

Seeing the non-timber forest products for the trees



A sample of valuable products that can be found in forest ecosystems include: pine straw, shiitake mushrooms, maple syrup, and jack-in-the-pulpit (pictured above).

AGROFORESTRY practices like windbreaks and riparian forest buffers provide valuable services to us in the form of wind protection, soil stabilization, and water quality. But, they can also deliver many marketable non-timber products like berries and mushrooms, decorative florals, and herbal products.

This issue of *Inside Agroforestry* provides a glimpse into the forest, beyond the obvious, to get you seeing the non-timber forest products for the trees. 🌲

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NAC Director's Corner

A commentary on the status of agroforestry
by Dr. Greg Ruark, NAC Program Manager



More research is needed

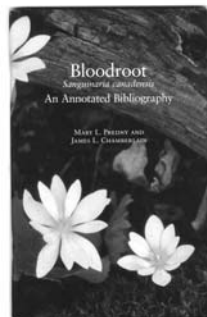
THE demand for specialty forest products has been growing rapidly over the past decade. Numerous plant species that are thought to have nutritional, medicinal, or culinary benefits are native to the understory of pine and hardwood forests throughout United States, but little is understood about how to intentionally propagate and cultivate most of them. As a result, these plants are typically harvested by gathering them from the wild. Several of these, like ginseng, goldenseal, cohosh, and edible mushrooms already have strong consumer markets. Unfortunately, their high economic value has created a situation whereby many species are already being over-harvested, threatening their long-term viability. To date, agroforestry systems have been designed that allow a few of these plant species, like ginseng, to be cultivated under a forest canopy. However, little is known about how or if other understory plant species could be intentionally cultivated.

Many farmers and private forest landowners with limited resources are seeking alternative production systems that will allow them to increase the income they derive from their lands. In many instances profitability will determine whether they will remain economically viable to remain on the land. In forests where valuable understory botanicals already exist, guidelines for sustainably harvesting them are needed, while on lands where they do not occur an improved understanding of the site conditions required to establish them is needed. NAC is coordinating with universities, state forestry agencies, conservation districts, and non-profit organizations to develop science-based guidelines for agroforestry cultivation systems for special forest products to provide landowners with economic opportunities that can be readily integrated into their ongoing operations. 🌲

Digging deeper

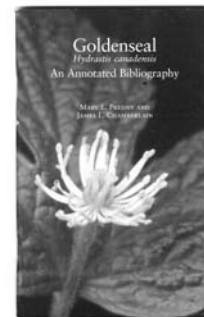
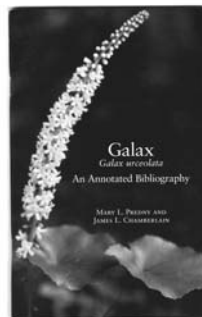
THE awareness of non-timber forest products (NTFP) has grown over the last decade. Concern about the sustainability of the resources from which NTFPs originate and consideration for the economic stability of the people who are involved in the harvesting and sale of these plants has also increased. Unfortunately, the information and knowledge needed to determine if collection activities are socially, economically, or ecologically sustainable is still lacking.

To help bridge this gap, three comprehensive guides are available for some of the most sought after botanical plants: bloodroot, galax, and goldenseal. Each publication addresses botany and ecology, medicinal and other uses, market trends, cultivation, and conservation issues.



Bloodroot – named for the blood-red sap found throughout the plant, particularly in the roots. Native Americans used bloodroot as a dye, love charm, and medicine. Today, it is used to cause expectoration and to clear the respiratory pathways of mucus.

Galax – an evergreen groundcover harvested for use in the floral industry. People living in the mountains of North Carolina and other rural Appalachian locations have



harvested galax to supplement their incomes since before the 20th century.

Goldenseal – originally used by Native Americans as both a medicine and a dye, the herb was eventually adopted by settlers and eclectic physicians in the 19th century. The alkaloids in goldenseal have been found to have antibiotic, anti-inflammatory, antispasmodic, and tonic effects. 🌲

For a copy of these, and other, publications visit the Non-Timber Forest Products website at: http://www.sfp.forprod.vt.edu/special_fp.htm

Here, needles of a naturally regenerated long-leaf pine forest are raked for resale. Straw can be raked, baled, and sold to garden centers. Landscapers and homeowners use pine straw as a mulch or ground cover in gardens and landscaping projects.

NAC file photo



Raking in the green stuff

James Chamberlain

USFS Research Scientist, Non-Timber Forest Products, Blacksburg, VA

WE know forests deliver food, medicine, and countless other goods. Common sense tells us about forest cents, but just *how much* cents does the forest have?

Though no formal estimates have been made of the total value of the NTFP markets, available data illustrate the economic importance of some individual products. Certainly, the aggregate value of non-timber forest products far exceeds these examples.

Medicinal and herbal products

Herbs and medicinal products are an extremely important component of modern medicine and health supplement

Some forest-based medicinal products, like goldenseal, have long-established markets and represent an ongoing economic opportunity.

Photo courtesy of Jeanine Davis, North Carolina State University



industries. Plants from the forest provide treatments for such diseases as cancer, leukemia, heart disease, and pain relief for major trauma. Over 40 percent of prescription drugs,

accounting for \$15 billion in sales in 1997, contain at least one natural element.

In 1998, the total retail market for medicinal herbs in the United States was estimated at \$3.97 billion, more than double the estimate for North America in 1996. Based on 2001 prices, the average wholesale value of forest-harvested ginseng in a four state region of Appalachia exceeded \$18.5 million. Exports of forest-harvested ginseng from 1993 through 1996 grew more than 300 percent. The estimated growth in the mass market for black cohosh, for the year ending in July 1998, was approximately 500 percent.

Edible products

Many culinary NTFP are considered specialty items and are sold directly to buyers like gourmet restaurants, specialized



The demand for specialty foods such as jellies, sauces, and marinades continues to grow.

Photo courtesy of James Chamberlain, USFS Research Scientist, Blacksburg, VA

grocery stores, and health food stores or to consumers through farmer's market-type venues. The products are consumed fresh, canned, frozen and dried or used to make value-added products.

see **Economics** on page 10

With an “i” toward management intensity

Many choices exist for growing non-timber forest products. After deciding which product to specialize in, there is a broad spectrum of management options to choose from.

Wild harvesting / wildcrafting

Wild harvesting is collecting food, decorative, or medicinal products that grow naturally in the woods. Cutting cedar boughs for a wreath or picking berries on the side of a road is wild harvesting. Harvesting forest products on public lands is a way of life for a significant number of people around the country. Sustainable harvesting can have a positive effect on the forest by removing products efficiently while protecting site productivity, minimizing impacts on wildlife, water, and soil and encouraging regeneration of desirable species.



Photo by James Chamberlain, U S F S Research Scientist, Blacksburg, VA

Over the past 15 years, the Belton family near Sandy, Oregon has used a variety of approaches to generate supplemental income to help sustain their forest operation. Most of their forest land is managed for multiple species and ages. To generate enough income selling non-timber forest products, they sell higher quality products for top dollar. These value-added commodities require considerable hand labor to harvest and process.

Some of the products that the Beltons harvest include cut, potted, or balled plants for the floral and nursery industries. They have sold various ferns and other floral greenery like salal, sphagnum moss, and vine maple. Popular potted plants have been red-flowering currant, flowering dogwood, tiger lilies, and bleeding heart. Red alder and wild cherry are sold as hardwood chips for smoking meats. Western redcedar bark, a favorite of Native Americans, is used to make baskets in the Northwest and 12" x 5" x 3/4" cedar planks are sold for cooking salmon. Various mushrooms can generate significant additional income as well.

Although wood products are the most common source of income for many forest owners, finding a niche and value-added market for a wider variety of the non-timber commodities from the forest will help generate additional revenue necessary to stay in business.

Wild simulated / forest tending / forest enrichment

Wild simulated plants are intentionally planted and cared for in conditions that mimic their wild habitat as much as possible. Essentially, the plants are allowed to grow naturally; most growers do not spray fungicides or add any additional fertilizer. It is simple, inexpensive, and requires few inputs. Modifying woodland vegetation to better meet landowner objectives is a shift in management activities to adapt and improve growth rate, volume, quality, and values of trees and non-timber forest products in forest. Common forest tending activities include: thinning, pruning, weeding, seeding, and fertilizing.



NAC file photo

Chip Harris began digging ginseng and goldenseal with his father in the 1970s. Today, he is experimenting with ginseng, goldenseal, and black cohosh cultivation on his farm in southern Ohio.

As his concern about the sustainability of wild populations increased and it became more difficult to find good roots, Chip moved from wild crafted ginseng to wild simulated ginseng. He says, “Eventually, if you wildcraft enough, you get the notion to cultivate.”

So Chip transplanted some wild ginseng to their farm. Today, he harvests only the mature roots, leaving the younger ones to grow for later harvest. He hopes this will minimize the labor he and his father must put into cultivation and lead to self-sustaining patches. Harvesting medicinal roots requires a combination of hard physical labor, skill, and luck.

While income is his primary motivation, spending time in the woods is rewarding. His wife has talked about spending more time making crafts and they discussed the possibilities of starting a pick-your-own raspberry patch and cultivating bitter-sweet for the decorative market. But, for now with help from his father, Chip is concentrating his energies on goldenseal and cohosh. He hopes that medicinal plants will generate “a significant side income” that will carry them into retirement.

Woods cultivated / forest gardening

Intensively managed, a cultivated forest garden is a purposely designed system of trees, shrubs, and perennial plants. These plants are mixed to mimic woodland ecosystems and include trees, shrubs, herbs, and vegetables. The yields are directly useful to humans. In a woods cultivated system, the objective is to produce the highest yield feasible; all modern production practices and pest control products are used including tilling, soil amendments, raised beds to control soil drainage, mulch, and pesticides.



NAC file photo

His father taught him about managing the forest and how to make a living off the land. In the 1930’s and 1940’s, his family sold evergreens and moss to florists for Christmas decorations. Today, the William Slagle “Walnut Meadows” farm near Bruceton Mills, West Virginia, among other things, raises black walnut, ginseng, and shiitake mushrooms.

Slagle says, “ginseng requires intense management, you must work the ground by hand.” He has six acres of cultivated ginseng growing in raised beds in a variety of sites under the trees. He digs anywhere from 200 to 1,200 pounds of roots per year which he sells to outlets in Hong Kong and New York.

Slagle is a retired vocational education teacher. As his profession would indicate, he enjoys educating others. Each year, his students benefited from applying classroom skills to a real working farm; they came out to Walnut Meadows to help with the ginseng, or the shiitake mushrooms, or the walnut trees.

“I hate to see land lay idle and I need an income while my 10 acres of black walnut trees mature,” Slagle says. “This 100 acre farm has been good to our family and we have been good to the land.” 🌱

NON-TIMBER FOREST PRODUCTS

JAMES CHAMBERLAIN USFS RESEARCH
SCIENTIST NON-TIMBER FOREST
PRODUCTS BLACKSBURG VA

UNCONVENTIONAL OPTIONS

FOR INNOVATIVE LANDOWNERS

A VARIETY of terms (e.g., non-traditional, secondary, minor, non-wood, and special or specialty) have been used to describe products that come from forests that are not timber-based. National legislation uses the term, “forest botanical products,” to describe these products. The USDA Forest Service defines them as, “special forest products.” A more common and widespread term is, “non-timber forest products” (NTFP).

Whatever the chosen term, these products are all based on plants or fungi or other flora materials. Wildlife, other fauna, or water and other ecosystem services are not included in the definition as they have designated management categories in national legislation and are well recognized in forestry.

Non-timber forest products come from plants; parts of plants, fungi, and other biological material. They are harvested from within and on the edges of natural, manipulated or disturbed forests. NTFPs include fungi, moss, lichen, herbs, vines, shrubs, or trees. Roots, tubers, leaves, bark, twigs and branches, fruit, sap and resin, as well as wood, are harvested to make non-timber products.

NTFPs are commonly classified into five product categories.



Pine straw, raked from southern plantations, is used as landscaping mulch.

Photo by Terry Bryant, Carthage, NC

There is growing interest in using native plants for landscaping. Native plant nurseries are popping up all over the place and more than 500 are listed in the Directory of Plant Material Providers, published by the USDA Forest Service.



Scarlet curls willow can be used to make gift baskets.

Photo courtesy of Nebraska Forest Service

CRAFT PRODUCTS

Plants collected to produce crafts are numerous. Wood-based crafts are produced from trees or parts of trees, excluding products made from cut timber. Some important wood-based NTFPs in the central hardwood region include sassafras stems for walking sticks, willow branches for furniture, and white oak splits for baskets. Products made from vines, such as smokevine and grapevine, are included in this category. The number of species that could be used in production of crafts is only limited to the crafter’s imagination and market acceptance.

CULINARY INDUSTRY

In the southern Appalachian hardwood region of the United States, food festivals are organized around the emergence of wild onions, known regionally as ramps.

Photo courtesy of James Chamberlain, U S F S Research Scientist, Blacksburg, VA



Edible NTFPs include: mushrooms, fungi, fruits, ferns, greens, roots, and tubers. Mushrooms and fungi are probably the most well known forest edible. The production of maple syrup is big business, particularly in the Northeast. Huckleberries and blueberries are collected and eaten for personal enjoyment or sold for cash income. Fiddleheads (young, tightly coiled fronds of the ostrich fern), dandelion greens, and poke salat are eaten in the spring, as well. Eastern black walnuts, muscadine grapes, raspberries, blackberries, and persimmons are gathered, consumed, and sold.

Plants harvested from the forest for their therapeutic value are marketed either as medicines or as herbal remedies. Many prescriptions dispensed in the United States contain active ingredients extracted from higher order plants. More than 125 plant species are harvested from southern forests for their medicinal value, with more than 80 percent of the forest-harvested ginseng coming from Virginia, Kentucky, Tennessee, and North Carolina. The central hardwood region of the U.S. is the principal source of many medicinal plants, including black cohosh, American ginseng, goldenseal, and bloodroot.

MEDICINAL AND DIETARY SUPPLEMENTS



Medicinal properties of plants can be found in the leaves, roots, and bark of trees or shrubs, or in the leaves, berries, or fruits of herbaceous plants.

Photo courtesy of Deborah Hill, Extension Professor, University of Kentucky



Markets have been steadily increasing for floral and greenery products like white pine and galax (pictured), Spanish moss, and flowers. *Photo by James Chamberlain, U S F S Research Scientist, Blacksburg, VA*

DECORATIVE PRODUCTS








Many forest plants are harvested and used in the floral industry. For example, curly willow and dogwood shrubs that have been incorporated into windbreaks or riparian buffers can be harvested for floral arrangements. In the Pacific Northwest, salal leaves, beargrass, and noble fir boughs are common in the floral industry. Sprigs and long-lengths of grapevine and smokevine also may be used as compliments or back drops in floral arrangements. Several species of moss and lichen are harvested from the forests for the European floral industry. 🌿

Migration

of    
plants  

 people 
and   

tradition 

Edited by Kimberly Stuhr

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PEOPLE have been “managing” land and its resources since the beginning of time. Everyone’s livelihood depended on observing, utilizing, and respecting the natural resources that surrounded them. As our ancestors migrated, so did the plant species that they used and valued. As a result, seeds and stock of traditional culinary and medicinal herbs with cherished characteristics were transported to new locations. Along with the plants came knowledge about them.

While indigenous people seldom used the term “managing,” anthropologists have long documented the significance of local knowledge to resource stewardship. Today, people who live and interact as part of an ecosystem often have traditions that have persisted over long periods of time. Not only did immigrants bring long-established forest product knowledge and practices with them, but they

adapted these customs to their new environment and borrowed from people they encountered. By sharing stories, spiritual beliefs, harvesting techniques, sustainability methods, and recipes, elders have transferred, and continue to pass along, an extensive variety

of skills and information to younger generations. These indigenous knowledge systems are often referred to as Traditional Ecological Knowledge and Wisdom (TEKW).

What is especially significant about TEKW are the attitudes, motivations, intimate connections, and cultural influences that underlie the daily interactions between the human and nonhuman elements. Understanding an ecosystem, and how to successfully manage it, is more than just recognizing biological processes; it is about understanding and respecting the interconnection of all elements, including people and their beliefs and behaviors.

From early history to the present, non-timber forest products (NTFPs) have contributed to a family’s sustenance in a variety of ways. Along with farming, diaries of Midwestern settlers describe consuming their own maple sugar to avoid the expense of purchasing sweetener and then selling some of the sugar for much needed cash. Other economic uses that are integrated with livelihood strategies include family-centered subsistence, gift giving, barter, petty commodity production, and sale as global commodities.

Lots of NTFPs and customs exist across the United States. Regional uses and cultural traditions reflect these differences. Various plants and traditions are found in contrasting forest ecosystems from the rain forests of the Pacific Northwest, the mixed conifer-hardwood forests of the Southeast, the central hardwoods of the Midwest and Appalachia, the conifers of the Lake states, and in the New England forests.

Nonagricultural plants continue to be vital to us for food and medicine and as utilitarian and ceremonial materials. The historical relationship between people and plants and the social structures and interactions within which these uses forms our current understanding of NTFPs.

Based on research and publications by Marla Emory, Research Geographer, USFS Northern Research Station, Burlington, VT. 🌱

Understanding an ecosystem, and how to successfully manage it, is more than just recognizing biological processes; it is about understanding and respecting the interconnection of all elements, including people and their beliefs and behaviors.



Don't overlook urban forest products

A Baltimore non-profit explored the value of urban NTFPs.

COMMUNITY trees, private and public landscaping, and gardens in the urban environment can often provide nuts, fruits, mushrooms, and decorative greens and cones that can be collected. Though not exactly forest farming, in Baltimore, MD people collect, use, and even sell Chinese chestnuts, walnuts, maple sap, ginkgo fruits, figs, and honey.



Community Resources, a non-profit organization based in Baltimore, explored the uses, issues, and values of urban non-timber forest products (NTFPs). In addition to field and market observations, the researchers conducted over 100 interviews to discover the uses, benefits, and values, both monetary and personal, as viewed by both environmental professional and local collectors.

Key findings of this research include:

- Over 103 products from 78 species are collected by individuals and organizations in Baltimore City.
- These 103 include edible products (43 percent), medicinal products (8 percent), horticultural or nursery products (31 percent), and craft and decorative products (18 percent).
- Products are collected by a wide diversity of ethnic and socio-economic



In addition to non-timber forest products, urban woods provide air quality and cooling effects, stabilize soil, and provide wildlife habitat and scenic beauty. *Photo by Richard Straight, USDA National Agroforestry Center*

groups including African-American, Asian-Americans, Native Americans, Eastern European-Americans, and Anglo-Americans.

- Products are collected from street trees, park trees, yards, vacant lots, roadsides, and forested areas.
- The direct net economic value of 60 products ranges from about \$0.30 per pound for Pokeweed to over \$10 per pound for some seeds and mushrooms. Net per tree values range from \$4 per



year for an average mulberry tree to over \$100 per year for mature Chinese chestnut, apricot, and peach trees.



- The potential value of NTFPs on three one-acre sample plots in the city are on par with the per acre values suggested for other urban forests benefits such as energy savings and pollution prevention.
- Urban NTFPs and their collection also provide important educational, nutritional, cultural, and recreational benefits.
- Key issues surrounding urban NTFPs collection include: the lack of collector empowerment, conflicts among collectors and property owners, health issues and safety, and sustainable harvest and ecological impact issues.

Adapted from Community Resources. Exploring Urban Non-Timber Forest Products: The Hidden Nutritional, Economic, Cultural, and Educational Resources Of The Urban Environment. 🌲

Examples of urban NTFP's collected in Baltimore, MD

Some of these products could be in your neck of the woods.

Medicinal

sassafras bark, jewel weed, bee pollen, maitake mushroom

Craft

pine boughs, pine cones, boxwood, grapevine, forsythia sprigs, willow bark



Edible

peaches, figs, mulberries, wineberries, chestnuts, ginkgo nuts, maple syrup, honey, morels, chanterelles

Horticultural

ash seeds, walnuts, acorns, seeds of various cultivars, bamboo, ferns, dogwood seedlings, oak seedlings, native azaleas



N T F P websites

- 1 www.fs.fed.us/ne/burlington/research/ne4454/nontimb/
This site contains information on gathering skills, norms, livelihoods, products, uses, and more.
- 2 www.sfp.forprod.vt.edu
Serves as a national clearinghouse for N T F P harvesters and growers, marketers, processors, and end-users.
- 3 www.forestryencyclopedia.net/Encyclopedia/Appalachian/resource_management/non-timber_forest_products
Presents definitions, historical perspective, market overview, management, and sustainability of resources about N T F P's harvested from oak ecosystems.
- 4 www.specialforestproducts.com
Established to help users look beyond timber and pulpwood with N T F P's found in Midwestern woodlands.
- 5 www.dnr.cornell.edu/ext/agroforestry/sare/
This Cornell University site focuses on ginseng, goldenseal, and mushroom production.
- 6 www.agroforestry.net/overstory/overstory.html
The Overstory is a free email agroforestry journal for practitioners, researchers, professionals, and enthusiasts.
- 7 www.fs.fed.us/r10/tongass/projects/sfp/
Everything you need to know before harvesting on the Tongass National Forest is located here.
- 8 www.herbalgram.org
Contains research reviews, grants, conference reports, book reviews, and legal and regulatory information.
- 9 <http://plants.usda.gov/java/factSheet?cultural=yes>
Offers plant guides about culturally significant plants.
- 10 www.royalroads.ca/programs/faculties-schools-centres/non-timber-resources
Supports the sustainable utilization of N T F P's in the temperate and boreal regions of the world. 🌲

Economics

continued from page 3

In 1999, the estimated wholesale value of wild edible mushrooms in Washington, Oregon, and Idaho was \$41.1 million. The value of mushroom exports from the Pacific Northwest varies annually from \$50 million to \$75 million, depending on harvest levels. In 1996, collectors of eastern black walnuts were paid more than \$2.5 million. Volunteer fire departments in western North Carolina generate from 30 to 90 percent of their budgets from annual ramp (wild onions or leeks) festivals.

Decorative products

The floral industry relies heavily on products gathered from the forests. Many forest plants and parts of plants are used in decorative arrangements to complement and furnish the backdrop for flowers as well as for the main component of dried ornaments. The end uses of these forest plants include wreaths, baskets, greenery, roping, and dried flowers.

For example, in 1995, the U.S. exported moss and lichen, much of which came from southern forests, valued at more than \$14 million. The sales of a pine roping company in southwest Virginia exceeded \$1.5 million in 1997. Within Oregon



There is a good demand for N T F P's used in the floral industry. Products such as sword fern (pictured), mosses, birch bark, cones, boughs, willow branches, and others are used for a variety of purposes.

NAC file photo

and Washington, the industry generates more than \$180 million each year in direct payments to harvesters and landowners. Bough collection, for holiday wreaths, is a major economic activity in the northern states of Wisconsin and Michigan.

It takes time to understand the ins and outs of local, national, and international markets for non-timber products. But as you can see there is profit potential if one is willing to invest the time and effort. 🌲

Forest farming by any other name

Multi-story cropping is a new NRCS practice standard

Bruce Wight

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National Agroforestry Center,
Lincoln, NE

The Natural Resources Conservation Service (NRCS) completed the suite of five agroforestry practice standards when it added “multi-story cropping” to the National Handbook of Conservation Practices in 2006. Multi-story cropping is defined as, “an existing or planted stand of trees or shrubs that are managed as an overstory with an understory of woody and/or non-woody plants that are grown for a variety of products.”

This practice standard is intended to encompass what the National Agroforestry Center and other agroforestry specialists call, “forest farming.” Forest farming has been defined as, “the intentional manipulation, integration, and intensive management of forested lands that capitalize on specific plant interactions to produce non-timber products.” This is not just wild harvesting of some understory plants such as mushrooms, but is a very intentional management system.

Many high-value non-timber forest crops (NTFPs) (e.g., ginseng, goldenseal, black and blue

cohosh, ramps, and decorative ferns) are cultivated under the protection of a forest canopy that

has been modified to provide appropriate microclimate and light conditions. Meanwhile, the timber stand improvement activities are carried out to develop the appropriate understory conditions. For example, thinning less desirable trees and pruning lower branches on the eventual



As many as seven layers may be found in a multi-story operation: the canopy, low-tree layer, shrub layer, herbaceous layer, ground-cover layer, rhizosphere, and a vertical layer (climbers). *Photos by Tony Ingersoll, USDA NRCS*

crop trees can result in the production of clean, knot-free wood that will eventually bring a higher economic return.

NRCS field staff from the Pacific Islands advocated the development of a conservation practice standard that would describe some of the traditional management of their forests where plant crops are grown in multiple layers within the forest from the forest canopy through the mid-level layers on down to the forest floor. After much discussion, the term “multi-story cropping,” was selected as the best term to describe this manage-

With a national standard developed, NRCS state staffs now have the option of developing a state standard.

ment approach. The multi-story cropping conservation practice standard has three general purposes:

- improve crop diversity by growing mixed but compatible crops having different heights on the same area;

- improve soil quality by increasing utilization and cycling of nutrients and maintaining or increasing soil organic matter;
- increase net carbon storage in plant biomass and soil. With the national practice standard developed, NRCS state staffs now have the option of developing a state standard that will be specific to conditions in the state.

The multi-story cropping conservation practice will help facilitate sustainable management systems that incorporate NTFPs into a landowner’s operation. A number of innovative landowners are already applying multi-story cropping. Tom Wahl, in southeastern Iowa, is developing “four story agriculture” with grants from the Practical Farmers of Iowa and the Sustainable Agriculture Research and Education program. The four levels include: medicinal roots from underground, medicinal plants at ground level, wood from the tree trunks up to about twelve feet, and at the fourth level the fruit, nuts, and leaves that are produced in the canopy. 🌱

Upcoming Events

October 23–27, 2007

Society Of American Foresters (SAF)
National Convention: "Sustaining
America's Forests." Portland, OR.
Contact: SAF, 866-897-8720,
<http://www.safconvention.org/natcon-07>.

[http://www.wildlifehc.org/events/
symposium.cfm](http://www.wildlifehc.org/events/symposium.cfm).

[http://www.awra.org/meetings/Virginia_
Beach2008/index.html](http://www.awra.org/meetings/Virginia_Beach2008/index.html)

November 12–13, 2007

Wildlife Habitat Council Nineteenth
Annual Symposium: "The Value Of
Green." Baltimore, MD.

February 4, 2008

Call For Papers. American Water
Resources Association (AWRA)
Summer Specialty Conference:
"Riparian Ecosystems & Buffers:
Working at the Water's Edge," June
30 – July 2, 2008, Virginia Beach, VA.
Contact: atodd@fs.fed.us,

For more upcoming events, visit our
website calendar: [www.unl.edu/nac/
calendar.htm](http://www.unl.edu/nac/calendar.htm).



"Inside Agroforestry" is published three times per year by the
USDA National Agroforestry Center. Phone: 402-437-5178;
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www.unl.edu/nac

Mission

The USDA National Agroforestry Center (NAC) is a partnership of
the Forest Service (Research and Development and State and
Private Forestry) and the Natural Resources Conservation Service.
It is administered by the Forest Service, Southern Research Station;
and its program manager and headquarters are located in Huntsville,
AL, on the campus of Alabama A&M University, while NAC's staff
are located at the University of Nebraska, Lincoln NE; University of
Idaho, Moscow ID, and in Blacksburg, VA. NAC's purpose is to
accelerate the development and application of agroforestry tech-
nologies to attain more economically, environmentally, and socially
sustainable land use systems. To accomplish its mission, NAC inter-
acts with a national network of partners and cooperators to conduct
research, develop technologies and tools, establish demonstrations,
and provide useful information to natural resource professionals.

Policy

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VOLUME 16 ISSUE TWO

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