



Sustainable Forestry: A Guide for Virginia Forest Landowners

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As a private woodland owner, you are a vital link in the sustainability of Virginia’s forest resources. Your land provides many benefits to all Virginians, including wood products, wildlife habitat, clean air and water, and recreational opportunities. Because woodland owners like you own and manage two-thirds of the state’s forestland, the decisions you make regarding your woods today will impact the quality of Virginia’s forests for many years. The purpose of this publication is to provide you with a set of suggestions for starting or continuing to manage your land actively. In addition, this guide will help you understand the importance of management planning and how to work with professional foresters and natural resource management agencies.

The information contained in this publication regarding taxation and environmental regulations is not official government interpretation. Regulations and laws are constantly evolving, so you are encouraged to obtain professional forestry assistance before making your final management decisions. Resources for learning more about any of the topics covered are provided at the end of this document along with a list of agencies you can contact for further assistance.

What Is Sustainable Forestry?

Virginia’s forests make a vital contribution to the commonwealth and beyond by providing environmental, social, and economic benefits essential to our quality of life. While sustainability is a dynamic concept, a basic principle is clear: Sustainable forestry consists of those management practices that meet present needs without compromising the ability of future generations to meet their own needs. Specifically, sustainable forestry integrates reforestation and the managing, growing, nurturing,



Virginia Sustainable Forestry Initiative Implementation Committee Program Participants

- Bear Island Paper Company WB LLC
- Conservation Forestry
- Domtar Paper Company LLC
- Enviva
- Forest Investment Associates
- Georgia-Pacific LLC
- Glatfelter
- Greif Packaging LLC
- Hancock Timber Resource Group
- Huber Engineered Woods LLC
- International Paper
- KapStone Kraft Paper Corporation
- Louisiana-Pacific Corporation
- Verso Corporation
- Plum Creek Timberlands LP
- Timberland Investment Resources LLC
- WestRock
- Weyerhaeuser Company

What Is the Sustainable Forestry Initiative?

The Sustainable Forestry Initiative® program is a comprehensive system of principles, objectives, and performance measures that integrates the perpetual growing and harvesting of trees with the protection of wildlife, plants, soil, and water quality. This comprehensive system is the SFI® 2015-2019 Forest Management Standard. SFI Inc. is an independent, nonprofit organization with a science-based, internationally recognized forest management standard for North America. SFI's 18-member multi-stakeholder Board of Directors comprises three chambers that equally represent environmental, economic, and social interests so it can meet the many needs of forests and communities.

The SFI 2015-2019 Forest Management Standard is based on principles and measures that promote sustainable forest management and consider all forest values. The SFI 2015-2019 Fiber Sourcing Standard includes unique fiber sourcing requirements to promote responsible forest management of all forestlands in North America.

SFI certification also extends to the market. When consumers see the SFI label on a product, they can be confident they are buying wood or paper from responsible sources — whether it's reams of paper, packaging, or two-by-fours. Finally, it is important to know that the SFI program recognizes lands certified to the American Tree Farm System as certified forest content for use in SFI on-product labels. Virginia's wood products industry purchases the majority of the wood necessary for their manufacturing processes from private forestlands like yours. With the cooperation of many state, federal, and private natural resource agencies, Virginia's forest industry encourages you to consider the information in this guide and to adopt sustainable practices in the management of your forest.

and harvesting of trees for useful products and ecosystem benefits such as conserving soil, air, and water quality; sequestering carbon; perpetuating biological diversity; conserving wildlife and aquatic habitats; improving recreational opportunities; and protecting aesthetics.

Following are examples of sustainable forestry practices:

- Regenerating forests as soon as possible following a timber harvest.
- Minimizing the impact of forest management activities on water quality and aesthetics.
- Maintaining important habitat elements for wildlife and plant species.
- Managing for populations of imperiled and critically imperiled species.
- Protecting forests of recognized importance and special sites.
- Managing biological diversity.
- Limiting the spread of exotic (nonnative) species.
- Using wood resources efficiently.
- Maintaining forest health and reducing wildfire susceptibility.

How Do I Begin?

You can implement sustainable forestry practices at any time. Whether you are a new forest landowner with little management experience or a veteran forest landowner already actively managing your property, this guide will provide you with useful strategies to make your forest sustainable.

After reading through this guide, sit down with your family to discuss your goals for owning forestland. A goal is the big picture or a general statement about how you want your land to look in the future. Goals you might have include the following:

- Improving the health of the forest.
- Harvesting timber and regenerating the forest.

- Providing quality habitat for game and nongame wildlife species.
- Identifying and protecting special sites.

This could also be a good opportunity to discuss the future of your land with your family. Who will carry out your management plan once you are gone? Which family members share your conservation values? How will you pass the land on to your heirs? These are difficult questions, but they are important ones to answer.

Once your goals are set, a professional forester can help you develop a management plan, the foundation of sustainable forest management.

Develop a Management Plan

A management plan takes into account the management of not only your trees, but all the other aspects of the forest ecosystem. A well-written management plan provides a roadmap to help you achieve your goals through well-managed, sustainable forestry practices.

Your plan can also help you in other ways:

- Have your woods certified as sustainably managed.
- Qualify for forest Use-Value Assessment where available.
- Enroll in cost-share programs.
- Place your land under a conservation easement.
- Continue family discussions about the future of your property.

Even if you already have a plan, it's a good idea to regularly review and update it because your property conditions, resources, and goals change over time. Allowing yourself the freedom to modify your plans as conditions change or as new information or resources become available is known as adaptive management. Adaptive management allows you to implement the best management practices available. Regular monitoring of your property to identify changes is an integral part of adaptive management.



A professional forester and a written management plan can help private landowners reach their goals. Photo courtesy of John Campbell, Virginia Department of Forestry.

More on Management Plans

A management plan includes key elements that will help you make good decisions about forest management. The plan should include:

- Current forest conditions.
- A detailed map of the property.
- Goals.
- Management activities/timeline to meet your goals.
- Location of special sites.
- Presence or absence of threatened or endangered species.
- Soil and water resources.
- Forests of recognized importance.
- Wood and fiber production.
- Current/potential forest health concerns, such as invasive species, wildfire, insects, or diseases.

Plans can also include, if appropriate,

- Use of prescribed fire.
- Protection of wetlands.
- Management for desired species (e.g., bobwhite quail).
- Recreation.
- Aesthetics.
- Biomass production/carbon storage.

There are several high-quality management plans available to forest landowners in Virginia. All plans encourage long-term stewardship by helping landowners practice active forest management. Forest Stewardship, Tree Farm, and Conservation Activity plans are all types of forest management plans.

These three types of plans are interchangeable when it comes to meeting the planning requirement for cost-share programs, becoming certified under the American Tree Farm System, or enrolling in the Forest Stewardship Program. Check with your forester for other things you might need to enroll in each of these programs.

Implement Your Multiresource Management Plan

Many landowners already have a management plan, but for some, taking the next step and actually implementing the plan can be daunting. A well-written management plan should have activities and an accompanying timeline that can guide you through the process. And remember to remain flexible. If you cannot complete an activity this year, try finishing it next year. Managing your forest is a long-term process. Depending on your resources (e.g., skills, money, equipment, and access to labor), you might be able to complete some activities on your own. For others, you will need the assistance of a professional forester.

What follows is a list of common management goals and some strategies for working toward them. This is not a complete list of possible goals, and the order is arbitrary. The goals in your own management plan will most likely be different. Each management plan is unique, like forests and the families that own them.

Goal 1: Maintaining and improving the health of your forest

Like all living things, forests are susceptible to a host of potential health threats, including wildfires, insect



The canopy of an unthinned hardwood stand. The crowns of the individual trees are touching, a sign that the stand is overcrowded, and competition for limited resources (e.g., sunlight, water, and nutrients) is high.

attacks, diseases, and natural disasters. While your control over these threats is limited, certain management actions will protect your investment by minimizing your forest's risk for damage.

Following are some actions you can take.

Plant species that are best suited for the site. Trees planted outside their natural range or on unsuitable sites are generally weak and unhealthy. Unhealthy trees are more susceptible to insect attack and disease, and they expose the healthy trees in your forest to damage as well.

Monitor the condition of your forest. Periodically walk through your forest, especially after severe weather such as ice storms, hurricanes, and tornadoes. While

some level of damage is natural and acceptable, you might want to conduct a salvage cut to remove severely damaged trees before further damage from insects and disease occurs.

When insect and disease outbreaks occur, respond quickly. Insects and disease destroy more timber in the United States than any other factor. If an insect outbreak such as southern pine beetle occurs, the infected trees and a small buffer of surrounding trees should be cut and removed immediately. Becoming familiar with the symptoms of insects and disease outbreaks can help you identify these problems early on when they are easier to treat.

Thin overcrowded stands. Thinning focuses sunlight, water, and nutrients on fewer trees, resulting in a healthier, more vigorous forest. Diameter growth of the remaining trees will likely increase, adding to the future value of the stand.

Consider prescribed burning. Burning at regular intervals can reduce fuel loads, control rust diseases, and encourage shrub and forage growth for wildlife food and cover. Forests in the Coastal Plain are typically burned every three to five years. In the ridge and valley, prescribed fires are less frequent.



Thinnings remove enough trees to open the canopy, so the crowns of the remaining trees are not touching, giving each tree access to more resources.

Reduce the risk of wildfire. Actions such as salvage logging, thinning, and prescribed burning reduce fuel loads and help reduce the risk of a wildfire damaging your woods.

Use the appropriate harvesting method. How you harvest your timber depends on your management goals. In some of Virginia's Ridge and Valley and Piedmont hardwood stands, poor historic harvesting practices such as high-grading or diameter-limit cutting have removed the best-formed, most vigorous trees from the forest, leaving predominantly weak and unhealthy trees.

If your goal is to grow a healthy vigorous forest, in some cases the best long-term prescription is to remove all trees within the stand and start over with vigorous natural or planted regeneration. This also holds true if your goal is to grow species that require full sunlight, such as loblolly pine or yellow-poplar. Most of Virginia's pine and hardwood species that have commercial and wildlife value require full sunlight for optimal survival and growth.

Other harvesting methods remove individual or small groups of trees and are suitable for regenerating species that are more tolerant of shade. With these methods, it is best to cut the worst trees and leave the best trees so your forest is healthier after each cut.

Control exotic (nonnative) invasive species. The introduction and spread of exotic plants, insects, animals, and diseases has severely impacted native

forests. Exotic invasive species often dominate disturbed sites such as forest edges, forest roads, and rights of way. These species can outcompete and displace native trees and alter the structure and function of forests, and they often have little wildlife value. These infestations increasingly erode forest productivity, hinder forest use and management activities, and degrade diversity and wildlife habitat. In addition, exotic species such as tree-of-heaven and autumn olive are very difficult to control once established.

Measures taken to prevent the introduction and spread of exotic invasives are the most practical and effective approaches. For example, having equipment cleaned before it is moved onto your property can prevent the accidental introduction of exotic invasives.

If necessary, however, a variety of tools are available to help landowners control unwanted species. These include mechanical controls (such as hand-pulling or mowing), biological controls (such as insects specifically bred to feed on another insect), or chemical controls (herbicides). The exact tool (or combination of tools) needed will depend on the type of exotic invasive species; however, the use of chemicals should be minimized if possible.

When thinking about the introduction of a nonnative species on your property, please consider its potential negative impact on native vegetation and the larger landscape. There are many suitable native species that can be used instead.

Goal 2: Harvesting your timber

A common component of forest management plans is a timber harvest. Timber is typically harvested for financial reasons (e.g., to pay for college or retirement); however, timber can also be harvested for a variety of other reasons:

- Establishing new forests.
- Improving overall forest health and vigor.
- Creating diverse habitats and recreation access.
- Controlling forest density.
- Releasing desirable tree species from competition.
- Controlling forest insects and disease.

To help ensure your satisfaction when a harvest is completed, be sure you have a current management plan, as discussed in the previous section, before finalizing your timber sale. Insufficient planning can be costly and can prevent you from reaching your goals. In addition to having a forest management plan, other important steps to consider when planning a timber sale include:

Use professional assistance. If you are uncertain about what you have to sell or have other questions about the timber sale process, don't guess — contact one of the sources of assistance listed at the end of this brochure.

Mark your sale boundaries. Identifying and marking your sale boundaries are critical first steps in a successful timber sale. Poorly marked boundary lines can lead to timber trespass, that is, the harvesting of a neighbor's timber. The penalty for timber trespass in Virginia could be three times the value of the timber taken plus the expenses of a timber appraisal. Well-marked boundaries will minimize the possibility of trespass. Property deeds, topographic maps, and aerial photographs will greatly aid in helping you establish your boundaries, but you might need to hire a professional surveyor.

Know what you have to sell. Have a complete inventory of your forest resources conducted to determine what your timber is worth. During the inventory, tree species, merchantable volumes, and potential products will be tallied. Note that timber markets are localized and the price you receive for your timber will depend on many factors, including tree quality, size, species, site access, soil conditions, harvest method, market conditions, and distance to the



Regeneration harvest of a loblolly pine plantation.

mill. During the inventory, other important nontimber resources, such as plant and animal species of concern, wildlife habitats, sensitive biological areas, historic sites, aesthetics, and wetlands, should be identified. A professional consulting or industry forester can conduct an inventory for you.

Work with a qualified logger. The forester you work with can provide a list of potential loggers. To choose a qualified logger, take into account requirements such as:

- Completion of logger training/continuing education programs such as Virginia's Sustainable Harvesting and Resource Professional (SHARP) Logger Program (www.sharpllogger.vt.edu).
- Knowledge and use of forestry best management practices (see the sidebar on BMPs).
- Proof of adequate workers' compensation and liability insurance coverage.
- Adequate equipment to do the job.
- List of references from previous harvesting jobs. You might want to visit an ongoing harvesting operation the logger is conducting. During the on-site visit, look at the condition of logging equipment and haul trucks, note whether workers wear protective equipment, examine the methods used to protect trees excluded from the timber sale, and check the condition of skid trails, landings, and haul roads.

Secure a written sale agreement. Your forest is a valuable economic and ecological resource. When you decide to sell timber, it is important that your short-term and long-term interests be protected. The best way to protect your interests during a timber sale is through a written timber sale agreement. Retain this contract as part of your management plan. At a minimum, a good timber sale contract will include:

- A description of land, with boundary lines and guarantee of title.
- Specification of payment terms.
- Description of timber, method of designating trees to be cut, and harvesting method.
- Specification of time period covered by the contract.
- Prohibition of excessive damage to residual trees, buildings, fences, and roads.

Best Management Practices

Forestry best management practices are forest management practices designed to reduce erosion and prevent or control water pollution resulting from forestry operations. The potential for water contamination occurs when runoff from rain or snow moves over a harvesting site. Without the proper use of BMPs, this runoff can pick up and carry away soil and other pollutants, depositing them as sediment into waterways, wetlands, and groundwater.

Forestry activities that can potentially cause water pollution include forest road construction and stream crossings, forest harvesting activities such as skidding and loading trees, site preparation (getting the harvest site ready for reforestation), and chemical treatments like pesticide and fertilizer application. Of these activities, road construction has the greatest potential to degrade water quality, so most forestry BMPs focus on proper road construction to minimize soil erosion.

Planning before the timber harvest is essential to minimize the potential impact to soil and water quality. Identify special and sensitive sites in your overall forest management plan. These sites include streams, areas with unique plant or animal species, areas with steep slopes and highly erodible soils, and forested wetlands. Forested wetlands are distinguished by specific plant communities, hydric soils, and hydrologic conditions. Minimize disturbance from forest management practices in these areas. Use this information in the more comprehensive preharvest plan specifically prepared for the portion of your forest to be harvested.

The preharvest plan should:

- Identify streamside management zones or buffers adjacent to perennial and intermittent streams. SMZs are designed to stop runoff from reaching waterways and to keep stream temperatures cool; harvesting within SMZs should be limited to minimize disturbance of the forest floor and canopy.
- Require the use of special harvesting equipment and techniques to protect water quality in and around wetlands.
- Minimize soil erosion by including properly



Proper stream crossings are an important part of protecting water quality. Notice that in addition to the bridge, the streambanks have been seeded to reduce erosion.

designed and constructed truck haul roads. Roads should be designed to follow the land's contour and to allow water removal while slowing the flow of runoff toward waterways (these include broad-based dips, turnouts, and culverts).

- Minimize stream crossings.
- Provide measures for keeping logging debris out of stream channels.
- Minimize soil compaction and ground disturbance by restricting the use of heavy equipment during wet periods.
- Prevent soil erosion with prompt revegetation of areas with bare soil, including logging roads, trails, and loading decks.
- Require prompt reforestation of harvested sites.

Note: If timber harvesting or other management activities are negatively affecting water quality, the logger or timber buyer and the landowner are liable, and each could be required to rectify water quality problems. The Virginia Department of Forestry has the responsibility and legal right to inspect all timber harvesting sites for water quality degradation.

The VDOF maintains a handbook for forestry BMPs that is available upon request and available for download at www.dof.virginia.gov. State law requires that loggers notify the VDOF within three working days of the start of the logging operation. This is easily done on the VDOF website or by calling 800-939-LOGS (5647). Be sure your logger meets this requirement.

- Specification of penalties for damage or removal of unmarked trees.
- Assignment of liability for losses caused by the timber buyer or his agents.
- Requirement of the use of forestry BMPs and adherence to all local, state, and federal laws.

Supervise the harvest. Before the harvest begins, review the timber sale agreement and walk the site with the logger. This will give you an opportunity to get to know each other and to explain your objectives for harvesting timber. A logger who is personally familiar with you and aware of your objectives will likely do a better job. Once harvesting begins, either you or your forester should periodically inspect the harvest site. Visits will ensure that logging is being conducted in compliance with the terms of the sale agreement and will identify any potential problems early, when they are more easily fixed. When the harvest is complete, conduct a final inspection to be certain that the job complies with Virginia’s forestry BMPs.

Keep the aesthetics of the harvest in mind. Work with your forester to create positive visual impacts with your timber harvest. Creating openings with irregular borders and leaving trees along ridge tops can help soften the appearance of clear-cuts. Allowing recently harvested areas to regenerate (or green-up) before harvesting adjacent tracts can also help maintain the aesthetics of an area. Additionally, the layout and design of the roads, skid trails, and landings can have a large impact on the aesthetics of the logging operation.

Manage harvest residue. Following a timber harvest, there is usually a significant amount of what was once considered nonmerchantable logging residue (tops, branches, and otherwise nonmerchantable stems) left on-site. As society focuses on deriving more energy from resources other than fossil fuels, these forest residues (also known as woody biomass) are important as potential sources of renewable energy. New markets for woody biomass are emerging, and where markets exist, landowners might be able to increase total revenue from a timber sale by harvesting and using this material. Harvesting woody biomass can make the site more aesthetically pleasing and help reduce site preparation costs for reforestation. Biomass harvests are conducted simultaneously with the timber harvest.

However, there is also value in leaving woody biomass on-site. Benefits include long-term increases in ecological values, such as carbon sequestration, soil organic matter, and soil-moisture and nutrient retention, as well as moderation of soil temperature fluctuations. In addition, the material can be used as a ground cover in implementing BMPs during the harvest. Landowners need to weigh the economic value of harvesting woody biomass versus the ecological values of leaving it on-site.

Goal 3: Regenerating your forest

If you have a management plan that includes a timber harvest, a plan for regenerating your forest will be included. You should consider several key items in your regeneration plan. For example, you will need to determine what species you want to grow. Forests are composed of evergreen trees (often pines), deciduous trees (sometimes called hardwoods), or a mix of both. The factors that determine which tree species grow on a specific site include the climate, land-use history, soil quality and structure, water availability, and the direction the slope of the site faces (its aspect).

The limits imposed by these conditions in combination with your management objectives will determine what types of trees are best-suited for your forest. In most cases, species that are native to your area will do best. When choosing to manage for pines or hardwoods, you should consider a few basic forest ecology principles.

Match your goals with your resources. Forests are managed in units called “stands.” A stand is a group of trees sufficiently uniform in species composition, age, and/or condition to be distinguished from surrounding groups of trees. Most forest ownerships include several different stands. Stand boundaries are identified by changes in tree species and are influenced by differences in soils, slope, climate, and other physical characteristics of the land. For example, yellow-poplar, white oak, and eastern hemlock are best-suited to cool, wet, north-facing hollows with deep, fertile soils. Other species such as Virginia pine and chestnut oak frequently occur on hotter, dryer, south-facing slopes with shallow soils. Your goals should match the different site types that occur in your forest.

Consider all options before converting one forest type to another. Conversion involves changing from one forest type to another (e.g., harvesting a mixed hardwood stand and replacing it with planted loblolly pine) or from one land use to another (e.g., from forest to pasture). Conversion is appropriate in some instances, but take care to ensure that rare and ecologically significant forest types are not converted.

Keep in mind that pine and hardwood forests are established differently. New pine forests are frequently established by planting nursery-grown seedlings (artificial regeneration). Studies show sites of average quality in Virginia's Piedmont and Coastal Plain regions that are reforested with improved loblolly pine seedlings yield good returns on investment. Returns on investment increase when landowners use all available cost-share programs and tax incentives. While risk factors such as damage from ice storms, hurricanes, insects, and disease can reduce the expected return on investment, proper management greatly reduces the occurrence of these threats. Cost-share is available to assist landowners reforesting with certain pine species.

While hardwood trees can also be planted, new hardwood forests are usually established using natural regeneration methods, such as seed germination and stump sprouting, which reduce the upfront investment. When regenerating most Virginia hardwood species, a heavy cut allows sunlight to reach the forest floor, encouraging seeds to germinate and stump sprouts to grow. Later in the life of the stand, you will likely



Although pines can be regenerated naturally, most landowners choose to plant nursery-grown seedlings. This ensures a uniform stand, better genetics, and an increased return on investment.



Stump sprouts and seeds are typically relied on to naturally regenerate a hardwood stand. This method is less expensive than planting.

need to do some management work (such as thinning) to produce quality hardwood sawtimber. The holding period (rotation age) is longer for hardwoods, often running 60 to 80 years or more.

Whether you manage your forests for pines, hardwoods, or both, plan to set aside a portion of the income you receive from your timber harvest to use toward regenerating a healthy new forest. You should aim for adequate stocking levels in your young forest within five years. The stocking levels or number of trees per acre will depend on your management goals. Your forester can advise you on what to aim for. Reforestation is one of the best long-term investment opportunities available to forest landowners. This conclusion is based on the appreciation of timber products in the southeastern United States over the past 50 years.

Calculate the returns from an investment in reforestation like any other long-term investment. To analyze the potential economic return of reforestation on your land, you will need the following information:

- The site quality or productive capability of your land.
- The costs of site preparation and reforestation.

- The amount and frequency of management activities required to maintain and protect a vigorous stand (e.g., prescribed burning; boundary line maintenance; fire, insect, disease protection; etc.).
- An estimate of the future value of harvested timber products.
- The length of time from planting to final harvest.
- Other costs and revenues (e.g., real estate taxes, hunt club lease income, etc.).

Convert nonforested areas to forest. While you are reforesting recently harvested areas, consider afforesting other parts of your property. “Afforestation” is defined as planting trees to create a forest on land that has not been previously forested. On privately owned lands, this could include areas that have been in pasture or agricultural production for long periods. The forest industry in Virginia supports afforestation of fields, strip mines, and other open areas as a way to increase forestland.

Typically, species used for afforestation are pines, but hardwood trees could also be planted. If you are interested in planting open areas on your property, you should consult with your professional forester. They can help guide you as to which species and planting techniques would best suit your preferences and needs.

Goal 4: Creating and improving wildlife habitat

Managed forests provide an abundance of resources other than timber, including wildlife habitat. To develop a variety of wildlife habitats, consider the following management options and activities:

Provide a variety of food, cover, and habitat for wildlife by managing some of your forest stands for a mixture of pines and hardwoods. Your forest will attract many wildlife species if you provide a diversity of habitats across your tract, such as different aged forest stands, a variety of species, forest openings, abandoned agricultural fields, overgrown fence lines, and streams and ponds with clean water.

Use the borders or edges of harvest sites to create unique wildlife management opportunities. Edges are transition zones between two adjoining land-use types. Many wildlife species use edge habitat.

Soften edges by planting shrubs and fruit trees along harvest and field/forest borders. Irregular, scalloped forest edges improve the visual impact of timber harvesting while providing good wildlife habitat. Timber harvests should also be designed to protect aquatic habitats and provide corridors for wildlife to move into and through the area.



Timber harvests help create a diversity of wildlife habitats across the landscape. Maintaining water quality is an essential component of protecting wildlife habitat.

Goal 5: Conserving special sites and protecting threatened and endangered species

Protecting significant natural communities and unique features in your forest is an important component of sustainable forestry. Accurately note on the map in your management plan if any of these sites are present on your property.

Protect sites with special biologic significance.

NatureServe, an international network of Natural Heritage Programs, assigns plant and animal species and natural communities a conservation status rank based on their rarity and conservation status across their entire range. Significant natural communities could be those that are rare in Virginia or those that are exemplary examples of more common types. Species ranked “G1” (global rank 1/critically imperiled) or “G2” (global rank 2/imperiled) are most at risk. Forest certification systems, such as the Sustainable Forestry Initiative, protect all “G1” and “G2” species and natural communities, even if they are not listed and protected under the Endangered Species Act. State rankings are similar (“S1” and “S2”) but only indicate the status of the species within Virginia. More information on special sites is available from the Virginia Natural Heritage Program.

If you are fortunate enough to have one or more state or globally ranked species or natural communities on your land, you should be particularly vigilant about

protecting them. Your efforts to manage rare species and significant natural communities have the added bonus of protecting more common species, which helps to keep them off regulated lists in the future.

Protecting sites with high aesthetic values. If your property has waterfalls, caves, exposed rock outcrops, or other visually appealing features, can you protect them by leaving forested buffers or by taking other appropriate actions to avoid negative impacts on their visual quality and biological functions.

Protecting sites with historic significance. Examples include Civil War and Native American sites and cemeteries. Because of their significance and sensitivity, these areas are often set aside and managed solely for their unique features. You might be able to reduce your tax burden through charitable contributions such as land donations or conservation easements. Be sure you understand your rights and obligations, as well as the implications for future forest management activities before entering into a conservation easement agreement.

Protect Forests of Recognized Importance. Forests of Recognized Importance represent regionally, nationally, and globally significant large landscape areas of exceptional ecological, social, cultural, or biological values. FORIs are typically already protected by federal or state governments or are under a conservation easement. The most-likely scenario for a private landowner is that their property is adjacent to a protected FORI. Landowners should consider the presence of an adjacent FORI when developing their management goals. These goals should enhance and protect the FORI, if possible.



Virginia sneezeweed is a rare perennial wildflower found only in wetlands in Virginia.

Certifying Your Forest

If you have a management plan and are implementing sustainable forestry practices, you might want to consider having your forest certified. Certification is a voluntary process that recognizes well-managed forests. Benefits of having your land certified include both recognition of your efforts to practice forestry in an environmentally responsible manner and the potential of access to markets that might seek wood from certified forests. There are a number of certification systems available. In Virginia, the American Tree Farm System® and the Forest Stewardship Council® offer internationally recognized certification programs for private woodland owners. Also, fiber from American Tree Farm System-certified forestlands is recognized and considered certified content in the Sustainable Forestry Initiative's chain of custody certification program. Contact either program for information on how to certify your woodland.



Prior to a timber harvest, walk your property and identify any areas with high aesthetic values such as this waterfall. The timber harvest should be planned in a way that minimizes impacts to these features.

Environmental Regulations

As you implement your forest management plan, be aware that forestry activities must comply with local, state, and federal regulations. Because you are liable for activities occurring on your land, you need to be aware of how environmental laws impact your forest management activities, and you are encouraged to obtain professional advice prior to conducting any forest operation such as a timber sale. Some frequently applicable environmental regulations are outlined here.

Water Quality

Excessive sediment and chemicals entering waterways resulting from forestry activities are subject to Virginia's Silvicultural Water Quality Law administered by the VDOF. If VDOF finds serious water quality degradation, it can stop the harvesting job, require corrective action, and, in extreme cases, institute civil penalties. In addition, Virginia's Debris in Streams Law requires that debris from harvesting activities, such as treetops, logs, felled timber, and trash, be removed from waterways to allow boats and aquatic wildlife unobstructed use of the water. Compliance with Virginia's forestry BMP guidelines for water quality is generally considered adequate to meet requirements under the federal Clean Water Act, which also requires that proper steps be taken to prevent water pollution. A large portion of Virginia is in the Chesapeake Bay Watershed and is subject to regulations under the Chesapeake Bay Preservation Act (for more information, contact the Virginia Department of Conservation and Recreation). Overall, the best prevention for pollution resulting from forestry activities is management planning and the proper installation and maintenance of forestry BMPs.

Burning

The leading cause of forest fires in Virginia is the burning of debris. Because woody debris in the forest dries out during winter months, fire danger is especially high during early spring. To prevent forest fires during this period, Virginia's 4 p.m. Burning Law states that between Feb. 15 and April 30, it is unlawful to burn debris within 300 feet of any material capable of spreading fire, except between the hours of 4 p.m. and midnight. Additional burning bans can be invoked during periods of extreme fire danger.



Following Virginia's forestry best management practices helps ensure the protection of water quality. These culverts are part of a well-planned stream crossing.

Reforestation

The purpose of Virginia's Seed Tree Law is to ensure proper pine regeneration following a timber harvest. The Seed Tree Law applies to any area of 10 or more acres on which loblolly or white pine constitute 25 percent or more of the live trees on each acre. Eight cone-bearing pine trees 14 inches or larger in diameter must be left uncut and uninjured on each acre for three years following harvest. An exception can be granted when an effective reforestation plan has been secured from the VDOF. For example, in lieu of leaving seed trees, the harvested site can be planted with genetically improved nursery-grown seedlings. This allows better control of spacing and stocking and usually provides a healthier and more productive forest. Cost-share assistance is available for reforestation activities under the VDOF's Reforestation of Timberlands Program.



In order to comply with Virginia's Seed Tree Law, mature seed-bearing trees must be left on-site after a timber harvest. Alternatively, landowners can plant nursery-grown seedlings.

Financial Considerations

Taxes

Annual surveys consistently reveal that timber and estate taxation are the leading management concerns among private forest landowners. Careful planning and accounting practices will likely save you money and help preserve your estate for future generations. Tax laws pertaining to forest management are subject to interpretation and frequent change. The information provided below should not be considered an official interpretation of the federal and Virginia income tax codes. You are strongly encouraged to seek the advice of a tax advisor on the applicability of the current tax law to your particular situation. In addition, consult with your forester and accountant to determine the best strategy to protect your assets. Following are some basic points to keep in mind:

Keep good records. Recordkeeping is perhaps the easiest but most neglected task of the forest landowner. At a minimum, you should keep a journal of all expenses and income along with evidence of transactions such as invoices, receipts, canceled checks, contracts, meeting agendas, mileage records, workshops attended, and maps that pertain to your land and forestry practices.

Determine your basis. The basis of your forestland is the original amount you invested to purchase your property. This amount is the cost of land including standing timber, roads, and buildings; payments to Realtors, foresters, surveyors, attorneys; and/or other costs associated with the acquisition. As with the purchase of land, the value of the property acquired by gift or inheritance is allocated proportionally among the categories listed above. Basis is used to determine gain or loss on sales and exchanges and for calculating amortization, cost recovery, depletion, and casualty-loss deductions. In addition, qualifying for long-term capital gains and deducting for management expenses are equally important.

Major tax advantages are available for forest landowners who harvest timber and reforest harvested land or previously nonforested land.

Investigate your land-use tax assessment. Almost three-fourths of Virginia's counties allow land to be assessed according to its land-use value rather than its fair market value. The intent is to preserve open space



Conservation easements are a tool that can protect forestland from subdivision and/or conversion to other, nonforested uses.

in rural areas by helping landowners keep their land in forest or farm use. Land-use value assessments are usually much lower than the rates associated with fair market value for real estate development.

Consider a conservation easement. A conservation easement is a voluntary legal agreement by which a landowner conserves the agricultural, environmental, and open space value of the land in exchange for tax credits and deductions. With a conservation easement, a landowner relinquishes the right to develop the land intensively for residential, commercial, or industrial purposes to a state agency or land trust. This will ensure that the land will remain undeveloped into perpetuity. Conservation easements can, however, be written to allow traditional uses of the land, such as farming and timber harvesting. Tax advantages include state income tax credits, federal and state tax deductions, and reductions in estate taxes. The landowner maintains ownership of the land, which can still be freely sold or passed on to children; however, the limits on development stay with the land. The Department of Conservation and Recreation's Office of Land Conservation serves as a statewide clearinghouse for land conservation information.

Financial Assistance

Financial or cost-share assistance is available to private forest landowners for many management activities, including reforestation, timber stand improvement, streambank and forest road stabilization, and wildlife habitat improvement. Cost-

share assistance can greatly offset your out-of-pocket expenses for forest and wildlife management activities. Most cost-share programs are administered by state and federal agencies. All programs have specific requirements such as minimum acreage, areas of application, water quality protection, and length of time that cost-share practices must be maintained. Funding for programs is limited, and programs can be added or dropped at any time. The VDOF can provide a comprehensive list of current programs.

State programs administered by the VDOF include Reforestation of Timberlands and the Pine Bark Beetle Prevention Program. The goal of the Reforestation of Timberlands Program is pine reforestation of harvested lands. This program can provide cost-share assistance for up to 75 percent of site preparation, tree planting, and stand improvement costs. Qualifying landowners must have a forest management plan developed by the VDOF or an approved forestry professional. The goal of the Pine Bark Beetle Prevention Program is to prevent and lessen the impact of bark beetle outbreaks. The program provides up to 50 percent cost-share assistance for thinning pine stands as a preventive measure.

Most federal programs are administered by the Natural Resources Conservation Service, Farm Services Agency, and Soil and Water Conservation Districts. Major programs include the Conservation Reserve Program, the Conservation Reserve Enhancement Program, and the Environmental Quality Incentive Program. The primary goal of these programs is to protect wetlands and water quality, prevent soil erosion, and improve wildlife habitat through the adoption of forestry BMPs and conversion of sensitive agricultural lands to streamside or riparian buffers. Some of these programs provide cost-share funds for approved practices and rental payments for agricultural land converted to these forestry uses. An approved conservation plan is required to qualify for any federal cost-share program, and practices must be maintained for 10 to 15 years.

In addition, some forest industry companies offer management assistance. Depending on the company, a variety of services might be offered at cost or free of charge, including management planning, site preparation, and reforestation. Funding and requirements for most cost-share programs change annually. Contact one of the management assistance agencies listed at the back of this guide for specific details.

Educational Opportunities

An important part of sustainably managing your forest is educating yourself and being aware of your options. You have already taken the first step by reading through this guide. In Virginia, numerous other educational opportunities are available. The following statewide programs are offered to loggers, landowners, and other interested parties to promote the sustainable management of the commonwealth's forest resources.

Logger Education

Loggers are another critical link in the sustainability of our forest resources. An important component of promoting sustainable forestry practices is enhancing professionalism among timber harvesters, foresters, and others in the forestry community. Virginia's Sustainable Harvesting and Resource Professional Logger Program focuses on the training and continuing education of these professionals in the use of forestry BMPs during timber harvesting, compliance with environmental laws and regulations; forest regeneration and resource conservation, awareness of the Endangered Species Act and other wildlife considerations, logging truck and equipment safety, business management, and many other topics. For more information, contact the SHARP Logger Program coordinator at the Virginia Tech Department of Forest Resources and Environmental Conservation or visit the SHARP Logger website at <http://sharplotter.vt.edu>.



SHARP loggers participate in continuing education courses to keep them up to date on safety and environmental regulations.



Private forest landowners can learn how to practice sustainable forestry through workshops, classes, field tours, and publications.

Landowner Education

The Virginia Forest Landowner Education Program offers short courses to forest landowners on a variety of natural resource topics, including options for forest and wildlife management, resource assessment and planning, sources of financial assistance, timber sales and harvesting methods, BMPs, nontimber forest products, land-use conservation strategies, forest taxation, and estate planning. Its landowner weekend retreats introduce new woodland owners to the basics of sustainable forest management through class lectures, field trips, and hands-on activities. An online landowner course on forest management is available annually at the VFLEP website. Additionally, VFLEP hosts the annual Fall Forestry & Wildlife Field Tour Series, during which participants visit public, private, and industry-owned land to learn about forest and wildlife management and cost-share programs. The Virginia Forest Landowner Update, a quarterly newsletter, is available to all Virginia landowners.



For a complete quarterly listing of educational programs or for more information, contact the VFLEP coordinator at the Virginia Tech Department of Forest Resources and Environmental Conservation or visit the VFLEP website at <http://forestupdate.frec.vt.edu>.

The logger and landowner education programs listed are cooperatively sponsored by the many natural resource agencies and companies listed in this guide.

Sponsoring Agencies

This introduction to sustainable forest management is meant to raise your awareness of the options available to Virginia forest landowners. Whether your goals are similar or very different from what has been presented in this guide, the hope is that you have enough information to begin to implement sustainable forestry practices on your land. Virginia is fortunate to have a wealth of well-trained natural resources professionals available to assist private forest landowners with these practices. Please contact the appropriate agency to find out more about their services.

Sustainable Forestry Initiative Inc.

2121 K St. NW, Suite 750
Washington, DC 20037
202-596-3450
www.sfiprogram.org
www.virginiasfi.org



Sustainable Forestry Initiative Inc. is an independent, nonprofit organization responsible for maintaining, overseeing, and improving a sustainable forestry certification program that is internationally recognized and is the largest single forest management standard in the world. The membership of the Virginia SFI Implementation Committee consists of representatives from 18 companies that are major producers of forest products in the commonwealth. The committee supports landowner, logger, and public outreach and education.

Virginia Cooperative Extension

Virginia Tech College of Natural Resources and Environment

Virginia Tech Department of Forest Resources and Environmental Conservation

313 Cheatham Hall (0324)
Blacksburg, VA 24061
540-231-5483
www.ext.vt.edu
www.cnre.vt.edu
www.frec.vt.edu



These state agencies administer the Virginia Forest Landowner Education Program and SHARP Logger Program and provide basic forestry, wildlife, and natural resource management information to forest landowners, farmers, and the public. Extension forest resources

personnel conduct educational tours, meetings, and short courses on a variety of forestry and wildlife topics. They publish numerous natural resource Extension publications. All Virginia counties have local Virginia Cooperative Extension offices; see the blue pages in your phone book under State Government or visit the VCE website.

Virginia Department of Forestry

Fontaine Research Park
900 Natural Resources Drive, Suite 800
Charlottesville, VA 22903
434-977-6555
www.dof.virginia.gov



The Virginia Department of Forestry is a state agency that provides basic forest management planning and forestry information, seedlings and seed mixes for reforestation and wildlife, and BMP guidance and enforces water quality, seed tree, and burning laws. The VDOF administers cost-share programs and maintains lists of private forestry consultants, contractors, and timber buyers by county. The VDOF cooperates closely with other state and private resource agencies and companies to conduct education programs for loggers and landowners. Most counties have local offices; see the blue pages in your phone book under State Government or visit the VDOF website.

Virginia Forestry Association

3808 Augusta Ave.
Richmond, VA 23230-8733
804-278-8733
www.vaforestry.org



This private nonprofit membership organization represents Virginia's broad forestry community. The Virginia Forestry Association is active in legislative and regulatory issues affecting forestry and forest management, works with the media on forestry issues, sponsors forestry and environmental camps for school-age youth, provides general forestry and forest industry information, and assists member landowners and others with interpreting regulatory requirements relative to forestry. The association publishes Virginia Forests, a quarterly magazine on forest management and issues.

Other Relevant Agencies/Programs

American Tree Farm System

c/o American Forest Foundation
2000 M. St. NW
Washington, DC 20036
202-765-3660
www.treefarmssystem.org



The American Tree Farm System is a private program of the American Forest Foundation with the mission to promote growth of renewable forest resources on private lands while protecting environmental benefits and increasing public understanding of all benefits of productive forestry. State ATFS committees bring foresters, consultants, and government agency officials together with experienced tree farmers to plan and administer each state ATFS program. The ATFS is a nationally recognized certification system and the oldest certification system in the world.

Forest Legacy

Forest Legacy Program Manager
U.S. Forest Service
State and Private Forestry
271 Mast Road, Durham, NC 03824
603-868-7683
www.fs.fed.us/spf/coop/programs/loa/flp.shtml



The Forest Legacy Program is a partnership between states and the U.S. Forest Service that was developed to identify and protect environmentally important forests from conversion to nonforest uses. The main tool used for protecting these important forests is conservation easements. The federal government can fund up to 75 percent of program costs with at least 25 percent coming from private, state, or local sources.

Forest Stewardship Council

212 Third Ave. N, Suite 445
Minneapolis, MN 55401
612-353-4511
<http://us.fsc.org/>



The Forest Stewardship Council® (FSC®) stands among the world's most respected certification systems, leveraging the power of the marketplace to reward responsible management of our woodlands. FSC is an open membership organization that develops standards for responsible forest management and chain-of-custody

to ensure the integrity of the FSC label. Accredited third-party auditors provide verification of standards conformance in this voluntary system.

Virginia Department of Conservation and Recreation

600 E. Main St.
Richmond, VA 23219
804-786-6124

www.dcr.virginia.gov
www.dcr.virginia.gov/natural_heritage/vaisc



The Virginia Department of Conservation and Recreation is a state agency that works with Virginians to conserve, protect, and enhance their lands and improve the quality of the Chesapeake Bay, rivers, and streams. The Virginia Department of Conservation and Recreation promotes the stewardship and enjoyment of natural, cultural, and outdoor recreational resources (e.g., state parks); conserves natural areas, natural communities, cave species, and caves; coordinates statewide nonpoint source pollution control; ensures the safety of Virginia's dams; and, via the Land Conservation Office, provides statewide land conservation information.

Virginia Department of Game and Inland Fisheries

7870 Villa Park Drive
P.O. Box 90778, Henrico, VA 23228
804-367-1000
www.dgif.virginia.gov



The Virginia Department of Game and Inland Fisheries is a state agency that provides information, education, and technical assistance on wildlife management to forest owners. The department monitors wildlife populations, enforces hunting and fishing regulations, and provides technical assistance to federal agencies on cost-share programs for wildlife management practices on private lands. The agency is currently developing a comprehensive strategy for managing wildlife, including threatened and endangered species.

Virginia Natural Heritage Program/NatureServe

600 E. Main St.
Richmond, VA 23219
804-786-7951

www.dcr.virginia.gov/natural_heritage
www.natureserve.org



The Virginia Natural Heritage Program represents a comprehensive effort to save Virginia's native plant and animal life and the ecosystems on which they depend through inventory, conservation information provision, protection, and stewardship. As a member of NatureServe, the VNHP contributes to an understanding of global diversity and helps to provide for the conservation and recovery of the Earth's common, rare, and endangered species and threatened ecosystems.

Virginia Outdoors Foundation

39 Garrett St., Suite 200
Warrenton, VA 20186
www.virginiaoutdoorsfoundation.org



The Virginia Outdoors Foundation is a state agency charged with the preservation of cultural and heritage lands in Virginia. The foundation works with private landowners to establish voluntary conservation easements to protect farm and forestland. Its easement program has grown to more than 3,700 properties (750,000 acres).

U.S. Fish and Wildlife Service

5275 Leesburg Pike
Falls Church, VA 22041
703-358-1715
www.fws.gov



The mission of the U.S. Fish and Wildlife Service is to work with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people. The agency is committed to a collaborative approach to conservation. Its strategy is to empower Americans to become citizen conservationists.

U.S. Forest Service

Forest Stewardship Program
1400 Independence Ave. SW
Washington, DC 20250
202-205-8333
www.fs.fed.us
www.fs.fed.us/spf/coop/programs/loa/fsp.shtml



The mission of the U.S. Forest Service is to sustain the health, diversity, and productivity of the nation's forests and grasslands to meet the needs of present and future generations. For more than a century, the Forest Service has managed public land in national forests and grasslands, which currently totals over 193 million acres.

Virginia Cooperative Extension

www.ext.vt.edu

Virginia Forest Facts

- Virginia is 62 percent forested (15.8 million acres).
- Nonindustrial private landowners own 62 percent (10 million acres) of Virginia's forestland.
- Timber investment management organizations, real estate investment trusts, and nonforestry corporations own 19 percent (3 million acres).
- The forest industry owns less than 0.5 percent (186,000 acres).
- Public lands make up 16 percent (2.5 million acres).
- There are 375,248 acres in Virginia that are certified to the Sustainable Forestry Initiative Forest Management Standard.
- As of December 2014, 729,596 acres are certified to the American Tree Farm System certification Standard.
- Hardwood forests make up more than 78 percent of all Virginia timberland (12 million acres).
- Softwood forests make up more than 20 percent of all Virginia timberland (3 million acres).
- Total hardwood forest acreage increased from 8.1 to more than 12 million acres since 1940.
- Total softwood forest acreage has declined from 6.2 million to 3 million acres since 1940.
- Overall growth rates exceed removal rates.
- Plantations account for 10 percent of Virginia's timberland and more than 50 percent of all softwood acreage.
- Forestry contributes \$21.8 billion annually to Virginia's economy.
- Forests provide more than \$2.5 billion in recreational opportunities.
- Forestry provides more than 103,000 jobs in Virginia.

Sources:

Rephann, T. J. 2013. *The Economic Impacts of Agriculture and Forest Industries in Virginia*. Weldon Cooper Center for Public Service, University of Virginia. www.dof.virginia.gov.

Virginia Department of Forestry. 2015. *2014 State of the Forest*. www.dof.virginia.gov.

Professional Foresters

Professional foresters are employed by government organizations, the forest industry, and private consulting companies. Professional foresters offer a full range of services to private landowners, including management planning, timber appraisals, timber sale preparation and administration, and site preparation and reforestation. Landowners are advised to check the foresters' references and professional affiliations before they choose a forester. These references include membership in organizations such as the Association of Consulting Foresters (www.acf-foresters.org) and the Society of American Foresters (www.safnet.org). Lists of professional foresters are available from your local VDOF office (www.dof.virginia.gov) and from the Association of Consulting Foresters and the Society of American Foresters.

Sponsors

Virginia Cooperative Extension

Virginia Department of Forestry

Virginia Forestry Association

Virginia Sustainable Forestry Initiative Implementation Committee

Virginia Tech College of Natural Resources and Environment

Virginia Tech Department of Forest Resources and Environmental Conservation

Resources for Sustainable Forestry: A Guide for Virginia Forest Landowners

This list, with live links, is available at the Virginia Sustainable Forestry Initiative Program website (www.virginiasfi.org).

This list is by no means all-inclusive, but it provides a starting point for readers who are interested in finding more information on sustainable forestry. All links were correct at the time of publication.

Developing a Multiresource Management Plan

- “Welcome to the Woods! A Guide for New Virginia Woodland Owners” - www.pubs.ext.vt.edu/ANR/ANR-136/ANR-136-pdf.pdf
- Resource inventory worksheet to help you work through the goal-setting process - <http://forestupdate.frec.vt.edu/resources/publications/familyresourceinventory.pdf>
- Sample management plan - <http://forestupdate.frec.vt.edu/resources/publications/stewardshiptemplate.pdf>;
- Management Plan Appendix - <http://forestupdate.frec.vt.edu/resources/publications/stewardshipplanappendix.pdf>
- Legacy planning for forest landowners - www.ext.vt.edu/topics/environment-resources/legacy-planning/index.html
- List of consulting foresters in Virginia - www.dof.virginia.gov/services/consultant-forester.htm
- Directory of Virginia Department of Forestry area foresters - www.dof.virginia.gov/locations/index.htm or call the central office at 434-977-6555
- Virginia Tree Farm Program - www.treefarmssystem.org/virginia
- Natural Resources Conservation Service, Virginia - www.va.nrcs.usda.gov/ or call the Virginia office at 804-287-1691

Maintaining and Improving the Health of Your Forest

- Learn to identify and plant tree species best-suited for the site.
 - Common Native Trees of Virginia: Tree Identification Guide, and Common Native Shrubs and Woody Vines of Virginia: Identification Guide, both available from the Virginia Department of Forestry - www.shopdgif.com/
 - Dendrology at Virginia Tech - <http://dendro.cnre.vt.edu/dendrology/main.htm>
 - Silvics of North America - www.na.fs.fed.us/spfo/pubs/silvics_manual/Table_of_contents.htm

- Buy native species.
 - Virginia Department of Forestry nurseries - www.dof.virginia.gov/nursery/index.htm
- Monitor the health of your forest.
 - Identify symptoms of insect and disease using the University of Georgia Center for Invasive Species and Ecosystem Health - <http://bugwood.org>
- Consider prescribed fire.
 - Virginia Department of Forestry - <http://dof.virginia.gov/fire/prescribed/index.htm>
 - The Bugwood Network - www.bugwood.org/pfire/
- Use the appropriate harvesting method.
 - Principles of Regeneration Silviculture in Virginia - <http://pubs.ext.vt.edu/420/420-405/420-405.pdf>
 - The Silvics of North America - www.na.fs.fed.us/spfo/pubs/silvics_manual/table_of_contents.htm
- Eliminate exotic (nonnative) species.
 - Virginia Cooperative Extension forestry publications - <http://pubs.ext.vt.edu/category/forestry.html>
 - University of Georgia Center for Invasive Species and Ecosystem Health - www.bugwood.org; www.invasive.org/species/weeds.cfm
 - A Field Guide for the Identification of Invasive Plants in Southern Forests - www.srs.fs.fed.us/pubs/gtr/gtr_srs119.pdf;
 - Native Alternatives to Invasive Plants, by C. Colston Burrell, available from most booksellers

Harvesting Your Timber

- General harvesting information - www.dof.virginia.gov/manage/harvest/index.htm
- Mark your sale boundaries.
 - Safeguard Your Forest - https://forestupdate.frec.vt.edu/newsletter/archives/2013/27_1/safeguardyourforest.pdf
 - Safeguard Your Forest Part II - https://forestupdate.frec.vt.edu/newsletter/archives/2013/27_2/worrell.pdf
- Deal with timber theft - www.pubs.ext.vt.edu/420/420-136/420-136_pdf.pdf

- Know what you have to sell.
 - Find a forester - www.dof.virginia.gov/locations/index.htm; www.dof.virginia.gov/services/consultant-forester.htm
- Secure a written sale agreement.
 - Examples of timber sale contracts - www.maced.org/Forestry-handbook/sample-contract.htm; http://forestry.about.com/od/sellingtimber/a/tbr_sale_contra.htm
- Manage harvest residue - www.extension.org/pages/Timber_Harvest_Residues; www.extension.org/pages/Woody_Biomass_Availability_Sources_and_Supply
- Best management practices - <http://dof.virginia.gov/water/index.htm>

Conserving Special Sites

- Forests of Recognized Importance - www.treefarmssystem.org/fori
- NatureServe - www.natureserve.org/
- Virginia Department of Historic Resources - www.dhr.virginia.gov/registers/register.htm
- Virginia Natural Heritage Program - www.dcr.virginia.gov/natural_heritage/

Creating and Improving Wildlife Habitat

- Timberdoodle - <http://timberdoodle.org/>
- Virginia Department of Game & Inland Fisheries
 - www.dgif.virginia.gov/wildlifewatching/tech-assistance.asp; www.dgif.virginia.gov/quail/

Education

- ADEC e-answers - <http://e-answers.adec.edu/>
- eXtension - www.extension.org/
- Virginia Cooperative Extension - www.ext.vt.edu/
- Virginia Forest Landowner Education Program - <http://forestupdate.frec.vt.edu>
- Webinar Portal for Forestry and Natural Resources - www.forestrywebinars.net/

Environmental Regulations

- Endangered Species Act - www.fws.gov/endangered/laws-policies/
- Virginia forestry laws and regulations - <http://dof.virginia.gov/laws/index.htm>

Financial Considerations

- Conservation easements - www.virginiaoutdoorsfoundation.org/
- Cost-share programs - www.dof.virginia.gov/costshare/index.htm
- Land-use taxation - www.usevalue.agecon.vt.edu/
- Taxes - www.timbertax.org/

Forest Certification

- “To Certify or Not? An Important Question for Virginia’s Family Forest Owners” - https://pubs.ext.vt.edu/ANR/ANR-50/ANR-50_PDF.pdf
- Forest certification programs
 - American Tree Farm System - www.treefarmssystem.org/
 - Forest Stewardship Council - <https://us.fsc.org/>
 - Sustainable Forestry Initiative - www.sfiprogram.org/

Sustainable Forestry

- Sustainable Forestry Initiative Program - www.sfiprogram.org
- Virginia Sustainable Forestry Initiative Program - www.virginiasfi.org
- American Tree Farm System - www.treefarmssystem.org/
- Forest Stewardship Council - <https://us.fsc.org/>