



Forest Matters

The stewardship newsletter

Spring 2006
Volume 9 Issue 1

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Forest Stewardship
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stewardship](http://www.na.fs.fed.us/stewardship)

Forest Landowners: The Next Generation

(Adapted from “The New Generation of Private Forest Landowners: Brace for Change” (p. 1–4) and “Q & A with Catherine Mater: The New Generation of Private Landowners Study” (p. 14–16), The Pinchot Letter, Vol. 10, No. 2, Winter 2005. [http://www.pinchot.org/publications/pinchot_letter/winter_2005.pdf].)

“Huge change is in the wind,” observed Catherine M. Mater, Senior Fellow of the Pinchot Institute, at a recent Northeastern Area Forest Resource Planners meeting. The United States will soon face the largest intergenerational transfer of family-owned forests in the Nation’s history. Aging landowners—more than 60 percent of the current forest landowners are older than 55 and more than half are older than 65—will transfer a substantial proportion of the country’s privately owned forest land, and the responsibility of managing it, to their heirs.

But will these future forest landowners be able to carry on their parents’ legacy? Will the next generation of forest landowners manage their forests with goals similar to those of the current generation? How will the demographics of the next generation differ? How will their values and motivations influence decisions they make regarding the future of their forests?

The United States will soon face the largest intergenerational transfer of family-owned forests in the Nation’s history.

To begin addressing these questions, the Pinchot Institute, in cooperation with the USDA Forest Service and State forestry agencies, conducted a survey in 2005 of the next generation of landowners—the heirs of current private forest landowners. For many current landowners, the survey offered an opportunity to raise questions with their children that may have not been previously discussed, namely, how will the family forest be managed in the next generation?

A total of 300 phone interviews were conducted in 25 States across the country. The majority of heirs surveyed (about 60 percent) have little involvement in the management of the family forest, and many of those have no interest in becoming more involved. More than half work in professions yielding average or higher household incomes, do not live near their families’ forests, and do not plan to live on those forests in the future. This disconnect from the land and lack of involvement in its management may lead future landowners to make decisions resulting in fragmentation, parcelization, and loss of working forests.

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While 80 percent want to inherit the family land, about half of those interviewed do not wish to be involved with its management. Most view taxes, maintenance costs, and the time commitment required to manage the land as the main costs and challenges of forest land ownership. The good news is that about 40 percent of the heirs are involved in forest management and the majority of those (70 percent) are part of the decisionmaking process.

About 60 percent of the heirs expect to generate income from their forests primarily through timber harvesting; however, results differed between males and females. Women place more value on maintaining undeveloped forest land and keeping their lands as a family legacy, whereas men are more focused on the land's potential for income and investment. Both genders agree that taxes are a key challenge to owning forest land; however, women are more concerned about not having the knowledge to manage their lands while men are more concerned about sibling rivalry. Despite the fact that they want to maintain their forests, both genders identified taxes and medical expenses as conditions that could force them to sell their forest land. This potential link between forest health and human health has not previously been identified in landowner research.

Where do we go from here?

⌘ These studies and surveys are not large enough for statistical evaluation; additional research is needed. The “voices” of next generation landowners will be important in developing assistance to reach for future family forest owners.

⌘ Strategies and incentives need to be developed to entice heirs to become involved with managing the family forest at an early age. As Mater remarked, “If you don’t get them interested early, you won’t get them interested at all at the time of property transfer.” One option is to develop a youth forestry organization similar to the Future Farmers of America, which boasts almost half a million members.

⌘ The differences voiced by female and male heirs in how they plan to manage their land are a key issue in developing landowner outreach efforts. “Research has found,” said Mater, “that women receive, perceive, and analyze information differently.” As more women become forest landowners, different approaches in reaching them will need to be developed.

⌘ The link between human health, in terms of medical costs and access to affordable health care, and forest health should be thoroughly investigated. “This is the first time where we’ve seen a connection between forest health and human health,” said Mater. The implications of this connection could extend far beyond the scope of this study and will require “out-of-the-box” thinking to foster collaboration between these two vastly different worlds.

⌘ Income generation from timber harvesting may be a stronger reason for heirs owning forest land than it was for their parents. Future outreach and cost-share programs will need to demonstrate how timber harvesting can generate income while allowing families to keep their lands forever.

The next generation of forest landowners may not share the same values and motives as their parents, but the resources they will inherit are of national significance. Private forest lands provide a wealth of benefits—they protect drinking water supplies, filter pollutants, control erosion and runoff, conserve plant and wildlife habitats, and produce renewable forest products, to name a few—that extend far beyond property lines. The future of private forest lands is too important to maintain the status quo. In order to protect these resources, we first must try to understand the needs and motivations of these new landowners and then craft better programs and policies to assist them in managing their forests sustainably and maintaining their forest lands well into the future.

Forest Matters: the stewardship newsletter is published semiannually by the USDA Forest Service Northeastern Area Forest Stewardship Program. Its goal is to bring the stewardship message to natural resource professionals, consultant foresters, and private forest landowners in the Northeast and Midwest. If you have any questions, or would like to be added to the hard copy or electronic mailing list, please contact Helen Thompson, USDA Forest Service, 271 Mast Road, Durham, NH 03824, phone: 603-868-7701, fax: 603-868-7604, e-mail: hthompson@fs.fed.us.

Stewardship News

Ask a Forester: *What should I do to grow a forest in my fields, pastures, or cutover lands?*

by Peter Smallidge, Cornell Cooperative Extension

In the Northeast and Midwest, reforestation of abandoned fields is often quick, and natural regeneration occurs on harvested sites. However, forest owners may want to speed up or guide forest regrowth through planting in order to achieve a particular goal. Most owners should consider enlisting the help of a professional forester to work through the details of reforestation. In some cases, a forest owner may decide that, while reforestation may be desirable in some areas, other areas should be left in open habitat for wildlife.

As a landowner, your first step is to write down your reasons for wanting to grow a forest. It may be for wildlife habitat, firewood or fence posts, or future timber production. Then visit the site and see if perhaps succession has already begun. If so, determine if you have sufficient numbers of trees. If the trees are evenly spaced, you will want between 600 and 800 seedlings per acre. Planting may not be necessary; you may only need to protect existing seedlings from deer or mice, or thin around some stems to increase sunlight.

If you do choose to plant, there are three key issues to consider: (1) matching the tree species to the soil, (2) protecting seedlings from deer, rabbits, and mice, and (3) controlling weeds and other competing vegetation. Contact your local service forester or Soil and Water Conservation District for help selecting trees that provide the qualities you want and match the soil conditions. The biggest mistake in reforestation is to plant a tree on soils where it won't thrive. For example, fertile soils can support maple, yellow birch, or cherry, but those species would not perform well on dry sandy soils better suited for some oak or pine species. Two issues to discuss with your forester include planting a variety of species rather than a single species and the use of noninvasive species.

Advance planning for tree planting is critical; once your seedlings arrive there is no time for planning or preparation. (1) Try to begin your efforts in the late summer or early fall, well before the spring planting season. Remove any grasses or shrubs from the planting sites. You can do this manually with a shovel or grub hoe, mechanically with a plow, or chemically with herbicides. (2) When the seedlings arrive in the spring, take special care to prevent overheating

or drying. Ideally, seedlings should be planted within days of their arrival. Check with your State forestry agency or Cooperative Extension office for publications that describe the planting process in detail. (3) Your newly planted trees will likely need protection, so plan ahead. Common tree seedling protection methods include tree shelters made of hardware cloth or area fencing to exclude deer. In areas with abundant deer, browsing can completely destroy an unprotected reforestation effort in just 1 year. Use caution because some tree shelters become attractive winter nesting sites for mice and voles, which may girdle your seedlings.

The planting design depends on your needs and desires. Traditionally, plantations are established in straight, regularly spaced rows and columns, with the distance between rows and within rows ranging from 6 to 10 feet. A regular pattern allows for easier access and maintenance with mowers, but can look unnatural. Irregular patterns, such as "islands" of 10 to 12 trees and mixtures of species, are more natural in appearance and can provide structure that will better satisfy other owner objectives such as wildlife habitat. Your written objectives should help determine the number stems, the variety of species, and the pattern of your planting.

Try to inspect your seedlings monthly during the first year to catch any problems as they develop. Thereafter, quarterly inspection and maintenance will help ensure the success of your plantation. Look for groups of sickly or dead seedlings that might require spot replanting. Be alert to a pattern of poor performance and evaluate whether you need to do something different. Inspect the structures you installed to protect the seedlings from browsing. Until the seedlings gain sufficient height, you may need to control grass and weeds. Seedlings are typically safe from competing grass and weeds at about 4 feet tall, and escape deer browsing at about 5 to 6 feet tall.

See page 7 for recommended Web links

The Latest Invader: *Sirex noctilio*

by Kevin J. Dodds

An exotic woodwasp from Europe and Asia was detected in a monitoring trap placed in Fulton, NY, in September 2004. The woodwasp, *Sirex noctilio*, is a highly invasive species; its introduction into North America could cause significant mortality in native and planted pine trees. In Australia, New Zealand, and Brazil, *S. noctilio* has caused widespread losses in plantations of North American pines (e.g., Monterey, loblolly, ponderosa). *Sirex noctilio* is a particular threat to pure even-aged pine stands or other stressed pine trees. Most North American hard pine species are likely susceptible to *S. noctilio* attack.

A ground survey conducted during spring 2005 discovered Scots and red pines infested with *S. noctilio* in Oswego, NY. Subsequent ground surveys also found infested white pines. During summer 2005, a large-scale delimitation effort was undertaken; approximately 550 traps were deployed in a 70-mile radius from Oswego. Results from this survey found *S. noctilio* as far as 46 miles away. Surveys in Canada have also detected the woodwasp in or around Prescott, Cambridge, and Uxbridge, Ontario. All indications point toward a large, well-established population in North America.

Integrated pest management (IPM) programs, using a combination of silvicultural treatments to reduce the susceptibility of pine stands and a highly specific biological control agent to reduce the impact of *S. noctilio*, have been developed and implemented in countries where the woodwasp has been introduced. Silvicultural treatments to increase tree vigor through stand thinnings have been critical for maintaining tree defenses against *S. noctilio*. The biological control agent used is a parasitic nematode (*Beddingia (Deladenus) siricidicola*) that is highly specific to *S. noctilio* and has helped keep populations below damaging levels in locations where it has been implemented.



Sirex noctilio poses a major threat to North American pines. (photo credit: David R. Lance, USDA APHIS PPQ, www.forestryimages.org)

The USDA Forest Service, APHIS, and State agencies throughout New England and portions of the Mid-Atlantic and Midwest are currently working on *S. noctilio* survey plans for 2006. A large-scale trapping grid will cover most of New York and parts of northern Vermont and northern Pennsylvania. States outside of the grid survey will also deploy *S. noctilio* traps in high-risk forests. With these efforts, it is hoped that the population will be successfully delimited in 2006. The next step is to develop an IPM program that will use both silvicultural recommendations and biological control. Consequently, the USDA Forest Service is developing silvicultural guidelines for reducing the susceptibility of pine stands to *S. noctilio* attack, as well as working with APHIS on getting approval for release of the parasitic nematode in North America.

For more information, visit <http://www.na.fs.fed.us/fhp/sww/> or contact Kevin Dodds at kdodds@fs.fed.us or 603-868-7743.

Don't Move Firewood!

As you head out this summer to campsites, cabins, and other recreation areas, you may unknowingly bring along an unwanted guest—invasive insects and diseases that live in trees cut for firewood. Public service campaigns across the Northeast and Midwest encourage recreationists to leave their firewood at home and obtain it at their destination. Emerald ash borer, sirex woodwasp, and Asian longhorned beetle are just a few of the many forest pests that can cause devastating effects if introduced into new areas when transported in firewood. With some invasive species, a single log can carry enough insects to establish a new infestation. Help protect our forests by following these simple steps: (1) leave firewood at home; (2) use firewood from local sources; (3) if you have moved firewood, burn all of it before leaving your destination; (4) share this important message with others.

Upper Mississippi River Forestry Partnership

The Upper Mississippi River watershed covers a huge area, approximately 189,000 square miles. About 200 years ago, forests occupied almost 75 percent of the watershed. Today they occupy only 18 percent, and agriculture is the dominant land use. Years of changing land use have altered the hydrology of the watershed and increased the runoff of nutrients and sediments, degrading local rivers and contributing to hypoxia (oxygen deficiency) in the Gulf of Mexico. Fish and aquatic organisms are harmed by environmental contaminants in runoff, and decreasing forest cover negatively impacts migratory bird populations.

The State Foresters of Illinois, Indiana, Iowa, Minnesota, Missouri, and Wisconsin, and the Northeastern Area joined forces in 2001 to form the Upper Mississippi River Forest Partnership (UMRFP), an informal alliance bringing together diverse organizations to address the challenges facing the Upper Mississippi. The UMRFP's goal is to promote

trees and forests as one tool to improve the health and sustainability of the watershed. Achievements to date include initiating GIS analysis to identify critical areas for forest conservation, water quality improvement, and wildlife habitat enhancement; hiring a Watershed Coordinator to help implement the UMRFP action plan; and developing a partnership with the National Fish and Wildlife Foundation to launch a new competitive grant program for watershed improvement projects.

At a Stakeholder Forum in February 2006, participants developed action strategies for improving migratory bird habitat, conserving priority forest areas, establishing riparian forest buffers, and regenerating bottomland hardwoods. Participants will form implementation teams to continue working on each strategy. For more information, visit http://www.na.fs.fed.us/watershed/upper_mississippi_partnership/.

Hot Off the Press

NEDLite User's Manual: Forest Inventory for Palm OS Handhelds—NED is a collection of software products developed by the USDA Forest Service in conjunction with State and educational institutions to help resource managers formulate goals, assess current and future conditions, and produce sustainable management plans for forest properties. NEDLite enables field data to be collected on handheld computers and automatically transferred into NED software for analysis and subsequent prescription development. NEDLite can be used purely for data collection and does not require NED software; data can be imported into a spreadsheet program such as Microsoft® Excel. However, NEDLite was designed specifically for use with NED-2 software, a system that expands on the previous version (NED-1) by integrating treatment prescriptions, growth simulation, and alternative comparisons of management scenarios across a management unit. The manual is the printed version of the on-line help delivered with NEDLite and includes a CD containing the software program. (Knopp, Peter D.; Twery, Mark J. 2006. Gen. Tech. Rep. NE-340. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northeastern Research Station. 64 p.)

Invasive Plants Established in the United States That Are Found in Asia and Their Associated Natural Enemies, Volume 2 is the second in a series containing summaries of plants found in Asia that were introduced purposefully or accidentally into the United States. The information in both volumes was obtained by searching and reviewing Chinese literature and through discussions with Chinese scientists. Included is background information on the biology of each plant, a photo to help with identification, indices of scientific names, a bibliography of over 200 references, and maps of United States distribution for all of the plant species. To obtain a copy of either publication, contact Lisa Cress at lcress@fs.fed.us or 304-285-1563. (Zheng, Hao; Wu, Yun; Ding, Jianqing; Binion, Denise; Fu, Weidong; Reardon, Richard. 2005. FHTET 2005-15. Morgantown, WV: U.S. Department of Agriculture, Forest Service, Forest Health Technology Enterprise Team. 175 p.)

Landowner Spotlight

A Farm Family's Transformation

(Adapted with permission from *Midwest Woodlands & Prairies*, P.O. Box 713, Monona, IA 52159, wooddriver@netins.net)

"Farming, at least the way we were farming, was almost alien to trees. You put everything you could into row crops because that put money into your pocket. Planting something that wouldn't produce income for 60 years or more never entered our heads."—Carolyn Koopman

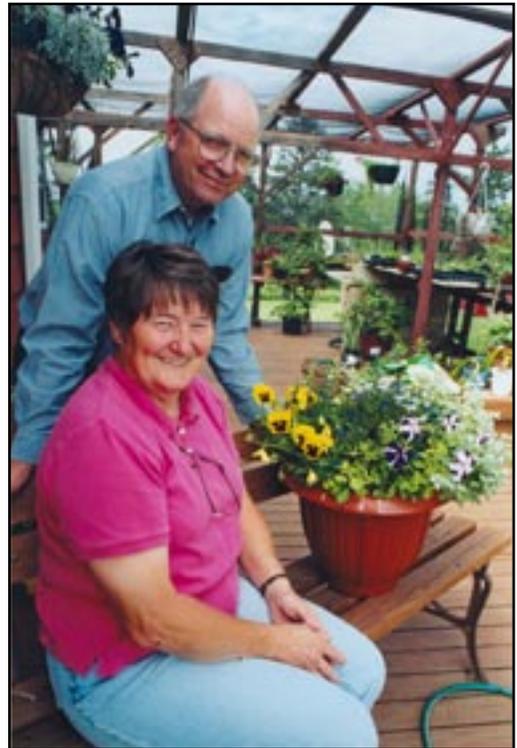
The early 1990s found Jerry and Carolyn Koopman farming full tilt with their son Rafe. They were producing 2,000 hogs a year in a farrow-to-finish operation in northeastern Iowa and running about 60 head of beef cows. With rented ground, they were farming about 800 acres.

But nothing is forever. In 1995 Rafe decided to go to college to study engineering, not to farm. The Koopman's other three children had already scattered. Rafe's decision ended any hopes of the next generation taking over the farming operation. What happened next was one of the turning points that many families experience, for better or worse.

Rafe's decision left Jerry free to pursue something he'd always wanted to do—become a trucker. Quicker than you could say 18-wheeler, they decided to liquidate their hog operation and rent out the crop ground.

With Rafe off to college and Jerry on the road, Carolyn filled the last opening in a Master Woodland Manager program conducted by foresters with Iowa State University and the Iowa Department of Natural Resources. It was then Carolyn's turn to experience an epiphany. "After that class, I knew that forestry was what I really wanted to do on the farm," she said. Carolyn's decision ushered in a new way of thinking for the entire family. The Koopman farm hasn't been the same since.

Over the next few years, with Carolyn as tree meister, some 90 acres of pasture and cropland were transformed into young forests of black walnut, ash, oak, and white pine. One-Stop Forestry, out of Postville, IA, direct-seeded the hardwoods under various government cost-sharing programs. The Continuous Conservation Reserve Program, with its annual rent on former cropland and cost-sharing for timber establishment, came along at just the right time for the Koopmans. "We never would have been able to make such fast progress without the government programs," Carolyn says. "But we wondered if anything was going to survive the first few years, the deer damage and weeds were so terrible."



Jerry and Carol Koopman have transformed their farm into a flourishing forest.

Despite the well-known taste deer have for white pine, Carolyn decided to interplant pine into the hardwoods after viewing 100-year-old pines at former governor William Larabee's historic home near Clermont, IA. They're magnificent trees and native to northeastern Iowa, she thought.

The Koopmans subsequently hand-planted more than 7,000 white pine into and around the edges of their hardwood plantings. More than half have survived, a remarkable survival rate given the deer pressure in that part of the Midwest and the fact that the Koopmans didn't protect the seedlings with plastic or wire-mesh tubes. Instead, they stapled fabric-softener sheets around the leader, a trick suggested by DNR district forester Bruce Blair. They put the sheets on in the fall and took them off in the spring, a routine they still follow.

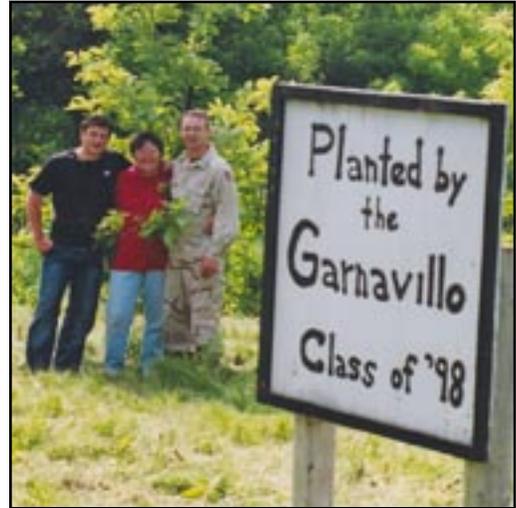
“It’s pleasant work on those nice fall and spring days,” Carolyn says. “The fact that the sheets help save our pines from deer adds to the fun.”

“We’ve experienced an interesting evolution on this farm,” Jerry says. “Carolyn would come back from these forestry field days and say to me, ‘Before you plant trees you have to set up a plan and decide what you want from your woodland.’ I was amazed. I thought the only purpose was to harvest logs. But she said you might also want to manage timber for wildlife or to restore it for esthetics or environmental reasons. I thought this was silly at first, but now I understand. When I’m home on weekends, I like to walk around in the timber just to enjoy it.”

The Koopmans’ 90 acres of native timber underwent a thinning 7 years ago in a timber stand improvement program. They say it could probably use another thinning to release crop trees and maximize growth, thus adding to the income potential that they might realize in their lifetimes.

“Kids will connect to trees if you give them a chance,” says Carolyn, who’s spoken to elementary and high school classes about forestry. “Fifth and sixth graders want to know about chipmunks and rabbits and things like that,” she says. “High schoolers want to hear about money. I told them that it can take 100 years for black walnut trees to mature under no management, but they’ll mature in 60 years if you take care of them. Then I said an acre of land around here will grow about 50 mature walnut trees. A single mature walnut might be worth \$2,000. That got their attention.”

High school classes came out to the Koopman farm on two different occasions to plant trees as a class project. “We had a lot of fun planting the seedlings, watering them, and putting down chips,” Carolyn says. “I remember one of the girls saying, ‘That’s my tree!’”



Former students Cory Brink (left) and Zach Their visited the Koopmans in 2005 to check on the progress of trees they had planted 7 years earlier.

“Our grandsons might be harvesting some of these trees,” Carolyn says. “Or their children. Or their grandchildren. Isn’t that a great legacy to leave? So many of us can do that. And you could also leave a written record, like a log book with occasional entries about what you did with a tree that day, or putting down your goals and other thoughts. It’s something that your descendants can read and pass on while the trees stand as the living record.”

“We never plan to be done planting trees,” Carolyn continues. “The fun is in the doing, not in being done. I think that’s why forestry is so much fun for us.”

Ask a Forester *Continued from page 3*

Recommended Web Links

Soil and Water Conservation Districts

☞ <http://www.nacdnet.org/directory/>

National Association of State Foresters

☞ <http://www.stateforesters.org/Sflinks.html> (State agency links)

Tree planting and spacing

☞ <http://www.extension.iastate.edu/Publications/PM1676.pdf>

☞ http://www.Irconline.com/EN_splash.html

Weed control

☞ http://www.Irconline.com/Extension_Notes_English/pdf/clrng.pdf

Fencing

☞ <http://pubs.cas.psu.edu/freepubs/pdfs/uh145.pdf>

Tree shelters

☞ <http://www.ag.iastate.edu/departments/forestry/ext/pubs/F-364.pdf>

☞ <http://pubs.cas.psu.edu/FreePubs/pdfs/uh169.pdf>

Research

Effects of Glossy Buckthorn on Tree Seedling Regeneration

According to researchers at the University of New Hampshire Department of Natural Resources,¹ the presence of dense glossy buckthorn (*Rhamnus frangula*), an invasive shrub native to Europe, on study plots in southern New Hampshire inhibited the establishment of tree seedlings. The research compared tree seedling density under three different treatment regimes: regime #1, with > 90 percent glossy buckthorn (Gb) cover; regime #2, with > 90 percent of the Gb removed; and regime #3, not invaded by Gb. Removal of Gb was accomplished by cutting all Gb cover at the soil level, removing the stems, and swabbing the stumps with a 50 percent glyphosate solution.

After 2 years of measurements, regime #1 had significantly lower first-year native tree seedling density than regimes #2 and #3. These short-term data suggest that inhibition of tree seedling regeneration by Gb could alter the successional path of invaded forests. Full canopy harvests or thinnings to encourage tree regeneration in stands invaded by Gb could have the opposite effect; Gb cover could actually slow or completely thwart tree seedling germination and growth after treatment. However, it is still unclear whether Gb cover will continue to inhibit tree seedling density for an extended period following forest canopy removal. The alternative is that the increased resource availability after harvesting or thinning may alter the response of tree seedlings to Gb cover and allow regeneration of native trees to continue with little impact.

An encouraging aspect of the study is that there was a sharp decline in Gb seedling density in the second year after Gb removal under regime #2 following a sharp increase in the first year. The Gb seedlings were presumed to have come from the seedbank rather than seed rain from adjacent individuals—the vast majority of Gb fruit not taken by birds drops directly below the parent plant, and additional Gb were removed in a 2-meter swath around study plots to minimize shading effects from adjacent shrubs. The sharp decline in seedling density the second year after removal is significant because it appears that the follow-up period for control efforts may not need to last longer than 1 or 2 years. In addition, the lack of difference between Gb seedling density in regimes #2 and #3 indicates that regime #2 forests may have begun to return to pre-invasion conditions in as little as 2 years, at least in terms of seedling density independent of species composition. The researchers recognize that, although the second year data is promising, continued monitoring is necessary, and continued herbicide use is still the most effective control method.



Glossy buckthorn was found to inhibit seedling regeneration on study plots. (photo credit: Gil Wojciech, Polish Forest Research Institute, www.forestryimages.org).

Glossy buckthorn has become a widespread invasive plant in the Northeastern United States and adjacent Canada. Its range will likely continue to expand in North America, becoming abundant in open and semi-open wetlands and some upland woodlands. It inhabits a wide range of soil and soil moisture conditions. The fruit is a small, black berry with 2 to 3 seeds; production is abundant, ranging between 430 and 1,804 fruit per genetically distinct individual (genet) in one study. Humans and birds, possibly including European starlings, grosbeaks, cedar waxwings, and American robins, are the most likely long-range dispersal vectors.

¹Frappier, Brian; Eckert, Robert T.; Lee, Thomas D. 2004. Experimental removal of the non-indigenous shrub *Rhamnus frangula* (glossy buckthorn): effects on native herbs and woody seedlings. *Northeastern Naturalist*. 11(3): 313–322.

Influence of Cutting Method on Stand Growth in Sawtimber Oak Stands

Over 80 percent of the 50 million acres of oak-hickory forest in the Northern United States is owned by nonindustrial private forest landowners. For many of these owners, noncommodity amenities such as recreation, wildlife, or esthetic enjoyment are more important than timber production. Nevertheless, forest ownership carries its own set of costs, such as property taxes and insurance. Nonindustrial forest landowners may be receptive to forest management practices that provide some income yet are compatible with their primary goals.

Many upland oak forests in the Eastern United States are approaching economic and biological maturity. Traditionally, forest management guidelines have suggested regenerating economically mature sawtimber oak stands by even-aged methods, but many landowners, especially those with smaller holdings, may want to avoid methods that remove all large trees. Few studies, however, have directly compared the effects on stand and yield development from alternative methods of managing sawtimber oak.

A recent article¹ by researchers at the Connecticut Agricultural Experiment Station addressed the influence of cutting method on stand growth in three sawtimber oak stands in central Connecticut. The objective of this research was to compare stand volume growth and development among alternative treatments (diameter-limit cutting, high-grading, multi-aged crop tree, and forest preserve) in mature sawtimber oak stands. The researchers also examined volume yield and growth for two even-aged management methods (silvicultural clearcut and shelterwood).

Three study areas were established in the early 1980s. All areas were fully stocked, upland oak forests with preharvest basal area values ranging from 75 to 107 square feet/acre. Oaks accounted for over half of total basal area at all three sites. Maple and birch were common, especially in the pole-size class, accounting for 26 to 44 percent of trees.

The study showed that three distinct treatments—shelterwood, multi-aged crop tree, and forest preserve—

resulted in similar stand volume growth rates in sawtimber oak stands. Shelterwood and multi-aged crop tree treatments can be used by landowners who wish to generate income to offset expenses; the choice will depend on the landowner's esthetic and regeneration goals. Diameter-limit cutting produced similar volume rates, but the diameter limits for the second cutting cycle had to be lowered to maintain economically viable harvests. As a consequence, residual stand structure after the second cutting cycle was similar to that for the high-grading plots. Although high-grading had the highest harvested volume during the first cutting cycle, the low quality of residual trees and depressed stand growth rates indicate it is not a viable option for long-term forest management.

Volume growth was significantly lower on high-grading plots (36 board feet/acre/year) than on the forest preserve, diameter-limit, shelterwood, and multi-aged crop tree plots (~214 board feet/acre/year) through two cutting cycles. Total board-foot yield (final volumes plus harvested volumes) was significantly lower for the silvicultural clearcut plots (7.3 MBF/acre) than for uncut, shelterwood, and diameter-limit cuts (12.3, 12.5, and 13.0 MBF/acre, respectively). Results of this study could be used by private and public foresters to select among management alternatives that best achieve the management goals of the landowner.

For more information, contact Jeff Ward at jeffrey.ward@po.state.ct.us or 203-974-8495.

¹Ward, Jeffrey S.; Stephens, George R.; Ferrandino, Francis J. 2005. Influence of cutting method on stand growth in sawtimber oak stands. *Northern Journal of Applied Forestry*. 22(1): 59-67.

Pesticide Precautionary Statement

This publication discusses the use of pesticides and reports research involving pesticides. Pesticides used improperly can be injurious to humans, animals, and plants. Follow the directions and heed all precautions on the label.

NOTE: Some States have restrictions on the use of certain pesticides. Check your State and local regulations. Also, because registrations of pesticides are under constant review by the Federal Environmental Protection Agency, consult your county agricultural agent or State extension specialist to be sure the intended use is still registered.



State Roundup

A historic event recently took place when the Illinois Secretary of State accepted the Articles of Incorporation for the **Illinois Forestry Association**. The founders see the association as an excellent opportunity to have a positive impact on several forestry issues in the State. The purpose of the association is to:

- ⌘ Provide a statewide voice for common interests of Illinois forestry
- ⌘ Offer an avenue for networking, fellowship, and sharing information
- ⌘ Connect people to available technical and forestry management training
- ⌘ Leverage activities of local forestry groups for greater impact

The association is working hard to increase and strengthen its membership base. It is also soliciting input from interested individuals to find out what issues matter most to State residents. Visit <http://ifdc.nres.uiuc.edu/> to complete a survey. Contact: Dick Little, dlittle4@uiuc.edu or 217-493-6736.

The **Spatial Analysis Project** (SAP) is up and running in **Iowa**. Maps have been developed for 2000 through 2004 displaying acres under forest plans and plan implementation by practice. During that timeframe, district foresters wrote over 2,100 Forest Stewardship plans on 89,000 acres statewide, although prescriptions had been implemented on only 8,645 acres. This information can be displayed by congressional and State legislature districts to visually describe the need for forestry technical assistance and cost-share funds. Contact: Paul Tauke, Paul.Tauke@dnr.state.ia.us or 515-242-6898.

A workshop on the use of the **NEDLite** and **NED-2** decision model software products in preparing Forest Stewardship Plans (see related article “Hot Off the Press” on page 5) is scheduled for August 11 in Augusta, **Maine**. Contact: Roger Monthey, rmonthey@fs.fed.us or 603-868-7699.

The **Working Woodlot Initiative**, sponsored by the **Maryland Forest Service** and **Pennsylvania Bureau of Forestry**, is designed to promote active forest management on woodlots less than 10 acres in size. The study will track all costs and profits to determine if any or all aspects of small-scale logging activity are economically feasible. The potential marketing of the products will rely on 11 years of Forest Stewardship plans, which include recommended removals, stand ages, and types. From that data, likely products and future trends in products will be developed. Contact: Dan Hedderick, dhedderick@dnr.state.md.us or 301-777-5835.

Ohio Division of Forestry recently hosted a field tour in the **emerald ash borer** quarantine zone to demonstrate what is being accomplished to slow the spread of this devastating forest pest. Members of the Forest Service’s emerald ash borer team, as well as representatives of the Northern Research Station, APHIS, OSU Extension, and the West Virginia and Michigan Departments of Agriculture, visited small pre- and post-harvested private landowner woodlots and discussed issues and concerns raised by the Division of Forestry regarding the ability of landowners to sell their timber. Contact: Gregg Maxfield, Gregg.Maxfield@dnr.state.oh.us or 419-429-8318.

About 70 service and consultant foresters attended the latest seminar sponsored by the **West Virginia Forest Stewardship Advisory Committee**. The *Forestry and Water* seminar offered presentations on the latest forestry best management practices (BMPs), water quality laws, and problems as seen by foresters, loggers, landowners, and regulators. Discussion topics included what is involved in inspecting a logging operation while it is active and at close out. During a field exercise at an active logging site, participants were able to critique BMPs and determine their effectiveness at preventing sedimentation from discharging into nearby streams. Contact: Dan Kincaid, dkincaid@wvforestry.com or 304-558-2788.

Naturalist's Corner

Stinkhorns, Flies, and Beetles—Oh My!

by Roger Monthey



Flies are attracted to the rancid odor emitted by netted stinkhorn mushrooms.

As I was walking in College Woods at the University of New Hampshire on a beautiful October day, my nose was assaulted by a fetid odor. It eventually drew my eyes to a curious mushroom form growing among the leafy litter on the forest floor—the netted stinkhorn mushroom (*Dictyophora duplicata*). This species' elongated fruiting body has a strongly chambered head covered by

brownish-olive slime consisting of basidia and basidiospores. It also has a beautiful skirtlike veil, although in this specimen the veil had fallen away.

While researching this species,¹ I found that the netted stinkhorn mushroom emerges from an egglike stage and hurls itself upward in a rapid lengthening process, reaching its full height of about 9 inches in just a few hours. It's little surprise that the smell, reminiscent of rotting meat, attracts flies. The flies obtain a few sticky spores for food, though not the decaying animal protein they were likely seeking. Some of the spores adhere to the flies' legs and mouthparts, and are transported elsewhere. This mushroom species apparently depends on the flies for spore dispersal, unlike most Basidiomycete mushrooms (i.e., those species that produce spores on a club-shaped structure called a basidium), which rely on wind dispersal. Stinkhorns are hardly the only mushrooms that have a connection to flies. The fly agaric (*Amanita muscaria*) is so named because of the long-standing belief that flies die when they feed on the mushroom. More recent observations, however, suggest that the mushroom just renders the flies unconscious for a period of time. The vagaries of nature!

Stinkhorns are members of the stomach mushrooms (Gasteromycetes, order Phallales), so named because they produce their spores inside the fungi. Other familiar

examples of gasteromycetes include puffballs, earthstars, and bird's nest fungi. The nauseating odor of stinkhorns is caused by a combination of chemicals, including hydrogen sulfide and methylmercaptan. Stinkhorns are saprobic and obtain their nutrition from dead plant materials. They are consumed and considered aphrodisiacs by some Chinese, but their officious odor and slimy spore mass put off most collectors.

Returning to the mushroom a day later, I noticed another interesting insect attracted to the rotting smell—a dermestid beetle. These beetles love to feed on carrion, thus their propensity to be drawn to such odors. Unfortunately, it too may have been hoodwinked by the mushroom, although, like the flies, it does obtain some nutrition from the spores and helps disseminate the spores to good growing sites. Dermestid beetles are primarily scavengers and feed on a wide variety of plant and animal products, including leather, furs, skins, woolen or silk materials, rugs, stored food materials, and carrion.

Dermestid beetles are intriguing because they have long been used in mammalogy laboratories to remove dead meat from animal skeletons used for scientific purposes.² They are well suited for this laboratory work in part because they (1) cannot fly at temperatures below about 80 °F; (2) reproduce quickly at room temperature; (3) are large enough to eat flesh quickly; (4) are small enough in the early larval stages to clean the smallest skeletons; (5) are relatively long-lived as adults (about 5 months); (6) are able to survive long periods without food; and (7) don't like feathers, fur, or skin, as well as most organs or dried blood.



Dermestid beetles are used to clean animal skeletons for laboratory work. (photo credit: Kenneth R. Dudzik, USDA Forest Service)

¹Volk, Tom. 1999. Tom Volk's fungus of the month for July 1999. http://botit.botany.wisc.edu/toms_fungi/july99.html. (1 March 2006).

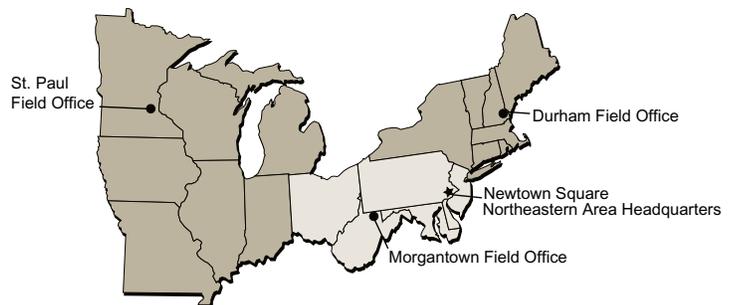
²Hinshaw, Stephen H. [n.d.]. Use of dermestid beetles for skeleton preparation. <http://www.ummz.lsa.umich.edu/mammals/dermestid.html>. (1 March 2006).



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