Northeast Forest Farmers Coalition Site Assessment Worksheet

This worksheet is designed to assist beginning forest farmers in selecting a site for establishing new populations of forest botanicals in their forest. Included below are resources used to collect site information helpful for understanding if a site is optimal for forest farming. Much of the information in this document is based on a) The Forest Farmers Handbook which was developed by Rural Action, United Plant Savers, and Appalachian Sustainable Development and b) the West Virginia Forest Farming Evaluation Guide designed by Appalachian Sustainable Development.

<u>**Resources that are complimentary to field-based assessments**</u>:

The following worksheet is designed to be filled out based on observations taken while in the forest. The only way to gain a true understanding of whether a site is ideal for growing forest botanicals is to spend time observing that site on the ground. However, there are useful online resources that can compliment information gathered in the field. **We recommend testing out the below resources before conducting field-level site assessments.**

PlantShoe: This is a site assessment tool developed by Virginia Tech that will produce a property report based on spatial datasets resulting from broad environmental analysis efforts conducted by organizations like USGS. It is important to recognize that the information produced in these reports can be useful but is limited to the accuracy and availability of underlying data. Therefor, this tool should only be used to compliment field-based observations.

NRCS Web Soil Survey: This website can be used to collect baseline soil information regarding the different soil classifications on your site. You will be able to draw a polygon around your area of interest and find out valuable information about the underlying soils of that area.

Google Earth: Google Earth is a free and user-friendly way to acquire basic topographical information about your site. This is useful when working to narrow down potential forest farming sites within a large area. For example, if you have 50 acres of land and want to find the single best acre to forest farm, you could use Google Earth to identify the ideally sloped areas (5-20% slope) that are facing either north or east on your property. This will narrow down your options so you can more accurately and efficiently target your in-field assessments.

Here is a short video showing how to make an elevation profile of a path in Google Earth, which will tell you the % slope of an area: Google Earth Elevation Path Demo

Here is a video showing how to find the aspect of a slope as well as how to see how much sunshine different parts of a landscape receive throughout the day: Google Earth Aspect and Sunlight Demo

Aerial photos: Most states in the Northeast have programs that have been taking landscape-level aerial photographs since at least the mid-1900s. This can be useful in seeing if the areas you are interested in forest farming have had large-scale disturbances like logging or major windstorms in the past. This can help you better understand if the present-day conditions you are seeing on the ground arose from underlying site conditions (like geology) or land use history (like forest management).

Topography:

Examining the topography—that is the arrangement of natural and artificial features of your forested landscape—is a great first step when selecting sites appropriate for forest farming. When talking about topographical features in the context of forest farming, **slope** (a measurement of steepness) and **aspect** (the cardinal direction a slope faces) are key.

TOPOGRAPHY		
Slope:	**SCORE**	**NOTES**
Flat (5% or less)	5	Fine if well-drained and never has long periods of standing water
Intermediate (5% - 20%)	10	Ideal, allows for good drainage and leaf litter accumulation
Steep (greater than 20%)	5	Can create issues around accessibility and erosion but can be productive
Aspect:	**SCORE**	**NOTES**
North, east, or northeast	10	Ideal conditions for cool, moist sites best for forest farming
South, southeast, northwest	5	Receives hotter afternoon sun but can still have ideal micro-sites
West, southwest	0	Generally too hot and dry, preferred micro-sites limited
Total section score (max of 20):		

Hydrology:

While forest botanicals like ginseng, goldenseal, black cohosh, and bloodroot all prefer growing in cool, shaded sites with moist soils, they do not grow well in overly saturated soils. In other words, they do not like "wet feet." Ramps can tolerate more saturated soils and can be found growing well in forested floodplains and out of hillside seeps. In general, if a site you are considering has standing water for long periods of time, it is likely too wet to grow most forest botanicals successfully. This is why having a natural slope that carries water away is ideal.

Even if your site does not have standing water, dig up a bit of soil in a few areas to check for **gleying**. Soil gleying occurs in low oxygen soil settings, like waterlogged soils, and results in a reduction in iron. This causes the soil to turn a bluish grey color (seen in photo) which can be a helpful indicator of oversaturated soil conditions.

If you see soil gleying on a site it is likely too wet to successfully grow most forest botanicals and you should move on.

Vegetative Composition:

Once you have used the topographical patterns on your landscape to identify some potential sites to forest farm, examining the existing vegetation on those sites is the next step in the site selection process. Certain woody plants (trees and shrubs) and herbaceous plants already growing on your

sites can be indicative of ideal growing conditions for certain forest botanical species. We call these plants **indicator species**.

Most of the forest botanical species people are interested in growing in the Northeast grow best on "rich sites"—that is, sites that have especially high levels of calcium. So, when we are looking for these rich sites, we want to be looking for rich site indicator species. First go through the check list of woody indicator species and see what is occurring on your site. Then go through and pick the dominant tree species category that best describes your site.

Woody indicator species:	Present? (yes or no)
Sugar maple (Acer saccharum)*	
Tulip poplar (Liriodendron tulipifera)*	
American basswood (Tilia americana)*	
White ash (Fraxinus americana)*	
Black walnut (Juglans nigra)*	
Butternut (Juglans cinerea)*	
Shagbark hickory (Carya ovata)	
Northern red oak (Quercus rubra)	
Slippery elm (Ulmus rubra)	
Pawpaw (Assimina triloba)	
Spicebush (Lindera benzoin)	
American elderberry (Sambucus canadensis)	
*particularly good rich-site indicators	

Identifying the most commonly occurring tree species on your site can be helpful in better understanding the site quality. For instance, a site that has a few sugar maple trees mixed in with an oak dominated canopy is likely going to be less ideal for growing forest botanicals than a site that is dominated by sugar maple. Try estimating the dominant tree species on your site and use the categories below to score your site.

Dominant tree species (50% or more of mature trees) - select only one that best describes site	SCORE
Sugar maple or tulip poplar (add 5 points more if average diameter at breast height (DBH) is greater than 20 inches, add 2 points if basswood is present)	10
White ash or black walnut (add additional 4 points more if average DBH is greater than 20 inches, add 2 additional points if butternut is present)	8
Mixed hardwoods consisting of black cherry, white ash, red oak, basswood, sugar maple and some red maple and beech	5
Mixed hardwoods as above plus some yellow birch, hemlock and/or white pine	5

Black and/or white oak	3
All softwoods, pine, hemlock, spruce, fir	0
TOTAL SCORE (max score of 17):	

Understanding what forest herbs are already growing on the forest floor of any potential site is arguably the most useful indicator of a site's potential for forest farming. Obviously, if you find populations of the species you are interested in growing already growing at your site that is a great sign. But there are a number of other forest herb species that are also helpful indicators. The best time to look for these species is between mid-spring and early summer when many spring ephemerals and forest dwelling herbaceous plants are easiest to identify. It is important to remember that past land use, like logging, can also reduce populations of sensitive forest herbs on your landscape. While the absence of these indicator species can be indicative of poor site quality, it can also be the result of past land use history, like logging. That is why it is important to look at these various site assessment factors in a wholistic way, rather than in a vacuum.

Start by going through the checklist of forest herbs and seeing what species, if any, are occurring on your sites. This will give you an overall sense of what is growing on your site. Then try scoring your site based on the categories below.

Herbaceous indicator species:	Present? (yes or no)
American ginseng (Panax quinquefolius)	
Spring Beauty (Claytonia virginica)	
Virginia Bluebells (Mertensia virginica)	
Hepatica (Hepatica nobilis)	
Cut-leaf Toothwort (Cardamine concatenata)	
Dutchman's Breeches (Dicentra cucullaria)	
Squirrel Corn (Dicentra canadensis)	
Showy Orchid (Galearis spectabilis)	
Goldenseal (Hydrastis canadensis)	
Ramp (Allium tricoccum)	
Baneberry spp. (Actaea spp.)	
Bloodroot (Sanguinaria canadensis)	
Black cohosh (Actaea racemosa)	
Maidenhair fern (Adiantum pedatum)	
Rattlesnake fern (Botrychium virginianum)	
Jack-in-the-pulpit (Arisaema triphyllum)	

Wild ginger (Asarum canadense)	
Blue cohosh (Caulophyllum thalictroides)	
Solomon's seal (Polygonatum biflorum)	
False Solomon's seal (Maianthemum racemosum)	
Trillium spp. (Trillium spp.)	
Enchanters Nightshade (Circaea lutetiana)	
Mayapple (Podophyllum peltatum)	
Virginia creeper (Parthenocissus quinquefolia)	
False Unicorn (Chamaelirium luteum)	

Dominant Understory Plants - select only one that best describes your site	SCORE
Reproducing populations of wild ginseng, goldenseal, black cohosh, bloodroot, ramps, and other forest botanicals or populations of maidenhair fern	10
Maidenhair fern, rattlesnake fern, or baneberry	8
Jack-in-the-Pulpit, other ferns, trillium, bloodroot, spicebush, jewelweed, hepatica, true or false Solomon's Seal	5
Wild sarsaparilla, Virginia creeper, yellow lady's slipper, mayapple	3
Bunchberry, garlic mustard, pink lady's slipper, ground pines, wintergreen	1
Woody shrubs such as Mountain laurel, lowbush or highbush blueberry, honeysuckle, maple leaf viburnum, Arrowwood, shrubby dogwoods, alder	0
TOTAL SCORE (max score of 10):	

Shade Level Estimates:

Estimating the percent of shade on potential forest farming sites can clarify what forest botanical species will grow best on those sites. While most forest botanicals have evolved to persist in very low light settings, studies have shown that some species tend to grow faster in certain light conditions. This varies by species (for example, ginseng has been shown to grow best under approximately 75% shade while black cohosh thrives under slightly lighter conditions—around 60-65% shade).

The importance of shade levels depends on your objectives as well. If you are looking to forest farm to grow herbs for sale, slightly altering the shade levels to bring more light to the forest floor can decrease the time it will take for you to grow a harvestable crop. If your motives are more driven by conservation of at-risk herbs, and you do not wish to harvest your forest botanicals anytime soon, altering shade levels might be less important to you.

Find below a cheap and relatively easy way to estimate shade levels:

"Place 10 or more white paper plates at even distances on the ground at approximately noon on a sunny summer day. Count the number of plates that are at least half shaded. Next, divide the number of shaded plates by the total number of plates placed on the ground. Multiply this number by 100. If this number is 70 or greater the site is probably shady enough to grow ginseng" (Apsley and Carroll, 2013). This number is an estimate of the **percent shade** of your site.

What shade level did you estimate on your site?

Percent Shade:

Soil and Site Surface:

Soil and Site Surface Characteristics	SCORE
Site dominated by mostly very large trees more than 20 inches DBH or few surface rocks, well-draining loamy soil, high in organic matter, 75% of site plantable	10
Site dominated by medium sized trees,10 to 20 inches DBH or some surface rocks, fairly well draining loamy soil with moderate organic matter, 50% plantable	8
Small trees less than 10 inches DBH, very stony, heavy clay soil, low in organic matter, 25% to 50% plantable	5
No large trees, saplings and shrubs dominate or large rock outcropping, many boulders, soil low in organic matter, less than 25% tillable	3
Soil too rocky to plant anywhere or poorly drained, standing water present	0
TOTAL SCORE (max score of 10):	

Site Accessibility vs. Security:

One final site factor to consider when selecting a site is the accessibility and security of that site. When thinking about **accessibility**, think about your objectives and plans for the site. If you are interested in a low-intensity wild-simulated model of forest farming and do not plan to visit the site all that often, picking a site far out in the woods might be okay. If you are planning on a more intensive woods grown cultivation model, where you might be constructing raised beds in the forest, picking a site that you can easily access might be preferable.

Finally, it is important to consider **site security**. Unfortunately, there are instances where people poach forest botanical plant materials from private properties. It is important to consider this when establishing a new population. Is your site near a busy hiking trail or well-traveled road? That might be okay if the site is also close enough to your house that you can check in on it frequently. But if your site is in an area that has high human traffic and is far away from your site you should consider finding a more secure location.

Final Results:	
Add up all of your scores from the previous sections.	**Total Score:**
50 points or above: Excellent site, great forest farming potential.	
40 to 50 points: Good site, do complete soil analysis, if soil analysis is positive, good forest farming potential.	
30 to 40 points: Fair site, do complete soil analysis, if soil analysis is positive, fair forest farming potential.	
Less than 30 points: Poor site, look elsewhere.	