



AGROFORESTRY NOTES

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Non-timber Forest Products and Forest Stewardship Plans

Introduction

To many woodland owners “harvesting” typically means the removal of timber from forests. In recent years many landowners have become aware of the role non-timber forest products (NTFPs) can play in supplemental management strategies to produce income while preserving other forest qualities.

NTFPs are a diverse group of craft, culinary, and medicinal products that have been traditionally harvested from the wild, but can be intentionally managed or cultivated on forestland. Cultivation on managed lands, in contrast with wild harvesting or wildcrafting, can help to meet landowner production and sustainability goals. By intentionally producing NTFPs, especially at a commercial scale, landowners can provide a conservation benefit by helping to satisfy market demand and reducing harvest pressure on wild populations, while simultaneously earning income. This is especially attractive to those interested in stewardship of the environment and sustainability. However, it is important to realize that not all NTFPs can be easily cultivated.

Producing NTFPs does not have to be an exclusive management goal. Landowners can implement timber stand improvements, manage invasive species, and conduct other forest management practices along with NTFP production. Many of these practices may enhance NTFP production sites by altering shade levels and arrangement of understory vegetation. It is important to consider how NTFPs can add value to the forest and create additional economic incentives. While finding foresters and other natural resource professionals with NTFP expertise can be challenging, integrating NTFPs into Forest Stewardship Plans will create a more diverse forest ecosystem, and can increase landowners’ income-earning potential.

Achieving landowner goals of good stewardship, sustainability and income requires planning and management of resources. A Forest Stewardship Plan is an excellent tool, recommended by the US Forest Service and State Forestry Agencies, to assist landowners in achieving their goals. Woodland owners can receive assistance to develop Forest Stewardship Plans from their State Forestry agency, Extension Forester or a consulting forester. Landowners may instead work with the USDA Natural Resources Conservation Service (NRCS) to develop a Forest Management Plan. With either type of plan, landowners will end up with a document that provides a thorough overview of their land, including an aerial photo and a map of the different woodland and plant communities and any unique resources. Based on the landowner’s desires, the plan will also describe the long-term goals and recommended activities to help meet those goals.

Types of NTFPs

NTFPs are generally classified and sold under five categories: culinary, medicinal, decorative, nursery stock and landscaping, and fine arts and crafts. Additional categories may evolve as knowledge about this industry develops. Many herbs, fruits, and vines growing naturally in the forest are collected and sold into these distinct markets. Species commonly used in the craft and floral industry include galax (*Galax urceolata*), salal (*Gaultheria shallon*), willows (*Salix spp.*), and pine boughs and cones (*Pinus spp.*). Other species are used as components of dietary supplements and medicinal products like elderberry (*Sambucus nigra*), ginseng

(*Panax quinquefolius*), black cohosh (*Acetaea racemosa*) and goldenseal (*Hydrastis canadensis*). Examples of popular edible and culinary species include ramp (*Allium tricoccum*), pawpaw (*Asimina triloba*), and shiitake mushrooms (*Lentinula edodes*) as well as forest nuts like shagbark hickory (*Carya ovata*) and black walnut (*Juglans nigra*). Another popular product is pine straw; needles that are naturally cast from pine trees can be raked from the forest floor and sold by the bale or the acre.

As a producer, it is important to investigate the historic and cultural traditions associated with the culinary, craft, or medicinal products being produced. Many NTFPs have cultural significance to groups of people or are traditional products in a geographic area. Before developing a management plan, work to understand local and regional markets and cultures.

Planning Approach

Step 1: Develop NTFP Management Goals

The first step in developing a Forest Stewardship Plan is to establish management goals and decide what role NTFPs will play. Will they be produced for supplemental income? As a hobby? For personal use? Or maybe as a conservation strategy to help preserve wild populations? Regardless of scale, the next step will be to research the products to be produced and determine if they are suited to the geographic area and forest type. Some NTFPs can only be grown in particular forest types or with particular overstory species. For example, ginseng and other forest medicinals are usually only successful when matched to a forest type similar to their native habitat, whereas some mushrooms can be grown in many types of forests. Many crops may be most suitable at a hobby scale, while others may be viable for larger commercial enterprises. A knowledgeable NTFP professional, Extension agent, or forester can help determine which products might be a good fit. Finding a NTFP professional in a local area may be difficult, but many specialists can be located through the Internet or the Forest Farming eXtension Community of Practice (“see “Communities and Networks” section below).

Step 2: Contact a Forester

After preliminary management goals and objectives have been established, it is time to contact a professional consulting forester or state service forester who will write the Stewardship Plan. It is important to find a forester who understands the landowner’s interest in both NTFPs and timber management recommendations. Many foresters may not have NTFP expertise, but would be willing to work with other natural resource professionals who have this knowledge.

Step 3: Site Visit

The next step in developing the plan will be a site visit. The forester will assess the condition and composition of the forest, and identify forest stands that share common elements, such as past land-use, quality of growing sites, species composition, aspect, or management needs. The management recommendations included in the plan will be based on these stands, and they will help prioritize the locations of NTFP production sites. It is strongly recommended that the landowner accompany the forester during the site visit. This will be a valuable opportunity to learn how to implement the recommended practices, suggest and assess NTFP growing sites, and much more.

Step 4: The Plan

After the initial site visit the forester will proceed with writing the plan. The plan should clearly reflect the landowner’s NTFP management goals and other interests. The landowner should review the plan to ensure that his or her management goals and priorities are included.

Step 5: Use the Plan

Following a time line and monitoring progress, as well as keeping track of expenses and revenue, will help ensure the success of the plan. Watching what works and looking for what has worked for others can increase learning through experience. If written to the proper specifications the plan should meet the eligibility requirements for cost-share programs like Environmental Quality Incentive Program, the Conservation Stewardship Program, and property tax incentive programs. In most states these programs will only be based on specific management practices, which may not include NTFPs. If the landowner is interested in cost share opportunities specifically for NTFPs, then the Natural Resource Conservation Service Multi-Story Cropping Technical Standard should be reviewed.

Integrating NTFPs into Forest Stewardship Plans

Integrating production of NTFPs into a Forest Stewardship Plan will not change how the plan is developed, but will add specific goals and identify management activities suited to the NTFP crops that the woodland owner wishes to manage and harvest. Some aspects of the plan, such as the stand prescription or even the size of the area and definition of the site to be managed for NTFPs, will be unique to the product being produced. It will be important to identify and map the sites that are suited to growing the NTFPs of interest. Some

landowners may not have any sites suitable for growing a particular plant, such as black cohosh. If possible, the plan can describe why black cohosh is not currently growing there, such as previous over harvesting, invasive species competition, or inappropriate levels of shade. The plan can also describe management activities that will help cohosh to repopulate or grow if it is planted.

All Forest Stewardship Management Plans have several criteria they must meet:

- Meet the minimum standards of a Forest Stewardship Management Plan, as verified by a professional resource manager, and be approved by the State Forester or a representative of the State Forester
- Document authorship
- Landowner information
- Location and plan maps
- Clearly state landowner objectives
- Describe current forest condition or condition class
- Describe desired forest condition or condition class
- Include practices and activities aimed at reaching the desired forest condition or condition class
- Document a feasible strategy and time line for practice and activity implementation
- Describe any suggested monitoring activities to be done by the forester or landowner
- Be developed for a specified management period that adequately allows for progress with the landowner's long term stewardship objectives.
- Be reviewed and renewed, revised or rewritten at the end of the specified management period or sooner as needed, to be considered current

In any forest management plan, the landowner must be involved so that the objectives, timetables and targets of the plan will assist them in achieving their personal desired outcomes. In addition to meeting the criteria listed above, the plan preparer must consider, describe and evaluate the following plan elements when they are present and important to the landowner:

- Soil and water
- Biological diversity
- Range
- Agroforestry
- Aesthetic quality and desired species
- Recreation
- Wood and fiber production
- Fish and wildlife
- Threatened and endangered species
- Forest health and invasive species
- General intergenerational transfer planning information
- Archeological, cultural and historic sites
- Wetlands
- Fire
- Carbon sequestration

Management recommendations and alternative strategies, consistent with landowner objectives, will be provided to protect or enhance all resource elements that are present. Prescriptions or treatments must be

stand or site specific. An ownership map drawn to scale, or photo, which accurately depicts vegetation cover types, hydrology and other significant forest related resources with a legend, is required. The professional resource manager will discuss the Forest Stewardship Management Plan with the landowner, following completion, and periodically, to assure understanding and encourage plan implementation.

Like timber species and agricultural products, NTFPs have specific management requirements that reflect the species' needs and characteristics. If a landowner is planning to manage his or her land for NTFPs, the stewardship plan should include information on the site requirements needed for those products. Details on NTFPs that could be incorporated into the Forest Stewardship Plan could include:

- Soil requirements
- Aspect preferences (position on a slope or hillside)
- Spacing required for the NTFP
- Plans for additional seeding or management of the existing population
- Shade requirements (percent canopy and light density)
- Overstory species needs
- Plan for developing the NTFP resource over time
- Amount of time until the NTFP is harvestable
- Regular management required for continued production of the NTFP:
 - » Thinning, pruning, and other plant management
 - » Regular inspection for disease or pests
 - » Other management needs

These requirements will differ based on the NTFP being produced and landowner objectives. Detailed information on the management of NTFPs varies in detail and quality, so natural resource professionals will need to use their professional judgement and the informational resources that are available. Some of these informational resources are included in the Resources section of this Agroforestry Note.

Roles

A collaborative approach to the planning and development process is helpful to achieving landowner goals. Landowners should work with foresters or other natural resource professionals to ensure best results. Each person will play an important role in the planning process.

The Landowner

It is important that landowners be involved from the beginning since they are the ones who will develop NTFP management goals and implement the plan. They may not have the technical expertise to make land management prescriptions, but landowners often have the most knowledge about the physical aspects, attributes, and the resources available on their property. As a landowner, there are a few things that can be done to make the planning and implementation process more effective.

The landowners can:

- Research local technical service providers, including Natural Resource Conservation Service, Extension Agencies, and State Service Foresters
- Identify a forester or other natural resource professional who is knowledgeable about NTFPs
- Obtain maps, aerial photos, and land surveys
- Locate copies of the property deed, and tax records
- Research NTFP crop requirements including site preparation and cultivation techniques, market information, and lifecycle biology
- Locate and mark property boundaries

*Natural Resource
Professional*

A forester is one type of natural resource professional who can help develop a Forest Stewardship Plan for NTFPs. They have a university-level degree in forestry or a related degree from a program accredited by the Society of American Foresters. Foresters may work for government agencies, private or non-profit companies, or be self-employed. Many foresters work for a state forestry agency. These agencies employ professional foresters to provide landowner assistance at little to no cost. Consulting foresters work for private companies or may be self employed and offer land management service to the public for a fee. Although every professional forester may not be familiar with managing for specific NTFPs, they do have a good understanding of forest ecology and management practices that can create a well-managed forest from which NTFPs are produced. Foresters can help a landowner determine which species are best suited for growth on a given piece of their property and how the forest should be managed through time based on these principles. For example, if a landowner is interested in managing their forest for pine straw production, a forester can help determine a suitable tree density, whether thinning is needed, and how long-term health and tree growth can be promoted. They can also assist with understory management prescriptions, which might include the use of herbicides or prescribed fire to control invasive plants.

Other natural resource professionals, besides foresters, can also help landowners manage their forests for NTFP production and in some cases may write forest management plans. The Natural Resources Conservation Service (NRCS) provides technical assistance to the public and has offices in almost every county in the U.S. NRCS employees can provide maps, soil surveys, and forest assessments; recommend reputable foresters; and help landowners enroll in programs. Cooperative extension provides outreach and education as part of land-grant universities. The Extension Service in your area may be able to connect landowners or natural resource professionals with other natural resource professionals who may be able to provide NTFP assistance. A good place to start the search is the eXtension Forest Farming Community of Practice website, http://www.extension.org/forest_farming, where contact information for NTFP Specialists, production resources, and answers to Frequently Asked Questions can be found.

**Opportunities,
Challenges, and
Market Outlets**

Beyond general financial planning, anyone considering cultivating NTFPs at a significant scale should develop a business plan for their enterprise. Markets for forest farming products should be investigated to determine current supply and demand, pricing, growth trends, and production costs. Market information can be collected online, at trade shows, through publications, and by talking with industry representatives.

Direct Markets

Given the variety of NTFP crops, market outlets and prices will vary for each product, and will fluctuate based on supply, demand, and market trends. For example, shiitake mushrooms may sell for \$10 per pound at one farmers market and in another be priced at \$20 per pound. Most chefs or restaurants will pay half or less of the direct market price to a local producer for things they could buy wholesale instead. The value of the product is typically highest when marketed directly to the consumer, allowing the producer to capture full value. Direct market outlets can include online sales, green grocers, farmers markets, roadside stands, herbal practitioners, and restaurants. Direct market opportunities are growing along with the rise in popularity of local foods and specialty crops.

Wholesale Markets

Many of the wholesale markets for NTFPs are well established, and have been operating for decades. Markets for American ginseng, for example, have State and Federal regulations, an established harvest season, and licensed buyers. Other markets, for example, pawpaw (*Asimina triloba*) are less developed and buyers will have to be researched and recruited. The advantage of wholesale markets is that producers with a high volume of product can easily move the entire quantity with less effort than in direct markets. Wholesale buyers purchase in bulk quantities, which accounts for lower prices. Working with growers networks (like farmers market groups) or with brokers who buy raw materials can be helpful. Brokers that serve as intermediaries or aggregators often have established buyer pathways and know sales prices.

*Seasonality and
Value Added
Opportunities*

Many NTFP markets are seasonal with defined harvest and buying seasons. Seasonality creates an opportunity to produce and market a diversity of crops, as well as value-added products that can be harvested and sold year round. For example, ramps and maple syrup are harvested in early spring, whereas medicinal roots and wild fruits are harvested in late summer and fall. Developing processed products, like frozen pawpaw pulp or a goldenseal extract, will enable the producer to add value to their raw products and transform them into a storable commodity that can be sold year round. Typical market outlets for value-added products include wholesale buyers, farmers markets, natural food stores, green grocers, restaurants, vending at roadside stands,

craft fairs or conferences, and practicing herbalists or herbal products manufacturers. Be aware that food safety and quality assurance rules will apply to value added products that will be sold to the public.

Challenges NTFPs can yield interim income for landowners in shorter rotations than required by most timber products. The challenge is that it may take years to establish the crop and the market. Being successful requires persistence and the ability to adapt to and address challenging situations. Given the long-term nature of NTFP production, it is not uncommon for periodic issues to arise. Some common issues include:

- Disease outbreaks and pests
- Soil fertility
- Crop loss (i.e. poaching, weather)
- Lack of crop insurance options
- Shortage of certified processing facilities

In addition to the maintenance and management problems listed above, there are also several business related challenges that the producer might encounter. The producer may need to:

- Adjust profit expectations based on market conditions
- Maintain an inventory of growing stock, harvestable products, and product sold
- Maintain records and lot numbers in compliance with Best Manufacturing Practices for a value-added products
- Adapt to fluctuating material costs
- Research market conditions, product demand, and other market factors
- Find new market outlets

It is important to begin market research early and to stay up to date with market trends during the life of the crop. Many NTFPs have multi-year life cycles and a lot can change from planting to harvest. Even if market conditions are good at the time of planting, producers may have a difficult time selling their product after harvest. It is also important to follow any State or Federal regulations that may apply to the products being produced.

General Resources

- National Agroforestry Center - Forest Farming: <http://nac.unl.edu/forestfarming.htm>
- NTFP Info Website: <http://www.ntfpinfo.us/>
- NTFP Webinar Series: <https://www.treefarmssystem.org/webinar-archive>
- Center for Agroforestry - Forest Farming: <http://www.centerforagroforestry.org/research/current.php#ff>
- Best Management Practices for Log-Based Shiitake Cultivation in the Northeastern United States: <http://www.uvm.edu/~susagctr/resources/ShiitakeGuide.pdf>
- Farming the Woods: <http://farmingthewoods.com/>
- Mushroom Guides: http://www2.ca.uky.edu/forestryextension/publications_nontimber.php
- A Guide to Analyzing Forestry Profit Potential: <https://store.aces.edu/ItemDetail.aspx?ProductID=18532&SeriesCode=&CategoryID=161&Keyword>
- North Carolina Herb: <http://ncherb.org>
- Forest Encyclopedia Network - Nontimber Forest Products: <http://www.forestencyclopedia.net/p/p1604/?searchterm=nontimber>
- Mapping Your Land: An Overview for Landowners: <https://store.aces.edu/ItemDetail.aspx?ProductID=18424&SeriesCode=&CategoryID=&Keyword=landowner>
- Harvesting Pine Straw for Profit: Questions Landowners Should Ask Themselves: [https://store.aces.edu/ItemDetail.aspx?ProductID=14407&SeriesCode=&CategoryID=&Keyword=pine straw](https://store.aces.edu/ItemDetail.aspx?ProductID=14407&SeriesCode=&CategoryID=&Keyword=pine%20straw)

Communities and Networks

- eXtension Forest Farming Community of Practice: http://www.extension.org/forest_farming
- Forest Farming Footnotes: <http://www.ext.vt.edu/topics/environment-resources/forest-farming/index.html>
- Mushroom Grower listserv: <https://list.uvm.edu/cgi-bin/wa?A0=MUSHROOMS>
- National Network of Forest Practitioners: <http://nnfp.org/Activities/index.php>
- Organic Trade Association: <https://www.ota.com/>
- Sustainable Woods Network: <http://nnfp.org/swn/>
- Western North Carolina Forest Products Marketing Project (Appalachian Region): <http://wncforestproducts.org/resources-2>
- Agroforestry at Cornell Small Farms: <http://smallfarms.cornell.edu/projects/agroforestry/>
- Forest Mushroom Cultivation at Cornell: www.cornellmushrooms.org
- Extension Forest Farming YouTube: <http://www.youtube.com/user/exforestfarming>

Government Resources

- USDA Forest Service Forest Stewardship Program: <http://www.fs.fed.us/cooperativeforestry/programs/loa/fsp.shtml>
- USDA Natural Resource Conservation Service State Websites: <http://www.nrcs.usda.gov/wps/portal/nrcs/sitenav/national/states/>
- USDA Service Center Locator: <http://offices.sc.egov.usda.gov/locator/app>
- NRCS Multistory Cropping Technical Standard: http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs143_026082.pdf
- Information on state-level forestry agencies: <http://www.stateforesters.org/about/who-we-are>
- USFS Cut and Sold reports: <http://www.fs.fed.us/forestmanagement/products/sfp/index.shtml>

Plant Conservation Groups

- United Plant Savers: www.unitedplantsavers.org
- Rural Action: <http://ruralaction.org/>
- Pennsylvania Certified Organic Forest Grown Verification Program: <http://www.paorganic.org/forestgrown>
- Georgia Plant Conservation Alliance: www.uga.edu/gpca/

Market Information

- Marketing Specialty Forest Products: http://nac.unl.edu/documents/morepublications/sfp1_MarketingSFP.pdf
- Agroforestry Note #45: Developing Consumer and Market Research for Non-Timber Forest Products: <http://nac.unl.edu/documents/agroforestrynotes/an45ff07.pdf>
- Center for Agroforestry - Profit in Agroforestry: <http://www.centerforagroforestry.org/profit/>
- USDA's Economic Research Service website, with statistics developed from National Agriculture Statistics Service data (e.g. mushrooms produced by state) <http://www.ers.usda.gov/>
- New Crops and Today's Market Prices: http://hort.purdue.edu/newcrop/related_web_sites.html#Marketing.
- North Carolina Consortium on Natural Medicines: <http://www.naturalmedicinesofnc.org/>
- Marketing Specialty Forest Products: <http://conservancy.umn.edu/bitstream/94129/1/7278.pdf>

Information about many market outlets can be found online. Working with an established broker may make a producer's commercial efforts more time effective and facilitate obtaining available market information. There are many businesses that buy and sell NTFPs. Some online research for regional businesses specializing in the type of product a producer has can help build a marketing network.

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A partnership between:
United States Forest Service
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