Healthy Forests: Proactive Strategies for Managing Threats and Promoting Conservation

Submitted by the Forestry Workgroup

Workshop Steering Committee Members:

1. Co-Chair: Katherine Brownson, U.S. Forest Service; Chesapeake Bay Program, CBP Forestry Workgroup Coordinator, USFS Liaison to the Chesapeake Bay Program
2. Co-Chair: Craig Highfield, Alliance for the Chesapeake Bay; Forests Program Director, Forestry Workgroup; Forest conservation, restoration and management practitioner
3. Matt Baker, STAC Sponsor; University of Maryland Baltimore County; Professor of Geography & Environmental Systems; Expertise in watershed, forest, and landscape ecology
4. Meghan Noe Fellows, Delaware Center for the Inland Bays; Director of Estuary Science & Restoration and forest conservation/restoration practitioner
5. Sarah Johnson, Pennsylvania Department of Conservation and Natural Resources, Bureau of Forestry; Forest Health Program Specialist
6. Michelle Katoski, U.S. Geological Survey; Chesapeake Bay Program, Physical Scientist, Expertise in landscape ecology and GIS
7. Craig Larcenaire, U.S. Forest Service; Morgantown Field Office, Entomologist
8. Laura Cattell Noll, Alliance for the Chesapeake Bay; Local Government Initiative Director, Local Government Advisory Committee Coordinator
9. TBD, Social scientist (preferably with expertise in rural sociology or behavioral science)
10. TBD

Previous STAC workshops applied for by the Forestry Workgroup:

Rising Watershed and Bay Water Temperatures – Ecological Implications and Management Responses, 2023. This report has led to increased discussion at the CBP of how water temperature impacts water quality. There is currently an in-progress Water Quality GIT funded project associated with water quality and water temperature.

Urban Tree Canopy, 2004

Logistics & Budget:

We propose to conduct the Workshop in Winter 2025/2026 to allow time to conduct the necessary pre-workshop activities, including reaching out to and securing audiences, speakers, venue, and completing a compilation and synthesis of background information. The Workshop will be conducted over two days; the first day being a discussion of the state of the science, and the second day being focused on the development of Bay Program recommendations and BMPs. The final report will be developed by April 2026, with the development of fact sheets by May 2026

The total cost is projected to be $15,000. The component are: venue: $2,000; food: $3,500; travel/lodging for selected participants: $4,000; contractual assistance with pre-workshop compilation: $3,500; and development of and printouts of the factsheets for public use: $2,000.

The Workshop will take place at a venue in or around the DC-Annapolis area. The Workshop will be in person, with hybrid options available depending on demand.

Workshop Topic & Objective:

Forest conservation has traditionally focused on conservation easements to protect existing forests from development. While protecting forests and critical ecosystems from development is important, additional efforts are needed to address growing threats to forest health. Although conservation easements protect forests from development, forests are still under the influence of external pressures and threats, such as introduction of non-native species and changing environmental conditions. These pressures in turn may negatively impact forest ecosystems, microbial systems, soil quality, and other factors, all of which are involved in a complex interplay that ultimately impact water quality and the health of the Bay. An unhealthy forest may also have reduced water quantity regulation capacity, increasing stress on ecosystem function in waterways, and increased vulnerability to forest mortality and loss through disturbances, such as extreme drought and flooding events.

These threats to forest health will require increased focus on proactive management and stewardship practices that are designed to promote and enhance forest health. By focusing on active forest management strategies, existing forests will be more resilient to loss and forest health threats. Healthy, diverse forests will deliver better ecosystem services that improve water quality and Bay health.

This Programmatic STAC Workshop will seek to provide the CBP and the Partnership with actionable recommendations on how to achieve meaningful conservation outcomes through active forest management and stewardship. The workshop will aim to achieve the following objectives:

- Identify major stressors to forest health and resilience in the Chesapeake Bay watershed, including from changing environmental conditions, land use change, non-native species, pests, diseases, and other stressors.
- Evaluate whether and the extent to which the major stressors identified (and interactions between multiple stressors) may lead to declines in forest health through impairment of forest ecology.
- Evaluate how impairments to forest ecology may impact the ability of forests to improve water quality, how these impairments may lead to forest loss, and the implications of these for meeting the Bay Program's goals.
- Develop actionable recommendations for improving forest health and resilience to enhance conservation outcomes through silvicultural practices, invasive species management, policy, community engagement, and other incentives, in addition to traditional conservation.

The workshop will integrate insights from scientific research, expert testimony, and case studies to build a comprehensive framework of monitoring programs, adaptive management strategies, collaborative efforts, and other measures for addressing these challenges effectively.

Degree of Urgency:

Forests make up about 2/3 of the land in the Chesapeake Bay watershed and the Bay Program has continually emphasized the importance of forests for water quality and habitat restoration. The Chesapeake Executive Council, in their December 2024 Charge to the Principals' Staff Committee, directed the Program to "elevate conservation as a key pillar of the Chesapeake Bay Program". It is therefore a critical time to evaluate major threats to forest health and resilience in the watershed and identify actions the partnership could take to reduce vulnerability to ensure the conservation of these valuable ecosystems.

The Forestry Workgroup has been emphasizing the importance of conservation since publishing the *Conserving the Forests of the Chesapeake* report in 1996. Since then, changing physical, biological, and social landscapes have continued to exert pressure on Chesapeake forests. Recent Land Use/Land Cover data has shown that despite major increases in tree plantings, these planting accomplishments have been overshadowed by very high rates of forest loss. The State of Chesapeake Forests 2.0 Report showed that from 2013/14 – 2017/18, the Chesapeake Bay Watershed lost 99,341 acres of forested extent. Once mature forests are lost, it can take one hundred years or more to restore to full ecosystem function, so it is essential and urgent to identify and address barriers to protecting and managing existing forests. These pressures and forest losses will continue to undermine the work accomplished by the Partnership, the important ecosystem services that forests provide, and threaten our ability to meet many of the Bay Program's water quality and habitat goals.

Relevant Background Information:

The Chesapeake Bay watershed faces significant forest health challenges that threaten its ecological integrity and the vital ecosystem services it provides. Invasive species, such as the emerald ash borer (*Agrilus planipennis*) and hemlock woolly adelgid (*Adelges tsugae*), are causing widespread decline and mortality in ash and hemlock populations, disrupting forest structure and habitat quality. For example, across the watershed, approximately 7% of the total volume of ash has been lost to emeral ash borer. Oak decline, driven by a combination of factors including pests, pathogens, drought stress, and aging stands, is further diminishing forest resilience and biodiversity. Periodic defoliation by the spongy moth (*Lymantria dispar*), which targets oak species, exacerbates this decline, leaving trees more vulnerable to secondary stressors and increasing mortality rates. However, with a relatively low monetary investment, oak stands can be protected from defoliation using aerial applications of a microbial biopesticide.

Additionally, forest fragmentation due to urbanization and land-use changes has reduced connectivity, impacted biodiversity, and increased edge effects that exacerbate susceptibility to pests and diseases. Rising temperatures and altered precipitation patterns further stress tree species and foster conditions favorable for new pests and pathogens. The loss of forest cover and degradation of riparian zones further contributes to increased nutrient runoff and sedimentation and increased light penetration in the understory, opening space for fast-establishing invasive plant species. Data from Forest Inventory and Analysis show the number of plots within the Chesapeake Bay Watershed with invasive plant species increased from 57% in 2014 to 63% in 2021.

The Forestry Workgroup was formed to help coordinate, develop, and implement plans and projects that contribute to forest lands. Since then, the Forestry Workgroup has been actively discussing ways to prioritize and focus on forest health and forest loss. The Forestry Workgroup published *The State of Chesapeake Forests* report in 2006 which highlighted the importance of forest health, as well as threats such as deer overpopulation, invasive species, and loss to development. Most recently, the Forestry Workgroup launched State of Chesapeake Forests 2.0 which speaks on forest fragmentation and loss to development.

Why a STAC workshop is an appropriate vehicle for this topic:

The STAC workshop will provide an ideal forum for addressing forest health and conservation. The interdisciplinary and collaborative nature of STAC workshops will ensure that new science, practical expertise, and diverse Chesapeake Bay stakeholders can be brought together. The workshop will help ensure that scientific research can be translated to actionable management recommendations.

The threats to forest health are varied, ranging from physical to biological, and macro scale to microscopic. Although forest stressors have been identified in previous reports, there has not been a systematic and focused effort to create a comprehensive list of forest stressors, their impact on Chesapeake Bay forests and water quality, and management options, which this Workshop proposes to accomplish.

Convening a STAC workshop will bring together forest entomologists & pathologists, urban foresters, ecologists, social scientists and more, all of which will be necessary when holistically assessing the threats to forest health, resilience, and conservation. The Workshop will as also engage practitioners in collaborative information sharing sessions to ensure that a variety of perspectives are brought in and to take advantage of the collaborative nature of a Workshop. Bringing together diverse expertise will help synthesize information about threats to Chesapeake forests and support the development of actionable recommendations.

Workshop Outcomes and Products:

1. A final report that will include a summary of the state of forest health science, as well as specific management actions designed to enhance forest health and forest conservation. These management actions will be tailored to key stakeholders throughout the watershed, including the Partnership's Habitat, Water Quality, Healthy Watersheds, and Stewardship Goal Implementation Teams and their workgroups, the Scientific and Technical Advisory Committee, and ultimately, the Management Board, Principals' Staff Committee, and the jurisdictions.
2. An appendix to the final workshop report presenting the synthesis of the information compiled during the preparation for the workshop(s).
3. Factsheets summarizing the final report in a visually distinct and publicly accessible manner (including online), specifically designed for a local and small non-profit audience.
4. Media briefs, developed in coordination with the CBP Communications Team and STAC.

The products of the Workshop will be presented to the following groups at the CBP, who will be the main beneficiaries of the findings: Forestry Workgroup, Water Quality GIT, and the U.S. Forest

Service. In addition, the products may also be presented to the Fostering Chesapeake Stewardship GIT, Habitat GIT, and the Healthy Watershed GIT. The products may also be presented to the following programmatic partners who engage with forest health, conservation, and restoration in collaboration with the CBP: National Park Service, Alliance for the Chesapeake Bay, Cacapon Institute, Upper Susquehanna Coalition, and various State Departments of Natural Resources.

Workshop Logistics, Anticipated Speakers, and Audiences:

Types of Speakers & Their Contributions:

Forest Entomologists: 2-3 experts.

- **Intended Audience:** State Departments of Natural Resources, Agriculture, Urban & Community Foresters, Local Governments, Federal Land Managers
- **Contribution:** Provide expertise on invasive forest pests, including identification, monitoring, and management strategies. Discuss case studies on successful mitigation efforts, costs, and benefits of control measures (e.g., managing *Lymantria dispar* outbreaks).

Forest Pathologists: 2-3 experts.

- **Intended Audience:** State Departments of Natural Resources, Agriculture, Urban & Community Foresters, Local Governments, Federal Land Managers
- **Contribution:** Provide expertise on invasive forest pathogens, including identification, monitoring, and management strategies. Discuss case studies on successful mitigation efforts, costs, and benefits of control measures (e.g., managing Oak wilt).

Ecologists: 4-5 experts.

- **Intended Audience:** State and Federal Agencies, Conservation Organizations, Urban Foresters, Academic Institutions
- **Contribution:** Explore the broader ecological impacts of invasive species and altered disturbance regimes on forest ecosystems across the landscape, including biodiversity loss and habitat alteration. Offer insights on ecosystem resilience and restoration strategies.

Urban Foresters: 4-5 experts.

- **Intended Audience:** Municipal Forestry Programs, Local Governments, Non-Profit Environmental Groups
- **Contribution:** Discuss strategies for maintaining urban forest health in the face of invasive pests and diseases. Share best practices for community tree management, risk assessment, and policy development.

Community Engagement Specialists: 3-4 experts.

- **Intended Audience:** Non-Profit Environmental Groups, Local Governments, General Public
- **Contribution:** Address strategies for fostering public awareness and community involvement in urban and community forestry. Provide guidance on grassroots advocacy, volunteer mobilization, and education initiatives to promote forest health.

Workshop Participants:

- **State Departments of Natural Resources & Federal Agencies: 5-7 participants.** Gain technical knowledge from entomologists and ecologists to improve monitoring and management programs.
- **Urban & Community Foresters: 5-7 participants.** Learn from urban foresters and entomologists about practical strategies for maintaining urban tree health and planning for invasive species threats.
- **Local Governments: 6-10 participants.** Understand policy implications and resource needs for forest conservation and management.
- **Academic Institutions: 4-5 participants.** Understand the specific forest health research priorities of stakeholders, including Local, State and Federal Governments in the Chesapeake Bay Watershed. Use this information guide research and publication efforts.
- **Non-Profit Environmental Groups: 5-7 participants.** Work with community engagement specialists to enhance outreach efforts and mobilize public support for forest conservation and management.
- **Social Scientists**: 2-3 participants. Help to elaborate the economics of conserving existing forests. Examine the public perception of the forested land in their state. Analyze land owner surveys to align the goals of landowners with public needs for healthy forests.

Total Attendance: 40 – 60 people.