



# FOREST RESOURCE STRATEGY

## 2010-2015



## **The Mission of the Maryland Department of Natural Resources**

The Department of Natural Resources preserves, protects, enhances and restores Maryland's natural resources for the wise use and enjoyment of all citizens.

### **Forest Service Mission**

To restore, manage, and protect Maryland's trees,  
forests, and forested ecosystems to sustain  
our natural resources and connect people to the land.

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Anthony G. Brown, Lt. Governor

John R. Griffin, Secretary  
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Steven W. Koehn, Director, Forest Service

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Dear Friend of Maryland's Forests

Forests are the largest single land use in Maryland, an integral part of Maryland's landscape, environment, and economy. Forests are the best land use for protecting water quality and cleaning the air, all the while providing wildlife habitat, beautiful scenery, and forest products, benefits we too often take for granted.



In an effort to help Marylanders better understand the value of our trees and forests and the actions needed to keep and improve their contributions in the state, the Maryland Department of Natural Resources and the Maryland Forest Service are please to present the Maryland Forest Resource Strategy 2010 to 2015. The companion document Maryland Forest Resource Assessment 2010 lays out forest trends and conditions, the information base for the Strategy.

Keeping forests in Maryland is important for all of us. Forests once grew on more than 95% of the state's landscape, but now only cover 39%, less than half of their former area. These losses are reflected in our continuing struggles with water quality, air quality, stream health, and the many other forest-related benefits. Maryland has some significant forest blocks in public ownership, but private landowners are responsible for keeping the majority (76%) of our forests present and managed well for the future. Maryland's cities and towns are growing; nurturing trees and forests where we live will be increasingly important for clean water, clean air, and livable communities in a changing climate.

Challenges abound. Forest patch sizes and overall area shrink as land passes from owner to owner. More people and homes in and near the woods increase vulnerability to wildfire. Many streamsides and shorelines still lack the natural forest vegetation to protect the water and aquatic life. New pests and weeds, development pressure, and out-of-balance deer populations affect the forest's ability to renew itself.

The future beyond 2010 also brings many opportunities. New forest product markets can be developed, keeping the incentive for private owners to keep their working woodlands. Environmental services markets are emerging, and can begin to reward landowners for the public goods their forests produce. Partnerships can build bridges to meet common goals, and are essential to meet the scale and scope of needed actions. With good planning and thoughtful stewardship, sustainable forests with environmental and economic benefits are achievable. We invite you to join with other partners, stakeholders, and volunteers to maintain and enhance all of the benefits of our hard-working forests and trees.

Sincerely,

A handwritten signature in black ink that reads "Steven W. Koehn". The signature is fluid and cursive, with "Steven" and "W." being more stylized and "Koehn" being more formal.

Steven W. Koehn  
Director / State Forester  
MD DNR Forest Service

## Executive Summary

The Maryland Forest Resource Strategy lays out a five-year plan based on a long-term approach to desired conditions for Maryland's future forests. The Maryland Forest Resource Assessment characterized a maturing forest base in Maryland that supports considerable biological diversity, expanding potential for sawtimber and other wood products, greater tree growth than removal, net gains in carbon sequestration, and protection of water quality. Forest land conversion to other uses is considered the greatest threat to many of these forest benefits, since forest land is being lost at almost 3% per decade, a loss much greater than the modest but increasing rates of land conservation.

Based on a public involvement and stakeholder process and internal strategic planning, the Forest Resource Strategy identified five major areas for action: Sustaining Forests, Forest Health, Watershed Forestry, Community Forestry and Jobs, and Climate Change. Sustaining Forests was consistently identified as the highest priority, since all the forest benefits depend on forests remaining on the landscape. Other supporting goals in priority order are Forest Health, Watershed Forestry, and Community Forestry. Climate Change goals were considered important to include, and will be used to leverage progress in other goals.

To sustain forests on Maryland's working landscape, core programs for forest management plans, tax incentives, and financial assistance will remain critical. Expanded actions will include a focus on forest markets, effective outreach and education, and greater interaction with local planning requirements at the local level. Responsible management of State Forests will play an important role in demonstrating sustainable forest management on public lands.

To continue supporting priority goals, functions protecting forests from wildfire, pests, and other injury will be maintained. Actions addressing chronic harm from stresses like deer browse, invasive plants and pests, elevated wildfire risk, uncontrolled recreation, and land use change will be addressed in priority areas with a range of partners. The conservation, care, and planting of trees will be used to support Chesapeake Bay commitments for riparian forest buffers, targeted forest conservation for water quality, and expanded urban tree canopy. Technical and financial assistance will support landowner assistance and urban forestry practices essential to building livable communities throughout the state.

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## Introduction

Maryland's forests are the foundation of healthy watersheds, scenic beauty, and a renewable natural resource-based economy in the State. Maryland faces many challenges in sustaining healthy, ecologically functional, and economically viable forests in the face of rapid urban development. Once, more than 90% of Maryland was forested. Today, 39% of Maryland's 6.2 million acres is covered by forest. Maryland is the nation's fifth most densely populated state, with more than 5.6 million people (U.S. Census, 2008 estimate). Population has more than doubled since 1950. There is less than one half acre of forest per person. There are 156,000 forest landowners in Maryland, 84 percent of which own tracts of 10 acres or less.



Maryland has been called "America in Miniature" because it spans eco-regions from the sandy ocean beaches and marshy estuaries across the rolling hills of the Piedmont to the steep slopes of the Blue Ridge Mountains and Allegany Plateau. This fosters a tremendous variety of conditions and habitats within a small state. Maryland also has extensive urban and suburban areas, housing 95% of the state's population on a little over 10% of the land area. Marylanders rely on their trees and forests for recreation, scenic beauty, and livable communities. Many take for granted that forests support healthy streams, fish and wildlife habitat, and clean air. Forest products contribute renewable natural resources for a rural economy and urban wood manufacturing centers, as well as wood for bio-energy. The intersection of the diverse forests, rising population, and varied demands yields an abundance of issues for Maryland's forests to address.

The importance of Maryland's forests was recognized in 2009 when the State Legislature passed the Sustainable Forestry Act, a landmark piece of legislation. This law expresses many of the significant public issues and strategic priorities for forestry in Maryland as summarized below:

- The need for retaining and expanding forests to meet Chesapeake Bay restoration goals, including nutrient and sediment reduction goals of the Chesapeake 2000 Agreement, the nutrient reduction goals of the Water Quality Improvement Act of 1998, and the forestry conservation goals of the 2007 Forest Conservation Initiative, since **forests are the most beneficial land use for protecting water quality**,
- The essential role of Maryland forests in assimilating air and water pollution, retaining up to 85% of the nitrogen they receive from air emission sources such as motor vehicles and electric utilities and filtering drinking water for 75% of the Bay's more than 11 million watershed residents, while simultaneously providing valuable ecological services and economic benefits.
- The broad economic benefits of Maryland forests, annually contributing an estimated \$24 billion to the Bay watershed in ecological services such as wildlife habitat, recreation, air and water filtration, and flood control, including the contribution of an estimated \$22 billion to the regional economy and more than \$2.6 billion to Maryland's economy from the forest products industry.



- The strategic importance of a sustainably managed forest system to promote domestic renewable energy production and locally sourced clean & green energy vital for energy independence, smaller trade deficits, and economic growth concurrently with clean air and water.
- The continued threat of forest land conversion equivalent to 100 acres per day within the overall Chesapeake Bay watershed linked to an expanding population, which absent remedial strategies like the Sustainable Forestry Act, could result in the detrimental impacts noted in “The State of Chesapeake Forests” report and other studies including:
  - (1) the loss of 9.5 million acres of forest by 2030 resulting in the amount of increased nitrogen reaching streams by 200%;
  - (2) the increase in the cost of drinking water and the decline in air quality adversely affecting public health;
  - (3) the largest intergenerational transfer of family-owned forest land in the region’s history with increased risk of loss of forest land to development; and
  - (4) the increase in invasive pests that dramatically alter forest habitat, diminish available food sources, and shelter and compete with native species.

The Sustainable Forestry Act was passed to help Maryland improve and sustain the health and ecological diversity of Chesapeake forests; encourage retention of privately owned forest lands; protect and expand forests in urban areas; increase public appreciation for the value of Chesapeake forests; measure Chesapeake forest conditions in the future; and promote new markets in the field of renewable energy emanating from the use of woody biomass. Maryland’s Forest Resource Assessment and Strategy identify the places and priorities to further realize the goals of Maryland’s ground-breaking Sustainable Forestry Act.



David Cappaert,  
Michigan State University  
Bugwood.org

### **National and Regional Charges for the State Assessments and Strategies for Forest Resources**

The Maryland Forest Resource Assessment and Strategy were produced as part of the national strategy to “redesign” how federal and state cooperative assistance programs address America’s forest lands. Conceived in 2007 this new approach within USDA Forest Service State and Private Forestry (S&PF) improves the ability to identify the greatest threats to forest sustainability, target program delivery and accomplish meaningful on-the-ground change in high priority areas. The Redesign process identified three national priorities:

- Conserve and manage working forest landscapes for multiple values and uses,
- Protect forests from threat, and
- Enhance public benefits from trees and forests.

The Food, Conservation, and Energy Act of 2008, also known as the 2008 Farm Bill, codified the main components of Redesign, including the three national priorities, into law by amending the Cooperative Forestry Assistance Act. Each state is required to complete a State-wide Assessment and Strategy for Forest Resources, and respond to the National and Regional Guidance listed below. The Assessments provide an analysis of forest conditions and trends in the state and delineate priority

rural and urban forest landscape areas. The Resource Strategies provide long-term plans for investing state, federal, and other resources to where it can most effectively stimulate or leverage desired action and engage multiple partners. Taken together the State Forest Resource Assessments and Strategies are to be used by states to target program delivery and develop competitive proposals for addressing priority landscape areas and issues.

**State Forest Resource Assessments** — In order to ensure that federal and State resources are being focused on high priority areas with the greatest opportunity to achieve meaningful outcomes, each state, territory or island has worked collaboratively with the U.S. Forest Service and other key partners to develop a comprehensive state forest resource assessment. These assessments provide a comprehensive analysis of the forest-related conditions, trends and opportunities in each state.

Assessments are slated for review and updates on at least a five year cycle. The assessments encompass existing planning requirements for USFS State and Private Forestry funding, moving assessment and planning tasks to be more integrated. At a minimum, Maryland's forest resource assessment:

- Describes forest conditions on all ownerships in the state
- Identifies forest related benefits and services
- Highlights issues and trends of concern as well as opportunities for positive action
- Delineates high priority forest landscapes to be addressed
- Outlines broad strategies for addressing the national priorities along with critical issues and landscapes identified through the assessment.

Maryland's Forest Resource Assessment also identifies critical information gaps so that this information can be acquired as opportunities arise and to better coordinate with other natural resource plans. The assessment addresses **all public and private ownerships** in Maryland, spans the **urban to rural continuum**, and is guided by the following **Seven Criterion of Forest Sustainability** established through the Montreal Process:

- Criterion 1: Conservation of **biological diversity**
- Criterion 2: Maintenance of **productive capacity** of forest ecosystems
- Criterion 3: Maintenance of forest ecosystem **health and vitality**
- Criterion 4: Conservation and maintenance of **soil and water** resources
- Criterion 5: Maintenance of forest contribution to **global carbon cycles**
- Criterion 6: Maintenance and enhancement of long-term multiple **socioeconomic benefits** to meet the needs of societies
- Criterion 7: **Legal, institutional, and economic framework** for forest conservation and sustainable management

## Vision of Maryland's Future Forests

Maryland's forests are resilient in the face of changing stresses and protected from major harm. The forest ecosystems are healthy, diverse and capable of renewing themselves. Landowners and other citizens are confident that investments made in forests will bear fruit, and voters are aware of the multiple benefits from forest products, clean water, clean air, thriving wildlife, and green jobs. Forests support a diverse and sustainable resource-based economy with a variety of sustainable forest products, living-wage sustainable jobs, and multiple ecosystem markets. Increased tree canopy and forests foster more livable communities where people of all ages enjoy a greater connection to the natural world.

The conditions, trends, threats and opportunities are laid out in a companion document, the 2010 Forest Resource Assessment.

**Forest Resource Strategy** — With the background provided by the State Forest Resource Assessment, to the Maryland DNR Forest Service worked collaboratively with partners and stakeholders to develop a State Forest Resource Strategy. Maryland's Forest Resource Strategies describe how Maryland proposes to invest state and federal dollars, in combination with other available income streams, to address national priorities to produce desired outcomes in accordance with priorities identified in the State Forest Resource Assessment.

### **The Maryland's Forest Resource Strategy:**

- Describes how Maryland Forest Service proposes to invest both competitive and non-competitive federal funding, along with other available resources, to address national and regional priorities as well as those identified in the state's forest resource assessment
- Describes how the state's proposed activities will accomplish national program objectives and respond to specified performance measures
- Outlines a specific timeline for project/program implementation
- Provides a detailed budget including opportunities to leverage non-federal resources
- Identifies partner/stakeholder involvement
- Identifies strategies for monitoring outcomes and revising action as needed

## **Strategy**

Maryland's Forest Resource Strategy is intended to chart a course that builds towards a desired future condition, a vision of Maryland's future forests (sidebar). The following strategies outlined herein are meant to guide actions and investment of resources over the next five years. It is built on an understanding that forests are long-term investments needing near term actions to contribute to progress over decades as well as a comprehensive and coordinated approach will improve the odds of effective progress.



The Strategy was developed following a public involvement process that identified four major issues:

- Issue 1 Maintaining Viable Forests and a Viable Forest Industry;
- Issue 2 Demographic, Social, Cultural, and Economic Trends as Impediments to Forest Retention;
- Issue 3. Strengthening Forest Management by the Private Landowner;
- Issue 4: New and Emerging Markets for Forest-based Resources.

The feedback from the public stakeholder on these four issues, involvement of Maryland Forest Service managers from throughout the state, and interaction with partners were used to develop the five statewide issues contained in the final Maryland Forest Strategy. Topics related to keeping forestland in forest were consistently rated as a critical issue. Details of the public involvement process are contained in the sections on Partner and Stakeholder Involvement and Appendix B.

The strategy for managing Maryland's forests and trees is based on the conditions, trends, threats, and opportunities, captured in the companion document, "An Assessment of Maryland Forests, 2010".

The assessment uses the seven criteria for sustainable forestry developed through the Montreal Process. The seven criteria for sustainable forests support the five statewide issues for the Forest Resource Strategy. The assessment also identifies priority areas to focus targeted actions addressing threats that vary across Maryland's forested landscape.

## ***Findings: Maryland Forest Resource Assessment, 2010***

### **1. Conservation of Biological Diversity**

- Loss of forest land to development, 151,500 acres between 1986 and 2008, and fragmentation of existing forests are among the most wide-spread threats to biodiversity.
- Maryland is characterized by a maturing forest mostly between 40 and 100 years old, with relatively low acreage in old growth (<1%) or early successional forest (9%).

### **2. Maintaining Productive Capacity of Forest Systems**

- The proportion of larger, sawtimber-sized trees (76%) is increasing as forests mature.
- Sixty-three percent of Maryland's forests are in the oak-hickory forest type.
- Less than 58% of average annual growth of forests is removed by harvesting, although in some pine areas of the Lower Eastern Shore, removals are closer to annual growth.



### **3. Maintaining Forest Ecosystem Health and Vitality**

- As with biodiversity, the greatest threat to forest health is considered to be forests converted to development, anticipated to increase 48% between 1990 and 2015. Development threat is highest in the central portion of the state.
- Wildfire is being effectively controlled, and current trends show declines in acreage of unplanned wildfire ignitions.
- Future shifts of species assemblages are likely in response to changing climate, with increases in pine and losses of sugar maple/beech/birch forests.
- Invasive species pose significant threats to forest health, with current damages from exotics like Hemlock Woolly Adelgid, Emerald Ash Borer, Gypsy Moth, Beech Bark Disease. Future damage is likely from pests like Sirex wood wasp present in neighboring Pennsylvania, while efforts are underway to avoid introduction of problems like Sudden Oak Death.
- Other forest stresses include damage from high populations of white-tailed deer and an array of invasive, exotic plants.

### **4. Conserving and Maintaining Soil and Water Resources**

- Forests are the most protective land use for water quality, so the conversion of forests to other land uses is one of the most significant threats to Maryland's water quality.
- Riparian areas and other hydrologically active areas like seeps, springs, and toe slopes are especially important locations to have forests present on the landscape.

### **5. Maintaining Forest Contributions to Global Carbon Cycles**

- Maryland's forests are contributing an increasing amount to sequestration of carbon, tied to the greater size of trees in the maturing forest landscape.
- Estimates of carbon in forest biomass suggested a 31% increase from 2004 to 2008.

### **6. Maintaining and Enhancing Long-term Multiple Socioeconomic Benefits to Meet the Needs of Societies**

- Forest industry is a significant economic engine in Maryland, a \$4+ billion industry and the fifth largest economic sector; the greatest influence of primary forest harvesting and management

activity is in the rural areas, Eastern Shore, Western Maryland, and Southern Maryland, but is present statewide.

- Recreation is an important forest use, but safety and environmental issues with motorized recreation like all-terrain vehicles are increasing.
- Maryland's forests are 76% privately owned. Most people who own forests don't plan to manage the forest primarily for timber; 84% of landowners own less than 10 acres of forest.
- Acreage of lands protected from development has been increasing through state and local acquisitions as well as easements and donated easements.



Tom Darden

## 7. Legal, Institutional, and Economic Framework of Forest Conservation and Sustainable Management

- Maryland has a robust suite of laws for protecting forests, from the Sustainable Forestry Act of 2009 to the Forest Conservation Act, Critical Area Law, Nontidal Wetlands Law, sediment and erosion control requirements, and local government comprehensive plan requirements.
- Maryland has committed to practice sustainable management on forests and third-party certify all State Forests under both Forest Stewardship Council and Sustainable Forestry Initiative standards.
- Chesapeake Bay commitments include expanded riparian forest buffers, increased forest conservation in priority areas, and urban tree canopy goals.

Maryland's Forest Resource Strategy addresses the priorities identified in the national strategic planning effort by the U.S. Forest Service. The national priorities addressed by the Maryland Issue are identified below the issue titles. The goals and objectives identify and respond to the current situation in Maryland's forests. Priority Areas from "An Assessment of Maryland Forests, 2010", are included in the sections of the strategy where they are most relevant for implementation. Please refer to the Assessment document for details of the GIS models, data sources, and analysis used to develop the priority areas. The priority areas do not mean that no actions will be taken outside of those areas for a particular goal or set of actions, but that planning and resources will emphasize progress in those areas. Colors in maps are used to distinguish among areas and do not denote different levels of priority.

### ***Maryland Issue I. Restore and Sustain Forest Landscapes***

(Supports National Priority I, Conserve and Manage Working Forest Landscapes for Multiple Values and Uses)

When the health and integrity of our lands deteriorate, so do the environmental, economic, and social benefits they provide, with enormous impacts on drinking water, carbon emissions, climate, wildlife, recreation, community health, and prosperity. To maintain these vital functions, the Maryland Forest Service will work with partners to restore and sustain forest landscapes and provide incentives to prevent the loss of private forests and other working lands to development. Public forests are uniquely situated to provide some wider ranges of benefits and serve as models for ecological forestry. None of the other benefits of forests can be provided if the forests themselves do not remain.

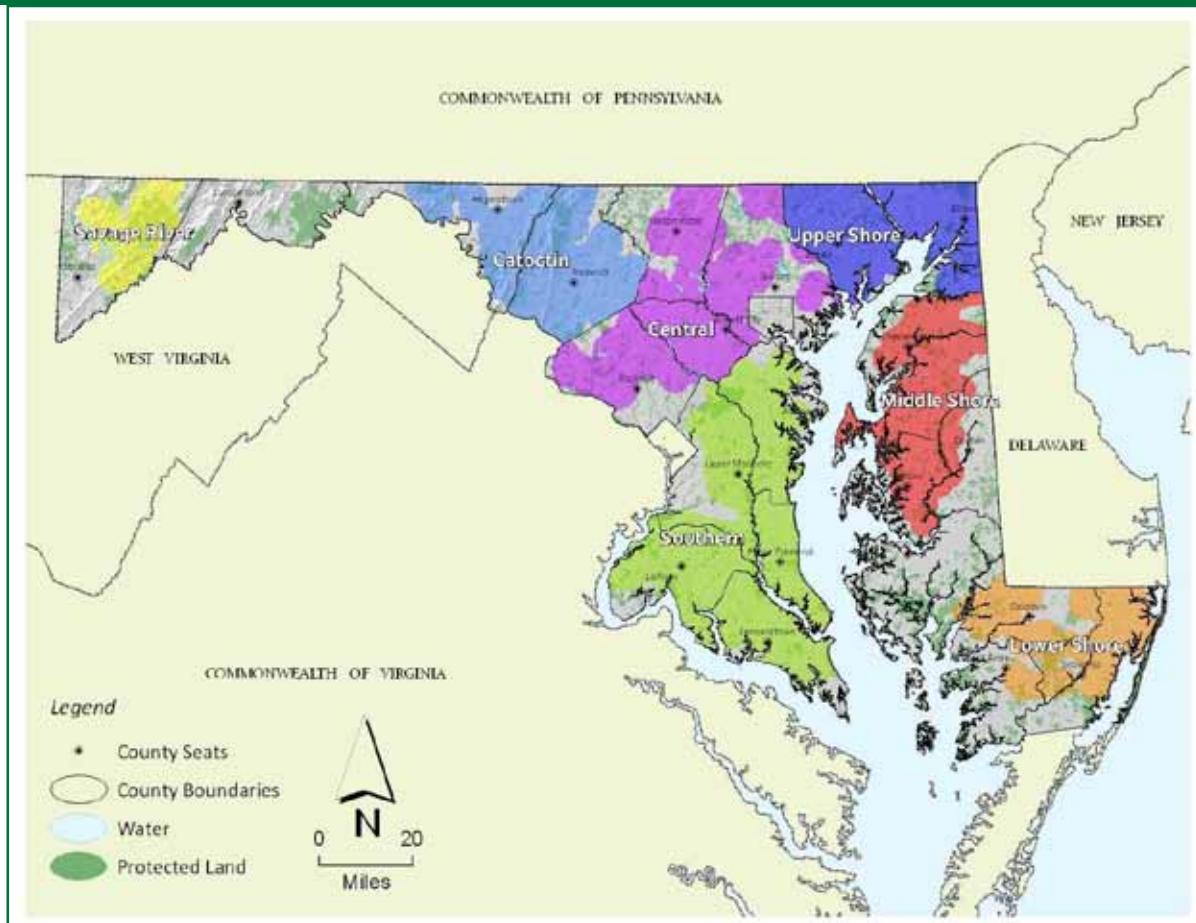


Figure 1: Priority areas to address forest fragmentation and risk of development

**Goal I.A. Keep Forests as Forests** – Prevent the loss of private forest land and forested landscapes through technical assistance, tax guidance, incentives, and mechanisms such as land acquisition and conservation easements.

*Strategy I.A.1. Improve the economics of private forest management and promote sustainable forest management through the Forest Stewardship Program.*

Example Tactics:

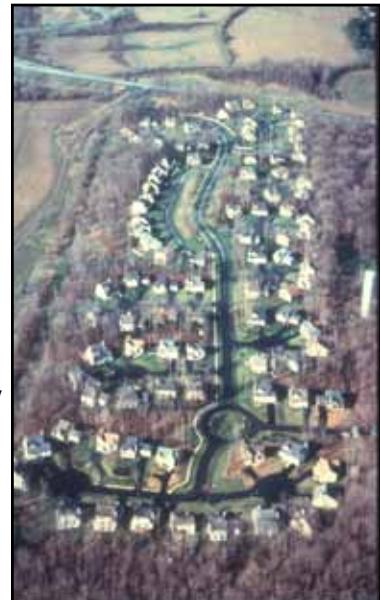
- Continue to work with NRCS, Soil Conservation Districts, University of Maryland Extension, and others to provide forestry assistance to landowners
- Deliver technical expertise in the preparation, implementation, and monitoring of sustainable forest management plans, tailoring State services to regional needs and partner capacity to share relevant information and avoid duplication of technical assistance
- Promote opportunities for good forest management by facilitating economic infrastructure for diversified forest products markets
- Develop options for forest income even on smaller forest parcels (< 10 acres)

*Strategy I.A.2. Develop and disseminate forestry resources for landowners with emphasis on outreach to new and future owners to help them maintain and manage forests.*

Example Tactics:

- Build capacity for landowners to educate themselves through programs such as Maryland woodland Stewards that will encourage cooperative land management and effective access to professional forest management assistance
- Initiate detailed surveys on private landowner demographics to target outreach and education

- With partners like Forestry for the Bay and University of Maryland Extension, provide enhanced portals for private landowners to access educational, technical, and financial assistance, leveraging strengths of multiple organizations through effective partnership
- With partners like the volunteer Forest Conservancy District Boards and University of Maryland Extension, expand awareness of forestry issues, good practices, and available resources for private landowners
- Educate landowners on silviculture, applied forest ecology, and economic implications for common forest harvest options.
- Target landowners with small acreage to encourage forest management and transition of lawn to natural areas through programs like Woods in Your Backyard



*Strategy I.A.3. Provide incentives to maintain forest cover.*

Example Tactics:

- Identify where changes in tax and other state policies could provide economic incentives for keeping large and small forest parcels
- Provide a fair, stable, and effective regulatory structure with timely permitting
- Remove barriers for family and industrial landowners to maintain their working lands and transfer unfragmented lands to the next generation
- Remove the cap on Woodland Incentive Program funding from forestland conversion transfer tax
- Provide incentives for small acreage owners to convert lawn to natural areas

*Strategy I.A.4. Reduce the trend toward fragmentation and parcelization, offering technical support and education for local, regional, and state governments and other stakeholders for effectively targeting important forest resources, maintaining working rural landscapes, and supporting responsible forest harvesting.*

Example Tactics:

- Provide technical forestry information to local land use planners and decision-makers
- Educate legislators and local government officials to support informed decisions on sustainable management of natural resources, using programs such as Local Government Exchange
- Work with local governments to avoid burdensome restrictions for acceptable forestry practices
- Transfer technology to local planners, focusing on messages related to planning goals and requirements such as protecting priority woodlands, setting goals for open space, and improving water quality

*Strategy I.A.5. Pursue no-net-loss of forests.*

Example Tactics:

- Expand tree planting on public and private land to offset forest loss,
- Establish the Sustainable Forestry Council and implement the Sustainable Forestry Act of 2009
- Refine the Forest Conservation Act, related laws, and planning guidance to minimize losses of forests important for water quality
- Identify important large tracts of forests not currently protected from development
- Use conservation easements, purchase of development rights, Forest Conservation Management Agreements, and other land preservation techniques to protect priority forest

- lands
- Improve ability of land preservation programs to protect important forest areas, such as the increased coordination of Maryland Agricultural Land Preservation Foundation with Forest Conservancy District Boards through the annual meetings required by the 2009 Sustainable Forestry Act
- Work with local jurisdictions to develop land use rules that support sustainable resource management, a viable resource-based economy, and conservation of priority working forests
- Explore options to create long terms for Forest Conservation Management Agreements, a key program for motivating landowners to conserve forests

*Strategy I.A.6. Assure supply of expertise and materials for forest management and tree planting, continuing efficient production of affordable seedlings with a diversity of species*

Example Tactics:

- Efficiently produce high quality yet affordable forest tree seedlings to support afforestation, reforestation and restoration needs on public and private lands
- Increase local source seed collection in partnership with conservation and community organizations.
- Provide genetically superior Loblolly pine and White pine for reforestation in Maryland and Delaware
- Establish mid-Atlantic provenance hardwood seed production areas, selecting sources from large forest blocks protected from development such as State Forests or forests conserved with perpetual easements
- Promote species diversity by offering a large variety of affordable tree and shrub seedlings suitable to the diverse habitat types of Maryland and Delaware
- Improve landowner access to and information on licensed foresters and sources of professional forestry advice.
- Partner with efforts like the Woods in Your Backyard and Forestry for the Bay to provide quality information on managing forests of all sizes, even small parcels (<10 acres)

**Goal I.B. Manage for Resilient Forests-** Apply ecologically sound forest management now to keep healthy native forests and habitats into the future, countering stresses from the altered ecology of Maryland's landscapes.

*Strategy I.B.1. Improve natural resource management and diminish the use of practices that degrade forest quality and wildlife habitat over time*

Example Tactics:

- Assure the ready availability of affordable professional forestry expertise
- Support ongoing partnership with the Society of American Forester and other professional organizations to provide training to maintain a cadre of well-trained professionals with access to current skills and science
- Support Forest Certification programs, landowner cooperatives for more efficient management, and other innovative programs for private forest landowners
- Encourage forest management that supports principles of Sustainable Forestry (Montreal Process Criteria and Indicators)

*Strategy I.B.2. Focus restoration and conservation efforts using priority areas identified by the State Forest Resource Assessment and Strategies, working across ownerships incorporating all lands*

Example Tactics:

- Prioritize activities based on mapped priority areas for urban forestry, fire risk, water quality, forest stewardship need, and Forest Legacy

- Work with NRCS, Soil Conservation Districts, and Farm Service Agency to implement appropriate forest practices in Priority Watersheds in cooperation with family farm owners and other qualifying forestland owners
- Encourage expanded use of Forest Conservation Management Agreements in watersheds with high priority for working forests

*Strategy I.B.3. Strengthen landscape restoration initiatives, providing focused integrated support utilizing science, land management, and technology transfer expertise across programs while considering ecological function in efforts to improve forest connectivity.*

Example Tactics:

- Improve forest conservation and connectivity over time by targeting afforestation and land protection programs
- Coordinate with land conservation stakeholders to design complementary actions that support overall landscape conservation and restoration strategies statewide, learning from Pennsylvania's Conservation Landscape Initiative
- Partner with other landscape initiatives, such as USFWS Landscape Conservation Cooperatives and other regional or national frameworks for landscape conservation
- Encourage landscape diversity, including older forests and early successional forest habitat

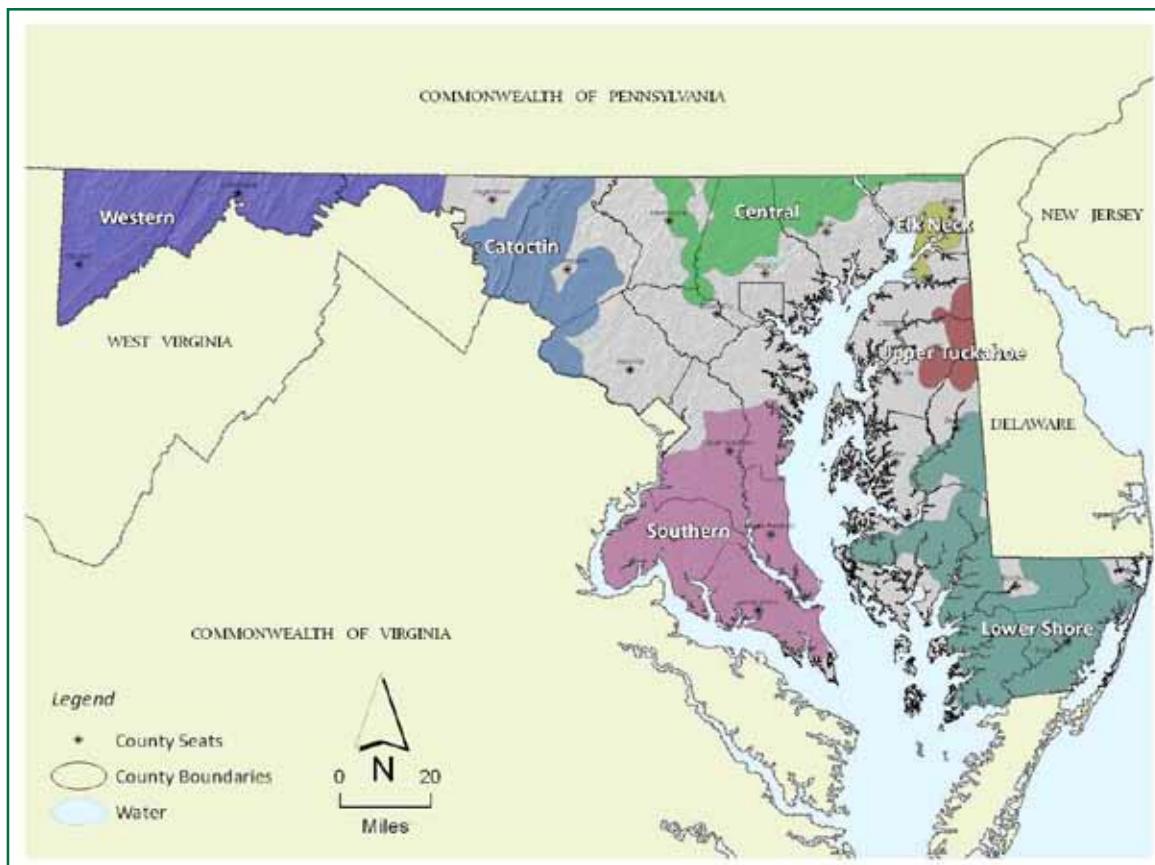


Figure 2: Priority map for fish and wildlife habitat

*Strategy I.B.4. Provide habitats for rare native species dependent on forest ecosystems, integrating efforts with landscape restoration and conservation and reflecting priority actions for forested habitats in the Wildlife Diversity Conservation Plan*

Example Tactics:

- Protect high-quality contiguous forest blocks
- Implement the Habitat Conservation Plan for Delmarva Fox Squirrel with emphasis on public lands

- Apply the Old growth policy and mapping to DNR lands
- Manage for ecological functions on High Conservation Value Forests identified on certified forest land (usually 30 to 40% of the certified land base)
- Seek opportunities to restore native forest communities such as Atlantic white-cedar, shortleaf pine, pond pine, cherrybark oak, American chestnut, and others using local genotypes to the extent possible
- Provide local seed source for selected species to the State Nursery to provide appropriate native genotypes for restoration
- Work with partners to improve deer herd management and reduce overbrowsing of native species

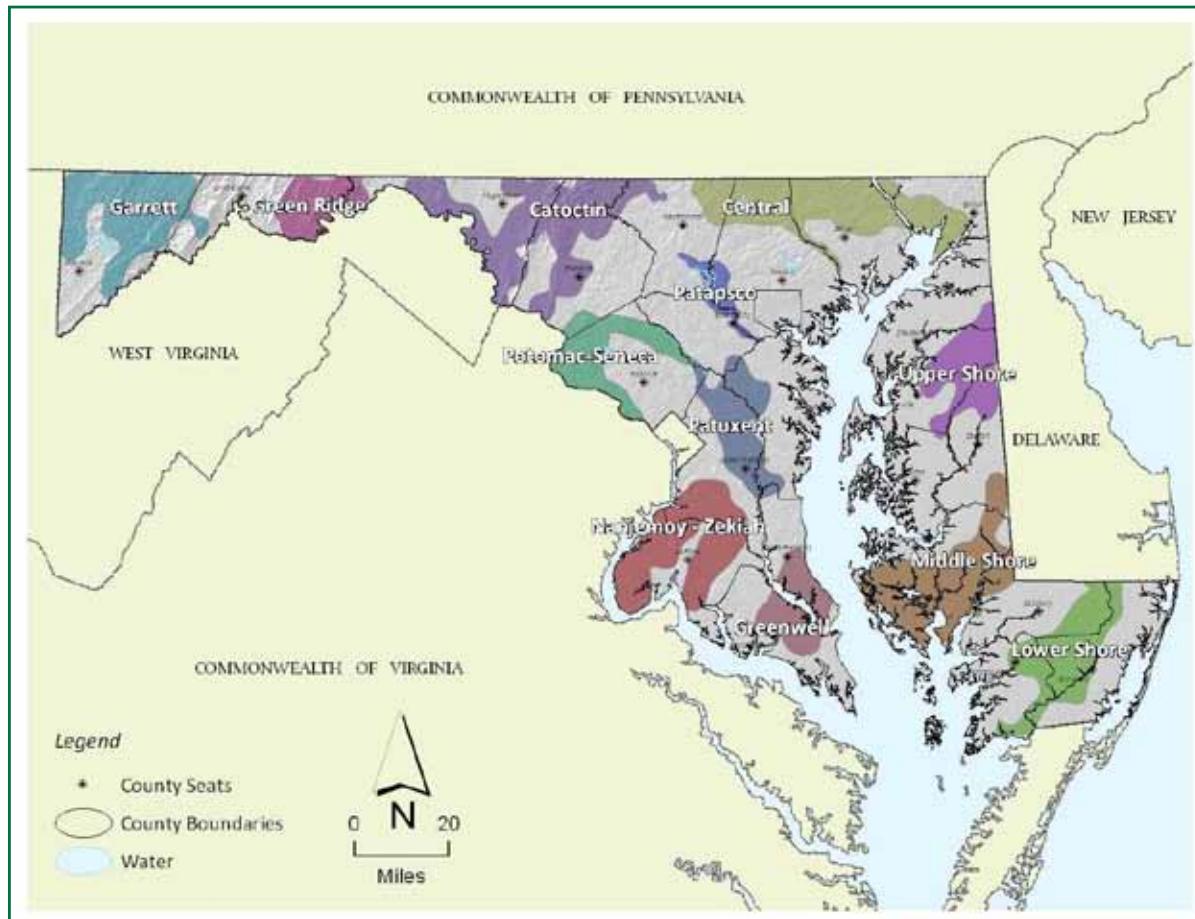


Figure 3: Priority areas for supporting a forest-resource-based economy

**Goal I.C. Support Traditional and Emerging Markets-** Develop sound policies and programs that allow markets to support good forest management, and ensure the continued right to practice forestry, because without appropriate markets, forest management is not affordable or widely practiced.

*Strategy I.C. 1. Maintain and Diversify Markets for Forest Products – Use markets for forest products to create rural wealth, retain jobs, and ensure a robust forestry infrastructure and economic diversity to perform critical restoration and management activities.*

Example Tactics:

- Establish pilot projects with a sound research basis to explore product viability, value-added products, new markets, and income options to support the development and expansion of diverse and innovative markets for sustainable forest products

- Support growth and expansion of forest-based markets and products and ensure a balance between new and existing infrastructure
- Support efforts to retain and enhance wood utilization infrastructure. Increase local capacity to facilitate local market development and oversight
- Communicate with landowners, local governments, investors, and entrepreneurs to convey technical and financial assistance programs, value-added uses of forest resources, their role in helping communities thrive, and public awareness of new opportunities
- Help develop new and expanded markets for bio-energy and bio-based products, using available programs such as Biomass Crop Assistance Program wisely to avoid damaging existing sustainable forest product markets. Capture emerging opportunities, find markets for various uses of woody biomass and new products, and enable cost-effective biomass utilization at both local and regional levels
- Facilitate a reliable and sustainable supply of biomass from public and private lands through projects that are compatible with sustainable healthy forests
- Use public policies and regulations that support efficient forest industry (truck weights, fumigation, low-interest capital, favorable tax treatment, marketing, role of public lands, government agency support, Dept. of Business and Economic Development)
- Uphold rights for landowners to lawfully practice forest management, established in the Sustainable Forestry Act of 2009
- Open markets to all green building standards and all wood certification programs, encouraging meaningful certification standards that improve practices
- Facilitate greater participation in certification for forest management and wood processing/chain-of-custody

*Strategy I.C.2. Support Ecosystem Markets - Support the development of emerging ecosystem markets to encourage private investments to conserve private forests and recognize the values they provide.*

Example Tactics:

- Advance and support market-based approaches to the conservation and enhancement of ecosystem benefits, such as water-quality trading, conservation banking, mitigation banking, tax incentives, renewable energy credit trading, and carbon-credit trading
- Sponsor pilot programs and demonstration projects that test and evaluate market mechanisms and innovative approaches
- Ensure that climate change and renewable energy legislation and policies recognize forestry contributions, include new market opportunities, and mitigation and adaptation activities

*Strategy I.C.3. Coordinate research needed to support sustainable forestry and efficient markets.*

Example Tactics:

- Collect and analyze data pertaining to timber consumption and usage, industrial output, and business trends
- Identify and market potential sources of underutilized biomass supply.
- Encourage utilization of biosolids, poultry litter and other wastes to grow short-rotational woody crops and enhance growth of existing forest
- Quantify carbon sequestration with partners, applying relevant research to develop useful estimates for policies and programs
- Develop estimates for carbon and water services supplied by rural forests to complement ecosystem services estimates available for urban forests.
- Track landowner demographics, attitudes toward management, and patterns of land development related to intergenerational transfer/inheriting land.

**Goal I.D. Demonstrate Sustainable Forest Management on Public Lands-** Use public forest lands to demonstrate the practice of sustainable forest management that could be emulated on private land and supply scarce landscape elements like old-growth and early successional habitat for the public good.

*Strategy I.D.1. Maintain capacity for forest management, including maintaining necessary workforce levels and appropriate skill sets*

Example Tactics:

- Provide appropriate training, equipment, compensation, and job classifications.
- Address institutional capability, both in workforce levels and transfer of knowledge
- Provide priorities for filling vacancies and analyze future needs

*Strategy I.D.2. Continue sustainable third-party certification of State Forests to improve the practice of ecological forestry with independent oversight.*

Example Tactics:

- Integrate certification into the long-term planning on all State Forests.
- Develop and maintain database and documentation capacity to support certification and adaptive management
- Develop and use a series of indicators to measure sustainable forestry on State lands and at the landscape level

*Strategy I.D.3. Provide a diversity of forest types and ages across the landscape, coordinating with interdisciplinary and advisory teams to assure a balanced approach to multiple resources.*

Example Tactics:

- Develop long-term plans that increase diversity over time, increasing extent and quality of older forests and early successional habitat, protect natural systems through BMPs and enhance native ecosystems
- Integrate measures of landscape context to increase benefits of the diverse forest types and plan for shifting conditions over time

*Strategy I.D.4. Maintain a regularly updated natural resources inventory and capabilities for monitoring forest conditions and health.*

Example Tactics:

- Invest in needed protocol development, personnel, equipment, and training
- Collaborate with federal and state partners to maximize utility of inventory data and ability to exchange information
- Identify additional information needs such as road location and condition, ecological importance, economic analysis, economic forecasts, and other data gaps

*Strategy I.D.5. Provide a diversity of sustainable recreation opportunities on public lands*

Example Tactics:

- Identify and use funding sources to develop recreational opportunities in balance with sustainable forestry practices
- Develop partnerships with recreational user groups to aid implementation of creating and maintaining recreational resources
- Address uncontrolled destructive recreational use on public lands
- Maintain/promote primitive/passive recreation opportunities
- Improve public access to waterways adjacent to public lands (incl. John Smith Water Trail)

**Maryland Issue II. Ensure Healthy and Resilient Forests**

(Supports National Priority II, Protect Forests from Threat)

The incredible range of benefits from forests relies on maintaining the health of the trees and forest communities over time. The stresses endured by forests have changed over time, and require some changes and additions to management actions. The settled landscape comes with an altered fire regime that demands widespread suppression, an increased variety and supply of invasive exotic species, and unprecedented populations of white-tailed deer. Keeping the natural resilience of the forests to storms, pests, and other threats requires addressing both sudden events and chronic stresses.

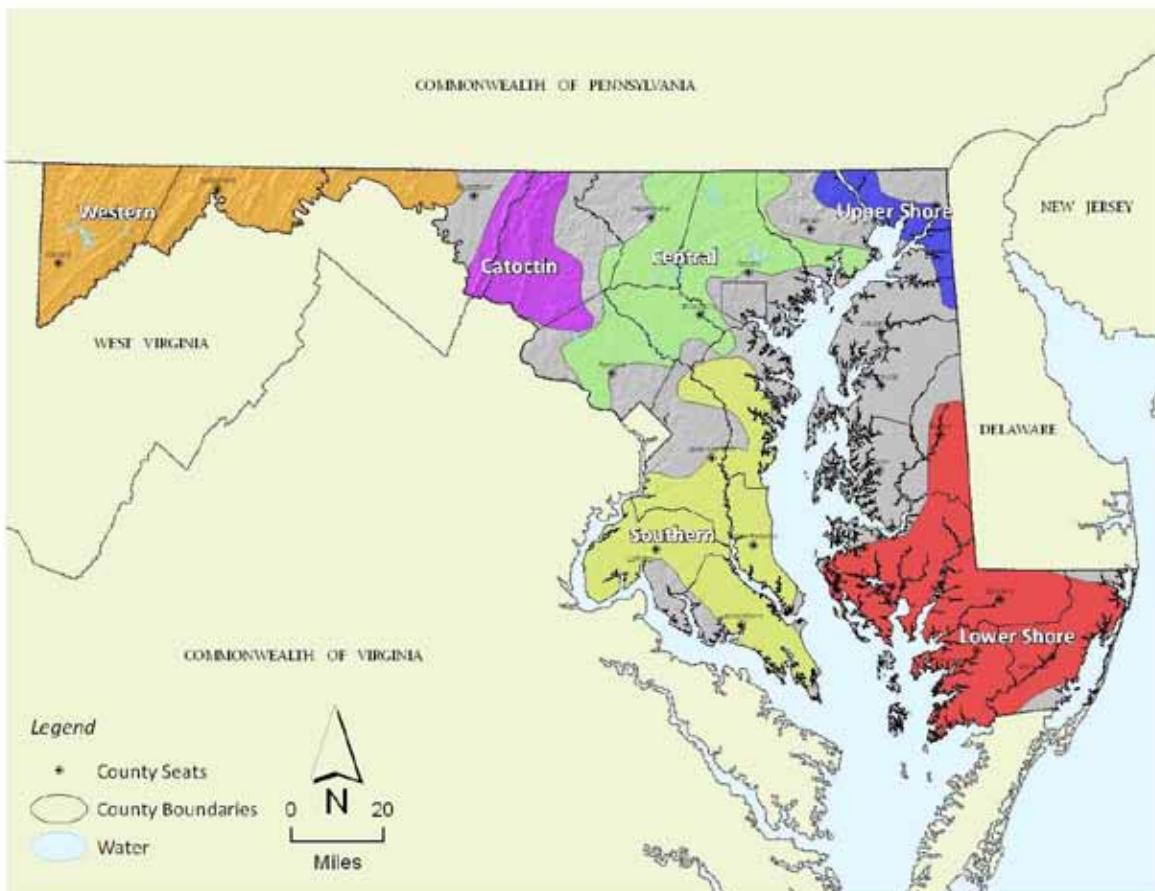


Figure 4: Priority areas for wildfire suppression and risk reduction

**Goal II.A. Provide Emergency Response to natural resource threats.** Develop the trained personnel, partnerships and resources needed during disasters like wildfire, storms, and other deadly threats that require immediate action to protect forests and minimize damage.

*Strategy II.A.1. Provide timely and effective fire suppression for wildland fires, maintaining skills for an incident command system*

Example Tactics:

- Maintain levels of trained personnel to effectively control wildfires
- Provide readily accessible wildfire training to agency and other emergency responders

*Strategy II.A.2. Provide timely and effective response to other emergencies or disasters affecting forests (invasive species, storm damage, earthquakes....)*

Example Tactics:

- Use incident command structure to provide a disciplined and effective response to emergencies
- Develop policies to guide response to identified catastrophic threats
- Develop funding sources for the Forest Health Emergency Contingency Program authorized by the 2009 Sustainable Forestry Act, am emergency response fund similar to the Beach Replenishment Fund

*Strategy II.A.3. Maintain partnerships and build response capacity with fire departments and emergency response agencies*

Example Tactics:

- Participate in State and local emergency response planning, assuring compatibility among responders and clarity of supporting roles.
- Provide grant funding opportunities to volunteer fire departments for effective wildland fire response
- Address wildland fire equipment needs through partnerships such as excess personal property programs
- Participate in the Mid-Atlantic Forest Fire Compact for regional coordination of emergency response needs

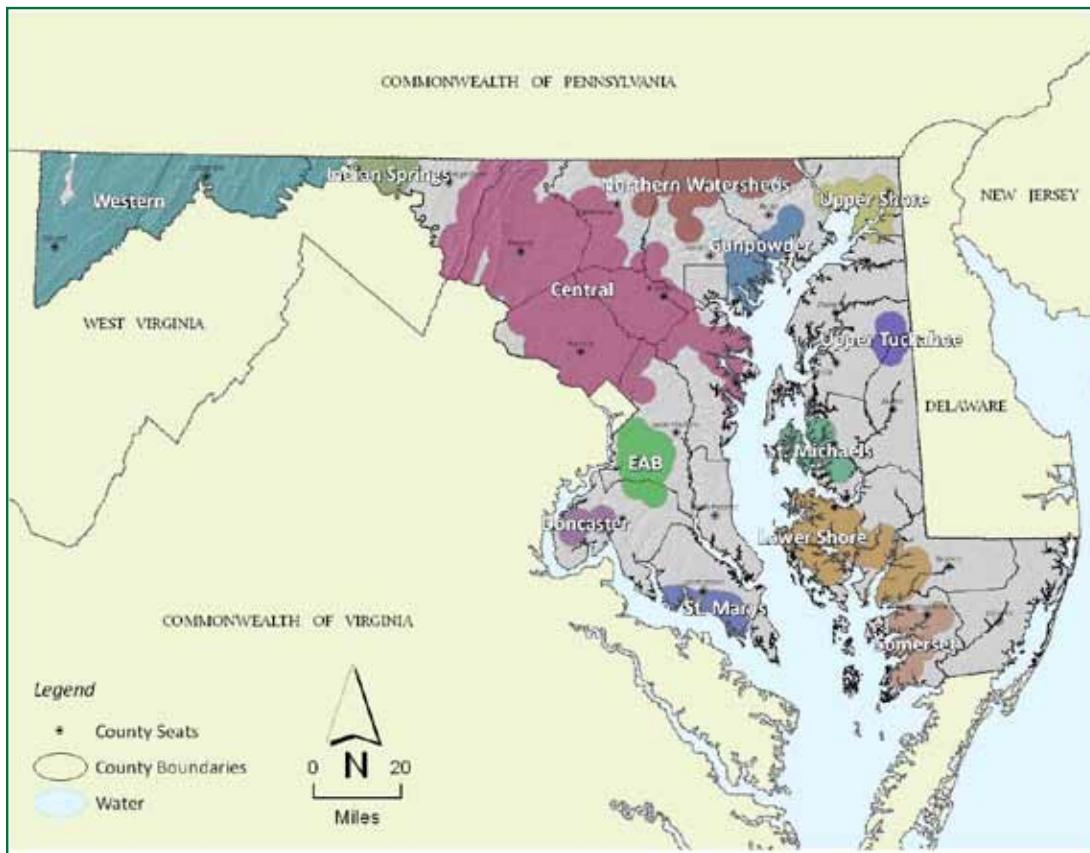


Figure 5: Priority areas for addressing forest health issues

## Goal II.B. Develop approaches to reduce threats from long-term stressors

**to forests.** Address the many threats to forests that act gradually and cumulatively but over time are changing the health, composition, and resilience of our forests. Use a tailored response that identifies gaps in information and actions needed, builds on existing partnerships and planning, and promotes actions that can shift trends toward more

sustainable conditions.

*Strategy II.B.1. Pursue control of deer browsing where normal forest regeneration is threatened*

Example Tactics:

- Work with wildlife agencies to support effective deer management policies and rules
- Develop cost-effective options appropriate to Maryland conditions to regenerate native trees at various levels of browse pressure
- Expand information available on trees and native vegetation less preferred by deer

*Strategy II.B.2. Control invasive plants where normal forest growth and regeneration is threatened*

Example Tactics:

- Expand awareness of invasive plants through forest stewardship planning and statewide coordination of invasive species control efforts
- Improve control recommendations in forest management plans and implement a DNR Do-Not-Plant policy for exotic invasive species
- Improve capacity to quickly control new invasions and reduce damage from established invasive plants, using approaches that protect rare species
- Prioritize efforts on species of greatest concern for tree regeneration and forest quality, using pilot projects to identify effective approaches for control.

*Strategy II.B.3. Control invasive pests, destructive insects and diseases to prevent widespread forest mortality and loss of native forest types*

Example Tactics:

- Work with partner agencies and groups to identify infestations, extent, and severity, and carry out available responses
- Improve capability for rapid response for control
- Develop long-term action plans to reduce severity of damage and increase resilience of forest ecosystems
- Develop data on species composition and distribution in urban and rural areas
- Use Integrated Pest Management practices to minimize unintended effects on non-target organisms like butterflies and beneficial insects

*Strategy II.B.4. Reduce wildfire risk in areas of Wildland Urban Interface*

Example Tactics:

- Develop Community Wildfire Protection Plans to address fuels, hazards, response capability, and defensible space in priority locations.
- Reduce hazard fuels through prescribed burning or mechanical treatments
- Reach private forest owners with information on managing fire risk on forested property.

*Strategy II.B.5. Promote scientifically based management practices to maintain native forest composition altered by fire suppression and other ecological disturbances.*

Example Tactics:

- Provide information on management need and forest management options for a variety of parcel sizes through an integrated forest landowner information portal like Forestry For the Bay
- Use prescribed fire and other practices to restore natural disturbance regimes in support of native plant communities like oaks and other mast-bearing species important for winter wildlife food
- Use available cost-share like the Landowner Incentive Program to support rare species habitat

*Strategy II.B.6. Address resource damage from uncontrolled recreation across ownerships*

Example Tactics:

- Work with stakeholder groups, landowners, and other interested citizens to develop policies,

- rules, areas, and fees that can balance access with resource protection
- Support BMPs for providing private recreation opportunities/markets
- Support restoration of damage from uncontrolled recreation

*Strategy II.B.7. Reduce impacts to forests due to change in land use* (development or roads) at state or local levels and promote beneficial mitigation locations

Example Tactics:

- Mitigate development impacts through coordinated implementation of laws like Forest Conservation Act, Chesapeake and Atlantic Coastal Bays Critical Area Law, Nontidal Wetlands Law, land use planning laws, State Highway mitigation (5-103) and other local programs.
- Offset forests lost to road construction with effective mitigation in proximity to the affected forests.

**Goal II.C. Develop approaches to improve health and survival of urban forests.** Work with public and private landowners, managers, and service providers to address the unique challenges to health for trees in cities, towns, and neighborhoods.

*Strategy II.C.1. Assure professional and safe urban tree care*

Example Tactics:

- Maintain and improve a state licensing program for tree care professionals with standards of practice and expertise, training, and testing

*Strategy II.C.2. Manage conflicts of natural tree growth with public utilities and built infrastructure*

Example Tactics:

- Maintain capacity to regulate tree care practices in public right-of-ways
- Promote the Right Tree/Right Place approach to tree establishment
- Work with efforts to improve tree care practices in public right of ways

*Strategy II.C.3. Identify appropriate standards and reward beneficial urban tree care programs and practices in localities*

Example Tactics:

- Recognize communities that have demonstrated good urban tree care and progress in tree cover through programs such as PLANT, Tree City USA, Tree Campus, and other local initiatives
- Provide technical assistance to aid communities in improving tree health as part of tree canopy expansion and urban forest management.

***Maryland Issue III. Ensure Clean and Abundant Water***

( Supports National Priority III: Enhance Public Benefits from Trees and Forests)

Forests are vital to providing clean and abundant water for Maryland. Our public lands are the source of fresh drinking water and more than a quarter of our fresh water flows from and is filtered by these lands. The threats of climate change, wildland fire, invasive pests, severe storm events, and increasing development pressures impact the quantity, availability, and quality of Maryland's water resources and the health of its watersheds. The Maryland Forest Service will promote the restoration and maintenance of watersheds to ensure abundant clean water, the protection of soils, and the health of aquatic and terrestrial ecosystems. Total Maximum Daily Load requirements have been developed for many of Maryland's watersheds, and a TMDL is being finalized for the Chesapeake Bay mainstem. Keeping and restoring forests in key locations is a fundamental path to reduce many pollutants in waterways with TMDLs, including nitrogen, phosphorus, sediment, and biological impairment. Forests offer long-term, sustainable improvements in water quality, particularly if pollutants are also controlled at sources.

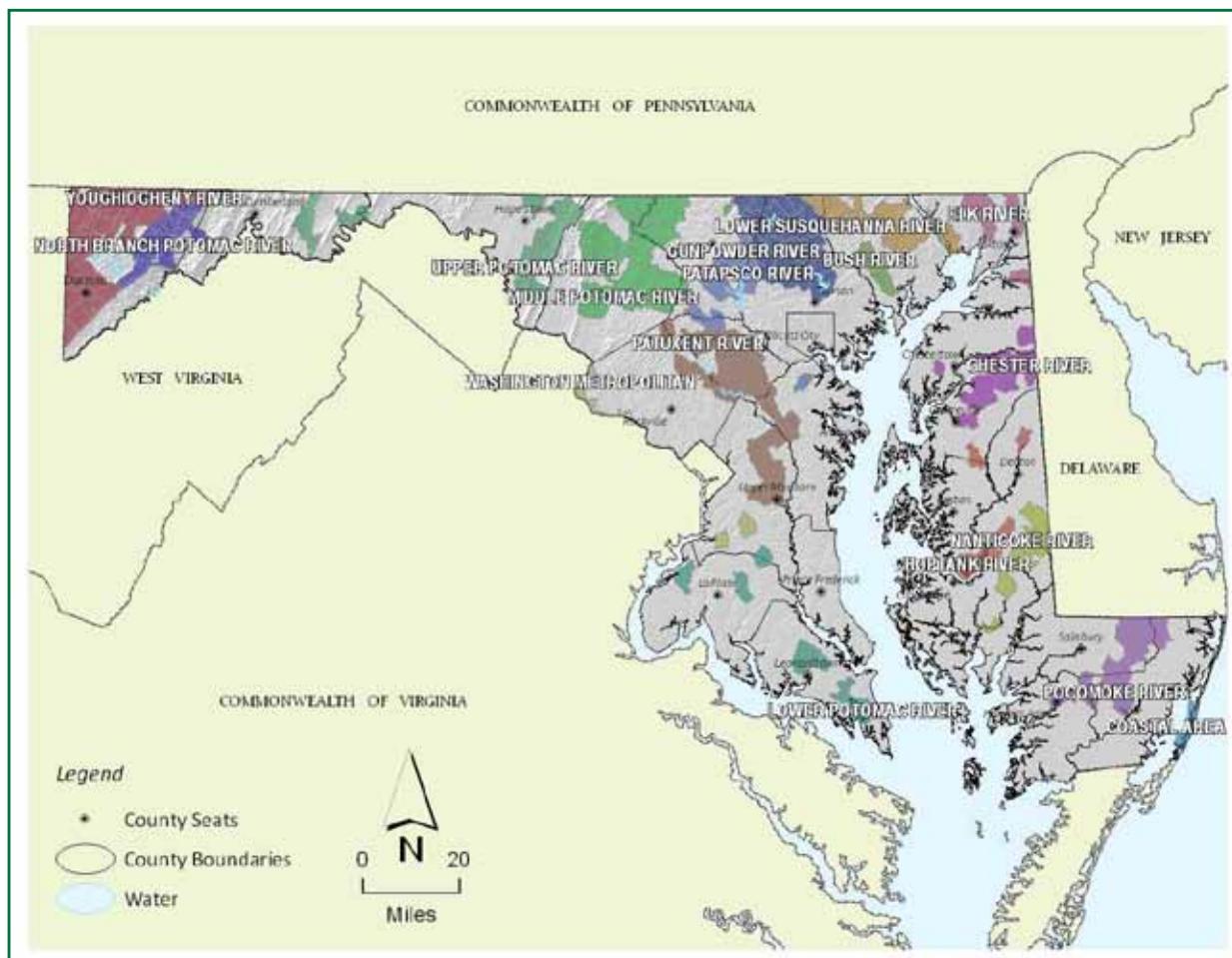


Figure 6: Priority areas for protecting water quality and supply, with emphasis on drinking water supply areas

**Goal III.A. Revitalize the Chesapeake Bay and other priority waters, using forests to help meet Total Maximum Daily Load (TMDL) requirements-** Work with partners to identify and revitalize waterways critical to the social, economic, ecosystem health of communities.

*Strategy III.A.1. Collaborate with local partners to use forests and trees to improve watershed conditions, meet TMDL requirements, and bolster and learn from other watershed organizations and efforts.*

Example Tactics:

- Focus resources in targeted areas to bolster progress in important watersheds, develop innovative approaches, and expand information on using forests for watershed health
- Use pilot projects to develop effective approaches for management challenges like urban watersheds, green infrastructure protection, or ecosystem-based management
- Mitigate forest loss and restore functional forests on a watershed basis to maintain water quality

*Strategy III.A.2. Protect 70% of Maryland streamsides and shorelines with riparian forest buffers.*

Example Tactics:

- Coordinate and promote forest buffer restoration efforts among multiple agencies and organizations
- Combine voluntary and regulatory approaches to maintain and expand forest buffers on streams and shorelines.
- Track progress in restoring riparian forest buffers by watershed and jurisdiction
- Map unbuffered streams and shorelines, identify areas most critical for water quality improvements, and develop targeting at a scale useful for planning projects
- Identify barriers to restoring forest buffers in priority areas, prioritize significance and approachability of barriers, and develop strategies to change or minimize barriers
- Identify opportunities where forest buffers can contribute significant improvements to meet TMDLs

*Strategy III.A.3. Conserve forests important for water quality*

Example Tactics:

- Expand awareness of programs and approaches available to conserve forests important for water quality, coordinating with adjacent states
- Update targeting of forests that disproportionately contribute to water quality
- Track progress of forest conservation through multiple land conservation efforts including purchase and donation of easements and other land conservation instruments, and effective regulation such as local zoning
- Develop other alternatives to increase forest conservation

*Strategy III.A.4. Protect important aquatic habitats and water-dependent terrestrial wildlife*

Example Tactics:

- Ensure that water quality targeting addresses the aquatic life aspect of water quality
- Collaborate with DNR Fisheries, Resource Assessment, and Wildlife units and MDE to develop long-term approaches for protecting priority habitats and sensitive resources

**Goal III.B. From Forest to Faucet** – Connect people to healthy forests through clean drinking water initiatives in priority watersheds.

*Strategy III.B.1. Identify priority watersheds and work with communities to improve source water protection through watershed forestry.*

Example Tactics:

- Offer technical forestry assistance for forest management to protect drinking water supplies
- Identify and address risks like wildfire that threaten community water systems and other important water resources
- Use science to design new conservation strategies for drinking water protection/disinfection byproducts/interaction with filtration systems

*Strategy III.B.2. Collaborate with watershed partners to restore watershed quality from the headwaters to rivers, through farms and working lands into urban centers.*

Example Tactics:

- Share learning from watershed partnerships, pilot projects, and monitoring to encourage use and improve success of forest restoration for watershed health
- Develop guidelines or best practices for incorporating forest restoration and conservation effectively into relevant land use planning for long-term improvement of streams and watersheds

### **Goal III.C. Avoid water quality impacts from prescribed forest management activities**

through the effective and widespread use of harvesting best management practices (BMPs)

*Strategy III.C.1. Expand awareness of BMPs*

Example Tactics:

- Provide logger and landowner education and training on efficient and effective use of BMPs, partnering with Soil Conservation Districts, local governments, MD Dept. of Environment, Master Logger, and the University of Maryland Extension
- Expand public awareness of need for BMPs and well-trained operators

*Strategy III.C.2. Improve implementation of BMPs*

Example Tactics:

- Collaborate with MD Dept. of Environment to support effective and efficient implementation of sediment and erosion control requirements
- Improve capacity of operators to minimize impacts through appropriate equipment choice, using programs like the EPA LILAC low-interest loans to promote light-on-the-land harvesting
- Periodically assess effectiveness and implementation of BMPs
- Assess soil conditions to assure soil quality is being maintained for water quality and long-term productivity

### **Maryland Issue IV. Create Jobs and Sustainable Communities**

( Supports National Priority III: Enhance Public Benefits from Trees and Forests)

The restoration and conservation of forests and working lands can provide jobs and support sustainable communities – generating economic value by sustaining green jobs, and producing timber and other forest products, food, and energy. Our forests are also of immense social importance, enhancing rural quality of life, sustaining scenic and culturally important landscapes, oftentimes defining the essence of a community.

### **Goal IV.A. Use forests to support a robust and growing rural economy-**

Provide a variety of forest-based outputs that help maintain viable rural communities, allowing jurisdictions to realize benefits from open space and manageable demand for services.

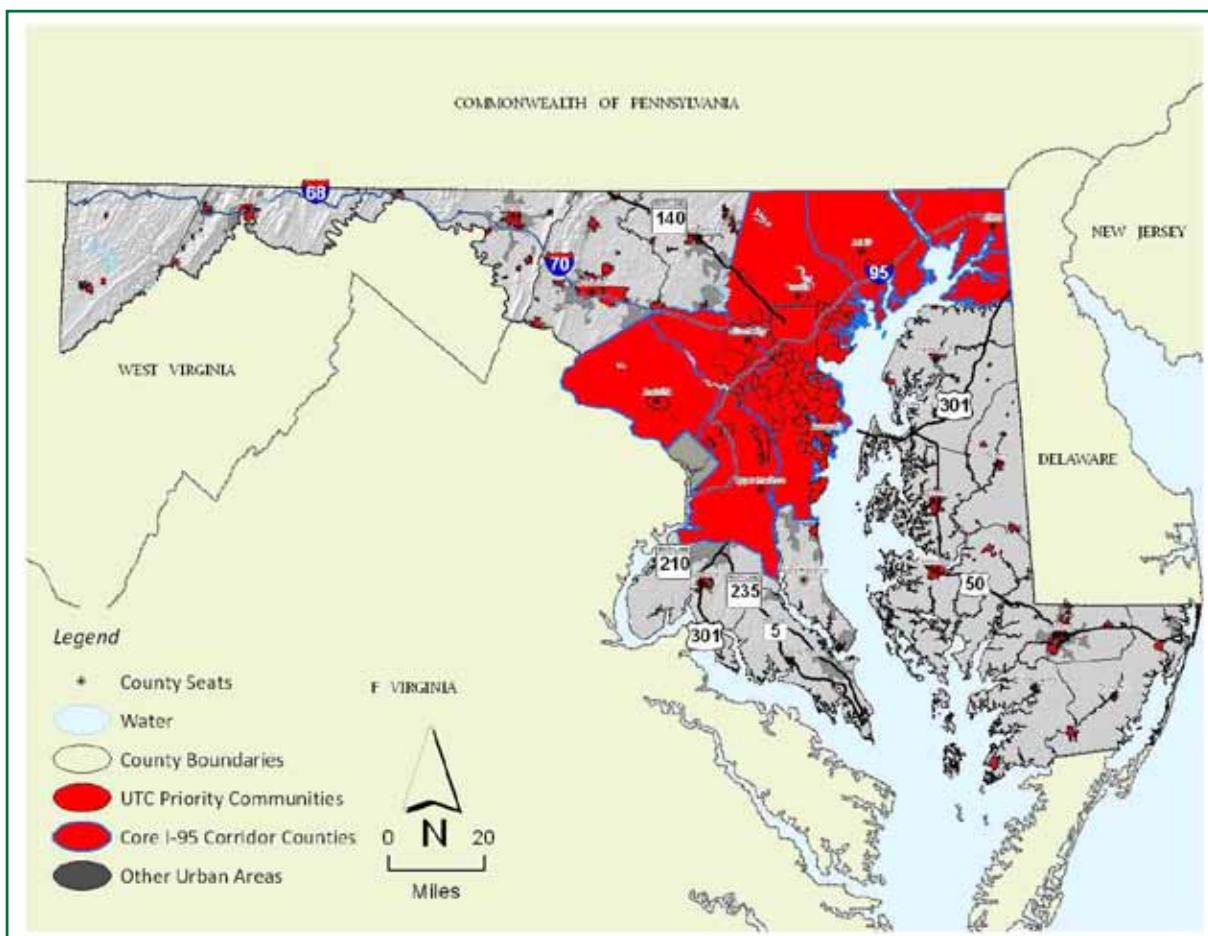


Figure 7: Priority areas for urban and community forestry goals

*Strategy IV.A.1. Aid communities in developing diverse natural-resource based economies centered on forest ecosystem restoration, renewable energy, and sustainable forest and agro-forestry products.*  
Example Tactics:

- Collaborate with local agencies and organizations to identify potential forest-based products and services that can be sustained with local resources and economic infrastructure

*Strategy IV.A.2. Create green jobs and promote a diverse forest products industry to support sustainable rural communities.*

Example Tactics:

- Develop innovation grants or low-interest loans for forest products businesses
- Utilize the resources of the Maryland Rural Enterprises Development Center to encourage the success of small enterprise development
- Integrate forest products into Buy-Local campaigns, developing a “Buy Maryland Forest Products” marketing strategy
- Include forest products in farmer’s markets and local craft markets

*Strategy IV.A.3. Improve social acceptance of prescribed forest and tree management practices*

Example Tactics:

- Increase use of forest-related curricula by schools and other youth organizations such as 4-H, Future Farmers of America, and Young Farmers
- Provide interpretation for practices applied on Demonstration Forests and other DNR forest lands
- Implement forest practices on school properties to improve resource sustainability and serve

- as demonstration areas for classes (“tending the forest garden”)
- Implement forest management on local government or other lands to serve as demonstration areas for citizens

*Strategy IV.A.4. Provide accessible forest-based recreation that maintain healthy forests and support healthy lifestyles*

Example Tactics:

- Collaborate with stakeholders, agencies, and organizations to develop plans, projects, and maintenance guidelines that improve recreational safety and maintain important environmental functions

**Goal IV.B. Support Livable Green Communities** – Support the use of trees and forests in communities to create green jobs and connect people with the forests and natural systems on which their quality of life depends. Work with a range of community types, from major urban centers to small rural towns.

*Strategy IV.B.1. Provide urban and community forestry assistance to cities, suburbs, and towns to enhance and restore open space and expand urban tree canopy to improve human and community health.*

Example Tactics:

- Work with the Maryland Urban and Community Forestry Committee to identify approaches and actions to improve urban forests
- Provide technical assistance on assessing urban tree and forest canopy, developing canopy goals, and targeting new areas for tree planting
- Track urban tree canopy goals and quantify benefits of planted trees with science-based assessment tools
- Provide opportunities for volunteer tree planting
- Support tree planting on public lands

*Strategy IV.B.2. Share urban forestry and agroforestry techniques and tools and continue working with municipalities to establish and maintain local urban forestry programs.*

Example Tactics:

- Assist communities with creating and maintaining programs that establish, maintain, and replace urban trees and forests
- Expand options for financial assistance for tree planting and urban tree canopy expansion
- Expand options and techniques for successful urban tree planting and maintenance

*Strategy IV.B.3. Develop tools to help communities strategically connect open spaces to build a functioning green infrastructure.*

Example Tactics:

- Develop and share information and tools to help local leaders and planners strategically protect parks, riparian areas, source water protection areas, and wetlands
- Integrate land planning, management, and conservation to build an interconnected green infrastructure that provides ecosystem services, recreation opportunities, and a high quality of life for urban and suburban citizens.

### ***Maryland Issue V. Make Landscapes More Resilient to Climate Change***

( Supports National Priority III: Enhance Public Benefits from Trees and Forests)

Climate change is one of the great challenges facing modern society, and has the potential to dramatically reshape how the Maryland Forest Service will deliver on its mission of sustaining the

health and diversity of Maryland's forests. Managing landscapes to be more resilient to climate change will require an adaptive management approach based on maintaining ecosystem health, diversity and connectivity. Specific management approaches include planting more diverse species, conserving migration corridors, and assisted migration of species. Experimentation, learning from experience, monitoring actions, and changing methods and techniques will help managers adjust actions as conditions change.

**Goal V.A. Engage in Leadership for Climate Change** by working with partners as a leader to convene, connect, restore and maintain focus on climate change priorities on a landscape scale.

*Strategy V.A.1. Develop and improve strategies for forest mitigation and adaptation in collaboration with other state and federal agencies and other stakeholders, supporting Maryland's Climate Action Plan.*

Example Tactics:

- Participate in coordination and tracking of actions related to Maryland's Climate Action Plan
- Identify opportunities to better implement actions through existing forestry programs

*Strategy V.A.2. Increase the use of woody biomass to create local, renewable energy – such as combined heat and power – while also restoring forest health.* Using renewable fuel sources like woody biomass reduces fossil fuel emissions, with the regrowth offsetting emissions except for energy used in harvesting, transport and energy generation. Most biomass projects in Maryland are expected to focus on harvest residues, portions of trees not used in other wood product markets, rather than land dedicated to farming woody biomass crops. Contributions will help meet goals for the Clean Air Act and the Maryland Clear Energy Incentive Act.

Example Tactics:

- Develop new silvicultural techniques and management guidelines
- Promote energy efficient, light-on-the-land harvesting, handling, and processing technologies for woody biomass
- Facilitate new uses and technologies for converting woody biomass into energy and other bio-based products
- Contribute to green power for State facilities and renewable energy portfolio

*Strategy V.A.3. Improve sustainable operations through green infrastructure development, efficiencies and energy savings.*

Example Tactics:

- Implement DNR Green Procurement policies and energy efficiency measures
- Use energy efficient designs for facility upgrades or rehabilitation

**Goal V.B. Promote Sustainable Forest Management and Operations in Response to Climate Change** – work with partners to enhance opportunities for sustainability in forest management and urban communities.

*Strategy V.B.1. Apply a climate change mitigation strategy to sustainable forest management*

Example Tactics:

- Deploy the needed information and technology on the growth, resilience, and adaptability of forests considering climate change effects
- Increase CO<sub>2</sub> sequestration in forest biomass and carbon storage in durable wood products through varied approaches, from optimizing growth to extended rotations and value-added markets that create long service lives for wood products

- Implement pilot projects for carbon sequestration on public and private lands to optimize benefits of fee-in-lieu mitigation or other funding sources, supporting green infrastructure expansion, reforestation offsets under RGGI, and anticipating wetland migration
- Provide information on landowner opportunities for carbon sequestration, tax incentives, and markets, targeting properties with forest stewardship plans
- Promote and track mitigation and energy conservation through urban tree canopy expansion and tree planting programs like Marylanders Plant Trees

*Strategy V.B.2. Apply a climate change adaptation strategy to sustainable forest management*

Example Tactics:

- Avoid epidemics and forest dieback by managing for diverse and resilient forests and reducing stresses from deer and invasive species (plants, pests, diseases)
- Identify sensitive species and plan for continuity of habitat (restoration, refugia, replication, and relocation if needed)
- Assure representation of species and habitats and protection during land management activities
- Design mitigation plantings to support adaptation needs (like forest diversity or afforesting stream buffers) to the extent possible
- Address effects of sea level rise and geologic subsidence through appropriate planning of buffer areas and species selection

Table 1: Maryland Forest Service Programs and Partners contributions to Strategy Elements

State Forestry Programs		Stewardship	Fire Ops.	Fire Prev.	Urban/Comm. Forestry	Public Forests	Planning	Utilization	W/E	Water	Health
<b>Strategy Elements</b>											
<b>1 Restore/Sustain For. Landscapes</b>											
1A Keep Forests as Forests											
1 Improve economics, sust. forestry	X	X	X	X							
2 Develop/deliver forest mgmt info	X	X	X	X							
3 Provide incentives to keep forests	X	X	X	X							
4 Reduce fragmentation/parcel.	X	X	X	X							
5 No-Net-Loss of forests	X	X	X	X							
6 Supply of expertise and materials	X	X	X	X							
1B Manage for Resilient Forests											
1 Improve management	X	X	X	X							
2 Focus restoration/cons.	X	X	X	X							
3 Strengthen landscape initiatives	X	X	X	X							
4 Habitat for rare native species	X	X	X	X							
1C Support Tradit./Emerging Markets											
1 Maintain/Diversify markets	X	X	X	X							
2 Support Ecosystem Markets	X	X	X	X							
3 Coord research-mgmt, markets	X	X	X	X							
1D Sust. Forest Mgmt/Public Lands											
1 Capacity/Training	X	X	X	X							
2 Certification	X	X	X	X							
3 Diversity of forest types/landscapes	X	X	X	X							
4 Inventory/monitoring	X	X	X	X							
5 Recreation	X	X	X	X							
<b>2 Ensure Healthy/Resilient Forests</b>											
<b>2A Emergency Response</b>											
1 Fire Suppression	X	X	X	X							
2 Other Emergency Response	X	X	X	X							
3 Partnerships (FD, MEMA)	X	X	X	X							
<b>2B Long-Term Stressors</b>											
1 Deer	X	X	X	X							
2 Invasive Plants	X	X	X	X							
3 Invasive Pests/Diseases	X	X	X	X							
4 Reduce wildfire risk	X	X	X	X							
5 Native Forest Composition/Mgmt	X	X	X	X							
6 Uncontrolled Recreation	X	X	X	X							
7 Land Use Change/mitigation	X	X	X	X							

Table 1, continued (Maryland Forestry programs- DNR/MDA, Strategy Elements 2C to 5)

State Forestry Programs		Stewardship	Fire Ops.	Fire Prev.	Urban/Comm. Forestry	Public Forests	Planning	Utilization	W/E	Water	Health
<b>Strategy Elements</b>											
2C	Urban Tree Health				Website						
1	Tree Care	X			Plans, Tech. Assist., Stew. Comm.						
2	Public utility	X			Tax Incentives/Cost-share						
3	Recognition/standards	X			Tree Farm, SFI, FSC						
<b>3 Clean and Abundant Water</b>					Forest Legacy						
3A	Chesapeake Bay and priority waters				Seedling Production/genetics, mktin						
1	Partnerships	X	X	X	State Fire Asst & Interagency Coord						
2	Buffers	X	X	X	Training, Vol. Fire Crews, and Repts						
3	Conservation for Water Quality	X	X	X	Vol. Fire Asst./FEPP Eqmt/Invstgtn.						
4	Aquatic Habitat	X	X	X	Comm. Wildfire Prot. Plans/Risk Re						
3B	Forest to Faucet				Outreach/Smokey Bear						
1	Source Water Protection	X	X	X	Prescribed Burning/Burn Permits						
2	Partnerships	X	X	X	Environmental Review						
3C	BMPS	X	X	X	Licensed Tree Experts						
<b>4 Create Jobs/Sust. Communities</b>					Local Govt. Asst./Enforcement						
4A	Rural Economy				Planting Programs						
1	Resourced based economy	X			Urban Tree Canopy/Goals, Plans						
2	Green jobs	X			Awards&Tech. Assist.						
3	Social acceptance of forest mgmt	X	X		Silviculture, Maintenance						
4	Forest based recreation	X			Planning/Inventory/Certification						
4B	Livable Green Communities				Recreation and Trail Grants						
1	UCF/UTC technical asst./planting	X		X	Forest Brigade/TEP						
2	Techniques/Urban For. Prgms	X		X	Data mgmt/GIS						
3	Community Open Space/GI	X		X	Tech support and Planning Liaison						
<b>5 Climate Change</b>					Forest Certification Support						
5A	Leadership Climate Change				Utiliz.(Biomass, Assmt., TA, FA)						
1	Develop strategies, MD CAP	X			Logger Training/Op.Licensing						
2	Increase woody biomass	X			Utilization/Marketing Liaison						
3	Sustainable Operations	X			Outreach/Volunteers						
5B	Forest Mgmt for Climate Change				Ches. Bay-Buffers, Forest Cons.						
1	Mitigation	X			Partnerships- PWP, Special Rivers						
2	Adaptation		X		Reservoir Forest Management						
					BMPAssessment						
					Survey/Detect/Educ.						
					Suppress/Treatmt						

Table 1, continued (Partner Programs, Strategy Elements 1-2B)

	Partner Programs
<b>Strategy Elements</b>	
<b>1 Restore/Sustain For. Landscapes</b>	
1A Keep Forests as Forests	
1 Improve economics, sust. forestry/	X
2 Develop/deliver forest mgmt info	
3 Provide incentives to keep forests	X
4 Reduce fragmentation/parcel.	X X X
5 No-Net-Loss of forests	X X X
6 Supply of expertise and materials	X X X
1B Manage for Resilient Forests	
1 Improve management	X
2 Focus restoration/cons.	X
3 Strengthen landscape initiatives	X X X
4 Habitat for rare native species	X X X X
1C Support Traditional/Emerging Markets	
1 Maintain/Diversify markets	
2 Support Ecosystem Markets	X
3 Coord. research/mgmt, markets	
1D Sust. Forest Mgmt/Public Lands	
1 Capacity/Training	X X X X X
2 Certification	X X X X X
3 Diversity of forest types/landscapes	X X X X X
4 Inventory/monitoring	X X X X X
5 Recreation	X X X X X
<b>2 Ensure Healthy/Resilient Forests</b>	
2A Emergency Response	
1 Fire Suppression	X
2 Other Emergency Response	X X X X X
3 Partnerships (FD, ME&MA)	X X X X X
2B Long-Term Stressors	
1 Deer	X X X X X
2 Invasive Plants	X X X X X
3 Invasive Pests/Diseases	X X X X X
4 Reduce wildfire risk	X X X X X
5 Native Forest Composition/Mgmt	X X X X X
6 Uncontrolled Recreation	X X X X X
7 Land Use Change/mitigation	X X X X X

Table 1, continued (Partner Programs, Strategy Elements 2C to 5)

	Strategy Elements	Partner Programs
2C Urban Tree Health		DNR Wildlife and Heritage
1 Tree Care	X	Critical Area Law
2 Public utility	X	DNR Land Acquisition/Planning
3 Recognition/standards	X	DNR Resource Assess/MBSS
<b>3 Clean and Abundant Water</b>		Other DNR-Sust.Future/Fish
3A Chesapeake Bay and priority waters		Natural Resources Police
1 Partnerships	X	MD Dept.Ag.-For.Health/Res.Cons.
2 Buffers	X X X X	MD Dept. Planning
3 Conservation for Water Quality	X X X X	MDE-Wetlands/Source Water, Sed./EC
4 Aquatic Habitat	X X X X	Univ. MD (Extension, Agroecology)
3B Forest to Faucet		Master Logger
1 Source/Water Protection		Maryland Fire and Rescue Institute
2 Partnerships	X	MD Emergency Mgmt Agency
3C BMPS	X X X X	MD Fire Service/MSFA
<b>4 Create Jobs/Sust. Communities</b>		MD Dept. of Education
4A Rural Economy		MD Env. Trust/Land Trusts
1 Resourced based economy		State Tax Assessment Dept
2 Green jobs	X X	Ches.BayPgm(USFS/EPA/USGS/NOAA)
3 Social acceptance of forest mgmt	X X X X	Natural Resource Cons.Service
4 Forest based recreation	X X X X	Farm Service Agency
4B Support Livable Green Communities	X X X X	U.S. Fish & Wildlife Service
1 UCFUTC technical asst./planting	X X X X	Dept. of Defense
2 Share Techniques/Urban For. Prgms	X X X X	Other fed.(NPS/APHIS/NASA/BARC)
3 Community Open Space/GI	X X X X	Balt. Ecosystem Study/ULTRA
<b>5 Climate Change</b>		Forestry for the Bay/AllianceCh.Bay
5A Leadership Climate Change		Bay Bank
1 Develop strategies, MD CAP	X X X X	Local Govts/MACO/MML
2 Increase woody biomass	X X X X	The Nature Conservancy
3 Sustainable Operations	X X X X	Trust for Public Land
5B Forest Mgmt for Climate Change		Forest Industry(MFA/AFI/FRA/MAA)
1 Mitigation	X X X X	Consulting Foresters
2 Adaptation	X X X X	Partnership Sust. Forestry

## Timeline and Funding

To implement scientific forest management is to take the long view. Forests mature over decades, even centuries, showcasing past management practices long afterwards. Maryland's Forest Resource Strategy was developed with goals focused on long-term improvements in conditions, and tactics that can be implemented in the near term. The annual work plan process will be used to identify yearly priorities and actions, since staffing levels do not permit all actions to be pursued every year. Unknown stressors or opportunities such as new invasive species or forest product technology changes are likely to occur. New conditions can change priorities quickly, and may require interim revisions of short-term priorities. The development of these assessments and strategies began in 2008 and they were completed in 2010. Assessments will be reviewed for needed updates on at least a five year cycle.

**Priority Actions:** Stakeholder comments and strategic planning efforts both yielded a clear priority on keeping Maryland's forests as a first step to sustainability. This has long been a priority, but it is clear that increased efforts are needed to avoid irreversible changes that harm the forest economy, watershed health and quality of life in the state. Since most of Maryland's forests are privately owned, this is a multi-faceted endeavor that does not lend itself to simple solutions. One facet is to continue fundamental activities like Forest Stewardship Plans for private forests, Forest Conservation Management Agreements restricting development for 15 years, other tax abatement programs limiting development, existing land acquisition, and easement programs. Expanded efforts will be needed in support of maintaining and diversifying forest products markets, often the most compelling incentive for keeping private forests and a resource that can enable sound forest management. Additional efforts were recommended for expanding outreach and education for forest landowners, and effectively reaching forest owners whether they have large or small holdings. Greater involvement in and resources for local governments with planning authority are also needed. All these received high priority for implementation and funding requests. The Sustainable Forestry Council authorized in the Sustainable Forestry Act of 2009 will provide additional direction on efforts to meet goals for no net loss of forests.

**State commitments:** New State tree-planting initiatives and existing State commitments also contribute to the goal of keeping Maryland's forests and trees. These include Marylanders Plant Trees, supporting urban tree canopy progress, and Forest Brigade, supporting no net loss of forests by planting on state lands. Other priorities are needed to meet commitments for the Chesapeake and Coastal Bays Programs and Maryland's Climate Action Plan. For the Chesapeake Bay, forest buffers and conserving other forests of high value for water quality will be near-term priorities based on existing commitments for 2012 and 2025. Two-year milestones have been established for several forest restoration practices to meet Chesapeake Bay nutrient reduction commitments. The Natural Filters strategy, focusing on revegetating buffers, wetlands and highly erodible lands, is part of Maryland's two-year milestones, and short-term priorities will reflect these needed actions on public and private lands. Federal funds may be requested to allow Maryland to meet these statewide and regional priorities more quickly and more effectively.

**State and Federal Laws:** Other priorities are set by ongoing legal obligations. Maryland has a robust set of laws protecting forests and environmentally sensitive areas. Maryland is responsible for implementing the Forest Conservation Act, Chesapeake and Coastal Bays Critical Area Law, Nontidal Wetlands Law, Sediment and Erosion Control regulations, the State Highway Reforestation Law, Seed Tree Law, Roadside Tree Law, and Licensed Tree Expert Law. Some areas have responsibilities to protect rare species under the federal Endangered Species Act, like the Delmarva Fox Squirrel on the Eastern Shore. Maryland's Sustainable Forestry Act of 2009 is the newest legislation; implementation will begin with the seating of the Sustainable Forestry Council. These responsibilities are incorporated

into the Forest Strategy and will require ongoing commitments of state resources to implement.

**Supporting Actions:** Success of many of the top priority goals depends on carrying out other key supporting actions. The goal of more livable communities is needed to encourage development patterns that better conserve existing forest. Reducing fire risk in communities through appropriate planning and hazard mitigation is needed to make wildfire suppression practical in the wildland urban interface. Working with partners to address long-term impacts of deer browse and invasive species is needed to allow normal forest regeneration, even if the forest are protected from the primary threat of conversion. Many of these projects will require additional support to have effective results, and some will be included in federal requests that primarily support identified priority actions and places.

Actions that support climate change activities considered an important element to include, although not as high a priority as simply keeping land in forest use. Many of the actions taken to mitigate for or adapt to climate change also support other goals, like improving air and water quality and expanding forest and tree cover. Maryland will use actions needed to fulfill commitments on climate change to leverage progress towards related goals. Leveraged mitigation options include expanding tree planting in a fashion that supports urban tree canopy and buffer goals and diversifying forest product markets with renewable fuels or durable value-added wood products in a way that expands rural economies. Setting expanded urban tree canopy goals, developing tree canopy implementation plans, and planting new trees in urban areas supports water quality and air quality goals, along with contributing to more livable communities.

The estimated work force needed to deliver all of the desired priorities is substantially more than existing funds can support (Figure 8). Resources already have been allocated to priority goals like keeping forests, but the reduction of more than 36% in forestry agency staffing over the past several years (see Appendix C) has necessarily translated into restrictions on scope of activities. Federal funding requests have generally made up less than 15% of Maryland Forest Service budgets, so

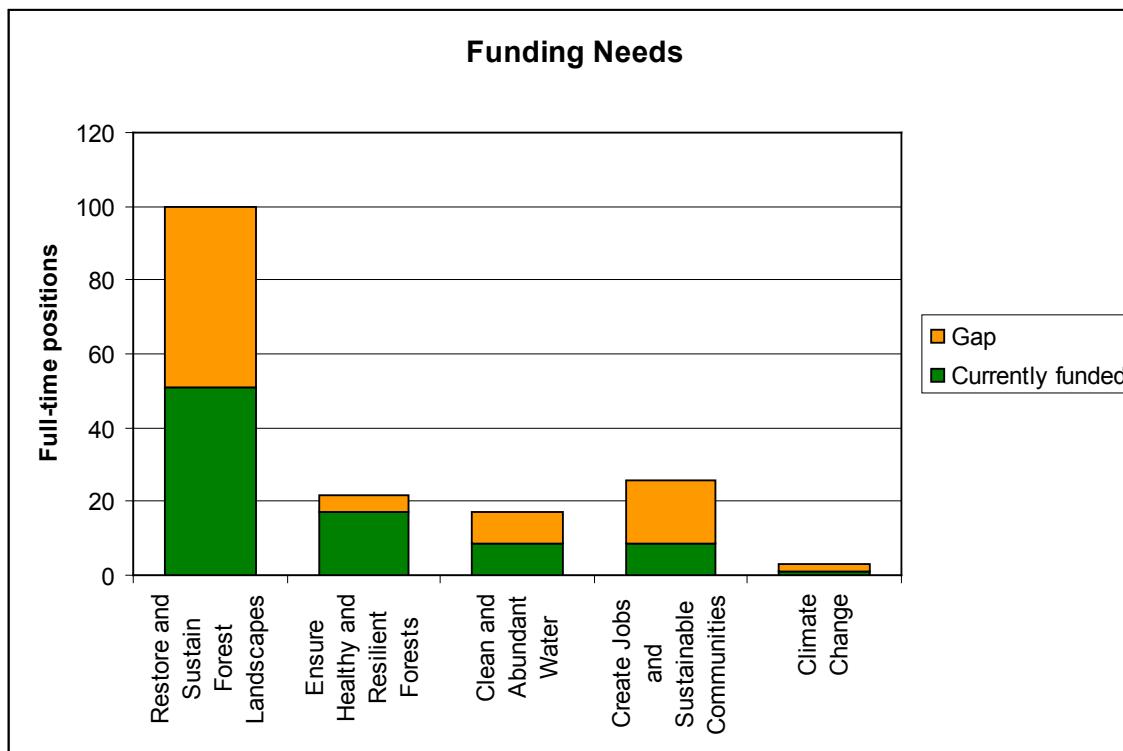


Figure 8: Estimated work force for delivering priority actions and comparison to existing funding with the state forestry agency

federal funds are not expected to fill the gap, merely to provide an avenue for priority actions in appropriate priority areas. Partner and volunteer contributions are not included in the funding analysis, but these are significant existing contributions and have the potential to be even greater.

Targeted program delivery is expected to make up 85% of requests for USFS funds and competitive proposals addressing specific issues and priority areas could make up another 15% of USFS funds requests. Maryland priorities for federal funding will focus on sustainable forests, jobs, water, and climate actions.

Top priorities related to keeping forests (dark green in Figure 9) are expected to be included in state and federal funding consistently, although some market development activities may not be submitted for federal funding every year. State land management and certification will be carried out with state funds. Other supporting goals (lime green) are needed to bolster quality of existing forest systems, and are expected to require more funding than is available from state funds. These include wildfire control and hazard mitigation, forest pest inventory and control, urban and community forestry, and watershed forestry actions to support Chesapeake Bay restoration. The least critical supporting actions (light green) are expected to be included in federal requests with less frequency and in response to specific needs in priority areas (like urban tree health in the I-95 Corridor multi-state area). Even though these goals were considered to be a second tier in priority, they were included in the strategy because they play critical supporting roles. They are considered important and necessary, even if they command less attention and resources. Partnerships will be important at all priority levels to augment and effectively use state and federal funds.

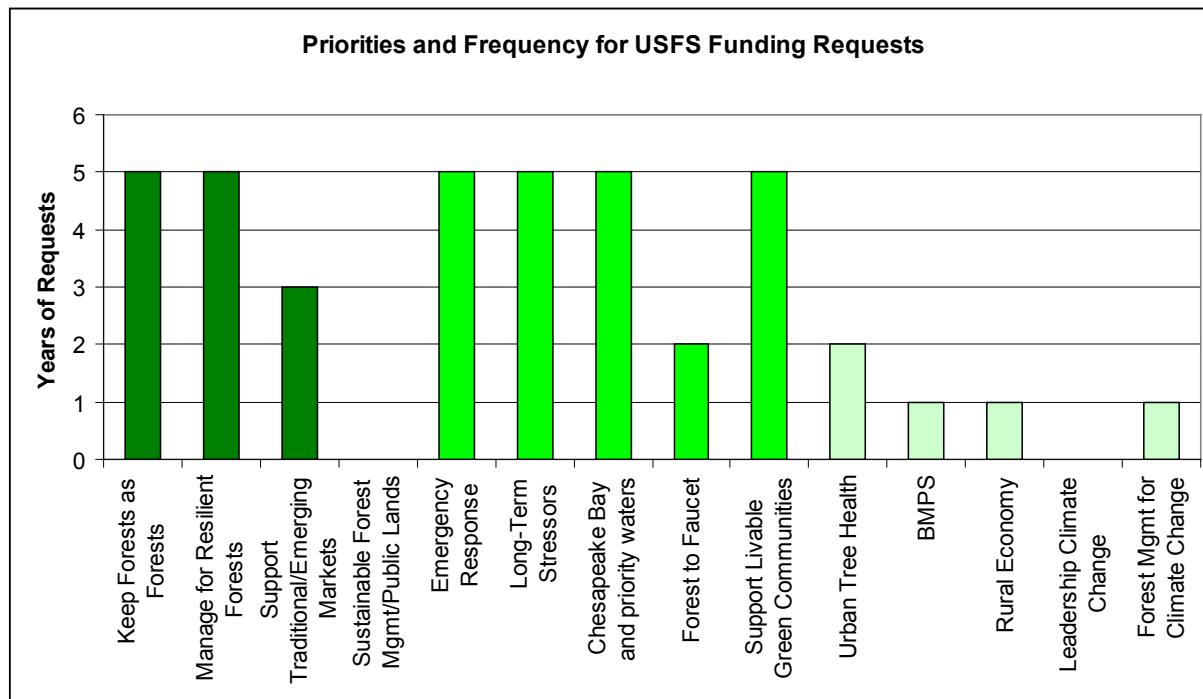


Figure 9: Expected uses for US Forest Service funding requests by priority ranking and expected frequency of request (dark green- top priority; lime green- supporting priority, light green- second tier supporting priority)

## Partner and Stakeholder Involvement

During 2009, a multi-stakeholder partnership led by the Harry R. Hughes Center for Agro-Ecology and the Maryland Department of Natural Resources – Forest Service developed a plan for obtaining public input in identifying key issues and strategies for sustaining forests and forestry in Maryland. Sponsoring organizations included The Harry R. Hughes Center for Agro-Ecology; The Biophilia Foundation; Chesapeake Bay Program; Chesapeake Bay Trust; The Conservation Fund; Maryland Department of Natural Resources – Forest Service; Forest Industry; Maryland Agriculture Council; Maryland Forest Association; The Nature Conservancy; The Pinchot Institute; Town Creek Foundation; and University of Maryland Extension.

The public engagement plan included a public survey of Maryland's forestry leaders and other interested parties, five listening sessions held throughout the State in June 2009, and a Statewide Forestry Summit held in October 2009, in Linthicum, Maryland. The public engagement process resulted in the identification of four issue areas and for each issue, strategies and recommended actions. Strategies and recommended actions are both presented in order of priority with the highest priority first.

A wide cross-section of forestry stakeholders was represented by survey respondents. The survey was forwarded to open networks of restoration and conservation interests including the Chesapeake Bay Program, and allowed to circulate freely. Anyone who chose to take the time to respond was counted.

### ***The Survey***

The first step taken was to develop a survey on forestry issues in Maryland, based on work done by various organizations and entities since the mid-1990's. The survey addressed five issue areas:

- Retention and Management of Private Forests
- Retention and Management of Public Forests
- Economic Viability of Forestry Industry in Maryland
- Maintaining Forest Diversity in Maryland
- Value-Added Alternative Opportunities

During Spring 2009, the survey was circulated to 155 of Maryland's forestry leaders and others in the state interested in forestry issues. The survey was distributed freely and posted on networking sites including Chesapeake Bay program email networks and the Chesapeake Network Maryland group, a networking website managed by the Alliance for the Chesapeake Bay. The response rate was 26%. Many of the survey respondents chose to be anonymous, but of those that identified a category, there was a mix of landowners, government agencies, non-profit organizations, and forest industry interests (Figure x). Private landowners were the largest response category.

Within each issue area, the survey identified the top recommended actions. Survey participants were then asked to rank the importance of the recommendations based on the current economic, environmental, and political climate. Respondents were also given the opportunity to add additional recommendations.

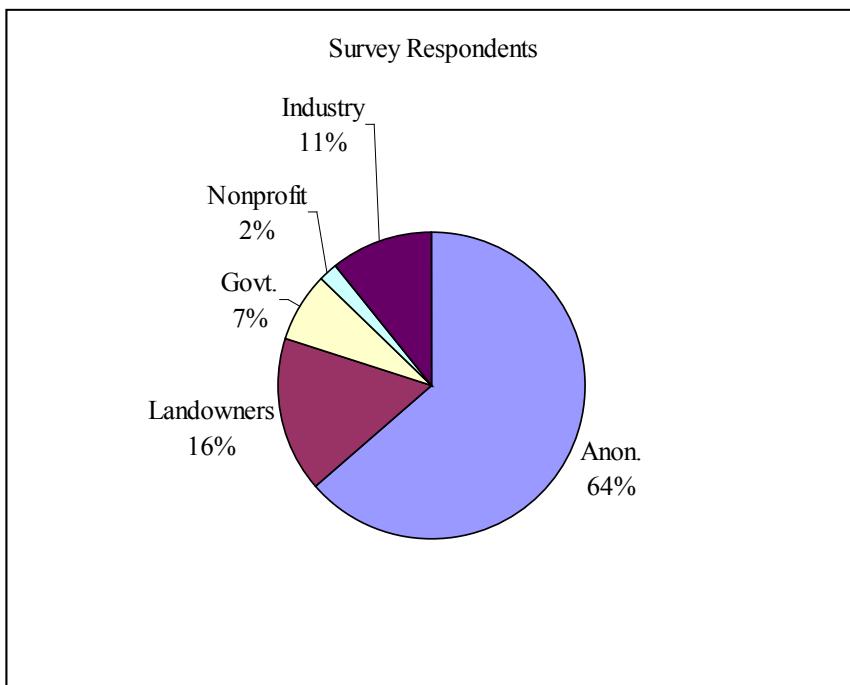


Figure 10: Diverse origins of survey responses for forestry issue on-line survey, Spring 2009

### ***Listening Sessions***

During June 2009, five regional listening sessions were held around the state to further explore forestry issues and opportunities in Maryland. Locations and dates were as follows:

June 08, 2009 – Harford Community College, Bel Air, MD  
 June 10, 2009 – The Ramada Inn and Conference Center, Salisbury, MD  
 June 15, 2009 – The College Of Southern Maryland, La Plata, MD  
 June 16, 2009 – The Urbana Library, Urbana, MD  
 June 17, 2009 – Frostburg University, Frostburg, MD

Approximately 45 – 55 people attended each session. The goal of the listening sessions was to more fully identify the problems that currently threaten Maryland forests and the kinds of technical support, educational opportunities, and cost share programs needed to help landowners manage their forest land and market forest products in the future.

Listening session participants were first presented with the results of the survey to provide context. They were then asked to identify their own concerns, a summary of which is in Appendix B. They were also asked to identify any other concerns they might have. Common concerns included:

- Conversion of forests to other land uses, particularly development
- Lack of staff for public land management
- Viability of the forest products industry
- Lack of financial incentives for forestry enterprises, especially small to medium scale
- Coordination of urban forestry with urban renewal projects
- Damage from invasive plants and pests

Participants then proposed actions that they felt would address their concerns. The lists of recommended actions generated during the listening sessions fell into four issue categories:

- Issue 1. Maintaining Viable Forests and a Viable Forest Industry
- Issue 2. Demographic, Social, Cultural, and Economic Trends as Impediments to Forest Retention
- Issue 3. Strengthening Forest Management by the Private Landowner
- Issue 4: New and Emerging Markets for Forest-based Resources

The recommended actions were summarized and served as the basis for the State-wide Forest Summit. The Forest Summit gathered over 100 stakeholders on October 5, 2009 in Linthicum, MD. Four speakers were respectively asked to address each of the four issue categories, describing for participants the opportunities and challenges associated with each issue and the possible strategies that Maryland might want to consider in setting a new strategic path for sustaining forests and forestry in the State. Over the course of the day, summit attendees:

- reviewed the findings from the listening sessions,
- considered the additional input from the issue experts,
- discussed the issues in small group roundtable sessions, and
- prioritized for their small group the list of actions that they felt would adequately address the identified forestry issues facing Maryland:
  - Managing The Impacts Of Changes In Maryland's Land Use And Forest Ownership
  - Enhancing Assistance To Maryland's Private Forest Landowners
  - Maintaining Maryland's Forest-based Economy
  - Minimizing The Threats Of Invasive Species, Pests And Pathogens To Maryland's Forests
  - Enhancing Maryland's Urban Forests
  - Conserving Maryland's Biological Diversity
  - Manage Recreational Use Conflicts In Maryland's Public Forests
  - Clean Air
  - Clean Water
  - Ecosystem Markets & Services/Climate Change
  - Wildfires
  - Administrative/Legal/Government

More details and survey results can be found in Mapping a Sustainable Forestry Strategy for Maryland: Report on the Public Engagement Process (December, 2009).

In Winter 2009/2010, MD DNR Forest Service developed a draft strategy, assessment, and priorities. Expertise from all programs and regions was tapped to inform the draft strategy and priority area process, through multiple meetings and exchange of draft products. Previous work was consulted, including a State Forest Strategy in 2006, several Commissions and Task Force reports, Chesapeake Bay goal state implementation plans, and priority area mapping efforts were consulted for the strategy and assessment, in addition to the broad-based public input from the public outreach process. Links to previous work include:

- [Maryland's Strategic Forest Resource Plan](#) – 2006
- [No Net Loss of Forest Task Force](#) -- January 2009
- [Guiding Maryland's Forest Community into the 21st Century](#) – December 2000

- [Maryland's Green Infrastructure Assessment](#) – May 2003
- [The Importance of Maryland's Forest: Yesterday, Today, and Tomorrow](#) – September 2003
- [The Impact of Resource Based Industries on the Maryland Economy](#) - 2005
- [Forests and Land Use](#)
- [Governor's Commission for Protecting the Chesapeake Bay through Sustainable Forestry](#) - October 2006
- [Forest Inventory Analysis Findings \(5th Statewide Inventory\)](#) - 1999
- [The State of Chesapeake Forests](#) – September 2006
- [Maryland Sustainable Forestry Act of 2009](#) (SB 549)
- Maryland's Strategic Forest Land Assessment – October 2003 <http://www.dnr.state.md.us/forests/planning/sfla/intro.htm> or [http://www.dnr.state.md.us/forests/download/sfla\\_report.pdf](http://www.dnr.state.md.us/forests/download/sfla_report.pdf)
- Maryland Stream ReLeaf Implementation Plan - 2005 <http://www.dnr.state.md.us/forests/download/Stream%20ReLeaf%20Plan%202005%20-%202010.pdf>
- Maryland Forest Conservation Goals – 2007 <http://www.dnr.state.md.us/forests/pdfs/MFCP43007.pdf>

### ***Stakeholders and Review Process for the Assessment and Strategy:***

Maryland Forest Service consulted with a wide variety of stakeholders during the development of the Forest Assessment and Strategy. These included the State Forest Stewardship Committee, DNR Wildlife and Heritage Service, and the Natural Resources Conservation Service State Technical Advisory Committee. Federal partners with significant forest holdings were contacted, including USDI Fish and Wildlife Service, National Park Service, Department of Defense, US Department of Agriculture, and National Aeronautics and Space Administration. Maryland Forest Service manages the Forest Legacy Program, so current priorities for Forest Legacy and anticipated future directions were considered in the development of the Assessment and Strategy.

The State Forest Stewardship Committee advises Maryland Forest Service on issues and programs related to private forest land management. They were considered a primary stakeholder group to offer informed input into priority maps and actions and refine the strategy. The membership of the State Forest Stewardship Committee was expanded from its historical composition to assure a more diverse group of stakeholders. The first meeting presenting background on the process and issues was in October 2009. A meeting to review the first draft of the Assessment and Strategy was held April 8, 2010 in Annapolis. The SFSC offered an interactive forum to share information and perspectives on complex issues, discuss potentially conflicting recommendations, and develop consensus on priorities. The Forestry Subcommittee of the NRCS State Technical Committee was included in the April 8<sup>th</sup> meeting to assure that key members had familiarity with details of the plan. Additionally, comments on the Assessment and Strategy were invited from the full NRCS State Technical Committee meeting on April 21<sup>st</sup>.

The DNR Wildlife and Heritage Service was consulted with particular attention to recommendations for fish and wildlife priority areas and preferred data sources. A review of the Wildlife Diversity Conservation Plan habitats and recommendations was compared to the Forest Assessment and Strategy results. Federal land management agencies were contacted as part of the State Forest Stewardship Committee meeting, or in broader outreach in late May and early June.

Drafts were distributed directly to likely interested stakeholders not already linked into the plan development process through distribution lists for coordinating committees, including the Stream ReLeaf Coordinating Committee, Forest Conservation Committee, Maryland Urban and Community Forestry Advisory Council, the Baltimore County Forest Sustainability Network, State Water Quality Advisory Committee, and broader list serves on the Alliance for the Chesapeake Bay Chesapeake Network, Maryland Group. Comments were solicited from all units within Maryland Department of Natural Resources. Partners included:

- Department of Natural Resources
- Department of the Environment
- Department of Agriculture
- Department of Planning
- Maryland Environmental Services
- University of Maryland
- Maryland Environmental Trust
- Maryland Association of Counties
- Maryland Municipal League
- Maryland Association of Forest Industries
- Maryland Forests Association
- Partnership for Sustainable Forestry
- Maryland Association of Forest Conservancy District Boards
- MD/DE Society of American Foresters
- Maryland State Fireman's Association
- Maryland Alliance for Greenway Improvement and Conservation
- Interstate Commission on the Potomac River Basin
- US Forest Service
- US Fish & Wildlife Service
- Natural Resource Conservation Service (State Technical Committee)
- EPA – Chesapeake Bay Program
- Forestry for the Bay
- Alliance for the Chesapeake Bay
- The Nature Conservancy
- The Conservation Fund
- Trust for Public Land
- Forest Resource Association
- Eastern Shore Land Conservancy
- Maryland Arborist Association
- Department of Defense
- National Park Service
- National Aeronautics and Space Association

The Draft Assessment and Strategy were posted on the website in May 2010, allowing access to the general public and ready distribution of requests for review by sending links to partners.

Based on the State Forest Stewardship Committee input, the Forest Resource Assessment and Strategy will be presented to the Governor's office and relevant Legislative committees. A system of tracking accomplishments will be developed, and periodic progress reports put on the website as available.

## Coordination with other Resource Management Plans

Forests are one of Maryland's many natural resources, and often interact with planning for related resources. Other plans were consulted for opportunities to coordinate management.

**Forest Legacy Assessment of Need-** "An Assessment of Need for the Maryland Forest Legacy Program" was originally approved by the US Forest Service on January 22, 1996. It is incorporated by reference into the Maryland Forest Assessment and Strategy. The Forest Legacy areas identify priority areas for conserving working forests, and are an important resource for Maryland Issue 1, Restore and Sustain Forest Landscapes. Maryland's Forest Legacy Areas were recently redefined using GIS ranking of important forest, landscape, and watershed traits, and underwent public review in concert with the Maryland Forest Conservation Goal development process supporting Chesapeake Bay commitments. The proposed Assessment of Need has been submitted to the US Forest Service and is currently under review. Once any needed changes have been made and final approval received, the new Forest Legacy Assessment of Need will be the document incorporated by reference. Maryland Forest Service will continue to coordinate the Forest Legacy goals into implementation of the overall Forest Strategy.

**Maryland Wildlife Diversity Conservation Plan-** Recommendations for all forested habitats identified in the plan <http://www.wildlifeactionplans.org/maryland.html> were compared to strategies identified in the Forest Assessment and Strategy. Frequently recommended actions included:

- Conserve large blocks of contiguous forest where appropriate
- Protect old-growth forest habitat and adequate forested buffers
- Establish and maintain landscape-scale protected forest habitat and movement corridors.
- Minimize fragmentation of large contiguous forest blocks
- Develop and implement protocols to control invasive species in a manner compatible with species of Greatest Conservation Need
- and protect forests/wetlands through easement/acquisition
- Incorporate forest conservation into land use and land planning efforts by local, state, and federal agencies
- Conserve appropriate corridors for movement and dispersal of rare species

Maryland is developing a detailed mapping resource for conserving rare species and their habitats called BioNet. The Forest Service will collaborate with the Wildlife and Heritage Service to use this and other data sources for targeting forest conservation and restoration where appropriate.

**Community Wildfire Protection Plans-** CWPPs are included in the State Priority areas for fire/forest health issues, and are directly represented in the responses to long-term stressors under Maintaining Healthy Forests

**Maryland Climate Action Plan-** Commitments from the Climate Action Plan <http://www.mde.state.md.us/Air/climatechange/legislation/index.asp> were included in the State Strategy as priorities under the Maryland Issue, Make Landscapes More Resilient to Climate Change. These commitments informed the chosen priorities, particularly for the mitigation strategy. The adaptation strategy was under development during the assessment and strategy process. Maryland Forest Service actively participated in mitigation and adaptation plan development, and continues to support tracking and implementation for climate change activities.

**Chesapeake Bay Goals and Commitments-** Commitments for forest buffers and forest conservation for water quality were included in the State Strategy, Maryland Issue, Ensure Clean and Abundant Water. The primary commitments are embodied in the 2007 Response to Forest Conservation

Directive 06-1 [http://www.chesapeakebay.net/content/publications/cbp\\_27761.pdf](http://www.chesapeakebay.net/content/publications/cbp_27761.pdf). The goals for forest buffers, urban tree canopy, and conserving forests in areas important for water quality are ambitious, and require new resources.

**Maryland Land Preservation, Park, and Recreation Plan-** <http://www.dnr.state.md.us/land/stewardship/pdfs/CompleteDNRORP.pdf> The Maryland LPRP includes recommendations on improving outdoor recreation opportunities in the State. The plan projects rising usage of outdoor recreation areas with an expanding regional population, and along with it increased conflicts among different users. It references additional plans for recreation, such as the Bay Access Plan and the Rails-to-Trails Study. The LPRP is included as an important strategy for forest conservation, Maryland Issue, Restore and Sustain Forest Landscapes. Many of the Strategy's goals and action echo recommendations made in the LPRP, such as:

- Develop educational materials to increase understanding of natural systems
- Connect schools and communities to natural areas using trails
- Use youth community service projects for construction and maintenance on DNR lands
- Partner with local schools, colleges, and universities for conservation education initiatives
- Aid local governments with developing local parks and greenways
- Partner with land trusts, local governments, and agencies to leverage greater land conservation
- Clearly mark land boundaries.

**Program Open Space** - The targeting developed to identify forests important for water quality for the Chesapeake Bay Forest Conservation Directive is one of four critical resource layers used to rank and prioritize land acquisition through Program Open Space (POS), one of the State's major land protection program. [http://www.dnr.state.md.us/land/pos/pos\\_eval\\_process.asp](http://www.dnr.state.md.us/land/pos/pos_eval_process.asp) Land conservation programs like POS are included as an important strategy for forest conservation, Maryland Issue, Restore and Sustain Forest Landscapes. The Sustainable Forestry Act also directs the Secretary of DNR to consider land conservation priorities that include conserving working landscapes and protecting and restoring forests from a wide variety of threats.

**Maryland Emergency Response Plan for Invasive Forest Pests**- The emergency response plan for invasive pests is modeled after the incident command structure used for wildfire response. This supports strategies protecting forests from threats. [http://www.mda.state.md.us/plants-pests/forest\\_plan/title.html](http://www.mda.state.md.us/plants-pests/forest_plan/title.html)

## Multi-State Issues

Many of the issues facing Maryland's forests are shared by neighboring states. Multi-state issues are being identified as areas (issue areas and/or landscapes) where activities are intended to be coordinated with adjacent states. Some multi-state issues will be approached through existing coordination groups, such as the Chesapeake Bay Program or Northeastern Area planning groups. Other multi-state projects will be coordinated on a project-by-project basis.

**Chesapeake Bay**- Work for the Chesapeake Bay multi-state issue will focus on actions needed to support Goal III.A. These include riparian forest buffers, forest conservation in areas of high value for water quality, and urban tree canopy. Invasive species issues affect most of these goals, and are included in watershed efforts. Watershed partnerships will be one of the approaches for applying all these actions to priority areas within the larger Bay watershed. Since over 93% of Maryland is within the Chesapeake Bay watershed, most activities in the state affect the water quality downstream. Coordination will be pursued through the continued active engagement in the Chesapeake Bay

Forestry Work Group. Maryland has been involved in the Forestry Work Group since its beginning in the late 1980's and will continue to pursue collaborative projects and goals supporting restoration of the Bay and its tributaries.

**Appalachian-** Western Maryland is part of the chain of Appalachian mountains and shares common issues like maintaining robust forest products markets, recreation pressures, surface mine reclamation, oil and gas development, wind energy development, and wildland-urban interface issues for wildfire control. Other issues like expanding ecosystem markets are applicable across a variety of landscapes.

**I-95 Corridor-** Interstate 95 connects a string of East Coast cities from Boston to Richmond. Many of the actions and solutions for urban forestry issues can benefit from learning from other states and sharing solutions for expanding urban tree canopy, dealing with invasive species, and incorporating more trees into developments.

**Forest Health-** Several forest health issues have the potential to change Maryland's forests within the next five years. Minimizing damage from forest pests almost always requires coordination with adjacent states and federal agencies like APHIS (Animal and Plant Health Inspection Service). The Maryland Department of Agriculture has primary responsibility for survey, detection, outreach, suppression or eradication of forest pests. Forest health issues anticipated to use a multi-state approach include emerald ash borer and hemlock woolly adelgid (HWA). Current funding requests for HWA have been submitted as a multi-state proposal. Southern pine beetle and Sirex wood wasp are other potential multi-state projects. Fire suppression planning will continue to be coordinated with adjacent states through the Mid-Atlantic Compact.

**Diminished Species Restoration-** Some of Maryland's forest species historically present are now only in small areas of their former range. These include American chestnut, shortleaf pine, pond pine, and Atlantic white-cedar. Restoring these species may be addressed as a multi-state issue since ranges cross state boundaries and shared resources could increase efficiency and effectiveness of projects.

**Delmarva/Mid-Atlantic Coastal Plain-** The coastal peninsula linking Delaware with coastal areas of Maryland and Virginia shares geographic boundaries, socioeconomic similarities. Southern New Jersey has some similar areas of rural land, pine predominance, and extensive wetlands. Cross-state coordination is already occurring with Delaware in the pilot development of the Bay Bank, one approach to addressing forest fragmentation and land conversion stresses common to the area. Other issues common to the peninsula include planning for sea level rise, maintaining robust forest product markets, protecting rare species like Delmarva fox squirrel, and controlling pests targeting pines such as southern pine beetle and Sirex wood wasp. Addressing the forest pests targeting the Shore or Atlantic white-cedar restoration would combine multi-state topic areas with multi-state geographic areas and facilitate sharing resources like genetically appropriate nursery stock or pest control approaches.

## Measures for Tracking Progress

Maryland Forest Service is responsible for reporting progress for a number of different commitments. Many of the forest stewardship, afforestation, urban forestry, fire suppression, and fire risk reduction activities are tracked to meet requirements for USDA Forest Service funding. Some forestry actions like riparian forest buffers, upland tree planting, forests conserved through the Forest Conservation Act, and sediment and erosion control harvest plans/implementation are reported as BMPs for credits

in the Chesapeake Bay model. Progress in meeting Chesapeake Bay Commitments like the Forest Conservation Directive is tracked and reported through the Chesapeake Bay Program Forestry Work Group. The Forest Conservation Act requires annual reporting on forests cleared, protected, and replanted to a legislative oversight committee. Progress to meet other goals including the Maryland Coastal Bays Strategy and the Maryland Climate Action Plan mitigation goals are reported annually or more frequently. The Marylanders Plant Trees program <http://www.trees.maryland.gov> has an online tracking mechanism for trees planted statewide. Overall progress tracking will have to coordinate the needs and formats required for these reporting requirements. Progress measures are expected to include:

- Percent forest cover
- Average DBH
- Acres affected by forest pests and diseases
- Number of owners served- stewardship plans, afforestation, timber stand improvement, sediment and erosion control review, buffers, invasive species
- Number and acres of trees planted
- Number of acres affected- in and out of Stewardship (SAP) priority areas
- Number and acres participating in tax programs
- Number of seedlings produced
- Number of species of seedlings raised
- Number of landowners on stewardship plan wait lists
- Acres of certified forest, public and private
- Acres and miles of forest buffers
- Acres of forest protected from development and open to management (total and those within areas of high priority for water quality)
- New forest businesses and distribution in state
- Number of low-interest loans or technical assistance aid
- Number of licensed tree experts
- % canopy cover and acres of urban tree canopy
- Number of municipalities with urban tree canopy goals
- Number of active ecosystem markets
- Actions supporting ecosystem markets (pilots, etc.)
- Number of people reached with forestry training provided or supported (financial or technical assistance)
- Public land forest resource inventory updated
- Biomass and tons carbon sequestered

Additional measures will be tracked, consistent with recommendations from the Redesign Implementation Council of the National Association of State Foresters and USDA Forest Service State and Private Forestry.

## Appendix A: Glossary

This glossary is designed to assist the reader of the Maryland State Assessment and Strategy better understand some of the terminology associated with forest management.

**A** **adaptive management**- a dynamic approach to forest management in which the effects of treatments and decisions are continually monitored and used, along with research results, to modify management on a continuing basis to ensure that objectives are being met

**agroforestry** - a land-use system that involve deliberate retention, introduction, or mixture of trees or other woody perennials in crop and animal production systems to take advantage of economic or ecological interactions among the components

**B** **basal area** - the cross-sectional area of the trunk 4½ feet above the ground; (per acre) the sum of the basal areas of the trees on an acre; used as a measure of forest density.

**Best Management Practice (BMP)** - a practice or usually a combination of practices that are determined by a state or a designated planning agency to be the most effective and practicable means (including technological, economical, and institutional considerations) of controlling point and nonpoint source pollutants at levels compatible with environmental quality goals, conceptualized in the 1972 Federal Water Pollution Control Act

**biological diversity or biodiversity** - the variety of life in all its forms and all its levels of organization. Biodiversity refers to diversity of genetics, species, ecosystems, and landscapes.

**biomass** (forest) – wood products used as a fuel or energy source that can replace fossil fuels with renewable fuels; usually considered to be wood not normally sold or utilized from a forest harvest, or a short-rotation tree crop grown for energy use.

**breast height** - 4½ feet above ground level. See diameter at breast height.

**browse** - parts of woody plants, including twigs, shoots, and leaves, eaten by forest animals.

**C** **canopy** - the continuous cover formed by tree crowns

**carbon credit** - A permit that allows the holder to emit one ton of carbon dioxide.

**carbon sequestration** - the incorporation of carbon dioxide into permanent plant tissues, used to mitigate increasing carbon dioxide levels linked to climate change; tree growth captures carbon dioxide from the atmosphere and reduces it until the wood is burned or decayed.

**certified forest** – forest land reviewed by a designated authority to attest that the management of forest land meets approved standards for sustainable forestry.

**clearcut** - the harvest of all the trees in an area. Clearcutting is used to aid species whose seedlings require full sunlight to grow well.

**commercial forestland** - any area capable of producing 20 cubic feet of timber per acre per year that has not been protected from such use by law or statute.

**commercial thinning** - a harvest where all or part of the felled trees are extracted from useful

products, regardless of whether their value is great enough to defray the cost of operation.

**conifer** - any tree that produces seeds in cones. See softwood.

**conservation easement** - the public acquisition, by purchase or donation, of certain rights on private lands or, in some cases, restricting the private owner's use of that land, usually restrictions on future buildings

**cordwood** - small diameter or low quality wood suitable for firewood, pulp, or chips. Cordwood is not suitable for sawlogs.

**crop tree** - a young tree of a desirable species with certain characteristics desired for timber value, water quality enhancement, or wildlife or aesthetic uses.

**D** **deciduous** - shedding or losing leaves annually; the opposite of evergreen. Trees such as maple, ash, cherry, and larch are deciduous.

**den tree** - tree with cavities suitable for birds or mammals to nest in.

**diameter at breast height (d.b.h.)** - standard measurement of a tree's diameter, usually taken at 4 ½ feet above the ground.

**diameter-limit harvest** - a timber sale in which all trees over a specified d.b.h. may be cut. Diameter-limit sales often result in high grading.

**dominant trees** - trees that extend above surrounding individuals and capture sunlight from above and around the crown.

**E** **ecosystem** - organisms and the physical factors that make up their environment.

**ecosystem market** - organizational structure for buying and selling units of environmental benefit, known as credits, created through the conservation or high-quality restoration of naturally functioning ecosystems (e.g., clean water, clean air, carbon sequestration, pollination, expanded habitat). An ecosystem market connects people willing to pay, usually businesses or governments required to offset environmental impact, with people who can take those actions, such as farmers, forest land owners, or other land managers who can conserve or restore ecologically valuable land.

**edge** - the boundary between two ecological communities, for example, field and woodland. Edges provide wildlife habitat. Consideration of an edge can reduce the impact of a timber harvest.

**endangered species** - any species or subspecies in immediate danger of becoming extinct throughout all or a significant portion of its range.

**even-aged stand** - a stand in which the age difference between the oldest and youngest trees is minimal, usually no greater than 10 to 20 years. Even-aged stands are perpetuated by cutting all the trees within a relatively short period of time.

**F** **fertilization** - the addition of nutrient elements to increase growth rate or overcome a nutrient deficiency in the soil.

**forest** - biological community dominated by trees and other woody plants.

**forest certification** – see certified forest

**Forest Conservation Management Agreement (FCMA)**- 15-year agreement that allows lower property tax assessments on forest land in exchange for landowners following a Forest Stewardship Plan and not changing land use.

**forest fragmentation** - the subdivision of large natural landscapes into smaller, more isolated fragments. Fragmentation affects the viability of wildlife populations and ecosystems.

**forest management** - the practical application of biological, physical, quantitative, managerial, economic, social, and policy principles to the regeneration, management, utilization, and conservation of forests to meet specified goals and objectives while maintaining the productivity of the forest —*note* forest management includes management for aesthetics, fish, recreation, urban values, water, wilderness, wildlife, wood products, and other forest resource values.

**forest types** - associations of tree species that have similar ecological requirements. Maryland forest types include Allegheny hardwood, loblolly-shortleaf, northern hardwood, oak-gum-cypress, oak hickory, and oak-pine.

**forested wetland** - an area characterized by woody vegetation taller than 20 feet where soil is at least periodically saturated or covered by water.

**forester** - a degreed professional trained in forestry and forest management. In Maryland, all foresters must be registered with the state.

**forestry** - the science of tending woodlands.

**G green infrastructure** - green infrastructure is strategically planned and managed networks of natural lands, working landscapes and other open spaces that conserve ecosystem values and functions and provide associated benefits to human populations.

**group selection** - a process of harvesting patches of trees to open the forest canopy and encourage the reproduction of unevenaged stands.

**H habitat** -the ecosystem in which a plant or animal lives and obtains food and water.

**Habitat Conservation Plan** – a legally binding plan prepared under the Endangered Species Act (ESA) by nonfederal parties and agreed to by the US Fish and Wildlife Service to protect a specified area as habitat for a threatened or endangered species; HCPs are required for those wishing to obtain permits for incidental taking of threatened and endangered species that may occur during land management activities.

**hardwoods** - a general term encompassing broadleaf, deciduous trees.

**harvest** - the cutting, felling, and gathering of forest timber.

**high grading** - to remove all mature, good quality trees from a stand and leave inferior species and individuals. High grading should be distinguished from even-aged management in

which mature and immature trees are removed to aid regeneration.

- I** ***improvement cut*** - a weeding done to remove less desirable trees in stands of pole-size or larger trees.

***incident command system*** - the facilities, equipment, personnel, procedures, and communications operating within an organizational structure and responsible for managing assigned resources to accomplish stated objectives pertaining to an emergency

***industrial forester*** - a professional employed by a wood-using industry, usually a sawmill, who purchases timber from private woodland owners. Many industrial foresters offer free forest management or marketing services to the landowners who sell timber to the forester's employer.

***intergenerational transfer*** – the passing of assets such as land from older to younger family members

***intermediate tolerance*** - a characteristic of certain tree species that allows them to survive, though not necessarily thrive, in relatively low light conditions.

***intolerance*** - a characteristic of certain tree species that does not permit them to survive in the shade of other trees.

***introduced species*** - a nonnative species that was intentionally or unintentionally brought into an area by humans.

**J**

**K**

**L**

***landing*** - a cleared area within a timber harvest where harvested logs are processed, piled, and loaded for transport to a sawmill or other facility.

***logger*** - an individual who harvests timber for a living.

**M**

***mast*** - nuts and seeds, such as acorns, beechnuts, and chestnuts, of trees that serve as food for wildlife.

***mortality*** - trees dying from natural causes, usually by size class in relation to sequential inventories or subsequent to incidents such as storms, wildfire, or insect and disease epidemics

**N**

***nongame wildlife*** - wildlife species that are protected by state wildlife laws and can not be hunted. Examples include songbirds, eagles, etc.

***nontidal wetlands*** - wetlands not affected by ocean tides. Nontidal wetlands are subject to special regulations.

***northern hardwood forest type*** - an association of tree species common to the Northeastern United States that includes sugar maple, red maple, yellow birch, hemlock, and American beech.

- O**
- old-growth forest** - a wooded area, usually greater than 200 years of age, that has never been altered or harvested by humans. An old-growth forest often has large individual trees, a multi-layered crown canopy, and a significant accumulation of coarse woody debris including snags and fallen logs.
  - overmature** - a quality exhibited by trees that have declined in growth rate because of old age and loss of vigor.
  - overstocked** - the situation in which trees are so closely spaced that they compete for resources and do not reach full growth potential.
  - overstory** - the level of forest canopy that includes the crowns of dominant, codominant, and intermediate trees.
  - overstory removal** - a silvicultural technique where the trees to be removed are all in the dominant or codominant crown class or position. This basically is performed to harvest mature trees and to remove competition from preferred understory trees.
  - overtopped** - the situation in which a tree cannot sufficiently extend its crown into the overstory and receive direct sunlight. Overtopped trees that lack shade tolerance lose vigor and die.
- P**
- parcelization** - division of parcels of land into smaller parcels among multiple owners; usually precedes fragmentation, when gaps in forest cover occur
  - pole timber** - trees 4 to 10 inches d.b.h.
  - precommercial thinning** - a harvest made purely as investments in the future growth of stands so young that none of the cut trees are extracted and utilized. This treatment is usually completed by hand on trees 5-10 years of age. Precommercial operations improve species composition and increase the quality, growth, and vigor of remaining trees
  - prescribed fire** - fires set deliberately, under proper supervision and certain conditions, to achieve a specific management goal such as enhancing wildlife habitat, encouraging fire-dependant plant species, reducing fuel loads that feed wildfires, and preparing sites for planting. Sometimes referred to prescribed burning.
  - provenance** - the original geographic source of seed, pollen, or propagules
  - pruning** - the act of sawing or cutting branches from a living tree. In forest management, pruning is done to promote the growth of clear, valuable wood on the tree bole.
  - pulpwood harvest** - a harvest where the trees are to utilized for paper pulp. This type of harvest usually is preformed as a commercial thinning where the trees are all pole sized (4" to 11" d.b.h.), but definitely less than sawtimber sized (11" d.b.h. or greater).
- Q**
- R**
- reforestation** – the reestablishment of forest cover either naturally (by natural seeding, coppice, or root suckers) or artificially (by direct seeding or planting).

**regeneration** - the process by which a forest is reseeded and renewed. Advanced regeneration refers to regeneration that is established before the existing forest stand is removed.

**Regional Greenhouse Gas Initiative (RGGI)** - The Regional Greenhouse Gas Initiative (RGGI) is a cooperative effort by ten Northeast and Mid-Atlantic states to limit greenhouse gas emissions. RGGI is the first mandatory, market-based CO<sub>2</sub> emissions reduction program in the United States. The states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont are signatory states to the RGGI agreement. These ten states have capped CO<sub>2</sub> emissions from the power sector, and will require a 10 percent reduction in these emissions by 2018.

**release** - to remove overtopping trees that compete with understory or suppressed trees.

**residual stand** - the trees remaining intact following any cutting operation.

**riparian buffer** - vegetated areas adjacent to or influenced by a perennial or intermittent stream or other bodies of water. These buffers are established and managed to protect aquatic, wetland, shoreline, and/or terrestrial environments.

**rotation** - the number of years required to grow a stand to a desired size or maturity.

**s** **salvage cut** - herbaceous the removal of dead, damaged, or diseased trees to recover maximum value prior to deterioration.

**sapling** - a tree at least 4 ½ feet tall and up to 4 inches in diameter.

**sawlog tree** - a tree at least 11 inches dbh and suitable for conversion to lumber. Sometimes, trees 11 to 14 inches dbh are called small sawlog trees, and trees larger than 18 inches dbh are called large sawlog trees.

**seed tree** - a mature tree left uncut to provide seed for regeneration of a harvested stand.

**seed-tree harvest** - the felling of all the trees in an area except for a few desirable individuals that provide seed for the next forest.

**selection or selective harvest** - the harvest of all individual trees or small groups at regular intervals to maintain an uneven-aged forest. Selection harvests are used to manage species that do not need sunlight to survive.

**shelterwood harvest** - the harvest of all mature trees in an area in a series of two or more cuts, leaving enough trees of other sizes to provide shade and protection for forest seedlings.

**silviculture** - the art and science of growing forest trees.

**site** - the combination of biotic, climatic, topographic, and soil conditions of an area.

**site index** - a measure of the quality of a site based on the height of dominate trees at a specified age (usually 25 or 50 years), depending on the species.

**site preparation** - treatment of an area prior to reestablishment of a forest stand. Site preparation can include mechanical clearing, burning, or chemical (herbicide) vegetation control.

**skidding** - the act of moving trees from the site of felling to a leading area or landing. Tractors, horses, or specialized logging equipment can be used for skidding. Skidding methods vary in their impact on soils and the remaining stands.

**slash** - branches and other woody material left on a site after logging.

**snag** - a dead tree that is still standing. Snags provide important food and cover for a wide variety of wildlife species.

**softwood** - any tree in the gymnosperm group, including pines, hemlocks, larches, spruces, firs, and junipers. Softwoods often are called conifers although some, such as junipers and yews do not produce cones.

**sprout** - a tree growing from a cut stump or previously established root system.

**stand** - a group of forest trees of sufficiently uniform species composition, age, and condition to be considered a homogeneous unit for management purposes.

**stand density** - the quantity of trees per unit area, usually evaluated in terms of basal area, crown cover and stocking.

**stocking** - the number and density of trees in a forest stand. Stands are often classified as understocked, well-stocked or overstocked.

**stumpage** - the value of standing trees in a forest.

**succession** - the natural replacement of one plant (or animal) community by another over time in the absence of disturbance.

**suppressed** - a tree condition characterized by low growth rate and low vigor as a result of competition with overtopping trees. See overtopped.

**sustainable forestry** - the practice of meeting the forest resource needs and values of the present without compromising the similar capability of future generations; criteria for sustainable forestry include (a) conservation of biological diversity, (b) maintenance of productive capacity of forest ecosystems, (c) maintenance of forest ecosystem health and vitality, (d) conservation and maintenance of soil and water resources, (e) maintenance of forest contributions to global carbon cycles, (f) maintenance and enhancement of long-term multiple socioeconomic benefits to meet the needs of societies, and (g) a legal, institutional, and economic framework for forest conservation and sustainable management (Montréal Process, 1993)

**sustained yield** - an ideal forest management objective in which the volume of wood removed equals growth within the total forest.

T **thinning** - a partial cut in an immature, overstocked stand of trees used to increase the stand's value growth by concentrating on individuals with the best potential.

**threatened species** - a species or subspecies whose population is so small or is declining so rapidly that it may become endangered in all or a significant portion of its range.

**timber stand improvement (t.s.i.)** - any practice that increases the value or rate of value growth in a stand of potential sawtimber trees. Pruning and thinning are considered t.s.i.

**tolerance** - a tree species' capacity to grow in shade

**Total Maximum Daily Load (TMDL)** - regulatory term in the U.S. Clean Water Act (CWA), describing a value of the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards

**tree expert** – a tree care professional practicing or advertising tree care services, requiring a license in Maryland; the applicant must possess adequate and related college education plus one year of experience under a LTE or have five years experience under a Licensed Tree Expert (LTE), then have passed an exam and carry adequate amounts of liability and property damage insurance.

**U**      **understocked** - a stand of trees so widely spaced, that even with full growth potential realized, crown closure will not occur.

**understory** - the level of forest vegetation beneath the canopy.

**uneven-aged stand** - a group of trees of a variety of ages and sizes growing on a uniform site; also called all-aged stand.

**urban tree canopy** - the layer of leaves, branches, and stems of trees that cover the ground when viewed from above.

**V**      **vegetation** - low-growing, non-woody plants, including wildflowers and ferns, in a forest understory

**veneer log** - a high-quality log of a desirable species suitable for conversion to veneer. Veneer logs must be large, straight, of minimum taper, and free from defects.

**W**      **watershed** - a region defined by patterns of stream drainage. A watershed includes all the land that contributes water to a particular stream or river.

**well-stocked** - the situation in which a forest stand contains trees spaced widely enough to prevent competition yet closely enough to utilize the entire site.

**wildlife habitat** - the native environment of an animal. Habitats ideally provide all the elements needed for life and growth: food, water, cover and space.

**windthrow** - a tree felled by wind. Windthrows, also known as blowdowns, are common among shallow-rooted species and in areas where cutting has reduced stand density.

**woodland** - see forest.

**working forest landscape** - forest lands that are managed consistently with the requirements of a forest stewardship plan or a forest conservation plan, approved by DNR or a licensed professional forester, that advances sustainable forest management

X

Y

Z

Portions of this glossary is credited to Nancy Pywell, Extension forester, Pennsylvania State University, whose bulletin, Forestry Terminology provided the framework for this fact sheet. Some definitions have been modified for Maryland Department of Natural Resources purposes.

Some definitions were taken from The Dictionary of Forestry, John A. Helms, Editor. Society of American Foresters, 1998. <http://dictionaryofforestry.org/dict/browse>

## Appendix B: Summary of Concerns from the Harry R. Hughes Center for Agroecology Five Regional Listening Sessions

### *I. Greatest Concerns Regarding Retention and Management of Private Forests*

Conversion of forests to non-forest uses through commercial and residential development was a primary concern. Fragmentation and parcelization of forests were also cited as key areas of concern, as was the lack of viable management strategies for the remaining small parcels. Many others cited the lack of appropriately structured financial incentives for retaining forest land and heavy tax burdens as disincentives.

Some were concerned that forest management plans and conservation easements were not being enforced. Many worried that individuals now acquiring forested home sites of 10 acres or less have never owned forestland in the past and need landowner assistance programs. The lack of access to professional services by landowners and the reduction of MD DNR foresters concerned many; the aging of forestry professionals also worried some. As one person summed it up, “the old axiom of ‘doing more with less’ has reached its limit.”

Others saw challenges due to the lack of public education and understanding about how forests function and the benefits they provide, such as water quality, forest diversity, forest industry, jobs, recreation, wildlife habitat, etc. Many cited the lack of markets as a threat to retaining private forest lands. Others felt that climate change and unsustainable management practices were significant threats.

### *II. Greatest Concerns Regarding Retention and Management of Public Forests*

The lack of people on the ground in the Maryland Department of Natural Resources and Department of Agriculture was seen as the greatest threat to retaining and managing public lands. Many felt that the agencies were top heavy, with too many people in administrative positions, leaving little budget for adding people at the field level. Inadequate funding for purchase of land by the State was also seen as a problem, especially with regard to in holdings and buffer areas adjacent to forests. Many expressed concern over the State’s ability to protect large contiguous tracts from development.

Publicly-owned forests were seen as particularly vulnerable given the current economic crisis. Concerns were also expressed about the effects of local regulation and zoning that was perceived as promoting development at the expense of forest land, especially in rural counties. Public lands were seen as at risk as long as elected officials were amenable to converting forests to other public purposes such as hospitals, schools, or water treatment facilities.

Many people expressed concern over the lack of active management on public forest lands, noting that benign neglect is insufficient to maintain the health and vigor of forest resources. Invasive pests were seen as indicative of inadequate management, and many expressed concern that pests were damaging the publicly-owned forests and then spreading from public to private land. Others feared that native biodiversity was being lost, and felt the role of State lands should be more holistic. The lack of public understanding of forest functions and benefits was seen as a threat to public lands, given that political will was necessary to sustain healthy forests and markets.

### *III. Greatest Concerns Regarding Economic Viability of Forestry Industry in Maryland*

Viability for the forest products industry in Maryland was seen as directly correlated to maintaining viable forests—that is, without a forest resource, there is no industry, and vice versa. It was feared that many people would not concern themselves with forest sustainability without a viable forest products industry to place an economic value on forest lands. Forest fragmentation was also a

concern, given the difficulty of harvesting small parcels profitably. Regulatory issues, such as the difficulty of acquiring harvesting permits in a timely fashion, were also seen as problematic.

As also noted under Issue 5, some were worried about maintaining a balance between a viable forest products industry focused on lumber and paper while also expanding forest-based enterprises using biomass for things like energy. In particular, there was concern that government assistance for alternatives would drive the price of wood fiber up too high for traditional forest industry to compete. Given the changing patterns of land ownership and decreasing parcel size, the lack of public education or understanding of forests and forest systems was again seen as a major shortcoming, as was the lack of technical assistance for business owners.

Concern was significant over the perceived lack of appropriate financial incentives in support of both producers and the mills forest industry, given the uncertainty of current markets and questionable return on investment. In particular, more support was sought for small and medium scale forestry enterprises in all parts of the state. Concerns were also expressed regarding redundant or duplicated processes and cumbersome regulations seen as discouraging forest owners from implementing forest improvement practices.

#### *IV. Greatest Concerns Regarding Maintaining Forest Diversity in Maryland*

Maintaining diversity was a primary concern for only a limited number of people, although problems associated with invasive species and changes in tree species mix were cited frequently in other categories of concern. For those concerned about maintaining forest diversity, the perceived lack of Maryland DNR field personnel was seen as a real problem, as was the effect of forest conversion due to development, climate change, and wild fire. Logging permits that did not address forest diversity as a criterion was also a concern. Many people worried that a lack of public education about forests and forest diversity benefits was making a bad situation worse.

#### *V. Greatest Concerns Regarding Value-Added Alternative Opportunities*

Value-added alternatives were most often a secondary concern, generally in the context of improving opportunities for forest landowners with small holdings and others who are most likely to convert forests to other land use purposes. Interests ranged broadly from biofuels and biomass opportunities to recreation and traditional non-timber products such as mushrooms, ginseng, ferns, etc. Some were worried about maintaining a balance between a viable forest products industry focused on lumber and paper while also expanding forest-based enterprises using biomass for things like energy. In particular, there was concern that government assistance for alternatives would drive the price of wood fiber up too high for traditional forest industry.

People also saw a conflict between the need for economic cost-share and technical help to develop these markets and the reductions in staffing identified at MD DNR. Given that the market for traditional forest products is cyclical at best, some were concerned as to how the viability and sustainability of new opportunities would be tested. However, there was broad consensus that a healthy forest products industry is crucial to helping forest landowners keep their forests intact by providing economic incentives through the market.

#### *VI. Other Concerns*

Participants were also given the opportunity to raise additional concerns outside of the identified categories. Citing the rate of development and the inevitability of transformation from development, urban forests were seen as an area in need of more research, resources, and regulation. Concerns was also expressed over the adoption of poorly thought out regulation that ignore urban revitalization and inhibit urban renewal, seeing smart growth as protecting more forest than any other form of land development. Others saw the need to return a portion of Maryland forests to old growth conditions.

Some called for more effective tools to assess the benefits of forests and to more effectively communicate the benefits to both policy makers and the public to build political will. Worries were expressed over the lack of communication and collaboration between stakeholders and agency professionals focused on the economic values of production and harvest versus those focused on environmental values of conservation and preservation. Similarly, people were concerned about landowners' lack of understanding of forest attributes, both economic and systemic. People's disconnection from forests and the value of forests in their busy lives was also a concern.

## Appendix C: Maryland Forest Service Funding Trends

Like many agencies and organizations, Maryland Forest Service is managing with a shrinking workforce and increases in responsibilities. Between Fiscal Year (FY) 2002 and FY 2010, the Maryland Forest Service lost 63 permanent positions. In 2006, the responsibility for managing the State Forests was assigned to Maryland Forest Service, and some permanent positions were shifted with that responsibility (13 positions for over 130,000 acres on 10 State Forests). A few positions were allotted for critical functions as vacancies occurred. The overall net loss over the nine years was 43 permanent positions, even with the transferred and new positions and substantial new assignments. Some of those positions were never filled, notably most (9 of 11) of the anticipated positions for the 58,000+-acre Chesapeake Forest acquired just prior to FY2002, which had been created to handle regular property management, the associated Sustainable Management Plan, and the State's first Certified Forest process.

As can be seen, the Forest Service has experienced a loss of permanent positions (PINs) in eight of the last nine years (Figure 11). The number of Forest Service authorized positions declined from 135.5 in FY2001 to 86 in FY2010, a 36.5% reduction.

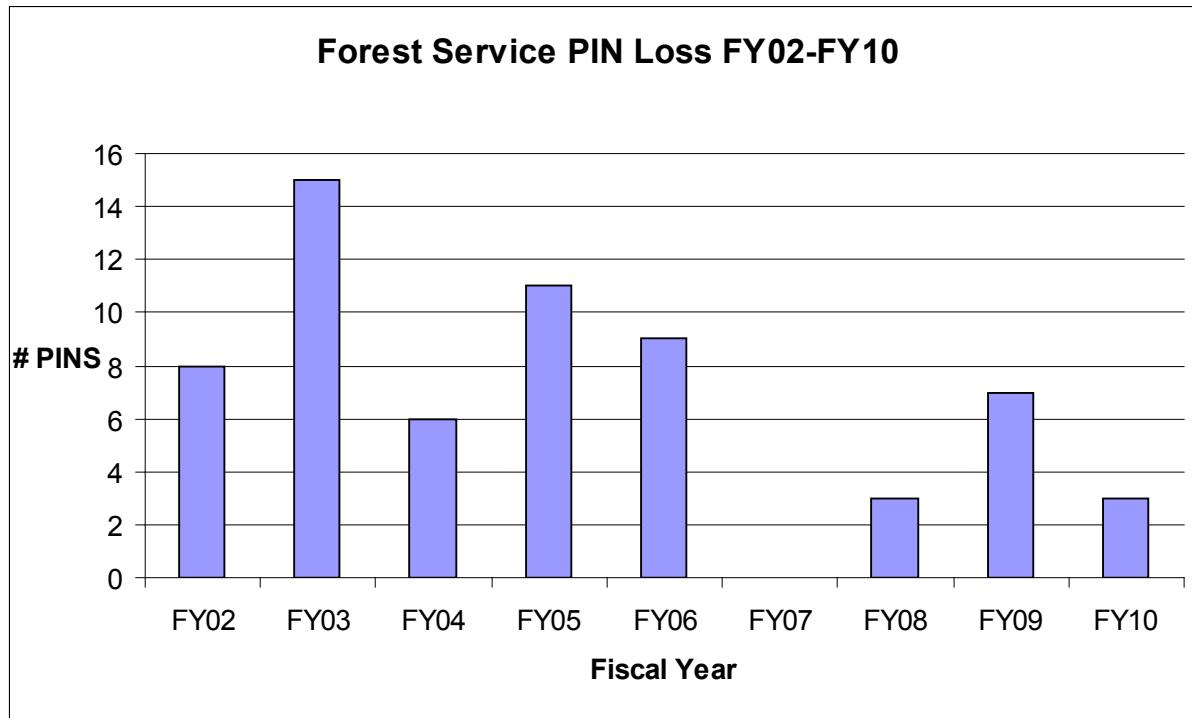


Figure 11: Number Maryland Forest Service permanent positions lost by Fiscal Year

The Maryland Forest Service has taken on new Chesapeake Bay goals, new Governor's Initiatives like Marylanders Plant Trees and Forest Brigade, and expanded State Forest Certification in recent years. Core activities like forest stewardship plans, urban forestry, riparian forest buffer establishment, and tree care responsibilities have become more important than ever as forest area declines and population expands. The total workforce for completing priorities with State forestry staff has declined overall, even with the addition of some positions with the shift of the State Forests (Figure 12).

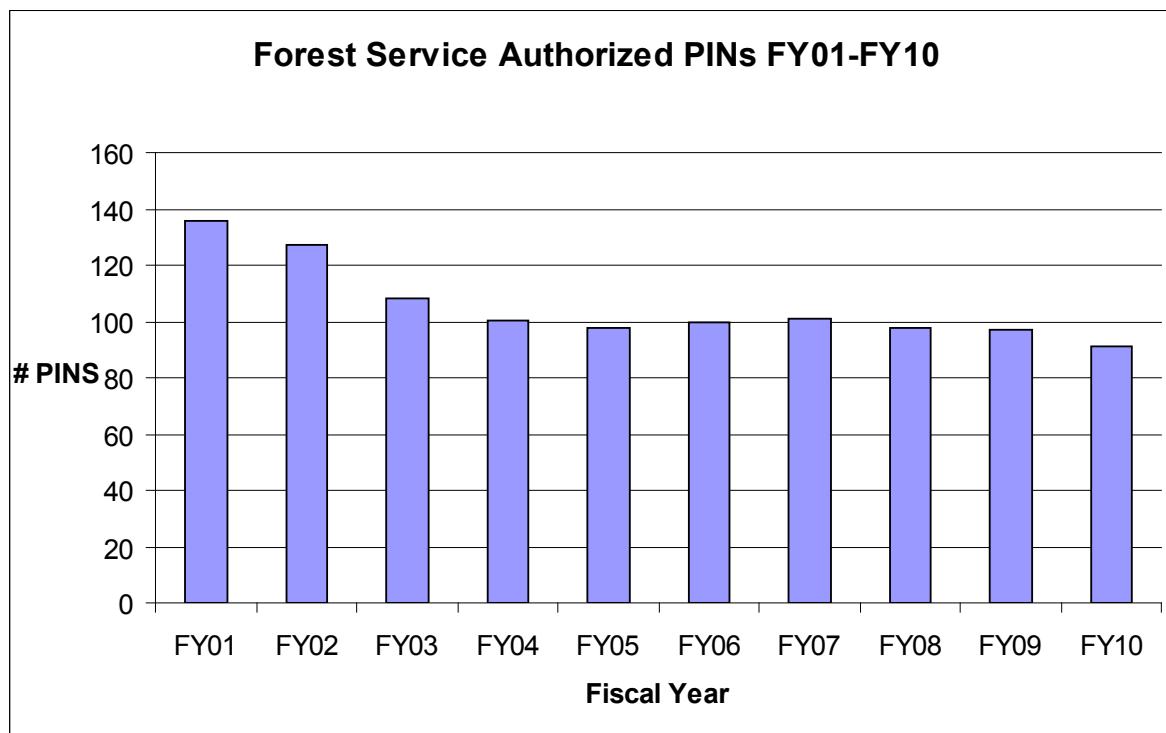


Figure 12: Number of full-time regular positions authorized for the Maryland Forest Service by Fiscal Year (July 1 to June 30)

Based on the long-term trend of declining PINs, the most likely scenario is that the Forest Service will continue to grow smaller as long as state budgets continue to experience shortfalls. Of course, if budgets stabilize, the Unit PIN count may also stabilize. However, to make realistic assessments of progress on priority tasks, the Forest Service needs to plan for accomplishing its priority tasks with the expectation it will remain a smaller workforce into the future.

Partnerships and grants have long been significant contributors to strategies for meeting forestry goals, and they are likely to play an even greater role in the future. Federal funds primarily from USDA Forest Service have been a valuable and fairly stable element in MFS budgets, and are matched 50:50 with State funds, so requirements of USFS grant deliverables have significant influence on MFS activities and directions. However, the majority of MFS funding has been from General Funds from State tax dollars until FY2010 (Figure 13).

The increase in budget from 2005 to 2006 and 2007 is attributable to the State Forests moving back to the Forest Service. The increase in budget from 2009 to 2010 is attributable to special projects such as Marylanders Plant Trees, Forest Brigade, Natural Filters and a \$300,000 WIP budget amendment for an agreement with NRCS. These special projects totaled over \$1,000,000 while salaries were reduced by over \$500,000. The new work was completed and projects funded even with the reduced staffing, but not all other activities were able to be maintained at prior levels.

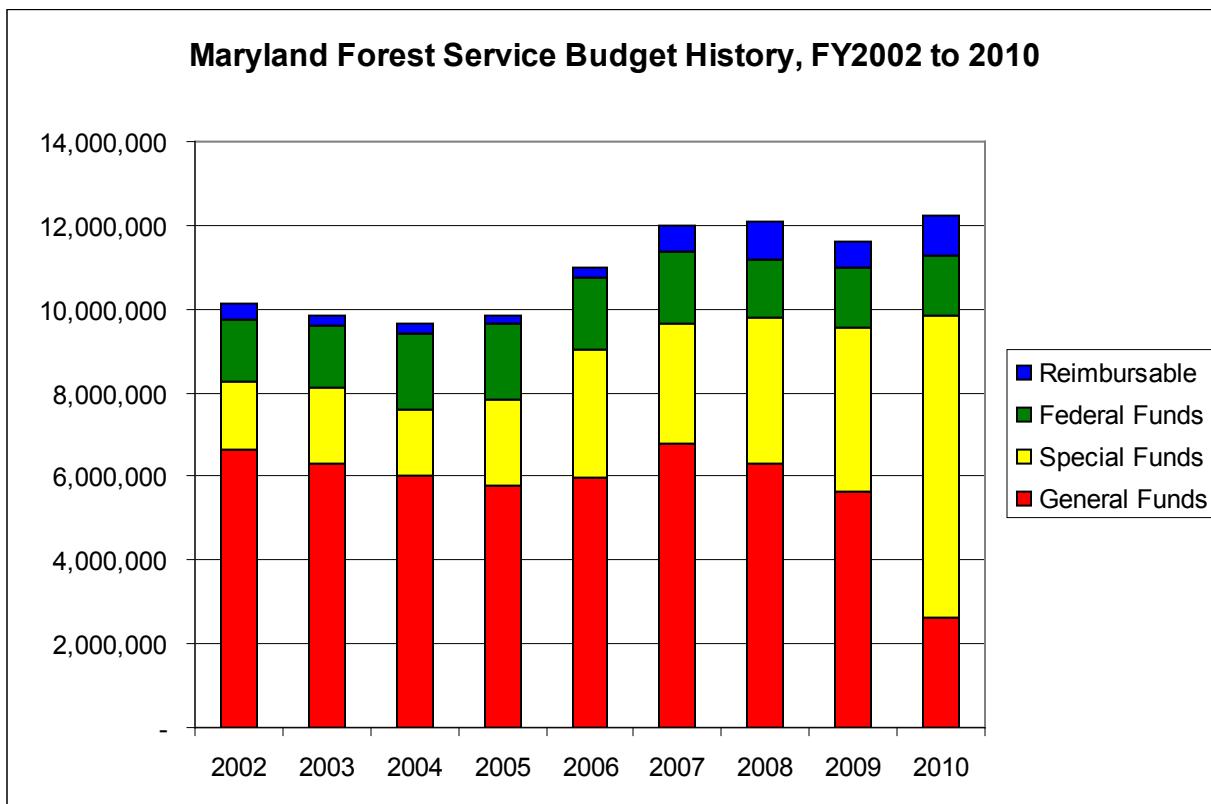


Figure 13: Maryland Forest Service budgets by fund types, FY2002 to FY2010

General funds have been trending downward since 2007 with a drastic reduction of \$3 million in 2010. Of this amount, \$1.8 million was due to a legislative deal involving county payment reductions. Parks didn't have to pay county payments in 2010 and 2011. During those years, \$1,880,000 of general funds was taken from the Forest Service and back-filled with Forest & Park Reserve Fund Special Fund dollars. If the legislative budget compromise is not "fixed" this year, the \$1,880,000 in FPRF goes away in 2012, and could leave the Forest Service without the General Fund revenue needed to fund even its reduced number of positions.

The overall trend toward less General Funds and more Special Funds places unsustainable expectations on the Maryland Forest Service. Special Funds are generated through sales and fees, including management plan fees, park entrance fees, timber sales, campsite fees, roadside tree permits, and similar sources. Timber sale revenue has declined due to the economic downturn. There are only so many licenses, permits, campsites and RT supervision opportunities. Special Funds are less predictable year to year than General Funds and will involve reliance on other units like the Park Service for basic expenses.

The priorities and actions laid out in the Strategic Plan will have to take into account these budget realities and further shifts in funding sources. Clear priorities, robust partnerships, and pursuit of targeted grant funding will be needed to make progress on the identified goals that will make a difference for Maryland's forests and its future.



