplar			

Persimmon			
6ft Tree Shelters			
5ft Tree Shelters			
Flagging per tree			
Labor per tree			
Spiral Guards			
Mulch per tree			
Vole Deterrent			
Electric fencing **(per linear foot of row**			
Aftercare. Per event (2 annual years 1 and 2. 1 annual years 3 and 4)			
Initial Total			
Landowner labor to install mulch			
Landowner providing mulch material			
Machinery/Equipmen (equivalent to a skid loader rental to instal the mulch and dig the holes for the trees)			
Total			

Implementation Checklist

- Plan approved by the landowner
- Flags laid out and approved by landowner
- Shelters to the site
- Trees to the site
- Bare root trees dipped
- Seedlings pruned as needed
- Stakes installed
- Holes dug
- Trees planted
- Vole guards installed
- Tubes installed
- Ties installed tightly
- Shelter protection installed
- Mulch installed
- Final walkthrough and approval by landowner
- Discuss maintenance schedule with landowner

Aftercare

Getting the trees in the ground is of course only the first step. The real goal is not to get them planted, but to have them mature to a stage where they can contribute to the farm. The first year is absolutely the most critical to tree survival, one more reason to not plant too many trees at once, since you don't want to be overwhelmed with aftercare. That said, good and thorough care in the planting phase will make aftercare a breeze.

Trees For Graziers cannot stress enough how important it is to be checking in on your trees the first few years. It really doesn't take much time (less than a minute per tree unless there's major issues), but it does need done.

Inspect trees for any damage in the course of rotating livestock through the paddock, along with any damage from wildlife, rodents, insects, disease, etc. Each tree should be

checked for problems twice annually in the first two growing seasons, and then once or twice annually thereafter for the following 2 years.

Survival and Replacement Policy

- When planting trees into the challenging conditions presented by actively grazed pastures, there will always be some portion that do not survive. When nature plants trees, it uses thousands or even millions of seeds to get just one mature tree. We have much higher success rates, but still need to account for mortality on every project.
- TFG is responsible for replanting trees at TFG's expense **only** if TFG is placed in charge of the entire project, including planning, tree selection, planting and aftercare, so that TFG can ensure that our quality standards are met throughout the process.
- If the above criteria are met,TFG will keep survival above 80% for 12 months after planting. Anything under 80% will be replaced at our expense to reach the 80% threshold.
- The above is voided by acts of God, including severe drought, storms, flooding and the like.
- Any mortality after 12 months cannot be covered by TFG. After 12 months the trees will have had plenty of chance to establish, and later mortality will be from causes other than potential mistakes on the part of TFG in the process of acquiring and planting stock.
- Any mortality that is determined to be caused by landowner neglect (for instance, not keeping electric fencing hot, giving livestock access when trees are unprotected, etc.) cannot be covered by TFG
- Because TFG cannot be at the farm all the time for minor repairs, the farmer is responsible for making repairs if livestock damage trees or tree shelter, and before livestock are given access to those trees again. If the farmer gives access to trees that have their protection compromised, and those trees are killed, TFG cannot be held responsible.

Aftercare Checklist

- Determine whether tree is alive
- If dead, mark the tree shelter for future replanting
    - Tally mortality by species and cause
- Remove weeds inside the tube
- Reset stake and tube as needed
- Replace broken stakes as needed
- Cut top of tubes if needed to reduce rubbing damage
- Remove stakes for trees that can support themselves
- Open up or remove tubes for trees that do not need protection from rubbing
- Apply vole deterrent
- (Optional) Starting in year 2, apply fertilizer
- (Optional) re-apply mulch after initial application breaks down