

As pine forestry is practiced by most landowners in Virginia, most pine stands have some hardwood understory. These layers of vegetation tend to increase bird diversity. Species that are common in mature pine forests include pine warbler, red-bellied woodpecker, chipping sparrow, and ruby-crowned kinglet. Some pine growers prefer to control hardwood understory, which can change the bird species present. Prescribed fire is one tool used in this way. It can benefit birds by stimulating new herbaceous growth at ground level. Early successional species like quail benefit from this practice. The longleaf pine ecosystem, now rare in Virginia, must be maintained by fire. The endangered red-cockaded woodpecker succeeds where regular fires control encroaching hardwoods.

Mixed pine-hardwood forests are transitional in the march toward successional climax. These woodlands have a high diversity of birds, including a few holdovers from earlier stages and new entries by birds more typical of hardwood forests. Birds of mixed woodlands include downy woodpecker, tufted titmouse, blue jay, Cooper's hawk, and many warblers.

Mature hardwood forests are often considered the gold standard of forest types, particularly for wood warblers, vireos, ovenbird, and wood thrush. Bird diversity in general tends to be high here, owing to the complex layered canopy with a midstory and shade-tolerant understory. These forests are most beneficial to forest interior birds when they are large enough to minimize edge. This reduces the effects of disturbance, such as nest access by cowbirds. Selective cutting can be used to maintain an uneven-aged, mature hardwood forest and still generate income.



Pileated woodpeckers in transitional pine-hardwood forest. Photo by VDOF.

Water quality best management practices, and actual laws in some parts of Virginia, require leaving forested riparian buffers along streams. Buffers create travel corridors for birds and habitat for streamside species, such as wood ducks and barred owls. One hundred feet is a standard buffer width, but wider buffers are even better for birds.

Controlling invasive species is in the best interest of the landowner, whether managing for boards or birds. Invasive plants provide little quality food for birds. For example, compare the nonnative tree-of-heaven with a native such as white oak. Tree-of-heaven seeds and foliage are not eaten by many species. White oaks, on the other hand, produce acorns, an excellent hard mast source for birds and wildlife. Perhaps most importantly for songbirds, oak trees also grow caterpillars. Over 500 species of moths and butterflies use oaks as their larval food source, compared with 6 for tree-of-heaven. For almost all songbirds, caterpillars are a preferred food source for raising baby birds.

Some people simply do not like the idea of managing forests and prefer to let nature take its course. Over time, this approach can result in more mature forests and fewer young ones, at the expense of early successional bird species. Ironically, it can also result in more conversion of forest land over time. Most forest lands in Virginia are privately owned. Landowners who can make money from



Thinning allows light to reach the forest floor (top). A barred owl using a riparian buffer (bottom). Photos by: VDOF.

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

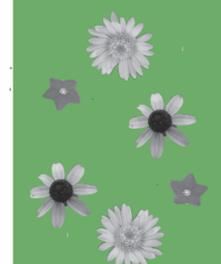
Forest Management Practices for Birds

2

Events Calendar

3

Old Dominion University Tick Research Team



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Forest Management Practices for Birds By Ellen R. Powell, Virginia Department of Forestry

Forest landowners often have a financial need to manage their land for income, even if they would prefer to manage for birds and other wildlife. The good news is that the two goals don't have to be mutually exclusive. Forests can be managed in ways that benefit both the birds and the bottom line.

Forests go through natural stages of succession, with each stage supporting characteristic plant and animal species. Because different birds have different habitat needs, there is no one forest stage that is best for all birds. Many forest management activities mimic natural disturbances that reset the successional clock. In a forest-heavy state like Virginia, wildlife management often involves manipulating the forest to attain or maintain a desired successional stage.

On a landscape level, having forests in different stages of succession is a key to bird diversity. This type of management is easiest to achieve on large tracts of land, such as State and National Forests. Management on these government lands is for multiple uses: wood products, wildlife, water quality, soil health, recreation, and more. On these lands, harvest intervals tend to be longer than they might be on private lands. Large mature tracts benefit forest interior birds, while younger sites of various ages support other species. Openings created by timber harvest may be small patches or large blocks, each with its own advantages to certain species. Edges tend to be left soft and brushy rather than abrupt and neat. Dead snags may be left standing, benefitting cavity nesters.

Consider a forest that has been reset to its earliest successional stage. When the cycle of forestry is being practiced, a clear cut harvest creates a very young forest stage. Grasses and annual forbs begin to grow almost immediately, soon followed by perennial forbs and shrubs like sumac and blackberry. The grassy stage attracts seedeaters, such as mourning dove and various sparrows, as well as predators like American kestrel. The brushy stage benefits species such as prairie warbler, brown thrasher, yellow-breasted chat, white-eyed vireo, and indigo bunting.



Prescribed fire can help maintain an early successional stage. Photo by: VDOF.

Even if not planted, pines begin to grow on open sites within a few years. Many birders object to the look of trees planted in rows, but birds don't seem to mind. (The visual row effect tends to disappear over time anyway, through commercial thinning or natural mortality.) There is a period as the pine canopy closes when bird diversity declines in pine stands. Pole-sized stands may have crowded trees with low light penetration and little understory. Forest thinning improves bird habitat, by allowing light to reach the forest floor and fueling the growth of herbaceous vegetation. Incidentally, thinning is good for forest health as well. The remaining trees have more space and resources, making them less susceptible to disease and insect attacks.

Birds cont. from page 5

their land are less likely to sell to developers. A managed forest is better for birds than a parking lot any day! Encouraging forest owners to manage their woods is a good way to keep land in forest for the future.

Sources:

Tallamy, D. W. 2007. Bringing nature home: How native plants sustain wildlife in our gardens. Portland, Or: Timber Press. Dickson, James G.; Thompson, Frank R.; Conner, Richard N.; Franzreb, Kathleen E. 1993. Effects of silviculture on neotropical migratory birds in central and southeastern oak pine forests. In: Finch, Deborah M.; Stangel, Peter W. (eds.). Status and management of neotropical migratory birds: September 21-25, 1992, Estes Park, Colorado. Gen. Tech. Rep. RM-229. Fort Collins, Colo.: Rocky Mountain Forest and Range Experiment Station, U.S. Dept. of Agriculture, Forest Service: 374-385.

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Table with 5 columns: 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 Committee. Each column contains contact information including address, phone, and website.

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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
DCR	July, Aug. & Sept.	Virginia's State Parks	A variety of events and activities For a complete list, visit: www.dcr.virginia.gov/parks	Varies	Varies
MP	Year-round	State-wide	Virginia Master Naturalist Volunteer basic training www.virginiamasternaturalist.org/chapters.html	Varies	Varies
JMM	July 15 Oct. 21	Montpelier Station	Working Woods Walk Venture into the Montpelier Demonstration Forest on a two-hour hike with experts in forest conservation. Learn about conservation and cultivation strategies that generate mutual benefit to man and nature.	2:00	\$5
BW	July 19 & 20	Abingdon	Preparing for Generation NEXT 2-day Workshops Are you prepared to pass the environmental and heirloom values rooted in your forest to the next generation? Join us to learn how to secure your woodland legacy.	1 - 5:30 9 - 4:00	\$70* for 2 family members; \$35* each additional
JF	July 27-28	Lynchburg	Preparing for Generation NEXT 2-day Workshops See description for Generation NEXT Abingdon above.	5:30-8:30 8:30-3:30	\$50* for 2 family members; \$25* each additional
AD/MS	July 24 Aug. 2 Aug. 9 Aug. 21	Alberta Halifax Farmville Surry	Preparing for Generation NEXT Mini Workshops This abbreviated version of the 2-day workshops will introduce woodland owners like yourself to the concepts behind securing your woodland legacy.	1 - 5:00 2:30 - 7 1 - 5:00 1 - 5:00	\$10 first person, \$5 each additional family member
JG	July 24 Aug. 23	Freeman Critz	Tree Farm Dinners Join the Virginia Tree Farm Foundation for a woodland tour and dinner. You do not need to be a Tree Farmer to attend.	4:30 - 7:30 4 - 7:00	\$10* first person, \$5* each additional family member
BEF	July 24	Boyce	Basic Botany for Gardeners and Naturalists	3 - 4:30	\$15
BW	Aug. 17-19	Abingdon	SW Virginia Beginning Landowner Weekend Retreat Is woodland management new for you? If so, come spend the weekend with fellow forest owners and natural resource professionals and learn how to get started with a combination of classroom talks, field tours, and hands-on activities.	All day Saturday & 1/2 day Sunday	Individuals \$55* no lodging \$95* w/lodging Couples \$90* no lodging \$170* w/lodging
BEF	Aug. 30	Boyce	Introduction to Tree Identification	2 - 4:00	\$15
NC	Sept. 21-23	New Kent	SE Virginia Beginning Landowner Weekend Retreat See description for SW Virginia Beginning Landowner Weekend Retreat above.	All day Saturday & 1/2 day Sunday	TBD
SREF	Sept. 26	On-line	What's Bugging Your Trees? Insects & Fungal Pests in Southeastern Urban Landscapes - Webinar	1:00	Free

*meals included; **meals and lodging included

EVENT CONTACTS

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DCR	Virginia Department of Conservation & Recreation	804/786-1712	www.dcr.virginia.gov
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JG	Jennifer Gagnon	540-231-6391	jgagnon@vt.edu
BEF	Blandy Experimental Farm	540-837-1758 x 224	blandy.virginia.edu
NC	Neil Clark	757-653-2572	neclark@vt.edu
SREF	Southern Region Extension Forestry	http://www.forestrywebinars.net/	

2

Old Dominion University Tick Research Team By: Sara Simmons, Alexis White, Laura Bitzer, & Holly Gaff, ODU

Old Dominion University has been known as a leader in tick research since Dr. Daniel Sonenshine arrived on campus in the early 1960's. The current ODU Tick Research Team has been conducting an active tick surveillance project since 2009 under the leadership of Drs. Holly Gaff and Wayne Hynes. We study everything about the ecology of ticks, including hosts, habitats and seasonal patterns. We also investigate the genetics of locally-collected ticks and the pathogens they may carry. From this, we can determine the origins of newly invading ticks and ask other questions about movement across the landscape. Our team includes students at all levels of study who gain hands-on research experience working with faculty members with expertise in mathematical ecology, mammalogy, avian ecology, micro- and molecular biology, and population genetics.

Our local field work is centered around the Hampton Roads Region of Virginia. Regular collection sites are typically located within an hour from Norfolk, VA, and include field sites from southeastern Virginia near the Great Dismal Swamp, across the bay to the Eastern Shore, and from North Carolina to Yorktown. Ticks are collected from these sites at least biweekly from April to October, and once a month for the remainder of the year. In addition to this work, our team collaborates broadly with other researchers in our region and throughout the world.

Fun Fact #1: Ticks are active year-round in Virginia. Blacklegged adult ticks are actively seeking hosts in winter. Most other species, and blacklegged nymphs are active in warmer weather from spring through

The ODU Tick Team approach includes active environmental surveillance in addition to passive collection, such as tracking ticks sent to the lab after being found biting humans or animals. Active environmental surveillance can alert us to potential new concerns, such as the appearance of a new pathogen for which illnesses haven't yet been reported. Flagging is our primary method of collection. This is done by taking a

large, white canvas flag on the end of a wooden dowel rod and passing it through vegetation with the flag out in front of the collector. Ticks cling to the flags, and we collect them in vials to bring them back to the lab. We also collect ticks from birds, small mammals, reptiles, deer processed at hunt check stations, and occasionally from roadkill.

One of the most common ticks that we encounter in Virginia is the lone star tick (*Amblyomma americanum*). Female lone star ticks are round, brown ticks with a single white spot located on the back, or dorsal surface. Males and nymphs are round and brown with few to no markings. Nymphs are much smaller than lone star adults. Larvae of this species are even smaller and generally found in clusters. This species is associated with several health-related conditions: ehrlichiosis, southern tick associated rash illness (STARI), and alpha-gal, an allergy to mammal meat. Ehrlichiosis is a rare but potentially life-threatening disease, especially for the elderly and immunocompromised. STARI is a skin rash that can develop near the bite and is sometimes mistaken for the classic bull's-eye rash that presents with Lyme disease. The alpha-gal allergy manifests as a delayed anaphylaxis after eating mammal meat products. Many people do not develop any type of hypersensitivity or immune reaction to tick bites. For those who do, symptoms can range from mild to severe and can be life-threatening.

Fun Fact #2: Ticks don't only feed on mammals. They will feed on almost any vertebrate, including birds, snakes, and lizards.

Another tick of concern in Virginia is the black-legged tick (*Ixodes scapularis*), also called the deer tick. These ticks can carry and transmit *Borrelia burgdorferi*, the causative agent of Lyme disease. Adult blacklegged ticks are active during the winter and feed on larger hosts, such as deer. They also bite humans! Female blacklegged ticks have a black upper back and legs, with a reddish-brown lower half. Blacklegged nymphs are much smaller, no larger than a poppy seed and look entirely black. Nymphs are a particular concern in our area because they are active in the summer when people are more likely to be out-



The ODU Tick Team at the 2018 Mid-Atlantic Tick Summit. From left: Dr. Robyn Nadolny (alumna), Lexi White (PhD student), Sara Simmons (PhD student), Laura Bitzer (MS student), Alex Cumbie (PhD student) and Dr. Holly Gaff.



Adult female lonestar tick (top) and adult female blacklegged tick (bottom). Photos by: Center for Disease Control (top) and graham.snodgrass@us.army.mil.

Tick Team cont. on page 4

3

Tick Team cont. from page 3

Fun Fact #3: No one has created a common name for *Ixodes affinis*. They do not bite humans and may be mistaken for its close relative, the deer tick.

doors, wearing less protective clothing. It is important to check for ticks after spending any time outdoors, and to be especially careful to look for nymphs, which can easily be mistaken for a freckle.

There are several other species that landowners are likely to encounter in Virginia such as the American dog tick (*Dermacentor variabilis*), the rabbit tick (*Haemaphysalis leporispalustris*), and *Ixodes affinis*, a tick that resembles its cousin the blacklegged tick, but does not bite humans. Some of these species may be locally present in high numbers. Also, you may notice that the number of ticks in your area changes dramatically from year to year. There are many reasons for this, not all of which are well understood. Changes in management practices, including the management of host species such as deer or rodents, may influence trends in tick populations. It is important to identify any tick species that is problematic in your area before you attempt any kind of tick control methods.

Tick control is a tricky task. Removing tick habitats can help prevent ticks in your backyard. Just by maintaining a mowed landscape and removing leaf litter from the edge of residential property, you can create a habitat less favorable for ticks. All ticks are sensitive to desiccation, so mulch barriers can be useful between lawns and forests, or along paths.

Broadcast sprays have also shown to be effective at reducing tick populations but can be damaging to all other invertebrates including pollinators. Prescribed fire is often used as a management tool for conservation of some species and has been shown to have some effect on tick populations as well. Ticks are very host driven. Initially after fire, tick populations tend to decrease. However, fire improves habitat and food sources for some wildlife, and therefore burning can indirectly contribute to increases in tick populations over time. This successional habitat can even be favorable to some species of ticks such as the Gulf Coast tick (*Amblyomma maculatum*), which is very habitat-specific to successional areas. Overall, fire may lead to reduction, but not eradication, of local populations of ticks.

Fun Fact #5: Ticks do not have real heads. When we say "head" we are referring to the mouthparts or capitulum.

Ticks can also be killed while they are on host. Rodents are common hosts for juvenile ticks of some species, like the American dog tick, so tick tubes were invented. Tick tubes are small tubes filled with chemically treated bedding. As rodents utilize the bedding, it will kill any ticks that come into contact with it. Tick tubes are useful for targeting some ticks. Lone star ticks and other species that do not often feed on rodents are less likely to be successfully managed with these methods.

Your greatest protection against ticks is awareness. Be aware when you are at risk of encountering ticks and be prepared. You should reduce any potential contact with ticks and skin. If they can't reach you, they can't bite you. In the tick lab, we tuck our pant legs into our socks and will end duct tape our pants to our shoes during times of the year when larvae are questing. We also treat our clothes and boots with permethrin and use DEET as a repellent. When used properly, permethrin has been shown to be effective on several tick species that are in Virginia.

If a tick bites you, make sure to remove it as soon as possible! The best way to remove a tick is with pointy tweezers. Be sure to disinfect the tick-bite area with rubbing alcohol. Place your tweezers as close to the skin as possible. With pointy tweezers you should be able to grab the tick's "head" or directly above the "head." Once you've grabbed the tick firmly between your pointy tweezers, apply a slow, steady, upward pull to avoid breaking the tick. Disinfect the area with rubbing alcohol after removal. Then save the tick by storing it in the freezer with the date the tick was removed. If you any symptoms of a tick-borne illness, you can have the tick tested to see what pathogens you may have been exposed to. Here at the ODU Tick Lab we can test ticks for you or you can donate them to our research (for more information: <https://sites.wp.odu.edu/tick-team/tick-testing/>).

If you are interested in helping our project, please send us your ticks! We love to get ticks from anywhere you collect them, whether you find them on yourself, your pets, or other animals you encounter. Hunters, farmers and backyard poultry growers can be a huge help to us by sending us ticks from deer, bear, wild boar, turkeys, chickens, guinea fowl or any other animals that you raise or hunt! For more info, follow our adventures on Facebook: www.facebook.com/oduticklab.

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4