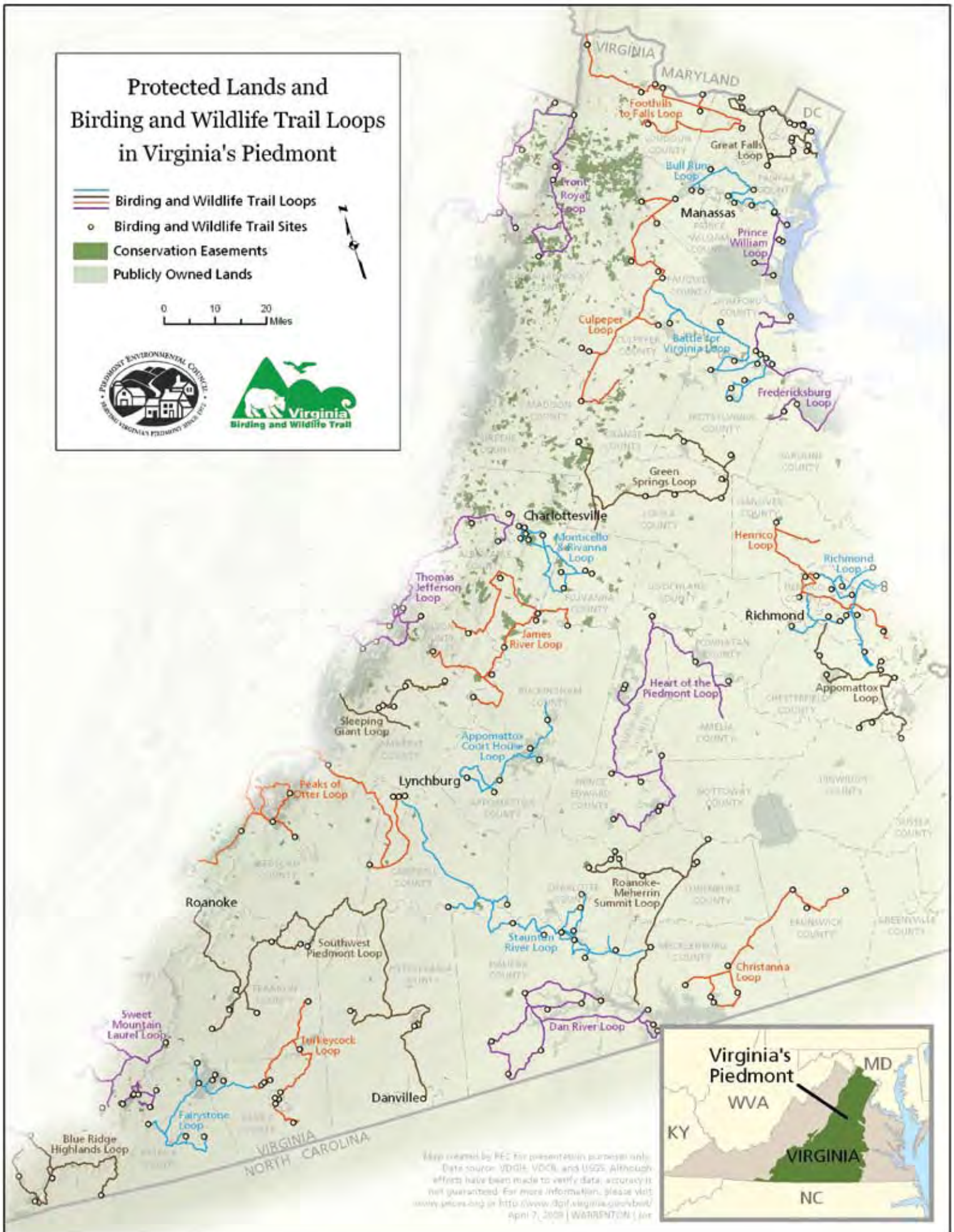




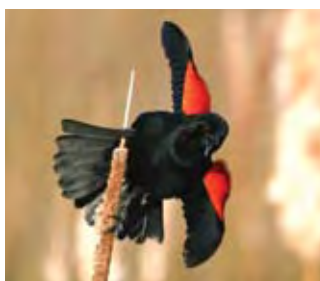
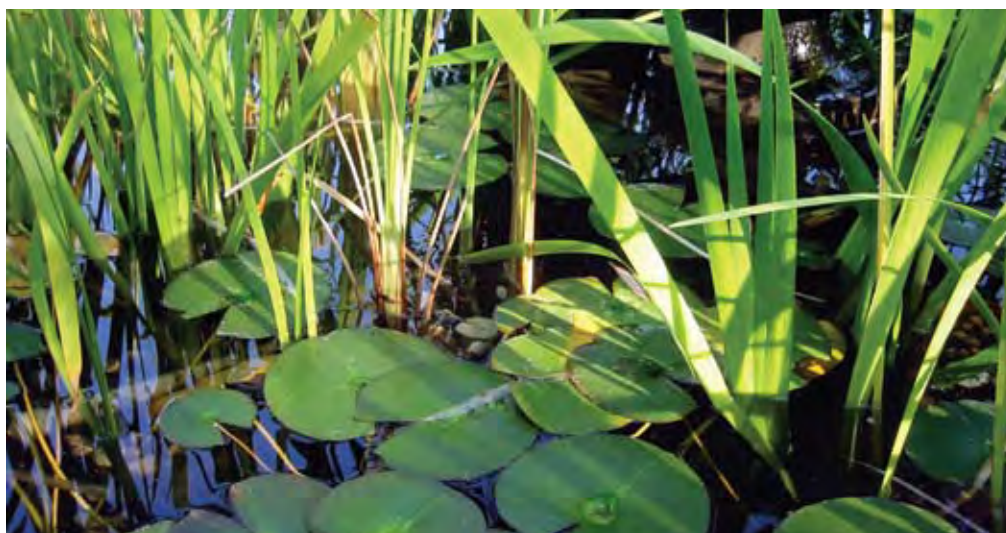
Managing Land in the Piedmont of Virginia for the Benefit of Birds and Other Wildlife



- Birding and Wildlife Trail Loops
- Birding and Wildlife Trail Sites
- Conservation Easements
- Publicly Owned Lands



Managing Land in the Piedmont of Virginia for the Benefit of Birds and Other Wildlife



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Second Edition, 2008



American Bird Conservancy

American Bird Conservancy (ABC) is the only 501(c)(3) organization that works solely to conserve native wild birds and their habitats throughout the Americas. ABC acts to safeguard the rarest bird species, restore habitats, and reduce threats, while building capacity in the conservation movement. ABC is the voice for birds, ensuring that they are adequately protected; that sufficient funding is available for bird conservation; and that land is protected and properly managed to maintain viable habitat.

ABC sets the bird conservation agenda by using the best science available to determine the highest priorities and the best solutions, and then communicating these priorities to the conservation community and the public through alliances, partnerships, and networks. ABC counts among its staff some of the foremost experts in bird conservation in the United States, and partners with many others throughout the Americas.

ABC is a membership organization that is consistently awarded a top, four-star rating by the independent group Charity Navigator. Please view our website, www.abcbirds.org.

Piedmont Environmental Council

The Piedmont Environmental Council (PEC) is a 501(c)(3) non-profit conservation organization and regional land trust. Founded in 1972, PEC uses a comprehensive strategy to promote and protect the Virginia Piedmont's rural economy, natural and historic resources, and scenic views. Accordingly, PEC works with landowners, residents, and local governments to ensure the long-term protection of their communities and quality of life through land conservation and land use planning that directs growth to places which ensure that new development fulfills the vision of local citizens. As communities change, we work to foster a sense of history, establish a viable transportation network, create enjoyable neighborhoods, promote strong local economies, and initiate opportunities which allow everyone to enjoy the outdoors.

PEC enjoys widespread public support of its work and primarily serves Albemarle, Orange, Madison, Greene, Culpeper, Fauquier, Loudoun, Clarke, and Rappahannock Counties, although assistance is also provided to citizens and organizations with parallel missions in neighboring counties. Consequently, PEC is recognized nationally for leadership in promotion of smart growth principles, land conservation, and related work in rural historic preservation, conservation of working forests and farmland, wildlife habitat, and watershed protection.

PEC is a membership organization that is consistently awarded a top, four-star rating by the independent group Charity Navigator. Please view our website, www.pecva.org.

Virginia Department of Game & Inland Fisheries

As Virginia's wildlife agency, the Virginia Department of Game and Inland Fisheries (VDGIF) works to manage Virginia's wildlife and inland fish to maintain optimum populations of all species to serve the needs of the Commonwealth; to provide opportunity

for all to enjoy wildlife, inland fish, boating, and related outdoor recreation; and to promote safety for persons and property in connection with boating, hunting and fishing. VDGIF is responsible for the management of inland fisheries, wildlife, and recreational boating for the Commonwealth of Virginia.

VDGIF is a leader in Virginia in the conservation of birds that are traditionally hunted, such as waterfowl, Wild Turkey, American Woodcock, Northern Bobwhite, and Ruffed Grouse; as well as of nongame avian species, including Red-cockaded Woodpecker, Bald Eagle, and Peregrine Falcon; colonial waterbirds such as terns and herons; and shorebirds such as Piping Plover and American Oystercatcher. Bird conservation by VDGIF includes research and monitoring of bird populations; regulatory review of projects in relation to wildlife resources, including state or federally endangered and threatened species; land acquisition, and habitat management of Virginia's Wildlife Management Areas; and a number of recreational, educational, and outreach programs, including the establishment of the Virginia Birding and Wildlife Trail and sponsorship of several of Virginia's birding festivals. Please see our website, www.dgif.virginia.gov.

VDGIF's conservation activities are taking on an expanded focus through the recent development of the Virginia Wildlife Action Plan (available on www.dgif.virginia.gov), which identifies 925 species of greatest conservation need, including insects, fish, mammals, reptiles and amphibians, mammals, and birds.

Acknowledgements

We thank Sarah Gannon Nagle for conceptualizing and writing the grant proposals that started the first edition. The resulting publication was received very well by landowners, local birding clubs, and resource management agency staff. So much so, that nearly all of the first run copies have been distributed since September 2006. While the first edition will continue to be available in an electronic format, partners began discussing ways to expand and improve the habitat guide for another hard copy edition.

In 2008, ABC and PEC collaborated closely with current and retired VDGIF staff to develop this second edition. This updated version has been expanded to cover the entire Piedmont range in Virginia, and includes the following topics: agricultural habitats, grasslands, early successional habitat, forests types (hardwood, pine, and savannah), wetlands and riparian areas, developed lands, invasive exotic plants, biofuels and wildlife habitat, and landowner resources.

We thank Rick Myers (VA Natural Heritage) for reviewing the sections on Grasslands and Savannas. Dean Cumbia (VA Dept. of Forestry) offered constructive suggestions on the Forestry section. Julie Hawkins (Natural Resources Conservation Service) provided text for the Cost Share Assistance section.

We sincerely appreciate funding support for this updated and expanded version from the following: Piedmont Environmental Council and Robert L.V. French, Virginia Chapter of The Wildlife Society, Virginia Department of Game and Inland Fisheries, and Virginia Society of Ornithology.

Managing Land in the Piedmont of Virginia for the Benefit of Birds and Other Wildlife

The Piedmont extends southwestward from New York City to Montgomery, Alabama, in a swath that is bordered on the east by the Coastal Plain and on the west by the Appalachian Mountains. The Virginia Piedmont is roughly triangular in shape, extending from a narrow band in northern Virginia to a width of 150 miles at the southern Virginia border. Although it was once mostly hardwood forest, centuries of human influence have converted the Piedmont to a mix of agriculture, abandoned farmland, forest, and suburban development. Often overlooked in its importance to birds, the Piedmont provides valuable nesting, migration, and wintering habitats that are scarce in other parts of the state.

Approximately 140 species of birds breed in the mid-Atlantic Piedmont. Data show that populations of many of these species have declined in recent decades. Habitat loss and degradation are the most important factors causing these declines. Suburban and agricultural development has eliminated much of the region's hardwood forest, and non-native plants and poor management have impaired much of what remains. Non-native grasses of little value to most birds dominate pastures, and early mowing for hay destroys the nests of those few that attempt to breed there. Farm modernization and increasing pesticide use have turned agricultural lands into wastelands for birds, in part by eliminating many brushy fence lines, ditches, and road banks that formerly provided valuable edge habitat for nesting and foraging.

Why should we care enough about bird population declines and habitat loss to devote our valuable time and resources to managing for wildlife? Birds are an integral part of our ecosystems and thus help maintain the dynamic balance of nature. They are some of our best pest control agents, helping to keep insect populations in check that might otherwise defoliate and damage timber and crops. Birds also serve as one of our most efficient seed dispersers, depositing them far from their place of origin and helping to main-

tain the vigor of our forests and grasslands. In addition, birds are aesthetically pleasing, providing beauty of both sight and sound. Birdwatching is quickly becoming one of our most popular hobbies, generating billions of dollars each year spread across local economies where opportunities are provided. But, perhaps most importantly, birds and other wildlife are entrusted to the care of those of us who are landowners and it is our responsibility to assure that future generations have these natural resources to nurture and enjoy.

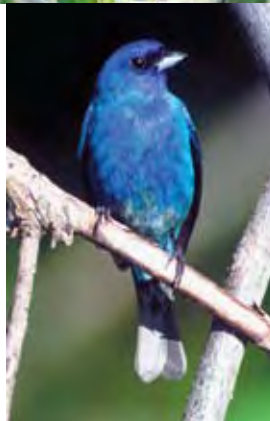


If you own land in the Piedmont, whether a large farm or estate, or just a small backyard, then you too can help provide valuable habitat for our birds. Simple changes, such as leaving a fence row to grow unkempt or allowing part of a yard to grow up in native grasses rather than mowing every two weeks, can provide great benefits to the birds that are struggling to survive under our ever-intensifying land use habits. Read on and find out about this and many more opportunities you have to help birds!

AGRICULTURAL HABITAT

Approximately 27% of the Virginia Piedmont is used for agricultural production. Although this habitat is not nearly as important for birds as are grasslands or forests, management of agricultural land can have important implications for birds. Not only do some birds make direct use of this habitat, but many other species, both close by and distant, can be affected by agricultural practices.

At least 50 Piedmont bird species have been documented to nest directly in crops. Other species use the open fields for hunting and foraging and nest in the weedy borders and shrubby edges of cropland. Raptors, including Red-tailed Hawk, American Kestrel, Northern Harrier, Barn Owl, and Great Horned Owl, hunt in crop fields, removing small rodents and insects. In fall and winter, agricultural fields provide food for migrating and wintering sparrows, bobwhite, and wild turkeys. Waterfowl and shorebirds frequently feed in flooded portions of crop fields during migration. Depending on their quality, agricultural buffers can be used by a wide variety of shrubland breeding species, including the Northern Bobwhite, Common Yellowthroat, and Indigo Bunting, as well as by wintering sparrows.



Maintaining Active Agricultural Production

Tillage—Conventional tillage practices, in which fields are disked or plowed, are detrimental to birds and the surrounding environment. These practices provide increased potential for soil erosion, which results in siltation of streams and wetlands that reduces their value for wildlife.

- Conventional tillage should be replaced with a no-till regime or conservation tillage in which at

least 30% of the soil remains covered by plants or plant residue.

- Conservation tillage allows plants and residue to keep the soil in place, provides habitat for birds, and increases food availability.
- Conservation tillage and no-till leave much more waste grain available as food for birds.
- No-till agriculture provides the greatest benefit to birds, however, this practice is often accompanied by increased use of pesticides. Pesticides can poison birds directly, and reduce their breeding success through both sub-lethal effects and by killing the insects that make up a large portion of their diet. Pesticides can impact the environment as far away as the Chesapeake Bay through runoff. If you employ no-till agriculture, practice integrated pest management that reduces the amount of pesticides that are needed.



Northern Bobwhite/Bill Hubick

Corn/Mike Parr

Indigo Bunting/FWS; Barn Owl/ClipArt.com

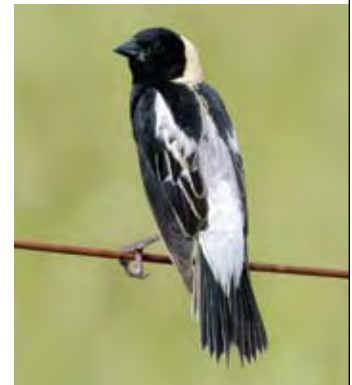
Maintenance of cover—Birds need cover to avoid predation, and maintaining residue or active growth on fields reduces erosion and its associated problems.

The optimal residue management is that which keeps cover on the ground at all times of the year.

- Rotate crops to maintain and improve soil productivity and fertility, reduce soil erosion, help control weeds, and manage plant pests by breaking the pest cycle.
- Planting a cover of native grasses, grains, or legumes in unused fields or as a part of crop rotation provides similar benefits and greatly promotes wildlife.
- In larger fields, planting alternating strips of grass or close-growing crops with cultivated crops can provide valuable nesting and cover habitat for wildlife.
- Leaving field and waterway edges unmowed and ungrazed helps prevent runoff and erosion, and provides areas where birds can raise young.

Buffers—In the past, the unkempt hedgerows and weedy environments often found around farmsteads served birds well by providing both cover and abundant insect food. Herbicides and so-called “clean” farming have resulted in the loss of weedy habitats and the clearing of hedgerows, both to the detriment of birds.

- Buffers between crop fields and forests or pastures are very beneficial, but buffers between individual crop fields can also provide useful habitat. Care should be taken not to create buffers against inhospitable habitat such as highways, as this creates a death trap for birds. Buffers up to 300 feet wide provide considerable benefits to birds, but smaller buffers of at least 35 feet in width have significant value. Buffers that are narrower than 35 feet provide essentially no benefit.
- Buffers should be planted with a diverse array of native plants and maintained to keep out invasive species. Maintenance is best accomplished in March or August either before or after the nesting season. Leaving buffers relatively high (10 inches) is preferred.



American Kestrel/Gary Snyle; Common Yellowthroat/Barth Schorre; Red-tailed Hawk/Gary Snyle; Bobolink/Joe Kosack, PGC

Tilling a farm field/stock.xchng



Hay bales/stockxchg

Grasslands occurred mostly in the west Piedmont and along river systems in presettlement times. They were maintained here for thousands of years by human manipulation. Even before the European settlers cleared land for pasture and crops, Native Americans had maintained open areas through the use of fire. Current Piedmont grasslands consist primarily of tame grass pasture and hay fields.

Bird population analyses show that grassland birds are declining nationwide. The trend on the Virginia Piedmont is similar, with some breeding species, including Henslow's Sparrow and Upland Sandpiper, being nearly extirpated.

However, small fields (< 100 acres) still support breeding habitat for Bobolinks, Eastern Meadowlarks, Northern Bobwhite, and Savannah Sparrows, while larger tracts (>100 acres) support Grasshopper Sparrows and create the potential for re-invasion by Upland Sandpipers and Henslow's Sparrows. During the winter, raptors such as Northern Harriers and Short-eared Owls hunt over Piedmont grasslands.

The fire-maintained stands of giant cane or native bamboo (*Arundinaria gigantea*) along the South Piedmont river bottoms were an amazing ecosystem, covering broad reaches of the Dan, Roanoke, and Bannister river floodplains. Standing 6-25 feet tall with 1-3 inch diameter stems, these lush cane grasslands were intensively utilized by Native Americans and early pioneers. Unfortunately for wildlife that used them, cane proved very palatable to cattle and indicated the very best soils for cultivation. Today, botanists have only found giant cane in two Piedmont counties. Because cane normally spreads by rhizome, not seed dispersal, it is probably unrealistic to consider reestablishing Piedmont canebreaks.

Creating and Maintaining Grassland Habitat

Size and configuration—Piedmont grasslands are now divided among many owners with different management objectives and practices. This often results in patches of land that are smaller than what is required by many grassland bird species.

- The minimum size for a productive grassland is 20 acres, with 100 acres or larger being optimum. Tracts smaller than 20 acres would be best for birds if managed as shrubland habitat (see p. 10).
- Circular or square tracts are better than rectangular or elongated tracts because they minimize the edge to area ratio, which reduces predation and increases reproductive success.
- Placing roads and infrastructure near the edges of fields can minimize fragmentation.

Optimum species composition—Many existing pastures are far from optimal for birds because they contain non-native grasses that require continuous maintenance.

- Avoid dense monocultures of exotic sod-forming grass and typical lawn grasses such as cold-season Kentucky bluegrass, orchardgrass, or tall fescue. These grasses are not beneficial to birds and they require intensive ongoing care, such as fertilizer and herbicide applications that are costly and harmful to wildlife.
- Plant native warm-season bunch grasses, which grow in clumps, allow open space at ground level for wildlife to move through, and do not require fertilizer or herbicides if burned every other year. These grasses provide dependable forage production during the summer, when exotic cool-season species have slowed growth.
- A mixture of short and tall native, warm-season species, including big bluestem, Indiangrass, switchgrass, little bluestem, and broomsedge, provides the greatest benefits to birds.

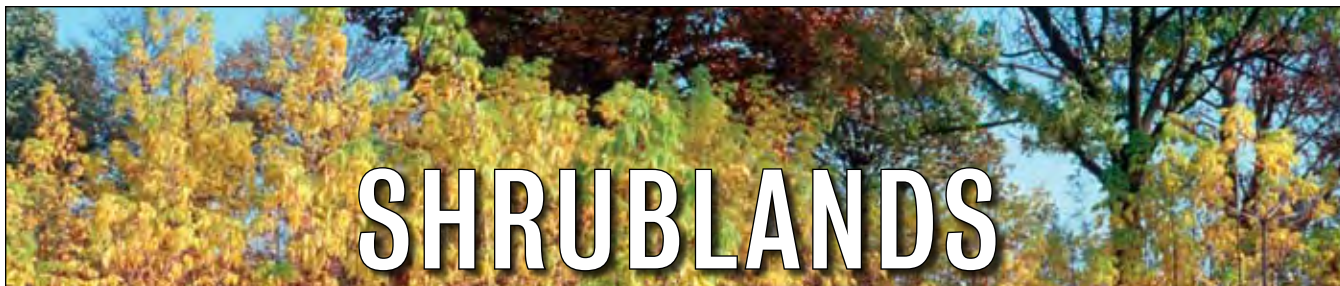
- Add some native forbs, such as black-eyed Susan, to increase the plant diversity and attract insects that are a vital source of protein for young birds during the breeding season.

Management—Without management, grasslands will naturally change to scrubland and eventually forest through the process known as succession.

- Grassland maintenance can be accomplished through grazing, light disking, or burning, but avoid year-round, uncontrolled grazing.
- Rotational grazing, in which some fields are lightly grazed while others are left idle, is the best practice if grazing is your management choice.
- Heavy bush-hogging and repeated cutting throughout the growing season should be avoided, as they may result in considerable nest habitat loss and bird mortality.
- Timing of cutting is crucial for wildlife management. The best time to cut is early spring (March or early April), followed by late summer or early fall (August–September). Avoid cutting from mid-April through the end of July when most birds are using grasslands for nesting and brood rearing. Note that maximum hay production and bird conservation are incompatible, especially with cool season grasses such as fescue and timothy.
- Although tricky to do, mowing from the inside out to push the birds out of the field rather than trapping them in the middle as the mower approaches will harm far fewer young birds.
- Hayfields of warm-season grasses need to be cut only once per year, so they are easier and cheaper to maintain. They are also cut much later in the summer than cool season grasses, allowing the birds to finish breeding before cutting occurs.
- Burning benefits the grassland and the birds the most. It increases herbaceous plant diversity, promotes vigorous grass growth, releases nutrients back into the soil, and suppresses competition from invasive species. Unlike other management practices, burning also removes the vegetative litter from the ground's surface, which is necessary to allow ground-nesting birds easy passage through the fields to forage for food and escape from predators.
- Burn in the early spring (March or early April), before green-up, or if this is not possible, burn in fall (October and November). Fall burns benefit management of the grassland but result in removal of good habitat for wintering sparrows and raptors.
- Most fields should not require burning more than once every two or three years. When carrying out a burn, safety is critical and local authorities should be consulted before any burn action is considered. Virginia fire laws can be found at www.dof.virginia.gov/fire/index.shtml. The Resources section on page 26 contains a list of contractors that carry out prescribed burns in Virginia.



James easement area/Faen Wolter



Barbara Tokarska-Guzik/www.forestryimages.org

Shrubland and old-field communities consist of scattered woody plants less than ten feet tall interspersed with open patches of diverse grasses and forbs. Other early-successional habitats occupied by similar birds include power line rights-of-way, restored strip mines, hedgerows, regenerating clearcuts, and old fields. Old fields consist of cropland or pasture that has been abandoned and allowed to grow up into vegetation.

Early successional birds are among the higher conservation priorities for the Piedmont, and include species such as the Northern Bobwhite, American Woodcock, Loggerhead Shrike, and Field Sparrow. In addition, Prairie Warblers occur in higher relative abundance in Piedmont shrublands than in any other part of their range. Other species that occupy these habitats include the Whip-poor-will, Yellow-breasted Chat, and Eastern Towhee. Species that particularly benefit from wide hedgerows include the Brown Thrasher, Gray Catbird, and a variety of wintering sparrows.



Yellow-breasted Chat/Greg Lasley

Shrubland habitat is the perfect option for fields smaller than 20 acres that are not adjacent to existing grassland or forest. These habitats appear messy to landowners and are usually either converted back to grasslands or allowed to grow into forest, most often through neglect. This loss has resulted in the decline and disappearance of wildlife that is dependent on these early-successional habitats for nesting, brood rearing, feeding, and escaping predation.

Creating and Maintaining Shrubland Habitats

Size and configuration—Early successional bird species can thrive in shrub habitat regardless of size or configuration, so maintenance as a shrubland is optimum for old fields less than 20 acres.

Maintaining land parcels larger than 20 acres as shrubland is difficult. Old fields between 20 and 100 acres would best be managed for birds as grassland, while those larger than 100 acres should be managed to

grow into forest. Both of these habitats are at a premium on the Piedmont, so these are both optimum uses for land this size.



Loggerhead Shrike/Michael Stubblefield

- Patches less than 20 acres in size that are adjacent to existing forests should be reverted to forest (see p. 12), and those adjacent to grasslands managed as grassland (see p. 8), thereby increasing the size of the adjacent habitat type.
- Patches that are 20 acres or smaller that are not adjacent to existing forest or grassland, or patches that are linear that do not offer much potential for successful reproduction by forest or grassland breeding birds should be considered for permanent maintenance as shrubland.



American Woodcock/FWS

- Hedgerows should be as wide as possible. Benefits greatly increase at widths of 35 feet and more.

Management—Shrublands require management to keep them from changing to a forest through succession.

- Creating shrubland habitat requires aggressive management, including stump removal, mowing, and herbicide applications for a few years to allow the appropriate vegetation to become established.
- A diverse mix of native, fruit-bearing shrubs and small trees is optimum habitat for a unique assemblage of shrubland-adapted birds.

- Maintenance of existing shrublands requires periodic (about every four or five years) disturbances through such means as burning, mowing, grazing, selective removal of trees, and where necessary, herbicide use.
- No disturbance should occur from mid-April through mid-August when birds are nesting and raising young.
- To control trees, burning or cutting should be accomplished as soon as possible after mid-August because these types of control work best if accomplished before the trees become dormant for winter.



FORESTS

There are two types of forest in the Piedmont, deciduous hardwood and coniferous softwood. Piedmont hardwood forests consist mainly of oak, maple, and hickory, with smaller numbers of tulip poplar, sweetgum, and red maple. Loblolly and Virginia pine are the primary species in pine forests, along with smaller numbers of shortleaf, white, and pitch pine. European settlers cleared much of the original forest habitat in Virginia, with the total amount of forested land beginning to increase in the 1940s. However, the amount of forested land began declining again in the early 1990s due to urbanization and development.



Forest/Mike Parr

Screech Owl/ClipArt.com

Bird populations in forests increase in density and diversity as the forest gets older, reaching a maximum in forests exceeding 100 years of age. Older forests also tend to support more dead trees or snags, which are important habitat components for many nesting birds and nearly half of North America's 45 bat species. Woodpeckers excavate cavities for nesting and roosting in dead and decaying snags, which can eventually be used by secondary cavity nesters such as Wood Duck, Prothonotary Warbler, and Great Crested Flycatcher, none of which excavate their own nest holes. The hardwood forests of the mid-Atlantic Piedmont are the heart of the breeding range for species including the Wood Thrush, Acadian Flycatcher, Scarlet Tanager, and Eastern Wood-Pewee. Other species found in Piedmont hardwood forests include the Kentucky Warbler, Worm-eating Warbler, Eastern Screech-Owl, Red-headed Woodpecker, Cooper's Hawk, and Red-shouldered Hawk. Pine forests can support Brown-headed Nuthatch, Whip-poor-will, Prairie Warbler, and possibly Bachman's Sparrow.

Creating and Maintaining Forested Habitats

Size and Configuration—Many bird species require large forest tracts for successful breeding, even though their individual territories may be relatively small. Unfortunately, most of the forested land in Virginia consists of highly fragmented small- or medium-sized tracts. Predation rates on bird eggs and young are much higher and reproductive success lower closer to forest edges than in the forest interior, and smaller tracts have larger relative amounts of edge.

Forest restoration is best for tracts of 100 acres or larger, and circular or square tracts have less edge than do linear tracts of comparable size. Long, rectangular tracts will simply create an extensive edge that pulls breeding birds into predatory traps. Consider management as shrubland for these types of the tracts (see p. 10).

Addition to existing forest should always be considered, particularly if it increases the amount of forest interior (defined as occurring deeper than 330 feet from the forest edge).

Plant trees in forest openings, particularly to decrease the amount of edge; locate new roads and utility lines around the forest and maintain a closed canopy over existing roads.

Restoration

- Determine what type of forest your land historically supported and/or what type of forest best fits into the surrounding landscape. It does not pay to attempt to establish a forest type that cannot be supported with the soil and climate in your area.
- Consider planting a variety of native species on your forested land. Diversity is the key to attracting all kinds of wildlife.
- Deer can decimate newly planted seedlings, so protect new hardwood and shrub plantings with tree shelters. Providing deer with a browsing alternative, such as a clover understory, will also increase seedling survival.

Management

- All livestock should be fenced out of forest stands.
- Monitor regenerating forests for invasive species that can take over in as little as a year if not eliminated or controlled.
- Forests with more structural complexity support a greater variety of bird species.
- Ensure a mixture of ground cover and understory plants to produce the best habitat for birds. Planting may accelerate establishment of these plants.
- Creating coarse, woody debris piles in a forest provides habitat for some birds as well as small mammals, amphibians, and reptiles. In addition, dead trees, limbs, and litter on the forest floor provide cover and a source of invertebrate foods.
- A good supply of standing dead trees, also called snags, provide foraging sites for woodpeckers, and natural cavities for nesting is one of the best benefits of an old forest. Aim for at least four standing dead trees per acre.

Special Considerations—Hardwood Forests

- Thin young stands every three to ten years to remove weak, poor quality, or suppressed trees, allowing more growing space for the remaining healthy trees and letting sunlight penetrate to benefit mid- and understory plants.
- Periodic thinning helps to reduce the risk of insect infestations, disease, and catastrophic fires.
- Thinning that preserves mast-producing trees and shrubs (those that produce a diversity of seeds) can help sustain songbirds, deer, black bear, Wild Turkey, and small mammals through the winter months.
- Girdle some large but malformed or damaged trees to create snags for nesting and perching. Girdling them kills them but leaves them standing in place. Try to select trees that already have some decay to accelerate cavity formation. Over 80 Virginia bird species nest in cavities.

Special Considerations—Pine Forests

- Loblolly and shortleaf pine stands are planted at an initial density of 400-450 trees per acre (TPA) for timber production. Consider planting at 300-350 TPA for improved wildlife value. To enhance wildlife values further, consider shortleaf pine instead of loblolly. Add a few outer rows or clumps of shrubs to enhance the array of birds using the area.
- Young, natural pine stands are often heavily overstocked, sometimes exceeding 2,000 TPA. These stands will benefit by a precommercial thin down to 10 ft. x 10 ft. spacing.
- Young pine stands can be outcompeted by hardwood species. To prevent this, use prescribed burns or selective herbicide treatments targeted specifically at hardwoods. Take care not to eliminate ground cover and understory plants.
- As a loblolly or shortleaf pine forest canopy closes, tree crowns intercept an increasing amount of sunlight, resulting in less light on the forest floor. This causes a decline in ground level and understory plants, leading to a decline in the number of bird species. Thinning at 15 to 20 years overcomes this problem. Ovenbirds and other ground nesters will benefit.
- Thinning is also economically beneficial, resulting in increased growth in diameter and volume of timber. To significantly increase bird diversity, 15 to 20-year-old stands should be thinned to 175 TPA. This allows at least 50% of the ground to have sunlight at noon. A second thinning should be considered as the pine canopy again closes, typically at about ten years after initial thinning. Thin to 85-100 TPA for a stand of large pines that is attractive to wildlife and financially profitable. Thin as early as economically feasible.
- After thinning, at least one third of the acreage should be burned every year to control hardwoods while providing the highest quality wildlife habitat. The first burn should cover the entire thinned stand roughly a year post-thin. Prescribed burning removes logging debris, stimulates herbaceous growth, which provides excellent habitat for turkey poults and quail chicks, and prevents reinvasion of woody seedlings.
- Herbaceous growth responds best to burning in early spring. If this is not possible, burn in August after birds have nested.
- Burning involves more than simply lighting your forest on fire. It requires skill, planning, and experience. Safety and compliance with burn laws is critical. Local authorities and the Department of Forestry should be consulted before any burn is considered. Virginia fire laws can be found at www.dof.virginia.gov/fire/index.shtml. The Resources section on page 26 contains a list of contractors that carry out prescribed burns in Virginia.

SAVANNAS: A SPECIAL CASE

Vast acreages of presettlement Virginia were covered by savanna, a fire-maintained, sparsely-stocked forest with a grassy herbaceous ground cover and lacking a woody understory layer. These primarily pine savannas were maintained by frequent surface fires, originating both from lightning and from intentional burning by Native Americans. A host of species such as the Brown-headed Nuthatch, Bachman's Sparrow, and southeastern fox squirrel have a strong association with pine savannas. Some forest birds, such as Red-headed Woodpecker, and early succession birds, such as Prairie Warbler, also do particularly well in savannas.

While the most extensive Virginia savannas were the longleaf pine forests of Southeastern Virginia (mostly southeast of Petersburg), the earliest historical diaries describe extensive savannas along the west Piedmont into the Blue Ridge foothills (most likely shortleaf pine savanna) and along the major Piedmont river corridors. However, it is unclear which kinds of trees dominated the historic Piedmont savannas of Virginia. In all likelihood, pine and oak species, due to their known adaptation to fire, would have been among the dominant savanna tree species.

Savanna Establishment/Restoration

- Undertaking pine savanna establishment or restoration involves a commitment to the regular use of prescribed burning, typically every two or three years. The goal is a scattered stand of trees with a grassy/herbaceous groundcover. This habitat structure provides trees for nesting and perching, an open and diverse herbaceous layer for foraging and nesting, and continuous light fuels which support frequent fire capable of controlling woody invasion.
- While savanna creation/restoration can begin with planting trees in field settings, it is more quickly and easily accomplished by thinning in

established forest stands. The above section on pine thinning will produce a savanna stand with an open canopy; however, reducing the TPA even further will produce better ground cover. A third thinning will most likely be required to maintain more than 50% sunlight on the forest floor.

- Creating and maintaining herbaceous ground cover requires regular burning. The initial, post-thin burn is usually the most difficult, as you have to contend with logging slash. About half of the subsequent burns can be carried out during the dormant season (January-March).
- In order to promote a diversity of herbaceous plants and better control unwanted hardwood species, it is recommended that every other prescribed burn be carried out in the growing season (April-August). Growing season burns are much more effective at controlling woody plants. However, burning during the growing season can be more challenging than during the dormant season. Talk to a professional to assess the need for and logistics of a growing season burn before undertaking it! It may require additional precautions.



Red-headed Woodpecker/Greg Lavary



Brown-headed Nuthatch/Bill Hubick

David Stephens, Bugwood.org

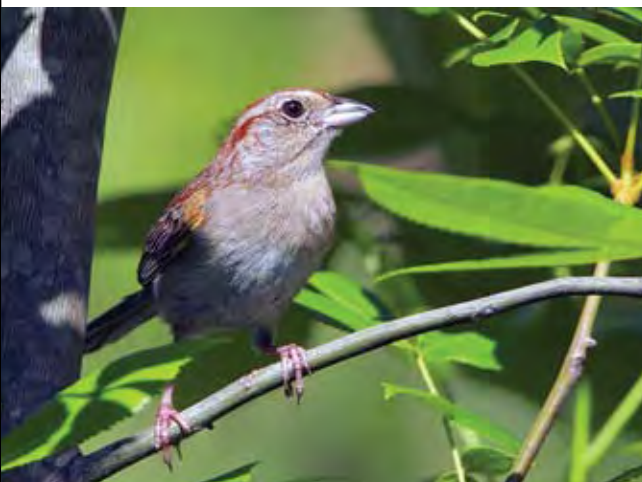
- Herbaceous ground cover is critical to full functioning of a savanna. The ground layer may be slow to establish, but prescribed burning will usually yield a surprising array of native plants that have been either lying dormant under the deep shade of a well-stocked forest, or which rapidly colonize an area which has been thinned and burned. Again, prescribed burning requires expertise, planning and suitable weather. Consult with the Department of Forestry prior to burning.
- Sometimes a diverse groundcover does not materialize, in which case it may be necessary to augment the developing savanna with appropriate native plants. Consider grasses such as wild rye, indiagrass, little bluestem, broomsedge, and bottlebrush grass, as well as wildflowers such as partridge pea, wild senna, goats rue, beggar lice, black-eyed susan, narrow-leaf mountain mint, and grass-leaf blazing star.

- Landowners may want to consider forest types other than loblolly pine as likely settings for savanna restoration. Shortleaf pine and oak/hickory dominated hardwood savannas are likely to have been dominant community types within large areas of the Piedmont and, if restored, would yield high wildlife habitat values and benefits for landowners. The Virginia Department of Game and Inland Fisheries has an ongoing experiment at the Amelia Wildlife Management Area to determine the most efficient method of restoring hardwood savanna. The Virginia Department of Conservation and Recreation is restoring shortleaf pine and hardwood savannas at the Difficult Creek Natural Area Preserve in Halifax County.

Prescribed burning/David Stephens, Bugwood.org



Bachman's Sparrow/Greg Lavaty



Prairie Warbler/Bill Hubick



Longleaf Pine/Ricky Layson Photography, Bugwood.org



Wetland/FWS

Wetlands in the Virginia Piedmont include the forested and grassed riparian areas along stream banks, farm ponds and their grassy margins, agricultural waterways, and other wet areas that support water-loving vegetation. Wetlands embedded in forests, pastures, or hayfields significantly add to the number of bird species that an area can support. Active beaver sites are particularly attractive to many birds. In addition to providing specialized habitat, wetlands also perform valuable ecological functions, including slowing flood waters, reducing erosion, and filtering sediments.

However, the ecological importance of wetland habitats is misunderstood and they are often viewed as wasted or useless land. Accordingly, wetlands are often converted to other land uses, which makes them one of the habitats most vulnerable to loss. Over 42% of Virginia's wetlands have been lost since the late 1700s. Many non-game migratory bird species that are threatened or declining are those that depend on inland freshwater habitat for at least part of their life cycle. The Louisiana Waterthrush, a riparian forest species, has a large portion of its breeding population in the Virginia Piedmont. Other bird species associated with wetlands in the Piedmont include the Prothonotary Warbler, Green Heron, King Rail, Least Bittern, and Pied-billed Grebe. Migrating shorebirds, wintering and breeding waterfowl, and some breeding rails and wading birds all benefit from well-managed wetlands.

Because wetlands are endangered, they are protected by state and federal laws, all of which should be considered when managing wetlands. When altering a wetland, you must contact the Virginia Department of Environmental Quality (www.deq.virginia.gov) and the Army Corps of Engineers (www.usace.army.mil) for permitting information.



Green Heron/Peter Wallach



Louisiana Waterthrush/© Patricia Velte, BackyardBirdCam.com

Creating and Maintaining Wetland Habitats

Management of riparian vegetation

- ❧ Avoid removing riparian vegetation that shades streams because this causes water temperatures to rise, which has a negative effect on fish and other aquatic life that are the basis of the wetland food web.
- ❧ Leaves and small twigs falling from surrounding vegetation into streams and rivers are critical to the maintenance of aquatic food webs.
- ❧ Erosion stimulated by removal of vegetative cover deposits fine sediments that are the most widely occurring pollutants in streams. This causes a lack of water clarity that has a negative effect on aquatic life.
- ❧ Intact riparian zones slow the runoff from fields, which allows sediment to be deposited before it enters waterways.
- ❧ Maintain riparian forest buffers of at least 100 feet on each side of the water body. These provide the best habitat for birds and the best maintenance of the aquatic food web.

- Fence riparian buffers to keep out domestic animals that otherwise can cause stream bank erosion and degrade water quality.

Management of farm ponds

- Allow the edges of farm ponds to grow native wetland vegetation rather than allowing grazing or planting them with lawn grass.
- When digging ponds, create a shallow gradient that provides both vegetated borders and open mudflats. This will benefit waterfowl, rails, herons, and shorebirds.
- Farm pond buffers of 50 to 60 feet, including vegetation of differing heights from upland areas to the pond itself, will provide the broadest benefits to birds. Allow a minimum buffer of 20 feet around all farm ponds.

Management of agricultural waterways

- Allow agricultural waterways to grow grassy strips, as this will limit transport of sediment and agricultural runoff (mainly fertilizers and pesticides) to surrounding lakes and streams. Wider is better, but strips can be as narrow as 35 feet. Strips at least 150 feet wide can also provide habitat for some birds.
- Maintain grassy strips by occasional mowing or disking, but do not graze them, as this will eliminate their ability to slow water flow.
- Grassy strips should not be disturbed during the nesting season from mid-April to mid-August.
- Many herbicides and insecticides are toxic to aquatic life. In addition to maintaining buffer strips, avoid applying pesticides within 20 feet of the water's edge.



Least Bittern/Peter La Tourette; Pied-billed Grebe/Bill Hubick; Prothonotary Warbler/Glen Tepke

Farm pond/stock.xchng



Garden/morguefile.com

Although we tend to think of the Piedmont as a rural area, urban and suburban development are on the rise, and this trend will certainly continue. With their mowed lawns and monoculture habitats, urban and suburban areas tend to have very little value as avian habitat. With a few small changes, however, even a suburban yard can offer good bird habitat.



American Goldfinches,
Carolina Chickadee/Gary Smyle

Managing your yard for bird habitat

- If you have the luxury of planning the structures on your lot, place them to maximize the size of natural habitat blocks.
- Avoid creating a park-like yard that provides little habitat for birds and other wildlife. A typical yard consists of two extremes, lawn and tall trees, with no middle layer of vegetation to provide the cover that is crucial to wildlife.
- Intersperse and mix native shrubs, hedges, and thickets to create habitat islands and habitat corridors that will substantially improve the appeal of any yard to birds.
- Place water sources in the form of bird baths or small pools around your yard, but remember to empty and refill these every two days to prevent mosquitoes and the spread of mosquito-borne diseases such as West Nile virus.
- If your yard includes a stream, allow the vegetation to grow up around the edges rather than mowing.
- Minimize the use of fertilizers and pesticides that can harm wetlands and streams, not only nearby, but as far away as the Chesapeake Bay.
- Using native plants that are best adapted to growing in local conditions will minimize the need for these chemicals.
- Include berry plants such as winterberry holly that provide an especially important food source to birds during the cold months. There are a multitude of berry and nectar producing shrubs that provide food in the spring and summer when birds are raising young.
- Leave dead trees and snags in your yard as long as they are not a safety risk. The dead and decaying wood provides nesting cavities and attracts insects that provide food.
- Create a brush pile that will provide cover for birds and attract insects.



Red-bellied Woodpecker/Bill Hubick

Extra things you can do for birds

- ❧ Put out bird feeders filled with quality seeds (black-oil sunflower and white proso millet), especially in the winter. Remember to clean feeders regularly to prevent disease.
- ❧ Keep your cat(s) indoors. It's healthier for the cat and for the birds.
- ❧ During the summer, suspended fruit will attract orioles, catbirds, and other fruit loving birds.
- ❧ Most yards have room for at least one or two nest boxes for wrens, chickadees, bluebirds, and woodpeckers.
- ❧ Hummingbirds are particularly attracted to feeders in suburban environments.

- ❧ In the spring, you can even put out the hair from your hairbrush and the birds will use it as nesting material.

Improving your neighborhood for birds

- ❧ Participate in park and stream restoration projects in your neighborhood and encourage the use of native vegetation.
- ❧ Help schools to transform part of their land to bird habitat. It will require less maintenance than closely cropped grass, which saves money and helps reduce greenhouse gas emissions.
- ❧ Garden clubs and home owners' associations are excellent organizations that can initiate restoration projects to benefit birds.



Blue Jay/Laura Erickson, Binoculars.com; House Wren/Chris Young; Eastern Bluebird/James Ownby

Yard/flickr.com

INVASIVE EXOTICS

Exotic species can brighten your day and be as harmless as a bed of tulips in March, or can be as destructive as the Johnsongrass in your corn field that you have been fighting for many decades. While numerous bird species may love multiflora rose, the problems associated with its spreading far outweigh encouraging or ignoring its presence on your lands. Invasive exotic plants must be addressed on a yearly basis because some of these species are very aggressive and can displace desirable species in two to three years if allowed to grow unchecked.

There are over 100 plant species that the Virginia Natural Heritage program recognizes as posing a major problem in significant portions of Virginia. For a more thorough discussion and listing of invasive species, see their web site at www.dcr.virginia.gov/natural_heritage/invspdflist.shtml.

It is much easier to control a few rogue plants than fight them after they have gained a foothold. Familiarize yourself with some of the more common invasive species, be vigilant with your lands, and quickly move to control invasive species when you find them. Spot-spray when the first few plants show up. Selective herbicides are usually better choices than broad-spectrum varieties. Your county Extension Agent is the best source of current information on control of specific pests.

Exotics in Agricultural Fields

Johnsongrass is an aggressive species, especially in agricultural settings. Don't relax in keeping it contained because once it has become established, it will very difficult to remove.

- Each crop field will have its own unique "seed bank" that has accumulated over the years. Minimizing tillage brings fewer seeds to the surface.



Johnsongrass/ Chris Evans, River to River CWNMA, Bugwood.org



Garlic mustard/Wisconsin DNR

- As you begin planting permanent cover in and around crop fields, you will need to be vigilant that dormant invasive species are kept under control. Tillage may have kept seeds of a mature *Ailanthus* tree from sprouting in the adjacent crop field, but once tillage ceases, these seeds may sprout into a major headache. Killing the *Ailanthus* at the field edge before initiating a permanent planting will make future maintenance much easier.
- Look for invasives in adjacent forested borders, fence lines, and pastures before starting a new, permanent planting.

Exotics in Grasslands

The presence of invasive species in grasslands may be as easy to control as using a prescribed burn to eliminate invading red cedar, or as difficult as trying to control the spread of *Sericea lespedeza* (Chinese bush clover).

- Multiflora rose is a particular problem in Piedmont grasslands. Spot-spray with herbicides.

Purple loosestrife/PANE: Invasive Plant Atlas of New England

- Bermudagrass may offer some value for grazing, but it will cause no end of problems in future management of any acres on which it is planted.
- Autumn olive, kudzu, exotic thistles, and knapweed are among the other invasives to look for in grasslands.
- Canada and nodding thistles can be particularly troublesome in newly established grasslands. Their seeds are dispersed by wind, so look for their presence not only in the field to be planted, but also in adjoining fields before initiating new plantings.



Exotics in Shrublands

By their very nature as successional habitats, shrublands are prone to problems with invasive species. The regular disturbances required to maintain shrublands will sometimes encourage the spread of invasive species.

- Hedgerow maintenance is particularly important because natural regeneration may quickly result in a dominance of invasive species such as tree of heaven (*Ailanthus*), multiflora rose, and autumn olive, which can sneak into shrublands almost unnoticed.

Exotics in Forests

Forests can play host to an array of invasive exotics. Invasive species often establish a strong presence in forests because forests are the climax community, and landowners often do not practice routine, annual evaluation of forest condition.

- Check forests annually for presence of invasive exotics.
- Watch the forest floor in particular for invasive species such as Japanese stiltgrass and garlic mustard.
- Vines such as kudzu and bittersweet can cause serious damage to forests and may spread quickly.
- Understory plants can be displaced by invading shrubs such as autumn olive, some honeysuckles, and privet.

Exotics in Wetlands

- Purple loosestrife may be a beautiful plant, but it can be extremely aggressive in aquatic environments. Few herbicides have proven effective in controlling it.
- Be careful to check boats and trailers if they have been used in waters with *Hydrilla*. Remove all traces of the plant, or you will have a real pest in your lake or pond.
- *Phragmites* is usually found in Tidewater wetlands, but it may occur in the east Piedmont. Be careful of any disturbance in wet areas as you may encourage expansion of phragmites stands.



Japanese stiltgrass: Wisconsin DNR



Multiflora rose/James H. Miller, USDA Forest Service, Bugwood.org



Autumn olive/IPANIE: Invasive Plant Atlas of New England

BIOFUELS AND WILDLIFE

Biofuels include an array of fuels derived from renewable resources such as crops, grasses, and trees. At present, virtually all biofuels in the United States are derived from feedstocks of corn and soybeans. There has been an increasing interest in producing biofuels from native Virginia feedstocks (wood and native grasses), yet we have very little knowledge of the potential impacts of such production on wildlife. Certainly the push to add more corn and soybean acres for biofuels has been detrimental to wildlife, as these acres have come from either idle or less intensive land uses that supported a lot of our wildlife. From a wildlife standpoint, then, what should you keep in mind if you decide to produce biofuels feedstocks on your farm?



Switchgrass/Meadowbrook Nursery

Soybeans/Howard F. Schwartz, Bugwood.org

- Native grasses (big and little bluestem, indian-grass, and switchgrass in particular) offer a lot of biofuel possibilities. Use only one harvest per year. These grasses are typically harvested for biofuels in winter, so ensure that a minimum of 35 feet next to woody cover is left standing in order to benefit wintering birds. That portion can be harvested the following year as you rotate the “leave-standing” portion to another part of the field. If you wait until late February or March, you can harvest the entire field with minimal impact on wildlife.
- Remember that true grassland bird species typically use stands that are 20 acres and larger.
- If you do not require full income from a native grass biofuel stand, consider harvesting in strips, cutting 100 feet, skipping 100 feet and repeating across the stand. Another approach is to cut half the field and leave the remainder unharvested. Harvest the unharvested portions in the following year. Numerous bird species that utilize relatively undisturbed, tall grasses will benefit and it appears that there will not be a significant loss of income.
- Set harvesting equipment as high as possible. A leaf node at eight or nine inches will give the plant a much quicker start in spring and leave some residual nesting cover for early-nesting birds.
- Woody feedstocks may be slash from logging operations, poor quality trees or high-graded stands from past logging activities, or purposefully planted, quick growing trees. This may offer



Little bluestem/Meadowbrook Nursery



Song Sparrow/Cary Smyle



Sunflowers/stock.xchng

opportunities to improve your woodland and benefit wildlife at the same time. With careful planning and a selective harvest, you may be able to restore a degraded hardwood stand and gain a biofuel harvest at the same time.

- Whole tree chipping harvests offer an array of opportunities to establish improved timber stands or to begin a scrub-shrub habitat. Always include wildlife-friendly species in a replanting of hardwood stands, including oaks, hickories, persimmon, hackberry, and perhaps a few fruit trees, if you can offer them initial protection from deer foraging.



Mourning Dove/Gary Smyle



Ruffed Grouse/Laura Erickson



Wild Turkey/Tom Grey



Switchgrass/Meadowbrook Nursery



Garden/flickr.com

RESOURCES

Planning Assistance

Virginia Department of Game and Inland Fisheries biologists are available for habitat planning and management advice. The Piedmont offices are: Fredericksburg, 540-899-4169, Lynchburg, 434-525-7522 and Farmville 434-392-9645.

Foresters with the Virginia Department of Forestry (DOF) offer a wide range of services. The DOF office nearest you can be found by contacting their Regional Office at Charlottesville, 434-977-5193 or Farmville, 434-392-4159. The Natural Resources Conservation Service (NRCS) has numerous offices in the Piedmont, located in your local USDA Farm Service Center.

Piedmont Environmental Council has well-qualified staff that can provide forestry, wildlife habitat, and geographic information systems (GIS) assistance for stewardship planning. Call the main office in Warrenton, 540-347-2334 and ask to speak to the Conservation and Stewardship Coordinator.

Contractor/consultant foresters are private foresters who offer an array of planning and habitat management assistance options. You can search the listing for the consultant that meets your needs on the VA Department of Forestry website at www.dof.virginia.gov/mgt/forestry-consultant-index.shtml.

A list of Certified Foresters (CF) can be found on the website for Society of American Foresters (SAF), the professional governing organization for foresters. www.safnet.org.

Contractor/consultant wildlife biologists are private biologists who offer a wide range of wildlife habitat and stewardship planning services; especially for non-game wildlife. (see list page 26). A list of Certified Wildlife Biologists (CWB) and Associate Wildlife Biologists (AWB) can be found on the website for The Wildlife Society (TWS), the professional governing organization for wildlife biologists: www.tws.org.

Cost Share Assistance

The Natural Resources Conservation Service (NRCS) offers financial and technical assistance to help landowners create, restore, and improve habitats for wildlife. Farm Bill programs offer conservation incentives for landowners and public and private groups specifically interested in improving and protecting wildlife habitat. The Wetland Reserve Program (WRP) provides conservation easements and cost sharing for wetland restoration practices. The Environmental Quality Incentives Program (EQIP) is the NRCS flagship program offering cost-sharing to help install conservation practices benefiting "At-Risk" species, which are defined as those identified in Virginia's Wildlife Action Plan (see www.bewildvirginia.org for a list of species). WHIP (Wildlife Habitat Incentives Program) provides technical and financial help to install practices that improve terrestrial and aquatic species habitats and control invasive species. The sister agency of NRCS, the Farm Services Agency, manages the Conservation Reserve Program (CRP) and Conservation Reserve Enhancement Program (CREP), which offer annual rental payments plus cost-sharing to plant vegetated buffers, restore wetlands, and protect declining habitats. Information on all of these programs can be found at www.va.nrcs.usda.gov. In addition, your county forester can provide information on forestry specific cost share programs such as Farm and Ranchland Protection Program (FRPP), Forest Legacy Program (FLP), and Reforestation of Timberlands (RT) program.

Piedmont Environmental Council (PEC) has published a comprehensive guide, *Sources of Funds for Conservation: A Handbook for Virginia Landowners and Non-Profit Organizations*. This guide provides a good flow chart to help landowners understand which programs are suitable for their given project. You may obtain a free copy by calling the PEC main office in Warrenton at 540-347-2334.

Cost Share Assistance: State Acres for Wildlife Enhancement (SAFE)

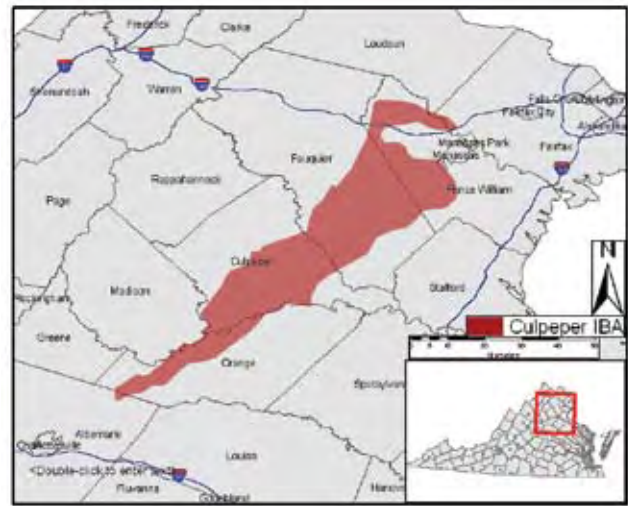
USDA's Farm Service Agency (FSA) created a cost share assistance program call State Acres for Wildlife Enhancement (SAFE) to benefit high-priority state wildlife conservation objectives through the restoration of needed habitat.

Through the local USDA office, landowners can enroll land for 10-15 year contracts provided they meet the following requirements:

- The land has a cropping history of four to six years from 1996 to 2001. This does not include marginal pasture land.
- For this project the land must be within the Culpeper Basin Important Bird Area (see map) and is appropriate for the proposed habitat restoration and management practices.
- Practices used and habitats created must be managed by the landowner during the life of the contract.

USDA may provide the following benefits to participating landowners:

- An up-front, one-time payment of \$100 per acre, which is made after the contract is approved.
- In addition to the acreage payment, USDA will pay up to 50% of the eligible cost of establishing a permanent ground cover for wildlife habitat.
- A practice incentive payment (PIP) equal to 40% of the eligible habitat installation costs.



- The remaining 10% of associated costs may be contributed through volunteer services, which means the costs associated with creating wildlife habitat through the SAFE program may be covered 100%.

Culpeper Basin IBA Pilot Project

The landscape recognized by the National Audubon Society as the Culpeper Basin Important Bird Area (see map above), which once supported an abundance of grassland bird species, has been transformed by centuries of human activities into a mosaic of farms, fields, and scattered secondary woodlots of oaks, hickories, and Virginia pine. Consequently, government agencies and private conservation organizations are working together to plant native trees, shrubs, and warm season grasses on 1,000 acres of retired cropland to restore grass and shrubland habitats along the Rappahannock and Rapidan Rivers, as well as upland habitat along their tributaries. Restored areas will link quality habitats together into a diverse wildlife corridor, creating a mosaic of habitats in various stages of succession to provide nesting sites, food, and cover for Bobwhite Quail, Loggerhead Shrike, Field Sparrow, and Prairie Warbler, and declining or imperiled grassland species such as the Barn Owl, Eastern Meadowlark, Henslow's Sparrow, and Grasshopper Sparrow.

For more information, contact the Piedmont Environmental Council at 540-347-2334; Mary A. Elfner, Virginia IBA Coordinator, 804-788-7660, melfner@audubon.org, or your local NRCS and FSA office.



Grasshopper Sparrow/Laura Erickson



Garden/flickr.com

Contractors/Consultants:

*Austin Jamison, Chesapeake Wildlife Heritage, 5497 Wyant Lane, Charlottesville, VA 22903
ajamison@cheswildlife.org • 434-825-7587

*Bob Warring (CF) Forestry Services, 9075 Totier Creek Road, Scottsville, VA 24590 • 434-286-9288

Collins Huff, 8205 James Madison Hwy, Gordonsville, VA 22942 • 540-967-5632 or 434-531-0451

*Dan Hammond, H&H Forest Management, PO Box 370, South Hill, VA 23970 • 434-955-2602

David Coleman, Conservation Services, 50 Lodge Lane, Suite 114, Verona, VA 24482
trees@conservationservicesinc.com • 877-257-4042

Fred Circle, 2948 Brookdown Dr., Columbus, OH 43235. www.fdcenterprises.com • 866-270-4833

*Glen Worrell, F&W Forestry Services, 404 8th St. NE, Suite C, Charlottesville, VA 22902 • 434-296-1464

*Justin LaMountain, Green Man Forest Management, PO Box 762, Warrenton, VA 20188
www.GreenManForestManagement.com,
greenmanforestry@gmail.com • 703-357-2403

Kevin Colbeck SMGC Wildlife Habitat & Restoration, 710 Severn Ave., Annapolis, MD 21403
smgcgrasses@aol.com • 410-991-1419

*Rex Bowen, In The Woods Land Management, HCR 74, Box 2132, Little Plymouth, VA 23127

Rick Bacon, Kenbridge, VA • 434-955-0139

*Will Argabright, P O Box 1413, West Point, VA 23181 804-785-5046

*Can conduct prescribed burns.

Note: Although it is not comprehensive, the list above reflects our current knowledge of contractors/consultants with experience in forestry and wildlife habitat work who service the Virginia Piedmont area. Your county forester (Department of Forestry) or county wildlife biologist (Department of Game and Inland Fisheries) usually has a list of local contractors for forestry and wildlife habitat work, including prescribed burning, pre-commercial thinning, reseeding, tree planting, writing stewardship plans, wetland restoration, and similar activities.



Bouquet easement area/Faren Wolter

Useful websites:

Native plants: www.dcr.virginia.gov/natural_heritage/nativeplants.shtml

A useful list compiled by the Division of Natural Heritage of the Department of Conservation and Recreation

Invasive species: www.dcr.virginia.gov/natural_heritage/invspdflist.shtml

Another useful list compiled by the Division of Natural Heritage of the Department of Conservation and Recreation

Southern Forests: www.srs.fs.usda.gov

link will take you to their publications page and most information is available at no charge. The USDA Forest Service Southern Research Station is the leading agency for research on natural resource management and sustainability in the Southern United States.

Additional interesting reading:

Center for Conservation Biology. *Migratory Birds of the Lower Delmarva: A Habitat Management Guide for Landowners*.

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Kearney, R.F. 2002. *Partners in Flight Landbird Conservation Plan, Physiographic Area 10: Mid-Atlantic Piedmont*. University of Maryland. College Park. 51 pp.

Kenyon, Irv. 2000. *Beyond the Food Patch: A Guide To Providing Bobwhite Quail Habitat*. Wildlife Information Publication 00-01. Virginia Department of Game and Inland Fisheries. Richmond, VA. 44 pp.

Miller, James H. 2003. *Nonnative invasive plants of southern forests: a field guide for identification and control*. Revised. Gen. Tech. Rep. SRS-62. Asheville, NC:U.S. Department of Agriculture, Forest Service, Southern Research Station. 93 p.

Natural Resource Conservation Service. 2002. *Managing Forests for Fish and Wildlife. Fish and Wildlife Habitat Management Leaflet Number 18*. Natural Resource Conservation Service. 44 pp.

Oehler, J.D, D.F. Covell, S. Capel, and B. Long. 2006. *Managing Grasslands, Shrublands, and Young Forests for Wildlife: A Guide for the Northeast*. The Northeast Upland Habitat Technical Committee. Massachusetts Division of Fisheries and Wildlife. 148 pp.

U.S. Geological Survey, 2001. *A Gap Analysis of Virginia*. 763 pp.

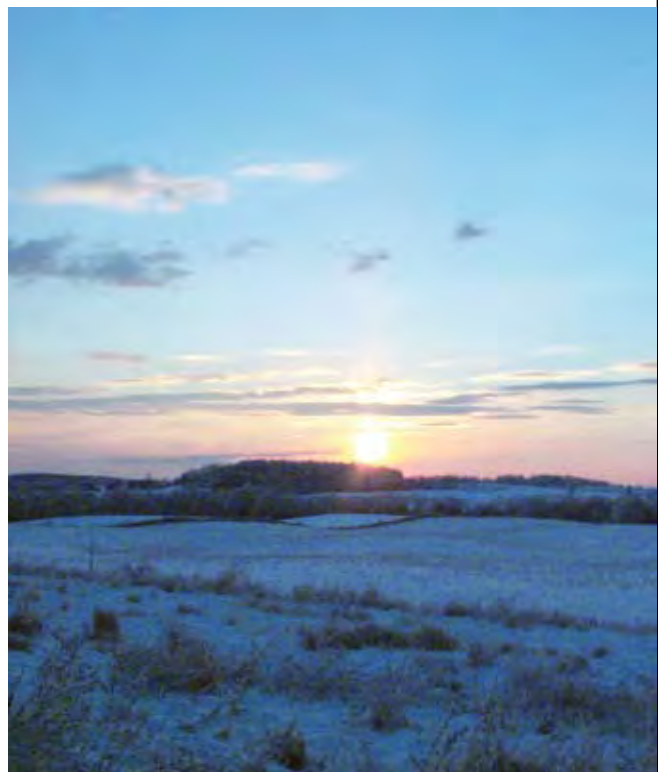
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Virginia Department of Game and Inland Fisheries. 1998. *Managing Pines for Profit and Wildlife*. Wildlife Information Publication No. 98-1. Virginia Department of Game and Inland Fisheries. 16 pp

Virginia Department of Game and Inland Fisheries. *Habitat At Home* brochure.



Scarlet Tanager/ClipArt.com



Brandy Station area/Andrew Grigby

American Bird Conservancy

P.O. Box 249
The Plains, VA 20198
www.abcbirds.org • abc@abcbirds.org
540-253-5780 • 888-247-3624

Piedmont Environmental Council

P.O. Box 460, Warrenton, VA 20188
www.pecva.org • pec@pecva.org
540-347-2334

Virginia Department of Game & Inland Fisheries

P.O. Box 11104
Richmond, VA 23230-1104
www.dgif.virginia.gov
804-367-1000

