



# FOREST STEWARDSHIP

A special issue of the Baltimore Sierran, funded by the Baltimore County Department of Environmental Protection & Resource Management and the U.S. Environmental Protection Agency.

## HOW MUCH FOREST IS ENOUGH?

What should the Greater Baltimore Sierra Club's answer be to this question?

Perhaps your first response is similar to ours:

“Well, let's allow our forests to mature into what existed prior to European colonization, beginning with the fourth of our woodlands located on publicly-owned land. After all, in pre-colonial times the air was so clear you could see up to 70 miles, not the 15-30 smoggy miles of present day. The Chesapeake was so clean you could see down six feet or more and submerged grasses, along with oysters, flourished throughout the Bay. Today, grasses cover but a third of the Bay bottom they once did, oysters are present on 1% of their pre-colonial habitat, and water clarity is reduced to a foot or less in many areas.”

The articles in this newsletter attempt to provide a foundation for answering the question posed above. As you'll see in the article *10,000 BC to Present - A Brief History of Our Forests*, our pre-colonial forests were not free of human influence. Native people may have cleared forest from up to a fourth of the County and this practice may have begun 2,000 - 3,000 years before the arrival of the first Europeans. Prior to human use of fire, a drier climate may have caused woodlands to periodically burn. In other words, the high-quality environment which greeted the first English settlers might be attainable by restoring forest to substantially less than 100% of the county.

Another important question is: How much forest management is too much? While it would be nice to simply let our forests mature to old growth - free of human manipulation - this may not be the best course for restoring a balanced ecosystem.

In the article *Forest Threats* you will see that invasive plants, diseases, and insects necessitate intervention just to undo the harm we humans have done. Plus, it appears that we've allowed deer populations to explode to the point that oak seedlings and other native species cannot compete with seedlings whitetails find less tasty. Sprawl is another threat described in the article,

*Continued on page two*

## THANKS TO DEPRM & EPA

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The articles contained in this newsletter were written by former Greater Baltimore Group chair Richard Klein. The author wishes to thank Group Co-Chair Ron Henry and Group ExCom member Robert Burchard for their contributions to this newsletter. Thanks also go to Don Outen and Pat Corman of DEPRM, Baltimore City Reservoir Manager Gene Scarpulla, Maryland Sierra Club Conservation Chair Dan Boone, and Baltimore County historian John McGrain.

## FOREST THREATS

Up until 3,000 years ago, much of the County's land area was forest. With the advent of the use of fire by native people to manage wildlife and clear land for farming, forest cover began to dwindle. But the most severe clearing did not occur until the late 1800s and early 1900s, by which time virtually every acre of forest had been cleared at least once. Since then our forests have been recovering, though they are far from healed. Following is a brief review of the leading threats facing our forests today.

### Forest Regeneration

Perhaps the greatest threats to the health of our forests are fragmentation and a severe paucity of regeneration in the form of tree seedlings and saplings. Minimal regeneration appears to be due to excessive deer browsing.

The paucity of tree regeneration was detailed in the 2003, Maryland Department of Natural Resources

*Continued on page three*

## 10,000 BC TO PRESENT - A BRIEF HISTORY OF OUR FORESTS

When glacial winds last chilled Baltimore County, the Chesapeake Bay was a hundred feet lower than today and our forests were dominated by fir and spruce, species now common in New England and northward. This portrait of our ancient forests comes from sediment core analyses presented by Dr. Grace Brush in *Discovering the Chesapeake* (The Johns Hopkins University Press 2001). During that long ago time - 12,000 years BP (Before Present) - deciduous trees like alder, ash, birch, hornbeam, and hazelnut, stood alongside and beneath the fir and spruce. This may have been the time when people first arrived in our area. At around 11,000 BP, the climate became drier, possibly warmer too, which brought about a decline in fir and spruce along with an increase in pine and ash. It appears that shortly thereafter the climate grew cooler again which allowed spruce and fir to increase and caused a decline in ash. For roughly 5,000 years, our forests were dominated by pine and hemlock with few herbaceous species. The absence of grasses and other herbaceous species may have indicated that vast areas were covered by an unbroken tree canopy.

About 7,000 BP the climate turned warmer and drier. It appears that forest fires were common then. Once the protective canopy and forest floor were burned away, soil erosion rates increased. Shrubs like blueberry and arrowwood became more common along with herbaceous species such as goldenrod. The drier conditions also allowed oak and hickory to flourish. In fact, for the 3,500 years preceding European colonization our forests were dominated by oak and hickory with fewer pine.

In the southeastern, coastal plain forests of the County, black gum and sweet gum may have dominated from 4,000 - 2,500 years BP. The abundance of birch and cinnamon fern during this time indicates it may have also been relatively wet.

Beginning around 2,500 years BP the gum species were replaced by chestnut, American holly, and blueberry which reflects a shift to a drier climate that persisted up to European colonization. The period of 1100 - 1300 AD may have been particularly dry in our area.

*Continued on page two*

### HOW MUCH FOREST IS ENOUGH?

*Continued from page one*

though forest loss due to this form of land development has slowed dramatically over the past three decades.

Finally, in *Sources of Help* we ask you to consider expanding and enhancing the three-fourths of our forests which are privately-owned, beginning with those on your property and that of your friends. Sources of technical assistance and restoration funds are provided, though further detail on this topic will be provided in the second and final issue of this newsletter. In the meantime, please take a moment to complete the questionnaire to the right so we can learn more about your needs and desires with respect to reforestation of your property.

### 10,000 BC TO PRESENT - A BRIEF HISTORY OF OUR FORESTS

*Continued from page one*

Prior to European colonization it appears that mature forest was absent throughout relatively large areas of northern Baltimore County. In 1957, historian William Marye published a series on *The Great Maryland Barrens* in *Maryland Historical Magazine*. Citing references in deeds and other documents dating from the late 1600s to early 1700s, Mr. Marye described large areas of Maryland where forest was absent when the first settlers arrived. One of these barrens was located in northern Baltimore County.

John McGrain, a historian with the County's Office of Planning, believes the Barrens were generally located northwest of a line drawn from Liberty Reservoir to Reisterstown to Butler to Hereford to White Hall and then running east towards Shawsville in Harford County. This Barrens covered an area of about 170 square miles; about a fourth of our county. Two other Barrens also existed in the County at the time of settlement - Soldiers Delight and Bare Hills. The three Barrens were dominated by grasses, other herbaceous growth, shrubs, and sapling trees.

Early settlers thought the Barrens resulted from a lack of soil fertility. This speculation was close to the truth for Soldiers Delight and Bare Hills, but not the northwest County. Both Soldiers Delight and Bare Hills are serpentine areas where thin soils hold little moisture and thereby inhibit the pace of tree growth. Mr. Marye speculated that the northwest Barrens were a product of forest fires set by native people. The fires were a form of wildlife management intended to increase populations of elk and other big game inhabiting the County in pre-colonial times. Fire was also used to clear areas for farming. Native people may have used fire for these purposes for as long as

2,000 to 3,000 years prior to the arrival of Europeans. It is also possible that large meadows existed along the headwaters of Jones Falls, Long Green Creek, and Western Run where the relatively flat terrain allowed beaver ponds to inundate extensive areas.

During colonial times the portions of the County denuded of forests increased largely due to tobacco

farming. But Dr. Brush believes that early tobacco farmers cleared rather small patches of forest, worked the fields for a few years, and then abandoned their fields allowing each to revert to herbaceous growth, shrubs, saplings, then forest. As population and farming technology progressed, so did forest clearing, which peaked in the late 1800s and early 1900s. Since the 1930s forest has returned to many formerly cleared areas.

*Continued on page three*

### WOULD YOU LIKE TO PLANT TREES ON YOUR PROPERTY?

If you would like to plant trees on your property, please contact us at 410-654-3021, [GBSierra@ceds.org](mailto:GBSierra@ceds.org) or complete the follow form. Also, please consider passing this article along to acquaintances who might wish to plant trees on their property.

#### TREE PLANTING QUESTIONNAIRE

Your Name: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

Phone: \_\_\_\_\_ Email: \_\_\_\_\_

1. What benefits would you like to obtain from planting more trees?  Attract birds  Attract other wildlife  Shade  Cool my home  Screening  Improve water quality  Improve air quality  Reduce noise  Flowering  Fruits, Nuts, Etc.  Other: \_\_\_\_\_

2. Do you know what species you'd like to plant? \_\_\_\_\_  
\_\_\_\_\_

3. How many trees would you like to plant? \_\_\_\_\_

4. Where would the trees be planted?  Next to a stream, pond, or other water body  Next to an existing forest  Other \_\_\_\_\_  
\_\_\_\_\_

5. When would you like to do the plantings? \_\_\_\_\_

6. What could we do to help? \_\_\_\_\_  
\_\_\_\_\_

**Mail to: Sierra Club Forest Survey, 811 Crystal Palace Ct., Owings Mills, MD 21117.**

**FOREST THREATS***Continued from page one*

(DNR) plan *A Comprehensive Forest Conservation Plan for Long-Term Watershed Protection on the City of Baltimore's Reservoirs*. The DNR plan identified a number of issues affecting the numerous benefits provided by the 17,580 acres of City-owned forests adjoining our three principal water-supply reservoirs: Liberty, Loch Raven, and Prettyboy. About 14% of the forest in the County is located on these reservoir lands.

The most pressing issue identified in the plan was the paucity of seedlings, shrubs, and young trees in many forest stands. As part of the planning process forest structure was analyzed at 2,500 plots (sampling sites). The data gathered through these analyses showed that seedlings and young trees were missing on 75% of the forest plots! The lack of understory vegetation was attributed to browsing by large deer populations.

Without seedlings and young trees the ability of the forest to perform vital functions, such as water quality protection and provision of wildlife habitat, is severely compromised. The plan calls for establishing a number of "exclosures" to assess the role deer play in the lack of regeneration. Exclosures are created by erecting a high fence to enclose a portion of the forest floor. The exclosure prevents deer from grazing vegetation within. Over time, biologists compare the number of tree seedlings, by species, within the exclosure and on adjoining areas to determine if deer browsing is a significant contributor to regeneration paucity. The results of these exclosure studies will then provide a starting place in developing policies to enhance forest regeneration.

**Disease & Insects**

While disease, insects, and other "pests" have always been part of the forest ecosystem, European colonists brought with them new species that virtually eliminated once common trees. Perhaps the best known example is the chestnut blight fungus, which was first documented in New York City in 1904. At that time American chestnut accounted for a third of the trees in many forest stands. By the 1930s no chestnuts remained which survived long enough to reproduce.

Gypsy moths were accidentally released in Massachusetts shortly after the Civil War. Gypsy moth caterpillars are particularly fond of oaks. Many of you may remember the devastation caused by the gypsy moth to the oak forests of Prettyboy Reservoir in the 1980s. At the peak of infestation entire forests stood denuded of leaves. In mid-summer these woodlands resembled those of winter; not a single green leaf in sight.

Dutch elm disease and dogwood anthracnose have reduced the diversity of our forests as well. The hemlock woolly adelgid is a recent invader which threatens some very special places such as Hemlock

Gorge at the head of Prettyboy Reservoir. The Maryland Department of Agriculture is monitoring adelgid populations in the Gorge and in hemlock stands elsewhere.

**Fire**

An assessment of the vulnerability of Baltimore County forests to wildfire is presented in DNR's 2003 report *Maryland's Strategic Forest Lands Assessment*. Based upon the following six factors the wildfire susceptibility of each "subwatershed" in the state was rated on a scale of low, moderate, high, very high, and extreme:

- Fuel hazard is based upon the amount and type of vegetation within a subwatershed;
- Risk of fire relates both to the dryness of the vegetative fuel and to presence of human activities that could ignite a fire.
- Aspect is based on the direction faced by slopes, with south- and west-facing slopes tending to be much drier than north- or east-facing slopes;
- Slope itself affects the rate at which a fire spreads due to the chimney effect of steep slopes.
- Sensitivity is a measure of public perception of losses that would be caused by a fire;
- Fire protection resources reflect road accessibility in a watershed and the location and availability of fire-fighting personnel and equipment.

The subwatersheds along Big Gunpowder Falls (above Loch Raven), Little Falls, and in the Prettyboy Reservoir area were rated as having a very high wildfire threat potential. The threat potential for the remainder of the County's forest was moderate to high. This is why it is so vitally important that all of us exercise great care with fire while enjoying the county's forest lands.

**Forest Interior Loss**

A number of birds and other wildlife species do best in forests where the nearest edge is at least 500 feet distant. Forest edges tend to be drier and support a greater abundance of predators (raccoons, opossums, crows, squirrels, etc.).

According to the Baltimore County Department of Environmental Protection & Resource Management (DEPRM), our 130,000 acres of forest is contained in 9,038 "patches." Only 355 of these patches, or 6%, are large enough to contain "forest interior." In small woodland patches, eight out of ten nests of birds known as "neotropical migrants" (wood thrushes, scarlet tanagers, etc.) may be lost to predators.

**Fragmentation**

Forest fragmentation adds to the impact of forest interior loss. Fragmentation refers to the the disruption of contiguous forest cover by conversion to non-forest land uses. The result is isolated forest patches without connecting corridors. These corridors can serve as routes of travel from forest patch to forest patch. Wildlife inhabiting smaller woodland patches, lacking connection to other patches via wooded corridors, tend to have fewer young per pair, die at a younger age, and have less genetic variability when compared to populations in patches large enough to contain forest interior.

The primary purpose of this newsletter is to encourage landowners to plant more trees on their property, especially where it would expand the size of existing forest and woodland corridors.

**10,000 BC TO PRESENT - A BRIEF HISTORY OF OUR FORESTS***Continued from page two*

By 1920, only 28% of Baltimore County was covered by forest, most of which consisted of 10- to 100-acre woodlots. It was also in the 1920s when disease first decimated our forests. The earliest victim of disease was the American chestnut. The 1910 publication *The Plant Life of Maryland* (The Johns Hopkins University Press), noted that 35% of forest trees were chestnut. Within a short period following the blight, American chestnuts capable of reproducing by seed no longer existed in Baltimore County.

The American elm was the next major tree species to succumb to disease (Dutch Elm disease) and today the Eastern hemlock is threatened by the hemlock woolly adelgid.

From the 1920s through the mid- to late-1950s forest cover increased in the County. Despite this increase in the total forest cover, however, the forest resource was and remains fragmented into isolated patches due to earlier clearing for agriculture and development. The onset of suburbanization introduced a new period of clearing. Statewide, forest cover has gone from 46% in 1950 to 41% today. Presently, 38% of Baltimore County is in forest.

Our forests have changed dramatically over the past 12,000 years. While we cannot restore fir and spruce as our dominant forest species, we can do much to repair the damage done to our woodlands and to regain the numerous benefits of vast areas of interconnected, maturing forests. For example, the Greater Baltimore Sierra Club has encouraged the City of Baltimore to allow nearly 9,000 acres of woodlands adjoining Liberty, Loch Raven and Prettyboy reservoirs to become old-growth forest.

## FOREST THREATS

*Continued from page three*

### Invasive Plants

The Maryland Native Plant Society lists 42 species of invasive plants. These species overwhelm native plants and tend to reduce forest diversity. They include trees, vines, and herbaceous species. Most of these invasives have no natural controls and can spread rapidly, even into deep forest.

A list of the 42 invasive species can be viewed at the Maryland Native Plant Society website: [www.mdflora.org](http://www.mdflora.org). There you will also find advice for eliminating any invasives on your land. Of course, you should avoid invasive species when selecting trees to plant on your land.

### Timber Harvesting

Land development and firewood production appear to be the two most common motivations for timber harvesting within the county. Trees are mostly felled for firewood using selective cutting. It is rare to see large stands of forest cleared for firewood production.

By the 1980s, gypsy moth infestations had decimated large areas of our oak forests. In the late 1980s a number of "salvage" cuts were made in gypsy-moth ravaged areas. Since then large clear-cut logging operations have rarely occurred within the County.

From 1987 to 2001, agricultural land declined by about 1,400 acres per year, mostly due to land development. About a third of the typical farm is forest land and three-fourths of our forests are on privately-owned land. Yet, over the past decade the pace of development-related forest clearing has declined substantially in Baltimore County. This success is due a number of factors, though the chief factors are land preservation, downzoning of rural lands, and the County's implementation of the Maryland Forest Conservation Act.

As of 2001, more than 33,000 acres of farmland has been preserved in the county, partly through the sale of development rights by farm owners as well as the granting of conservation easements, which preserves land in perpetuity.

In 2004, the Baltimore County Council changed the zoning on about 45,000 acres of rural land. Previously, these lands could be developed at a

density of one house for every 1.5- to 5.0-acres. The 2004 zoning change reduced the development density to one house for every 20- to 50-acres.

Since 1992, the Maryland Forest Conservation Act has required preservation of 15% to 50% of the existing woodland on development sites. As of 2002, nearly 5,000 acres of forest had been preserved on building sites within the county. On average, about 68% of the existing forest is preserved on a development site. Annually, some 200 acres of forest is lost due to residential, commercial, and other development forms.

### SOURCES OF HELP

Following are some places to go if you are looking for help with planting a few trees around your yard or improving a forest stand.

#### Tree-Mendous Maryland

If you know of a park, a street, or a community open space area that would be even better with a few more trees, then check out Tree-Mendous Maryland at:

[http://www.co.ba.md.us/Agencies/environment/education/ep\\_needtrees.html](http://www.co.ba.md.us/Agencies/environment/education/ep_needtrees.html)

or call the Maryland Department of Natural Resources (DNR) Forest Service at 410-665-5820 or the County's Tree-Mendous Program Coordinator at 410-887-4488, ext. 242.

### Green Schools

Through this joint County-State program you can plant trees around neighborhood schools and employ other practices to make the campus more environment-friendly. Details on the Green Schools program can be found at:

[http://www.co.ba.md.us/Agencies/environment/education/ep\\_greenschool.html](http://www.co.ba.md.us/Agencies/environment/education/ep_greenschool.html)

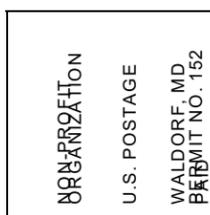
or call 410-887-4488 x242.

### Forest Stewardship Plan

Prepared by Maryland Department of Natural Resources (DNR) foresters, this planning process helps land owners to better manage woodlots for a variety of purposes: watershed protection, wildlife, timber production, etc. Once the plan is written the land owner is eligible to participate in a variety of programs. For example, with the plan the landowner can enter into a Forest Conservation and Management Agreement which freezes property taxes at a very low rate. With the Agreement the landowner also becomes eligible for a number of cost-share programs, such as the Environmental Quality Incentive Program which covers up to half the cost for carrying various beneficial practices. Further detail on these and other DNR programs for forest owners can be found at:

<http://www.dnr.state.md.us/forests/programapps/faland.html>

or by calling 410-665-5820.



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