NATIONAL PRIORITIES IN ACTION

INTRODUCTION

Forests, both private and public, deliver public benefits and require public investments. State forestry agencies provide state and federal programs that benefit all Americans. Forest Action Plans (FAP), including Vermont's 2017 Plan, represent a strategic plan for the nation's forests that can direct limited resources where they are needed most. Through FAPs, state foresters can demonstrate how federal investments can be used to leverage other resources and produce measurable outcomes that address national priorities. To demonstrate the collective impact of the federal investment and its link to national priorities, the US Forest Service requested that FAPs include a new section focused on how states are meeting the national priorities.

This new national priorities section in the 2017 Plan is designed around the three national priorities in the Farm Bill. We have selected several programs and projects in each national priority category that demonstrate how federal investments have resulted in successful, measurable outcomes. This is not intended as a complete or comprehensive list but is a representative sample of the leverage and value federal funds provide in accomplishing our collective work. For each of our highlighted programs and projects, we have provided:

- A description and demonstrated how it ties into our desired futures conditions in the 2010 FAP;
- Indicated the measures of success and corresponding accomplishments;
- Identified our partners; and
- Outlined how we will carry each program or project forward in 2017Plan.

National Priority 1

CONSERVE AND MANAGE WORKING FOREST LANDSCAPES FOR MULTIPLE VALUES AND USES

PRIORITY AREA: Rural, Rural/Residential, Multi-State REGIONAL

ISSUE ADDRESSED: Forest fragmentation, Forest Integrity

DESIRED FUTURE CONDITION 1: Conserve biological diversity across all landscapes

GOAL 1: Maintain and enhance a mix of forest structure and complexity across the landscape.

2010 Plan Strategy	2017 Plan Strategy
Maintain a mix of programs aimed at keeping forests in forests including UVA, Forest Legacy, local and regional planning, and land acquisition.	Encourage long-term conservation efforts to keep forests forested by supporting programs such as Vermont's Forest Use Value Appraisal (UVA), Forest Legacy, Community Forests and Open Space, and Vermont Housing and Conservation Board projects to protect intact forests.

PROGRAMS

Forestry Use Value Appraisal (UVA):

The Vermont UVA Program started in 1980 as state property tax rebate program to provide a use-based, non-investment-speculative method for taxation of private forest lands. Forested parcels over 25 acres in size are eligible. Participants in the program must have a current 10-year forest management plan approved by the Department of Forests, Parks and Recreation.

Forest Stewardship

The Forest Stewardship Program provides cost-share funds to state forestry agencies through the USFS to encourage forest landowners to write management plans and implement prescribed practices. The program provides technical assistance through a network of partners to forest landowners.

FOREST LEGACY

The Forest Legacy Program provides federal funds for the acquisition or conservation easements of forest land at risk of development. The program goals are to protect productive, working forests that provide ecosystem services on a landscape scale. This program incorporates Forest Stewardship plans, working with partners such as the Trust for Public Land and other land trusts, state and local governments, and the Vermont Housing and Conservation Board to finance and monitor parcels. The program also collaborates on community land protection needs through a smaller, related Community Forest Grant and Open Space.

STATE LANDS ACQUISITION AND MANAGEMENT

The Vermont Agency of Natural Resources (ANR) has several programs for the acquisition and management of public land, including easements for critical habitat, landscape, recreation, and water quality protection. A principal source of funding for state land acquisition is the Vermont Housing and Conservation Trust Fund. ANR uses private and federal funds (including the Forest Legacy Program and the Land and Water Conservation Fund) to leverage limited Housing and Conservation Trust Funds. A variety of state, local, federal, and non-governmental partners are often involved. FPR administers lands acquired by ANR and provides some management services for all ANR lands, but more specifically for lands and easements acquired by FPR.

MEASURES OF SUCCESS

- Reduce development, land-use conversion, and fragmentation of Vermont's forest land across all landscapes.
- Support for tax programs, legacy projects, state land acquisition, and forest stewardship remains high among the public and state political leaders.

ACCOMPLISHMENTS/OUTCOMES

FORESTRY UVA: The Forestry UVA Program has been extremely successful in conserving and managing working forest landscapes. Forty-eight percent of eligible private forest land in Vermont - 1,846,743 acres - are under forest management with a UVA plan written to state-approved standards.

FOREST STEWARDSHIP: Vermont's 12 county foresters are arguably the public "face" of the Division of Forests, reaching over 6,000 landowners annually. In addition, Vermont has two foresters who are funded largely by the Natural Resources Conservation Service (NRCS) and work with private landowners on NRCS programs to see that planning and implementation are consistent with the Forest Stewardship and Forestry UVA Programs. As of 2015, 15,000 acres are listed as Forest Stewardship acres in the USFS SMART system, with a backlog of eligible UVA properties meeting Forest Stewardship standards waiting to be entered.

FOREST LEGACY: Vermont has been a leader in the Forest Legacy Program since the authorizing legislation was introduced by a member of the Vermont congressional delegation. The Forest Legacy Program's contribution of $22.95 million since 1993 has enabled Vermont to conserve 80,316 acres in 16 projects across the landscape. Vermont was the first state in the United States to have both the first Forest Legacy Project and the Community Forest and Open Space Project.

LANDS ACQUISITION AND MANAGEMENT PROGRAMS: ANR has acquired important forested parcels across the state, providing a variety of benefits, including clean air and drinking water protection, flood mitigation, and a variety of outdoor recreation opportunities for Vermont's 625,000 citizens. The State owns 346,000 acres of public land and manages easements on and maintains public access rights on 55,000 and 84,000 acres of private land, respectively.

KEY PARTNERS

- Cooperating landowners
- The Nature Conservancy
- Professional resource managers
- Vermont's Current Use Tax Coalition
- Vermont Fish & Wildlife Department
- Vermont Land Trust
- Vermont Natural Resources Council
- Vermont Woodlands Association
- Trust for Public Land
- US Forest Service

2017 PLAN STRATEGIC ACTIONS

FORESTRY UVA

- Make use of new online tools for recording, reporting, training, and outreach.
- Improve outreach on Ecologically Significant Treatment Areas in UVA, publicize new resources such as the improved *A Landowner's Guide: Wildlife Habitat Management for Lands in Vermont*, *Voluntary Harvesting Guidelines for Landowners in Vermont*, and specific recommendations for managing for northern long-eared bat or other threatened, endangered, or invasive species.

FOREST STEWARDSHIP

- Continue to work with NRCS to assist private landowners and their foresters in planning and implementation, as well as expanding practices to address emerging resource concerns.
- Strengthen the ability to report on SMART accomplishments through US Forest Service. Keep SMART aligned with UVA data systems.
- Look for opportunities to encourage landscape-scale forest stewardship policies in local and regional planning agencies.

FOREST LEGACY

- Continue to work with communities and private forest landowners to identify areas to protect using criteria that enhance biodiversity, recreation needs, climate, and flood resiliency. Leverage federal funds with state and local funds.
- Continue to provide support for town forest acquisition and management projects.
- Provide consistent management and stewardship monitoring of parcels.

LANDS ACQUISITION AND MANAGEMENT PROGRAMS

- With partners, continue to identify lands to purchase/protect using criteria that enhance biodiversity, recreation needs, climate, flood resiliency, and other ANR goals.
- Provide consistent management and data on state land conditions, benefits, and concerns. Keep website information on state lands current and useful.
- Use public land as a demonstration site for best management practices (BPMs) to be encouraged on private land.

National Priority 1

CONSERVE AND MANAGE WORKING FOREST LANDSCAPES FOR MULTIPLE VALUES AND USES

PRIORITY AREA: Rural, Rural/Residential, Multi-State Regional

ISSUE ADDRESSED: Forest fragmentation

DESIRED FUTURE CONDITION 1: Conserve biological diversity across all landscapes.

GOAL 1: Maintain and enhance a mix of forest structure and complexity across the landscape.

2010 Plan Strategy	2017 Plan Strategy
Maintain a mix of programs aimed at keeping forests in forests including UVA, Forest Legacy, local and regional planning, and land acquisition.	Strengthen collaborative land use planning and policy efforts with partners to keep forests forested, developing strategies to reduce or mitigate the rate of forest conversion and reduce forest fragmentation and parcelization at local, statewide, and regional levels.

PROJECT

2015 VERMONT FOREST FRAGMENTATION REPORT: A REPORT TO THE VERMONT LEGISLATURE

In 2014 the Vermont General Assembly enacted Act 118 calling for a report from the Commissioner of FPR assessing the current and projected effects of forest fragmentation on Vermont's forest and recommendations for how to best protect forest health and integrity.

MEASURES OF SUCCESS

- Reduce fragmentation of Vermont forest land across all landscapes.
- Forest fragmentation is recognized by the Vermont legislature as an important issue and strategies to address it are implemented and funded.

ACCOMPLISHMENTS/OUTCOMES:

FPR and ANR staff, along with staff from the US Forest Service Northern Forest Research Station contributed to the Forest Fragmentation report, which was presented simultaneously to five legislative committees and received significant press attention. The report has greatly raised awareness of forest fragmentation in Vermont. It lays out a number of policy options for the Vermont Legislature to consider. FPR is developing additional recommendations through an affected partner public process, and the Legislature has requested follow-up actions to the report, which are currently under development in ANR.

KEY PARTNERS

- Vermont Fish & Wildlife Department
- Vermont Agency of Natural Resources Office of Planning and Legal Affairs
- Vermont Natural Resources Council
- US Forest Service Northern Research Station–Forest Inventory and Analysis
- NRCS

2017 STRATEGIC ACTIONS

Strengthen collaborative land use planning and policy efforts with partners to keep forests forested, developing strategies to reduce or mitigate the rate of forest conversion and reduce forest fragmentation and parcelization at local, statewide, and regional levels.

- Implement policy options laid out in the report. These fall into the following categories:
    - Conservation
    - Education and outreach
    - Landowner incentives
    - Land-use planning, and
    - Sustainable forestry and Vermont forest economy
- Incorporate additional strategies on forest fragmentation and parcelization in the next FAP, specifically identifying priority landscapes most affected/vulnerable to change.

National Priority 1

CONSERVE AND MANAGE WORKING FOREST LANDSCAPES FOR MULTIPLE VALUES AND USES

PRIORITY AREA: Rural, Rural/Residential, Multi-State Regional

ISSUE ADDRESSED: Landscape-level Conservation and Connectivity

DESIRED FUTURE CONDITION 1: Conserve biological diversity across all landscapes

GOAL 1: Protect, conserve, and restore landscapes, habitats, and species of greatest conservation need.

2010 Plan Strategy	2017 Plan Strategy
Support activities and leverage resources to protect and conserve landscapes and species of greatest conservation need.	Encourage long-term connectivity and protection of landscapes, habitats, and species of greatest conservation need by increasing forest cover in all forested landscapes, especially in high priority forest blocks and in linkage areas between those blocks.

PROGRAM

LANDSCAPE CONSERVATION TARGETS AND CURRENT USE ECOLOGICALLY SIGNIFICANT TREATMENT AREAS

Vermont has a rich natural heritage, with at least 268 species of birds, 61 species of mammals, 42 species of reptiles and amphibians, more than 2,000 species of vascular plants, and innumerable species of non-vascular plants, fungi, and invertebrates. Past conservation efforts are typically reviewed on a parcel-by-parcel basis, depending on the desirability of the natural resource attributes, as well as social factors or opportunity.

LANDSCAPE CONSERVATION TARGETS PROJECT

The Landscape Conservation Targets Project has a landscape- rather than parcel-scale conservation design which features a rigorous scientific process with an emphasis on habitat connectivity, prioritizing each potential project in terms of its function or impact within the overall landscape. The goal of the project is to identify areas that are critical to the preservation of an ecologically functional landscape into the future to maintain and enhance the natural heritage, in the face of climate change and human population growth. This project was led by the Vermont Fish & Wildlife Department in close partnership with FPR and non-profit partners and will be used as a guide for many future conservation efforts in Vermont. It will be incorporated in the 2015 Vermont State Wildlife Action Plan.

ECOLOGICALLY SIGNIFICANT TREATMENT AREAS (ESTA)

A provision adopted in 2009 under Vermont's forestry UVA program allows landowners with significant ecological sites to enroll and manage these sites for protection rather than timber. Under this important provision, private landowners can afford to protect these critical habitats and sensitive sites, including vernal pools, riparian habitats, unique natural communities, and sites of cultural significance. Although the acreage enrolled to date is small, ESTA Program will become an essential tool in protecting these sites.

MEASURES OF SUCCESS

To identify and protect features of the Vermont landscape that need to be conserved in order to retain or enhance an ecologically functional landscape. This means:

- A landscape of large unfragmented forests, healthy aquatic systems, and associated riparian areas;
- Diversity of physical landscape features on which plant and animal natural communities depend; and
- Ecological connections between these features.

ACCOMPLISHMENTS/OUTCOMES

The Landscape Conservation Targets Project, using a landscape based matrix, has identified priority areas for an ecologically functional landscape and produced a spatial layer. This layer will be the basis for conservation targets. Thus far, the ESTA Program has conserved over 2,800 acres of private lands with important ecological sites.

KEY PARTNERS:

- Cooperating landowners
- The Nature Conservancy
- Professional resource managers
- Vermont Department of Taxes
- Vermont Fish & Wildlife Department
- Vermont Land Trust
- US Forest Service

2017 STRATEGIC ACTIONS

Encourage long-term connectivity and protection of landscapes, habitats, and species of greatest conservation need by increasing forest cover in all forested landscapes, especially in high priority forest blocks and in linkage areas between those blocks.

- Incorporate appropriate layers of conservation targets in both the Vermont Wildlife Action Plan and Vermont FAP as a coarse filter to assist in identifying landscape-scale priority areas for conservation. Implement conservation strategies based on this work.
- Incorporate layers of conservation targets for work carried out by partners to help identify landscape-scale priority areas for conservation.
- Expand the use of ESTAs by informing and educating private landowners already enrolled in the UVA Program. Target landowners not enrolled in the UVA Program with information about the benefits of enrollment in the ESTA Program.

National Priority 1

CONSERVE AND MANAGE WORKING FOREST LANDSCAPES FOR MULTIPLE VALUES AND USES

PRIORITY AREA: Urban, Rural, Rural/Residential, Multi-State Regional

ISSUE ADDRESSED: Landscape-level biological diversity, and Species of greatest conservation need

DESIRED FUTURE CONDITION 1: Conserve biological diversity across all landscapes

GOAL 1: Protect, conserve, and restore landscapes, habitats, and species of greatest conservation need.

2010 Plan Strategies	2017 Plan Strategies
Support activities and leverage resources to protect and conserve landscapes and species of greatest conservation need. Support monitoring and programs that maintain Vermont's common flora and fauna.	Encourage management activities and develop conservation plans to protect and restore landscapes, habitats, genetic diversity, rare, threatened and endangered species, and species of greatest conservation need. Monitor, plant, and retain native flora and fauna, including supporting native species restoration efforts with the Vermont Fish & Wildlife Department and other partners.

PROJECT

FORESTERS FOR THE BIRDS

Foresters for the Birds is an innovative project that works to keep forests forested and support keeping common birds common by helping landowners integrate the practices of timber and habitat management. The project includes forest training, habitat assessments, and demonstration harvests as well as workshops for landowners, foresters, and loggers. The project was established through a partnership between Audubon Vermont and FPR in

2008. In 2012, a US Forest Service S&PF Forestry Re-Design grant provided funding to promote the wide-spread adoption of silviculture with birds in mind.

MEASURES OF SUCCESS

- Number of foresters engaged
- Acres covered by habitat assessments
- Number of workshops and participants
- Number of Demonstration harvests
- Number of states developing Foresters for the Birds programs

ACCOMPLISHMENTS/OUTCOMES

Over 200 foresters participated in training, collectively managing more than 1 million acres. One hundred thirty-two habitat assessments were completed in collaboration with 111 foresters covering 193,894 acres. More than 160 foresters attended 22 forester training events, 38 workshops were hosted at 10 demonstration harvests and more 1,000 people attended tours. Nine states are currently implementing Foresters for the Birds programs.

KEY PARTNERS

- Audubon Vermont
- Cooperating landowners
- US Forest Service, State & Private Forestry financial support through a Re-Design grant
- Vermont Fish & Wildlife Department
- Vermont Land Trust
- Vermont Woodlands Association

2017 STRATEGIC ACTIONS

- Encourage management activities and develop conservation plans to protect and restore landscapes, habitats, genetic diversity, rare, threatened and endangered species, and species of greatest conservation need.
- Monitor, plant, and retain native flora and fauna, including supporting native species restoration efforts with the Vermont Fish & Wildlife Department and other partners.
- We envision healthy forests that provide suitable breeding and post-breeding habitat conditions for a suite of priority birds and sustained yields of timber and other forest products and services along the Atlantic Flyway.
    - Forest plans that manage for bird habitat and timber will be the norm along the flyway.

- Parcelization and fragmentation rates will be reduced in priority forest blocks.
- Priority bird species populations will stabilize or increase along the flyway.

National Priority 1

CONSERVE AND MANAGE WORKING FOREST LANDSCAPES FOR MULTIPLE VALUES AND USES

PRIORITY AREA: Rural, Rural/Residential

ISSUE ADDRESSED: Healthy Forest Landscape

DESIRED FUTURE CONDITION 5: Vermont has a legal, institutional, and economic framework in place for forest conservation and sustainability.

ISSUE ADDRESSED: Maintain and enhance a mix of forest structure and complexity across the landscape.

PROJECT

VOLUNTARY HARVESTING GUIDELINES FOR LANDOWNERS IN VERMONT

In 2015, as required by the Vermont Legislature, FPR developed a set of voluntary timber harvesting guidelines designed for private landowners to support long-term forest health and sustainability. An advisory group consisting of a broad array of stakeholders provided input during guideline development. Forest land in Vermont is 80% privately owned, and the bulk of timber-harvesting activities take place on these parcels. The harvesting guidelines are a proactive step in raising the standard of sustainable timber harvesting to maintain healthy forests.

MEASURES OF SUCCESS

- *Voluntary Harvesting Guidelines for Landowners in Vermont* is widely used and has become the standard operating procedure in the state.
- Vermont's forests are healthy, highly resilient, and capable of self-renewal, maintaining forest processes that are structurally complex, ecologically productive, and composed of a great variety of native flora and fauna.
- Vermont's forests can maintain ecological and economic health, productivity, diversity, and overall integrity in the context of human activity and use, while meeting current and future needs.

ACCOMPLISHMENTS/OUTCOMES

The guidelines were developed incorporating work carried out in other states and address a wide range of topics, including newer issues such as climate change impacts. The guidelines cover preparing for a harvest, conducting a harvest, protecting water resources, protecting soil health and productivity, biodiversity and wildlife habitat, and planning for uncertainty.

These guidelines are now being implemented, positioning Vermont as a leader in timber harvesting that focuses on forest health and sustainability.

KEY PARTNERS

- Audubon Vermont
- Forest Guild
- The Nature Conservancy
- Plum Creek Timber Company, Inc.
- US Forest Service, Green Mountain National Forest
- University of Maine
- University of Vermont
- Vermont Agency of Natural Resources
- Vermont Coverts
- Vermont Forest Products Association
- Vermont Land Trust
- Vermont Natural Resource Council
- Vermont Sustainable Forestry Initiative
- Vermont Woodlands Association

2017 STRATEGIC ACTIONS

Support new and emerging policies and initiatives, including forest certification, forester licensing, Voluntary Harvesting Guidelines, and state guidelines for management of riparian buffers, vernal pools, and other ecologically significant habitats.

- Outreach to landowners through existing forestry division programs, workshops, and online resources for the utilization of the guidelines.
- Outreach to foresters and loggers through existing forestry division programs and workshops for the adoption of the voluntary harvesting guidelines.
- Development of a simpler, pocket-sized guide.

National Priorities 1 & 3

CONSERVE AND MANAGE WORKING FOREST LANDSCAPES FOR MULTIPLE VALUES AND USES
ENHANCE PUBLIC BENEFITS FROM TREES AND FORESTS

PRIORITY AREA: Urban, Rural, Rural/Residential, Multi-State Regional

ISSUE ADDRESSED: Ecosystem Services

DESIRED FUTURE CONDITION 3: Maintain and enhance forest contribution to ecosystem services.

GOAL 3: Maintain and enhance the full spectrum of forest-based recreational and tourism opportunities.

2010 Plan Strategies	2017 Plan Strategies
Build partnerships that enhance forest-based recreational opportunities. Work with partners to maintain forest access, land stewardship awareness and outreach, and well-maintained trail networks that support recreational opportunities. Partner with State Parks, Green Mountain National Forest and other organizations to support forest-based recreational opportunities.	Build partnerships to support sustainable forest-based recreation and tourism, including new forms of recreation Work with community groups and landowners to provide access to a well-maintained trail network for appropriate forest-based recreation. Manage and maintain existing state-owned lands and recreation facilities for public use and support additional recreational opportunities where compatible with the resource and supportive of the Statewide Comprehensive Outdoor Recreation Plan (SCORP).

Program

STATEWIDE COMPREHENSIVE OUTDOOR RECREATION PLAN (SCORP)/VERMONT TRAIL COLLABORATIVE

The 2-year Vermont Trails Collaborative is a partnership between FPR, Green Mountain National Forest, the University of Vermont, and numerous user groups. The goal of the Trails Collaborative is to establish a collaborative process to improve management of trails and recreation in the Green Mountain National Forest and throughout Vermont. Their first task was to generate important, trail-related information essential for the development of the Vermont SCORP in 2013-2014.

MEASURES OF SUCCESS

- A substantial contribution to the betterment of social and biological health in the region.
- A trail system more sustainable today than it was 2 years ago and will continue into the foreseeable future.
- Our understanding and application of science to trail and recreation management has improved.
- We have empowered local and regional groups.

ACCOMPLISHMENTS/OUTCOMES

In addition to completing the Vermont SCORP, another successful outcome of the Vermont Trails Collaborative was the development of the universal Vermont Trail Ethic.

The Vermont Trail Ethic was created and developed by the Vermont Trail Collaborative in partnership with the Vermont Trails and Greenways Council. The goal of the collaborative was to unite all trail managers, property owners, and trail users toward trail stewardship as a common goal and improve the sustainability of and management efforts on Vermont's trail networks and in trail-based recreation.

The Vermont Trail Ethic is a set of 10 guidelines aimed at enhancing the trails experience for all trail users. Users, trail managers, and organizations are encouraged to post these guidelines to their websites, in their publications, and at trailheads. See the figure at right for the 10 guidelines of the Vermont Trail Ethic.

KEY PARTNERS

- US Forest Service, Green Mountain National Forest
- University of Vermont
- Cooperating landowners

2017 PLAN STRATEGIC ACTIONS

- Build partnerships to support sustainable forest-based recreation and tourism, including new forms of recreation
- Work with community groups and landowners to provide access to a well-maintained trail network for appropriate forest-based recreation.

- Manage and maintain existing state-owned lands and recreation facilities for public use and support additional recreational opportunities where compatible with the resource and supportive of SCORP.
- Continue to implement the 2014 Vermont SCORP.
- Expand forest-based recreational strategies in FAP update.

National Priority 2

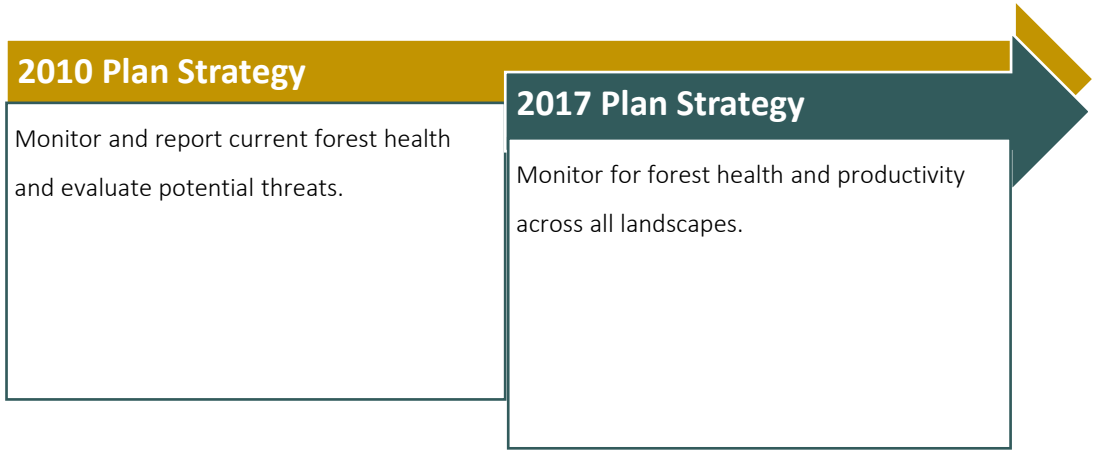
PROTECT FORESTS FROM THREATS

PRIORITY AREA: Urban Rural, Rural/Residential, Multi-State Regional

ISSUE ADDRESSED: Forest Ecosystem Health

DESIRED FUTURE CONDITION 1: Conserve biological diversity across all landscapes

GOAL 1: Identify trends in forest ecosystem health and productivity.



PROGRAM:

ANNUAL MONITORING OF FOREST HEALTH CONDITIONS

The health of Vermont's forest is monitored by periodic measurements of tree condition and other ecosystem parameters such as damage-causing agents and the diversity and structure of vegetation. Aerial surveys have been conducted since the 1960s to sketch-map forest health damage. Vermont's North American Maple Project (NAMP) plots have been used to track the health of sugar maple and other tree species since 1988. Surveys for insect and disease pests are conducted based on current or expected threat.

Vermont participates in the National Forest Health Monitoring Program and receives cooperative funds for the collection of data on forest stress and disturbance using nationally standardized methods. Additional grants funded by the US Forest Service Forest Health Program or the Northeastern Area competitive process have allowed for more intensive monitoring of special issues.

MEASURES OF SUCCESS

- Early detection of forest pests and other problems.
- Communication of forest health issues to managers for rapid response.
- No damages exceeding 1,000 acres are missed.

ACCOMPLISHMENTS/OUTCOMES

Aerial surveys covering the entire state have been conducted in late summer on an annual basis using the Digital Aerial Sketch-Mapping System. Among the findings was a recent outbreak of beech bark disease which has been brought on by a drought period. These detection surveys have also pinpointed several areas of rapid red pine mortality, highlighting the need to further study this problem.

Thirty NAMP plots are rated annually. While the health of overstory maples remains healthy, data from these plots indicates that the lack of sugar maple regeneration is an increasing concern.

Insect and disease monitoring has also provided information that has helped forest pest management. For example, hemlock woolly adelgid monitoring has revealed the impact of winter temperatures in Northern New England. Pheromone traps provide insight into the growing populations of two major defoliators: forest tent caterpillar and spruce budworm. Although results of surveys in high-risk areas for emerald ash borer and Asian long-horned beetle have been negative, to date the surveys have been improving chances of early pest detection.

KEY PARTNERS

- Citizen volunteers
- Cooperating landowners
- Professional resource managers
- University of Vermont
- US Department of Agriculture, Animal and Plant Health Inspection Service (APHIS)
- Vermont Agency of Agriculture, Food, and Markets

2017 STRATEGIC ACTIONS

- Monitor for forest health and productivity across all landscapes.
- Redirect surveys for non-native pests to new areas, as determined by risk assessments and the changing footprints of pest invasions.
- Continue monitoring and encourage research on emerging issues.
- Enhance use of geodatabases and other archiving systems to make monitoring information more widely available.

National Priority 2

PROTECT FORESTS FROM THREATS

PRIORITY AREA: Urban, Rural, Rural/Residential, Multi-State Regional

ISSUE ADDRESSED: Forest Health Monitoring

DESIRED FUTURE CONDITION 2: Maintain and enhance forest ecosystem health and productivity

GOAL 1: Identify trends in forest ecosystem health and productivity.

PROGRAM

VERMONT MONITORING COOPERATIVE (VMC)

The mission of VMC is to improve our understanding of long-term trends, annual conditions and interdisciplinary relationships of the physical, chemical and biological components of forested ecosystems. The program, begun in 1990, achieves its mission through long-term monitoring, leveraging resources by partnering with many additional agencies and organizations, and providing networking opportunities, support and data management services for natural resource managers and scientists from many disciplines.

MEASURES OF SUCCESS

- No data gaps in ongoing sets of critical data.
- An increase in the number of data sets archived and readily available.
- An increase in collaboration between scientists and technical specialists to synthesize information.
- An increase in the use of data to identify long-term trends and understand resource issues.

ACCOMPLISHMENTS/OUTCOMES

VMC continued to support long-term monitoring of forest bird, amphibian, and reptile populations; forest soil chemistry; weather; atmospheric chemistry; tree health and phenology; carbon biomass; forest pests; and stream hydrology. Some of these monitoring efforts have been expanded. Yearly monitoring of the urban forest began in 2011, using the I-Tree Eco methodology on 200 plots. In addition, the network of non-urban forest health monitoring plots was expanded to include plots statewide to allow yearly measurements across the full range of common forest types for the region.

Also in recent years, VMC has modernized its database management to improve ease of use for scientific, natural resource manager, educational, and public interest audiences. Database services have been upgraded for both numerical and spatial data, as well as real-time data access and data quality assurance and control.

KEY PARTNERS

- Over 50 cooperating agencies and organizations have contributed to the VMC database (including 17 colleges and universities, 11 state or federal agencies, and 17 private organizations)
- The University of Vermont, Rubenstein School of Environment and Natural Resources
- US Forest Service, Green Mountain National Forest

2017 PLAN STRATEGIC ACTIONS

- Support access to forest health data archives and collections.
- Crosswalk all monitoring efforts into a common format that will enable cross-network integration of data.
- Continue to support long-term monitoring projects, balancing historical consistency with evolving stakeholder needs. Use an enhanced plot network to add measurements of regeneration, seedling survivorship, and prevalence of invasives; include more detailed productivity measurements, and provide ground truth for remote sensing products.
- Expand collaborative efforts within Vermont and enhance integration with regional and national monitoring programs.
- Pursue urban FIA as a substitution for iTree.

National Priority 2

PROTECT FORESTS FROM THREATS

PRIORITY AREA: Urban, Rural, Rural/Residential

ISSUE ADDRESSED: Climate Change

DESIRED FUTURE CONDITION 3: Maintain and enhance forest ecosystem health and productivity

GOAL 2: Maintain the health and productive capacity of forests.

2010 Plan Strategies	2017 Plan Strategies
Encourage appropriate forest management that maintains health and productivity.	Encourage landscape level planning and management activities that maintain health, productivity, and ecological functions across all forests
Support research and monitoring that improves the understanding of trends in air quality, weather, climate and how they affect forests.	Promote widespread use of Vermont's Voluntary Harvesting Guidelines and climate resiliency recommendations.

PROJECT

ADAPTING FORESTS TO CLIMATE CHANGE

Foresters and forest landowners face considerable challenges in identifying current and future climate trends and in adjusting land management to prepare for and avert risk to long-term forest health. Yet historically few resources have been available to inform and assist them in adapting forests to climate change. Augmented by a USFS competitive grant, FPR initiated a multi-partner project to assess forest vulnerability, anticipating forest responses and developing resources to assist foresters and forest landowners in adapting their practices and forests to account for anticipated changes.

MEASURES OF SUCCESS

- Awareness of climate change effects on forests and methods needed to prepare for extreme weather events.
- Forest management that incorporates strategies that improve climate change resilience.

ACCOMPLISHMENTS/OUTCOMES

Climate change demonstration areas were established in five state forests and one private forest cooperative. A vulnerability study for Vermont natural resources was conducted. The guidebook for foresters, *Creating and Maintaining Resilient Forests in Vermont: Adapting Forests to Climate Change*, was published. And an online webinar on forest adaptation, as part of the Urban and Community Forestry webinar series, was produced.

KEY PARTNERS

- Manomet Center for Sustainability
- Northeast Institute for Applied Climate Science (NIACS)
- US Forest Service, Green Mountain National Forest
- US Forest Service, State & Private Forestry financial support through a Competitive Allocation Request for Proposals grant
- Vermont Department of Environmental Conservation
- Vermont Fish & Wildlife Department

2017 PLAN STRATEGIC ACTIONS

- Encourage landscape level planning and management activities that maintain health, productivity, and ecological functions across all forests.
- Promote widespread use of Vermont's Voluntary Harvesting Guidelines and climate resiliency recommendations.
- Provide technical assistance to foresters, forest landowners, and policy makers to implement climate adaptation strategies that create and maintain resilient forests in Vermont.
- Support incorporation of climate adaptation strategies into the State Lands Acquisition and Management Programs.
- Work with partners to monitor climate change adaptation demonstration projects.

National Priority 2

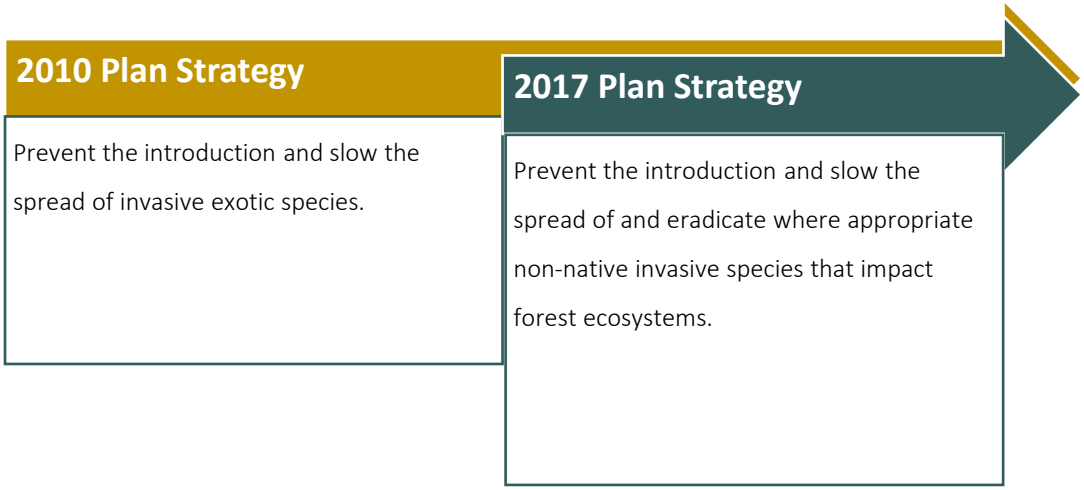
PROTECT FORESTS FROM THREATS

PRIORITY AREA: Urban, Rural, Rural/Residential, Multi-State Regional

ISSUE ADDRESSED: Non-Native Invasive Species

DESIRED FUTURE CONDITION 2: Maintain and enhance forest ecosystem health and

GOAL 3: Maintain and enhance forest ecosystem health and productivity.



PROGRAM

INVASIVE PLANT MANAGEMENT AND COORDINATION

Invasive Plant Management and Coordination efforts are aimed at increasing public understanding of the impact invasive plants have on an ecosystem; provide resources for land managers to assess, monitor, and manage invasive plant populations; coordinate collaboration with related projects and partners on tools and technical resources; support the creation and ongoing efforts of Cooperative Invasive Species Management Areas (CISMAs) in Vermont; and focus efforts on priority landscapes, including sites with rare, threatened, and endangered species and natural communities.

MEASURES OF SUCCESS

- An increase in the number of property owners and managers who recognize and manage invasive plant populations.
- An increase in invasive plant reporting including early detection species.

- Landscape-scale management implementation through local efforts including CISMAs.

ACCOMPLISHMENTS/OUTCOMES

Several grant opportunities have supported terrestrial invasive plant management efforts in Vermont over the past 5 years. The program was launched in 2010 when the State of Vermont received an American Recovery and Reinvestment Act (ARRA) grant to fund the Public Campground Invasive Species and Outreach Project. This was a combined effort between FPR and the Green Mountain National Forest.

Surveys were completed on 37 state parks with 2,100 campsites, 41 US Forest Service recreation sites with 300 campsites, and 160 miles of hiking trails including sections of the Appalachian and Long Trails. These data were analyzed to develop non-native invasive plant control projects and establish priorities for some of these high-risk sites. Contractors completed non-native invasive plant control work, including spraying with herbicides, manual and mechanical eradication work in 62 campgrounds and dispersed camping and roadside recreation sites.

FPR has built on those efforts with three additional grant opportunities:

- Building Capacity for an On-the-Ground Invasive Plant Management Program (2010)
- The Vermont Chapter of the Nature Conservancy for Invasive Terrestrial Plant Treatment on Working Forests and Conserved Natural Areas in Vermont's Forest Priority Areas (CARP 2012)
- Invasive Plant Mitigation on State Land in Vermont: Education, Volunteer Outreach and Capacity Building (Re-Design 2013)
- Prioritizing Treatment Areas for Effective Management of Invasive Plants (Landscape Scale Restoration 2014)

Accomplishments from these various projects include documenting and publicizing plant management demonstration areas, providing targeted information about existing cost-share programs for invasive plant treatment to landowners and managers. We have continued to increase the pool of resource managers trained in invasive plant management and developed tools for landowners and land managers to assess, map, and manage invasive plant populations and on how to hire a contractor. One of the key accomplishments was the development of a database of 326 volunteer groups; developing recruitment materials, a toolkit of resources for volunteers, and an educational curriculum; conducting 29 educational programs in 14 different state parks, which engaged 76 adults and 83 children; and training volunteers to identify and manage invasive plants, which engaged 448 people at approximately 2,250 volunteer hours.

Each of these efforts has been built on the efforts of the others, creating the foundation for what has become a statewide invasive plant program. As a result, we have partnered with The Nature Conservancy to create a full-time invasive plant coordinator position within FPR to coordinate invasive plant efforts statewide, including technical

support, volunteer training, data analysis, project implementation for mapping, attracting local resources for management efforts, and promoting the creation and support of CISMAs or other local groups.

KEY PARTNERS

- Cooperating landowners
- Local conservation commissions and conservation districts
- Natural Resource Conservation Districts
- The Nature Conservancy
- Professional resource managers
- University of Vermont Extension
- NRCS
- US Fish and Wildlife Service
- US Forest Service, State & Private Forestry competitive grant
- Vermont Agency of Agriculture, Food, and Markets
- Vermont Department of Environmental Conservation
- Vermont Fish & Wildlife Department

2017 PLAN STRATEGIC ACTIONS

- Prevent the introduction and slow the spread of and eradicate where appropriate non-native invasive species that impact forest ecosystems.
- Support and update vtinvasives.org, a website developed to provide information about non-native invasive plants and pests.
- Provide communities and partners with technical assistance and resources for invasive mapping, prioritization, and treatment.
- Encourage the development and support of CISMA's or other multi-partners' approaches to managing invasive plant populations.
- Continue to provide statewide leadership in invasive plant management.

National Priority 3

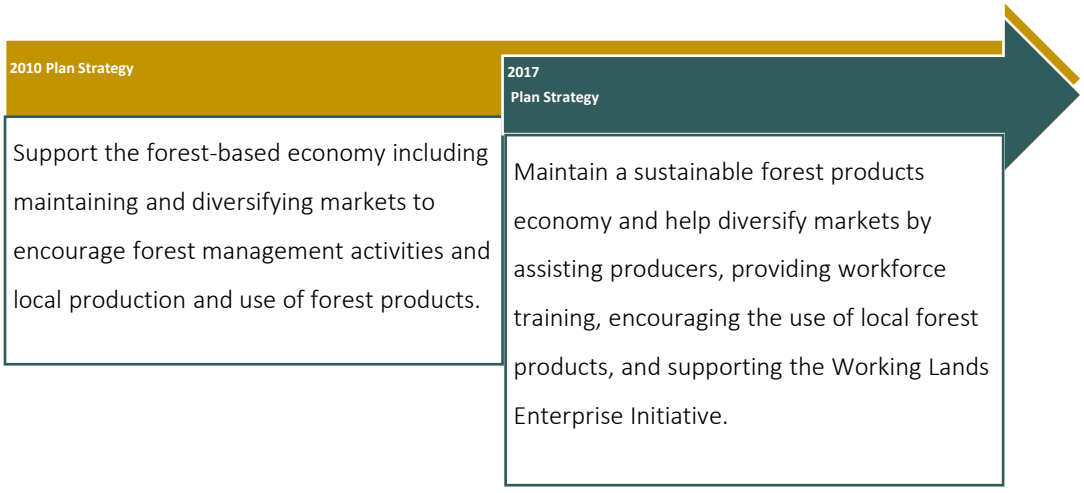
ENHANCE PUBLIC BENEFITS FROM TREES AND FORESTS

PRIORITY AREA: Rural, Rural/Residential

ISSUE ADDRESSED: Working Lands

DESIRED FUTURE CONDITION 3: Maintain and enhance forest contribution to ecosystem services.

GOAL 1: Maintain and enhance a sustainable forest products infrastructure.



PROGRAM

WORKING LANDS ENTERPRISE INITIATIVE

The 2012 Working Lands Enterprise initiative (Act 142) created the Working Lands Enterprise Fund (WLEF) and the Working Lands Enterprise Board (WLEB) to support Vermont's working landscape of forests and farms. The WLEB is composed of private sector members from agriculture and forestry, the Vermont Agency of Agriculture, FPR, the Vermont Agency of Commerce and Community Development, the Vermont Housing Conservation Board, the Vermont Economic Development Authority, and the Vermont Sustainable Jobs Fund.

The goals of the initiative, particularly the WLEP, are to:

- Stimulate a concerted economic development effort on behalf of Vermont's agriculture and forest product sectors by systematically advancing entrepreneurialism, business development, and job creation;

- Increase the value of Vermont's raw and value-added products through the development of in-state and export markets;
- Attract a new generation of entrepreneurs to Vermont's farm, food system, forest, and value-added chain by facilitating more affordable access to the working landscape; and
- Increase the amount of state investment in working lands enterprises, particularly when it leverages private and philanthropic funds.

MEASURES OF SUCCESS

- New jobs in the forest and agriculture industries are created.
- Aggregated gross income in the sectors is increased.
- Business output is increased.

ACCOMPLISHMENTS/OUTCOMES

Based on outcomes of 39 completed grant projects (both agricultural and forestry sectors combined), the initiative has resulted in 65 full-time equivalent jobs created in the first year of grant investments, aggregated gross income increased by over $4,931,168, and an increased product output by businesses of 70%

KEY PARTNERS

- Cooperating businesses
- Vermont Agency of Agriculture
- Vermont Agency of Commerce and Community Development
- Vermont Economic Development Authority
- Vermont Housing Conservation Board
- Vermont Sustainable Jobs Fund

STRATEGIC ACTIONS

- Maintain a sustainable forest products economy and help diversify markets by assisting producers, providing workforce training, encouraging the use of local forest products, and supporting the Working Lands Enterprise Initiative.
    - The Forestry Subcommittee of the WELB Board, in collaboration with Yellow Wood Associates, is currently completing work on the Vermont Forest and Wood Products Systems Analysis. The goal of the project is a comprehensive report to establish a strong foundation for increased support and strategic growth in Vermont's forest products sector. The project engaged a broad range of industry stakeholders and included exploration and analysis of forestry and wood markets, products, and services. The final report will:
        - identify market opportunities,

        - facilitate connectivity across the sector,
        - identify gaps in infrastructure,
        - identify priority interventions, and
        - develop strategies to promote the forestry and wood products industry within Vermont.
- Strategies supporting a sustainable forest products economy will be added to the updated FAP.

National Priority 3

ENHANCE PUBLIC BENEFITS FROM TREES AND FORESTS

PRIORITY AREA: Rural, Rural/Residential, Multi-State Regional

ISSUE ADDRESSED: Water Quality – Non-Point Source Pollution

DESIRED FUTURE CONDITION 3: Maintain and enhance forest contribution to ecosystem services.

GOAL 2: Maintain and enhance soil, water, and air resources.

2010 Plan Strategy	2017 Plan Strategy
Encourage inclusion of soil and water conservation considerations by foresters, forest landowners and loggers through appropriate forest planning and practices.	Address non-point source pollution associated with forest land and forestry operations to meet phosphorus reduction allocations across the landscape, including the EPA Lake Champlain TMDL.

PROGRAM

FOREST WATERSHED PROGRAM

The Forest Watershed Program focuses on efforts to reduce non-point source pollution associated with forest management activities. This is being accomplished through BMP monitoring, development, and delivery; and educational and technical assistance to loggers, landowners, and natural resource professionals. BMP studies and audits conducted in Vermont have consistently shown that stream crossings are the principal source of sediment associated with logging operations. One way that Vermont is addressing this problem is through the Portable Skidder Bridge Initiative.

MEASURES OF SUCCESS

- Non-point source pollution associated with forest management activities is reduced.
- Use of portable skidder bridges becomes a standard operating practice for stream crossings on logging jobs.

ACCOMPLISHMENTS/OUTCOMES

Portable skidder bridges are designed and intended for use as temporary structures for crossing streams during logging. Portable skidder bridges are becoming widely viewed as a BMP for controlling non-point source pollution associated with timber harvesting operations. FPR is working with partners and promoting and demonstrating the use of portable bridge designs on timber-harvesting operations throughout Vermont. The use of portable skidder bridges as a method for crossing streams during logging operations is gaining popularity as loggers, landowners, and foresters realize their environmental and economic advantages.

KEY PARTNERS

- US Forest Service, State & Private Forestry financial support through a Competitive Allocation Request for Proposals grant
- Cooperating landowners
- Professional resource managers
- NRCS
- Vermont Association of Conservation Districts
- Vermont Forest Industry
- Vermont Agency of Natural Resources
- Vermont Logger Education to Advance Professionalism (LEAP) Program

2017 PLAN STRATEGIC ACTIONS

- Address non-point source pollution associated with forest land and forestry operations to meet phosphorus reduction allocations across the landscape, including the EPA Lake Champlain TMDL.
- Inform loggers, landowners, and foresters about the benefits of using portable skidder bridges through workshops and presentations, field demonstrations, informational brochures, static displays, video and web production, and news articles.
- Provide portable skidder bridges to loggers for purchase, loan, and rental using a variety of means and partners.
- Provide assistance and support for existing and start-up businesses that would fabricate and sell portable skidder bridges.
- Incorporate BMPs and all available tools in NRCS, EQIP practices.

National Priority 3

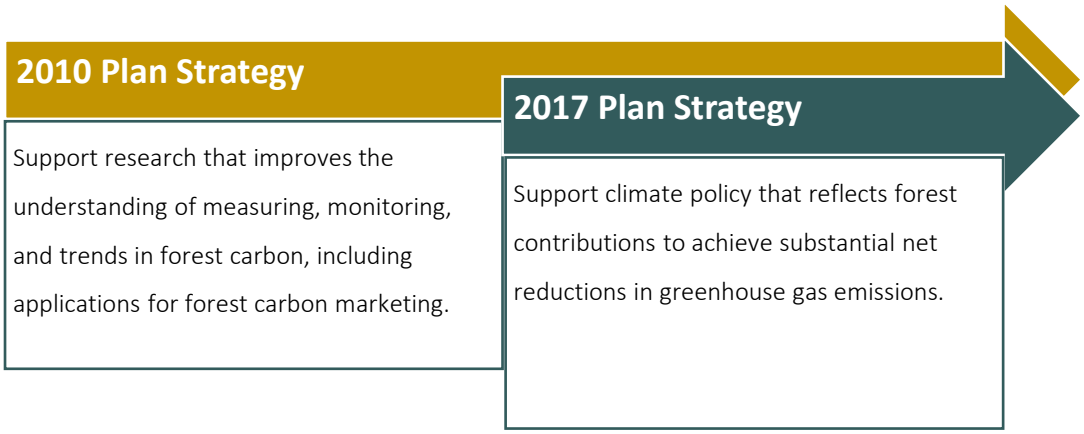
ENHANCE PUBLIC BENEFITS FROM TREES AND FORESTS

PRIORITY AREA: Urban, Rural, Rural/Residential

ISSUE ADDRESSED: Carbon Sequestration

DESIRED FUTURE CONDITION 3: Maintain and enhance forest contribution to ecosystem services.

GOAL 1: Maintain and enhance forest carbon.



PROJECT

CLIMATE CHANGE AND FOREST CARBON

The range of carbon stored in forests can be large, but the US Forest Service FIA estimates that privately owned forest land in Vermont stores only 77.1 metric tons carbon per acre compared to public forest land which stores 81.6-84.6 metric tons per acre. This project is intended to promote management strategies that improve carbon storage on privately owned forest land.

MEASURES OF SUCCESS

- FIA statistics showing an increasing trend in forest carbon stored on private and public forest land.

ACCOMPLISHMENTS/OUTCOMES

Our recent update to the FPR website includes a new Climate Change and Forests page with fact sheets and useful links to information that educates foresters and forest landowners about the critical role forests play in reducing atmospheric greenhouse gas about the value of forest management strategies in maintaining and increasing forest carbon, and about the current carbon offset markets available to stimulate long-term investment in forest carbon.

KEY PARTNERS

- Cooperating landowners
- Northeast Institute for Applied Climate Science
- US Forest Service, Forest Inventory and Analysis

2017 PLAN STRATEGIC ACTIONS

- Support climate policy that reflects forest contributions to achieving substantial net reductions in greenhouse gas emissions.
- Work with State Lands foresters to establish demonstration areas where forest carbon management can be used.
- Work with the Foresters for the Birds Program to incorporate forest management strategies that highlight forest carbon management as a co-benefit to bird habitat management.
- Explore the feasibility of establishing a forest carbon offset pilot project on State Lands.

National Priority 3

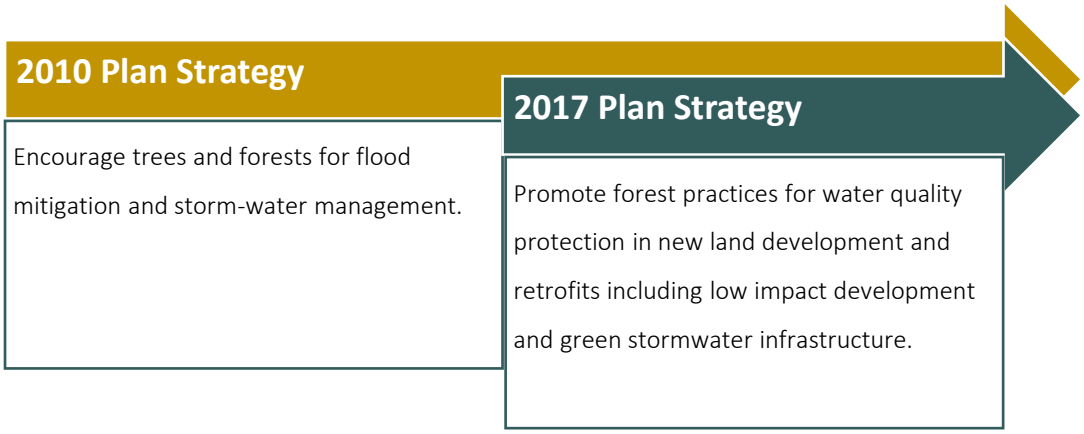
ENHANCE PUBLIC BENEFITS FROM TREES AND FORESTS

PRIORITY AREA: Urban

ISSUE ADDRESSED: Green Infrastructure

DESIRED FUTURE CONDITION 3: Maintain and enhance forest contributions to ecosystem services.

GOAL 2: Maintain and enhance soil, water, and air resources.



PROGRAM

GREEN INFRASTRUCTURE INITIATIVE

In 2011, ANR and the Green Infrastructure Roundtable invested considerable effort in developing a strategic plan for developing a statewide Green Infrastructure Initiative. The overarching goal for the Vermont FAP is to restore and maintain predevelopment hydrology in Vermont's developed areas through the use of low-impact development (LID) and green stormwater infrastructure (GSI) practices. To meet these goals, it was recognized that a full spectrum of resources must be leveraged and strategically applied to promote the growth of forests and trees and implement other GSI practices and LID principles where they matter most. This work has moved Vermont from the planning stage to tactical stage where implementation of water quality protection through a coordinated effort is focused on the benefits of natural systems and the reduction of urban stormwater runoff. Over the past 5 years the Division of Forests has worked to implement the following key elements of its FAP:

Provide high-priority municipalities with technical and financial resources, such as the Green Infrastructure Toolkit, which encourage and incentivize implementation of GSI practices;

- Help municipalities understand the benefits of utilizing trees and other GSI practices and LID principles for stormwater management;
- Provide design professionals and municipal officials with the training and education necessary to understand and implement LID and GSI projects to foster connectivity between the trees and the landscape, thus promoting environmental stewardship; and
- Build capacity within state government to act as the leader, role model, and support system for professionals, landowners, and municipalities.

The Division of Forests' approach combines the expertise of many external partners and relies on statewide coordination through ANR for technical and financial assistance, as well as educational outreach. These activities have the Division closer to meeting the following desired future conditions:

- Maintain and enhance forest ecosystem health and productivity;
- Maintain and enhance an ethic of respect for the land, sustainable use and exemplary management; and
- Vermont has a legal, institutional and economic framework in place for forest conservation and sustainability.

MEASURES OF SUCCESS

- Stormwater in urban areas is reduced through green engineering and low-impact development.
- Impervious surface is reduced.
- No net loss in forest cover.

ACCOMPLISHMENTS/OUTCOMES

- Creation of Vermont's Green Infrastructure Initiative within the Vermont Department of Environmental Conservation's Ecosystem Restoration Program with dedicated staff.
- The signing of Executive Order 06-12 which asks State Agencies to act as role models for LID and GSI adoption.
- Increased training and networking opportunities for design professionals.
- Focused, targeted efforts to raise awareness at the municipal level on LID principles and GSI practices.
- Non-profit groups actively educating the public on stormwater issues.
- Including additional LID principles and GSI practices in the Vermont Stormwater Manual revision process.

KEY PARTNERS

- Agency of Commerce and Community Development
- Agency of Transportation
- Department of Buildings and General Services
- Lake Champlain Sea Grant
- Municipalities
- Natural Resource Conservation Districts
- Non-profit watershed associations
- Private design companies
- Vermont Association of Planning and Development Agencies
- Vermont Department of Environmental Conservation
- Vermont League of Cities and Towns

2017 PLAN STRATEGIC ACTIONS

- Promote forest practices for water quality protection in new land development and retrofits including low impact development and green stormwater infrastructure.
- Continue to train and provide networking opportunities for design professionals.
- Continue to raise awareness at the municipal level on LID principles and GSI practices.
- Actively educating the public on stormwater issues.

National Priority 3

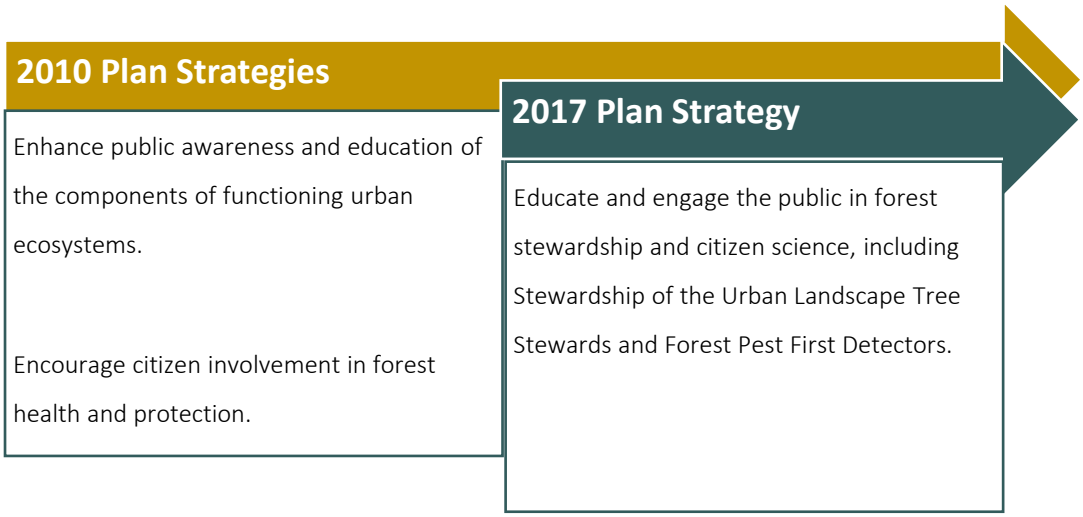
ENHANCE PUBLIC BENEFITS FROM TREES AND FORESTS

PRIORITY AREA: Urban

ISSUE ADDRESSED: Public Engagement and Education in Forest Stewardship

DESIRED FUTURE CONDITION 4: Maintain and enhance an ethic of respect for the land, sustainable use, and exemplary management.

GOAL 3: Increase public understanding and the application of exemplary forest management, conservation, and protection



PROGRAMS

STEWARDSHIP OF THE URBAN LANDSCAPE (SOUL)

This program trains participants to become stewards and advocates for the trees, forests, and green spaces in which they live and work. Topics covered include tree identification, biology, and planting; resource assessment; landscape design; and conservation planning. This educational and community leadership opportunity has enjoyed over 15 years of SOUL Tree Steward course offerings and has engaged more than 400 Vermonters. The SOUL Tree Stewards Program is offered by the Vermont Urban & Community Forestry Program, a joint initiative between the University of Vermont Extension and FPR.

FOREST PEST FIRST DETECTOR (FPFD) PROGRAM:

In response to the growing threat of invasive pests pose to Vermont's forests, state and federal entities working together, targeting invasive tree pests, identified that there was a need to support local leaders by providing ongoing outreach, education, and local planning and supporting survey efforts. To address this need, the Vermont FPFD program was established. First Detector volunteers are Vermont's front-line defense against pest infestations in the state.

MEASURES OF SUCCESS

SOUL:

To train individuals in communities across the state by:

- Enhancing their understanding of trees and proper tree care.
- Enhancing their understanding of urban forestry as a field and within the context of the state of Vermont.
- Making them a part of a cohort of regional citizens committed to improving the environmental, social, and economic quality of their communities through trees.

FOREST PEST FIRST DETECTORS:

The goal of Vermont's FPFD program is to create a group of well-trained, committed volunteer leaders at the community level to:

- Increase public awareness about the threat of tree pests to Vermont's forests.
- Serve as a local tree pest *expert*.
- Help coordinate local volunteer efforts.
- Assist their community in preparing for and responding to invasive forest pest infestations.

ACCOMPLISHMENTS/OUTCOMES

More than 400 Vermonters are trained as SOUL tree stewards. Currently, there are 147 volunteers, representing over 110 communities in Vermont, trained as Forest Pest First Detectors.

KEY PARTNERS

- University of Vermont Extension
- US Forest Service, State & Private Forestry financial support through a Competitive Allocation Request for Proposals grant.

2017 PLAN STRATEGIC ACTIONS

- Educate and engage the public in forest stewardship and citizen science, including Stewardship of the Urban Landscape Tree Stewards and Forest Pest First Detectors.
- Continue to train SOUL stewards and FPFDs in communities across the state, targeting those who do not have active participants.