



Pennsylvania Forest Strategies

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Pennsylvania Department of Conservation and Natural Resources
Bureau of Forestry
Rachel Carson State Office Building
400 Market Street, P.O. Box 8552
Harrisburg, PA 17105-8552

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Forest Strategies

Introduction

Strategies for the Pennsylvania Statewide Forest Resource Assessment and Strategy were developed for each of the *Priority Issues, Threats, and Opportunities* identified in the Assessment. An additional strategy was developed for one of the *Benefits and Services* (Recreation and Quality of Life) that was not sufficiently address in the Priority Issues. The Strategy topics include:

- Land Use
- Forest Health
- Forest Management
- Climate Change
- Communicating Natural Resource Values
- Energy Development
- Wildland Fire and Public Safety
- Plant and Animal Habitat
- Recreation and Quality of Life

For each Strategy, a short narrative is provided, along with a list of the specific strategies, followed by a matrix of additional information. For some strategies an initial list of tasks or actions is also provided. The details of each strategy are organized in a matrix format with the following columns:

1. Long-term Strategy
2. Priority Landscape Areas
3. Secondary Issues
4. Program Areas that Contribute
5. Key Stakeholders
6. Resources Available/Required

7. Measures of Success
8. Supports National Objective

The strategies are designed to be broad in nature and scope. Some represent current programs, while others are new or indicate future direction. Details for the strategies will be further developed as priorities are determined and implementation begins. The Bureau of Forestry intends to form an internal, interdisciplinary committee that will review the Assessment and Strategy and make recommendations to the State Forester for implementation. Stakeholders will be consulted as appropriate. Additionally, based on stakeholder feedback, as we begin to implement the strategies, we intend to connect the strategies to the Criteria and Indicators Analysis in Chapter 3 of the Assessment to provide a linkage to the conditions and trends of Pennsylvania's forests.

Forest Strategies

Land Use

Issue Overview

The prognosis for forested lands conservation in Pennsylvania is stable but threatened. The Commonwealth is slowly losing net forested acreage, particularly in the rapidly developing southeast and the south-central Chesapeake Bay watershed, though somewhat offset by afforestation of agricultural lands. Because of increasing rates of agricultural land conversion, this loss rate is likely to accelerate in coming years if no new programs or funding are developed. Other factors influencing loss of high-value forestland include fragmentation from rights-of-way and energy development; continuous parcelization as private forestland owners turn over lands to the next generation; proliferation of plant and insect invasives; and economy-driven divestiture of forestlands, particularly by hard-hit farmers.

Funding for forestland conservation has come primarily from state special funds such as Growing Greener funds, Key '93 funds, and the Oil and Gas Lease Fund. Federal funds have also contributed toward forest conservation over the years, particularly Forest Legacy, the Land and Water Conservation Fund, and the Highlands Act. State special fund sources are in jeopardy, as some will be substantially expended soon, and others are declining with the recession or are being diverted to help balance the state budget. New creative funding solutions hold some hope for conservation of these lands in the future. The newly re-energized Chesapeake Bay Program is putting increasing emphasis on protection of forestland and urban forest renewal. Trading schemes such as carbon and nutrients may be able to offer cash to forestland owners soon, and economic incentives like tax credits may help forestall more forestland sell-offs. Landowner networks that pool information, aggregate forest-resource value-added chains and promote land preservation have begun to help regions resist fragmentation and development, while new planning and prioritization efforts like the development of voluntary Forest Security Areas may help neighbors access more federal funding for conservation.

Strategies

1. Promote acquisition of priority forestland in fee or through permanent easements by leveraging existing private, state, local and federal funding sources.
2. Identify and promote new funding mechanisms to finance forestland conservation.
3. Slow the present rate of forestland conversion by fostering state and local government cooperation and legislation.
4. Address forest fragmentation and conversion from inter-generational land transfers through outreach and education of individual private forestland owners.
5. Develop and promote approaches to conserving and revitalizing forest-dependent communities.
6. Accelerate afforestation and reforestation through new and ongoing state, federal, local and private programs.

Land Use Strategy Matrix

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/Required	Measure of Success	Supports National Objective
1. Promote acquisition of priority forestlands through fee purchase or easements	statewide	Plant & Animal habitats, climate change, water quality	Forest Legacy, Healthy Forest Reserve Program, UCF	Land trusts, conservancies, woodland assoc, water companies, USFS, NRCS	Forest Legacy, land trusts/conservancies, state special funds	Acres protected	1.1, 3.1, 3.5
2. Develop new funding (e.g. tax credits) for forestland conservation	statewide	climate change, plant and animal habitats, water quality	TNC's Working Woodlands, Chesapeake Bay Model	Hardwoods Council, PA Center for Budget + Policy, TNC	Ngos to identify legislative champions at state level	New funding dollars identified, Tax credit enacted	1.1, 3.4
3. Slow forestland conversion through state and local cooperation and legislative efforts	Bedford county, Perry county, others	Communicating natural resource values, plant & animal habitat	UCF, Maryland model of forest mitigation legislation	County planners, municipalities, state legislature, PSATS, PDA	training for local decisionmakers, no net loss forestland legislation	Statewide forestland mitigation law enacted, # managing forest communities	1.1, 3.4
4. Accelerate afforestation and reforestation through new and ongoing state, federal, local and private programs	statewide	Water quality, forest management, climate change	ARRI, TreeVitalize, UCF, DEP nutrient trading program, CREP, EQIP	PASA, Dept Ag, OSM, DEP, Conservation Districts, Penn Nursery, Chesapeake Bay Program and partners	DEP/DCNR coordination on more ARRI sites, expanded funding, coordinated volunteer networks	Acres of each /year	3.7, 3.6
5. Develop and promote approaches to conserving and revitalizing forest-dependant communities	South Mountain, Poconos, others	Communicating natural resource values, forest management, energy development	Shop Local/Save Land, Woodnet, UCF, Pinchot Institute programs	CLIs, NY State Catskills program, water companies, Stroud Water Research Center, Department of Ag, NRCS, SFI	Training and source of seed money to expand working forest networks	# businesses or owners involved in individual woodnet associations, # of Forest Security Areas	3.4, 3.6
6. Address forest fragmentation and conversion from inter-generational land transfers through outreach/education of private landowners	statewide	Communicating natural resource values, forest management, plant & Animal habitat	PSU, PALTA's toolkit, UCF	PennState Ext, forest stewards, woodland owner associations, universities, financial management org s, SFI, Pinchot Inst.	Training for financial advisors, woodland associations Internet-based tools to reach private forestland landowners	# individual landowners reached by technical service providers and/or outreach materials	3.6

Initial List of Tasks and Projects

1. Promote acquisition of priority forestland.
 - a. Advocate for full funding for federal and stateside Land and Water Conservation Funds.
 - b. Advocate higher funding levels for the USDA Healthy Forest Reserve Program and Forest Legacy.
 - c. Work through private funders, including new health care conversion funds and smaller community foundations, to prioritize forestland conservation.
 - d. Work with land trusts and conservancies to better target priority forestland, combine resources, and increase forestland donations.
 - e. Develop outreach materials for landowners on the financial benefits of easements and tax credits.
2. Develop and promote new sources of funding for forestland conservation.
 - a. Develop/broaden tax credits, tax incentives, and improve assessment-based programs like Clean and Green for forestland conservation in Pennsylvania.
 - b. Advocate for federal cap and trade legislation to provide incentives and markets for carbon credits.
 - c. Encourage development of ecosystem service credits, such as nutrient credits for forestland water quality protection.
3. Slow forestland conversion through state-local cooperation and legislation.
 - a. Encourage municipalities to adopt protective and effective zoning for working forests.
 - b. Incentivize forestland conservation through recognition of “forest managing communities.”
 - c. Promote statewide legislation to require mitigation (reforestation) for forestland acreage losses due to development.
 - d. Work to eliminate state subsidies for greenfield development, promote brownfield redevelopment.
 - e. Bureau of Forestry staff work with county and municipal planners to promote forest protection ordinances.
4. Address forestland fragmentation & conversion through inter-generational transfers.
 - a. Provide additional outreach and education materials to technical assistance providers, including service foresters, agricultural extension staff, and financial advisors.
 - b. Develop new landowner education materials specifically focused on inter-generational transfer issues and opportunities, including tax benefits.
 - c. Support university research on incentives to promote inter-generational forestland retention.
5. Develop approaches to conserving and revitalizing forest-dependant communities.
 - a. Support private landowner and wood-industry networking efforts like Woodnet.
 - b. Develop multi-owner forestland partnerships, or Forest Security Areas, that would be prioritized for Farm bill funding like Farm Security Areas.
 - c. Promote economic services studies of Woodnet-type projects to show local decisionmakers the numerous public benefits of conserving working forests.

6. Accelerate afforestation and reforestation through new and ongoing state, federal, local and private programs.
 - a. Develop programs for large-scale suburban reforestation.
 - b. Support local grow-out centers for seedlings to make them cheaper and widely available for reforestation efforts in rural and urban communities.
 - c. Work with DEP and Office of Surface Mining to promote afforestation of abandoned mine lands through the Appalachian Regional Reforestation Initiative.
 - d. Work with Department of Agriculture to promote silvopasturing.

Forest Strategies

Forest Health

Issue Overview

Forest insects and diseases, invasive plants, inadequate forest regeneration, and over-abundant deer populations are the principal factors affecting forest health in Pennsylvania (Wildland fire and climate change are covered as separate issues with their corresponding strategies elsewhere in this document).

All the major forest tree species and many other tree species are at risk in Pennsylvania. Oaks, maples, eastern hemlock, ash, American beech, pines, black cherry, walnut, butternut and elm all have significant forest stressors that threaten their health. Forest benefits in both urban and rural areas are at risk from non-native invasive species. Gypsy moth, hemlock woolly adelgid, emerald ash borer, beech bark disease, *Sirex noctilio*, and many invasive plant species such as Japanese stilt grass, tree-of-heaven, and mile-a-minute weed are already established in Pennsylvania. Other non-native invasive species, not yet established in Pennsylvania, threaten our forests, such as the Asian longhorned beetle, thousand cankers disease/walnut twig beetle, and winter moth.

Inadequate forest regeneration and over-abundant deer populations are additional factors affecting the long-term health of Pennsylvania's forests. Addressing these issues will require managing and mitigating many of these impacts and stressors across agency, land use, and program areas. An integrated approach is required as well as providing the leadership in the field of forest health management that will lead to sustainable and healthy forests in Pennsylvania.

Strategies

1. Develop and implement integrated pest management strategies and plans, and provide management recommendations for significant forest damage causing agents. An emerald ash borer management plan will be developed in 2010-2011.
2. Detect, monitor, and evaluate forest pests and forest health conditions statewide and regionally using a permanent plot system and a pest event reporting system. Participating in the early detection and rapid response programs for invasive species is a part of this strategy.
3. Identify high risk habitats threatened by invasive species using inventory and monitoring.
4. Implement invasive species management projects on DCNR managed lands and on private lands through the Forest Stewardship and Urban Forestry programs; and through cooperative agreements with county governments and municipalities.
5. Identify and conserve high priority eastern hemlock ecosystems and landscapes through the development of a conservation management plan for eastern hemlock.
6. Identify and utilize soil zones and data to prepare forest regeneration plans.
7. Improve on monitoring and reporting forest regeneration progress on public and private lands through integration of available datasets.

8. Develop an adaptive management framework for deer management and forest health management and provide and support basic scientific research regarding deer management and forest health issues.

Strategies for Forest Health Issues

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
<p>1. Develop & implement IPM plans & provide management recommendations for significant forest damage causing agents. An emerald ash borer management plan will be the first plan developed.</p>	<p>All CLI regions; DCNR State Forests and State Parks; PA Game Commission Lands; Ridge & Valley Landscape; French Creek; Kittatinny Ridge; all Private Forestland regions; Chesapeake Bay, Delaware, Erie & Ohio Watersheds; Appalachian Region.</p>	<p>Forest Management; Climate Change; Communicating Natural Resource Values; Plant & Animal Habitats</p>	<p>Forest Health; Competitive Grants; PA Dept of Agric.; USDA PPQ.</p>	<p>PA Dept. of Conservation & Natural Resources (DCNR) Bureau of Forestry (BOF); USDA Forest Service (FS); Local and County Governments; PA Dept. of Agric. (PDA); PA Invasive Species Council (PISC); NAASF Forest Health Committee; Eastern Plant Board; Northeastern Forest Pest Council (NEFPC)</p>	<p>DCNR BOF Division of FPM General Fund; County Cost-share funds for private land gypsy moth suppression; USDA Forest Service Cooperative Forest Health Program and Suppression grants; USDA FS Special Project grants</p>	<p># of IPM plans developed & implemented over the next 5 yrs.; protect 200,000 acres of high risk forest per yr from gypsy moth defoliation.</p>	<p>2.2 1.1 3.4</p>

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
<p>2. Detect, monitor, & evaluate forest pests and forest health conditions statewide & regionally using a permanent plot system & a pest event reporting system. Participating in early detection & rapid response programs.</p>	<p>All CLI regions; DCNR State Forests and State Parks; PA Game Commission Lands; Ridge & Valley, French Creek & Kittatinny Ridge Landscapes; All Watersheds & River Basins; all Private Forestland Regions; Appalachian Region.</p>	<p>Climate Change; Forest Management; Plant & Animal Habitats; Communicating Natural Resource Values; Energy Development</p>	<p>Forest Health; Forest Stewardship; USDA and PA Dept of Agric. CAPS Program; USDA FS Forest Health Monitoring (FHM)</p>	<p>USDA FS Forest Health; USDA FS Forest Health Technology Enterprise Team (FHTET) & Forest Health Protection; PDA; PISC; USDA APHIS PPQ; DCNR BOF Inventory Section; DCNR Bureau of State Parks (BSP); PA Game Commission; Forest Stewardship program landowners; NAASF Forest Health Committee; Eastern Plant Board; PA Sustainable Forestry Initiative (PA SFI)</p>	<p>DCNR BOF FPM General Fund; USDA FS CFHP grants; USDA FS Special Project grants</p>	<p>Establishment of permanent plot system within 3 yrs.</p>	<p>2.2</p>

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
3. Identify high risk habitats threatened by invasive plant species and invasive insects and pathogens using inventory & monitoring.	DCNR State Forests and State Parks; All CLI regions; Marcellus Shale region; all Private Forestland regions; Chesapeake Bay Watershed; Delaware River Watershed; Ohio River Basin; Appalachian Region.	Plant & Animal Habitats; Forest Management; Climate Change; Communicating Natural Resource Values	Forest Health; Competitive Grants; USDA FS FHM & FIA; BOF Ecological Services; PA Dept. of Agric.	DCNR BOF Ecological Services; USDA FS; PDA; PISC; Western Pennsylvania Conservancy (WPC); PA Natural Biodiversity; PA Game Commission; PA Fish & Boat Commission; NAASF Forest Health Committee; Penn State Univ. Coop. Ext.; PA SFI	DCNR BOF funds; USDA FS Special Projects funds	Mapping of high risk habitats on annual basis.	2.2 1.1 3.4 3.7

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
4. Implement invasive species management projects on DCNR lands and municipalities; and on private lands through the Forest Stewardship and Urban Forestry programs; and through cooperative agreements with county governments and municipalities.	DCNR State Forests and State Parks Statewide; all Private Forestland Regions; all CLI regions	Forest Management; Plant & Animal Habitats; Communicating Natural Resource Values	Forest Health; Competitive Grants; Forest Stewardship; BOF Ecological Services; BOF Forestry Operations; DCNR Bureau of State Parks	DCNR BOF Ecological Services; DCNR BOF Operations; DCNR BSP; USDA FS; PDA; PA Nature Biodiversity; NAASF Forest Health Committee; County and Municipal governments	DCNR BOF and BSP funds; USDA FS program grants; Special Project funds.	Implement control projects on 2,000 acres of DCNR lands per year; acres of stewardship lands conducting invasive species management; success rate of implemented projects	2.2 3.6 1.2 1.1 3.4
5. Identify & conserve high priority eastern hemlock ecosystems & landscapes through the development of a Conservation Management Plan for eastern hemlock.	All Watersheds & River Basins; all CLI regions; DCNR State Forests & Parks; PA Game Commission Lands; Appalachian Region.	Forest Management; Plant & Animal Habitats; Climate Change; Communicating Natural Resource Values	Forest Health; Forest Stewardship; Forest Legacy	DCNR; USDA FS; WPC; Trout Unlimited; PA Fish & Boat Commission; PA Game Commission; Chesapeake Bay Foundation NAASF Forest Health Committee	DCNR BOF; USDA FS	Produce a management plan within 2 years; # of acres of protected hemlock (annual & cumulative).	1.1 2.2 3.5 1.2 3.1 3.7

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
6. Identify & utilize soil zones and data to prepare forest regeneration plans.	DCNR State Forests & Parks; all Private Forestland Regions; all CLI regions; PA Game Commission forestlands	Forest Management; Climate Change; Land Use; Wildland Fire	Forest Health; Forest Stewardship; USDA FS FIA/FHM	DCNR BOF; USDA FS; Allegheny Hardwood Utilization Group; PA Forest Products Assoc.; Hardwood Development Council; PA SFI	DCNR BOF; USDA FS FIA	Integration of updated soil survey data into forest management plans.	1.1 1.2 3.4 3.7
7. Improve on monitoring & reporting forest regeneration progress on public & private lands through integration of available datasets.	All CLI regions; DCNR State Forests and State Parks; Forest Stewardship lands; all Private Forestland regions	Forest Management; Climate Change; Plant & Animal Habitats; Land Use	Forest Health; Forest Stewardship; USDA FS FIA/FHM	DCNR BOF; USDA FS; Allegheny Hardwood Utilization Group; PA Forest Products Assoc.; Hardwood Development Council; PA SFI	DCNR BOF; USDA FS FIA	Produce a report integrating state forest regeneration data with FIA plot data from PA.	1.2 3.7
8. Develop an adaptive management framework for deer management & forest health; and provide and support basic scientific research regarding deer management and forest health issues.	All CLI regions; DCNR State Forests and State Parks; PA Game Commission lands; all Private forestland regions	Plant & Animal Habitats; Forest Management; Land Use	Forest Health; USDA FIA/FHM	DCNR; USDA FS; PA Game Commission; WPC; PA Natural Biodiversity; Allegheny Hardwood Utilization Group; PA Forest Products Assoc.; Hardwood Development Council; PA SFI	DCNR BOF; PA Game Commission	Produce a plan and monitoring system of management objective indicators within 2 yrs; improvement of forest regeneration; reduction in deer fencing needed on state managed forest lands, public support of and hunter participation in DMAP on state forest land.	1.1 1.2 3.5 3.6

Ongoing Forest Health Programs and Activities:

There are three cooperative programs between the USDA Forest Service and the DCNR Bureau of Forestry that play a key role in protecting Pennsylvania's forests from insects and diseases and other forest stressors:

1. Cooperative Forest Health Management Program and Special Project Grants
2. Forest Health Monitoring Off-plot Program
3. Gypsy Moth and Other Forest Pest Suppression Programs

These three core programs are funded by the DCNR Bureau of Forestry, USDA Forest Service, and other cooperating agencies (for gypsy moth suppression).

Cooperative Forest Health Management Program –

A critical program in protecting Pennsylvania's forests is the Cooperative Forest Health Management Program (CFHP). This cooperative program between the USDA Forest Service and the DCNR Bureau of Forestry provides the State with federal funds to detect, monitor, and evaluate forest health conditions on state and private lands (non-federal lands). The Division of Forest Pest Management coordinates the pest survey program with the Pennsylvania Department of Agriculture and their Cooperative Agricultural Pest Survey Program (CAPS). In addition, all surveys for invasive species are coordinated with the Commonwealth's Invasive Species Council and Invasive Species Task Force. The CFHP program assists the Bureau of Forestry in conducting forest health management activities on non-federal forestlands to achieve healthy sustainable forests. Forest health data is collected in a standardized manner so that this data is compatible with data from other states in the region. The goal of the program is to protect forest lands from significant loss of economic, ecological, or aesthetic value due to insects, diseases, and other forest health stressors utilizing integrated pest management procedures, providing assistance, and conducting projects aimed at preventing, detecting, evaluating, and suppressing forest pest outbreaks.

There are three key components to the Cooperative Forest Health Management Program in Pennsylvania, with several components requiring funding for Special Projects:

1. Detection, identification, and evaluation of damage-causing agents
 - a. Aerial surveys for tree damage and mortality
 - b. Forest insect and disease ground surveys
 - c. Enhanced surveys and evaluations for exotic pests
 - d. Maintain and staff a diagnostic facility and reference collection
 - e. Standardization and use of technology to improve aerial and ground surveys, databases, and reports
2. Management of Forest Pests
 - a. Support activities for the gypsy moth suppression program
 - b. Release of predatory beetles for control of hemlock woolly adelgid (HWA) and the elongate hemlock scale
 - c. Biological control studies and releases to control other exotic pests (emerald ash borer, *Sirex noctilio*, etc.)
3. Providing Forest Health Information and Training

- a. Forest Health Update Conferences in March
- b. Forest Health and Pest Conditions Annual Report
- c. Forest Health Highlights
- d. Web site information
- e. Training Bureau of Forestry District's staff

In addition, collaborative surveys and support for federal and university researchers on specific forest health issues, such as sugar maple decline, HWA biological control, genetic conservation efforts toward insect and disease resistance in select host species (beech, hemlock, ash, butternut, oak, black cherry, chestnut) are examples of the projects being conducted in Pennsylvania.

Forest Health Monitoring Off-plot Program –

The Forest Health Monitoring (FHM) Off-plot Program supplements plot-collected forest health data with landscape level data on forest stressors such as insects and disease. This program is critical in promoting survey standardization among states, enhancing surveys of specific forest health problems, and producing forest health reports and maps for healthy sustainable forests. Aerial surveys and associated ground-truth survey activities are the principal activities performed in this program.

Gypsy Moth and Other Forest Pest Suppression Programs –

The gypsy moth suppression program has been conducted by the DCNR Bureau of Forestry in cooperation with the USDA Forest Service in Pennsylvania since 1972. The objectives of the program are to protect foliage in designated forest lands at the request of the landowner or land manager. Reduction of gypsy moth populations in these treated areas help to mitigate the environmental, economic, and aesthetic losses caused by gypsy moth caterpillars. The program's goal is to protect 200,000 acres of forest per year from significant gypsy moth defoliation.

DCNR has undertaken management projects on DCNR managed lands to control hemlock woolly adelgid and invasive plants. In addition, training, survey, and monitoring activities have become incorporated into DCNR field operations. The Department has an Invasive Species Management Plan that guides where DCNR efforts and resources are needed and utilized. The DCNR Invasive Species Management Plan describes efforts in the following areas: prevention, survey and monitoring, control and management of invasive species, data management, and public outreach and training. All of these activities are coordinated with the Pennsylvania Invasive Species Council.

Invasive Plants –

DCNR has an Invasive Species Management Plan in place for dealing with invasive species in the various units of the department. A number of programs and activities dealing with invasive plants are listed below:

- Invasive plant coordinators have been designated in each Forest District and have received training and technical support in managing invasive plants on State Forests. This includes planting guidelines on planting known invasive plant

- species, monitoring guidelines and seed mix suggestions that include native and less aggressive species.
- Invasive plant control projects in State Forests and State Parks are now being conducted annually and are incorporated into forest resource management plans.
 - Invasive plant monitoring during inventory assessments on State Forests and in State Parks helps to identify areas of concern; monitoring for invasive plants after disturbance events and taking control actions has also been incorporated into the departments programs.
 - Biological control releases have been conducted on DCNR lands for mile-a-minute weed.
 - DCNR has representation on the Pennsylvania Governor's Invasive Species Council to inform the group on land management experiences and gain a better understanding of statewide invasive species concerns.

DCNR personnel participate in a variety of education and outreach opportunities to inform the public on invasive plant identification and management, including presentations and talks with students, volunteer groups, forest landowner groups, municipality officials, and garden clubs.

Regeneration Activities –

Pennsylvania's current forest cover is largely the result of extensive clear cutting and agricultural use of the landscape during the late 1800's to 1900's. This relatively even-aged forest, coupled with multiple factors impacting the make up of forest understory plant diversity provides significant regeneration challenges. Common silvicultural practices necessary to ensure diverse forest regeneration during timber harvesting activities include pre-treatment of competing vegetation layers, deer exclusion fencing, and treatment and monitoring of invasives species. In many cases, up to three stages of shelterwood harvesting are used to address understory issues while gradually increasing light levels through the forest canopy to establish a desirable mix of plant species for stand replacement. In some cases, re-inforcement planting is also necessary to increase stand component diversity, especially where a conifer component is lacking. On state forestlands, where investments are made to cover these and other necessary regeneration costs, timber harvesting and regeneration activities in the disproportionately large block of maturing hardwood stands provides a critical tool in addressing forest health and biodiversity concerns.

Deer Management Assistance Program (DMAP) –

Since 2004, DCNR has been administering the Pennsylvania Game Commissions Deer Management Assistance Program on state forest and state park lands. By enrolling lands in the program, DCNR land managers can provide hunters with additional opportunities to harvest antlerless deer in order to meet their land management goals. Enrollment and harvest allocation decisions for the program are based on intensive, landscape level vegetation sampling, and a structured decision making model is being developed to provide consistent and objective interpretation of the data within an adaptive management framework.

Additional Tasks and Activities Related to Strategic Initiatives:

1. Develop a system whereby all forest insect and disease, forest disturbance, and invasive plant spatial data is GIS based.
2. Develop and incorporate technology and applications for assessments of forest health conditions.
3. Utilize educational and training opportunities to increase awareness of forest health issues with both the public and DCNR staff.
4. Conduct invasive plants training and education for staff and other resource managers, including web-based education programs.
5. Initiate an invasive plants “awareness campaign” with key partners that captures peoples’ attention.
6. Prioritize invasive species survey and management plans by coordinating with the Pennsylvania Invasive Species Council. Coordination efforts include prevention activities.
7. Maintain credibility with the public and hunters regarding deer management.

Other Resources and Plans Used:

1. DCNR Invasive Species Management Plan
2. Pennsylvania Invasive Species Management Plan
3. DCNR Bureau of Forestry State Forest Resource Management Plan
4. DCNR Action Plan
5. DCNR Bureau of Forestry Division of Forest Pest Management Strategic Plan
6. Pennsylvania’s Forest 2004 Resource Bulletin, NRS-20
7. Pennsylvania’s Wildlife and Wild Places – Our Outdoor Heritage in Peril
8. PA DCNR Hemlock Woolly Adelgid Integrated Pest Management Plan
9. Pennsylvania Emerald Ash Borer Action Plan

Forest Strategies

Forest Management

Issue Overview

The sustainable management of rural and urban forests, both public and private, is a significant topic of discussion, innovation, and action for the Commonwealth's natural resource managers and citizens alike. Managing the approximately 2.2 million acres of third-party certified state forest in the Commonwealth is a challenge in itself, where carefully balancing a wide variety of sometimes competing uses on the land is paramount to success. The Commonwealth's natural resource managers work to strike this balance - from working with industry to satisfy societal demand for wood products; to opening the land to the public for various types of outdoor recreation; to the challenges of leasing oil, gas, or other mineral extraction on publicly-owned property to help meet the financial and energy needs of the Commonwealth.

While the significance of publicly owned forestland cannot be overstated, it is important to remember that approximately 54% (8.9 million acres) of the Commonwealth's forests are privately owned by families or individuals. Private ownership can pose even greater challenges to sustaining our forests as a whole. Forest landowners come from diverse backgrounds and have varying degrees of knowledge about and interest in the forest that they own. This makes it very challenging to reach all forest landowners through educational efforts. Studies have shown that the average age of Pennsylvania landowners is 57, indicating that a significant change in land ownership will occur in the relatively near future. There is also a need to reach out to other types of large landowners such as quasi-public entities (such as water authorities), county or municipal governments, industry, and TIMOs/REITs.

While the majority of the state is forested, only a very small minority of the population owns forest land; the vast majority of people live in urbanized areas. Yet the management of forested landscapes is integral to the health of the Commonwealth's waters and thus directly affects all its citizens.

In urbanized areas, individual trees and small wooded areas are critical to the quality of life. Urban tree canopy is increasingly valued for ecological services such as energy conservation, air and water purification, stormwater uptake, and carbon storage capacity. Studies are also showing wide ranging economic, social, and human health-related benefits from community trees. Sustainable management of city trees and forests produces an immediate impact on the quality of life for the majority of the population. Increasing public appreciation for the importance of natural resources also results in increased support for the sustainable management of the state's forestland.

Whether the land is publicly or privately owned, Pennsylvania's natural resource managers are facing many challenges in the management of forested landscapes within the urban to rural continuum. Major challenges and opportunities include fragmented

and parcelized ownership, unsustainable timber harvesting, third-party certification of forests and forest products, marketing of forest products, participation in carbon markets, an increased interest in biomass energy, the management of community forests, water concerns, and the continued monitoring of forest conditions. Because Pennsylvania is nearly 60% forested, these challenges and opportunities affect a significant land mass area of the state. The state must continue to use current successful strategies, expand on these strategies, and formulate additional creative ways to ensure the sustainability of its forests.

Historically, funding for these types of strategies has come from various sources. The Bureau of Forestry supports 24 full-time equivalent service foresters in the field, as well as a program manager and three program specialists in the central office. Additional state dollars supplement the Urban and Community Forestry program through DCNR Bureau of Recreation and Conservation funding of the TreeVitalize tree planting and education program. The bulk of the Federal funding comes through the US Forest Service State and Private Forestry office, utilizing the Stewardship and Urban and Community Forestry Programs. In order to increase capacity, most of the funds that come in via these Federal programs are passed through to the Bureau's partners in Penn State Extension, who assist with carrying out the missions of these programs and are treated as essential adjunct staff.

Strategies

1. Effective and innovative use of communication tools, venues, and opportunities throughout the urban to rural continuum.
2. Support private forestland stewardship initiatives, urban tree planting, maintenance, and educational programs through staff time and innovative funding sources.
3. Continue working with (or modifying) existing open space tax incentive programs, such as Clean and Green.
4. Engage in county/community planning efforts, ensuring that both rural forestry and urban forestry planning are considered.
5. Assess the urban tree canopy within the Commonwealth.
6. Promote formal and sustainable management of trees by municipalities
7. Invest in training our staff and our partners on current issues, thinking, and technologies.
8. Support reforestation/afforestation efforts on private, industry, quasi-public, and municipal lands.
9. Continue to promote and help fund the planting, protection, and maintenance of riparian buffers in key watersheds within the state.
10. Monitor programs, easements, and outcomes where necessary and appropriate.
11. Meet or exceed all goals set through Presidential Executive Orders or through state and multi-state laws, regulations, or agreements.
12. Support partners in projects where our goals coincide.

Strategies for Forest Management

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
STRATEGY #1: Effective and innovative use of communication tools, venues, and opportunities throughout the urban to rural continuum							
1.A. Create regional plans that take the information in this Assessment and Strategy and hone it to what makes sense at a regional level	Private Forestland Regions	All issues	All program areas	Regional stakeholders, as appropriate	- BOF central office & field staff - Regional stakeholders - FIA & other relevant data - Need for additional spatial data	- one plan is created in each region - the plans are being followed - more discussion is happening amongst districts	Assists with all objectives
1.B. Continued education/outreach to private/municipal forestland owners (continuation of PAFS program and partner programs such as WOAs)	Identified by state map and honed by regional plans	FM: Ownership: PFL FM: Unsust harvesting FM: Certification FM: Mktng of prods/serv FM: Carbon Markets FM: Biomass FM: Water Forest Health Climate Change Comm Nat Res Values Wildfire/Pub Safety	Private Forestland Stewardship Chesapeake Bay CLIs	PSU ACB CBF PALTA PSATS PSAB WOAs PAFS SFI Tree Farm Consulting Foresters PFPA PLT	- Stewardship Forester - Continued support of PSU Extension - educational resources - educational venues - educational opportunities for BOF staff	- Volunteers trained and percent increase in - staff trained - number of hours worked by volunteered	1.2 2.2 3.4 3.5 3.6 3.7

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
1.C. Continued education/outreach to private citizens/municipalities regarding benefits and care of urban tree plantings (continued support of the TreeTenders™ program and the Community Tree Institute)	Metro areas	FM: Ownership: UCF Forest Health FM: Mktng of prods/serv FM: Comm For Mgt FM: Water Climate Change Comm Nat Res Values Wildfire/Pub Safety	UCF TreeVitalize TreeTenders™	PSU WPC PHS FPUF ACB PSATS PSAB EACs STCs PLNA Arborists Public Radio Stations PLT ISA DVRPC and other county/regional planning organizations	- TreeVitalize coordinator - GIS expertise - educational resources - educational venues - educational opportunities for BOF staff	- Volunteers trained - staff trained - number of hours worked by volunteered - plans created	1.2 2.2 3.2 3.4 3.5 3.6 3.7
1.D. Continue to facilitate vital communication amongst DCNR's various Bureaus	everywhere	All issues	Private land stewardship UCF TreeVitalize Chesapeake Bay	All internal partners	- cross training with other bureaus - invite other bureaus to BOF trainings - be sensitive to the needs/concerns/philosophies of other bureaus - regular communications	- open lines of communication are established and maintained - attendance at cross trainings - project designs are collaborative	Assists with all objectives

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
1.E. Stay up-to-date on and communicate information regarding nutrient trading/TMDLs	In applicable jurisdictions	All For Mgt Sub-issues	Private land stewardship Chesapeake Bay UCF TreeVitalize	DEP CBF PennVest PDA NRCS FSA SFI Farm Bureau Ag Co-ops Stroud Water Res Cntr DCNR Policy Office	- stay up to date with ongoing trends/programs - communication tools to convey information on research relevant to constituents as well as BOF staff - better communication among the partner groups - a concise guide for TMDLs	- a functional, useful program is created	3.1 3.5 3.6
1.F. Maintain and Diversify PA Forest Products in local, national, and international markets	Statewide	Energy, Forest Health, Communications	Rural and Community Forestry, Communications, Resource Planning & Inventory	PFPA PDA HDC PSU AHUG SFI	Increase resources available to market PA forest products locally, nationally, and internationally	Net gain in wood products business; net gain in wood products employment; net gain in hardwood lumber production	1.1 1.2 2.2 3.1 3.4 3.5 3.7

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
1.G. Continue to strengthen the BOF's relationship with forest products industry	Statewide	FM: Unsust. Timb. Harv. FM: Certificatin Systems FM: Mktng of for prod/ser FM: Carbon Markets FM: Biomass FM: Ownership FM: Water Forest Health	Private land stewardship UCF	PFPA SFI Certification systems HDC PDA AHUG USFS SAF	- continue to meet with industry and understand what their issues are - BOF staff continued involvement in SFI training - work with Silviculture to make allowances when necessary - promotion of local wood products	- timber sales rise - healthy timber economy in PA - increased local markets for PA timber	1.1 1.2 2.2 3.1 3.4 3.5 3.7
1.H. Promote the benefits of Forestry, and UCF in particular, in ameliorating climate change/offsetting carbon/stormwater benefits/etc	Identified by state map and honed by regional plans	Climate Change Comm nat res values	Private land stewardship UCF TreeVitalize Chesapeake Bay Comm/Interp Planning/Inventory	PennVest USFS PSU NEMO PHS WPC SFI BRC DEP Public Radio Watershed Orgs STCs/EACs ISA	- educational/pro motional materials - fact sheets - assign dollar values to benefits - make connections to local print media - placemat idea - utilize existing tools to quantify benefits of trees (such as iTree software)	- new audiences reached - ordinances created/changed - iTree Hydro analysis before and after in communities	3.1 3.2 3.4 3.6 3.7

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
1.I Disseminate Biomass Harvesting guidelines to landowners	Statewide	FM: Biomass FM: Unsus timb harv	Private Forestland Stewardship Chesapeake Bay Planning/Inventory	USFS PSU Consultants WOAs PAFS SFI Municipal officials (municipalities owning land)	- physical copies of the guidelines - attend/create workshops/meetings	- guidelines are utilized by landowners	1.2 2.2 3.1 3.4 3.5 3.6 3.7
1.J. Quantify and promote the health and economic values of clean water to municipalities (cost of urban runoff/ municipal water treatment)	Metro Areas and priority watersheds	Comm Nat Res Values Land Use FM: Comm For mgt FM: Water	UCF Chesapeake Bay TreeVitalize	PennVest USFS ACB WAC DEP NEMO PEMA/FEMA SRBC PSATS PSAB SFI Water companies/authorities PAFBC Trout Unlimited PSU Stroud Water Res Cntr Municipal authorities PennDOT DCED developers	- iTree Hydro analysis - cost savings/benefit analysis - community outreach -	- number of communities adopting clean water/stormwater BMPs - enhanced green infrastructure in municipalities - building codes are changed to reflect BMPs	3.1 3.2 3.4 3.5 3.6 3.7

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
1.K. Promote the idea of backyard buffers	Identified by state map and honed by regional plans	Comm Nat Res Values Land Use FM: Comm For mgt FM: Water	UCF TreeVitalize Chesapeake Bay	STCs EACs CBF ACB Watershed orgs Master gardeners Audubon society NWF PSU USFS Developers iConserve	- outreach - landscape design templates - promotion of native plants	- add buffers planted to the TreeVitalize website - decreased stormwater runoff	1.2 3.1 3.2 3.4 3.5 3.6 3.7
1.L. Continue to promote the value of creating and implementing sustainable forestry plans on private land	Identified by state map and honed by regional plans	Forest Health FM: Ownership FM: Unsus Timb Harv FM: Certification systems FM: Mktng of For Prod/ser FM: Carbon Markets FM: Biomass FM: Water FM: Monitoring Conditions Comm Nat Res Values	Private forestland stewardship Chesapeake bay	NRCS USFS SFI PACD WOAs PAFS PSU PGC PFPA Tree Farm	- venue for cost sharing of both plan writing and implementation - additional private sector incentives for good stewardship of land - work with NRCS	- plans continue to be written and implemented - estimated plans followed (via monitoring) -	1.2 2.2 3.3 3.4 3.5 3.6 3.7

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
1.M. Continue to promote the value of creating and implementing sustainable UCF plans at a community level	Metro Areas	Forest Health FM: Mktng of For prod/ser FM: carbon markets FM: Comm for mgt FM: water FM: monitoring conditions	UCF TreeVitalize Chesapeake Bay	PSU USFS Arborists Municipal officials EACs STCs PCF PHS WPC FPUF Public radio stations Metro partners Susq river basin Comm Large arborist companies PEMA	- TreeTender™ trainings - community tree institute trainings - cost/benefit analyses - street and park inventories - grant funding	- TreeTenders™ trained - UTC commitments - number of plans - increase in CARS numbers	1.2 2.2 3.1 3.2 3.4 3.5 3.6 3.7
1.N. create a decision tree for landowners on the website	Available statewide	All forest management issues	Private forestland stewardship Operations	PSU PAFS	- time allocated to do this - technical support -	- increase in website hits - decrease in calls to staff - calls received are more focused	3.6

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
1.O. Make sure that landowner interactions are strategic (regarding priority locations/issues set on a regional basis)	All	All For Mgt sub issues Forest Health Comm Nat Res Values Climate Change	Private land stewardship Chesapeake Bay CLIs	Partners at the regional level	- regional plans - creation of our goals and knowledge of partner goals - a way to identify, at the regional level, what is more strategic/less strategic	- service foresters and their supervisors are comfortable making decisions of who to visit based on the priorities in the regional plan	1.2 2.2 3.3 3.4 3.5 3.6 3.7
1.P. Utilize current “social media” and devices to communicate to various audiences	Statewide	All For Mgt sub issues Comm Nat Res Values	All	Various	- proper technology - permission from the Commonwealth	- “hits” or “friends” on networks indicating utilization	Potentially assists with all objectives

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
STRATEGY #2: Support Private Forestland Stewardship Initiatives, Urban Tree Planting, Maintenance, and Educational Programs through staff time and innovative funding sources							
2.A. Engage non-traditional partners in support of Private land Forestry/UCF (funding and partnering opportunities)	Honed by regional plans	All For Mgt Sub-issues	Private Land Stewardship UCF TreeVitalize Tree City USA Tree Line USA Tree Campus USA MTRP	Builders Assns PLNA Dept. of Health PEMA DCED PennDoT SFI PFPA PASA PHMC PSATS Public Radio PCN PDA Home Depot Lowes Wal-Mart Target Arbor Day Found Other Foundation Distribution facilities County planning Water Authorities PennVest Utility Companies	- establish good working relationships with these organizations -	- funding received from a variety of sources - new relationships developed - increase in cooperative efforts	Assists with all objectives
2.B. Continued support of the TreeVitalize coupon program	Metro areas	FM: Ownership: UCF FM: Comm For Mgt	UCF TreeVitalize	Nurseries Alcoa	- continued funding - expansion to other areas would be helpful	- coupons redeemed - nurseries participating	3.2 3.6

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
2.C. Work with NRCS, FSA, and USFS to tailor Farm Bill and other USDA programs for PA realities, making sure that funding is used strategically	Identified by state map and honed by regional plans	All For Mgt Sub-issues	EQIP Private Land Stewardship CREP CSP WHIP Chesapeake Bay Program BCAP Healthy Forests Initiative	NRCS FSA USFS Landowners PDA WOAs SFI PFPA Conservancies Land Trusts Municipalities?	- good working relationship with all listed agencies - additional support and higher levels of funding for forestry practices under NRCS and FSA - funding to the BOF as a TSP for NRCS - cross-training among agencies	- number of forested acres enrolled in Farm Bill programs - increase in number of forestry programs funded through NRCS - number of landowners served - increased funding in subsequent years	1.1 1.2 2.2 3.1 3.2 3.5

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
2.D. Work with grantors (such as BRC, DEP, DCED, PennVest etc) to make sure that forest conservation/tree planting are included/considered in grant ranking criteria and grants in general	Statewide	FM: Ownership FM: Unsus Tim Harv FM: Comm For Mgt FM: Water	Private land stewardship UCF TreeVitalize Chesapeake Bay	BRC DEP DCED FDC PennVest	- support from the DCNR leadership - open relationship with the other organizations - continued communication about the benefits of trees/forests - concise fact sheet - communicate information on how to conserve trees in projects and how to plant the right tree in the right place	- BRC keeps track of trees planted via their grants - consistency in the quality of projects completed	1.1 1.2 3.6
2.E. Support integration of urban forestry with urban renewal/urban gardening concepts	Metro areas	FM: Comm For Mgt FM: Ownership: UCF FM: Carbon Markets FM: Water	UCF TreeVitalize	PSU PHS WPC FPUF Metro Partners Conservancies Municipalities PASA Master Gardeners DCED SBA	- evaluate existing successful programs - integrate with Buy Fresh, Buy Local programs - outreach to non-traditional partners	- local urban farmers markets established - acres of brownfields converted	1.2 2.2 3.1 3.2 3.4 3.6 3.7

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
2.F. Tap into the carbon offset arena for possible funds for tree planting or green infrastructure plans	Honed by regional plans	FM: Carbon Markets FM: Community Forest Management Climate Change	UCF TreeVitalize Chesapeake Bay Resource Planning & Inventory Private forestland stewardship Bay Bank	USFS DEP PSU WOAs PAFS CBF ACB PHS WPC FPUF PFPA PLNA Arbor Day Foundations Water Companies Utility Companies Distribution centers Plow and Hearth PennDOT Non-traditional partners such as Wal-Mart, McDonalds, other box stores, etc	- marketing/ outreach/ education/comm unication efforts are necessary - support of DCNR leadership - intra/inter-agency communication - search for existing models - connections to high carbon footprint activities (airlines, NASCAR, commuters, etc)	- additional funds are available to plant more trees - increase in new partners involved	2.2 3.1 3.2 3.4 3.6 3.7

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
2.G. Continue to work with various funders to provide grants for urban tree planting	Honed by regional plans	FM: Comm for mgt FM: Water Climate Change Comm Nat Res Values	UCF TreeVitalize Chesapeake Bay	USFS PennVest PennDOT BRC DCED Water Companies Utility Companies Transportation companies Arbor Day Foundation Plow and Hearth Private foundations PCF Public Radio Stations HUD Big box stores FEMA/PEMA DEP iConserve	- effective communication amongst the partners - need to have a “canned” communication tool - support from DCNR leadership (an internal champion) - work with public radio stations and other media to publicize tree planting - utilize iConserve connections	- we receive additional funds for tree planting efforts - we exceed our million tree goal	1.2 3.1 3.2 3.4 3.5 3.6 3.7
2.H. Secure permanent funding for Extension Stewardship Position	Statewide	Communications	-Private Forestland Stewardship	PSU USFS PAFS	-USFS -PSU School of Forest Resources	- funding is secured	1.1 1.2 2 3
STRATEGY #3: Continue working with (or modifying) existing open space tax incentive programs, such as Clean and Green							
3.A. Continue working with (or modifying) existing tax incentive programs, such as Clean and Green	Statewide	FM: Ownership	Clean and Green	Landowner Assns PSU PDA PFPA SFI Consultants County Tax assessors	-BOF central office -PSU faculty -better county level forest data	- values are [generally perceived as] equitable across the Commonwealth	1.2 3.1 3.2 3.4

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
STRATEGY #4: Engage in county/community planning efforts, ensuring that both rural forestry and urban forestry planning are considered							
4.A. Engage in County/Community planning efforts – ensure that rural forestry and UCF planning are considered	Identified by state map and honed by regional plans	All For Mgt sub-issues	Private land stewardship UCF TreeVitalize Chesapeake Bay	Topo Geo Planning Section County Planners Municipal Planners PSU SFI PFPA STCs EACs BRC DEP USFS Metro Partners	- support from Topo Geo - support from PSU - TreeVitalize Coordinator - Chesapeake Bay Forester - proper training for BOF staff who will be engaged in planning efforts -DVRPC and other regional planning organizations	- plans created - BOF staff involvement - documented requests for BOF involvement - hits on the TreeVitalize website	Assists with all objectives

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
4.B. Assist in preparation of practical and effective ordinances	Identified by state map and honed by regional plans	All For Mgt sub-issues Land Use	Private land stewardship UCF TreeVitalize Chesapeake Bay	PSU PMPEI County planners Municipal planners PSATS PSAB PALTA (toolbox) DEP PFPA SFI DCNR Policy office iConserve BOF Communications NEMO	- BOF staff should be trained in how to evaluate bad/good ordinances - what is out there? Which are enforced and which aren't - how do we keep up with changes/amendments? - utilize resources at NEMO and PALTA - can we tie ordinances to TMDLs? To carbon trading? To grant opportunities? - utilize visualization planning tools such as Revision PA and UFORE	- evidence of bad ordinances revised - evidence of good ordinances adopted - communities engaged in ordinance creation/revision	1.2 3.1 3.2 3.4 3.5

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
<p>4.C. Assist in the development of local markets for forest products (such as Shop Local, Save Land™) – this includes such things as utilization of urban wastewood</p>	<p>Identified by state map and honed by regional plans</p>	<p>All For Mgt sub-issues</p>	<p>Private land stewardship UCF TreeVitalize Chesapeake Bay Fuels for Schools</p>	<p>DHC Other land conservancies PSU Local producers/artisans USFS PASA Buy Fresh, Buy Local RC&D PDA Municipalities DEP PFPA SFI PHS WPC FPUF NY WAC Water Companies County Economic Devt offices DCED Farmers’ Markets SBA PennVest</p>	<p>- evaluation, modification, and utilization of existing models - use simple survey tools to gauge public and producer interest - continued partnership and sharing of information amongst partners - utilize CLIs - utilize iConserve - key into DCED’s Main Street and Elm Street programs</p>	<p>- increased revenue in local communities - satisfaction of producers with their listings in the directories - business “hits” directly related to directories - decreased woodwaste in landfills or other depositories? - more local communities providing opportunities for residents, such as mulching of downed debris</p>	<p>1.2 3.4 3.6</p>

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
4.D. Evaluate and strategize whether we participate in actively promoting forest certification, and if so, how will we promote it?	Statewide	All For Mgt sub-issues	Private land stewardship Chesapeake Bay Planning & Inventory	TNC Rainforest Alliance (FSC) Tree Farm SFI PSU	- use simple survey tools to gauge public and producer interest in certification - decide how the agency will promote certification of private lands	- decision on whether or not we will actively promote certification - clarity as to the requirements of the various certification systems - if we will actively promote certification, a decision on how we will go about it	1.1 1.2 2.2 3.2 3.2 3.4 3.5 3.6 3.7
STRATEGY #5: Assess the Urban Tree Canopy within the Commonwealth							
5.A. Complete urban tree canopy assessments (minimum: all 14 metro areas)	Metro Areas	FM: Comm For Mgt FM: Mktg of For Prod/Serv FM: Water FM: Monitoring Conditions Forest Health Land Use Climate Change Comm Nat Res Values Wildfire/Public Safety	Chesapeake Bay UCF TreeVitalize	PSU USFS PHS WPC DVRPC University of VT Ches Bay Forestry Workgroup Participating Municipalities PCF NEMO PennVest DEP	- Chesapeake Bay Forester - imagery - LiDAR production - purchase NIR band of NAIP imagery - analyze imagery	- 14 assessments of metro areas complete	1.1 1.2 2.2 3.1 3.2 3.4 3.5 3.6 3.7

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
5.B. Complete urban tree canopy plans (minimum: 10 metro areas)	Metro Areas	FM: Comm For Mgt FM: Mktg of For Prod/Serv FM: Water FM: Monitoring Conditions Forest Health Land Use Climate Change Comm Nat Res Values Wildfire/Public Safety	Chesapeake Bay UCF TreeVitalize	PSU USFS PHS WPC DVRPC University of VT Ches Bay Forestry Workgroup Participating Municipalities PCF NEMO	- Chesapeake Bay Forester - work with municipalities to set UTC goals and create plans - funding for implementation of the plans	- 10 communities participating - 10 plans completed	1.1 1.2 2.2 3.1 3.2 3.4 3.5 3.6 3.7
5.C. Complete the processing of PA's LiDAR data	Statewide	All For Mgt sub-issues	UCF TreeVitalize Chesapeake Bay Private forestland stewardship Minerals	TopoGeo USFS PASDA	- work with TopoGeo to find a funder	- completion of all of PA's LiDAR data	1.1 2.2
5.D. Acquire the NIR band of the NAIP imagery for 2010	Statewide	All For Mgt sub-issues	UCF TreeVitalize Chesapeake Bay Private forestland stewardship Minerals	TopoGeo USFS PASDA USDA	- work with TopoGeo to find a funder	- data acquired and utilized	1.1 2.2

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
STRATEGY #6: Promote formal and sustainable management of trees by municipalities							
6.A. Boost enrollment in Tree City USA	Statewide	Communications, Land Use, Forest Health	UCF TreeVitalize	-Arbor Day Foundation -PSU -USFS -PCF -participating municipalities	-Ext UFs Service -Foresters -Municipal Planners -Municipal Foresters -Consulting Arborists	-increased TreeCity USA communities -increased “Managing” communities in CARS	1.1 1.2 2.2 3.1 3.2 3.4 3.5 3.6 3.7
6.B. Focus educational workshops on key needs of communities and key needs of potential service providers	Metro Areas	Communications, Land Use, Forest Health	-UCF -Private Forestland Stewardship	-USFS -PSU -PCF -participating municipalities -consulting arborists -civil engineers -forest products industry	-PSU -Villanova University -PMPEI -DCED -USFS -DEP -PennVest -civil engineers	-increased TreeCity USA communities -increased “Managing” communities in CARS	1.1 1.2 2.2 3.1 3.2 3.4 3.5 3.6 3.7

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
6.C. Secure permanent funding for Extension Urban Forester positions	Statewide	Communications, Land Use, Forest Health	-UCF -Private Lands Stewardship	-PSU -PCF -municipalities -USFS	-USFS -PSU School of Forest Resources -PennVest -DEP Air Quality -DEP Water Quality -DCNR BRC -water companies -electric utilities -nursery industry	- funding is secured	1.1 1.2 2.2 3.1 3.2 3.4 3.5 3.6 3.7
6.D. Secure BOF field staff dedicated to UF	Metro Areas	Communications, Land Use, Forest Health	-UCF -Private Lands Stewardship -State Forest Management	-municipalities -service foresters -PSU Extension UFs	-USFS -PSU School of Forest Resources -PennVest -DEP Air Quality -DEP Water Quality -DCNR BRC -water companies -electric utilities -nursery industry	- staff positions are secured	1.1 1.2 2.2 3.1 3.2 3.4 3.5 3.6 3.7

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
STRATEGY #7: Invest in training our staff and our partners on current issues, thinking, and technologies							
7.A. Invest in training of our own staff and partners in the current technologies such as inventories that will satisfy carbon market requirements	Identified by state map and honed by regional plans	FM: Carbon Markets Climate Change	Private forestland stewardship UCF Resource Planning & Inventory	Davey Resources PSU USFS TNC Consultants Arborists NRCS ISA PFPA SFI	- support of senior staff and district managers - IT support - methodology - train the trainer	- number of people trained - inventories completed	3.4 3.7
7.B. Continue to support logger training through SFI	Statewide	Communication	Private forestland stewardship	SFI Loggers consultants	-Service Foresters -Pinchot office program staff -Financial assistance for course instructors and course development	- number of loggers trained	3.4 3.7
7.C. Promote/ facilitate the training of partners in software such as iTree, which helps describe the benefits of urban trees	Identified by state map and honed by regional plans	FM: Comm For Mgt FM: Water FM: Monitoring Conditions Comm Nat Res Values	UCF TreeVitalize Chesapeake Bay Comm/Interp	Metro partners PSU PHS WPC FPUF Davey Tree USFS Arborists Developers Home owner assns ISA	- trained teachers - knowledge of the technology - equipment (such as field data collectors) - locations to conduct training	- number of people trained - software packages implemented - thorough evaluations of communities using this type of software	2.2 3.4 3.6

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
7.D. Work with and offer trainings to STCs and EACs to maintain and increase UTC and awareness of the importance of urban forest health	Identified by state map and honed by regional plans	FM: Comm for mgt FM: water FM: Monitoring Conditions	UCF TreeVitalize Chesapeake Bay Comm/Interp	Metro partners PSU PHS WPC FPUF Davey Tree USFS Arborists Developers Home owner assns ISA BRC PEC	- creation of UTC plan model - factsheets on benefits of urban forests - locate a distribution list of these entities	- more communities setting UTC goals - iTree analysis of communities - more cities meeting CARS criteria - greater number of TCUSAs	1.1 1.2 2.2 3.1 3.2 3.4 3.5 3.6 3.7
7.E. Properly equip BOF staff on issues such as land use, O&G, Carbon, Biomass, ginseng (and other NTFPs)	Identified by state map and honed by regional plans	All For Mgt Sub-issues Land Use Comm of Nat res	Private land stewardship UCF TreeVitalize Chesapeake Bay	Various	- everyone should know what DCNR's policy is on all current issues	- our staff feels comfortable to engage on any of these issues	1.2 2.2 3.1 3.4

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
STRATEGY #8: Support reforestation/afforestation efforts on private, industry, quasi-public, and municipal lands							
8.A. Support afforestation efforts to restore the American Chestnut	Identified by state map and honed by regional plans	FM: Biomass FM: Monitoring Conditions FM: Water FM: Ownership Forest Health	Private Forestland stewardship Chesapeake Bay Eco Services	[PA]TACF PGC Landowners PAFS NWTF Energy industry DEP ARRI OSM USFS	- cooperative agreement b/t DCNR and TACF (complete) - DCNR volunteers to do the work - staff must have current knowledge of the issue - identification of potential planting sites	- increase in planting and acres of disease-resistant American Chestnuts - acres reforested - seedling availability	1.2 2.2 3.1 3.2 3.4 3.6 3.7
8.B. Encourage diversified tree plantings (discourage planting of invasives)	Identified by state map and honed by regional plans	Forest Health FM: Comm for mgt	Private forestland stewardship UCF TreeVitalize Chesapeake Bay Eco Services	iConserve USFS PLNA Arborists Consutants Box stores Planners Landscape architect PSU Grantors Master gardeners TreeTenders™	- factsheets - handout such as the “Delaware Trees” publication	- fewer problem species planted - possible creation of best practices recognition program	Assists with all objectives

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
STRATEGY #9: Continue to promote and help fund the planting, protection, and maintenance of riparian buffers in key watersheds within the state							
9.A. Continue to promote and help fund the planting, protection, and maintenance of riparian buffers in key watersheds within the state	Priority watersheds	FM: Water FM: Community For Mgt Climate Change Forest Health Land Use	Chesapeake Bay Private Forestland stewardship UCF TreeVitalize	PDA CBF ACB Watershed Assns PASA Stroud Water Res Cntr Plow and Hearsh Public radio partnerships Utility companies Water companies PAFBC PEMA	- media support - create advocacy outside of government agencies - communicate compelling reasons to do this - seek out partnerships with ag coops (the milk and butter people) - reach out to plain sect people	- buffer goals are reached - water quality is restored - less flooding - increased canopy cover along streams - riparian habitat restored - riparian habitat protected	1.1 1.2 2.2 3.1 3.2 3.5 3.7
STRATEGY #10: Monitor programs, easements, and outcomes where necessary and appropriate							
10.A. Continued monitoring of all conservation easements held by the BOF	Forest Legacy Areas PA portion of the multi-state Highlands landscape	FM: monitoring conditions FM: Ownership FM: Unsust timb harv	Forest Legacy Highlands Conservation Act Private forestland stewardship	USFS USFWS Conservancies Archives	- continued education of our staff on what is necessary in the monitoring procedure - work with archives to find “permanent” storage for original records	- easements are monitored at least once per year - new landowners are appraised of the easement situation as soon as possible after transfer of property	1.2 2.2 3.4 3.5

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
10.B. Continued monitoring of all BOF approved stewardship or sustainable management plans	Where stewardship plans exist	FM: monitoring conditions FM: Unsust timb harv	Private forestland stewardship	USFS	- continued staff support to monitor plans in the field	- yearly monitoring complete to standards each year	1.2 2.2 3.4 3.5
10.C. Monitor municipal tree ordinances and management plans	Identified by state map and honed by regional plans	Communication, Land use	-UCF -Private Lands Stewardship	-municipalities -service foresters -PSU Extension UFs	-additional field staff dedicated to this task -trained field staff able to assist in making necessary revisions -clear state guidelines for key ordinance components and model language	-Periodic reports generated -Instances of non-compliance corrected	1.1 2.2
STRATEGY #11: Meet or exceed all goals set through Presidential Executive Orders or through state and multi-state laws, regulations, or agreements.							
11.A. Meet or exceed current Chesapeake Bay riparian forest buffer goals	Chesapeake Bay Watershed	FM: Unsus Timb harv FM: Water FM: Monitoring Conditions	Private land stewardship UCF	USFS DEP CBF ACB NRCS Conservancies Watershed associations PACD PDA	- focused funding - assistance in identifying available projects/ opportunities - reach out to new audiences (such as ag coops)	- goals are met or exceeded	3.1 3.5 3.6

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
11.B. Meet or exceed current Chesapeake Bay land conservation goals	Chesapeake Bay Watershed	FM: Unsus Timb harv FM: Water FM: Monitoring Conditions	Private land stewardship	USFS DEP NRCS Conservancies Watershed associations PACD PALTA	- work with PALTA to identify and capture land conserved within priority areas - update priority watershed map for the Chesapeake Bay - improve tracking	- goals are met or exceeded	1.1 1.2 3.1 3.5 3.6
STRATEGY #12: Support partners in projects where our goals coincide, for example							
12.A. Support TNC's Working Woodlands Model	As set by TNC	FM: Ownership FM: Unsus Timb harv FM: Certification Systems FM: Mktng for prod/serv FM: Carbon Markets FM: Water FM: Monitoring Conditions Climate Change	Private land stewardship	TNC Rainforest Alliance (FSC) Blue Source USFS NRCS	- set by TNC	- set by TNC	1.1 1.2 2.2 3.2 3.2 3.4 3.5 3.6

Forest Strategies

Climate Change

Issue Overview

Climate change is widely regarded as one of the greatest threats to the medium and long-term survival of the Earth's biodiversity. Projections reported by the Intergovernmental Panel on Climate Change (IPCC) suggest that as the global average temperature increase exceeds 3.5⁰ Celsius, significant numbers of species (40-70%) could go extinct around the globe. Models using realistic assumptions about the output of greenhouse gases concur that much of North America will reach this threshold in just 50 years.

While there are still many unknowns, climate change combined with other major stressors will have impacts on Pennsylvania's forests and in some cases is already affecting the structure and composition of our forestland in Pennsylvania. Some examples include:

- Climate change will increase the spread and impact of invasive species. Kudzu, an especially aggressive southern species, has moved further north and has been identified in 140 sites in Pennsylvania.
- Mild winters can result in sharp increases in hemlock wooly adelgid populations, especially in higher elevations and more northern extents. Other forest pests are expected to spread as temperatures increase.
- Changing species composition and distribution will affect the current food web and ecosystem dynamics. The adaptive capacity of many species is likely to be exceeded at the current rate of change. According to the UCS, the forested northern portion of Pennsylvania could experience some of the greatest losses in suitable bird habitat across the northern U.S.
- The US Department of Agriculture has shifted growth zones for the United States; parts of Pennsylvania have moved from Zone 6 to Zone 7, similar to Tennessee and Virginia.
- Severe weather, more high intensity storms and even prolonged periods of drought will place greater stress on natural resources.
- The US Forest Service predicts that black cherry and sugar maple are two species under the worst case emission scenario whose range may shift northward out of Pennsylvania. Black cherry has already seen some decline in regeneration in Pennsylvania.

Developing practical conservation measures that address existing stresses and improve forest resilience will provide the most effective approach to retaining healthy forest ecosystems in Pennsylvania while addressing climate change. Developing baseline information, identifying trends and gaining a better understanding of the impacts of climate change will help guide future management decisions to help natural systems adapt.

Strategies

1. **Identify climate change impacts and prioritize research and survey efforts:** Consider both direct and indirect impacts of climate change; identify and execute research in partnership with other conservation organizations, and state and federal agencies to gain economy of scale and consider climate change as an additional “layer” of threats added to existing threats.
2. **Promote resilience to climate change:** Evaluate and adapt as needed forest management practices to reduce or eliminate other stresses of forest resources (e.g., wild land fire, pest and pathogen outbreaks).
3. **Identify species and resources vulnerable to climate change:** Identify and prioritize plant and wildlife species and other natural resources most vulnerable to climate change impacts. Identify survey, management, and monitoring needs for vulnerable species and resources.
4. **Plan for changes in forest composition:** Assess potential response of forest species and communities to climate change projections through scenario building, plan for the appearance and implications of novel communities/ecosystems and consider appropriate spatial and temporal scales including where species and habitats are likely to occur.
5. **Identify the range of conservation options:** Consider actions for a range of likely future climate conditions; identify/describe how conservation actions will be prioritized when considering multiple threats; identify actions that minimize, not necessarily eliminate climate change impacts; provide for plant and wildlife adaptation; and provide for resilience and/or facilitate movement to suitable habitats and conditions.
6. **Adapt monitoring programs:** Strive to adapt and streamline existing monitoring programs to inform management decisions under a changing climate; work with other states and partners to monitor species and habitats across their entire range.
7. **Coordinate with partners:** Coordinate and collaborate with partners since the scope, scale and uncertainty of climate change impacts will require a broad interdisciplinary approach that includes sharing data, strategies and expertise.
8. **Maintenance and Expansion of Urban Tree Cover:** Urban tree cover provides significant benefits to communities and will face challenges in the context of a changing climate. Projections of increased drought, shifting geographic species suitability, and a number of increased stressors, will challenge the ability to maintain and/or expand urban tree canopy cover.
9. **Educate the public:** Strive to improve understanding of the impacts to forest resources and gain public support for communication, mitigation and adaptation plans; involve conservation partners early during the public participation planning process. Reach out to landowners, communities and industry to educate them about the issue and to encourage them to implement BMPs and long-term forest sustainability practices.

Strategies for Climate Change

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/Required to Implement	Measure of Success	Supports National Objective
1) Identify climate change issues and prioritize research and survey efforts	PA Wilds, Pocono Region, Marcellus Shale formation, statewide	Energy development	BOF: Ecological Services, Silviculture, Planning and Inventory, Operations and recreation, Forest Pest Management, Forest Fire Protection, Rural and Community Forestry, Communications, District Foresters	USGS, USFS, NPS, NOAA, DOI, Forest product industry, DCNR, PGC, PFBC, NGOs, academia	BOF staff, PNHP, WRCP grant programs, OCS, USFS, USGS	Framework for identifying and evaluating, and prioritizing climate change related issues	1.1,1.2, 2.1,2.2,3.1 3.3, 3.5,3.7
2) Promote resilience to climate change	Pocono region, PA Wilds Marcellus Shale formation, statewide	Energy development Invasive species, deer management, forest mgmt	BOF: Ecological Services, Silviculture, Forest Planning and Inventory, Operations and recreation, Forest Pest Management, Forest Fire Protection, Rural and Community Forestry, Communications, District Foresters	USFS, NOAA, USGS, NPS, DOI, Forest product industry, DCNR, PGC, PFBC, NGOs, academia	BOF staff, WRCP grants, USFS and USGS grants, EPA grants, NRCS/USDA	Best management practices that promote resilience to climate change are identified and implemented	1.1,1.2,2.2 ,3.1,3.2, 3.4,3.5, 3.7
3) Identify species and resources vulnerable to climate change	State-wide	Invasive species, fragmentation	BOF: Ecological Services, Planning and Inventory, District Foresters, Forest Pest Management, Rural and Community Forestry	USFS, USFWS, Forest product industry, DCNR, PGC, PFBC, NGOs, academia	PNHP, academia, research grants, Growing Greener grants, partner agencies (PGC, PFBC)	Identification of species and resources at-risk to climate change impacts, conserve critical habitats and migration corridors	1.1,1.2, 2.2, 3.1, 3.4, 3.5 3.6, 3.7

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/Required to Implement	Measure of Success	Supports National Objective
4) Plan for changes in forest composition	Northern tier, Pocono Region, statewide	Invasive pest and pathogen species, invasive plant and wildlife species	BOF: Silviculture, Ecological Services, Forest Planning and Inventory, Rural and Community Forestry, Forest Pest Management	USFS, NPS, Forest product industry, DCNR, PGC, PFBC, NGOs, academia	BOF staff, research grants to academia, PA Plant community classification , PA Biological Survey, USFS, USGS/Topographic and Geologic Survey, DCNR	Maintain forest species diversity, Develop and implement management plans to address species in decline	1.1,1.2, 2.1, 2.2 3.1, 3.4, 3.5,3.6,3.7
5) Identify the range of conservation options	State-wide, pilot in Pocono Region, PA Wilds	Plant and Animal Habitat, Forest Mgmt, Forest Health	BOF: Silviculture, Ecological Services, Forest Planning and Inventory, Rural and Community Forestry, Forest Pest Management, District Foresters,	USFS, Forest product industry, DCNR, PGC, PFBC, NGOs, academia	BOF program staff, PNHP, NGOs – TNC, WPC Audubon; USFS,	Development of a statewide climate change management plan, pilot application to a geographic region	1.1,1.2,2.1 ,2.2,3.1 ,3.4,3.5,3.6, 3.7
6) Adapt monitoring programs	State-wide, potential multi-state projects,e.g. Chesapeake Bay watershed	Plant and Animal Habitat, Forest Mgmt, Forest Health	BOF: Forest Planning and Inventory, Ecological Services, Forest Pest Management, Silviculture	USFS, USFWS, NPS,Forest product industry, DCNR, PGC, PFBC, NGOs, academia	USFS, Continuous Forest Inventory Program, PNHP (Threatened and Endangered Species data, high elevation wetland monitoring), Audubon (bird surveys), energy development monitoring, NPS	Development and implementation of a coordinated and integrated monitoring program	1.1,1.2.2.2 ,3.1,3.2, 3.4,3.5,3.6 3.7

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/Required to Implement	Measure of Success	Supports National Objective
7) Coordinate with partners	State-wide, mulit-state	Plant and Animal Habitat, Forest Mgmt, Forest Health	BOF: Forest Planning and Inventory, District Foresters, Ecological Services, Pest Management, Communications	USFS, Forest product industry, DCNR, PGC, PFBC, NGOs, academia, resource agencies in adjacent states	DCNR-OCS/TNC climate change document (“Weathering climate change: Framing strategies to minimize impacts on PA ecosystems and wildlife, 2010), BOF staff, academia, USFS	Develop and implement framework for sharing information and strategies	1,2,3
8) Maintenance and Expansion of Urban Tree Cover	Statewide, identified key urban areas in Ch. 5 of the Assessment	FM: Water, Forest Health, Climate Change, Comm Nat Res Values	BOF – Rural and Community Forestry	USFS, Penn State Cooperative Extension, local communities, urban and regional planning commissions	DCNR Tree Vitalize Program, Chesapeake Bay Program	Maintenance of existing urban tree cover; measurable increase in urban tree cover	2,3
9) Educate the Public	State-wide	Plant and Animal Habitat, Forest Mgmt, Forest Health	BOF: Communications, Forestry Planning and Inventory, District Foresters, Rural and Community Forestry, Forest Pest Management, Forest Fire Protection	USFS, DEP, academia, Forest product industry, TIMOs, private forest landowners, NGOs,	Climate Change Advisory Committee process, USFS, Ecosystem Management Advisory Committee, DCNR iConserve	Measure and track outreach efforts in elevating the awareness of the impacts of climate change on Pennsylvania’s natural resources	1,2,3

Initial List of Tasks & Projects

1. Incorporate climate change mitigation and adaptation into the State Forest Resource Management Plan
2. Establish a climate change subcommittee in EMAC to identify and prioritize climate change issues. Use this committee to identify immediate, short-term and long-term issues, research and monitoring needs.
3. Work with the DEP Climate Change Advisory Committee's "natural resource adaptation workgroup" on climate change adaptation issues.
4. Identify and implement Best Management Practices that promote forest health and climate change resilience
5. Identify species vulnerable to climate change impacts. Engage PNHP to continue climate change vulnerability assessment work. Identify forest resources vulnerable to climate change.
6. Identify tree species likely to experience climate-related population declines (review USFS model projections) and develop management plan to address potential loss of economic and ecological values due to species declines.
7. Develop and implement program to identify and evaluate genetic stocks of PA forest tree species to maintain forest genetic diversity and identify climate change resistant stocks. Short-term objective will be to assess genetic diversity for species currently under the greatest threat (e.g., eastern hemlock, ash species).
8. Establish program to identify and evaluate tree species that may be appropriate to introduce into PA in response to the decline and/or loss of PA native tree species.
9. In collaboration with stakeholders, develop and implement a statewide forest management strategy to address climate change impacts on public and private forest lands..
10. Identify a region of the state in which to implement a pilot public-private climate change management strategy.
11. In collaboration with stakeholders, develop and implement an integrated monitoring program that coordinates climate-change related monitoring by federal and state agencies as well as NGO's and other stakeholders.
12. Work with stakeholders to develop and implement a framework for sharing climate change mitigation and adaptation information and strategies.
13. Incorporate climate change education into current public communication and education programs (e.g., iConserve website, BOF web pages, Rural and Community Forestry programs).

Forest Strategies

Communicating Natural Resource Values

Issue Overview

Effective public communication strategies are especially important to natural resource agencies, where conservation efforts are closely tied to promoting “stewardship” or care of the resource to individuals and communities.

These strategies will serve to create a greater awareness of the role forests play in providing a multitude of values to society, from clean air and clean water to places for healthful outdoor recreation to the wide array of wood products forests provide. Their aim is a citizenry that understands and appreciates the importance of Pennsylvania’s forests and is willing to act to conserve them. These strategies help to promote the work and missions of all of the program areas within the Bureau of Forestry.

Strategies

1. Develop a statewide interpretive plan for state forest land to engage/connect people with resource values and benefits.
2. Utilize recreational interest on state forest land to promote forest stewardship.
3. Conduct research of key forest conservation stakeholders/audiences to better understand their needs/knowledge of forest resource issues.
4. Coordinate messaging on forest values and benefits with other key stakeholders
5. Improve the Bureau of Forestry’s web presence to include high quality technical assistance to private forest landowners.
6. Develop regionally specific communications tools to enhance citizens’ understanding of forest sustainability issues.
7. Develop communications and outreach tools to aid in the delivery of technical assistance in group settings.
8. Expand and improve the Bureau of Forestry’s conservation education efforts.

Strategies for Communicating Natural Resource Values

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
1. Develop statewide Interpretive Plan for State Forests to engage/connect people with resource/values and benefits	Statewide; All CLI regions; DCNR State Forests	Forest Management; Forest Health	Communications; Recreation; RCF	DCNR BOF; BSP	DCNR BOF; BSP; PGC; PFBC; Dept. of Ed.; NAI; NAAEE; FIA;	Plan completed in 2 years	1.1, 3.6
2. Utilize recreational interest on State Forest Land to promote the values of forested lands	Statewide; All CLI regions; DCNR State Forests and state parks;	Forest Management; Forest Health;	Communications; Recreation;	DCNR BOF; BSP; PGC; PFBC	DCNR BOF; DCNR OECP; BSP; PGC; PFBC; SCORP;	Initiate three pilot projects within the next 2 years	3.6
3. Conduct research of key forest conservation stakeholders/audiences to better understand their needs/knowledge of forest resource issues.	Statewide; All CLI regions; Private Forestland Regions	Forest Management; Forest Health; Plant & Animal Habitats; Climate Change;	Communications; Recreation; RCF; Planning;	DCNR BOF; PSU Extension; USDA FS; PSATS;	DCNR BOF; PSU; USDA FS	Research priorities identified/better understanding of key audiences to target outreach and communications	1.1,3.6
4. Coordinate messaging on forest values and benefits with other key stakeholders	Statewide	Forest Management; Forest Health; Climate Change	Communications; Recreation; RCF; Ecological Services	DCNR BOF; BSP; PFBC; PGC; Dept. of Ed.; PSU	DCNR BOF; BSP; PFBC; DEP; PGC; SRBC; DRBC; Dept. of Ed.; PSU; USDA FS;	Yearly review of messaging efforts	1.1,3.6

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
5. Improve the Bureau of Forestry’s web presence to include high quality technical assistance to private forest landowners.	Statewide; Private Forestland Regions	Forest Management; All Secondary Issues	Communications; Minerals; Fire; UCF, Ecological Services; Planning; Silviculture; Operations; FPM;	DCNR BOF; DCNR OECP; PSU; PA Forest Stewards; Woodland Owner Assoc.	DCNR BOF; DCNR OECP; PSU; USDA FS; TreeVitalize; iConservePA;	Enhanced website completed in 2 years; better accessibility to technical assistance	3.6
6. Develop regionally specific communications tools to enhance citizens’ understanding of forest sustainability issues.	Private Forest Regions	All secondary issues	All BOF sections	DCNR BOF; DCNR OECP; PSU; various local and statewide organizations	DCNR BOF; OECP; DCNR BSP; USDA FS	Tools created for a pilot region	1.1, 3.6
7. Develop communications and outreach tools to aid in the delivery of technical assistance in group settings.	Statewide; Private Forest Regions	Forest Health; Forest Management	Communications, RCF, Planning	DCNR BOF; BSP; OECP; USDA FS; PSU	DCNR BOF; BSP; USDA FS; TreeVitalize; iConservePA;	Yearly review of resources available	1.1,1.2,3.6
8. Expand and improve BOF’s Conservation Education efforts	Statewide	All secondary issues	Communications; RCF; Ecological Services; Fire	DCNR BOF; BSP; Dept. of Ed.; NAAEE; USDA FS;	DCNR BOF; BSP; PSU; NAAEE guidelines for excellence in education; USDA FS	Conduct Cons. Ed. Summit; Draft plan in 2 years	3.6

Initial List of Tasks and Projects

1. Survey forest districts for a comprehensive list of our current interpretive efforts. Develop those current efforts on all state forest lands to engage people with the resource and communicate conservation messages.
2. Plan a pilot project to develop recreational programming on state forest land that links visitors to forest stewardship.
3. Identify key audiences/stakeholders for social/market research.
4. Meet with other key stakeholders such as the Pennsylvania Game Commission and Pennsylvania Fish and Boat Commission to begin to coordinate messaging efforts.
5. Develop a protocol for improving the bureau's web presence. Work with the Bureau of Information and Technology and the Department's Office of Education, Communication and Partnerships to develop a plan for website restructuring.
6. Identify a Private Forestland Region for a pilot communications project. Define goals, objectives and audiences.
7. Determine outreach needs with staff input. Define priority projects.
8. Hold a Conservation Education Summit with key work partners to discuss and plan how to better coordinate efforts.

Forest Strategies

Energy Development – Rights-of-Way

Issue Overview

Rights-of-way have crisscrossed Pennsylvania for more than a century. Many were developed as the national power grid was assembled in the early 1900s. They bring electricity via transmission towers and lines into Pennsylvania and from Pennsylvania-generated electricity sources to in-state and out-of-state locations. Rights-of-way (ROWs) have also been developed in the state for gas lines, water lines, sewer lines and, more recently, buried cable lines. Since 2008, the number of ROW requests in the state has accelerated as natural gas drilling technology has made recovery of gas from the Marcellus shale play more available, and the demand for east-coast electrical transmission has grown. This increase, in turn, has raised concerns about the state forest system's ability to retain current third-party certification, address increased forest fragmentation, and combat the introduction and spread of invasive species.

In 2009, DCNR developed a new set of policies and practices regarding the permitting and implementation of rights-of-way on state forest and park lands in response to an escalation in the number of requests. These new policies address the application process itself, provide new siting criteria, update the fee structure, and offer guidance to help limit invasive plant species along rights-of-way and for other related practices.

Strategies

1. Continue careful permitting and environmental review processes.
2. Continue practice of proactive planning to minimize and mitigate impacts to natural resources.
3. Improve communication between DCNR, industry and the public.
4. Encourage dialogue at ongoing public forums like the Ecosystem Management Advisory Committee to mediate conflicts and develop new solutions.
5. Monitor impacts and document concerns about energy-development impacts via an agency database.
6. Work with permitting agencies like DEP to address noncompliance.

Rights-of-Way Strategy Matrix

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/Required	Measure of Success	Supports National Objective
1. Careful permitting and environmental reviews	Statewide, partic. in Marcellus gas region	Plant & Animal habitats, energy development	PNDI, ROS	Energy companies, DEP, adjacent landowners	BoF Ecological Services, PNDI	Protective permits and mitigation requirements compliance	1.1, 2.2, 3.5
2. Continue proactive planning efforts	Statewide, particularly in Marcellus gas region	plant and animal habitats, communicating natural resource values, energy development	BoF ROW Summits, stakeholder meetings, BoF ROW database	Energy companies, county planners, municipalities, FERC, PUC, consultants	periodic ROW summits, EMAC; Staff needed to assemble GIS data	ROWs concentrated along existing lines, wild areas left intact, forest zones preserved	1.1, 2.2
3. Improve communication to industry and the public	Statewide, especially in Marcellus region	Communicating natural resource values, plant & animal habitat, energy development	BoF district staff, ROW internal team	Energy companies, DCNR advisory committees, general media, FERC, PUC	New DCNR Gas Advisory Group, EMAC, Energy subcommittee	# meetings with industry, # positive news clips, # public forums	1.1, 3.6
4. Use advisory groups, public forums to mediate and develop solutions	Statewide, especially in Marcellus gas region	forest management, communicating natural resource values	BoF ROW internal team	DCNR advisory committees, non-profits, academics, energy companies, consultants	New DCNR Gas Advisory Group, EMAC, stakeholder meetings, Transmission line listserv	Improved/updated ROW guidance document, ROW-related policies	2.2, 3.6
5. Monitor impacts and document concerns via an agency database	Statewide, especially in Marcellus region	Communicating natural resource values, forest management, energy development	DEP website, SRBC website, EPA	WPC, TNC, advisory groups, trail groups, Audubon PA, SRBC, academics	Staff to respond to and update website, staff to do onsite monitoring	Developed database, # monitoring efforts, # concerns addressed	2.2, 3.6
6. Work with DEP, PUC, FERC, others to address noncompliance	Statewide, especially in Marcellus region	Communicating natural resource values, forest management, plant & animal habitat	PUC hearing process, FERC comments	PUC, FERC, DEP, energy companies, consultants	Staff to report concerns Coordination with other agencies	# non-compliance actions taken, and redressed	2.2, 3.6

Forest Strategies

Energy Development - Marcellus Shale

Issue Overview

The Marcellus Shale is a rock deposit which lies as much as 8,000 feet below the surface of two-thirds of Pennsylvania. It may contain nearly 170 trillion cubic feet of natural gas that was previously thought too difficult and too expensive to access, as it must be released from between the impermeable layers of shale. Advances in drilling technology, along with high but fluctuating gas prices, have made natural gas production from shale deposits more economically viable and thus more desirable for both industry and landowners. The resulting interest and growth in natural gas production is generating interesting opportunities and challenges for Pennsylvania.

Marcellus Shale development has the potential to provide benefits to Pennsylvania including production of a “clean” source of energy, revenues to landowners, and jobs and other economic benefits to communities. While the potential benefits are great, state and local leaders are concerned about potential negative social and environmental impacts. Potential environmental impacts include loss of forest cover, fragmentation, invasive species spread, drinking water contamination, and plant and animal habitat degradation. Social impacts include “boom and bust” phenomena in local communities, aesthetics and change to rural PA character, infrastructure maintenance, and conflicts with recreation. Developing strategies that leverage opportunities while understanding and minimizing potential negative impacts will be critical to ensuring sustainable forests and healthy and vibrant communities.

Strategies

1. Manage oil and gas activities on State Forest land in a manner that minimizes environmental and social impacts of Marcellus Shale development.
2. Work with partners to develop monitoring systems to address all potential social and environmental impacts and promote better understanding and communication.
3. Develop outreach materials to assist landowners, communities, and the industry in implementing BMPs for surface activity management, landscape-level infrastructure planning, and long-term restoration.

Marcellus Strategy Matrix

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/Required to Implement	Measure of Success	Supports National Objective
1. Manage oil and gas activities on State Forest land in a manner that minimizes environmental and social impacts of Marcellus Shale development.	Marcellus region, PA Wilds CLI	Land use, Forest Health, Forest Management, Plants and Animals, Communicating Values	Forest Stewardship Program, Forest Health, Urban & Community Forestry BOF: Minerals, Planning & Inventory, Ecological Services, Communications	Oil and gas industry, agencies, NGOs, community leaders, academia, extension	BOF staff, partner contributions, potential severance tax, royalties from existing leases	area of converted forest minimized, no change in water quality, no species lost, positive community impacts	1, 2.2, 3.1, 3.2, 3.4, 3.5
2. Work with partners to develop monitoring systems to address all potential social and environmental impacts and promote better understanding and communication.	Marcellus region	same as above	Same as above	same as above	same as above, research grants	systems in place, reports generated, same as # 1	same as above
3. Develop outreach materials to assist landowners, communities, and the industry in implementing BMPs for surface activity management, landscape-level infrastructure planning, and long-term restoration.	Marcellus region, PA Wilds CLI	same as above	Same as above	same as # 1, landowner associations	same as above	website developed, BMPs published, same as # 1	same as above

Initial List of Tasks & Projects

1. Form a broad-based advisory committee that fosters strong relationships among partners, aims to minimize all potential impacts to the forest system (including water, soil and air quality, fragmentation, recreation, plant and animal habitat), and capitalizes on opportunities.
2. Utilize State Forest management guidelines to develop BMPs for managing natural gas surface activities and make BMPs available to private landowners for guidance or adopt separate list of private landowner BMPs for natural gas activities.
3. Work with partners to develop a comprehensive monitoring system that evaluates all forest related impacts including plants, animals, invasive species, fragmentation, soils and water, air quality, recreation and social considerations.
4. Work with partners to promote landscape-level planning related to infrastructure needs such as water and rights-of-way.
5. Work with partners to develop appropriate water use and disposal methods.
6. Develop a set of restoration activities to guide reclamation or rehabilitation of disturbed sites due to natural gas activities or infrastructure.
7. Develop communications tools such as websites, publications, etc.
8. Provide support for severance tax legislation and use of revenues for conservation purposes.
9. Characterize changes to forested landscapes as a result of Marcellus development.
10. Understand changes in forest landowner attitudes toward their lands as a result of Marcellus development.
11. Develop and allocation-based approach for future leasing of state forest land.
12. Assess statewide impacts from all sources of expanding energy production (gas, biomass, ROWs, wind) and coordinate with TNC effort.

Forest Strategies

Energy Development - Wind Energy

Issue Overview

Wind energy is produced from wind-driven turbines that convert kinetic energy in the wind into mechanical power. The wind turns the blades on a turbine, which spins a shaft that connects to a generator, making electricity. Pennsylvania has good-to-excellent wind resources, and the state is ranked 22nd in the nation in terms of potential wind power capacity. Wind power has become a growing industry in Pennsylvania. The Alternative Energy Portfolio Standards Act requires that 18% of electricity sold to retail customers in Pennsylvania come from renewable and advanced energy sources within 15 years. Wind power will compete for a substantial share of this alternative energy market. The interest in this safe, clean, and renewable energy source presents numerous opportunities and challenges for Pennsylvania.

Unlike energy produced from fossil or nuclear fuels, wind energy generation has no pollutants and constantly renews itself. As such, producing energy from wind in place of other fuel types will reduce greenhouse gas emissions. However, wind energy development also has limitations. Wind turbines have the potential to impact bird and bat populations, create forest fragmentation, disrupt scenic views, and diminish the quality of other recreational opportunities in the forest. Developing wind energy in an environmentally responsible manner and identifying appropriate wind farm locations that balance conflicting uses of forest land will be critical to maintaining productive forests in years to come.

Strategies

1. Identify appropriate legislation, regulation, policy, and guidance needs to develop wind energy in an environmentally responsible manner.
2. Develop a publicly accessible library of outreach materials and training opportunities to assist landowners, communities, the wind industry, and other stakeholders in implementing BMPs for wind energy development.
3. Develop BMPs, monitoring protocols, equipment provisions, compensatory plans, and other strategies to continuously assess impacts from wind energy development and establish adaptive management procedures to adjust to changing or unpredicted circumstances.
4. Improve and refine wind energy siting criteria on public forests.

Wind Energy Strategy Matrix

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/Required to Implement	Measure of Success	Supports National Objective
1. Identify appropriate legislation, regulation, policy, and guidance needs to develop wind energy in an environmentally responsible manner.	Ecological & Working Forest Priority Areas; Ridge & Valley Landscape; Erie Watershed; Laurel Highlands CLI	Plants and Animals, Recreation, Fragmentation	<u>U.S.:</u> Fish and Wildlife Service <u>PA:</u> PGC, PFBC, DEP, DCNR <u>BOF:</u> Planning, Ecological Services, Communications <u>Other:</u> Penn Future, Audubon, Conservancies	Wind Industry, Communities, Avian Conservation Groups, Astronomical Associations, Recreation Groups, Academia	Wind and Wildlife Collaborative; PennFuture; Partnering Contributions; State Government Agencies' Staff	Amount of power produced from wind; Environmental impacts minimized	1, 2.2, 3.2, 3.4, 3.5, 3.6, 3.7
2. Develop BMPs, monitoring protocols, equipment provisions, compensatory plans, and other strategies to continuously assess impacts from wind energy and establish adaptive management procedures to adjust to changing or unpredicted circumstances.	Same as above	Same as above	Same as above	Same as above; Landowners	Same as above	Monitoring systems in place; Compensatory plans implemented	Same as above
3. Develop a publicly accessible library of outreach materials and training opportunities to assist stakeholders in implementing BMPs for wind energy development.	Same as above	Same as above	Same as above	Same as above; Landowners	Same as above	Library of outreach material established; Training sessions conducted; Wind & Wildlife Collaborative Website Maintained	Same as above

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/Required to Implement	Measure of Success	Supports National Objective
4. Improve and refine wind energy siting criteria on public forests.	Same as above	Same as above	Same as above	Same as above	Same as above	Siting criteria improved / refined	Same as above

Initial List of Tasks & Projects

In cooperation with the Wind and Wildlife Collaborative, work to:

1. Identify appropriate wind legislation needs.
2. Identify appropriate wind regulation needs.
3. Identify appropriate wind policy needs.
4. Identify appropriate wind guidance needs.
5. Improve and refine siting criteria for wind development on State Forest Land.
6. Provide outreach & training to stakeholder groups
7. Develop a resource library on wind energy development.
8. Develop a process for addressing community concerns.
9. Develop an efficient process to make national studies, NGO studies, and industry mitigation practices & site experience information available
10. Monitor risk to habitat and wildlife from wind power development.
11. Develop pre and post monitoring protocols.
12. Catalogue compensatory tools and approaches where wildlife populations can be enhanced (especially bats).
13. Model avian and bat plans.
14. Develop equipment provisions (e.g, buried cables, smooth side towers, no lighting, etc).
15. Develop project inspection protocols.
16. Develop best management practices for wind energy development.
17. Develop risk criteria and evaluate / develop adaptive management strategies, exclusionary premise, or mix.

Forest Strategies

Energy Development - Biomass Energy

Issue Overview

Woody Biomass Energy

With environmental concerns and rising fuel costs, many Pennsylvanians are looking for ways to reduce their dependence on fossil fuels and to replace them with renewable energy sources. In Pennsylvania sources of renewable energy include wood, wood residue and dedicated agricultural energy crops. Collectively, these sources of renewable energy are known as biomass.

Wood for energy can come from a number of sources such as low value wood from timber harvesting operations, urban or construction site wood, and residue from wood manufacturing processes. Wood manufacturing facilities routinely take advantage of the wood residues they generate to heat their facility or for process heat. During timber harvesting operations, low value wood can be sustainably removed and converted to wood chips to be used as an energy source. Wood chips can be a viable alternative used to heat and/or power other building such as schools, hospitals, offices, greenhouses and prisons. Locally generated wood can be used near the source, minimizing the cost of transport. Wood fired systems can become part of the support structure for local economies through jobs and energy savings. Biomass as a fuel source also avoids price volatility associated with natural gas and oil. Ultimately, the energy costs for biomass heat systems are returned to the local economy. Biomass is also a renewable resource that is carbon neutral and reduces greenhouse gases which contribute to global warming. Modern biomass burners are clean burning and meet current air emission standards. Its sustainable production protects soil and water resources for future generations while providing high quality habitat to many species of plants and animals.

Loss of habitat, forest fragmentation, invasive species, and water and air quality degradation are all potential negative impacts associated with over-harvesting natural resources. Conflicts with existing wood-using industries, negative changes to rural communities, aesthetic-loss implications, and infrastructure maintenance demands are all potential social impacts that could result from the non-sustainable activities associated with biomass production. Strategies must be developed to maximize the wise management and use of natural ecosystems on a sustainable basis while minimizing the negative impacts that over-harvesting may bring to those ecosystems. Implementing these strategies will be critical in ensuring sustainably managed forests and productive, economically secure communities across Pennsylvania.

Pennsylvania Timber Product Output (TPO) Survey

A comprehensive survey of the Pennsylvania wood products industry is needed to determine mill production levels, capacity and products, wood consumption by type

(roundwood versus mill residuals) and byproduct supply by type. Such studies have been done in many states around the country.

The U.S. Forest Service has developed an extensive database on Pennsylvania timber supply; however, there is a lack of information on the demand for Pennsylvania timber and the flow of wood fiber through the industry. In a market where lumber and pulp production is trending lower and removals are below growth levels, there has been little interest in the actual demand requirements of the industry. However, heightened interest in wood fueled alternative energy by both federal and state government introduces a potentially large source of demand for wood fiber. In the absence of adequate demand side data there is significant risk of developing over ambitious wood based energy policies that place industry stakeholders at business risks due to potential higher input costs based on developing resource scarcity.

Forest industry stakeholders should therefore support a comprehensive survey of the Pennsylvania wood products industry to understand production, capacity, roundwood and residuals consumption and mill residuals production. The survey should be repeated on a biannual basis so that the database remains relevant, data quality improves, and the biannual survey and data summary costs decrease due to familiarity and efficiency and industry has a strong incentive to participate.

Those who benefit...

- Utilities looking to site new alternative energy facilities in Pennsylvania will be able to assess impacts of their new demand on existing timber and wood markets.
- Traditional forest industry stakeholders will be able to manage their supply sources and understand risk exposure in respective timber baskets.
- Government policymakers looking to underwrite or support alternative energy options without having a negative impact on existing forest based businesses. Timberland owners and managers will get a better understanding of the demands placed on their resource and alternatives available for marketing timber.

Strategies

1. Solicit support statewide for the TPO process from stakeholders, utilities, consumers, economic development groups, and communities.
2. Establish processes for collecting TPO data from a compilation of primary and secondary wood-product facilities that would be analyzed, summarized and reported in aggregated form to identify current fiber demand and supply balance within each region of Pennsylvania.
3. Market the Pennsylvania Fuels for Schools & Beyond energy-use initiative across the Commonwealth; coordinate the initiative across agency lines as a lead contact and establish availability and economics of bio-fuel production at facilities through natural resource assessment surveys.
4. Assist the Department of General Services to evaluate co-firing biomass with coal at state-owned facilities to reduce carbon and other emissions, to utilize waste wood in urban settings, and to develop short rotation woody fuel-crop development/management as it relates to abandoned mine land reclamation and forest regeneration on difficult sites.
5. Market sustainable, scalable combined heat and power systems with integrated district heating components in suitable communities throughout the Commonwealth.
6. Coordinate a network of communications among bio-fuel producers and end users to best match local resources with appropriate conversion technologies through development of media, workshops, facility tours, and published best management practices/user guides.

Strategies for Biomass Energy

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
<p>1. Solicit support statewide for the TPO process from stakeholders, utilities, consumers, economic development groups, and communities.</p>	<p>Private Lands Regions (6), statewide</p>	<p>Land Use, Forest Health, Forest Management, Plants and Animals, Communicating Social Values, Communicating Economic Values Air Quality, Water Quality, Climate Change,</p>	<p>Forest Stewardship Program, Forest Health, Urban & Community Forestry, Forest Utilization & Marketing, State Lands Management BOF: Planning & Inventory, Biomass Energy, Forest Stewardship, Communications</p>	<p>USFS FIA & S&PF, PFPA, PA SFI, BOF, KKDA, PSU SFR & Extension, electric utilities, woody biomass consumers, economic development groups, NGOs, community leaders,</p>	<p>BOF staff devoted to planning & inventory, Biomass Energy Specialist, stakeholder contributions, PSU SFR, USFS</p>	<p>Implementing and bi-annualizing a timber products output survey in Pennsylvania with funding support from a diverse group of forest products industry stakeholders</p>	<p>1.2, 2.2, 3.1, 3.2, 3.4, 3.5, 3.6, 3.7</p>

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
2. Establish processes for collecting TPO data from a compilation of primary and secondary wood-product facilities that would be analyzed, summarized and reported in aggregated form to identify current fiber demand and supply balance within each region of Pennsylvania.	Private Lands Regions (6), statewide	Land Use, Forest Health, Forest Management, Plants and Animals, Communicating Social Values, Communicating Economic Values Air Quality, Water Quality, Climate Change,	Forest Stewardship Program, Forest Health, Urban & Community Forestry, Forest Utilization & Marketing, State Lands Management BOF: Planning & Inventory, Biomass Energy, Forest Stewardship, Communications	USFS FIA & S&PF, PFPA, PA SFI, BOF, KKDA, PSU SFR & Extension, electric utilities, woody biomass consumers, economic development groups, NGOs, community leaders,	BOF staff devoted to planning & inventory, Biomass Energy Specialist, stakeholder contributions, PSU SFR, USFS	Completing a bi-annualized TPO in an efficient manner which produces timely information on the demand side of the forest products industry with high standards of quality control and confidence in analysis and projections.	1.2, 2.2, 3.1, 3.2, 3.4, 3.5, 3.6, 3.7

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
3. Market the Pennsylvania Fuels for Schools & Beyond energy-use initiative across the Commonwealth, to coordinate the initiative across agency lines as a lead contact and to establish availability and economics of bio-fuel production at/for facilities through natural resource assessment surveys.	Private Lands Regions (6), PA Wilds, Laurel Highlands CLI, Poconos Forests & Waters CLI, Lower Susquehanna CLI, South Mountain CLI, Schuylkill Highlands CLI Lehigh Valley Greenways CLI., statewide	Land Use, Forest Health, Forest Management, Plants and Animals, Communicating Social Values, Communicating Economic Values Air Quality, Water Quality, Climate Change,	Forest Stewardship Program, Forest Health, Urban & Community Forestry, Forest Utilization & Marketing, State Lands Management, Community Forest & Open Space Program, Conservation Education, Watershed Forestry, Fire Management Program, Forest legacy Program BOF: Planning & Inventory - Biomass Energy Unit, Forest Stewardship, Communications	USFS FIA & S&PF, PFPA, PA SFI, BOF, KKDA, PSU SFR & Extension, electric utilities, woody biomass consumers, economic development groups, NGOs, community leaders,	BOF staff devoted to planning & inventory, Biomass Energy Specialist, stakeholder contributions, PSU SFR, USFS	Increase the number of small scale biomass combustion systems installed used for heat and hot water in institutional settings across the Commonwealth. Quantify local low use wood utilized, positive community impacts, numbers of new jobs, total value of resources leveraged through partnerships with states and others partners	1.1, 1.2, 2.1, 2.2, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
4. Assist the Department of General Services to evaluate co-firing biomass with coal at state-owned facilities to reduce carbon and other emissions, to utilize waste wood in urban settings, and to develop short rotation woody fuel-crop development/management as it relates to abandoned mine land reclamation and forest regeneration on difficult sites.	Private Lands Regions (6), PA Wilds, Laurel Highlands CLI, Poconos Forests & Waters CLI, Lower Susquehanna CLI, South Mountain CLI, Schuylkill Highlands CLI Lehigh Valley Greenways CLI., statewide	Land Use, Forest Health, Forest Management, Plants and Animals, Communicating Social Values, Communicating Economic Values Air Quality, Water Quality, Climate Change,	Forest Stewardship Program, Forest Health, Urban & Community Forestry, Forest Utilization & Marketing, State Lands Management, Community Forest & Open Space Program, Conservation Education, Watershed Forestry, Fire Management Program, Forest legacy Program BOF: Planning & Inventory - Biomass Energy Unit, Rural and Community Forestry, Communications	USFS FIA & S&PF, PFPA, PA SFI, BOF, KKDA, PSU SFR & Extension, electric utilities, woody biomass consumers, economic development groups, NGOs, community leaders,	BOF staff devoted to planning & inventory, Biomass Energy Specialist, stakeholder contributions, PSU SFR, USFS	Tracking the number of DGS facilities utilizing biomass for heat or co-firing with coal. Tracking additional waste wood utilized as biomass energy. Tracking acres of AML that is planted for short rotation woody crop production.	1.1, 1.2, 2.1, 2.2, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7
5. Market sustainable, scalable combined heat and power systems with integrated district heating components in suitable communities within the Commonwealth	PA Wilds CLI, northcentral private lands region, statewide	Forest Health, Forest Management, Communicating social and economic values, climate change	Forest Planning and Inventory – Biomass Energy Unit, Rural and Community Forestry	USFS, PSU SFR, PSU Cooperative Extension, Regional Chamber of Commerce, County Planning, Electric Utilities, DCED, DEP, regional foundations	BOF staff devoted to planning & inventory, Biomass Energy Specialist, stakeholder contributions, PSU SFR, USFS	A pilot project demonstrating the sustainable, scalable use of woody biomass providing economic security and energy independence to suitable communities	1.1, 1.2, 2.1, 2.2, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/ Required	Measure of Success	Supports National Objective
6. Coordinate a network of communications among bio-fuel producers and end users to best match local resources with appropriate conversion technologies through development of media, workshops, facility tours, and published best management practices/user guides.	Private Lands Regions (6), PA Wilds, Laurel Highlands CLI, Poconos Forests & Waters CLI, Lower Susquehanna CLI, South Mountain CLI, Lehigh Valley Greenways CLI, Schuylkill Highlands CLI	Land Use, Forest Health, Forest Management, Plants and Animals, Communicating Social Values, Communicating Economic Values Air Quality, Water Quality, Climate Change,	Forest Stewardship Program, Forest Health, Urban & Community Forestry, Forest Utilization & Marketing, State Lands Management, Community Forest & Open Space Program, Conservation Education, Watershed Forestry, Fire Management Program, Forest legacy Program BOF: Planning & Inventory, Biomass Energy, Forest Stewardship, Communications	USFS FIA & S&PF, PFPA, PA SFI, BOF, KKDA, PSU SFR & Extension, electric utilities, woody biomass consumers, economic development groups, NGOs, community leaders,	BOF staff devoted to planning & inventory, Biomass Energy Specialist, stakeholder contributions, PSU SFR, USFS	Tracking biomass producers and end users development in relation to requests for technical assistance. Demonstrate value of assisting in facilitating improved communication between the two market sectors.	1.1, 1.2, 2.1, 2.2, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7

Forest Strategies

Wildland Fire & Public Safety

Issue Overview

Fire in wildlands introduces a dynamic that has far reaching impacts on both public safety and the health and viability of Pennsylvania’s natural resources. The Bureau’s authority and responsibility in protecting our residents and wildlands from wildfire is clear. Recent legislation has provided the opportunity to use fire as a tool where appropriate and necessary for natural resource benefit.

Although there may be tension at times between fire suppression and fire use, the Bureau’s role is to understand the differences and “manage” fire in the best interest of the citizens of the Commonwealth.

Pennsylvania has a rich history of forest fire protection. Equipment development and technology has fire-fighting methodology in many ways. However, most of the elements of an effective wildland fire protection program are grounded upon basic and timeless principles.

In recent years, Pennsylvania has invested in building the capacity to reach beyond the state’s borders to help neighbors across the nation. Although wildfire suppression has been the usual focus, staff experience and expertise has positioned the Bureau to help mitigate other natural and manmade disasters.

The following list of long-term strategies is an effort to clarify the complexity and range of activities concerned and to see each strategy in the context of the larger mission.

Strategies

- 1) Maintain capacity within the Bureau of Forestry to engage in safe and effective wildfire suppression activities.
- 2) Train and equip volunteer Forest Fire Wardens and volunteer fire departments for safe and effective wildfire.
- 3) Ensure the Bureau of Forestry is prepared to respond to all-risk incidents as needed.
- 4) Cooperate with other fire management agencies in the Commonwealth and the nation.
- 5) Provide for the Bureau-wide safe and effective operation of aircraft.
- 6) Engage in and support efforts that prevent unwanted fires in wildlands.
- 7) Ensure the safe use of prescribed fire in Pennsylvania and build capacity for its use as appropriate.

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/Required	Measure of Success	Supports National Objective
1. Maintain capacity within the Bureau of Forestry to engage in safe and effective wildfire suppression activities	Statewide	Forest Health; Forest Management ; Communicating Natural Resource Values; Urban & Community;	Districts and Division staff	DCNR-BOF; USDA-FS; Mid Atlantic Forest Fire Compact (MAFFC); PA Local, County and State Emergency Management Agencies (EMAs); Forest Fire Wardens (FFW); Volunteer & Paid Fire Departments (VFDs); Local Communities and Homeowners	DCNR – BOF General Fund; DCNR General Counsel; Attorney Generals office; State, County & local EMAs; PA State Police (PSP), State Fire Marshall; State Fire Commissioner support; USDA – FS Grants; FS Fire Fighter Property (FFP) and Federal Excess Personal Property (FEPP) programs; USDA-FS staff support; MAFFC; National Wildland Fire Coordinating Group (NWCG); Penn State University; National Association of State Foresters (NASF);	Number of trained wildland firefighters available; Number of Aircraft and Equipment available. Number of injuries or fatalities caused by wildfire. Amount of property damaged by wildfire. Number of training classes conducted.	2.2, 3.3, 3.5
2. Train and equip volunteer Forest Fire Wardens and volunteer fire departments for safe and effective wildfire	Statewide	Communicating Natural Resource Values; Urban & Community	Districts and Division staff	PA - DCNR, BOF; USDA-FS; MAFFC; FFWs; EMAs; VFDs; Local Communities and Homeowners	DCNR – BOF General Fund; DCNR General Counsel; Attorney Generals office; State Fire Commissioner support; PSP; State Fire Marshall; State, County & local EMAs; USFS Grants; FS-FFP and FEPP programs; USFS staff support; MAFFC; NWCG; Penn State University; NASF;	Number of active Forest Fire Wardens . Amount of Federal Excess equipment distributed. Amount of VFA money awarded. Number of training classes offered to VFDs.	2.2, 3.3, 3.5

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/Required	Measure of Success	Supports National Objective
3. Ensure that the Bureau of Forestry is prepared to respond to all-risk incidents as needed.	Statewide	Land Use; Communicating Natural Resource Values; Urban & Community;	Districts and Division staff	PA - DCNR, BOF; USDA-FS; FFWs; EMA; VFDs; MAFFC; Local Communities and Homeowners	DCNR – BOF General Fund; DCNR General Counsel; Attorney Generals office; USFS Grants; FS-FFP and FEPP programs; USFS staff support; State Fire Commissioner support; Penn State University; State, County & local EMAs; PSP; State Fire Marshall; NASF; MAFFC; NWCG	Availability of trained Type III Incident Management teams. Number of trained and qualified Type III team members.	3.3
4. Cooperate with other fire management agencies in the Commonwealth and the nation.	Statewide	Land Use; Forest Health; Forest Management ; Climate Change; Communicating Natural Resource Values; Energy; Plant & Animal Habitats; Urban & Community; Forest Recreation	Districts and Division staff,	PA - DCNR, BOF; USDA-FS; FFWs; EMA; VFDs; MAFFC; Local Communities and Homeowners	DCNR – BOF General Fund; DCNR General Counsel; Attorney Generals office; USFS Grants; FS-FFP and FEPP programs; USFS staff support; State Fire Commissioner support; Penn State University; State, County & local EMAs; PSP; State Fire Marshall; NASF; MAFFC; NWCG	Availability of trained and Nationally qualified wildland firefighters, crews and single resources; Availability of trained Type III Incident Management teams;	2.2, 3.3

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/Required	Measure of Success	Supports National Objective
5. Provide for the Bureau-wide safe and effective operation of aircraft.	Statewide	Forest Health; Forest Management ;	Districts, FFP & FPM	PA - DCNR, BOF; USDA-FS; FFWs; EMA; VFDs; MAFFC; Local Communities and Homeowners	DCNR – BOF General Fund; DCNR General Counsel; Attorney Generals office; USFS Grants; FS-FFP and FEPP programs; USFS staff support; State Fire Commissioner support; Penn State University; State, County & local EMAs; State Fire Marshall; NASF; MAFFC; NWCG; PSP Aviation Group; US Military support	Number of tactical aircraft available. Number of recon aircraft available. Number of sorties flown for suppression and recon. Number of significant accidents.	1.1, 2.2, 3.3, 3.5
6 Engage in and support efforts that prevent unwanted fires in wildlands.	Statewide	Land Use; Forest Health; Forest Management ; Communicating Natural Resource Values; Urban & Community; Forest Recreation	District and Division staff, EMAs statewide.	PA - DCNR, BOF; USDA-FS; FFWs; EMA; VFDs; MAFFC; Local Communities and Homeowners	DCNR – BOF General Fund; DCNR General Counsel; Attorney Generals office; State Fire Commissioner support; State, County & local EMAs; PSP; State Fire Marshall; USFS Grants; FS-FFP and FEPP programs; USFS staff support; MAFFC; NWCG; Penn State University; NASF	Number of prevention programs completed. Number of new CWPPs established. Number of current CWPPs maintained.	2.2, 3.3, 3.5

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/Required	Measure of Success	Supports National Objective
7. Ensure the safe use of prescribed fire in Pennsylvania and build capacity for its use as appropriate.	Statewide	Land Use; Forest Health; Forest Management ; Climate Change; Communicating Natural Resource Values; Energy; Plant & Animal Habitats; Urban & Community; Forest Recreation	Districts, FFP, FPM, Ecological Services; Silviculture	DCNR-BOF; USDA-FS; FFWs; EMA; VFDs; MAFFC; Local Communities and Homeowners	DCNR – BOF General Fund; DCNR General Counsel; Attorney Generals office; PSP; State Fire Marshall; State Fire Commissioner support; State, County & local EMAs; USFS Grants; FS-FFP and FEPP programs; USFS staff support; MAFFC; NWCG; Penn State University; NASF; Pennsylvania Prescribed Fire Council	Cooperation among partners in the Pennsylvania Prescribed Fire Council in ensuring the appropriate and safe use of fire for resource management benefit. Number of RX fires conducted. Number of acres burned through RX fire. Number of escaped RX fires.	1.2, 2.1, 3.3, 3.5

Initial List of Tasks and Projects

- Maintain current staff levels in the Division of Forest Fire Protection.
- Continue to staff at least one primary fire position in each Forest District.
- Continue to staff, train and operate 3 Type III incident management teams.
- Ensure all Bureau of Forestry employees have basic wildfire training.
- Maintain Bureau of Forestry wildfire suppression equipment and facilities.
- Operate and maintain 9 Remote Automated Weather Stations (RAWS) in the Commonwealth.
- Maintain a cooperative agreement with the NWS for fire weather forecasts and weather related intelligence.
- Provide at least two statewide training events at the 200-level or above annually for Bureau of Forestry staff.
- Host an annual training of volunteer forest fire wardens in each forest district at least once annually.
- Train and equip volunteer forest fire wardens and volunteer fire departments for safe and effective wildfire suppression.
- Ensure that the Bureau of Forestry is prepared to respond to all-risk incidents as needed.
- Maintain full EPLO staffing in Bureau of Forestry.
- Coordinate all-risk incident response with Pennsylvania Emergency Management Agency (PEMA).
- Coordinate Type III team activities with PA-IMT when applicable.
- Engage county emergency management agencies in 800MHZ transition.
- Maintain an active role in the Mid-Atlantic Forest Fire Protection Compact.
- Maintain a Cooperative Fire Protection agreement with the U.S. Forest Service.
- Maintain a Cooperative Fire Protection agreement with the National Park Service.
- Maintain formal relationship with the Eastern Area Coordinating Group and the Eastern Area Coordination Center.

- Provide a ready force of NWCG qualified resources in all functional areas of the Incident Command System for mobilization to national and presidential declared wildfires and disaster emergencies.
- Hold a fitness test and safety refresher in each forest district annually.
- Host an annual, statewide training to prepare firefighters for national assignments.
- Ensure that each district has access to reconnaissance aircraft.
- Train district personnel in the safe use of aircraft. Provide refresher training each spring for staff and users of each air tanker base or helibase.
- Maintain three air tanker and five helitanker base facilities.
- Contract for seven suppression aircraft for support during the spring fire season.
- Provide for the ability to obtain emergency suppression aircraft during other periods of need.
- Cooperate with the Forest Pest Management Division on air operations.
- Education: Provide information and training that will enable forest users to make wise decisions about their use of fire.
- Engineering: Be aware of and mitigate situations that allow or contribute to unwanted fire.
- Enforcement and Investigation: When necessary, engage in enforcement actions necessary to stop illegal or inappropriate activities that lead to wildfire starts.
- Identify and engage communities in the development and implementation of Community Wildfire Protection Plans (CWPPs).
- Continue to develop a marketing plan and adjust strategies to target communities at risk. Motivate these communities to develop CWPP's and mitigate hazards and risk.
- Identify and increase the number of acres included in a Wildland Urban Interface (WUI) formal risk assessment utilizing a database system such as RAMS.
- Utilize and track the use and accomplishment of grants in addressing wildfire prevention issues.
- Review all prescribed fire plans submitted within the mandated time period.

- Maintain an active presence in the Pennsylvania Prescribed Fire Council.
- Track the number of acres burned by various organizations in the Commonwealth.
- Track the qualifications of Bureau of Forestry personnel in prescribed fire.
- Track the numbers of prescribed fires and the acres burned by all agencies and/or organizations in the Commonwealth.

Forest Strategies

Plant and Wildlife Habitat

Issue Overview

Pennsylvania functions as a keystone state for critical forms of biodiversity for both the Mid-Atlantic and Midwest, harboring northern, southern, and easternmost outlier populations and subspecies for numerous plant and animal species. It forms the northernmost part of the range for southern species such as shortleaf and Virginia pine (*Pinus enchinata* and *Pinus virginiana*), and animals such as the Southern leopard frog (*Rana sphenoccephala*) and the eastern fox squirrel (*Sciurus niger*). Northern species that terminate the southern end of their range in the state include a number of rare aquatic plant species such as Seven-angled pipewort (*Eriocaulon aquaticum*), bur-reed (*Sparganium angustifolium*), water milfoil (*Myriophyllum tenellum*), and water lobelia (*Lobelia dortmanna*) in the states glacial lakes. The endangered Massasagua rattlesnake (*Sistrurus catenatus*) and remnant prairie grass communities including the rare side-oats gramma (*Bouteloua curtipendula*) represent easternmost biotic forms of species and communities whose ranges lie westward.

Pennsylvania also contains significant populations of numerous species whose wide habitat ranges but fragmented and poorly distributed populations make them critical conservation priorities from a genetic diversity standpoint. Just a few examples of species with critical core populations in the state include the Allegheny woodrat (*Neotoma magister*), henslow's sparrow (*Ammodramus henslowii*), snowshoe hare (*Lepus americanus*), and plants such as tamarack and red spruce trees (*Larix laricina* and *Picea rubens*), and the yellow lady slipper orchid (*Cypripedium parviflorum*). Pennsylvania also serves as a critical migratory and northern nesting site bottleneck between the great lakes and the eastern seaboard for species like the Louisiana waterthrush (*Seiurus motacilla*) and the golden-winged and cerulean warblers (*Vermivora chrysoptera* and *Dendroica cerulea*) making the maintenance of migratory corridors, and connectivity between feeding and nesting sites for a diverse assemblage of species a critical conservation concern in the state.

The following are the strategies to be pursued in addressing the critical plant and wildlife habitat issues outlined in Chapter 4.

Strategies

- 1) **Identify plant and wildlife taxa and habitats of special concern that rely on private and state forest land:** Identify forest species and habitats considered to be at-risk based upon the *State Wildlife Action Plan* (SWAP) and recommendations of the Pennsylvania Biological Survey (PBS) and Pennsylvania Natural Heritage Program (PNHP). Work with state and federal agencies, nongovernmental organizations (NGO) and private landowners to identify critical habitat.
- 2) **Develop regional or landscape level plans to promote protection and restoration of contiguous forest landscapes:** Utilize existing tools developed by the Bureau of Forestry, PNHP and conservation NGO's to develop a comprehensive plan for implementing the State Wildlife Action Plan and prioritizing conserving and potentially restoring landscape-level contiguous forest habitats

that minimize fragmentation impacts and incorporate the work of the Statewide Climate Change Adaptation plan.

- 3) **Conserve wetland and aquatic habitats on private and state forest lands:** Develop plans to mitigate ongoing threats to wetlands and aquatic habitats (e.g., acid mine drainage, Chesapeake Bay watershed non-point source pollution issues, and loss of hemlocks in headwaters of cold water streams). Identify and develop best management practices and plans for emerging threats (e.g., water withdrawal and disposal associated with Marcellus shale natural gas extraction) based on at-risk species, tributaries, and habitat types.
- 4) **Assist in developing effective identification, tracking, and management of invasive species impacts to plant and animal habitats and provide training about habitat specific concerns related to invasive species to technical service providers, land managers, and landowners:** Invasive species can significantly alter plant and wildlife habitat and disrupt ecosystem function, while reducing or eliminating native species populations. There is a great need to disseminate invasive species management information to critical audiences as it is developed.
- 5) **Identify plant and wildlife species and habitat types vulnerable to climate change impacts:** Climate change is already beginning to impact plants, wildlife and their habitats in a number of ways, including changes in phenology, species ranges, and the expansion of pests and pathogens to new habitats to the north and at higher elevations. A first step in managing climate change impacts to plants and wildlife will be the identification of species at risk (see Climate Change Section).
- 6) **Develop an effective “bioreserve” network across public and private forest lands:** A network of representative habitat and community types across the state forest systems, in conjunction with state game lands and landscape-level conservation efforts on private lands (initiated by NGO partners such as The Nature Conservancy, Western Pennsylvania Conservancy and the Natural Lands Trust) can serve as core refugia for plants, wildlife and habitats in response to a range of threats and stresses across Pennsylvania.
- 7) **Maintain forest canopy diversity:** The decline of several forest canopy species in the past (e.g., American chestnut, American elm), in the present (e.g., eastern hemlock, ash species, sugar maple) and potentially in the future (e.g., white pine, walnut, oak), stresses the need for effective forest management to maintain a healthy and diverse forest canopy. The decline of forest tree species can result in significant shifts in the ecological value of plant and wildlife habitats including, the modification of light and moisture regimes, the loss of mast-producing species, and the provision of cover and other habitat for wildlife. Long-term breeding and reintroduction efforts (similar to that pursued by the American Chestnut Foundation) and development and dissemination of silvicultural BMP’s designed to sustain canopy species diversity and tree species at-risk are a part of this strategy.
- 8) **Restore and manage forest understory vegetation:** The forest understory across much of Pennsylvania is considered to be impoverished, a condition which has been attributed to one or more causes including browsing by overabundant deer, acid deposition, and long-term fire suppression. Large-scale habitat restoration projects are needed to develop and demonstrate adaptive management understandings on landscape level interrelationships among recognized causal factors.
- 9) **Adapt monitoring programs:** Strive to adapt and streamline existing monitoring programs to inform plant and wildlife management decisions; work with other states and partners to monitor species and habitats across their entire range.

- 10) **Coordinate and collaborate with partners,**, public and private, regarding management of plant and wildlife resources on forest lands. Maintaining healthy forest ecosystems and forest connectivity will require a broad interdisciplinary approach that includes sharing data, strategies and expertise.
- 11) **Educate the public about forest habitat values:** The majority of forest land in PA is privately owned (71%), therefore it is important to improve understanding of the impacts to forest resources and gain public support; and involve conservation partners early during the public participation planning process.
- 12) **Intentionally integrate use and non-use habitat values in habitat improvement projects:** Conserving natural resources, particularly habitat for wild species, enjoys great public support. However, differing perspectives on use vs. non-use values of natural habitat often erode public support for habitat management activities by failing to legitimate, demonstrate and promote all stakeholder perspectives. Greater collaboration and trust needs to be built between stakeholder groups by intentionally integrating habitat improvement projects for popular game species around the habitat needs of keystone non-game species.

Strategies for Plant and Wildlife Habitat

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/Required to Implement	Measure of Success	Supports National Objective
1) Identify plant and wildlife taxa and habitats of special concern that rely on private and state forest land	PA Wilds, Pocono Forests and Waters, Laurel Highlands, Marcellus Shale region, statewide	Energy development , climate change	BOF: Ecological Services, Forest Resource Planning and Inventory, Forest Pest Management, Rural and Community Forestry, Communications, District Foresters	USFS, NPS, USFWS, forest products industry, PNHP, DCNR, PGC, PFBC, NGOs, academia	BOF Ecological services staff, PNHP, WRCP grant programs, USFS, USDA, NPS, PGC, PFBC, USFWS, Pennsylvania Biological Survey technical committees	Identification of forest dependent taxa and habitats A set of strategies to conserve species and habitats developed thru a collaborative process with stakeholders and partner agencies.	1.1, 1.2, 2.2, 3.5, 3.6
2) Develop regional or landscape level plans to promote protection and restoration of contiguous forest landscapes	PA Wilds, Pocono Forests and Waters, Laurel Highlands, Marcellus Shale region, statewide	Energy development, private forest management, forest fragmentation	BOF: Ecological Services, Forest Planning and Inventory, Operations & Recreation, Rural & Community Forestry, Communications, District Foresters	USFS, NPS, forest products industry, DCNR, PGC, NGOs, TIMOs, private landowners	BOF staff, Conservation planning products developed by NGOs (e.g., TNC, WPC, NLT), BRC, PNHP (conservation opportunity areas)	Develop new or adopt existing forest landscape conservation plans or strategies	1.1, 1.2, 2.2, 3.1, 3.4, 3.5, 3.6, 3.7

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/Required to Implement	Measure of Success	Supports National Objective
3) Conserve wetland and aquatic habitats on private and state forest lands	PA Wilds, Pocono Forests and Waters, French Creek Landscape, Marcellus Shale region, statewide	Invasive species, water quality and quantity, climate change	BOF: Ecological Services, Planning and Inventory, District Foresters, Rural and Community Forestry, Operations and Recreation	USFS, USFWS, forest products industry, DCNR, PGC, PFBC, NGOs, academia, private landowners	BOF Ecological services staff , PNHP, WRCP grant programs, PFBC, USFWS, NRCS/USDA wetland programs, PA-DEP, NGOs (e.g., Trout Unlimited, WPC-Watershed Conservation Program)	Identification and development of best management practices for existing and emerging threats to wetlands and aquatic resources on private and public forest lands.	1.1,1.2, 2.2, 3.1, 3.4, 3.5 3.6, 3.7
4) Assist in developing effective identification, tracking, and management of invasive species impacts to plant and animal habitats and provide training about habitat specific concerns related to invasive species to technical service providers, land managers, and landowners	PA Wilds, Pocono Forests and Waters, French Creek Landscape, Marcellus Shale region, statewide	Forest fragmentation, climate change	BOF: Ecological Services, Forest Resource Planning and Inventory, Rural and Community Forestry, Forest Pest Management, District Foresters	USFS, NPS, forest products industry, DCNR, PGC, PFBC, NGOs, academia, private landowners	BOF staff, PNHP, PA Biological Survey, USFS, iMapInvasives program, Governor’s Invasive Species Council	Establish a state-wide system for reporting and tracking invasive species Establish ongoing program to provide BMP’s , training, etc., on invasive species to public and private forest managers.	1.1, 1.2, 2.2, 3.4, 3.5, 3.6, 3.7

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/Required to Implement	Measure of Success	Supports National Objective
5) Identify plant and wildlife vulnerable to climate change impacts	PA Wilds, Pocono Forests and Waters, French Creek Landscape, Marcellus Shale region, statewide	Forest fragmentation, invasive species, energy development	BOF: Ecological Services, Forest Resource Planning and Inventory, District Foresters	USFS, USFWS, NPS, Forest products industry, DCNR, PGC, PFBC, NGOs, academia	BOF Ecological Services, PNHP, NGOs (TNC, WPC Audubon) USFS, WRCP grants	Evaluation of climate change vulnerable plants, plant habitats and <i>State Wildlife Action Plan</i> species. Management strategies developed for climate change vulnerable species and habitats.	1.1, 1.2, 2.2, 3.4, 3.5, 3.7
6) Develop an effective “bioreserve” network across public and private forest lands	PA Wilds, Pocono Forests and Waters, French Creek Landscape, statewide multi-state	Forest fragmentation, Marcellus shale development, energy development	BOF: Ecological Services, Forest Resource Planning and Inventory, Rural and Community Forestry, District Foresters, Communications	DCNR, USFS, forest products industry, PGC, PFBC, NGOs (especially conservancies and land trusts), private landowners	BOF staff, PNHP, Conservation planning products developed by NGOs (e.g., TNC, WPC, NLT)	Review and update earlier bioreserve plans. A framework for active public-private participation in a bioreserve network	1.1, 1.2, 2.1, 2.2, 3.1, 3.4, 3.5, 3.6, 3.7
7) Maintain forest canopy diversity	PA Wilds, Pocono Forests and Waters, French Creek Landscape, Marcellus Shale region, statewide	Pests and pathogens, invasive species, climate change	BOF: Ecological Services, Silviculture, Forest Planning and Inventory, Forest Pest Management, Rural and Community Forestry, District Foresters	DCNR, USFS, forest products industry, PGC, NGOs, private landowners	BOF staff, USFS, CFI monitoring data, USFS FIA data	A strategy for maintaining diverse forest canopy communities, with emphasis on the provision of ecological services as well as economic benefits	1.1, 1.2, 2.1, 2.2, 3.1, 3.4, 3.5, 3.6, 3.7

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/Required to Implement	Measure of Success	Supports National Objective
8) Restore and manage forest understory vegetation	PA Wilds, Pocono Forests and Waters, French Creek Landscape, Marcellus Shale region, statewide	Deer management, invasive species, climate change	BOF: Ecological Services, Forest Resource Planning and Inventory, Forest Pest Management, Rural and Community Forestry, District Foresters	DCNR, USFS, forest products industry, PGC, NGOs, private landowners	BOF staff, USFS, CFI monitoring data, USFS FIA data	A strategy, including BMPs, to promote forest regeneration and the recovery of forest understory species.	1.1, 1.2, 2.2, 3.4, 3.5, 3.6, 3.7
9) Adapt monitoring programs	Statewide, multi-state	Forest Mgmt, Forest Health, Climate Change	BOF: Forest Resource Planning and Inventory, Ecological Services, Forest Pest Management, District Foresters	USFS, USFWS, NPS, forest products industry, DCNR, PGC, PFBC, NGOs, academia	USFS (FIA), BOF Continuous Forest Inventory Program, PNHP, Audubon, energy development monitoring, NPS	A coordinated and integrated monitoring program for plants and wildlife and their habitat	1.1, 1.2, 2.2, 3.1, 3.4, 3.5, 3.6, 3.7
10) Coordinate and collaborate with partners	Statewide, multi-state	Comm-unications, Forest Health, Forest Mgmt, Climate Change	BOF: Forest Planning and Inventory, District Foresters, Ecological Services, Pest Management, Communications	USFS, forest products industry, DCNR, PGC, PFBC, NGOs, academia, resource agencies in adjacent states, private landowners	BOF staff, academia, USFS, NGOs	A framework for sharing plant, wildlife and habitat information and management strategies.	1, 2, 3

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/Required to Implement	Measure of Success	Supports National Objective
11) Educate the Public about forest habitat values	Statewide	Land Use Forest health Climate Change Communicating Natural Resource Values	BOF: Communications, Forestry Planning and Inventory, District Foresters, Rural and Community Forestry, Forest Pest Management, Forest Fire Protection, Ecological Services	USFS, DEP, academia, forest products industry, private forest landowners, NGOs,	Ecosystem Management Advisory Committee (EMAC), DCNR iConserve and BOF staff (especially Rural and Community Forestry program – service foresters)	Number of habitat restoration demonstration projects on state park and forest lands Number of collaborative educational projects with joint funding DCNR, PGC, PFBC, and PNHP	1, 2, 3
12) Intentionally integrate use and non-use habitat values in habitat improvement projects	Statewide	Communicating Natural Resources Values	Communications, Forestry Planning and Inventory, District Foresters, Rural and Community Forestry, Ecological Services	PFBC, PGC, PNHP	DCNR iConserve and BOF staff, complimentary initiatives and resources in other partner agencies	Number of habitat improvement projects on state forest land incorporating both game and RTE species habitat needs throughout planning process	1,2,3

Initial List of Tasks & Projects

1. Review *State Wildlife Action Plan*, and consult with Pennsylvania Natural Heritage Program and Pennsylvania Biological Survey technical committees to identify plant and wildlife species that are dependent on forested habitats.
2. Collaborate with stakeholders to develop strategies to conserve, restore and manage habitat for forest dependent plant and wildlife taxa.
3. Collaborate with stakeholders to review existing landscape conservation plans or strategies in the context of forest-dependent species. Identify and prioritize forest blocks or landscapes that minimize fragmentation and capture the range of diversity in forest habitats.
4. Review existing best management practices for wetlands and aquatic resources on forest land. Work with stakeholders to update or develop new best management practices as needed to reflect current understanding of threats as well as plant and wildlife needs.
5. Collaborate with the Governor’s Invasive Species Council to develop and implement a statewide tracking system for invasive species. Evaluate existing invasive species tracking tools as developed by other state and federal agencies.
6. Develop program to provide best management practices, training, etc., on invasive species to public and private forest managers
7. Work with PNHP to complete evaluation of climate change vulnerable plants, plant communities and species listed in the *State Wildlife Action Plan*.
8. Collaborate with appropriate partner agencies to develop management strategies for species and habitats vulnerable to climate change.
9. Review earlier bioserve plans in context of current priorities and threats. Collaborate with stakeholders and partners to coordinate DCNR bioserves with existing landscape-level conservation plans developed by NGOs and other government agencies.
10. Develop a framework for engaging private forest landowners in a bioserve network that includes private as well as state forest lands.
11. Develop a strategy to identify forest canopy species in decline or at-risk for decline (due to pests, pathogens, failed regeneration, climate change, etc.) and develop best management practices to minimize impacts to forest canopy diversity, ecological and economic benefits. Collaborate with USFS and other state programs to develop a unified regional approach.

12. Develop a strategy, including best management practices to promote forest regeneration and recovery of a healthy and diverse forest understory. Development of best management practices may require one or more research projects to address various likely causes and possible solutions.
13. Collaborate with stakeholders and partner agencies to share monitoring information and data, reduce redundancy and maximize efficiency of monitoring efforts for plant, and wildlife species and their habitats.
14. Develop a framework for sharing information and strategies regarding plant and wildlife management between partner agencies and key stakeholders.
15. Develop a communication plan for engaging the public in support of plant and wildlife management issues. Coordinate communications/messaging between partners and key stakeholders.

Forest Strategies

Recreation & Quality of Life

Issue Overview

Pennsylvania is a time-honored outdoor destination. Visitors to and citizens of the Commonwealth have enjoyed traditional outdoor pursuits like fishing, hunting, camping and boating across generations, and Pennsylvania’s whitewater rivers have lured thrill-seekers from around the world. Forests cover two-thirds of the Commonwealth and provide endless opportunities for outdoor experiences, recreation and solitude.

Pennsylvanians today benefit from a long proud history of natural resource conservation. Public ownership protects over 2 million acres of state forest land, 1.5 million acres of game and wildlife lands, the 500,000 acre Allegheny National Forest and 117 state parks. Many private landowners also allow recreational pursuits such as hunting and hiking on their properties. Research consistently shows that Pennsylvanians place a high value on outdoor places and activities from the standpoint of personal benefit, viewing these resources as an important component of maintaining quality of life. Forestlands serve as incubators for stewardship and facilitate meaningful outdoor experiences for all who appreciate its history, science and natural beauty.

Today Pennsylvania faces many challenges as it continues to conserve lands and waters while working to meet the outdoor recreational needs of a changing population. The Commonwealth’s people are more diverse and their life experience is more urban than a generation ago. Simultaneously, Pennsylvania’s population is aging. Over a quarter of its citizens (3.4 million) are considered “Baby Boomers,” born between 1946 and 1964. These societal shifts, in combination with development pressure on rural landscapes and open space, make it imperative to plan carefully for the future if Pennsylvania is to fulfill the needs of all who recreate in its forests, whether participating in traditional, new or emerging sports – whether young or old.

Strategies

1. Implement visitor use monitoring program for state forest system; and incorporate visitor use monitoring data into Recreation Opportunity Spectrum (ROS) process to improve visitor experience management.
2. Increase outreach efforts and develop and market recreational programs aimed at increasing the interest and participation of “baby boomers” and urban youth and facilitate programs for them to experience the forest.
3. Continue collaborative efforts with other relevant state agencies, such as PennDOT, Game Commission and Fish and Boat Commission; use advisory groups to guide policy development and implementation strategies.
4. Continue GIS inventory and mapping of trails and forest-based recreation facilities; and promote a wide range of recreation opportunities on forest lands through easily accessed web information.

Recreation & Quality of Life Strategy Matrix

Long-term Strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas that Contribute	Key Stakeholders	Resources Available/Required to Implement	Measure of Success	Supports National Objective
1. Implement visitor use monitoring program for state forest system; and incorporate visitor use monitoring data into Recreation Opportunity Spectrum (ROS) process to improve visitor experience management.	PA Wilds CLI, Laurel Highlands CLI, Pocono Forests & Waters CLI, Potential Multi-State Areas	Land Use, Forest Management, Energy Development, Communicating Values, Urban and Community Values	All programs	USFS, community leaders and planners, academia, extension, SCORP TAC	BOF staff, academia, extension, federal partners, research grants	completion of data collection, base information for land use management, minimization of fragmentation and development pressure	1, 2.2, 3.5, 3.6
2. Increase outreach efforts and develop and market recreational programs aimed at increasing the interest and participation of “baby boomers” and urban youth and facilitate programs for them to experience the forest.	Urban and Community Forest Areas, CLIs, Conservation Education	Land Use, Forest Management, Communicating Values, Urban and Community Values	Recreation, Operations, Rural and Community Forestry, Communications	User Groups, PPF, community leaders and planners, SCORP TAC	BOF staff, academia, extension, community partners, research grants	programs designed and active, participation levels high, positive community impacts	1.2, 3.6
3. Continue collaborative efforts with other relevant state agencies, such as PennDOT, Game Commission and Fish and Boat Commission, and with the Recreation Advisory Committee; and utilize these groups to guide policy development and implement strategies.	Statewide; Urban and Community Forest Areas, CLIs	Land Use, Forest Health, Forest Management, Plants and Animals	Recreation, Operations, Rural and Community Forestry	PennDOT, PFBC, PGC, User Groups (to include PSSA), SAAC SCORP TAC	BOF staff, BSP staff, BRC staff, DCNR Executive Staff	regular meetings begin/continue, strategies and policies become seamless across agencies and stakeholders and user groups	1, 2.2, 3.1, 3.4, 3.5, 3.6
4. Continue GIS inventory and mapping of trails and forest-based recreation facilities; and promote wide range of recreation opportunities on forest lands through easy web information.	Statewide; CLIs, BOF Private Lands Regions, Potential Multi-State Areas	Communicating Values, Urban and Community Values	Recreation, Operations, Communications	PennDOT, PFBC, PGC, RAC, User Groups, SCORP TAC	BOF staff, academia, extension, community partners, research grants	website developed, trails and facilities inventoried and data transferred to website, web data searchable	1.2, 3.6

Initial List of Tasks & Projects

1. Develop Visitor Use Monitoring plan to measure participation levels in varying activities, satisfaction levels regarding quality of facilities, and to provide economic data and determine schedule of annual inventory and reporting.
2. Pilot Recreation Opportunity Spectrum on landscape level and fold data into GIS inventory.
3. Provide a diversity of forest settings and recreational opportunities to allow visitors to select the experience(s) most closely matching their reason for using public lands.
4. Utilize local land use planning tools in conjunction with ROS data to avoid conflicts among visitors with differing interests and expectations.
5. Ensure backcountry experiences are identified and preserved in the face of increasing recreational use and industrial development within forest systems.
6. Communicate quality of life benefits of forest recreation and stewardship to public, with concentration on marketing techniques aimed specifically at the “baby boomer” and urban youth populations.
7. Use urban parks, tree planting events and fall foliage activities to communicate to the public and municipal officials the connection of outdoor experiences to quality of life; interpolate environmental education messages of stewardship and environmental conservation.
8. Develop and adopt statewide non-motorized trail standards to assure consistent experiences; compile information manual using existing standards and discussions with applicable users groups and other stakeholders.
9. Work with partner agencies (PennDOT, PGC and PFBC) to determine areas of congruency and advise one another in planning and implementation of natural resource based recreation operations and help identify recreational needs, opportunities, and directions to pursue.
10. Use advisory committees and partner agencies to review current and proposed operating guidelines and procedures to align recreation based policy and planning statewide.
11. Coordinate trail and facility GIS data gathering and transfer to centralized GIS database to generate web based information for both interactive public use and future recreation facility planning.
12. Provide uniform and clear web based information on trails and recreational facilities to ensure public safety by leading varying users to appropriate settings in which expectations meet true with experience.

Appendix A

Stakeholder Engagement

Stakeholder engagement for the Pennsylvania Statewide Forest Assessment and Strategy occurred with several groups and individuals during a 12-month period. Major milestones are described below.

State Forest Stewardship Coordinating Committee

September 21, 2009

- Shared early outlines and received feedback on the overall approach, including list of Priority Issues, Threats, and Opportunities, as well as the draft Priority Landscape Areas analysis.

April 30, 2010

- Provided full overview and summary of the draft Assessment and Strategy. Facilitated discussion and received feedback.

State Wildlife Agency

November 19, 2010

- Met with staff from the Pennsylvania Game Commission, the lead agency for the Pennsylvania State Wildlife Action Plan. Shared early outlines and overall approach, including list of Priority Issues, Threats, and Opportunities, as well as the draft Priority Landscape Areas analysis. Game Commission staff provided an overview of the SWAP priorities, which we incorporated into the Assessment and Strategy. Game Commission staff provided feedback on drafts of the Assessment and Strategy.

State Technical Committee

The Forest Stewardship Coordinating Committee serves as the official Forestry Subcommittee of the State Technical Committee. This committee was engaged as part of

the Forest Stewardship Coordinating Committee meetings on September 21, 2009 and April 30, 2010 as described above.

Lead agency for the Forest Legacy Program

DCNR, Bureau of Forestry is the lead agency.

Applicable Federal land management agencies

August 9, 2009

- Met with staff from the Allegheny National Forest. Shared early outlines and received feedback on the overall approach, including list of Priority Issues, Threats, and Opportunities, as well as the draft Priority Landscape Areas analysis. ANF staff participate in the Forest Stewardship Coordinating Committee, and provided feedback during their meetings as well. We also received an official comment letter from the ANF.

Penn State Forestry Extension

June 26, 2009

- Met with staff from Penn State Forestry Extension. Shared early outlines and received feedback on the overall approach, including list of Priority Issues, Threats, and Opportunities, as well as the draft Priority Landscape Areas analysis. Extension staff participate in the Forest Stewardship Coordinating Committee, and provided feedback during their meetings as well.

Pennsylvania Urban and Community Forestry Council

May 26, 2010

- Provided full overview and summary of the draft Assessment and Strategy. Facilitated discussion and received feedback.

Mar. 22, 2010, Dec. 9, 2009, Aug. 12, 2009

- Shared early outlines and received feedback on the overall approach, including list of Priority Issues, Threats, and Opportunities, as well as the draft Priority Landscape Areas analysis.

DCNR Ecosystem Management Advisory Committee

June 10, 2009

- Shared early outlines and received feedback on the overall approach, including list of Priority Issues, Threats, and Opportunities, as well as the draft Priority Landscape Areas analysis.

DCNR Conservation and Natural Resources Advisory Council

May 26, 2010

- Provided full overview and summary of the draft Assessment and Strategy. Facilitated discussion and received feedback.

DCNR, Bureau of Forestry Staff Meeting

April 22, 2010

- We conducted a day-long staff meeting with approximately 70 central office and field staff. An overview presentation was provided along with stations for all the major components of the Assessment and Strategy. Staff had the opportunity to interact with the authors and provide comments and feedback.

Website and Comment Form

Complete drafts of the Assessment and Strategy were posted on the Bureau of Forestry's website on April 14, 2010. Letters from the State Forester were email to the list of organizations below. The website included a comment form for submitting comments. Stakeholders were asked to submit comments by May 21, 2010

Webinar

We hosted a webinar on May 11, 2010, which included about 40 participants. We gave an overview of the Assessment and Strategy and then responded to questions and comments submitted by participants.

Stakeholder Comments

Written letters and comments were received from approximately 20 individuals and organizations (excluding internal DCNR staff). Many comments were supportive of the overall effort. Several organizations asked for additional time to comment and specifically requested to be acknowledged as key stakeholders. Several comments focused on the Sustainability Analysis; asking for more in-depth analyses. Overall, many of the comments focused on the need for more details and greater specificity in the Strategies.

Organizations receiving email/letter from the State Forester

Department of Conservation and Natural Resources, Bureau Directors and Executive Staff

Pennsylvania Game Commission

Pennsylvania Fish and Boat Commission

Pennsylvania Department of Agriculture

Pennsylvania Department of Environmental Protection

Pennsylvania Department of Community and Economic Development

USFS, Newtown Square

USFS, Allegheny National Forest

National Park Service, University Park, PA

Natural Resource Conservation Service, Pennsylvania State Conservationist

Susquehanna River Basin Commission

Delaware River Basin Commission

Pennsylvania Hardwoods Development Council

Northeastern Area Association of State Foresters

Northeastern Area Forest Health Managers

Northeastern Area Forest Resource Planners

Pennsylvania State University, School of Forest Resources

Pennsylvania State University, College of Agricultural Sciences

Western Pennsylvania Conservancy
The Nature Conservancy, Pennsylvania Offices
Pennsylvania Parks and Forestry Foundation
The Pennsylvania Forestry Association
The Chesapeake Bay Foundation
Society of American Foresters, Pennsylvania Division
Pennsylvania Forest Stewards
Pennsylvania Woodland Owner Associations
Pennsylvania Association of Sustainable Agriculture
Pennsylvania Forest Products Association
Sustainable Forestry Initiative, Pennsylvania Office
Pennsylvania Gypsy Moth County Coordinators
Pennsylvania Prescribed Fire Council
DCNR Snowmobile/ATV Advisory Committee
DCNR Conservation and Natural Resources Advisory Committee
DCNR Ecosystem Management Advisory Committee
DCNR Recreation Advisory Committee
DCNR Forest Stewardship Steering Committee
DCNR Urban and Community Forestry Council
DCNR *Resource* Newsletter

Stakeholder Letter from the State Forester

Dear Stakeholder of Pennsylvania's Forests,

I am pleased to announce that the Department of Conservation and Natural Resources' Bureau of Forestry is soliciting comments on a draft Statewide Forest Resource Assessment and Strategy. We are fortunate to live in a state containing nearly 17 million acres of forest. These rich woodlands provide countless benefits and services to society, including clean air and water, recreation opportunities, wood products, and habitats for thousands of plants and animals. This Assessment and Strategy is part of a coordinated, nationwide forest planning effort that will serve as a foundation for programs aimed at sustaining our forests for future generations.

The Assessment and Strategy describes current forest conditions and trends, identifies priority issues, delineates important landscapes across the Commonwealth, and proposes long-term strategies for achieving sustainability. As mandated by the 2008 Farm Bill, completing this effort also makes Pennsylvania eligible for continued federal funding for its private lands, urban and community forestry, wildland fire, and forest health programs. The final documents are due to the USDA Forest Service in June 2010. Your feedback is critical and will be considered as we develop strategies charting our future.

Sustaining Pennsylvania's forest resource will require continued coordination and partnerships among many stakeholder groups and individuals. The Bureau of Forestry has always strived to protect and enhance Pennsylvania's forests, but this effort is unique in its holistic and lasting approach to maintaining a full breadth and depth of forest values and benefits. To meet this important and ambitious goal, **we need to hear from you**. Please take the time to review the draft documents, which can be found on the Bureau's website: <http://www.dcnr.state.pa.us/forestry/farmbill/index.html>. Please forward this information to others with an interest in Pennsylvania's forests, ask questions and discuss the document. Please let us know what you think through the convenient on-line form by May 21, 2010.

As we look to the future, Pennsylvania's forests face many challenges, including development pressure, invasive plants, insects and diseases, Marcellus shale development, and unsustainable timber harvesting. While many indicators are causes for concern, many also point to a positive future that is within our capacity to secure. This Assessment and Strategy process provides us the opportunity to highlight the many values of the forest and propose strategies to ensure its sustainability. As always, I appreciate your passion for Pennsylvania's forests and look forward to hearing from you or your organization.

Sincerely,

Daniel A. Devlin

Appendix B

Other Plans Incorporated in the Statewide Assessment and Strategy

The following plans were incorporated into the Pennsylvania Statewide Forest Resource Assessment and Strategy.

Community Wildfire Protection Plans

Pennsylvania State Wildlife Action Plan

Pennsylvania Statewide Comprehensive Outdoor Recreation Plan

Pennsylvania State Water Plan

Pennsylvania Greenways Plan

Pennsylvania Invasive Species Management Plan

Pennsylvania Emerald Ash Borer Action Plan

DCNR Bureau of Forestry State Forest Resource Management Plan

DCNR Action Plan

DCNR Invasive Species Management Plan

DCNR Bureau of Forestry Division of Forest Pest Management Strategic Plan

DCNR Hemlock Woolly Adelgid Integrated Pest Management Plan

DCNR Bureau of Forestry draft Marcellus Work Plan

Penn State Forestry Extension Annual Work Plan

Glossary of Acronyms	
ACB	Alliance for the Chesapeake Bay
AHUG	Allegheny Hardwood Utilization Group
AML	Abandoned Mine Land
APHIS	United States Department of Agriculture Animal and Plant Health Inspection Service
ARRI	Appalachian Regional Reforestation Initiative
BCAP	Biomass Crop Assistance Program
BMP	Best Management Practice
BOF	DCNR Bureau of Forestry
BRC	DCNR Bureau of Recreation and Conservation
BSP	DCNR Bureau of State Parks
CAPS	Cooperative Agricultural Pest Survey Program
CARS	Community Accomplishment Report System
CBF	Chesapeake Bay Foundation
CFHP	Cooperative Forest Health Management Program
CFI	Continuous Forest Inventory
CLIs	Conservation Landscape Initiative
CREP	Conservation Reserve Enhancement Program
CSP	Conservation Security Program
CWPP	Community Wildfire Protection Plans
DCED	Department of Community and Economic Development
DCNR	Department of Conservation and Natural Resources
DEP	Department of Environmental Protection
DGS	Pennsylvania Department of General Services
DHC	Delaware Highlands Conservancy
DMAP	Deer Management Assistance Program
DOI	United States Department of the Interior
DRBC	Delaware River Basin Commission
DVRPC	Delaware Valley Regional Planning Commission
EAC	Environmental Advisory Council
EMA	Emergency Management Agency
EMAC	Ecosystem Management Advisory Committee
EPA	United States Environmental Protection Agency
EPLO	Emergency Preparedness Liaison Officer
EQIP	Environmental Quality Incentives Program
FDC	DCNR Bureau of Facility Design and Construction
FEMA	Federal Emergency Management Agency
FEPP	Federal Excess Personal Property
FERC	Federal Energy Regulatory Commission
FFP	DCNR Bureau of Forestry Division of Forest Fire Protection
FFW	Forest Fire Warden
FHM	Forest Health Monitoring
FHTET	Forest Health Technology Enterprise Team
FIA	Forest Inventory and Analysis
FPM	DCNR BOF Division of Forest Pest Management
FPUF	Friends of the Pittsburgh Urban Forest
FS	United States Department of Agriculture Forest Service
FSA	Farm Service Agency
FSC	Forest Stewardship Council
GIS	Geographic Information System
HDC	Hardwood Development Council
HUD	United States Department of Housing and Urban Development

HWA	Hemlock Woolly Adelgid
IPCC	Intergovernmental Panel on Climate Change
IPM	Integrated Pest Management
ISA	International Society of Arboriculture
LiDAR	Light Detection And Ranging
MAFFC	Mid-Atlantic Forest Fire Compact
MTRP	Municipal Tree Restoration Program
NAAEE	North American Association for Environmental Education
NAASF	Northeastern Area Association of State Foresters
NAI	Natural Areas Inventory
NAIP	National Agriculture Imagery Program
NASCAR	National Association for Stock Car Auto Racing
NASF	National Association of State Foresters
NEFPC	Northeastern Forest Pest Council
NEMO	Nonpoint Education for Municipal Officials
NGO	Non-Government Organization
NIR	Near-Infrared
NLT	Natural Lands Trust
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NTFPs	Non-Timber Forest Products
NWCG	National Wildland Fire Coordinating Group
NWF	National Wildlife Federation
NWTF	National Wild Turkey Federation
NY WAC	New York Watershed Agriculture Council
O&G	Oil and Gas
OCS	DCNR Office of Conservation Science
OCEP	DCNR Office of Education Communications and Partnerships
OSM	Office of Surface Mining
PACD	Pennsylvania Association of Conservation Districts
PAFBC	Pennsylvania Fish and Boat Commission
PAFS	Pennsylvania Forest Stewards
PA-IMT	Pennsylvania All-Hazard Incident Management Team
PALTA	Pennsylvania Land Trust Association
PASA	Pennsylvania Association for Sustainable Agriculture
(PA) TACF	(Pennsylvania Chapter) The American Chestnut Foundation
PBS	Pennsylvania Biological Survey
PCF	Pennsylvania Community Forestry or PA Urban and Community Forestry Council
PCN	Pennsylvania Cable Network
PDA	Pennsylvania Department of Agriculture
PEC	Pennsylvania Environment Council
PEMA	Pennsylvania Emergency Management Agency
PennDOT	Pennsylvania Department Of Transportation
PFPA	Pennsylvania Forest Products Association
PGC	Pennsylvania Game Commission
PHMC	Pennsylvania Historical and Museum Commission
PHS	Pennsylvania Horticulture Society
PISC	Pennsylvania Invasive Species Council
PLNA	Pennsylvania Landscape and Nursery Association
PLT	Project Learning Tree
PMPEI	Pennsylvania Municipal Planning Education Institute

PNDI	Pennsylvania Natural Diversity Inventory
PNHP	Pennsylvania Natural Heritage Program
PPFF	Pennsylvania Parks and Forests Foundation
PPQ	United States Department of Agriculture Plant Protection and Quarantine
PSAB	Pennsylvania State Association of Boroughs
PSATS	Pennsylvania State Association of Township Supervisors
PSP	Pennsylvania State Police
PSSA	Pennsylvania State Sportsmen's Association
PSU	Pennsylvania State University
PUC	Public Utilities Commission
RAC	Recreation Advisory Committee
RAMS	Risk Assessment Methodology System
RAWS	Remote Automated Weather Stations
RC&D	Resource Conservation and Development
ROS	Recreation Opportunity Spectrum
ROW	Right-Of-Way
RTE	Rare, Threatened, and Endangered
RX	Prescribed
S&PF	State & Private Forest
SAAC	DCNR Snowmobile and ATV Advisory Council
SAF	Society of American Foresters
SBA	Small Business Administration
SCORP	State Comprehensive Outdoor Recreation Plan
SFI	Sustainable Forestry Initiative
SFR	School of Forest Resources
SRBC	Susquehanna River Basin Commission
STC	Shade Tree Commission
SWAP	State Wildlife Action Plan
TC	Tree City USA
TCUSA	Tree City USA
TIMO	Timber Investment Management Organization
TMDLs	Total Maximum Daily Loads
TNC	The Nature Conservancy
Topo Geo	DCNR Bureau of Topographic and Geologic Services
TPO	Timber Product Output
TSP	Technical Service Provider
TU	Trout Unlimited
UCF	Urban and Community Forestry
UCS	Union of Concerned Scientists
UTC	Urban Tree Canopy
UF	Urban Forester
UFORE	Urban Forest Effects
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United State Geological Survey
VFD	Volunteer & paid Fire Departments
WAC	Watershed Agricultural Council
WHIP	Wildlife Habitat Incentives Program
WOAs	Woodland Owners Association
WPC	Western Pennsylvania Conservancy
WUI	Wildand Urban Interface