

Managing Forests for the Future

STONEY DEMONSTRATION FOREST

*One of the Maryland Department of Natural
Resources' Best Kept Secrets*

**A Self-Guided Tour of
Forest Harvest Treatments
and
Best Management Practices (BMPs)**



Forest Stewardship Planning

STONEY DEMONSTRATION FOREST covers more than 300 acres of hardwood forest in Harford County, Maryland. It was gifted to the State of Maryland in 1981 to show good forest management practices.

Stoney Forest started growing approximately 90 years ago when the landowners stopped farming. Throughout the 1980's and early '90s, the MD DNR Forest Service managed the forest to demonstrate commercial timber production, with numerous timber sales. In addition to learning about forestry, the public can hunt with a free daily permit from the MD DNR Wildlife Division, Gwynnbrook office @ (410) 356-9272. Taking a hike? Pets are welcome but must be kept on a leash.

You can gain access to the 2 miles of forest road (motor vehicles prohibited) via Nova Scotia Road off Route 543, in [Harford County, Maryland](#).

Purpose of the Forest

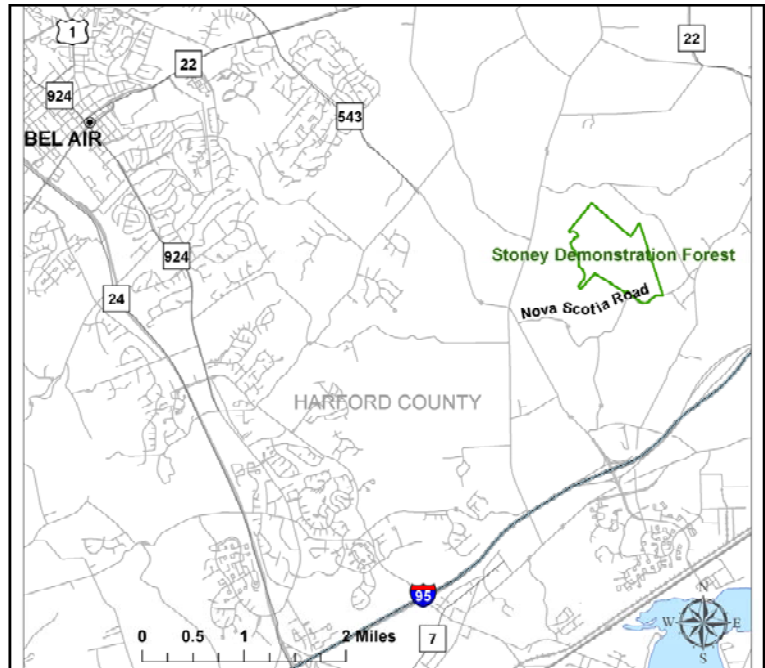
The goal of Stoney Demonstration Forest is to show how foresters use scientific forest management techniques for multiple forest uses including the following:

- Production of commercial forest products like lumber & *pulpwood* for paper.
- Enhancement of wildlife *habitat*.
- Protection of soil and water resources.
- Forest recreation.

The Forest is an educational resource where school groups, landowners, industry professionals and others can learn about a variety of forest and wildlife *habitat* management practices. Stoney Demonstration Forest is dedicated to providing these values in a sustainable fashion for the benefit and enjoyment of the Citizens of Maryland and for future generations.

What is a Stewardship Plan?

A Forest Stewardship Plan is your key to managing your woodlot for the future. "*Forest Stewardship*," according to the Society of American Foresters, is "*the management of forests for all goods, benefits, and values that can be sustained for present and future generations.*" A plan identifies the forest types and special resources on your property. Forests take a long time to grow. One bad decision can affect the health and value of the woodland for decades. That is why it is important for you and a professional forester to develop a Forest Stewardship Plan for your woodland together.



Forest Stewardship Planning

How You Can Get a Forest Stewardship Plan

A licensed forester can prepare a Forest Stewardship Plan with you. You decide which two of the four major Forest Stewardship objectives, *Fish and Wildlife Habitat Improvement, Wood Products, Soil and Water Conservation, and Natural Heritage, Aesthetics and Recreation*, you like. The forester walks the woodland with you to locate boundaries and separate management units. Then, the forester collects important data about your forest, such as tree characteristics and wildlife *habitat* features. Finally, the forester provides long-term management recommendations that help you meet your stewardship objectives. These steps will help improve the future health and value of the forest

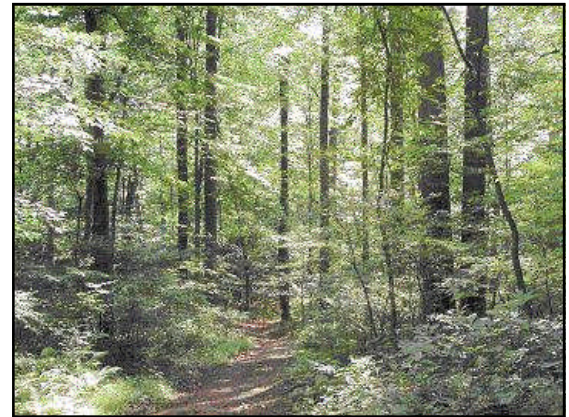


Anne Hairston-Strang — DNR Forest Service

Forester performing a "cruise" in the woods. The forester collects Data to determine a number of factors that a forester will use to make recommendations.

How Much Does it Cost?

Forest Stewardship pays! Stewardship plans make you eligible for State and Federal cost-sharing programs, for participation in a forestry tax program, which lowers property taxes, and help you protect the future value of your woodland. Your [MD DNR forester](#) will provide you with the fee schedule for Forest Stewardship plan preparation. You can find more information about forest stewardship at the University of Maryland Extension's website: <http://www.naturalresources.umd.edu/>.



Missouri Dept of Conservation

Got Timber? See a Forester Before Selling

One bad decision, such as performing a *high grade*, a harvest that removes the best trees and leaves the unhealthy, *undesirable* trees behind, can reduce the value of the forest indefinitely. That is why it is important to contact a professional forester before harvesting. Professional foresters will help you manage your forest resources wisely, that is, leaving the best immature trees for the future and maximizing your profit from the sale. Contact your [MD DNR forester](#) for more information.

Silvicultural Practices

What is Silviculture?

Silviculture is simply how foresters grow trees to meet various objectives in the forest. The Society of American Foresters defines silviculture as “*The art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis.*” As you walk through the forest you will be able to see a number of silvicultural practices that a forester can use to meet a landowner’s objectives.

Several kinds of silvicultural practices can be seen in the Stoney Demonstration Forest. The number before each definition indicates its position on the map on page 7. Look for the posts along the forest road with the corresponding number. A glossary of terms is located in the back of the booklet. Each term is in *italics*.

1) Road Buffer - This uncut 200-foot band of trees left along Nova Scotia Road preserves the outward appearance of a forested area while being harvested. If necessary, one can harvest buffers at a later time once the young trees have grown up beyond the buffer. In Stoney Demonstration Forest, there are also 100-foot buffers along property lines.

2) Forest Interior Dwelling Species (FIDS) - Forest Interior Dwelling Species (FIDS), like the Scarlet Tanager, breed and summer deep within the mature forests here and in other temperate forests of North America, away from any clearings or edges. These birds then migrate to Central and South America, and the Caribbean to winter.

The size and shape of forest land, and its proximity to larger tracts of mature forest land affect whether FIDS will breed and spend the summer. To breed, FIDS need large blocks of mature forest, or smaller blocks that are not isolated. Forest fragmentation, especially by development, reduces *habitat* for many species. Round, or square blocks of woods are better than narrow or irregular strips of forest.

Restoring forest land and creating forested corridors that connect larger blocks of forest increase *habitat* for FIDS too. While certain silvicultural practices can reduce FIDS *habitat*, it is only temporary. Furthermore, a landowner can rotate FIDS areas throughout the forest as it ages and different harvests take place.

3) Unmanaged Forest - Depending on your objectives, you may not want to manage a forest for timber production. That is okay. However, regardless of your objectives, a forester can make recommendations that help keep the forest healthy, the roads and trails stable, keep the invasive exotic species from taking over, keep deer from eating the forest floor clean of new trees and other vegetation, and to enhance wildlife habitat. Healthy forests can return to their natural state after disturbances such as harvest, fire, insect attack, or storms. If you manage the forest, you can also help keep the historically native species present. The loss of fire in the landscape has favored some species, while others, like oaks, are becoming less numerous.



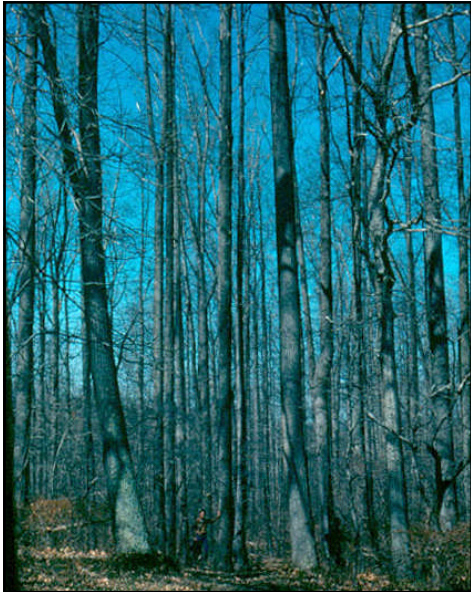
Scarlet Tanager

4) Pulpwood Thinning - In a *pulpwood* thinning, foresters remove unacceptable trees, that is, deformed, damaged or undesirable species, from mainly the lower *canopy*. We call this “thinning from below.” This thinning most mimics the death of trees in nature due to natural competition and surface fires. The result is that the remaining larger trees get more nutrients, water, and growing space. In addition, the cut, if done in an oak stand 10 to 15 years in advance of a harvest and after a large seed crop, can stimulate oak regeneration. Most of the removed trees do not have the size or quality to cut into boards. In this demonstration plot, at least 90 square feet of *basal area* of acceptable trees remain. Some of the undesirable trees remain for wildlife, aesthetics and other purposes.



Yellow-poplar regeneration in a forest understory.

Wayne Merkel — DNR Forest Service



An overstocked stand in need of thinning.

5) Sawtimber Basal Area Thinning - The forest is like a grocery store. If we have too many items too close together on the shelves, we would say our store is overstocked. As the grocer, we would have a sale to thin out the inventory before it goes bad, trying to move inventory that expires the soonest. The forest works the same way. Too many trees growing too close together, means the forest is overstocked, may stagnate, and be more susceptible to insect attack and disease. Foresters will sell the trees that will not survive or trees that are not desired for the future *stand*. Foresters aim to keep the best trees, called *acceptable growing stock*, growing, and which will meet the Stewardship plan’s objectives.

Stocking is a measure of how well trees occupy their space, that is, are the trees growing at the right spacing to produce high quality timber? Foresters measure stocking by taking an inventory that estimates the number of trees there are per acre and *basal area*. *Basal area* is simply the space that trunk(s) of the tree (s) occupy. In hardwood forests around central Maryland, we average about 50 to 300 square feet of *basal area* per acre. An acre is 43,560 square feet, about the size of a football field. Even in the densest forests, the trunks don’t take up much space. Why? Roots and branches need their space and trees need their nutrients, water, and sunlight.

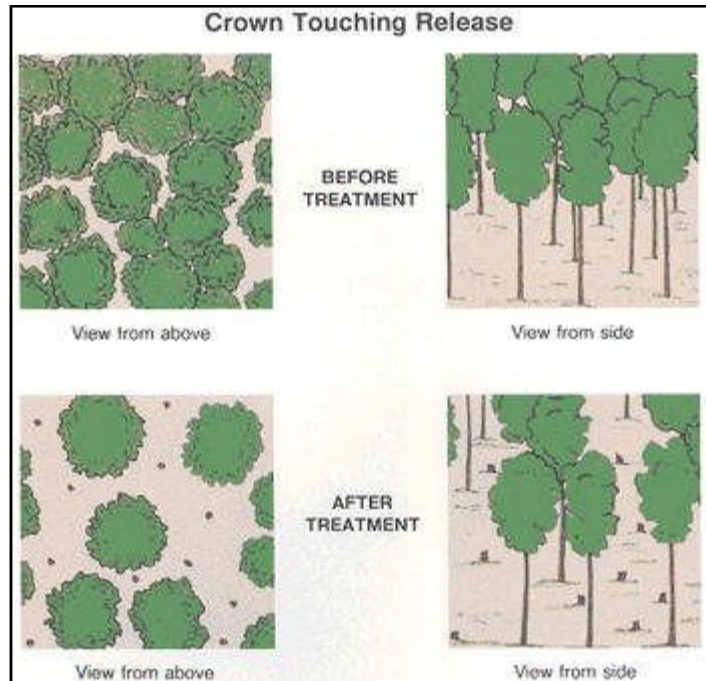
In this *stand*, we removed the least desirable, yet salable, medium & large trees. We left this stand fully stocked (80 square feet of *basal area* per acre) with acceptable trees, evenly distributed throughout the unit. As Central Maryland’s most common timber harvest technique, it is often performed improperly, resulting in a “*high-grade*,” which leaves mostly undesirable trees for the future. A *basal area* thinning can produce a high level of financial return, while enhancing forest health. Landowners should make sure to preserve wildlife den trees during this type of harvest.



US EPA

Silvicultural Practices

6) Crop Tree Release - The trees marked with a blue, painted "C," are crop trees. Crop trees are the healthiest and/or best trees in the stand that will help meet your objectives, such as food or habitat, valuable wood, flowers or fall color, and more diversity. On this site, we identified 10 to 20 crop trees per acre. Non-crop trees immediately adjacent to crop trees were removed or killed and left standing for wildlife habitat. The added light, water and nutrients that the crop trees receive, allows the crop trees to grow larger *crowns*, which will produce more nuts and berries, flowers, leaves, wood on the trunk, and a healthier variety of trees. Areas without suitable crop trees were left in their current condition.



Wayne Merkel — DNR Forest Service



7) Group Selection - Here, small openings were made in the forest to encourage the *regeneration* of tree species that can establish themselves in full-sun to full-shade conditions. This type of harvest demonstrates a way to regenerate a forest in small increments over time with a variety of species. The openings are roughly $\frac{3}{4}$ acre in size. Four group selection cuttings will be performed in ten year increments.

Wayne Merkel — DNR Forest Service



A Clearcut.

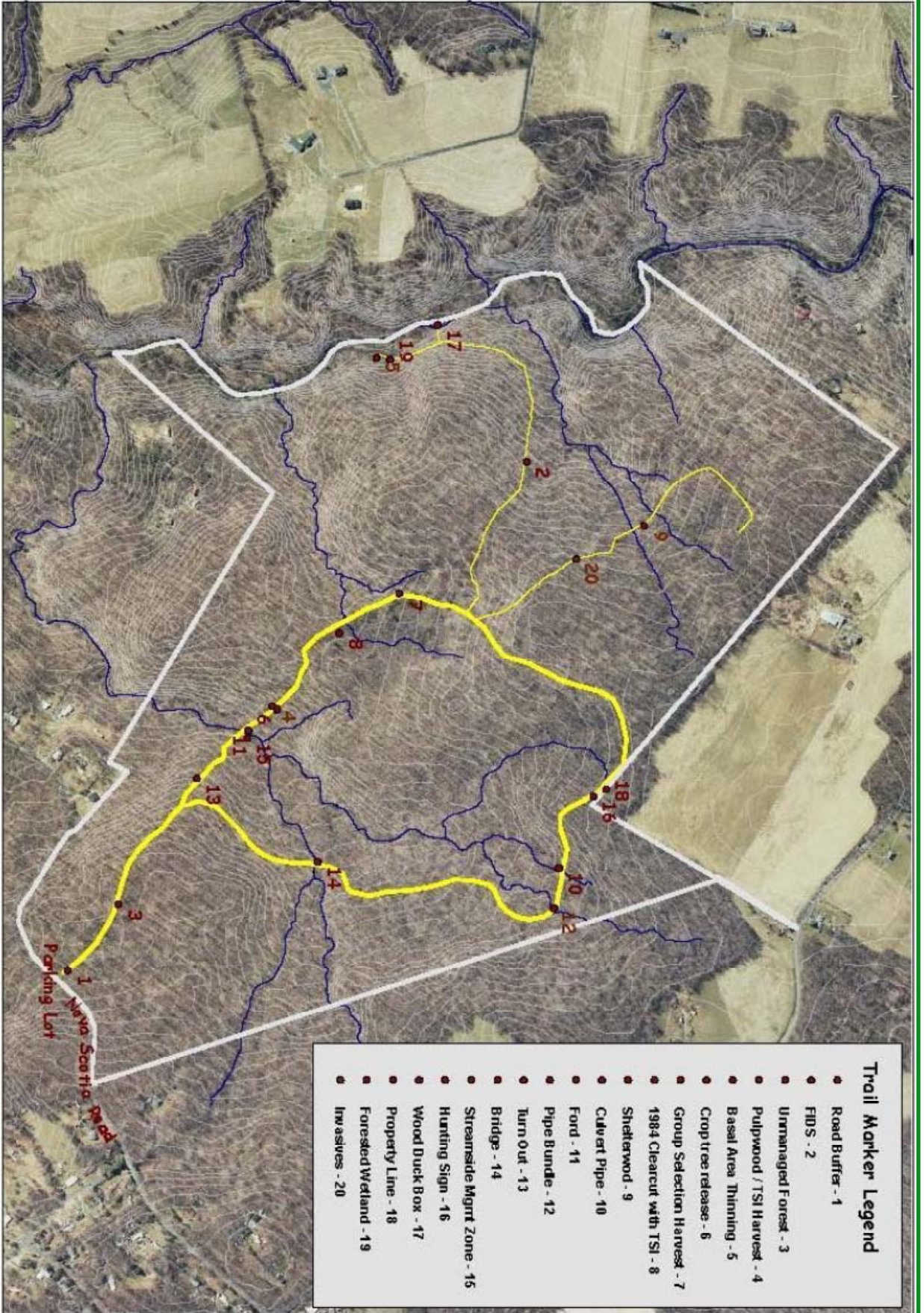
8) 1984 Clearcut with a Non-Commercial Timber Stand Improvement (TSI) - Yes, this is a clearcut. A clearcut is one of many ways to start a new forest quickly. We use clearcuts to regenerate valuable, full sunlight trees, such as yellow-poplar or pine. First, we remove all trees in a financially mature or low quality forest. Then, we start a new forest from existing seed and seedlings, stump sprouts or by planting seedlings in the cut area. Clearcutting is not clearing. Clearing removes all trees and their stumps for development or agriculture. Once the trees started crowding each other, a non-commercial *TSI* reduced density of the new young trees, making more growing room for a selection of well-spaced and healthy *desirable* trees. At least 800 trees per acre of *acceptable growing stock* were retained, or approximately 60 square feet of *basal area* per acre.

Map of Stoney Demonstration Forest

Stoney Demonstration Forest Silviculture and BMP Trail Map

Legend

- Property Boundary
- Primary woods road & trail
- Secondary woods roads & trails
- Trail marker
- Contour Lines - 5'
- Streams



- Trail Marker Legend**
- Road Buffer - 1
 - FIDS - 2
 - Unmanaged Forest - 3
 - Pulpwood / TSI Harvest - 4
 - Basal Area Thinning - 5
 - Crop tree release - 6
 - Group Selection Harvest - 7
 - 1984 Clearcut with TSI - 8
 - Shelterwood - 9
 - Culvert Pipe - 10
 - Ford - 11
 - Pipe Bundle - 12
 - Turn Out - 13
 - Bridge - 14
 - Streamside Mgmt Zone - 15
 - Hunting Sign - 16
 - Wood Duck Box - 17
 - Property Line - 18
 - Forested Wetland - 19
 - Invasives - 20



Silvicultural Practices

9) Shelterwood Harvest - Certain kinds of high value trees, such as oak, start growing best under some shade. Foresters use a shelterwood harvest to start growing a new forest in partial shade. The shelterwood leaves about 50 square feet of *basal area* per acre, consisting of high-quality young *sawtimber*-sized seed trees. The remaining trees are evenly distributed; they will serve as shelter and as a seed source for *regeneration*.

Prior to the first cut we may have to remove dense understory trees and plants, such as shrubs and ferns, to make space for the new seedlings. Also, we try to time the first cut with a large acorn crop year to ensure enough seed. Once the oak seedlings have grown tall enough to survive, we remove all of the larger trees and sell them. It may take two to three cuts to complete a shelterwood harvest, usually spaced 10 to 20 years apart.



Anne Halston-Strang — DNR Forest Service

An opening in the canopy allows just enough light in for oaks.

Forest Harvest Best Management Practices (BMP)

Good stewardship means keeping streams and wetlands free of sediment and chemical pollution. During and after a timber harvest, the greatest threat of erosion is from the logging roads, skid trails and log landings. To help loggers and landowners comply with the state sedimentation law and regulations, the Maryland Department of the Environment (MDE) and the Department of Natural Resources (DNR) have developed a **Compliance Agreement for the Standard Erosion and Sediment Control Plan for Forest Harvest Operations** (also known as a **Standard Plan**). This plan contains the general sediment control requirements for each harvest and may be obtained at any Soil Conservation District office.



To comply with the Standard Plan, there are a number of Best Management Practices or “BMPs” to guide foresters and loggers. A Best Management Practice is any practice whose primary purpose is to prevent damage to a water body or the quality of the water flowing into those water bodies. Look for the following BMPs as you walk the forest road.

10) Culvert Crossing - Culverts are large, strong pipes, covered with dirt and stone. They are a common and generally cheap method of building a permanent road crossing. Culverts are strong, but their installation requires experience, a backhoe, and a skilled operator. They need to be sized based on stream flow.



King County, Washington Water and Land Resources Division

Forest Harvest Best Management Practices (BMP)

11) Ford - Perhaps the earliest form of stream crossing, fords are only practical where they cause minimal damage to the stream banks and the risk to water quality is very low. Fords are inexpensive to install but can only be used where approaches are very stable, usually in rocky areas.



Chesapeake Bay Program

12) Pipe Bundle - Pipe bundles consist of a number of PVC pipes cabled together. These bundles have several key advantages. They install rapidly. They will support the weight of equipment, and can be configured for various sized streams. However, pipe bundles are only temporary crossings.

13) Turnout - A water turnout, or diversion ditch, is a narrow mound of earth pushed up with the blade of a dozer or skidder. This practice collects and directs road surface runoff away from the road and disperses it into undisturbed areas, to reduce the volume and velocity on slopes. As slope increases, turnouts are spaced closer together. Unlike waterbars, turnouts can withstand heavy vehicle traffic.

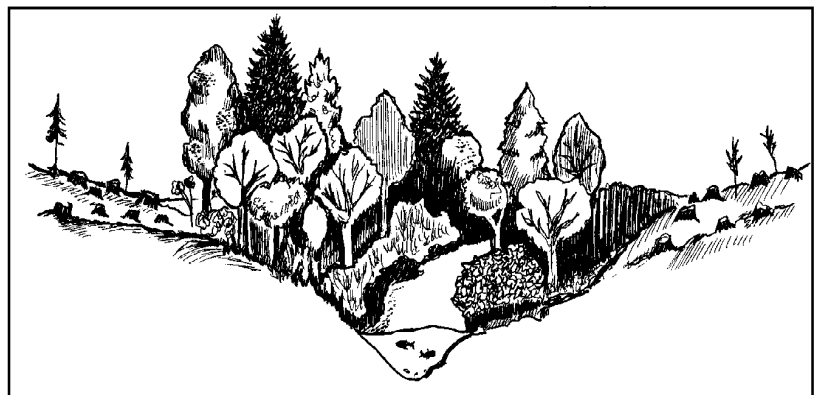
14) Temporary Bridge - It is often necessary to construct a bridge to span a wider creek or stream. Although this one is permanent, temporary bridges can be expensive so they are often removed and reused. Care needs to be taken to install appropriate footers and reshape banks after taking out a temporary bridge.



15) Riparian Forests & Streamside Management Zones (SMZ) - *Riparian areas* are lands that are next to streams, rivers or other bodies of water. Forested riparian buffers help to:

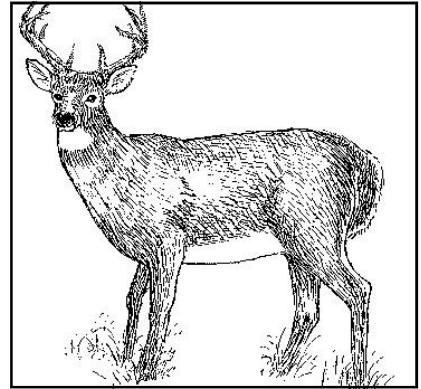
- Maintain integrity of stream channels and shorelines.
- Reduce the impact of pollution by trapping, filtering, and converting sediments, nutrients, and other chemicals.
- Supply food, cover, and shade to fish and other wildlife

Leaving SMZs in place during a harvest preserves the above benefits. In Maryland the width of an SMZ is based on the steepness of the adjacent slopes, ranging from a minimum of 50 feet, expanding up to 150-250 feet. Landowners can harvest SMZs as long as they retain a minimum of 60 square feet of *basal area/acre*, which is usually more than half of the trees, to shade the stream.



General Forestry Practices

16) Hunting as a Management Tool - Oh Deer! Young trees are the natural food for deer, so deer can be the greatest obstacles to forest *regeneration*. In Maryland, deer populations are too high in many areas, not only wiping out native plant life but also compromising the health of the herd. After harvests, having deer populations under control helps until desired tree species have had a chance to establish themselves. [See also **Forest Interior Dwelling Species (FIDS)** at No. 2]



17) Wood Duck Nest Box - Nest boxes were introduced to combat a declining wood duck population in the early 1900's. The birds made a huge comeback. If you have a wooded stream or pond on your property or live along a Chesapeake Bay shore with woods nearby, you may be able to attract wood ducks by erecting a wood duck nest box. You can make a difference too. Check out our "Wild Acres" webpage for this and other wildlife information: <http://www.dnr.state.md.us/>

18) Boundary Line - Being a good forest steward means being a good neighbor. It is important to have boundary lines marked and maintained. The tree in front of you has a bright blue stripe and yellow ring. The yellow ring marks the state boundary. The blue stripe means private property. You too can mark your property like this landowner. This prevents trespass, accidental or otherwise, during and after a timber harvest. Operators who accidentally remove trees from another property owner's land to may be penalized three times the value of the tree. Also, the blue marks tell hunters that hunting and trespassing are not allowed.

19) Forested Wetlands - According to the most recent National Wetlands Report by the US Fish and Wildlife Service, forested wetlands have declined more than any other wetland type - a loss of 1.2 million acres. Special care must be taken to protect forested wetlands for the following benefits they provide, which include:

- Supporting high numbers of plant and animal species with diverse *habitat*;
- Filtering nutrients, wastes, and sediments;
- Providing flood control by stabilizing soils with their extensive root systems and absorbing excessive water
- Sequestering carbon dioxide and acting as a sink for carbon.



20) Managing Non-Native Invasive Species - Non-native species can harm native plants, animals and ecosystems. Where possible, measures have been taken to control Multiflora rose, Japanese Stilt Grass, Mile-a-Minute and Garlic Mustard throughout Stoney Forest, through the use of herbicide and machinery. Landowners should control invasive exotic species along road corridors and before timber harvests, in order to give desired *regeneration* a chance to become established.

In addition to invasive exotic plants, the hemlock woolly adelgid, gypsy moth, and other common invasive exotic insects exist in Stoney Forest. Integrated pest management (IPM) techniques to prevent insect related problems may be necessary in the future.

Glossary of Terms

Acceptable Growing Stock: Trees that do not have any major defects or diseases and have a full crown.

Age Class: The trees in a stand that started growing at, or about, the same time. The range of tree ages in a single age class is usually less than 20 percent of the rotation age of that class.

Basal Area: The area in square feet of the cross section of a tree's stem at 4 ½ feet above ground, commonly called diameter at breast height (DBH).

Browse: The parts of woody plants including twigs, shoots, and leaves that animals, such as deer, eat.

Canopy: The overhead branches and leaves in the forest that make up one or several layers.

Codominant: Trees with crowns forming the general level of the crown cover and receiving full sunlight from above but comparatively little from the sides; usually with medium sized crowns.

Crown: The part of the tree bearing the live branches and foliage.

Desirable / Undesirable: From a timber production point of view, desirability of a tree is based upon the form of the tree (straight, crooked) species and is dependent upon local markets, disease or insect infestation.

Dominant Species: Trees with crowns extending above the general level of the crown cover and receiving full sunlight from above and partly from the side; larger than average trees in the stand.

Erosion: The wearing away of the land surface by geological or manmade agents such as wind, running water, and vehicles.

Even-Aged Stand: A stand of trees composed of a single age class in which the range of tree ages is usually ± 20 percent of rotation .

Habitat: Wildlife needs four things to survive, food, water, cover, and space. Collectively, we call these things habitat. Each species has unique habitat requirements.

High Grade: A harvest that takes all commercially valuable trees leaving a residual stand of poorly formed and unhealthy trees. This type of harvest destroys the future value of a forest.

Intermediate: Trees shorter than dominant or codominant trees with crowns extending into the canopy and receiving little direct light from above and none from the sides; usually with small crowns.

Mast Tree: A tree that produces fruit eaten by wildlife. Hard mast is nut-like fruits such as acorns, beechnuts, and hickory nuts. Examples of soft mast are berries, grapes and apples.

Overstory: A level of the forest canopy including the crowns of dominant, codominant, and intermediate trees.

Overtopped: Trees with crowns entirely below the general level of the crown cover, receiving no direct sunlight from above or from the sides. Also called suppressed.

Pulpwood: Logs, whole-tree chips, or wood residues that are used for the production of wood pulp (paper products)

Regeneration: The seedlings and/or saplings in a new forest stand originating from seeds, sprouts, or root suckers.

Riparian Area: The area where the transition between streams, or other bodies of water, and forest vegetation occurs.

Sawtimber: Trees with minimum diameter and length and with stem quality suitable for conversion to lumber

Stand: The basic forest management unit. A grouping of trees which are uniform in species composition, age arrangement and condition to be distinguishable from the forest in adjoining areas.

Stocking: The measure of how well trees are occupying their space.

High - Too many trees, diameter growth rate is below normal rate.

Adequate - An optimum number of trees which have sufficient room to grow at an acceptable rate.

Low - Too few trees. Diameter growth is usually fast, however, the trees are too branchy to be of any value.

Timber Stand Improvement (TSI): This intermediate harvest removes undesirable trees to allow crop trees greater space to grow. A TSI creates increased sunlight and greater uptake of nutrients and water, resulting in faster tree growth.

Two-aged Stand: A growing area with trees of two distinct age classes separated in age by more than ± 20 percent of rotation

Understory: The small trees, shrubs, and other vegetation growing beneath the canopy of forest trees and above the herbaceous plants on the forest floor.

Uneven-Aged Stand: A forest stand containing three or more age classes.

Watershed: An area defined by pattern of stream drainage, and includes all the land from which a particular stream or river is supplied.

Contact the Maryland DNR Forest Service:

**Central Region Field Office
2 S. Bond Street
Bel Air, MD 21014
(410) 836-4551**

**Serving Baltimore, Carroll, Cecil, Harford, Howard, and Montgomery Counties
and
Baltimore City**

**Forest Service headquarters is located at
580 Taylor Avenue, Annapolis, MD 21401.
In state, contact the Forest Service headquarters toll-free
1-877-620-8DNR, extension 8531,
or call (410) 260-8531.
TTY users, please call via the MD relay.**

**Or on the Internet at
<http://www.dnr.Maryland.gov>**

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