

Hardwoods cont. from page 1

The sooner these problems are identified, the easier and more affordable they may be to control. If a forest health problem is suspected, landowners should reach out to their local Virginia Department of Forestry forester or local Virginia Cooperative Extension office for help.

3. Improve the growth of desirable trees in young stands. In Virginia, the most limiting resource for tree growth is light. Increasing the amount of light a tree receives can improve its growth and vigor. In young hardwood forests, there is a simple and effective management practice that accomplishes this called crop tree release (CTR, Figure 3). CTR accelerates the growth of desirable trees and improves the quality of the timber produced by mimicking the natural competition that occurs in forests, with the added benefit of allowing landowners to select which trees are favored (the crop trees).

CTR removes unwanted vegetation around selected crop trees. A crop tree is any tree that will remain in the forest for the long term. Crop trees can be selected based on aesthetics (black gum is beautiful in the fall), wildlife (white oak is a great producer of acorns), timber production (northern red oak is a desirable timber tree), or any other factors a landowner wants to manage for.

4. Improve the overall health of the forest. Timber stand improvement (TSI) is a management practice that can be used in hardwood forests of any age. TSI focuses on removing undesirable vegetation throughout the forest. Undesirable vegetation includes nonnative invasives, unwanted species such as beech and red maple, and diseased and poorly formed trees. Through this process, TSI reduces competing vegetation and focuses growth on desired vegetation, as the additional light entering the forest improves the growth and health of the remaining trees.



Figure 3. Crop tree release is a management practice that is most effective when applied in young, crowded hardwood stands, such as the one shown in this photo. Photo by: Jennifer Gagnon, Virginia Tech.

2. Hack and squirt herbicide application is an efficient method of injecting herbicide into unwanted stems. A hatchet is used to make downward angled cuts around the trunks. Herbicide is then sprayed into the cuts using a spray bottle. Hack and squirt is most effective when trees are not experiencing heavy sap flow (in spring when the tree is leafing out) and not frozen.

3. Girdling kills trees by interrupting the flow of sap between the roots and crown. A hatchet, ax, or chainsaw is used to cut two bands all the way around the stem of the tree. The distance between the two bands should be roughly 2-4 inches. The height of the bands is flexible and can be made at a comfortable level. Girdling can be done anytime of the year. It may take time for girdled stems to die.

4. Felling using a chain saw or handsaw is a more labor-intensive option but is useful if you do not want dead standing trees or want material to create brush piles for wildlife. Felling can be done any time of the year, but cooler weather is recommended to make cruising around the woods with a chain saw easier. The lack of leaves and understory plants in the winter months improves visibility and, thus, safety too.

VIRGINIA FOREST LANDOWNER UPDATE

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VIRGINIA FOREST LANDOWNER UPDATE

Events, news, and information promoting the stewardship of Virginia's forest resources.



VIRGINIA FOREST LANDOWNER EDUCATION PROGRAM

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INSIDE

1

Tools for Sustainably Managing your Hardwoods

2

Events Calendar

4

Plant More Trees for Cleaner Water

Events Contacts

6

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Tools for Sustainably Managing your Hardwoods
Wrapping up the Year of the Hardwood
By: Jennifer Gagnon, Virginia Tech

Over the past year, the Virginia Forest Landowner Update (<https://forestupdate.frec.vt.edu/newsletter/archives.html>) has featured articles outlining the history of exploitation and recovery of Virginia's hardwood forests, the current state of the resource, and the many challenges it faces. This article will wrap up the series with a review and a discussion of the tools and resources available to help private woodland owners improve the health and productivity of their hardwood forests.

Recall that hardwood forests (made up of deciduous tree species such as oaks, hickories, and maples) are the most prevalent forest type in Virginia. Over 79% of the forests in the commonwealth (12.6 million acres) are hardwood forests. And these diverse forests provide important ecological and economic benefits (Figure 1).

Virginia's hardwood forests have a long history of exploitation, mismanagement, and health issues. Excessive harvesting, high grading, an influx of diseases and insects, a changing climate, and a dearth of robust regeneration due to poor harvesting practices and deer, have left many of the hardwood forests of the commonwealth in a less than ideal state. Add to this a lack of research into effective and affordable management options, and the future of these forests seems grim.

Yet Virginia's hardwood forests have persisted and shown resiliency despite these issues. This provides hope for the future - hope that with proper management, the health and productivity of these forests can be improved over time to ensure a sustainable resource into the future.

What can Virginia's landowners do?

There is a variety of things woodland owners can do *now* to improve the health and productivity of their hardwood forests (Figure 2). Implementing even one of these practices can be beneficial.

1. Start Early. Improvement of hardwood stands takes time. It's best to plan and prepare for future hardwoods years before you cut timber. Contact your forester early, before you cut timber, to maximize your options and make full use of the resources listed below.

2. Walk the property frequently and look for health problems. Walking a property regularly will not only increase familiarity with it, but will also allow early identification of infestations of nonnative invasive species, insect outbreaks, and pathogens.



Figure 1. Healthy and productive hardwood forests provide ecological and economic benefits to all Virginians. Photo by: Jennifer Gagnon, Virginia Tech.



Figure 2. Virginia's private forest landowners can implement management practices today to help improve the hardwood forests of the future. Photo by: David Richert, Mason, Bruce & Girard Inc.

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| Virginia Department of Forestry | Virginia Tech Department of Forest Resources & Environmental Conservation & Virginia Cooperative Extension | USDA Forest Service Forest Stewardship Program | Virginia Forestry Association | Virginia Sustainable Forestry Initiative SIC/Virginia Tree Farm Foundation |
| 900 Natural Resources Drive Ste. 800 Charlottesville, VA 22903 434-977-6555 https://www.dof.virginia.gov | 228 Cheatham Hall 0324 Blacksburg, VA 24061 540-231-6391 https://forestupdate.frec.vt.edu | 1400 Independence Ave. SW Washington, D.C. 20250 202-205-0929 https://www.fs.usda.gov/managing-land/private-land/forest-stewardship | 3808 Augusta Ave Richmond, VA 23230 804-278-8733 www.vaforestry.org | 804-278-8733 http://virginiastfi.org/ 757-354-6721 https://vtff.org/ |

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| EVENTS CALENDAR | | | For the most complete listing of natural resource education events, visit the on-line events calendar at https://forestupdate.frec.vt.edu | | |
|-----------------|--------------------|------------------------------|--|--|----------------------------|
| Contact | Date | Location | Event | Time | Fee |
| MP | Year-round | Statewide | Virginia Master Naturalist Volunteer Basic Training People who are curious about nature, enjoy the outdoors, and want to be a part of natural resource management and conservation in Virginia are perfect candidates to become Virginia Master Naturalists. Visit http://www.virginiamasternaturalist.org/chapters-a-map-and-contacts.html for information on training schedules and application procedures. | Varies | Varies |
| 15Forest | Every other Friday | Online | Fifteen Minutes in the Forest Join Virginia Cooperative Extension's Forestry Team (and special guests) every other Friday for a video on a natural resources-related topic. View past videos on the VFLEP YouTube Channel. | 12:15 | Free |
| JG | Oct. 6 | Franklin City | Virginia Tree Farm Foundation Tour The Virginia Tree Farm Foundation would like to invite current and potential Tree Farmers to lunch & a tour of the Franklin Lumber sawmill. This tour will provide a rare opportunity for a behind-the-scenes look at an operating sawmill. See how your trees are turned into solid wood products. | 11:30 | \$10* |
| NC/JF | Oct. 7 | Amelia-Henrico-Powhatan Cos. | 46th Annual Fall Forestry & Wildlife Field Tour Amelia-Henrico-Powhatan Counties In many parts of Virginia, the landscape quickly changes from urban to rural and back again. This tour will start in the city, with an exploration of urban forests and a discussion about the value of urban wood. After lunch, we'll move to the country to look at forest & wildlife management practices in a rural setting. | 8:30 - 5:00 | \$45*/person; \$80*/couple |
| BW | Oct. 14 | Smyth & Washington Cos. | 46th Annual Fall Forestry & Wildlife Field Tour Smyth & Washington Counties The bourbon industry depends on well-managed oak forests. For a spirit to be labeled as bourbon, it must be aged in new, charred oak barrels. On this tour, we'll learn about programs to help woodland owners improve the management of their hardwood forests and visit two mills to see how bourbon barrels are made. | 9:00 - 4:00 | \$30*/person; \$50*/couple |
| JG | Oct. 21 | Blackridge | Virginia Tree Farm Foundation Tour The Virginia Tree Farm Foundation invites current and potential Tree Farmers to lunch & a tour of a privately owned Tree Farm in Mecklenburg County. | 11:00 | \$10* |
| KS | Oct. 27 | Galax | Preparing for Generation NEXT - Legacy Planning Workshop Join the Generation NEXT Team and experienced conservation, legal, and financial advisors to learn how to pass your land and your legacy on to the next generation while keeping it intact, in forest, and in family. | 8:30 - 4:00 | \$25*/person; \$40*/couple |
| AD | Oct. 28 | Louisa Co. | 46th Annual Fall Forestry & Wildlife Field Tour Louisa County Historic Louisa County boasts some of the largest intact private forestlands in Virginia. It's also the site of the 2011 earthquake, felt by more people than any other quake in U.S. history. Join us as we rock and roll through the countryside for a scenic, historic, educational tour that will leave you quaking with opportunity! | 9:00 - 5:00 | \$45*/person; \$80*/couple |
| NC | Nov. 2 | Providence Forge | Preparing for Generation NEXT - Legacy Planning Workshop See above for description. | 6 - 9:00 | \$25*/person; \$40*/couple |
| JG | Nov. 10 | Pulaski | Learn to Burn: Using Prescribed Fire to Manage your Land This workshop will outline benefits of using fire as a management tool, where to go and who to contact, and how burns are conducted safely and successfully. You will be able to participate in a prescribed burn (conditions permitting). | 9 - 5:00 | \$15* |
| JG/BW AD | Feb. 11 Feb. 25 | Wytheville Culpeper | 2023 Woods & Wildlife Conferences Save the dates! Registration & agendas available in January. | TBA | TBA |
| | | | *Meals included | See Events Contacts page 4 | |

Hardwoods cont. from page 5

For more details on how to implement these management methods, including herbicide recommendations, visit these resources:

Crop Tree Release

- Crop Tree Management: A Tool to Help You Achieve Your Woodland Goals (<https://ohioline.osu.edu/factsheet/f-50>)
- Technical Guide to Crop Tree Release in Hardwood Forests (https://www.uky.edu/~jmlhot2/Resources/TechnicalGuideToCropTreeReleaseinHardwoodForests_Milleretal2007.pdf)

Timber Stand Improvement

- Timber Stand Improvement for Wildlife | Virginia DWR (<https://dwr.virginia.gov/blog/timber-stand-improvement-for-wildlife/>)

Control methods

- Non-Removal Forest Stand Improvement Techniques (https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_010620.pdf)
- Using Basal Bark Herbicide Applications to Control Understory Tree Species (<https://extension.psu.edu/using-basal-bark-herbicide-applications-to-control-understory-tree-species>)

What resources are available to help Virginia's landowners?

There are tools and programs available to help landowners with both financial and technical aspects of hardwood management. These include:

1. The Hardwood Habitat Incentive Program (HHIP) provides cost share for qualified landowners to implement one or more of six approved hardwood management practices (including CTR and TSI). VDOF foresters across Virginia are trained to specifically help landowners participate in the HHIP. Contact your local VDOF office to reach the forester for your area (https://forestupdate.frec.vt.edu/content/dam/forestupdate_frec_vt_edu/resources/contact-professional/HHI-Trained-Foresters-Map.gif).

2. The Beneficial Hardwood Management Practices HB1319 Tax Credit (<https://vaforestry.us4.list-manage.com/track/click?u=eb649a059245dbacc8ab50381&id=40f4aba5df&e=1ca1be7366>) will provide landowners with a nonrefundable individual income tax credit for expenses incurred for the implementation of beneficial hardwood management practices. The credit is equal to eligible expenditures up to \$1,000. This new tax credit went into effect on January 1, 2022. Details for applying will be available by the end of November 2022.

3. The White Oak Initiative (<https://www.whiteoakinitiative.org/>), a partnership among state, federal, and private groups (including the spirits industry) is working to help woodland owners ensure the long-term sustainability of white oak (an important component of hardwood forests). The Initiative supports research and policies that support white oak.

4. The Oak Crop Tree Release Tool is an online interactive tool being developed at Virginia Tech that will provide landowners with a consolidated location for information on how to implement CTR in their hardwood forests. This tool will be tested with landowners and natural resource professionals in the fall of 2023.

5. Educational programs that include examples of different sustainable hardwood management practices are offered through the Virginia Forest Landowner Education Program (VFLEP, <https://forestupdate.frec.vt.edu/index.html>). Most programs are a partnership between the VDOF, Virginia Cooperative Extension, and the VFLEP. Check the Events Calendar (<https://forestupdate.frec.vt.edu/eventscalendar.html>) for programs near you.

As Joe Rossetti, coordinator of Virginia's Hardwood Forest Habitat Initiative, said in the Summer 2022 issue of the VFLU, (https://forestupdate.frec.vt.edu/content/dam/forestupdate_frec_vt_edu/newsletter/archives/2022/summer-2022/RossettiHardwoods.pdf) "*together, with intentional management, we can ensure a productive hardwood resource for future generations. Forestry professionals are stepping into this future. Won't you walk along with us?*"

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The Virginia Forest Landowner Update is getting a face lift! After 20+ years of rocking the same look, the printed VFLU will ring in 2023 with a fresh look plus an interactive and dynamic digital version.

Plant More Trees for Cleaner Water

By: Caitlin Verdu and Patti Nylander, Virginia Department of Forestry

Everyone needs water to live and Virginia is fortunate to have an abundant supply. Virginia's rivers provide irrigation for crops, water supply for various types of manufacturing, and energy through hydroelectric power. Over 30,000 miles of creeks, streams, and rivers provide endless recreational opportunities including fishing, canoeing, kayaking, swimming, and wildlife viewing. In addition, the waters of the commonwealth provide drinking water to residents either through private wells or municipal water supplies. Access to water, particularly clean water, is important for human health, environmental health, and economic growth.

To ensure Virginians have continued access to clean, affordable water, the Virginia Department of Forestry (VDOF) recently established a Watershed Program, operating with the core belief that trees are the answer to most of our environmental challenges, particularly when it comes to protecting our waterways and providing access to safe drinking water. So how do we get cleaner water? It's simple: we plant more trees.

As rain falls in the forest, the canopy intercepts the water droplets, reducing the velocity of the water as it hits the ground, which reduces erosion. The leaf litter and organic matter in the soil act like a sponge, soaking up the water and allowing it to infiltrate slowly back into the ground rather than allowing the rainwater to simply run off, carrying soil, excess nutrients, and other pollutants with it. In these ways, forests improve our water quality and increase our available water quantity.

Even in urban areas, where there may not be space for a traditional forest, trees play a critical role. Urban areas have a lot of impervious surfaces (roads, sidewalks, buildings, etc.) that do not allow rainfall to soak back into the ground. Not only can this lead to destructive flooding during storm events, but it can also reduce groundwater supplies over time. Trees help soak up that excess water, slowing the flow and reducing flood damage.

So now that we know we need to plant more trees, what resources exist to help make that happen? The good news is there are a variety of partners working on this very issue. State and federal agencies work with communities, landowners, local governments, and non-profits to implement strategies that will reduce the amount of pollution that can make its way into our streams. Some examples include the VDOF's Virginia Trees for Clean Water Program (VTCW). This is a matching grant program for communities to establish more trees in urban spaces. Projects include new tree planting in urban areas that previously did not have any trees, riparian tree plantings (trees near streams), and planting trees to help reduce the impacts of storm water.

Another example is the James River Buffer Program which is co-managed by the James River Association and the VDOF. This program funds projects that may not qualify for state or federal cost-share assistance because the landowner is not an agricultural producer. State and federal cost-share programs are also available for producers to help implement conservation practices on agricultural land (no-till farming, planting a cover crop, rotational grazing, nutrient planning, and livestock exclusion).

Virginia is diverse and so are our land uses, from the rugged backcountry of Mt. Rogers to the hustle and bustle of Downtown Richmond. No matter where you may live, there is something you can do to help improve water quality at a local and watershed scale. If you live in a rural area near a creek, consider planting trees next to the creek to establish a buffer. If you live in a more urban part of the state, participate in a community tree planting, or consider adding new trees to your yard. If you would like more information on ways you can help protect and improve water quality, reach out to your local VDOF forester and visit our website at: www.dof.virginia.gov.

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| MP | Michelle Prysby | 434-872-4580 | www.virginiamasternaturalist.org |
| 15Forest | Fifteen Minutes in the Forest | ZOOM live: https://virginatech.zoom.us/j/97509089739 YouTube: https://www.youtube.com/c/VirginiaForestLandownerEducationProgram Facebook live: www.facebook.com/VFLEP | |
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