

The State of Chesapeake Forests

EXECUTIVE SUMMARY

THE CONSERVATION FUND

America's Partner in Conservation

THE STATE OF CHESAPEAKE FORESTS

ABOUT THE REPORT

The health of the Chesapeake Bay—its water quality, its ability to enhance local economies, and its provision of wildlife habitat and outdoor recreation—depends on the health of the forests within its watershed. Synthesizing more than a decade's worth of data, this report presents a comprehensive picture of the state of these critical forests, identifies current and future threats, sets large protection and restoration goals, and suggests strategic avenues of action that can restore this magnificent ecosystem to a level of health that will benefit both wildlife and people.

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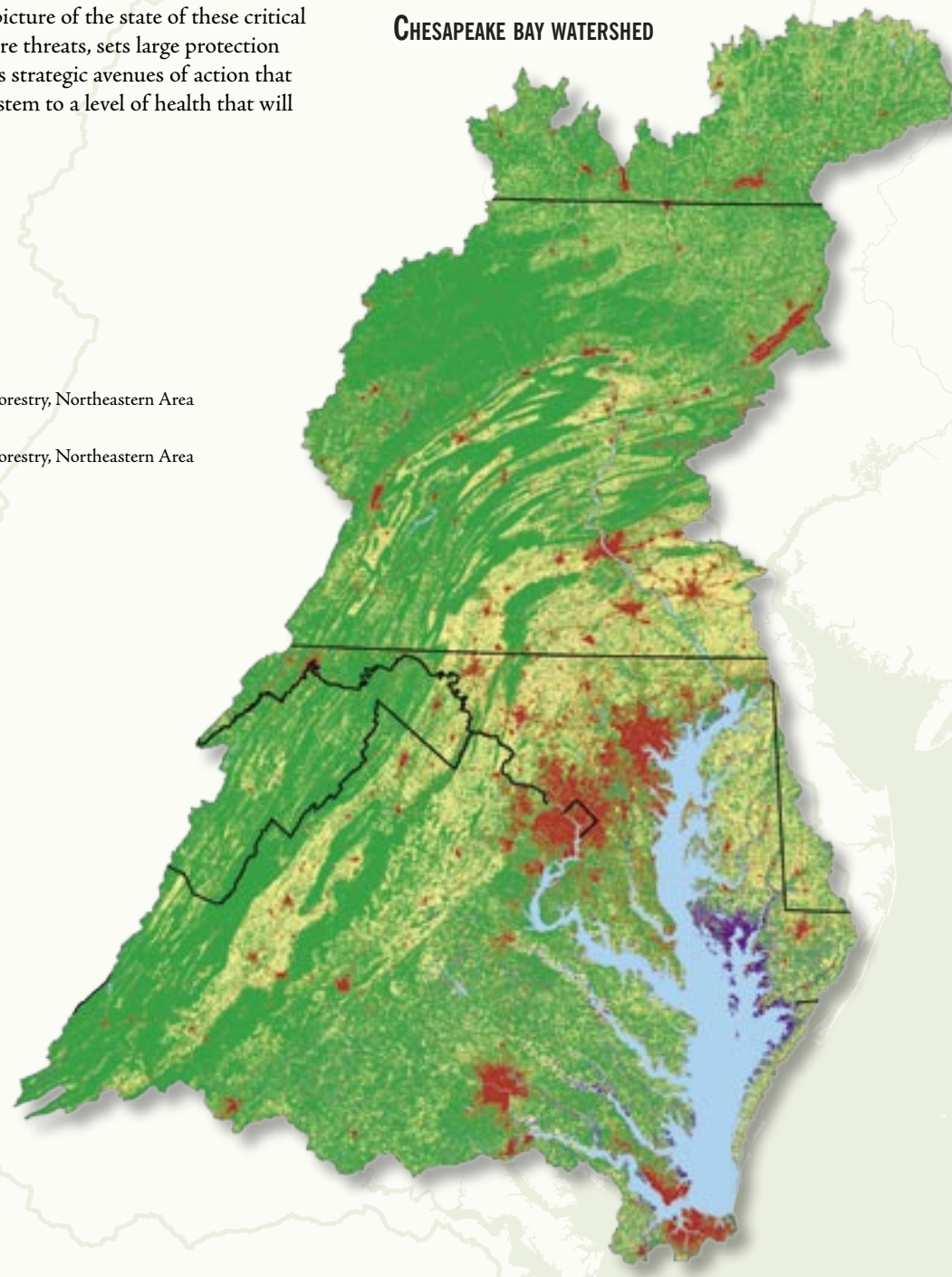
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CHESAPEAKE BAY WATERSHED



The Chesapeake Bay, America's largest estuary, is one of the nation's most productive and vibrant resources. The Bay's watershed—spanning nearly 65,000 miles, six states, the District of Columbia, and millions of acres from Cooperstown, New York, and the Pennsylvania Wilds to Virginia's Blue Ridge Mountains and the shores of the Delmarva Peninsula—contains some of the most intact hardwood forestland remaining in the temperate world. An important part of the heritage of the Bay watershed, forests have contributed to its special sense of place for hundreds of years.

Chesapeake forests are crucial to maintaining the water quality of the Bay and its tributaries. They also safeguard wildlife habitat, contribute billions of dollars annually to local economies, protect public health, provide recreation opportunities, and enhance the quality of life for the watershed's 15 million residents.

Despite these benefits, forests in the Chesapeake Bay watershed are at risk. Nationally, by 2050, more than 23 million acres of forestland across the nation may be lost to other land uses, principally development. In the Bay region alone, some 750,000 acres—equivalent to 20 Washington, DCs—have been developed since the early 1980s, and the Bay watershed now loses forestland at the rate of 100 acres each day. Chesapeake forests also lack regionally coordinated forestland conservation, restoration, and stewardship plans, making them more vulnerable to fragmentation, haphazard development, and invasive species, as well as less likely to be well managed.

To better understand and address these challenges, The Conservation Fund and the USDA Forest Service have partnered to assess and report on the state of Chesapeake forests. This first-of-its-kind report synthesizes more than a decade's worth of data from public and private sources, highlights current forest conditions, forecasts future trends, and outlines key goals and strategies necessary to conserve and restore the forests of the Chesapeake Bay watershed.

The report calls for a strategic, long-term approach that identifies and focuses on forests with the highest environmental, economic, and social values. Together, public and private partners can help preserve the health of the Chesapeake Bay and its residents through a concerted effort to protect its forests.



THE STATE OF CHESAPEAKE FORESTS

FORESTS ARE THE BEST LAND COVER FOR IMPROVING WATER QUALITY IN THE CHESAPEAKE BAY

Forests filter pollution, transform and store nutrients, provide shade, and sustain aquatic habitat.

Forests are responsible for less nitrogen (15%) and less phosphorus (2%) than any other land cover. The Bay's two primary pollutants, nitrogen and phosphorus, fuel enormous algal blooms, starving aquatic flora and fauna by reducing available oxygen.

Forests protect and filter drinking water for 75% of the Bay watershed's residents (more than 11 million people).

CHESAPEAKE FORESTS PROTECT PUBLIC HEALTH

As they grow, forests and tree canopies absorb air pollutants that can induce asthma, cancer, and other health problems.

Forests provide many benefits that improve the physical health and quality of life of Bay watershed residents including recreational opportunities, enhanced community desirability, and reduced stress.

FORESTLAND PAYS

Each year, Chesapeake forests contribute at least \$24 billion to the Bay watershed in ecological services such as wildlife habitat, recreation, air and water filtration, and flood control.

The forest products industry annually contributes \$22 billion to the Bay watershed economy and is an important source of jobs and income for many communities.

CHESAPEAKE FORESTS ARE INCREASINGLY THREATENED BY CONVERSION TO DEVELOPMENT

While forests now cover 58%, or 24 million acres, of the Chesapeake Bay watershed, the watershed loses 100 acres of forestland each day.

If current trends continue, an additional 9.5 million acres of Chesapeake forests will be threatened by conversion to residential development by 2030.

CHESAPEAKE FORESTS ARE MORE HEAVILY FRAGMENTED THAN EVER BEFORE

Currently 60% of the Bay watershed's forests are fragmented—crossed by roads or power lines, or near developed areas. Forests covering larger, undisturbed areas provide healthier habitat.

SHIFTING OWNERSHIP TRENDS THREATEN SUSTAINABLE MANAGEMENT ON PRIVATE LANDS

In many areas, sustainable management is critical to ensuring the long-term provision of forest benefits to the Bay watershed.

Changing ownership trends and a lack of incentives for sustainable management have resulted in private forests being managed primarily for short-term economic gains, not managed at all, or sold for development.

Private owners, particularly families, hold nearly 80% of Chesapeake forests.

The number of family forest owners in the Bay watershed has reached 900,000, a 25% increase within the previous decade.

More than 70% of family forest owners in the Chesapeake Bay watershed are older than 55; as the owners age, the watershed will face its largest ever intergenerational transfer of land.

Average parcel size has decreased by 24%.

HABITAT HEALTH AND DIVERSITY IN CHESAPEAKE FORESTS ARE DECLINING

An upsurge in invasive species, overbrowsing by deer, forestland fragmentation, forest homogeneity and the suppression of fire are key factors in the degradation of native habitat diversity.

CHESAPEAKE FORESTS LACK REGIONAL CONSERVATION PLANS

Where conservation does occur, it is often haphazard, non-strategic, and on a small scale.

A lack of public awareness and policy has resulted in insufficient financial support for the large-scale protection of Chesapeake forests.

GOALS AND KEY STRATEGIES FOR PRESERVING CHESAPEAKE FORESTS

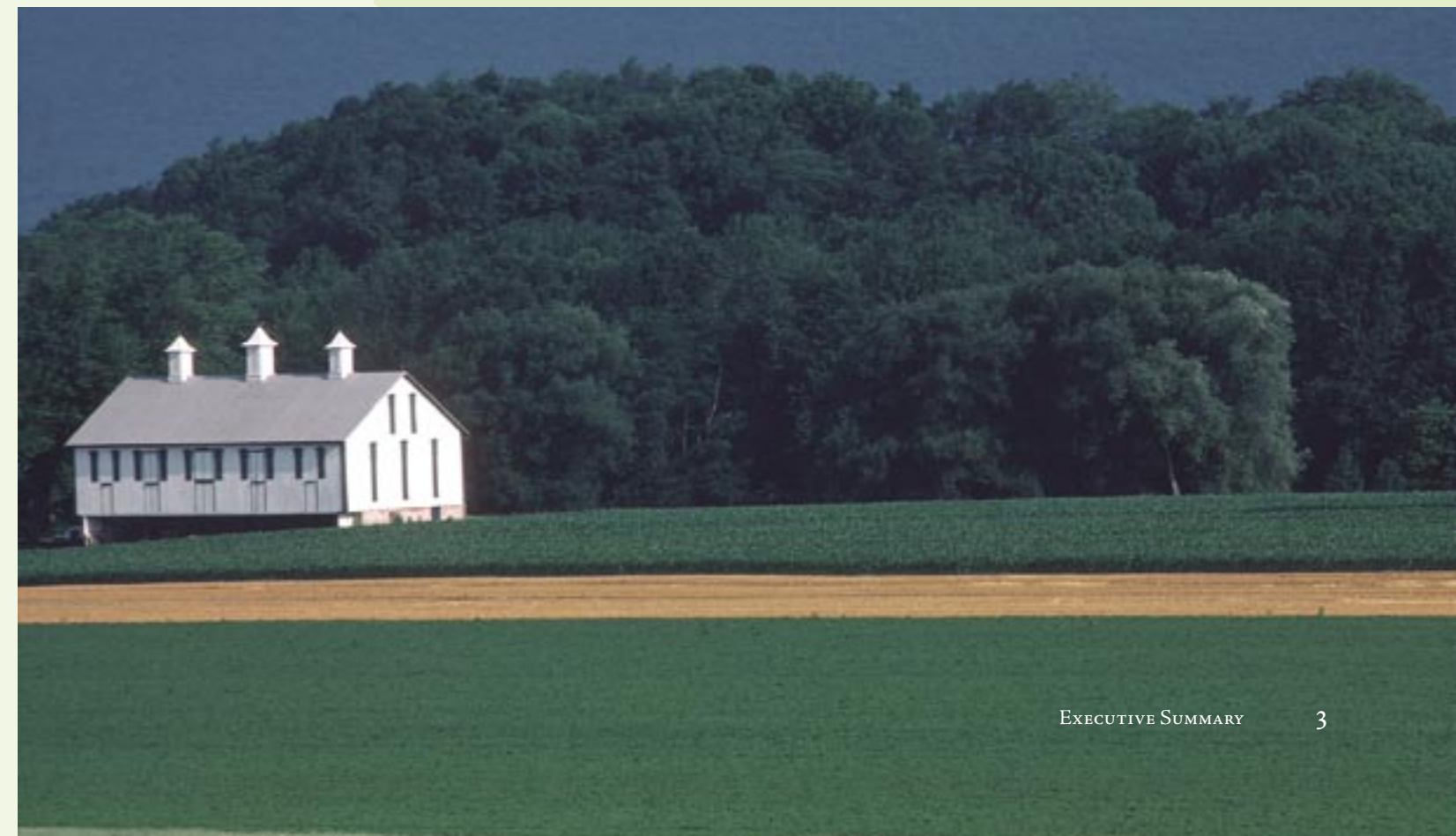
GOALS

1. Set regional forestland protection goals to retain and expand the Chesapeake's exceptional forest resources.
2. Improve and sustain the health and diversity of Chesapeake forests.
3. Manage Chesapeake forests to enhance ecological services and public health benefits.
4. Increase public appreciation for the value of Chesapeake forests.
5. Track Chesapeake forest conditions over time.

KEY STRATEGIES

1. Encourage strategic and large-scale forestland conservation practices by identifying, conserving, and restoring forests that have the highest values for water quality, local economies, wildlife habitat, and public recreation.

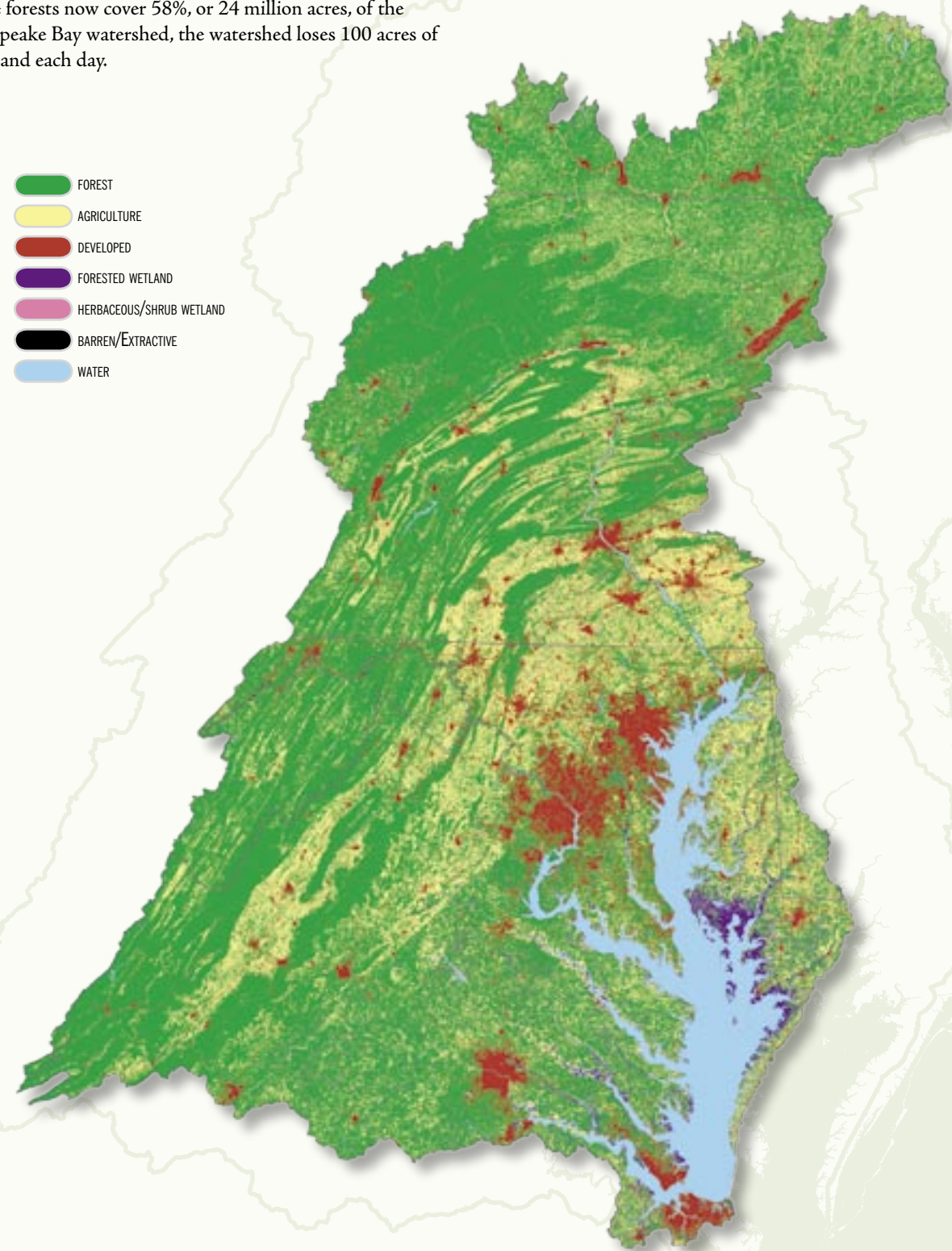
Set acreage goals for forest conservation using the best available tools, such as the Resource Lands Assessment, to identify where retention and expansion of forests are most needed.
2. Improve land-use planning and development practices to reduce forest loss and fragmentation.
3. Recognize the public benefits of private forestland by identifying ways that planning, regulations, incentives, funding, and other programs can be used to protect native biodiversity, improve economic return, and enhance sustainable management and stewardship.
4. Develop innovative programs to increase awareness about the public's dependence on Chesapeake forests.



CHESAPEAKE BAY WATERSHED TODAY

While forests now cover 58%, or 24 million acres, of the Chesapeake Bay watershed, the watershed loses 100 acres of forestland each day.

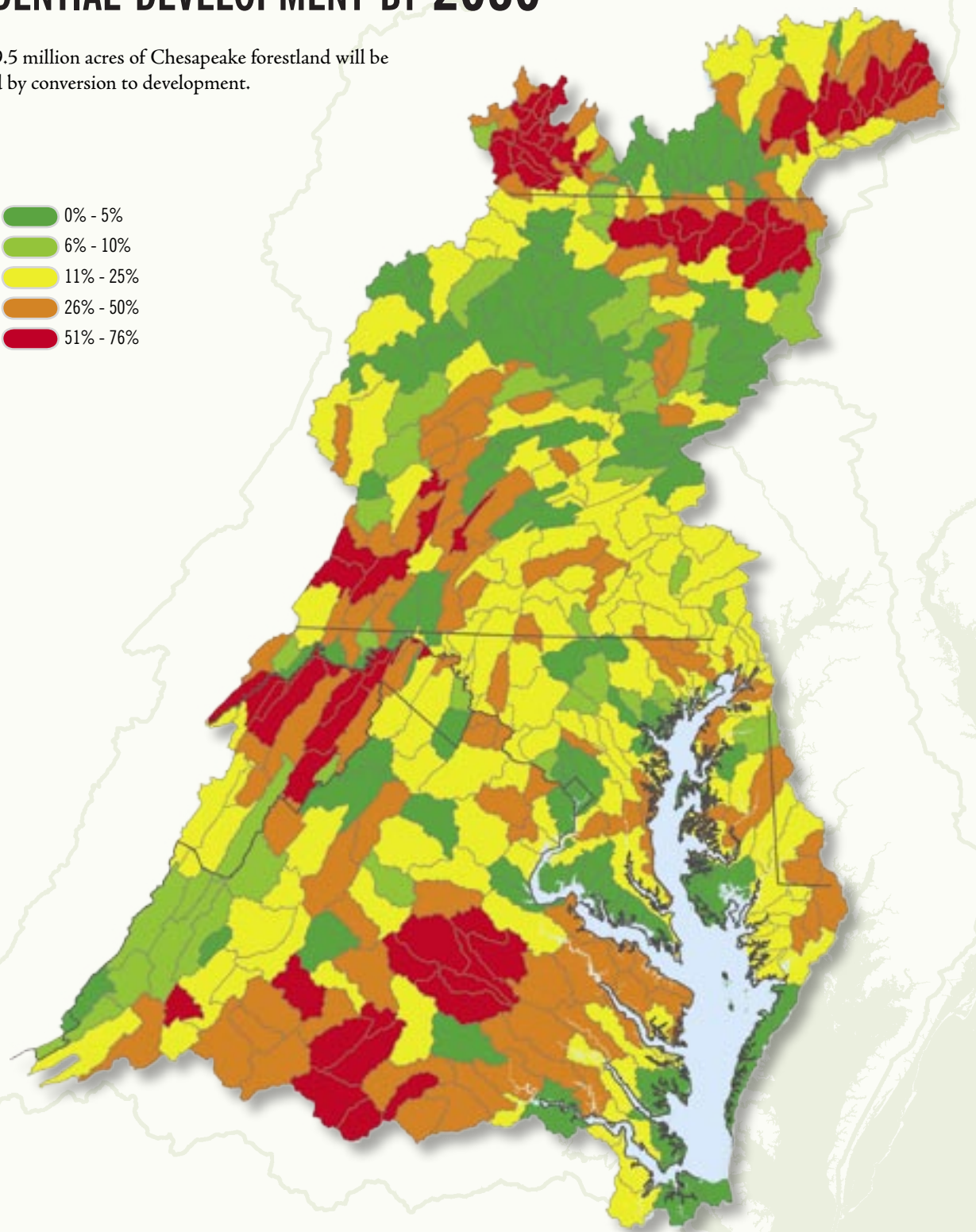
- FOREST
- AGRICULTURE
- DEVELOPED
- FORESTED WETLAND
- HERBACEOUS/SHRUB WETLAND
- BARREN/EXTRACTIVE
- WATER



PERCENT OF PRIVATE FOREST EXPECTED TO INCREASE IN RESIDENTIAL DEVELOPMENT BY 2030

By 2030, 9.5 million acres of Chesapeake forestland will be threatened by conversion to development.

- 0% - 5%
- 6% - 10%
- 11% - 25%
- 26% - 50%
- 51% - 76%





FORESTS ARE THE BEST LAND COVER FOR IMPROVING WATER QUALITY IN THE CHESAPEAKE BAY

By trapping, filtering, and retaining nutrients and sediment, forests keep them out of the Bay and its tributaries. Sub-watersheds with the highest percentage of forest cover have the lowest annual sediment yields in the Bay region. Even though forests account for 58% of the land area in the Bay watershed, they contribute only about 15% of the total load of nitrogen and 2% of the phosphorus load to the Bay.

Of the forests most critical for water quality protection in the Bay watershed, 31% are threatened by future development.

The Chesapeake Bay's riparian forests—forests along stream banks—are especially effective, buffering nearly 60% of the watershed's streams. However, riparian areas currently have the lowest amount of forest cover in the watershed. Some developed sub-watersheds in the Chesapeake region contain as little as 15% riparian cover, greatly reducing their ability to maintain clean water for people and wildlife. Seven out of 10 of the Bay's sub-watersheds are not maximizing the water quality benefits of buffers; at least 30,000 more miles of riparian buffer are needed to meet Chesapeake Bay program watershed health guidelines.

IF TRENDS CONTINUE...
The most valuable and vulnerable Chesapeake forests could disappear, greatly decreasing the Bay's water quality.

Chesapeake forests will become less able to absorb and retain nitrogen. The amount of nitrogen in streams could increase by 200%, with lethal results for Bay aquatic species.

STRATEGIES
Make forest conservation and restoration a primary tool for improving stormwater management by recognizing the superior ability of forestland to remove pollutants, improve stream health, and moderate runoff.

Sustain the ability of forestland to improve water quality by restoring and managing forest cover in areas with high nitrogen air deposition rates.

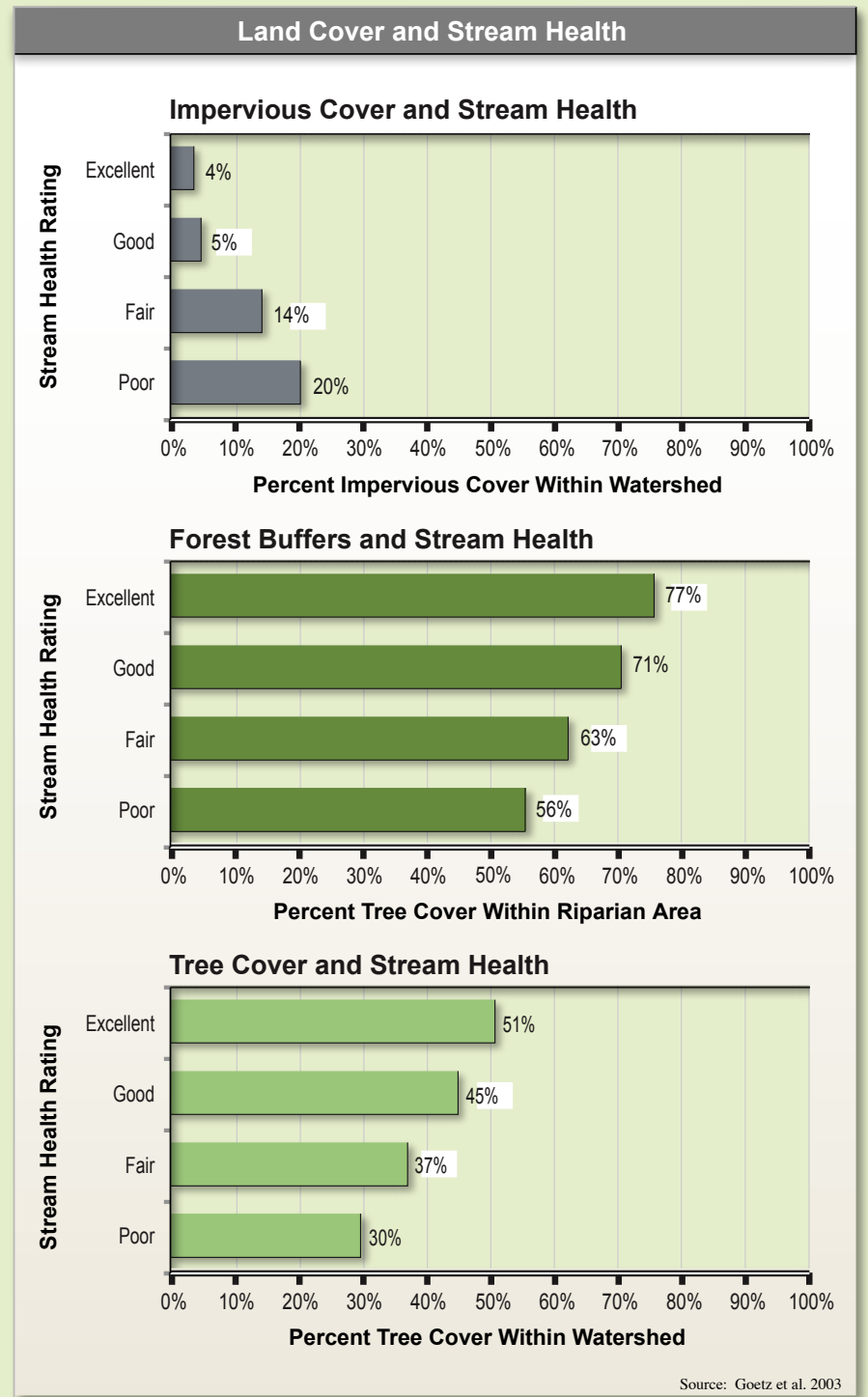
Use a combination of incentives and regulations to ensure that forests buffer more than 70% of riparian areas.

From the Forest to the Faucet: Chesapeake forests protect drinking water better than any other land cover. Approximately 75% of Bay watershed residents rely on surface water supplies—which are directly affected by forest cover—for clean drinking water.

IF TRENDS CONTINUE...
Water quality in the Bay will suffer.

The cost of drinking water will increase for the watershed's residents if forests are not present in sufficient quantities and appropriate locations to provide filtration benefits.

STRATEGY
Ensure a long-term drinking water supply and reduce treatment costs by focusing on protecting and restoring forests in high-priority areas.



CHESAPEAKE FORESTS PROTECT PUBLIC HEALTH

Forests and tree canopies directly improve local and regional air quality by removing air pollutants and lowering temperatures. The majority of the watershed's residents live in areas where the fewest Chesapeake forests remain.

Improving air quality can substantially improve public health. The American Lung Association has graded air quality for 64% of Bay watershed residents with a D or an F.

The area of forest per person, or forest population density, has dropped steadily since the early 1900s. As a result, more and more people are depending on fewer and fewer acres of forest.

Because forests provide vital public health benefits to residents of the Bay watershed, reductions in ecosystem health translate directly to declines in public health.

IF TRENDS CONTINUE...

Air quality will continue to decline, significantly affecting public health.

STRATEGIES

Incorporate forest benefits in air quality attainment strategies.

Assess tree cover, set local goals, and adopt implementation plans focused on urban tree canopies.



FORESTLAND PAYS

Getting More Than You Pay For: Chesapeake forests provide approximately \$24 billion each year in carbon sequestration, flood control, wildlife habitat, and recreation. These ecological services are rarely accounted for in private and public decision-making or in developing incentives for retaining and managing forestland.

IF TRENDS CONTINUE...

Communities may have to spend millions of dollars to replace services that forests provide for free.

STRATEGIES

Compensate private forest landowners with funding and other incentives to sustainably manage their land for the good of the Bay watershed.

Establish forest mitigation, trading systems, and a registry to facilitate transactions.

The Forest Products Industry: According to output from the economic model IMPLAN, the Chesapeake forest products industry directly employs approximately 140,000 people and supplies \$6 billion in labor and proprietor income with a total industry output (sales) of more than \$22 billion annually.

A growing number of forces are reducing the viability of a wood-based manufacturing economy in the Chesapeake Bay region. Of forestland in the Bay region currently able to support the forest products industry, 20% is vulnerable to development.

IF TRENDS CONTINUE...

Management costs will rise, making the forest products industry less profitable.

STRATEGIES

Protect large tracts of forestland by enhancing the viability of the forest products industry by directing incentives to a system of "forest economic resource areas" and promoting forest certification systems.

Tailor management innovations to small-parcel landowners.

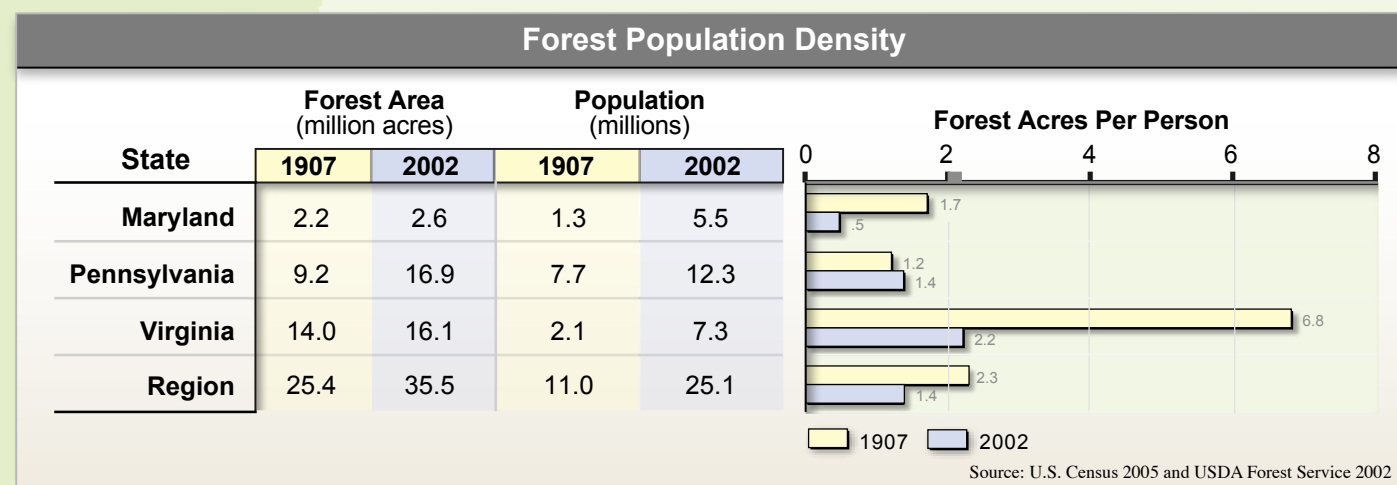
Support the use of small-diameter and traditionally low-value species like red maple.

Economic Impact of Chesapeake Forestry by State			
STATE	Workers Employed	Income (million dollars)	Sales (million dollars)
Delaware	4,300	100	600
Maryland	16,300	600	2,400
New York	10,300	300	1,500
Pennsylvania	66,200	2,300	9,700
Virginia	36,300	1,400	6,600
Washington D.C.	200	10	20
West Virginia	6,000	100	700

Source: IMPLAN 2001



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FRAGMENTATION AND DEVELOPMENT PRESSURES THREATEN CHESAPEAKE FORESTS

Forests now cover 58% of the Chesapeake Bay watershed. Since 1970, the forests in the Bay watershed have been declining at a rate of at least 100 acres each day. More than 750,000 acres of the watershed's forests—equivalent to 20 Washington, DCs—have vanished since 1982, replaced primarily by sprawling development. Today, 45% of the Bay watershed's forest habitat is vulnerable to development.

Already, 60% of Chesapeake forests are fragmented by roads, housing subdivisions, farms, and other human uses. Only 40% contain enough habitat to support healthy populations of interior forest-dwelling bird species such as the scarlet tanager. More than 50 plant and animal species are threatened by current development patterns in major metropolitan areas of the watershed.

IF TRENDS CONTINUE, BY 2030...

An additional 9.5 million acres of Chesapeake forests will be threatened by conversion to residential development.

The watershed will experience a net loss of forest.

New forest growth will consist mainly of scattered trees planted in suburban developments.

Habitat for terrestrial and aquatic species will dwindle.

STRATEGIES

Use strategic land-use planning to direct conservation and development in order to conserve forestland on a large scale and to reduce forest loss and fragmentation in areas with high ecological value.

SHIFTING OWNERSHIP TRENDS THREATEN SUSTAINABLE MANAGEMENT ON PRIVATE LANDS

The number of family forest owners in the Bay watershed has reached 900,000, a 25% increase in just the past decade. Families now own 64% of all Bay watershed forestland. As these numbers continue to grow (more than 70% of family forest owners are older than 55, meaning that additional ownership changes are imminent), the future of forests in the Chesapeake Bay watershed hangs in the balance.

Although there are more family forest owners than ever before, the parcels they own have grown ever smaller. In the past decade alone, the average size of family forest holdings in the Bay watershed decreased by 24%; nearly 70% of family forest owners hold fewer than 10 acres.

IF TRENDS CONTINUE...

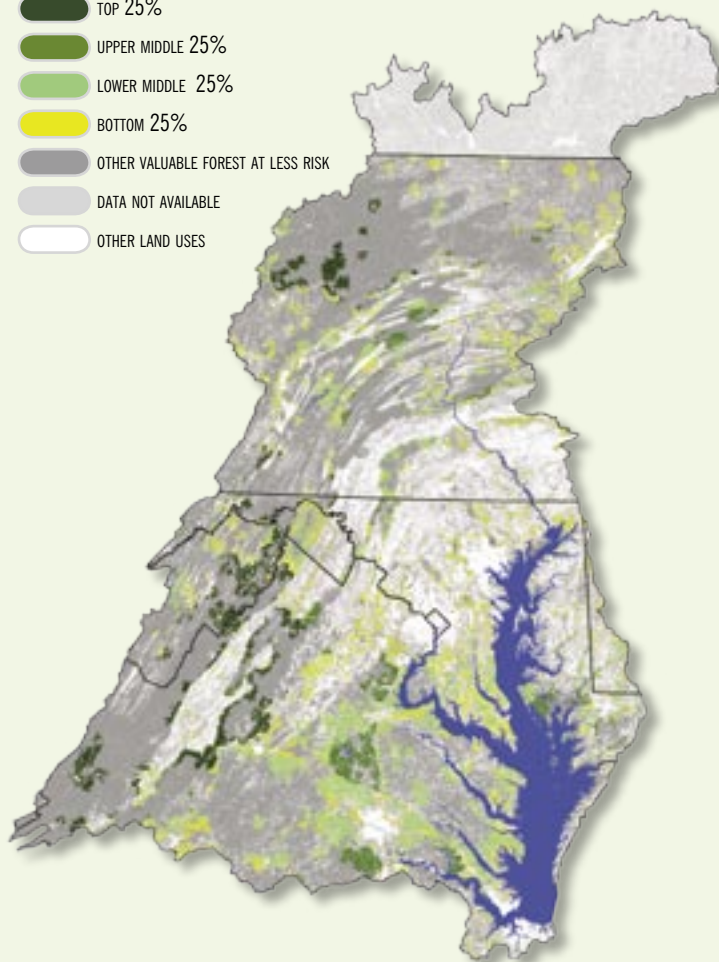
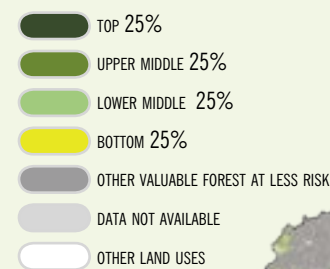
The Bay watershed will soon face the largest intergenerational transfer of family-owned forestland in the region's history.

Individual management strategies may be increasingly inconsistent with large-scale forest conservation, magnifying declines in forest health.

STRATEGIES

Compensate landowners with funding and other incentives to sustainably manage their forests to benefit the Bay watershed and its tributary stream system.

ECOLOGICALLY VALUABLE FORESTLAND VULNERABLE TO DEVELOPMENT — VALUE OF AT-RISK FORESTS



HABITAT HEALTH AND DIVERSITY IN CHESAPEAKE FORESTS ARE DECLINING

Invasive Species: Without effective restrictions or preventive measures, non-native and invasive forest pests and associated diseases will continue to dramatically alter forest conditions in the Bay watershed. Removing non-native pests once they have established themselves is nearly impossible, with dramatic consequences for habitat.

Preventing the entry of new pests and rapidly attacking new outbreaks are of paramount importance. Since 70% of Chesapeake forests at high risk are on private land, keeping pests out requires the cooperation and action of more than 900,000 owners.

IF TRENDS CONTINUE...

Invasive pests will dramatically alter forest habitat, diminishing available food sources and shelter and competing with native species.

The emerald ash borer may kill more than 470,000 ash trees in the Bay watershed.

The Asian longhorned beetle may kill 70% of Pennsylvania's trees and more than 50% of West Virginia's, causing damages of more than \$1 billion.

STRATEGIES

Prevent the introduction of invasive plants, pests, and pathogens, in part by curbing the sale of highly invasive species.

Focus control efforts on high-priority forests.

Changing Forest Makeup: Chesapeake forests are more homogeneous in age and size than they have been at any time over the last several thousand years. This uniformity has resulted in declining habitat diversity, greater susceptibility to disease and pests, and decreased forest resilience.

Forests in the 50- to 100-year age range dominate the Bay watershed, making younger and older forests and the habitats they provide relatively scarce.

Young forests are increasingly rare. Overbrowsing by white-tailed deer has essentially eliminated the tree seedling, sapling, and shrub layers in many regions of the Bay watershed. Trees with diameters of nine inches or less—those that will influence future forest composition—have declined by 8% over the past 20 years. Pests and other forces threaten the future prominence of oak, the region's most ecologically important tree species.

IF TRENDS CONTINUE...

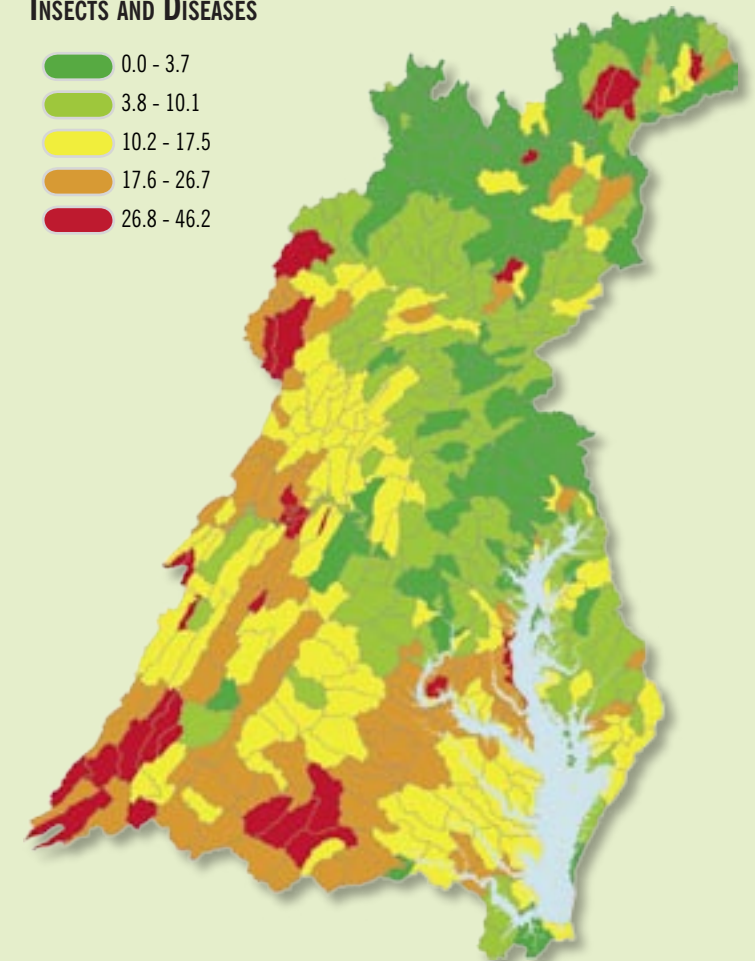
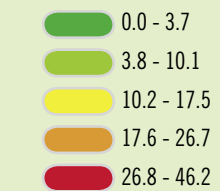
Northern Chesapeake forests could become near monocultures of black cherry with remnants of red maple, American beech, and striped maple, degrading habitat.

In Pennsylvania, the state most affected by overbrowsing, more than 60% of desirable timber species will not be available to the timber industry over the next century.

STRATEGY

Sustain the naturally great diversity of Chesapeake forests by managing for a variety of habitats and balanced deer populations.

PERCENTAGE OF CHESAPEAKE FORESTS AT RISK TO INSECTS AND DISEASES





THE FUTURE FOREST

At stake are both the long-term sustainability of Chesapeake forests and the future health of the Bay. Although a range of forces is threatening the ability of these forests to make critical contributions to the environment, economies, public health, and quality of life for residents of the Chesapeake Bay watershed, these trends need not continue unabated. The choices we make in the next decade have the potential to alter these scenarios and usher in a healthier, more sustainable future. By setting aggressive regional goals for forest retention and expansion and being more strategic in conservation and development planning, governments, forestland owners, developers, environmental groups, and others can ensure a bright future for both Chesapeake forests and the Chesapeake Bay.

The last 100 years have been a time of dramatic change for forestland in the Chesapeake Bay watershed. Concern about the widespread loss and degradation of forestland at the turn of the 19th century led to the increased focus of governments, universities, and environmental groups on forest health and function. This prominent social and political movement gave birth to the field of conservation and helped forest cover rebound.

Chesapeake forests are again being threatened and damaged. It is unlikely that watershed residents can maintain their quality of life and restore the Chesapeake Bay unless forests and their conservation become a more prominent part of public discourse. Embarking on conservation over the next 100 years may need a movement no less dramatic than that of a century ago.

