FOREST RESOURCE STRATEGIES OF MASSACHUSETTS

The Department of Conservation and Recreation
and
The Department of Natural Resources Conservation
University of Massachusetts Amherst

Prepared for The
USDA Forest Service

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Cover art and formatting by Jim Taylor.

EXECUTIVE OFFICE of ENVIRONMENTAL AFFAIRS

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FOREST RESOURCE STRATEGIES OF MASSACHUSETTS

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Executive Summary

Petersham Massachusetts

DWSP

The 2008 Farm Bill requires each state to analyze its forest conditions and trends and delineate priority forest landscapes in a State Assessment. Based on the State Assessment, a Statewide Forest Resource Strategy is required by each state and will become the foundation for formulating U.S. Forest Service State & Private Forestry (S&PF) competitive project proposals and guiding S&PF program
direction. The U.S. Forest Service has issued guidance to the states with recommendations for developing the strategies and minimum requirements for each state strategy document. This guidance states that each state forest resource strategy should:

- Outline long-term strategies and programs to address priority landscapes identified in State Assessments and the three national priorities
- Describe how the state proposes to invest funding to address management objectives
- Include long-term timeline for projects and program implementation
- Identify partner and stakeholder involvement
- Identify strategies for monitoring outcomes
- Describe how state's proposed activities will accomplish S&PF objectives
- Describe how S&PF programs will be used to address priority landscapes
- Incorporate existing statewide natural resource plans

In the Fall of 2008, the Massachusetts Department of Conservation and Recreation Bureau of Forestry (DCRBOF) began planning for the development of the state assessment and strategy. After reviewing the size and scope of the project and the resources available to complete the work within DCRBOF, it was quickly determined that DCRBOF would need assistance with this endeavor. DCRBOF is fortunate to have enjoyed a long working relationship with the excellent forestry researchers and practitioners at the University of Massachusetts Department of Natural Resources (UMass DNR) and enlisting the aide of UMass DNR to complete the assessment and strategy was a natural outgrowth of this relationship. Because of the high end skills and resources at the University, the state assessment portion of the project was delegated to UMass DNR and the strategy has been developed by DCRBOF. Development of both sections of the document has been completed with the help of interested stakeholders from forestry and conservation agencies and organizations across the state.

The state assessment has been developed to analyze the forest resources of Massachusetts through the lens of the Montreal Process that includes the following seven criteria:

Criterion 1: Conservation of Biological Diversity
Criterion 2: Maintenance of productive capacity of forest ecosystems
Criterion 3: Maintenance of forest ecosystem health and vitality
Criterion 4: Conservation and maintenance of soil and water resources
Criterion 5: Maintenance of forest contribution to global carbon cycles
Criterion 6: Maintenance and enhancement of long-term multiple socio- economic benefits to meet the needs of societies
Criterion 7: Legal, policy and institutional framework

Additionally, the assessment linked the Montreal Process criteria to the three national priorities that came from the U.S. Forest Service redesign process*: Conserve and Manage Working Forest Landscapes for Multiple Values and Uses; Protect Forests from Threats; Enhance Public Benefits from Trees and Forests.* Using the combined parameters of the Montreal Process Criteria and the S&PF National Priorities, DCRBOF and UMass DNR conducted a GIS analysis of the state to identify high priority forest resources. The data layers that were derived from this analysis include:

Conserve and Manage Working Forest Landscapes for Multiple Values and Uses Overlay

Protect Forests from Threats Overlay

Enhance Public Benefits from Trees and Forests Overlay

-Water Resources and Biological Diversity

-Local Wood Production and Forest Sector Employment

Synthesis Overlay

-Forest Functions, Benefits and Values

-Forest Vulnerability

These layers were then combined in to one unified comprehensive overlay that identifies the highest priority forested landscapes of the state. A separate urban forest layer was also developed and is included in the urban forestry section of this strategy document.

Misty Summer Morning

DWSP

KEY FINDINGS FROM THE MASSACHUSETTS FOREST ASSESSMENT

From the assessment process, DCRBOF has identified the following key findings:

1. The inherent worth of forests to the Commonwealth's citizens is at least moderate to very high on approximately 2/3 of the watersheds across Massachusetts. This is an important relationship to state lands management because the state forest, park and reservation system is distributed across the entire State.

2. The central and western areas of Massachusetts are where the most traditional forest management will occur on state owned lands.

3. The greatest potential for protecting and enhancing water resources and biological diversity on state lands is in the Berkshires and the central Quabbin area.

4. Isolated state lands in the northeast and southeast play an important role in protecting water resources and biological diversity.

5. State owned lands in the southeast at are at high risk to harm from wildfire and other forest health issues.

6. State owned lands in the western (Berkshires) area of the state are at general forest health.

7. The highest priority areas for urban forestry are the major urban centers and surrounding communities.

8. Worcester County is the urban forestry/traditional forestry frontier

9. **Productive Capacity** - With increased growth and removals come jobs and local economic stimulus which is desperately needed.

10. **Forest Health -** Hurricanes of F3 category have occurred 8 times in the last 400 years. These blow down most of the trees in their path. This average of one every 50 years means that if the frequency holds we are overdue with the last being 1938. This creates a big incentive to maintain as much of our primary processing infrastructure as possible.

11. **Soils and Water -**The active management and harvesting of the DWSP watershed lands has shown that harvesting is compatible and important to producing high quality water.

12. **Carbon Cycles** - As the studies cited in the Assessment have pointed out certain approaches to sustainable forest management can increase annual carbon sequestration and offset annual fossil fuel-based carbon emissions in the State.

13. **Biomass** - Although the Biomass discussion is controversial and the state is smart to proceed cautiously it is important to implement a balanced approach that supports markets for local, low quality forest products to encourage good forestry and enhance local economic development.

14. Exotic invasive insects and diseases are a serious threat to the overall health of Massachusetts forests. The incidence of Asian Longhorned Beetle in Worcester County and established populations of Hemlock Woolly Adelgid across the state are the greatest concerns. In addition there are large areas of mortality on the south shore attributed to the combined defoliation from Winter moth, Gypsy moth and Forest tent caterpillar.

15. The unpredictability of changing weather patterns, and the increasing amount of urban interface are creating new challenges for the future of wildland fire management in Massachusetts.

The **Massachusetts Forest Resource Strategy** highlights how DCRBOF plans to utilize resources to address the issues identified in the key findings and the priority areas identified in the Forest Resource Assessment. This document will also provide DCRBOF with the framework to develop service area action plans.

The strategy document is organized into seven sections according to the DCRBOF programs:

State Lands Management

Service Forestry

Forest Health

Urban and Community Forestry

Marketing & Utilization Forestry

Forest Legacy

Touring the big White Pines

DWSP

State Lands Management

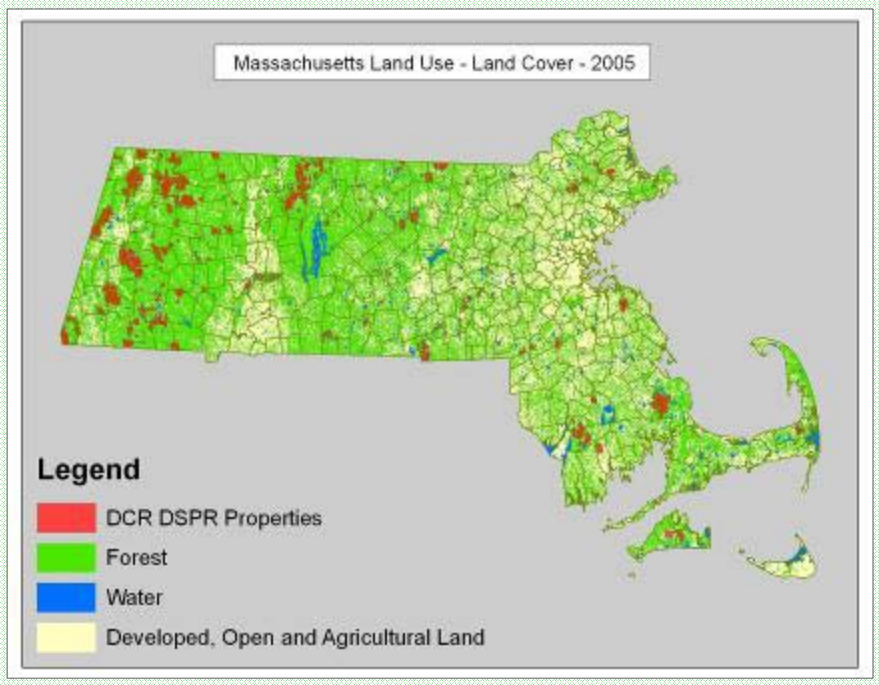
Quabbin Reservoir in Spring

Gordon Boyce

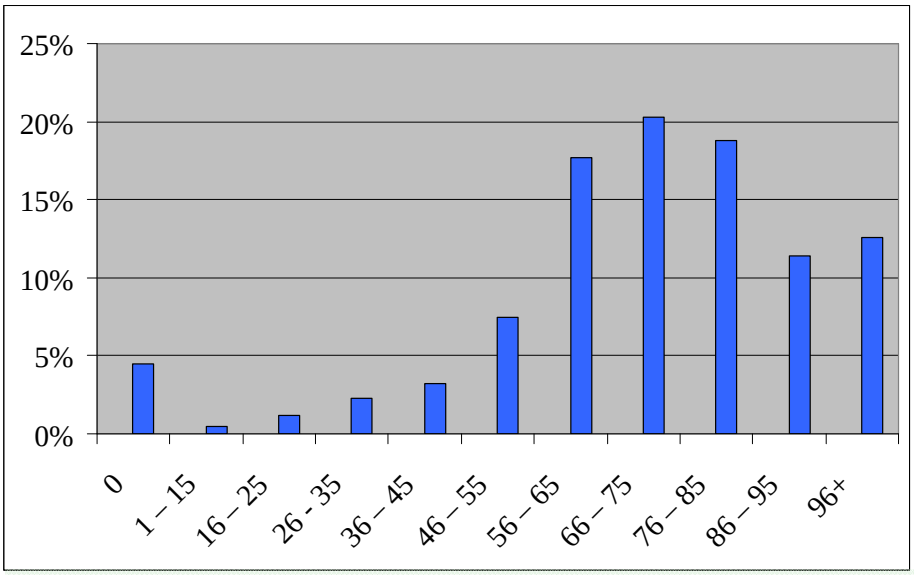
INTRODUCTION

The Massachusetts Department of Conservation and Recreation (DCR), Division of State Parks and Recreation (DSPR) actively and passively manage about 290,000 acres of land for multiple uses such as recreation, watershed protection, wildlife habitat and timber production. Other protected lands managed by the DCR include 18,000 acres of urban parks, beaches, and other unique properties; they are not managed for multiple uses but for intensive recreational use. In 1897, Mt. Greylock was designated as the first state reservation and in 1904, the Commonwealth hired its first state forester. The state Reforestation Act of 1908 authorized the purchase of land with the express purpose to produce the best forest growth, with a focus on "unproductive or wastelands". The first state forest was established in 1915.

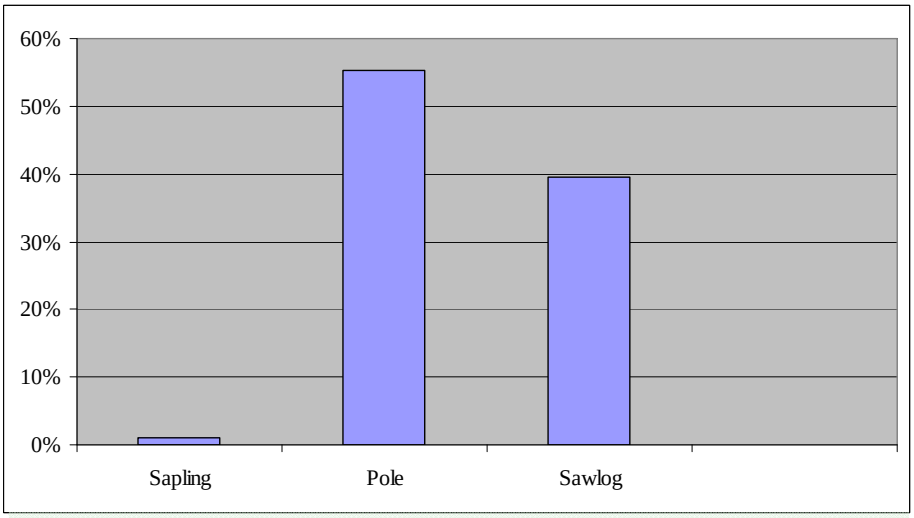
DSPR PROPERTIES ON LAND COVER



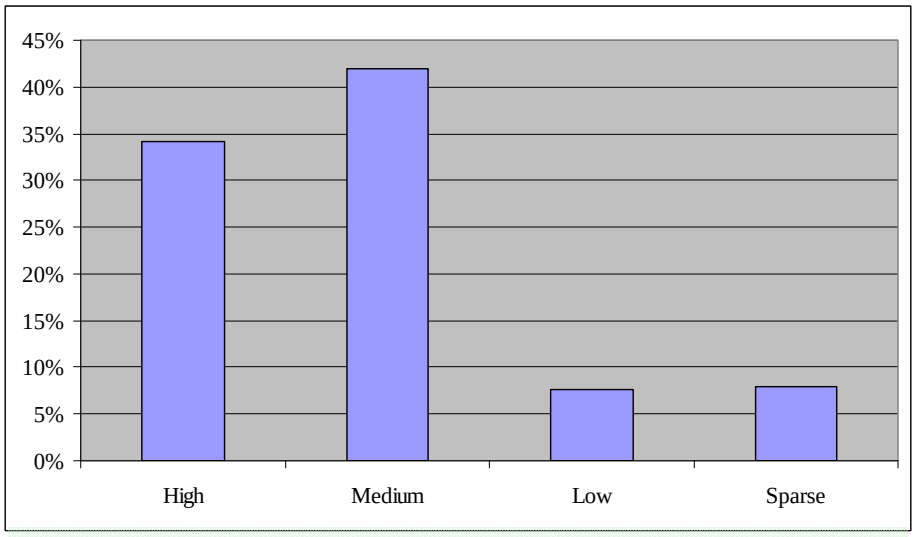
After settlement, Massachusetts' forest cover was its smallest extent in the mid-nineteenth century and reached its zenith in the 1950's. At the present, about 60% of the state is forested (around 3 million acres) and the average tree size is increasing. The Massachusetts Continuous Forest Inventory (CFI), established in the late 1950s, has generated statistics from over forty years of inventory data. The CFI indicates that in the year 2000, forests on DCR land are mostly in the 55 to 95 year age category, are mostly pole and small sawlog sizes, and have high and medium stocking levels.



FOREST AGE – Massachusetts State Forests and Parks CFI - 2000



SIZE CLASS - Massachusetts State Forests and Parks CFI - 2000



STOCKING CLASS - Massachusetts State Forests and Parks CFI - 2000

Also, according to CFI data, our forests had a net increase in volume each year of 12.8 ft^3 per acre. The volume of timber harvested from DSPR lands over this same time period (1980 – 2000), was calculated at 2.2 ft^3 per acre or 17% of the net increase in volume growth over the last 21 years.

The DCR is the largest single landowner in the Commonwealth of Massachusetts. DCR forests account for about 10 percent of the Commonwealth's forested land and they include some of the state's largest continuously forested tracts, providing an opportunity for long-term ecosystem management that is not possible on more fragmented forestlands. Included in the DCR properties are many of the largest blocks of forest in the Commonwealth that remain un-fragmented by development. These forest blocks represent an enormously important resource for current and future generations, providing services and uses that include public recreation, diverse habitat for wildlife, forest products, carbon sequestration, soil, air and water quality protection, biological and ecosystem diversity, nutrient cycling, culture, history and spiritual values.

MISSION STATEMENT:

The mission of the DSPR State Lands Management program is the stewardship and management of the natural resources on land in the DSPR forest and park system to provide a wide range of environmental, social and economic benefits. These lands are managed using the principles of ecosystem management to meet these responsibilities and the public's expectations under Massachusetts General Laws Chapter 132 which states:

the public welfare requires the rehabilitation, maintenance, and protection of forest lands for the purpose of conserving water, preventing floods and soil erosion, improving the conditions for wildlife and recreation, protecting and improving air and water quality, and providing a continuing and increasing supply of forest products for public consumption, farm use and for the wood-using industries of the commonwealth.

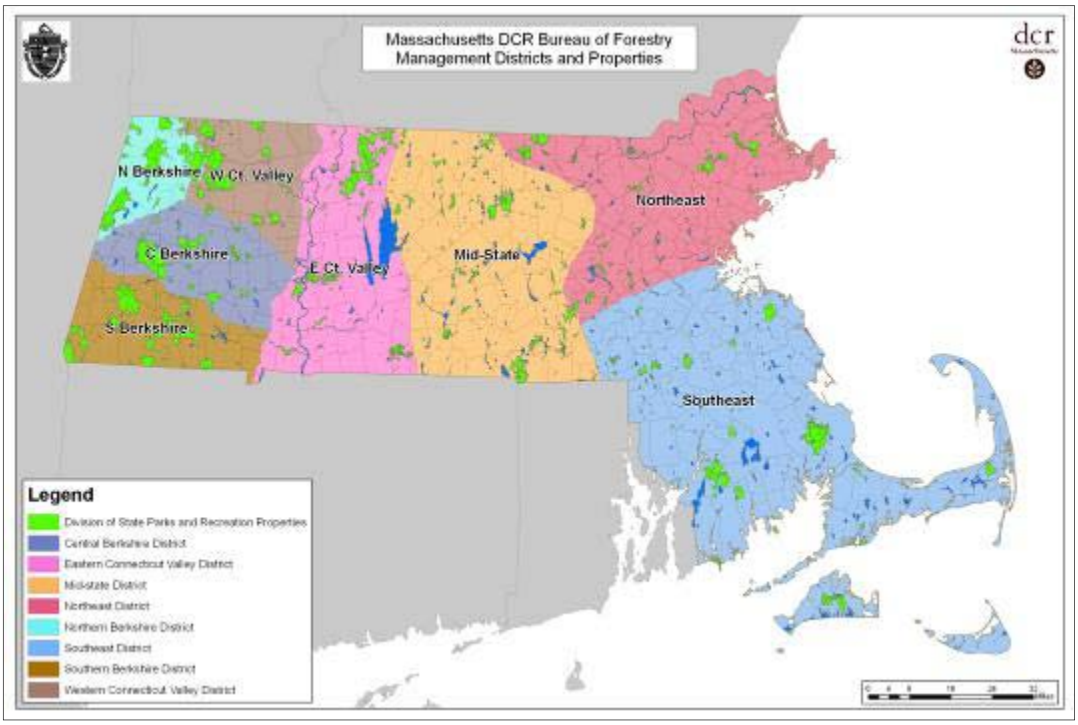
PROGRAM OVERVIEW:

State lands management in the DSPR system is conducted by the Bureau of Forestry (BOF) Management Forestry Program.

Traditionally the BOF has performed silvicultural operations on these lands in the form of commercial timber sales. From an area perspective harvest levels from state lands have been relatively light. In the past 20 years harvests from the state forest parks and reservations have averaged about 1500 acres per year or approximately ½ of one percent of the land base. Timber stand improvement (TSI) has been conducted on a limited basis in conjunction with commercial timber sales. Control of invasive species on DSPR lands has become a critical part of state lands forest protection and has also been conducted through timber sale contracts and revenue.

Very recently, forestry on state lands has come under intense scrutiny and for some stakeholders some forestry practices have become controversial. Much of the controversy has stemmed from harvesting non-native and offsite plantations established in the CCC era. The monoculture plantations were/are often, but not always, rapidly declining due to a variety of disease and weather vectors. Overstory removals and clearcuts were used to promote and regenerate native forest species particularly with the intent of establishing at least temporarily, early successional habitat lacking on the New England landscape. The controversy has resulted in a suspension of timber sales statewide. As of this writing, there has not been a timber sale sold since November of 2008. Also, due to increased vocalization of forestry issues by stakeholders, the DCR instituted the Forest Futures Visioning Process (FFVP), to assist in the shaping of forest policy on state lands. The FFVP report and recommendations were released in April of 2010.

The State Lands Management program traditionally has generated revenue from the sale of forest products that has in recent years helped fund many aspects of the program. Due to the recent decline in revenues from timber sales and the suspension of funding that came from capital funds, Management Forestry views the Forest Assessment process as an opportunity to integrate program goals for mutual benefit.



The Bureau administers these lands in eight management forestry districts using the principles of ecosystem management in the context of a working forest. In contrast with traditional, production-oriented resource management, ecosystem management is a philosophical concept for dealing with larger spatial scales; longer time frames; and in which management decisions must be socially acceptable, economically feasible and ecologically sustainable. Rather than setting commodity-based targets, DCR defines desired conditions and develops strategies that lead to achieving them.

To achieve its mission of balancing social needs with ecosystem health, the program uses silviculture and other management tools to create a range of desired forest and non-forest conditions. These conditions and the management guidelines to achieve them are defined in the planning process. This process guides the programs activities and provides for the long-term stewardship of these valuable resources for this and future generations.

In 2005, the BOF Strategic Plan identified four strategic goals for State Lands Forest Management:

1. Complete Ecoregional Ecological Assessments, Resource Management Plans, and Prescribed Fire Plans

2. Manage Forest Lands

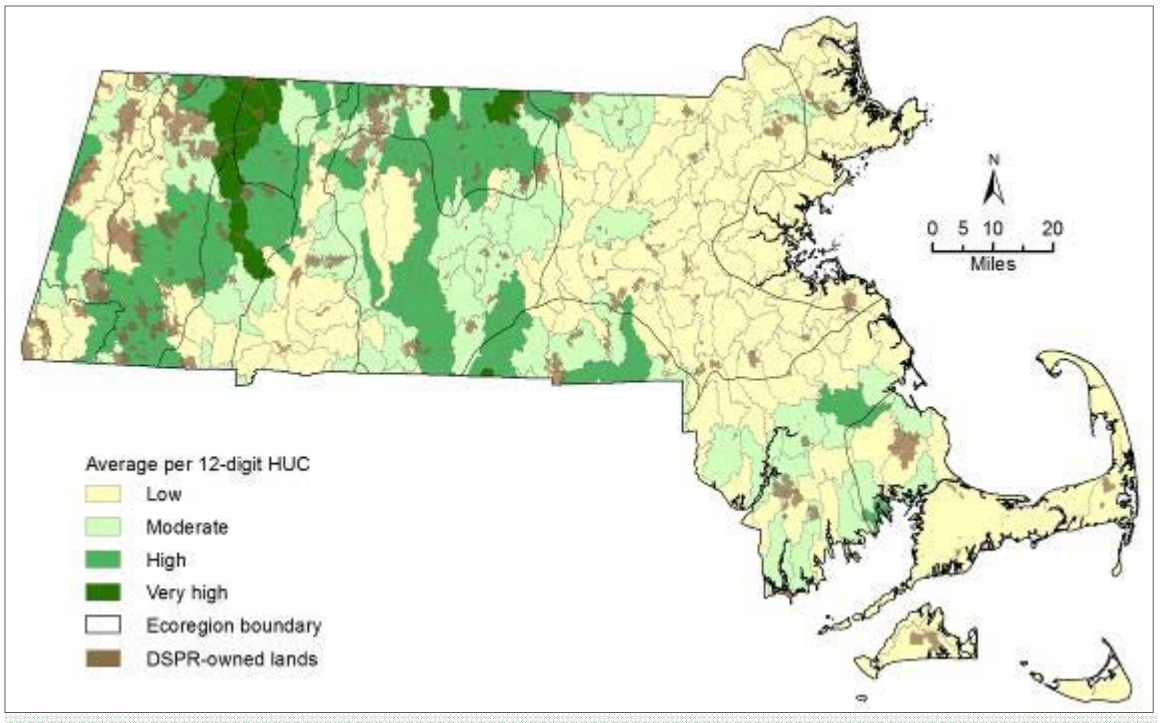
3. Maintain Forest Certification

4. Manage Forest Infrastructure

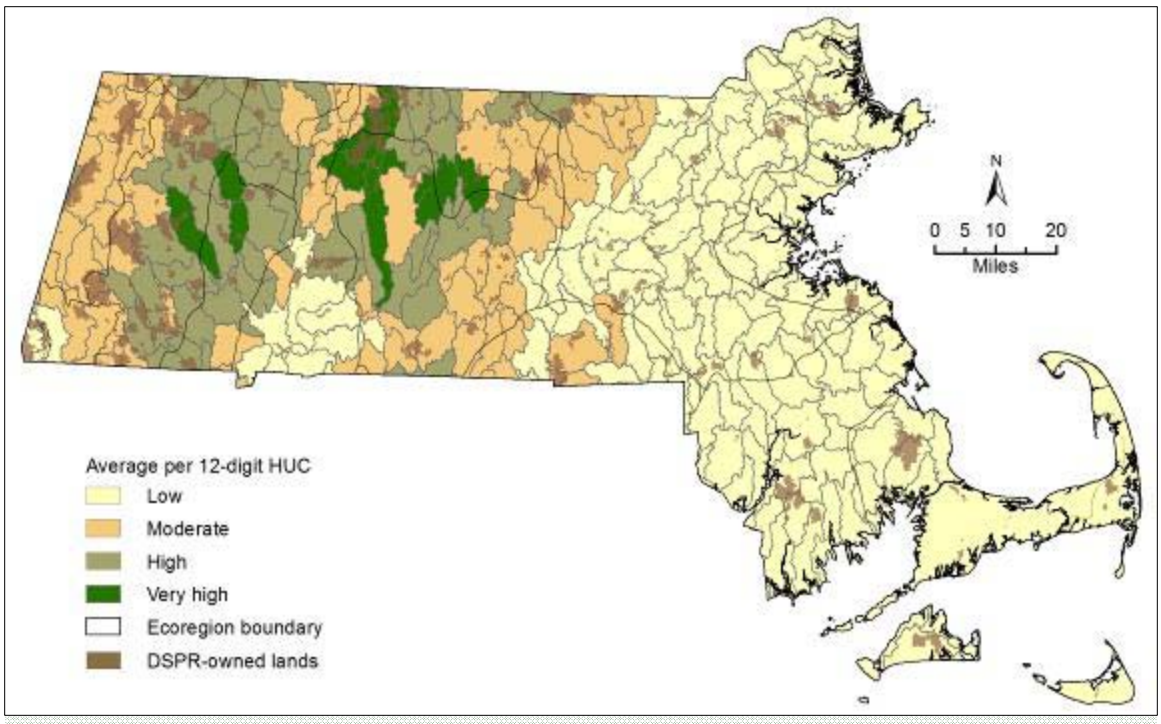
Outline of State Strategy Components

PRIORITY LANDSCAPE AREAS

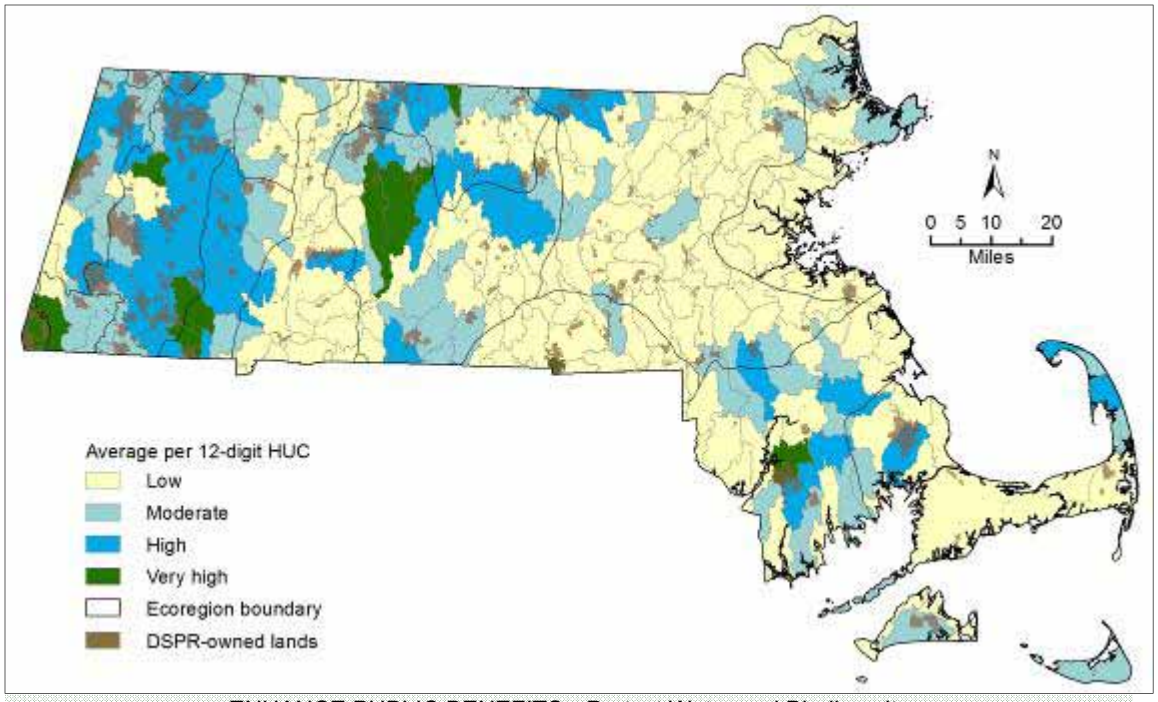
The summary forest assessment analyses evaluated how forests in Massachusetts contribute to the themes of "conserve working forests", "enhance public benefits from trees and forests" and "protect forests from harm". The following maps indicate the juxtaposition of DSPR state lands in the state and in relation to the analyses. From a State Lands Management perspective, the priority landscapes have been identified as those DSPR state lands within the range of moderate to high on the national themes analysis



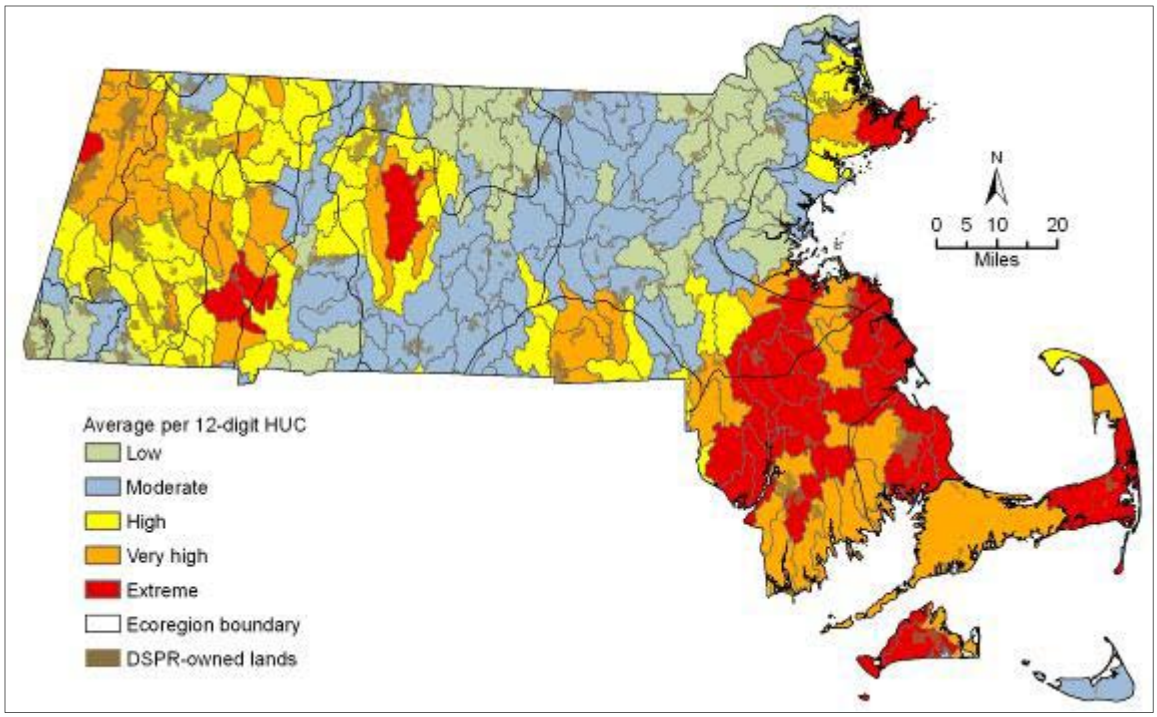
CONSERVE WORKING FORESTS - State Lands Priority Landscapes



ENHANCE PUBLIC BENEFITS—Working Woodlands Analysis
– State lands Priority landscapes



ENHANCE PUBLIC BENEFITS—Protect Water and Biodiversity
—State priority landscapes



Protect State Forest Lands from Harm—Priority landscapes at Risk

PRIORITY PROGRAM ISSUES AND OPPORTUNITIES
FOR THE MANAGEMENT OF PUBLIC LANDS

Priority 1

Conduct Balanced, Long Term, Sustainable Forest Management on State Lands -

Update (4) Existing and Prepare (4) Needed Forest Resource Management Plans that direct forestry on all 290,000 acres of DSPR

Criteria: All Criterion Apply

National Themes: All National Themes Apply

Strategy

- Remeasure permanent **Continuous Forest Inventory (CFI).** There are approximately 1,700 existing permanent 1/5 acre plots measured in 1960, 1965, 1980 and 2000. There is a need to expand the network by approximately 200 plots to account for lands acquired since the last measurement and for research purposes (see below). The MA CFI system, considered one of the oldest in the US, was originally developed with an emphasis on timber management. It has become a storehouse of information about forest ecosystem dynamics with the information being applicable to private forest lands as well.

The cascading benefits of measuring these plots include information for forest resource planning, carbon cycle research, and forest growth and succession studies. The single most expensive endeavor that the State Lands Management program will undertake. Conducting this one project dovetails with a multitude of issues and threats to state lands.

Funding Structure – CFI has historically been conducted by forestry staff and temporary forestry employees. That is not currently possible due to funding cuts, reduced staffing levels and changing staff demographics. In early 2009 DCR received a proposal of $937,000 to re-measure and collect data from about 1900 CFI plots.

Current Funding Levels $0

Decreased/Lost Funding - 2009 $200,000

Proposed allocation of resources:

- Conduct 1/3 - ½ of work with staff foresters
- Federal Funding for contract work: 1/3 – 1/2
- NGO/Non-profit grants for contract work: 1/3 – ½

Timeline

Summer 2010 - 2014

Partners and Stakeholders:

The Nature Conservancy

Harvard Forest

University of Massachusetts

MA Wood Producers

Priority 2

Protect rare species habitat and habitats of concern (wetlands and water resources including vernal pools and riparian areas); maintain ground and surface water quality while conducting forestry activity on state lands.

Criteria: Criterion 4: Conservation and maintenance of soil and water resources (Primary); Criterion 1: Conservation of Biological Diversity and Criterion 2: maintenance of productive capacity of forest ecosystems (secondary)

National Themes: Enhance Public Benefits from Trees and Forests, Protect Forests from Harm

Strategy

- Conduct rare and endangered species surveys habitat and wetlands inventories prior to forest management activity. Additionally, monitoring of harvesting results/ impacts and training of personnel should be an integral part of this strategy. The MA Natural Heritage and Endangered Species Program (NHESP), in the two years prior to 2010, was contracted by BOF to conduct surveys of wetlands, habitats and species occurrences on areas proposed for timber sale. This funding has been lost.

Funding Structure

Funding for this program activity was through a capital bond account that is no longer available to the BOF. Contracting with the MA NHESP to conduct surveys of species and habitats strictly on proposed harvest units would be the priority for funding. That is estimated at $12,000 per year. Ideally, entire large state forest or park properties where harvesting is anticipated should be surveyed. That cost is estimated to be $40 – 50,000/year.

Timeline

Annually 2010 – 2015

Partners and Stakeholders:

MA Natural Heritage and Endangered Species Program

State Forest and Park Friends Groups

Priority 3

Provide public outreach and informational services about forest management on state lands. Recent controversy about harvesting and forest management decisions on state owned lands have left the interested public with many questions. The public in MA desires to be environmentally conscious but chooses to import 97% of the wood. A better information stream that is proactive is needed at the BOF.

Criteria: Criterion 6: Maintenance and enhancement of long-term multiple socioeconomic benefits to meet the needs of societies.

National Themes: Enhance Public Benefits

Strategy

- Restructure the Forest Management web page, develop interpretive signs at state forests and parks positioned at recently harvested areas and areas that are reserved from harvest, and develop printed interpretive information/brochures for distribution at regional and park/forest offices. Each sub strategy should discuss the purpose of managing or not managing state forest land and the benefits and tradeoffs associated with the choices. Interpret forest ecology and silviculture. Informational materials should include a discussion of available tools for forest management on state lands including prescribed fire.

- Promote buy local wood products theme.

Funding - There has not been internal funding within the Management Forestry section of the Bureau of Forestry for this type of work.

Timeline

Annually 2010 – 2015

Partners and Stakeholders

University of Massachusetts

MA Woodlands Cooperative

DCR - Service Forestry

DCR - Forest Fire Control

MA Wood Producers

State Forest and Parks Friends Groups

Priority 4

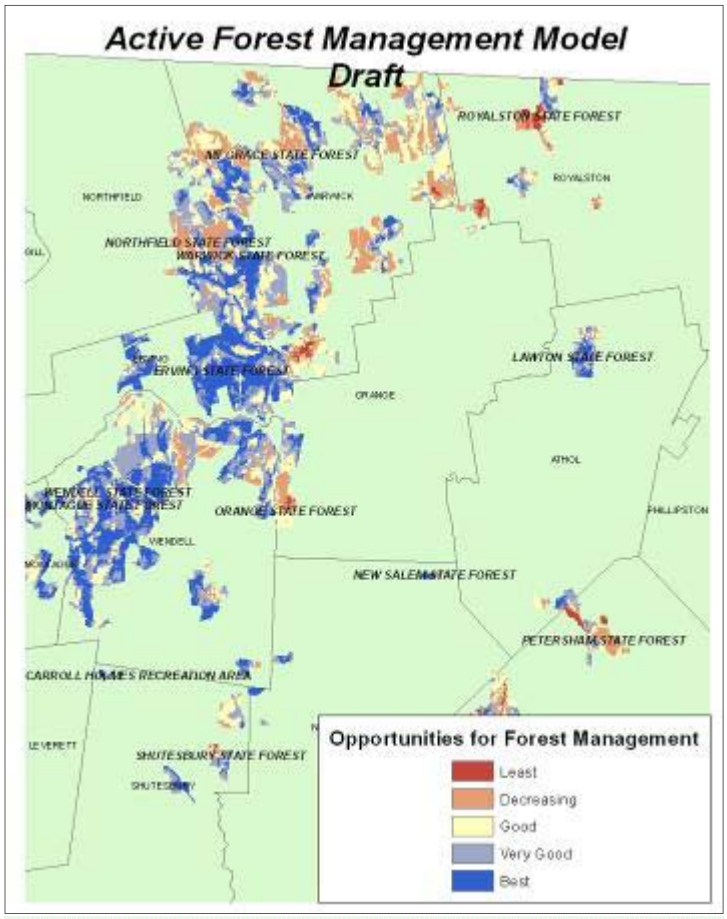
Within the framework of the Forest Resource Management Plans (Priority 1) appropriately allocate the state lands land base to working woodlands, forest reserves and parklands.

Criteria: Criterion 1: Conservation of Biological Diversity; Criterion 2: Maintenance of Productive Capacity of Forest Ecosystems

National Themes: Conserve Working Forests

Strategy

- Use data collected from CFI, remote sensing data, special habitat data and various other geospatial spatial data to allocate, optimize resource use on state lands. Use forestry optimization software to schedule sustainable even age and uneven age silvicultural treatments on the working landscape considering affects (benefits and costs) to all resources.



TOOLS FOR STRATEGY 4—Active Forest Management Model using Geospatial Technologies

Funding – There is no preexisting funding for this strategy within the priority; it is a new strategy. Optimization software that uses linear programming and geospatial technologies, such as Woodstock Spatial produced by Remsoft costs approximately $25,000.

Timeline – 2010 - 2015 Period of Continued Forest Management Planning; Project Level Planning

Partners and Stakeholders

Massachusetts Wood Producers

University of Massachusetts (teaching/research opportunities)

Priority 5

Control invasive exotic species on state forest lands.

Criteria: Criterion 3: Maintenance of forest health and vitality

National Theme: Protect Forests from Harm

Strategy

- Develop mechanism and policy within Forest Resource Management Plans that will use viable resources to manage invasive species.
  - All timber sale contracts provide for prevention and control measures
  - Train DCR personnel to identify and treat invasive species
  - Develop policy for Parkland and Reserve Areas to be inventoried

Funding - There has not been internal funding within the Management Forestry section of the Bureau of Forestry for this type of work. Often invasive species control has been done with timber sale revenue. Outside funding will be needed to make concerted efforts to control invasive species on lands classified as reserves and parklands

Timeline

After rezoning of state lands – 2011 – 2015

Partners and Stakeholders

- University of Massachusetts - training in identification
- US Fish and Wildlife Service – training and identification
- Friends Groups of State Forests and Parks – assistance in identification

Priority 6

Stabilize and prevent further degradation of the forest road and trail system on state lands. An extreme need for maintenance and reconstruction has been indicated from the ongoing inventory of the state lands road and trail system.

Criteria: Criterion 4: Conservation and maintenance of soil and water resources

National Theme: Enhance Public Benefits

Strategy

- Complete Road and trail Inventory
- Partner with forest and park managers (recreation) to close trails
- Stabilize road surfaces through maintenance and closure (gates and other structures)
- Improve roads in active forestry activities

Funding - Funding was historically provided through capital bonds and retained timber sale revenues. Both funding sources have been eliminated. Funding of seasonal employees and/or contract labor is needed to assist in the completion of the road and trail inventory. Forest road infrastructure maintenance funding from external sources is needed.

Timeline

Annually 2010 – 2015

Partners and Stakeholders

- Municipal Water Suppliers
- Division of State Parks Hierarchy - *funding, scheduling, prioritizing*
- Bureau of Fire Control – *access prioritizing*
- State Forest and Parks Friends Groups

Ware River DWSP

Service Forestry

MISSION STATEMENT

to encourage forest conservation (management and protection) primarily through the promotion of sustainable forest management on private, municipal, and conservation organization forest lands, and through land protection on private lands by:

- Carrying out statutory and regulatory mandates
- Providing leadership in forestry program and policy development
- Providing technical assistance and educational programs

PROGRAM OVERVIEW:

Currently, 63% of Massachusetts (3.187 million acres) is forested. The vast majority of forest land (70%) is privately owned by an estimated 212,000 individuals and enterprises and approximately 47,000 landowners with 10 or more acres (Forest Resources of Massachusetts, 2000, USFS FIA 2006, UMass Study). The future of our ecosystem benefits depends upon the collective decisions of these landowners. Each day, Massachusetts loses 22 acres to development (MassAudubon 2009). The Service Forestry Program seeks to inform the decisions of woodland owners, through a wide range of statutory and incentive programs, in order to protect and conserve our forest resources.

Early in the 20th century the Commonwealth recognized the importance of forest land and the critical nature of private lands through legislation that created regional state forestry committees to develop standards to reduce destructive logging practices (1941) and that provided free outreach and education to private land owners in what was the beginning of the Service Forestry Program (1904).

Today, the focus of the program builds upon the tradition of conservation by providing a first line of contact to landowners and municipal officials regarding forestry programs, land conservation options and timber harvesting. Whether providing information on various incentive programs, ensuring sustainable harvesting through the regulatory oversight of commercial timber harvesting or connecting landowners and land trusts, Service Foresters create a direct link between landowners and the conservation of the forest resource in Massachusetts.

Figure 1: Tom Ryan, Service Forester, meeting

The primary focus of the program is the administration of two regulatory programs complimented by a focus on education:

1. The Forest Cutting Practices Act, which ensures soil and water quality protection during timber harvesting
2. The current use program, which reduces property taxes on forestland when the landowner makes a commitment to sustainable forest management through a 10-year forest management plan.
3. Education to guide the forest management and land protection of landowners through one-one-one assistance and educational programs as well as assistance to municipalities and conservation organizations.

The Service Forestry Program also serves the public through a variety of programs, partnerships and initiatives designed to conserve working forests, encourage sustainable resource management and enhance public benefits from forests such as:

1. The Working forest initiative
    a. Forest Viability
    b. Carbon Trading
    c. Forest Stewardship
    d. Estate Planning
2. FSC Green Certification
3. 'Buy Local' for working forests in partnership with Mass Dept. of Ag Resources and the Mass Farm Bureau
4. Licensing of Timber Harvesters
5. Natural Heritage and endangered species Liaison program
6. Cooperation with NRCS on the delivery of EQIP and WHIP forestry practices
7. Talks/Presentation/Workshops for landowners, community leaders and land trusts
8. Outreach partnership with UMass Extension to inform landowner decisions through programs and internet based tools

PROPOSED PROGRAM PRIORITIES FOR AREAS IDENTIFIED THROUGH THE STATE ASSESSMENT PROCESS

It is clear that in a state that is both densely populated and provides a high percentage of forest cover, that great opportunities and challenges are present for woodland stewardship.

Massachusetts is divided both colloquially and by the degree of urbanization into two distinct regions, eastern Massachusetts and western Massachusetts (Figure 2.). These regions are in effect mirror images of each other. In eastern Massachusetts there is a high degree of vulnerability and a moderate to low degree of forest functions. In western Massachusetts the converse is true, vulnerability is low (from a relative scale) and forest functions, benefits and values are high. A visual representation of this divide is clearly shown in the GIS overlays created during

the state assessment process. This distinction means that different tools will be needed in western Massachusetts and eastern Massachusetts to be effective. It is from this perspective that priority areas and outreach strategies are focused for the Service Forestry program into landowner outreach and community outreach.

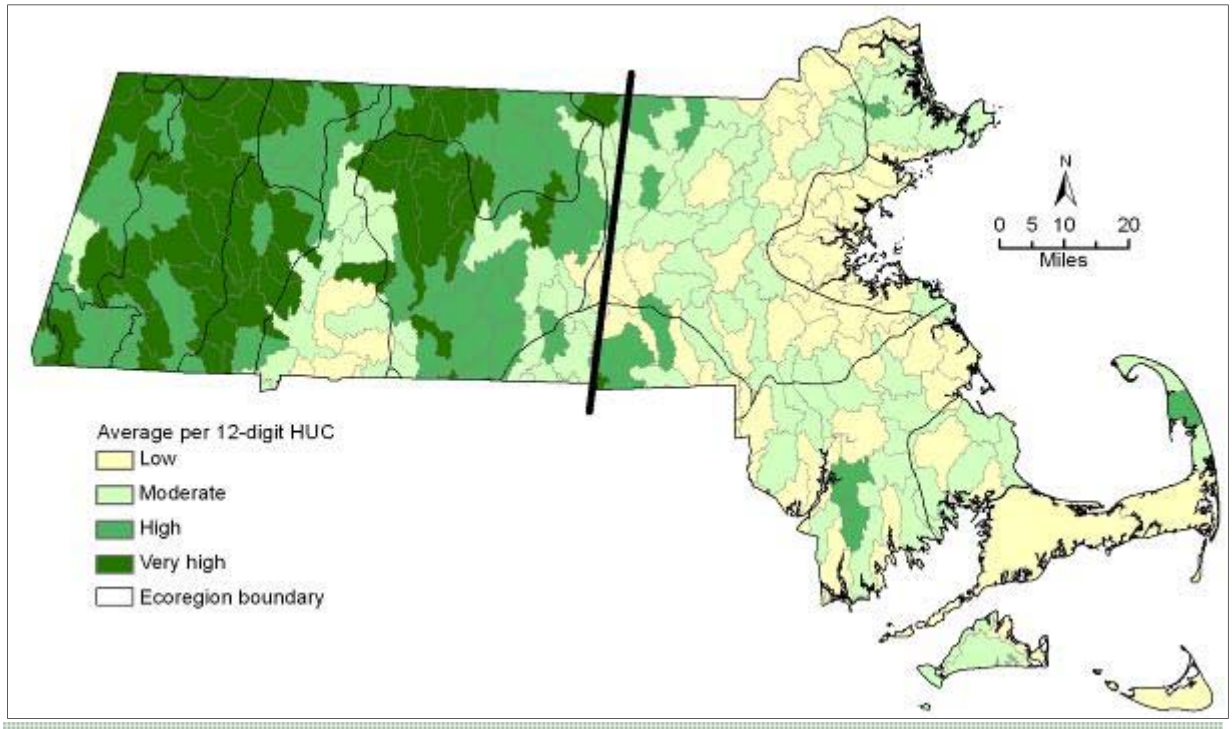


Figure 2: Forest Functions Benefits and Values analysis shows the distinction between eastern and western Massachusetts

LANDOWNER OUTREACH AREAS

Where larger forest blocks are present, there is evidence of active forest management (current use, stewardship, harvesting plans), and significant areas of unprotected forest there is high potential for forest conservation through a variety of programs and networks.

A closer examination reveals much of this area in the western part of the state as well as a small band in the southeast near Cape Cod (Figure 3.). In these areas outreach will be focused on programs and tools to engage private woodland owners through a suite of methods designed to cover traditional one on one outreach as well as new technologies and social networks that may effectively reach larger groups of landowners.

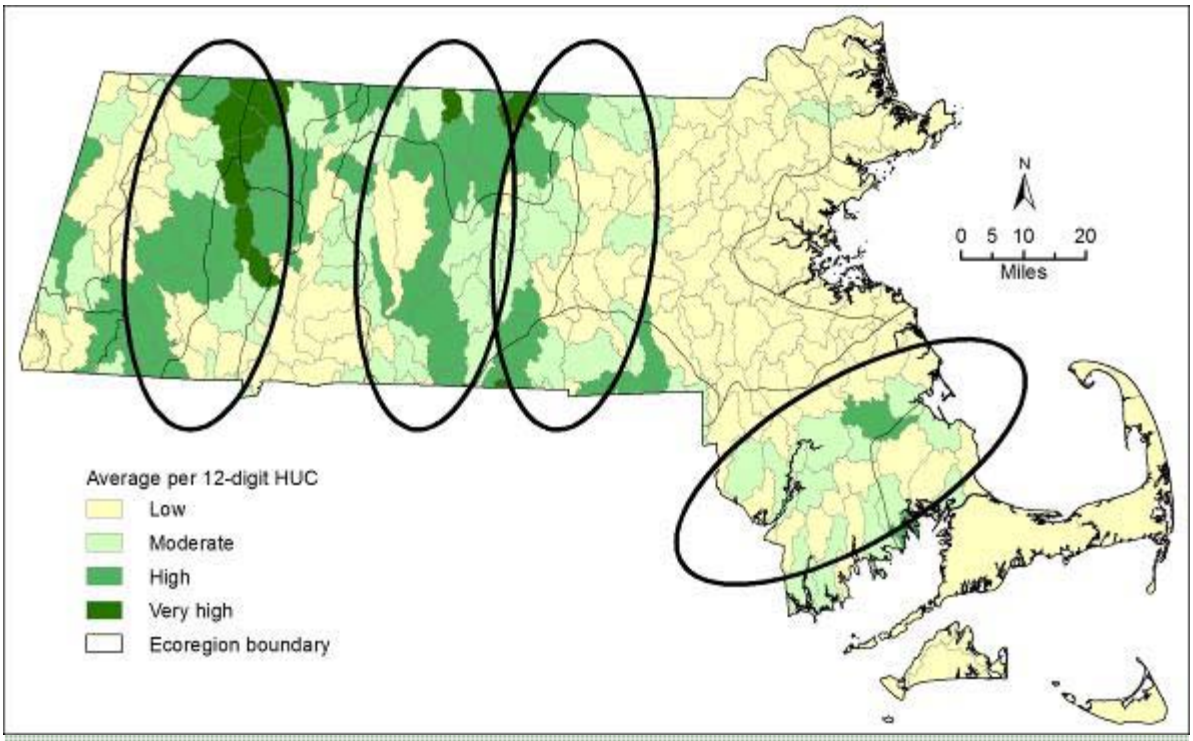


Figure 3: Conserving working forests: Priority areas for landowner outreach and landscape level projects.

Landowner Outreach Priority Areas by ecoregion

- Berkshire Uplands
- Central Uplands
- Western portion of Coastal Plains and Lowlands
- Narragansett Bristol Coastal Lowland and Islands

COMMUNITY OUTREACH PRIORITY AREAS

The eastern third of Massachusetts is more densely populated with smaller parcel size (Estimating Ownerships and Parcels of Nonindustrial Private Forestland in Massachusetts, Kittredge et. al. 2008). Although traditional forest management still occurs in this region there tends to be less infrastructure in terms of mills or loggers, in general public attitudes toward traditional land management activities are lower and development pressures are high.

In the areas where forest vulnerability is shown to be high to very high, priorities will include both traditional landowner outreach as well as an increased focus on municipal lands and land trust land. In this region municipal and land protected b y local land trusts tend to be the larger forest blocks. It is also these owners that have the highest potential to influence the citizens of eastern Massachusetts of the values benefits and resources of our forests.

Objectives for outreach in this area include finding ways to connect the public to their forest resource and all of the services it provides as well as maintaining enough forest cover to continue to provide ecosystem services. Success will also help to maintain the existing industry infrastructure so that forest management remains an option. In these areas there will be an emphasis on partnering with municipalities, land trusts and the Urban and Community Forestry program.

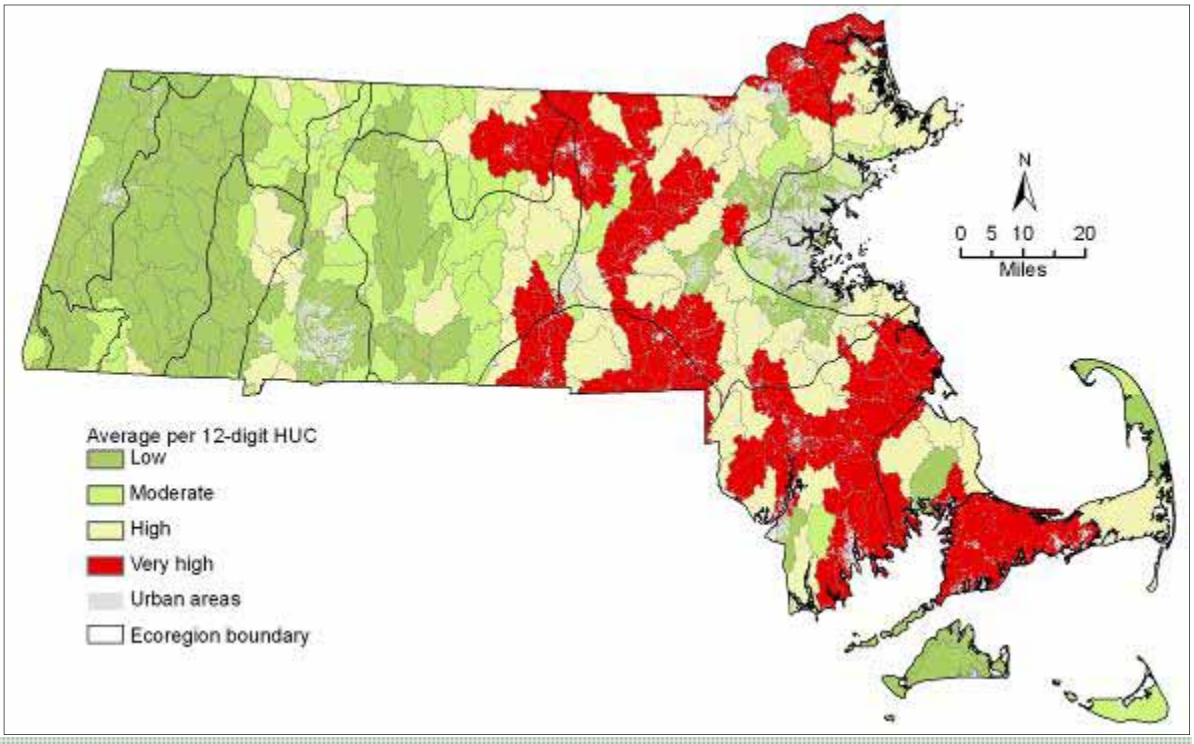


Figure 4: Forest Vulnerability indicates priority outreach for communities as well as individual woodland owners

Community Outreach Priority Areas

- Coastal Plains and Lowlands
- Other at risk communities as well as the urban rural interface

PROGRAM PRIORITIES

Many of the program's priorities are interrelated and focus on multiple pathways for citizen engagement. The Service Forestry program strives encourage participation by those new to land stewardship as well as continuing to foster existing relationships to provide avenues for a deeper stewardship connection.

The Service Forestry Program relies on both federal and state money for landowner assistance programs. In order to more effectively reach as broad an audience as possible, it is paramount that these services are coordinated with other Bureau programs as well as external organizations with similar missions, such as UMass extension and the land trust community. It is also important that the Service Forestry Program continues to communicate and foster relationships among landowners, foresters, wood producers and harvesters to achieve consistent messaging, reduce time spent on regulatory functions and to maintain ecosystem services.

- Increase the amount of private forest protected from development and managed for long-term multiple objectives.

  - Criteria: C1, C2, C6, C7
  - National Theme: Conserve Working Forest Landscapes

  Strategy: To increase the promotion of working forest conservation through a variety of outreach programs such as estate planning, current use tax programs, buy local initiative and neighbor-to-neighbor networks which provide landowners options, tools and guidance for land conservation.

  In addition, technical assistance to community leaders will be provided to encourage forest conservation. This includes working at the community level with municipal officials to help promote policies that support working forests (e.g., Ch. 61 ROFR) and connecting citizens to their local forest resource.

  All outreach programs will continue to be offered statewide, however, program promotion geared toward private landowners will focus on forest land in the Berkshire Uplands and Central Uplands as well as the western region of the Coastal Plains and Lowlands.

  Funding Source: Variety of state, federal and cooperation (in-kind) with non-profits and private sector

  Funding Needs: maintenance of state bond money or equivalent, additional funding (minimum of $40,000) needed to expand programs. The maintenance of adequate staffing is critical.

Example: Estate Planning

Intergenerational transfers of forest land will occur at an unprecedented rate as over one-third off forest owners, who own 44% of forestland in the US, are 65 years old or older. Addressing this intergenerational transfer of forest land is the one of the greatest challenges facing forest conservation efforts, one that will determine the viability of forest management and the ecosystem services our forests will provide in the future.

"Your Land, Your Legacy: Deciding the Future of Your Land to Meet the Needs of You and Your Family" Photo credit: B. Labrie

In Massachusetts, we are facing this challenge head-on with a new three-year initiative using a diverse partnership to reach landowners with conservation based estate planning information. This effort, funded by MA DCR's Service Forestry program, is a partnership of UMass Amherst, The Trustees of Reservation, and Mount Grace Land Conservancy. Included in this initiative is the development of a publication for landowners on conservation based estate planning which will include information on: family communication, estate planning professionals, as well as legal instruments and land protection tools. The initiative also includes a significant investment in outreach which will include peer learning programs and internet based information. Service Foresters will be trained in basic estate planning and work collaborative with the partnership to help inform the decisions of the landowners deciding the future of our forests. The goal of this initiative is to provide landowners the information they need to plan their land's future in a way that will meet their family's needs while maintaining forest cover.

- Provide access to and development of incentive programs to promote forest conservation, help mitigate adverse effects of climate change and support forest-based rural economies

- Criteria: C1, C2, C4, C4, C5, C6, C7
- National Theme: Enhance Public Benefits from Trees and Forests
  Conserve Working Forest Landscapes

Strategy: Provide leadership to increase landowner knowledge on how sustainable forest management can increase forest resistance, resilience, and adaptation to climate change while meeting the social and economic goals of communities.

Current projects include providing access to carbon trading markets for private landowners and municipalities, a forest viability program to encourage forest based businesses, green certification and a buy local forest products program. In the future we will continue to explore new outreach program possibilities including REDD+ as well as the potential retool existing programs, such as current use, to be more effective.

All incentive programs will continue to be offered statewide, however, program promotion will focus on forest land that falls within or adjacent to priority landscapes as identified by the state assessment process.

Funding: State and Federal

Funding Needs: maintenance of state bond money or equivalent. As new programs are explored a more adequate funding picture will become clear. The maintenance of adequate staffing is critical.

- Explore and implement new technology to reach a broader landowner audience, to respond effectively to environmental concerns (such as invasive pests) and to evaluate program effectiveness.
  - Criteria: C1
  - National Theme:
    Enhance Public Benefits from Trees and Forests

  Strategy: Engage in web based outreach through active participation in and support of various web based technologies. Current projects include collaboration with UMass on MassWoods and MassAcorn as well as exploring crowd sourcing through smartphone applications.

  Funding Source: State, Federal and private grants

  Funding Needs: $40,000 - $50,000

- Connect people with their natural environment through multiple resource management plans on both private and municipal forest land.

  - Criteria: C1, C2, C4, C6, C7
  - National Theme:
    Conserve Working Forest Landscapes

Strategy: Build support for Forest Stewardship Program to ensure continued program funding. Explore landscape level or joint plans between neighbors or neighborhoods. Continue to offer individual plans that serve as an access point to other programs and incentives.

Encourage the participation of municipalities in the Forest Stewardship program. Town forests and watershed lands are an important community resource for multiple values. They can serve as a bridge to tie the community to all of the resources their forests provide, including a local source of wood products.

Partner with nonprofit organizations, land trusts and municipalities to connect sustainable forest management practices to long-term watershed health and a variety of ecosystem services.

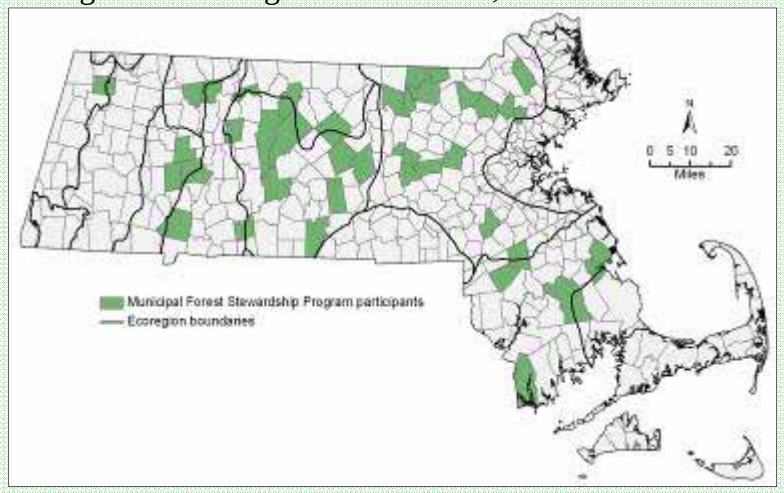
Example – Forest Stewardship Program

Increasingly, forward thinking communities are beginning to take on the role of forest stewards, and as a result have begun managing their forestland as "community forests". In the town of Sturbridge MA, community leaders have a long history of forest protection rather than multiple resource management.

Now through the hard work of a conservation agent trained through the Keystone program, examples set forth by other communities and financial incentives provided by the Forest Stewardship Program community leaders are taking fresh look at their forest resource.

Important elements of the story include:

- Community Forests can be a valuable component of economic development strategies by expanding the assets of a community. They can create revenue and jobs, protect ecological services, and provide a resource base for economic activity
- The importance of strong leadership furthering the well-being of the whole community and achieving community goals
- The importance of government programs and legislative instruments such as the Forest Stewardship Program and the 2008 MA Environmental Bond Bill
- The cooperation and coordination of partners from both the private and public sector for instance conservation restriction held by Division of Fisheries and Wildlife; forest planing funding made available through the Working Forest Initiative; MA licensed consulting forester
- The Community Forest can provide support for other community priorities such as education and recreation.



Work with social marketing techniques to reach underserved populations, older landowners, those new to landownership or land management and especially those that have not yet been engaged by traditional forestry programs.

Management plans will continue to be an important tool on a state level; however, program promotion will focus on high priority areas within the Landowner and Community outreach areas as identified above.

Funding Source: State and Federal

Funding Needs: Maintenance of state bond money or equivalent. Additional funding required to achieve landscape level or neighborhood planning.

- Work with partners such as NRCS to encourage landowners to implement forest management plans.
  - Criteria: C2, C7
  - National Theme:
    Conserve Working Forest Landscapes

Strategy: Continue to work with partners to provide landowners information and tools to implement their forest management plans.

Funding Source: Federal and state
Funding Needs: maintain adequate staffing

- Improve compliance with the Forest Cutting Practices Act and associated laws and regulations while decreasing regulatory oversight.
  - Criteria: C4, C6, C7
  - National Theme:
    Enhance Public Benefits from Trees and Forests

Strategy: The Forest Cutting Practices Act is essential to protecting soil and water quality, socioeconomic benefits and sustainable management however, effective administration is paramount to achieving many other priorities.

Methods will be explored to stream line the regulatory process and emphasis will be placed on ensuring adequate staffing. Best Management Practices (BMP) monitoring protocol will be employed as feasible to quantify success.

Funding Source: State and Federal

Funding Needs: The program is currently not adequately staffed due to retirements. Funding will be sought to hire 2 service foresters to ensure that the Forest Cutting Practices Act is being fully implemented and to allow adequate staff time to focus on other program priorities.

- Implement the Massachusetts Endangered Species Act more efficiently through the Natural Heritage Liaison process and the development of Rare Species Conservation Management Practices.
    - Criteria: C1
    - National Theme:
      Enhance Public Benefits from Trees and Forests

  Strategy: This program involves training service foresters to be a bridge between forest landowners and the Natural Heritage and Endangered Species Program (NHESP) at the time of management planning or implementation. With specialized training regarding at risk species service foresters can help landowners achieve their management goals while protecting vulnerable species. Service Foresters also collaborate with NHESP to develop standard Conservation Management Practices (CMP's) that provide a basic framework for the protection of a specific species during timber harvesting.

  Funding: This program has been funded through a combination of state agency programs including the Bureau of forestry budget; however, recent state cut backs have reduced the ability to continue fully with this program. In the future we will seek to restore prior state funding as well as explore other avenues for funding.

- Increase involvement with CR monitoring and forester training to monitor CRs
    - Criteria: C1
    - National Theme:
      Enhance Public Benefits from Trees and Forests

  Strategy: The need for monitoring Conservation Restrictions (CR's) is an ongoing problem for agencies and land trusts. Foresters have the field skills and are familiar with land use issues potentially encountered during CR monitoring. Service Foresters have the added advantage of experience and competency when dealing with regulatory land use issues.

  Work with state agencies, land trusts and private foresters to explore individual entities need for and interest in using either state or private foresters for CR monitoring. Provide training for foresters in reading and understanding CR language.

  Funding: State and Federal

  Funding Needs: Maintain adequate staffing. Additional funding needed for training.

Forest Health

Misty Morning Near Quabbin Reservoir

DWSP

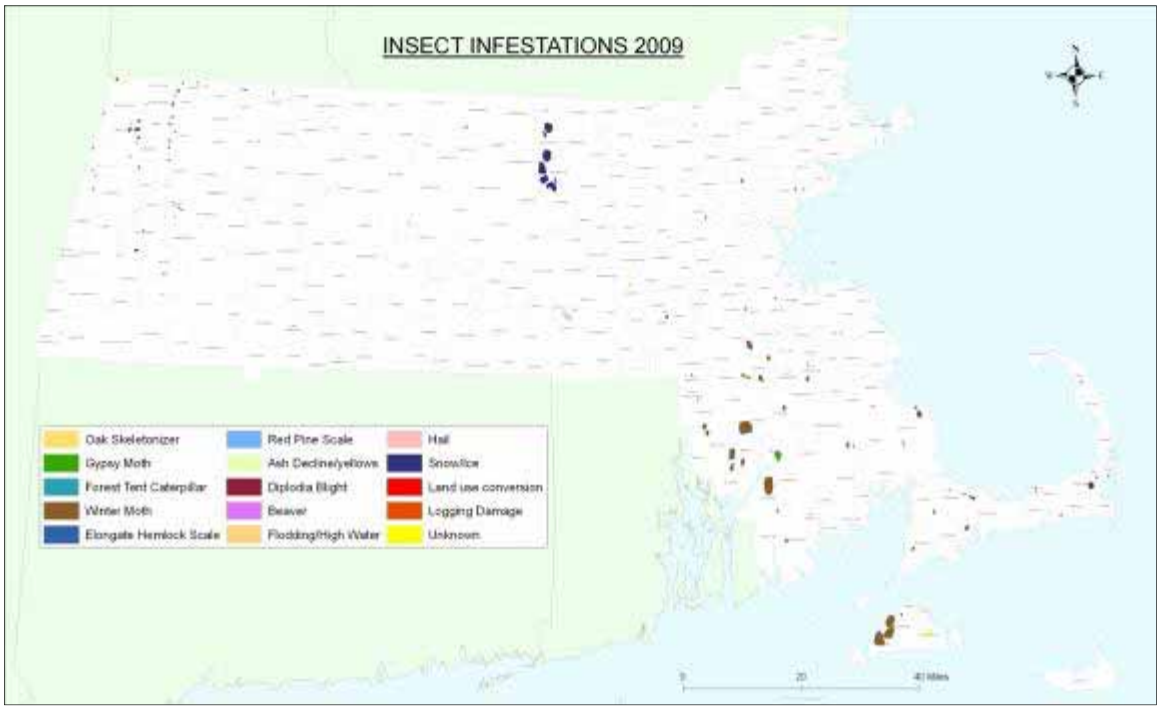
MISSION STATEMENT:
To monitor, assess and report on woodland and urban forest health conditions within the Commonwealth's forests. When warranted and appropriate institute proper control measures to protect the forest resources. Maintain state forest and park recreation areas using in-house and contracted tree crews to minimize tree hazards. Respond to tree related natural disasters.

PROGRAM OVERVIEW:
The Forest Health Program works in cooperation with a variety of partners including the USDA Forest Service (USFS), Animal Plant Health Inspection Service (APHIS), and the University of Massachusetts Extension Program to protect the Commonwealth's forests. Currently there are several main stressors affecting the state forest resources including; gypsy moth, hemlock woolly adelgid, winter moth and the recent discovery in August 2008 of Asian Longhorned Beetle in Worcester and several surrounding communities. Exotic invasive species pose a major threat to Massachusetts forests. Working cooperatively with the USFS, the Forest Health program has several ongoing long term forest health monitoring projects including gypsy moth population trends using a system of 85 monitoring plots throughout the state (30+ years ongoing); North American Maple Project, NAMP (ongoing); Urban Forest Health Monitoring Project (6 years); Forest Health Monitoring Project (10 years); Sudden Oak Death Monitoring Project (6 years) and several projects including hemlock woolly adelgid monitoring, beech bark disease monitoring and emerald ash borer monitoring. The DCR Forest Health Program continues to be the lead state program in the eradication of Asian Longhorned Beetle efforts being conducted in Massachusetts.

In addition the Forest Health Program cooperates with other state, federal and private entities working to promote good forest health practices by supporting and producing ongoing workshops, educational seminars and publications. Using USFS funding the Forest Health Program has initiated and printed technical assistance publications for distribution among public and non-public entities. These include:

- Guide to Common Tree Insects and Diseases
- Cultural Practice Problems of Trees and Shrubs in the Landscape
- Homeowners Guide to Hazardous Trees
- Common Trees of Massachusetts Forests
- Helping Trees Recover from Stress
- and many related forest "Pest Alerts"

***2007 oak/maple mortality on south shore detected through aerial survey**



PROGRAM PRIORITIES

- **Monitor the Commonwealths urban and rural forests using a system of aerial and ground survey techniques.**
  Each year the Forest Health Program using USFS provided funding conducts aerial surveys to determine large scale defoliation and mortality events in Massachusetts. These surveys are generally conducted during the early part of the growing season (late May – early July) to identify damage caused by tree insect and disease defoliators. Other defoliation events such as weather damage, large scale logging/land clearing operations or natural processes are also mapped. Surveys are conducted using the current sketch mapping technology provided by the USFS with collected data reported back to the USFS for inclusion in national forest health maps. In addition DCR Forest Health Program staff ground truth areas mapped to determine the causes for the defoliation. Using this compiled data the USFS and the DCR Forest Health Program can provide information and make predictions on the health of the state's forest resources.

  Current Funding: Same as above.

  Additional Funding: The forest health program with additional funding would increase the frequency of aerial surveys with the inclusion of special surveys to detect the presence and distribution of spring defoliators such as Winter moth as well as late season defoliators i.e. Saddled prominent. Currently the Forest Health Program is surveying for early season defoliation for Winter moth. This work is to map out the increased distribution and related mortality attributed to the spread of WM.

Participate in region wide USFS sponsored forest monitoring programs to identify and report on the health of Massachusetts forests.

The DCR Forest Health Program has for many years been a cooperator with the USFS on different forest monitoring projects. This monitoring has been used to address different aspects of forest health including the long term effects of insect defoliators on tree health, acid deposition effects on forests, and locating exotic insect and disease populations before they can get established in a location. Some of this monitoring is still ongoing such as the Gypsy moth monitoring plots which have been done in the state for more than 35 years. Using a system of plots throughout the state the Forest Health Program determines the density of Gypsy moth in areas which is then used to predict future defoliation events. Other USFS sponsored monitoring projects completed in Massachusetts by the DCR Forest Health Program include:

- North American Maple Project (NAMP)
- Forest Health Monitoring Project (FHM)
- Urban Forest Health Monitoring Project
- Sudden Oak Death Monitoring Project (SOD)
- Early Detection Rapid Response Project (EDRR)
- Bio-surveillance for Emerald Ash Borer using the *Cerceris* wasp

- Winter moth monitoring
- Sirex noctilio surveillance/trapping
- Xyleborus seriatus Scolytid beetle delineation surveys
- Impact monitoring plots for HWA and Beech Bark disease

Current Funding: Annually the Forest Health program using various monitoring techniques and continues the NAMP, EDRR, Impact, bio-surveillance and Winter moth programs. In 2005 using the EDRR program Xyleborus seriatus was discovered as a new introduction to the US in one of the DCR deployed traps. The Forest Health program continues to work with the USFS on various X. seriatus projects including delineation surveys, fungal cultures, and host specificity.

Additional Funding: With increased funding the Forest Health Program could expand its Cerceris wasp bio-surveillance for Emerald Ash Borer. As the threat of EAB becomes closer to Massachusetts early detection and rapid response is key to preventing the establishment of this pest which would potentially alter the forest composition. In addition the Forest Health Program would increase the intensity of its trapping for exotic/invasive pests and diseases. For example redeploying SOD stream baiting traps in high risk areas would help to protect the oak resources of Massachusetts.

The Forest Health Program is the lead state DCR division in the Asian Longhorned Beetle eradication efforts in Worcester County.

Asian Longhorned Beetle was discovered in August 2008 in Worcester County. The Forest Health Program is working cooperatively with the USDA Forest Service and APHIS to eradicate this serious invasive pest from Massachusetts. Using federal APHIS funding the Forest Health Program has currently hired 9 full time employees who work exclusively on the ALB program. In addition the forest health program provides one state funded, full time lead forester to act as the state program director. When necessary, additional Forest Health staff will assist in ALB duties. Current USDA APHIS cooperative

funding also provides dollars for additional Forest Health staff will assist in ALB duties. Current USDA APHIS cooperative funding also provides dollars for DCR hiring additional tree climbers and foresters who will assist in the eradication efforts. The DCR is also going to manage the eradication program wood disposal site starting September 2010. This involves the purchase of heavy wood reduction equipment and staffing to operate the equipment. Forest Health also cooperates with the DCR Urban Forestry Program as part of the reforestation efforts. The Urban Forestry Program has received 4.5 million dollars in federal stimulus monies for replanting in the ALB areas and the Forest Health program assists with this initiative. The ALB eradication in Massachusetts is at a minimum expected to last 10 years and will require a DCR Forest Health presence throughout the life of the program.

Work in cooperation with the USFS to monitor for Hemlock Wooly Adelgid, release predators and possible parasites and diseases that affect HWA; develop and assist with hemlock forest management decisions.

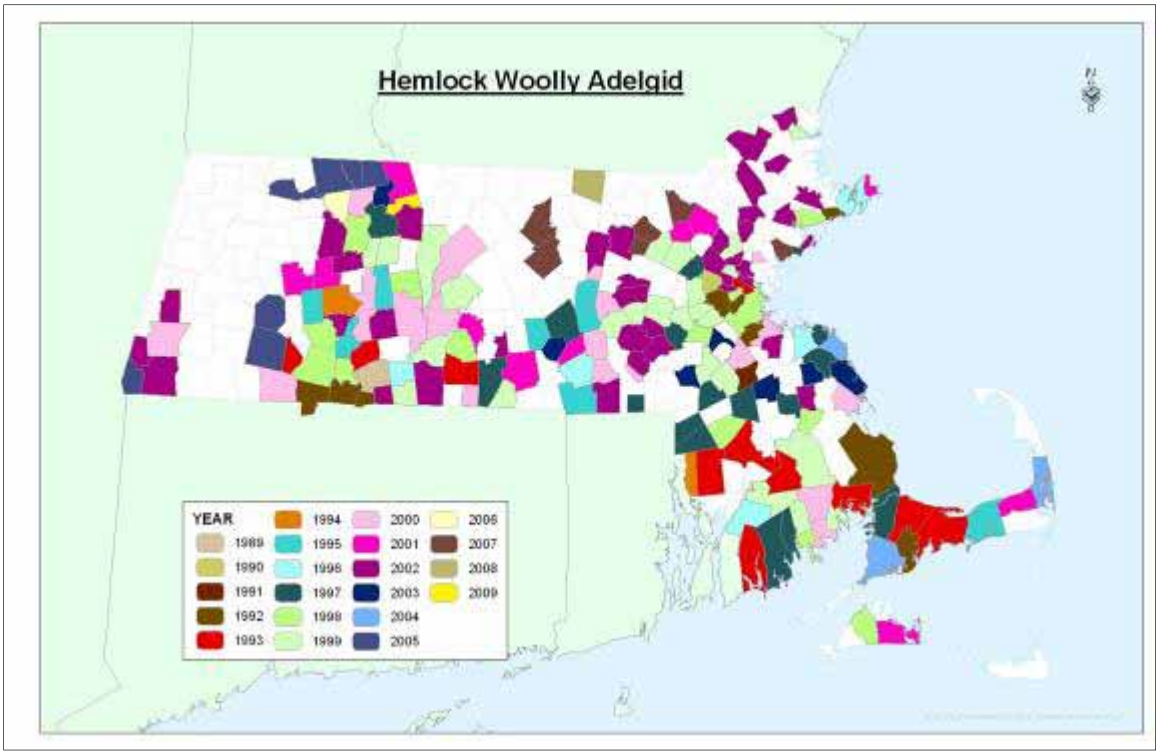
Hemlock wooly adelgid is a serious threat to Massachusetts forests. Since the original find of HWA in Springfield in 1988 this pest has been located in every county of the state. It continues to spread, although much slower than originally predicted, to newer hemlock stands each growing season. HWA has not outright killed hemlock stands in the state but has weakened them considerably and aesthetically disfigured them. The DCR Forest Health Program has worked cooperatively with the USFS to release two different predatory beetles with the hope of establishing a population. Recent releases of the predatory beetle *Laricobius nigrinus* has had limited success to date. Finding the beetle in release areas in post release monitoring is necessary to determine whether or not it has been permanently established. In addition the Forest Health Program works with public and private entities educating them on HWA issues and continues to cooperate with the USFS on new and innovative techniques for HWA control.

Currently there are two main concerns related to HWA the Forest Health Program needs to address. The first is the large scale preemptive cutting of hemlock stands that's being recommended by foresters in the state. In states south of Massachusetts HWA has and continues to be a primary effect in the death of hemlock. We are not seeing that in Massachusetts. This could be due to climatic differences and cold weather caused dieback of HWA. But we're also seeing what we believe to be is genetic resistance to HWA building up in hemlocks. Hemlocks in infested areas are not in perfect health but they continue to survive with moderate populations of HWA and have done so for many years. That's not to say this could all change with the potential for global climate change but the Forest Health Program believes more research is needed into this aspect of hemlock health in the state. Also the occurrence of the non-native Elongated Hemlock Scale (EHS) needs additional research into the long term effect on hemlock. Elongated Hemlock Scale continues to be found in stands throughout the state generally following HWA outbreaks.

Current Funding: To date the Forest Health program has released two different species of predatory beetles throughout the state of Massachusetts in HWA infested stands. Fol low up monitoring is done subsequent years after initial release. Hemlock stands are con-

continually monitored for the presence of HWA especially in areas on the northern borders adjacent to Vermont and New Hampshire.

Additional Funding: With additional funding the Forest Health Program would increase the number of bio-control release site in order to control and limit the spread of HWA. Also increased funding would allow additional outreach and education on HWA and EHS issues.



Work in cooperation with the USFS and the University of Massachusetts to monitor for Winter moth and release predators and possible parasites of WM, Develop and assist in forest management decisions regarding affected tree hosts.

Winter moth is a serious threat to Massachusetts forests. Currently it is established in the eastern section of the state. It is responsible for annual large scale defoliation and mortality events predominantly in the south shore. Current research is being conducted at the University of Massachusetts on bio-controls using the parasitic fly *Cyzenis albicans.* The Forest Health program provides partial funding for the rearing and release of the parasitic fly throughout the state. In addition the Forest Health Program does aerial surveys for WM damage.

Current Funding: Same as above

Additional Funding: With increased USFS funding the Forest Health Program could provide additional support to the University of Mass. for bio-control releases within the state. Also an annual dedicated aerial survey for Winter moth could be conducted. Additional Forest Health staff time could be allocated to help with conducting WM monitoring surveys.

Provide workshops and training in woody plant diagnostics, insect and disease identification and control, hazard tree mitigation, arboricultural techniques including tree pruning, planting and proper cultural practices. Provide ongoing training to staff members to keep them up to date on current insect and disease issues.

The Forest Health Program provides training to public and private entities on various woody plant issues. The program offers these trainings as a way of encouraging better stewardship of the land and environmental awareness from participants. In addition more people trained in identifying exotic insect, diseases and plants offers a better chance for earlier detection. Trainings are offered in a variety of settings which includes seminars, powerpoint presentations, hands on workshops and general outreach i.e. industry trade shows. Using USFS funding and training opportunities the Forest Health program has been able to increase its staff expertise in forest health issues.

Current Funding: same as above

Additional Funding: Increase outreach on exotic and invasive insect and diseases. Provide additional opportunities for training of forest health staff on pests and diseases and technical skills.

Provide assistance to DCR Forests and Parks utilizing in house tree crews performing arboricultural services; provide arboricultural services to cities and towns in declared natural emergencies. Assist other Forestry Bureau's with analysis of forest health conditions.

Currently there are three full time forest health district supervisors and two full time tree crews, downsized from five due to state budget cuts, working for the forest health program. Each tree crew performs arboricultural services at specific assigned DCR forest and park areas. Using in-house tree crews allows for quicker response time to tree emergencies. It also provides DCR cost savings versus contracting out tree work. District supervisors have wide responsibilities including all work related to federally funded forest health monitoring projects, overseeing and assigning work for all arboricultural activities on DCR properties, assisting municipalities with forest health and arboricultural expertise and managing all related DCR forest health program activities within their assigned districts.

Current Funding: Currently there is a large backlog of arboricultural work that needs attention on DCR park properties. With current staffing and lack of equipment this backlog increases daily. With the current funding structure and no additional monies for hir-

ing staff or utilizing tree contractors to supplement DCR forest health staff, tree maintenance issues are reaching a critical stage.

Additional Funding: With additional funding DCR can increase tree crew staffing and equipment. Additional funding would also allow for increased assessments by forest health district supervisors of high use forest and park areas to plan for tree care needs.

Western Massachusetts Tree Canopy

Lena Fletcher

Urban and Community Forestry

Tree Planting in Fall River

E. Seaborne

INTRODUCTION

Urban and community Forests, comprised of street trees, trees in open spaces, parks, forested patches, and transportation zones lined with trees, constitute a critical part of a community's infrastructure and define the character of each town or city in the Commonwealth. Massachusetts has experienced one of the highest rates of urban development with a 5% growth in urbanized land between 1990 and 2000, most of which occurred in open forested land (Nowak et al. 2005). In spite of this growth, Massachusetts remains the eighth most forested state with approximately 62% of its land area considered to be forested (USDA Forest Service (FS) 1998). This combination of population density, urbanization, and forest cover suggests that the pressure between urban vegetation and people in Massachusetts is particularly intense. Massachusetts urban areas have an estimated 86.8 million trees forming an average urban tree cover of 25.3% with an estimated total value of $55 billion (State Urban Forest Data). It is the third most densely populated and urbanized state in the nation, which makes the management of its forest resources, particularly community forest resources, vital to the quality of life of the states' residents.

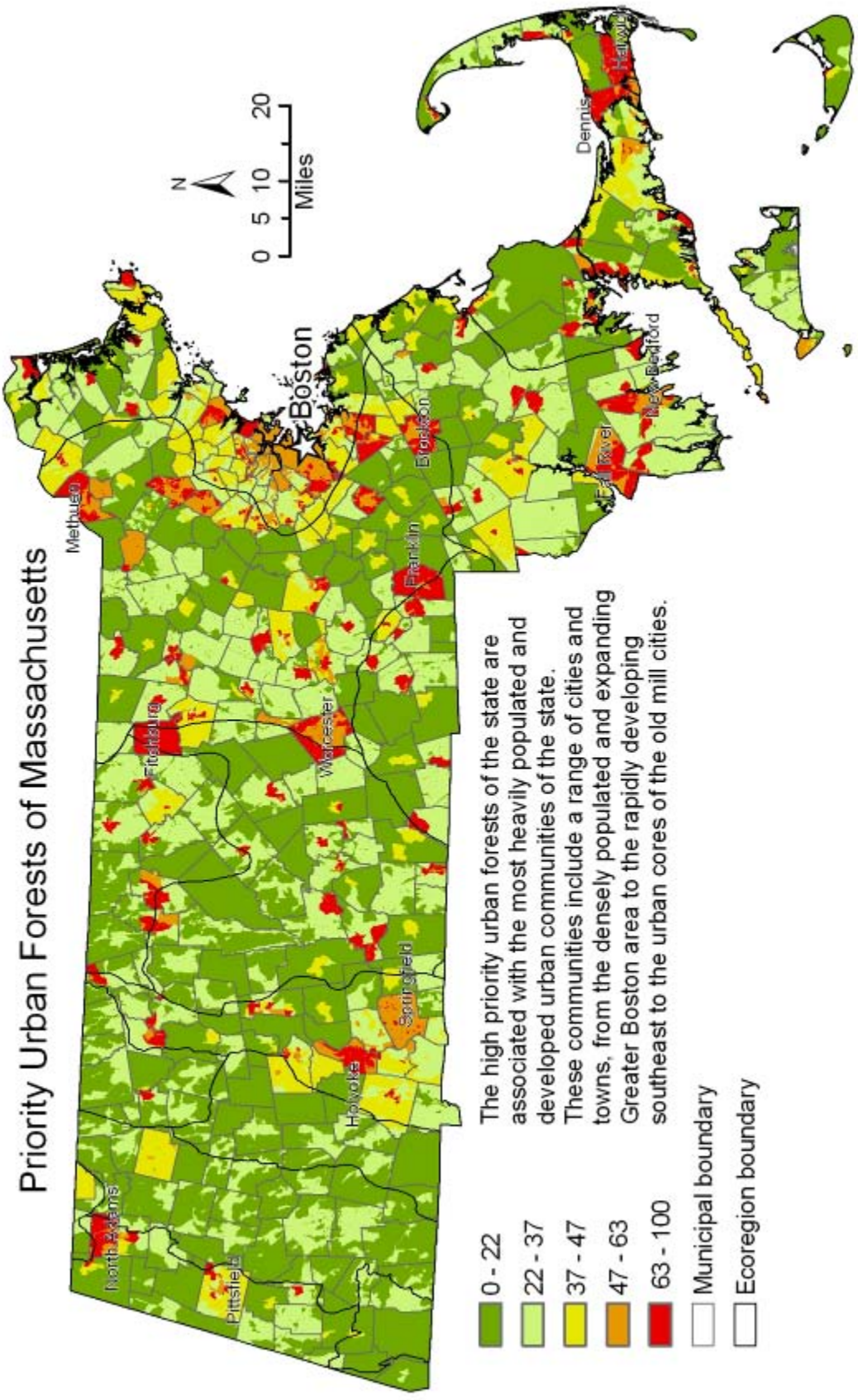
The citizens of Massachusetts have long recognized and valued the forests and trees that comprise the community forest. As early as 1646, the citizens of Boston Neck (the area now known as Beacon Hill and Boston Common) recognized that they had made a mistake in removing all of the trees from their small community and took legal action to remedy the situation. They had cut the trees out of a fear of highwaymen and the natives who might, in true old world style, hide in the forest to accost the unwary traveler. The result of their actions was a shortage of fuel wood and increased exposure to the fierce winds that swept off of the ocean. These early Bostonians voted to raise public funds for the planting of trees and enacted strict penalties for the unlawful removal of these trees. Interestingly, many of the trees that the colonists planted were American Elms, one of which would become the celebrated Liberty Tree of the American Revolutionary period which stood near the Boston Common until the occupying British troops spitefully cut it down in 1775.

The state legislature acted on the desire of the citizenry to protect local forest resources by passing "The 1899 Law Mandating Tree Wardens (MGL Ch. 330). This has evolved in to Massachusetts General Law Chapter 87 (MGL Chpt 87) known as the "Shade Tree Act." This law became perhaps the first statute in the nation to offer protection for community trees by designating trees planted and growing along the "public right of way" to be public property. The law also created the novel position of the Tree Warden and empowered this municipal representative with sole authority to plant, maintain and remove public shade trees and to act as the convener of public tree hearings to settle disputes related to public trees. Every municipality in the state was mandated to designate a Tree Warden and to ensure that the statutory protections enacted through the mandated processes of the law were followed. Soon after the law was enacted and in recognition of its innovative measure, the other five New England states adopted similar statutes that also included the Tree Warden position.

The value of the Tree Warden was quickly recognized and efforts to improve the training and education of those who held this position were quick to arise. In 1913, the Tree Wardens gathered together to form the Massachusetts Tree Wardens and Forester's Association to "provide a forum for professional tree managers to share their concerns
for a common cause ... the shade trees growing in our communities." The association was the first tree organization in the United States and engaged in activities that were the first examples of urban and community forestry work in the nation. Today, the Association continues as an important and vibrant player in the protection and management of the states community forest resources.

Many other conservation groups are active players in the management of community forestry resources in Massachusetts. It was on March 5, 1890 that Boston landscape architect Charles Eliot proposed the formation of the first non-profit land trust in the country, The Trustees of Reservations. Other conservation organizations were quick to follow, leading to the formation of a strong network of advocates for the protection of local natural resources. This list of organizations includes The Nature Conservancy of Massachusetts, The Massachusetts Audubon Society, the Trust for Public Land, the Massachusetts Association of Conservation Commissions and numerous local tree committees and neighborhood greening associations. Underpinning all of these groups is an interest in the protection and proper management of local natural resources that pervades the citizenry of the state. A "green" cultural awareness is one of the hallmarks of the general public of the state of Massachusetts.

With this long and rich history of conservation firsts and a widespread recognition of the importance of local natural resource protection, Massachusetts offers a unique set of opportunities and challenges for the DCR Urban and Community Forestry Program and its partners. DCR and its partners seek to capitalize upon the support for local forestry efforts so evident in the populace of the state while also meeting the high expectations and standards of these concerned citizens. It is with this goal in mind that the following assessment and subsequent program strategy has been developed.


Priority Urban Forests of Massachusetts
N
0 5 10 20
Miles
Boston
Methuen
Fitchburg
Worcester
Franklin
Brockton
Fall River
New Bedford
Dennis
Springfield
Holyoke
North Adams
Pittsfield
The high priority urban forests of the state are associated with the most heavily populated and developed urban communities of the state. These communities include a range of cities and towns, from the densely populated and expanding Greater Boston area to the rapidly developing southeast to the urban cores of the old mill cities.
0 - 22
22 - 37
37 - 47
47 - 63
63 - 100
Municipal boundary
Ecoregion boundary

METHODOLOGY OF ASSESSMENT AND DISCUSSION

This assessment and strategy document has been prepared by an urban forestry advisory group comprised of key partners to the DCR Urban and Community Forestry Program and DCR staff. The list of members of this advisory group can be found in section 4 below. This group of advisors and program staff is referred to as the Assessment and Strategy Team from this point forward in the document.

The Assessment and Strategy Team began the process by selecting GIS layers that seemed most relevant to the prioritization process. Team members then individually weighted the layers for perceived relative importance for use in identifying priority areas using a simple assignment of points totaling 100 for all layers. The individual weighting scores were then compiled and an urban overlay map based upon these weights was generated (Figure 1). The layers used to generate this overlay, their rank according to the weighting scores and a rationale for the use of each layer is provided below.

First Layer: "The Maryland Method" (already done by USFS) **Rank: 1**

- Greater than average population
- Greater than average urbanized area
- Greater than average impervious surface area
- Less than average Urban Tree Canopy

Rationale: This layer was used as it is recognized standard developed by the USDA Forest Service and the State of Maryland specifically for the purpose of prioritizing communities for urban forestry resource targeting. This layer also contains data elements that, unlike the other layers, characterize the urban forest resource itself such as the rankings of canopy cover and impervious surface. It is hoped that inclusion of this layer in the assessment may facilitate some process for interstate comparison of the actual urban forest resource itself which could eventually lead to a national urban forest assessment.

Second Layer: Massachusetts Sustainable Community Forestry Score **Rank: 2**

The Massachusetts DCR Urban and Community Forestry Program has adopted the four criteria developed by the USDA Forest Service to measure urban and community forestry performance (items 1 through 4 in the list below). In addition to these federal performance measures, DCR has added attainment of Tree City USA status and indication of good local interagency communication about community forestry matters to create a more comprehensive set of metrics for measuring community forestry performance. Thus, the six criteria that DCR will use to measure community capacity to effectively manage forest resources are:

1. Securing or training professional staff
2. Developing and implementing an urban forestry management plan
3. Building and strengthening citizen advocacy and action organizations

4. Developing and adopting tree and forest ordinances and policies
5. Achieving Tree City USA® accreditation
6. Coordinating community tree and forest management decisions among municipal departments.

Rationale: The sustainable community score has been the standard by which the DCR has been measuring community performance for the past three years. This metric has been fully integrated in to the DCR Urban and community Forestry Program and a web based community assessment tool based upon the six criteria has been made available to the public (please see the "Community Status Map" on the DCR website at http://www.mass.gov/dcr/stewardship/forestry/urban/index.htm). Use of this layer thus insures continuity of program performance measurement and the criteria themselves give a good indication of community forestry program capacity. The criteria that comprise this layer do not, however, measure the health of the actual community forestry resource. **Note: DCR funded a study through the University of Massachusetts of the six criteria of program performance. The study revealed that there is very little correlation between these programmatic measures and the actual status of the urban/community forest resource.**

Third Layer: Percent of population below poverty level Rank: 3

Data from the year 2000 Federal Census have been used to create this data layer. Communities that registered the highest poverty levels in the state (percent poverty $\geq$ 10%) are delineated in this layer.

Rationale: In 2004, DCR decided used 2000 census data to create a priority ranking of communities in the state to focus the resources of the Urban and Community Forestry program. One of the key data points used to determine that priority ranking was percent poverty by community. The rationale for this decision in 2004 was the same reasoning for including poverty data in this current assessment. DCR believes that federal and state resources should be directed at areas where there exists the greatest need. Not coincidentally, the communities that have the highest levels of poverty also have the highest population densities and the greatest amount of impervious surface. Thus, the residents of the poorest communities in the state must also contend with the most degraded urban forest conditions and the least benefits that can be provided by urban forestry. Prioritizing these communities by including this poverty layer incorporates an environmental justice component in to the delivery of the DCR Urban and Community Forestry Program.

Fourth Layer: Wildland Urban Interface Rank: 4

Data from the ? has been used to create a layer separating areas with above average WUI per unit area from those with below average WUI. This layer shows forests of the state located in close proximity to urbanized or urbanizing areas.

Rationale: The Assessment and Strategy Team recognized the importance of including a layer that addresses threats to the forest. In Massachusetts, the greatest threat to forests across the spectrum from the urban core to interior wildlands is development pressure and concurrent forest fragmentation. Incorporating the WUI layer provides a method for prioritizing program services to areas that are currently experiencing development pressure and loss of forest or will be experiencing these phenomena in the near future. It is hoped that identifying these areas will permit the DCR and its partners to bring urban and community forestry resources to these areas to help slow the loss of community canopy cover and intact forest parcels. This layer also identifies areas of the state where there exists a strong programmatic nexus between urban forestry and other forestry programs and opportunities for addressing forestry issues with shared resources.

Fifth Layer: 303d (Clean Water Act) list of Impaired Waters Rank: 5

This layer separates areas with above average acreage of impaired waters per unit area from those with below average 303d waters per unit area. There is a strong correlation between levels of urbanization and impairment of waters, including drinking waters.

Rationale: The Assessment and Strategy Team recognized the importance of linking the status of the urban/community forest to a resource the importance of which is easily understood and indisputable. Water quality and particularly protection of drinking water quality provides an ecosystem services model that is easily communicated and understood. The correlation between urbanized and urbanizing areas and impairment of waters provides object evidence of the importance of protecting forests and offers a natural prioritization of DCR program resources.

FINDINGS OF THE ASSESSMENT:

Priority Urban and Community Forests

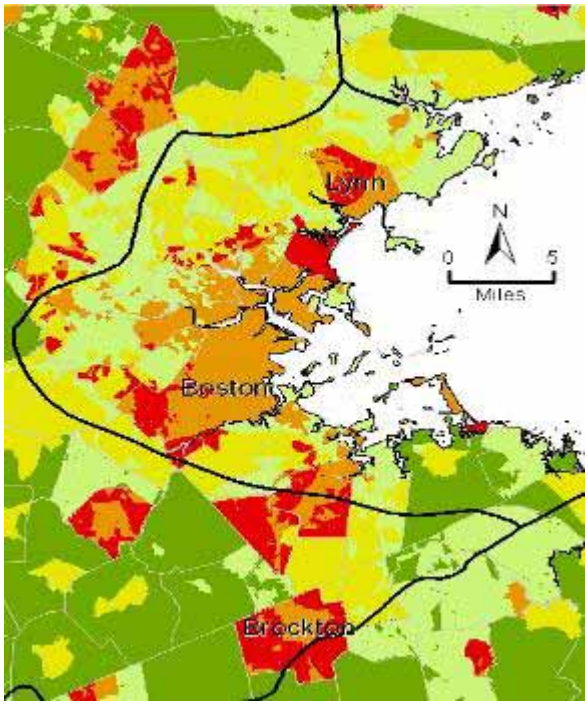
The major findings of the Assessment of urban forest resources for the state of Massachusetts are:

1. **The highest priority urban forest areas are the major urban centers and surrounding communities.**

2. **Moving west from the Boston/coastline area, Worcester County is the urban forestry frontier**

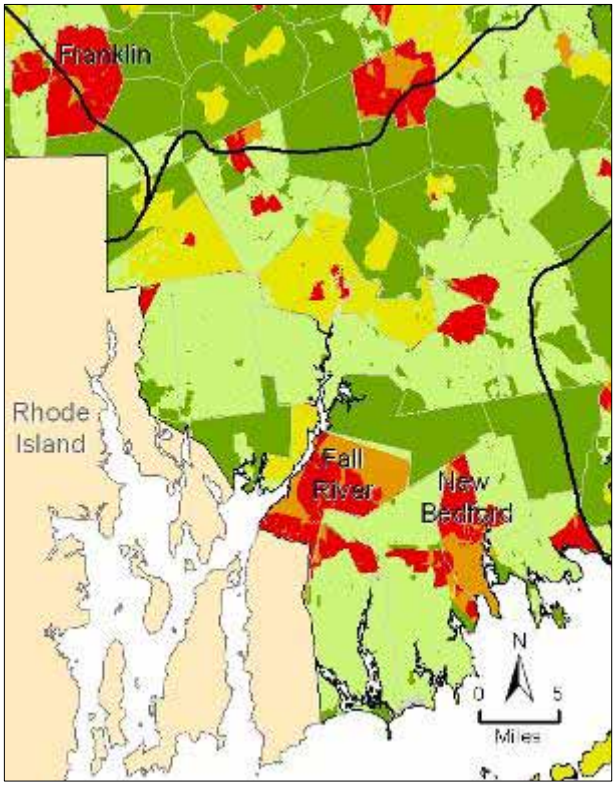
From the composite GIS Urban Forestry Layer generated by this assessment, DCR identifies the following areas of the state as Priority Urban and community Forests.

Greater Boston Area:



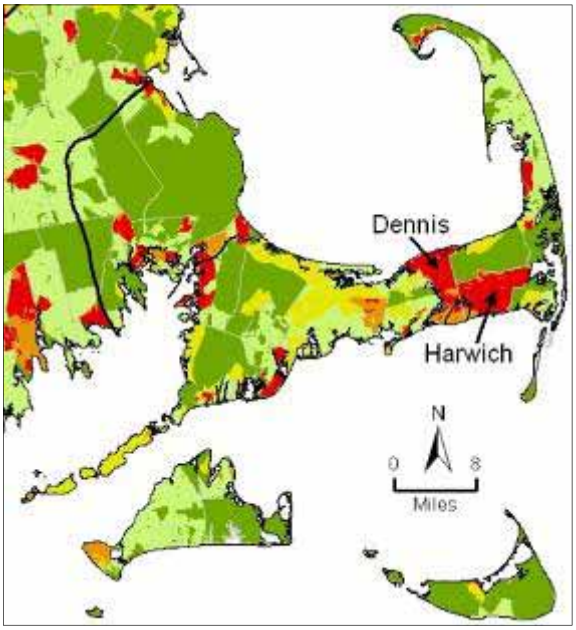
Sub-region Description: The Greater Boston area is the oldest and most heavily developed area of the state. Communities in the this region are largely "built out" such that redevelopment of already disturbed sites may be more prevalent here than in other areas of the state. Forestry programs in this region are necessarily concerned with maintaining current canopy and re-building forest canopy within the dense matrix of human development.

Interior Southeast: Greater Franklin, Greater Fall River/New Bedford Area:



Sub-region Description: The southeastern area of Massachusetts is the fastest developing area of the state with large parcels of forest land being developed in to housing and commercial use sites. Also within this area are a number of older, densely settled cities. Forestry programs in this area need to address the effects of urban sprawl and also work to re-build tree canopies within the urban core communities.

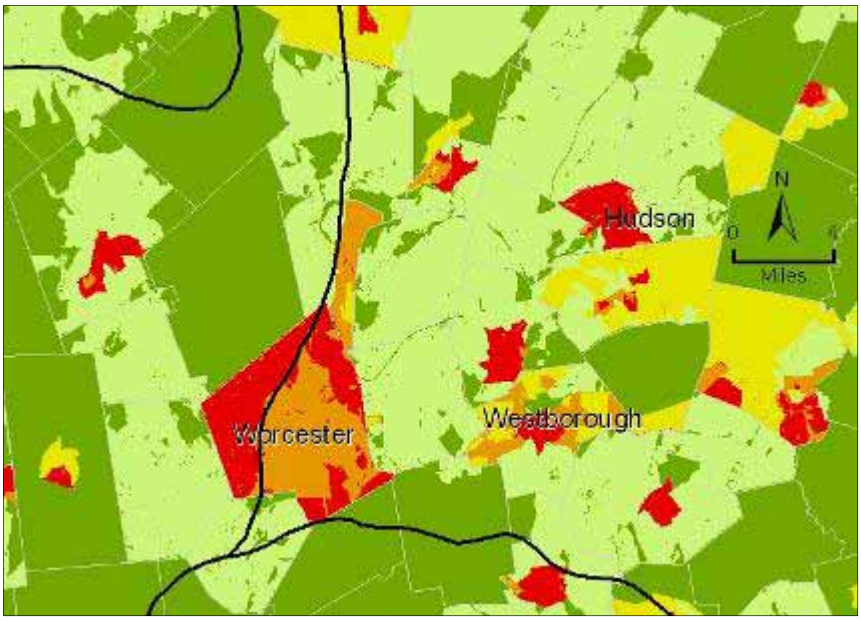
Cape Cod and Islands:



Sub-region Description: The southeastern area of Massachusetts is the fastest developing area of the state with large parcels of forest land being developed in to housing and commercial use sites. Also within this area are a number of older, densely settled cities. Forestry programs in this area need to address the effects of urban sprawl and also work to re-build tree canopies within the urban core communities.

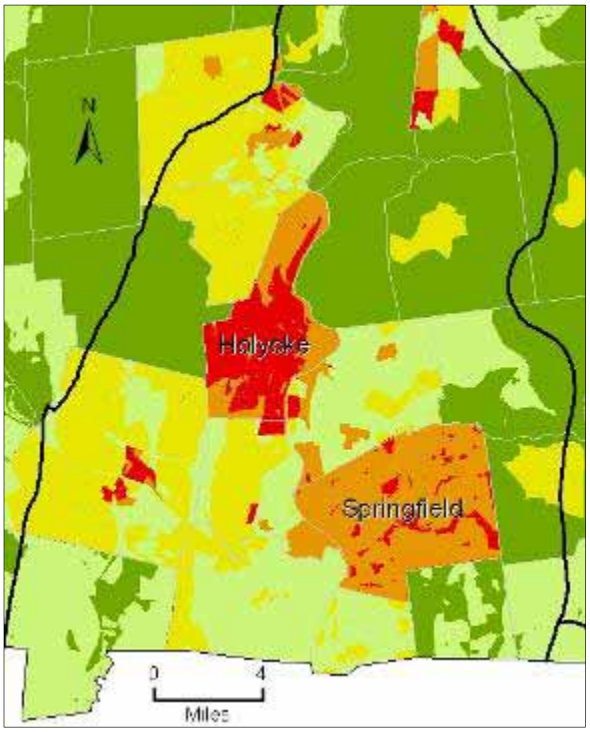
Greater Worcester Area:

Sub-region Description: The Greater Worcester Area is comprised of the densely developed City of Worcester proper and surrounding suburban towns. This area of the state is becoming increasingly developed as commuters who work in the Greater Boston area move here to find slightly reduced real estate prices. Forestry programs in this area need to address the increasing effects of urban sprawl and also work to re-build the forest canopies within the urban core.



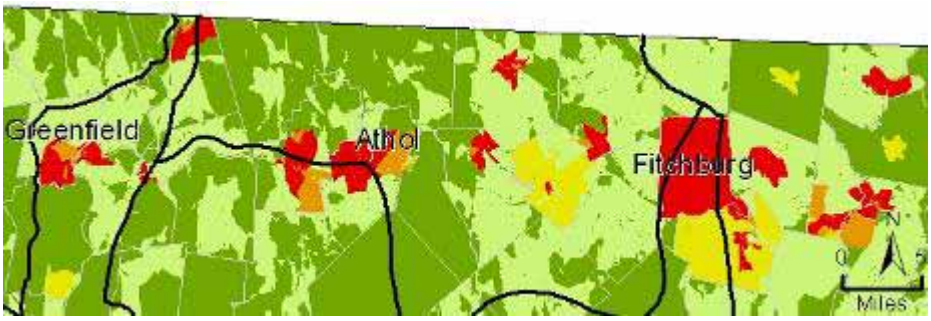
Greater Springfield Area:

Sub-region Description: The Greater Springfield Area is comprised of the densely developed cities of Springfield and Holyoke and surrounding sub-urban towns. Communities in the area are characterized by older infrastructure and pockets of diverse, lower income populations. Forestry programs in this area face the challenge of limited budgets and lack of staff while working mostly to protect and re-build existing tree canopy.

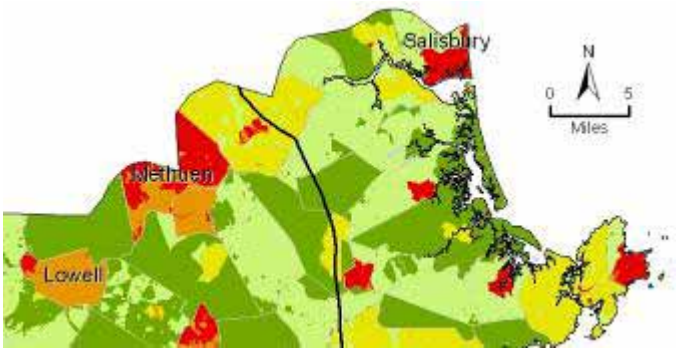


Route 2 Manufacturing Corridor Cities:

Sub-region Description: The Route 2 Manufacturing Corridor is comprised of the older mill cities of Fitchburg, Athol and Greenfield and a small number of sub-urban towns. Development pressure in this region of the state has been historically lower than in other regions to the east and south. Forestry programs in this area face the challenge of limited budgets and lack of staff while working mostly to protect and re-build existing tree canopy.

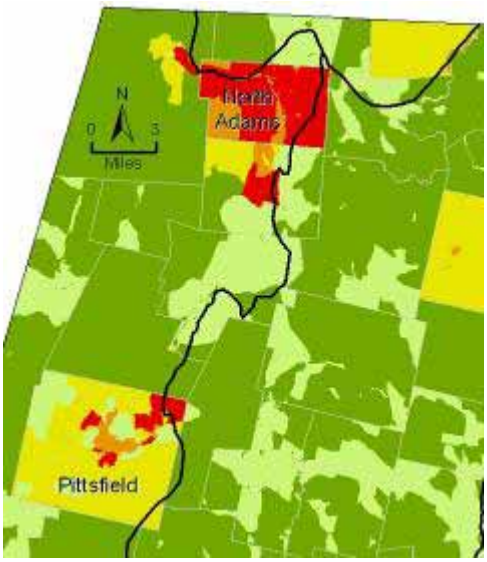


Northeast Industrial Cities Area:



Sub-region Description: The Northeast Industrial Cities Area is comprised of the older mill cities of Lowell, Lawrence, Methuen and Haverhill and a number of smaller communities surrounding these urban centers. This area is characterized by a wide discrepancy in relative community affluence with Newburyport being one of the wealthiest communities in the state while Lawrence is one of the poorest communities. Forestry programs in this region work to protect the existing tree canopy in the sub-urban and rural communities while re-building tree canopy is the goal in the densely settled cities.

Greater Pittsfield Area:



Sub-region Description: Greater Pittsfield Area is comprised of the older mill cities of Pittsfield and North Adams and a small number of sub-urban towns. Development pressure in this region of the state has been historically lower than in other regions to the east. Forestry programs in this area face the challenge of limited budgets and lack of staff while working mostly to protect and re-build existing tree canopy.

The communities within the regions identified above will be the priority target areas of the DCR U&CF program and its partners. Services provided to these priority communities are identified in the strategies described in the next section.

STRATEGIC URBAN AND COMMUNITY FORESTRY PROGERM DELIVERY IN MASSACHUSETTS

DCR Urban and Community Forestry Program Mission Statement: Assist communities in managing and sustaining a healthy and productive urban and community forest, with the ultimate aim of improving the quality of life in MA.

Program Overview:
The Massachusetts Urban and Community Forestry Program (U&CF) assists communities and nonprofit groups in protecting, growing and managing urban and community trees and forest ecosystems, with the ultimate aim of improving the environment and enhancing the quality of life in all of Massachusetts' 351 communities. We provide grants, technical assistance, training and recognition awards to communities of all sizes throughout Massachusetts and provide guidance on urban forestry policy at the state level.

1. Program Top Priorities in Response to the Assessment

- Continue to focus DCR U&CF Program resources on the most urbanized communities in MA focusing particularly on those urbanized areas that fall within or are in close proximity to priority landscapes as identified by the state assessment process.

  Montreal Process Criteria: 1, 3, 4, 5, 6,
  National Theme: Protect Forests From Harm, Increase Public Benefits from Trees and Forests

  Strategy: The strategy to address this priority would involve directing the majority of the Urban Forestry Program funding, technical assistance and direct community support to the communities in these high priority regions. Specific program resources to be dedicated to these communities will include the following:

  - Delivery of technical tools such as canopy analyses, I-Tree urban forestry system and other high end analysis tools while also working to build local coalitions and urban forest capacity within the cities identified as highest priority. This service delivery will be based upon similar DCR efforts currently under way in the cities of Boston, Chelsea, Lawrence and Worcester.

  - Coordinated delivery of U&CF services with DCR Bureau of Forestry services e.g. grants to municipalities to analyze and rebuild urban forest infrastructure to reduce urban sprawl in to undeveloped forest land, coordinated messaging of bureau educational programs highlighting all bureau services, sharing of program staff time and materials.

- Assistance for communities completing and implementing Tree Inventories or other resource assessments and Management Plans

- Efforts to increase the number of communities "participating" in U&CF Program in these regions

- Assistance to communities for planting trees through DCR grants

- Efforts to increase the number of communities achieving Tree City USA status in these regions

Current Funding: Presently, the DCR Urban and Community Forestry Program operates almost entirely on federal monies. Approximately 80% of federal dollars for the program are passed through to communities in the form of Urban Forestry Challenge grants. The DCR also manages the Mass ReLeaf Trust Fund which accepts private donations that are then passed through to communities through the grant program.

Increased Funding: With increased funding, the DCR U&CF Program could deliver more services to more communities in the high priority regions. Specific high value projects that could be undertaken with increased funding include urban tree canopy analyses for a larger number of communities and focused efforts to build local forestry capacity based upon these analyses. In addition, a huge opportunity for afforestation exists in urban and suburban areas through coordinated tree planting efforts. A state wide urban forest tree planting campaign could make a substantial contribution towards efforts to address climate change, and using the employment model implemented in the Worcester ALB reforestation program, could also be a major employment program.

- Focus the greatest percentage of program resources on the urban and exurban areas in Worcester County and the eastern region of the state.

  Montreal Process Criteria: 1,3,4,5,6,7
  National Theme: Protect Forests From Harm, Increase Public Benefits from Trees and Forests

  Strategy: Same as above but with emphasis on the communities in and to the east of Worcester County.

  Current Funding: Same as above

  Increased Funding: Same as above but with emphasis on the communities in and to the east of Worcester County.

- Coordinate DCR U&CF Program service delivery with other DCR Bureau of Forestry Programs

  Montreal Process Criteria: 6,7

National Theme: Conserve Working Landscapes, Protect Forests from Harm, Increase Public Benefits from Trees and Forests

Strategy: Opportunities exist for greater coordination with the other forestry program within the DCR. Such coordination could have the effect of addressing the spectrum of forestry issues from the inner city core out to the surrounding sub-urban, bucolic and finally undisturbed forest lands as a cohesive ecological system. This approach would permit use of more ecologically comprehensive initiatives and could also facilitate cost effective, shared use of limited DCR program resources. Specific strategies to be adopted will include:

- Grants to municipalities to analyze and rebuild urban forest infrastructure to reduce urban sprawl in to undeveloped forest land

- Coordinated messaging of bureau educational programs highlighting all bureau services, sharing of program staff time and materials.

- Grants and technical support for communities to develop Town Forest management plans

- Close coordination with the Service Forestry Program to share technical and educational resources

Current Funding: Same as above

Increased Funding: Increased funding would afford greater opportunities to provide grants to communities to rebuild urban forest canopies and to manage Town Forest lands. Focusing these increase grant funds on communities in regions of the state threatened by urban sprawl would be one tool to help slow the effects of development and loss of forest land.

- Continue to act as the lead program for implementation of the Asian Long Horned Beetle reforestation effort.

Montreal Process Criteria: 3,6
National Theme: Protect Forests from Harm, Increase Public Benefits from Trees and Forests

Strategy: Develop and implement the ALB reforestation program services based upon multiple sources of funding – USDA, ARRA Stimulus funds, DCR U&CF funds, Private Donations. Coordinate ALB Reforestation efforts with all participating partners within the ALB quarantine zone. Implementation of this strategy is underway and involves:

- Private landowner outreach and education to site trees on private property and educate landowners about proper tree maintenance

- Hiring of 10 DCR Foresters to oversee the reforestation effort
- Training of DCR foresters for outreach to private landowners
- Oversight of professional planting contractors
- Design and implementation of a large scale effort to plant up to 15,000 trees over 4 planting seasons using seasonal laborers planting trees by hand
- Design and use of data coordination and tracking programs to track every tree planted by all the partners in the reforestation effort.
- Hiring and training of 40 seasonal laborers each planting season

Current Funding: Federal USDA funds, federal ARRA funds, DCR Mass ReLeaf Funds

Increased Funding: Increased funding for reforestation is currently being considered as part of the federal allocation for the overall ALB program. Any additional funds for reforestation will permit the continuation of the reforestation program using the same methodologies currently being employed.

2. Key Partners and Service Delivery

University of Massachusetts:
The Arboriculture & Community Forestry program at the University of Massachusetts-Amherst has worked very closely with DCR's Urban and Community Forestry program for many years. The interactions have mostly involved DCR's funding of 1) graduate and undergraduate students to address pressing questions on urban forest management (e.g., one recent student conducted a survey of tree wardens in Massachusetts to determine their work priorities) and 2) the annual Community Tree Conference held at the University (the conference provides much needed educational opportunities for practitioners in Western Mass. Since 2004, the Urban and Community Forestry program has supported three graduate students in the Arboriculture & community Forestry program, providing helpful information to the Urban and Community Forestry program (e.g., the tree warden survey and a subsequent project that analyzed tree inventories to quantify the diversity--with respect to species and size--of street trees in Massachusetts). Part of the inventory analysis was critical to quickly assessing street trees in Worcester, shortly after discovery of ALB. Faculty in the Arboriculture & Community Forestry program envision continued collaboration with the Urban and Community Forestry program including additional work by graduate and undergraduate students, as well as outreach by faculty. There is a real push at the University to work in Springfield and other nearby cities, and issues of urban forestry management fit well with this push.

Massachusetts Tree Warden's and Forester's Association (MTWFA):
The DCR Urban and Community Forestry Program has enjoyed a long and close working relationship with the MTWFA. As legislatively mandated and empowered municipal officials in

each community of the Commonwealth, the Tree Wardens are arguably the most important partners of the DCR program. DCR will continue the partnership with the MTWFA by providing annual funds to support the Association's professional development program and annual educational conference. MTWFA will continue to work with DCR to provide exceptional educational programming for Tree Wardens and staff and will also provide assistance to DCR with state wide urban forest policy development, advocacy and project support. MTWFA will also continue to serve as a member organization represented on the DCR Urban and Community Forestry Advisory Council.

Urban Ecology Institute (UEI):
The Urban Ecology Institute has worked closely with DCR to develop an integrated approach to building the capacity of communities to manage community trees and forests. These strategies that include high end canopy and ecosystem analyses tools, local coalition building, tree planting program models and educational programming were developed and tested in the City of Boston with the formation of the Boston Urban Forest Coalition. Since that time, UEI and DCR have brought this integrated program to the cities of Chelsea and Lawrence and are beginning the effort in Worcester. DCR will continue to work with UEI to develop the tools of this comprehensive program with the goal of making this successful approach available to the other communities identified in this report as high priority urban forests. When appropriate, and following state procurement laws and regulations, DCR will provide funds to support the implementation of these strategies in these high priority areas. UEI, will also continue to serve as a member organization represented on the DCR Urban and Community Forestry Advisory Council.

Worcester Tree Initiative:
The Worcester Tree Initiative is a private, non-profit effort to reforest the City of Worcester and surrounding communities. It was Initiated in January 2009 by Congressman Jim McGovern and Lt. Governor Tim Murray with the intent of planting 30,000 trees in Worcester and surrounding towns in the next 5 years.

The Initiative is a public/private partnership between the city of Worcester, Massachusetts Department of Conservation and Recreation, the US Department of Agriculture, many local non-profits, businesses and residents of Central Massachusetts. The program includes intensive outreach, education and training, and long term tracking to realize significant environmental and quality of life improvements with this community based approach.

Municipal Governments of 351 Towns and Cities:
The municipal governments of the cities and towns of Massachusetts are the keystone partners of the DCR Urban and Community Forestry Program. These local entities are entrusted with the care of all public shade trees, town forest lands, municipal parks, local water supply protection lands and other forested open spaces. Officials from each municipal government, including and especially the Tree Warden and the Conservation Commission, are empowered by state law to protect forests and trees and act as the "first line of conservation" of the urban and community forest. Municipal governments, particularly those identified as high priority in this assessment process, will continue to partner with DCR to implement plans and projects that lead to the protection and enhancement of forest resources. DCR and municipal agencies will cooperate through shared funding, staffing and resource allocation to build the capacity of the Common-

wealth's local governments to sustainably manage community forests for the benefit of all residents including those living presently and the generations to come.

USDA Forest Service: The Urban and Community Forestry Program was authorized by the Cooperative Assistance Act of 1978 (PL95-313) and revised by the 1990 Farm Bill (PL101-624) to promote natural resource management in populated areas and improve quality of life. U&CF goals of awareness, outreach and environmental equity, partnerships, and comprehensive natural resource management focus on achieving healthy sustainable forests, sustainable economic development, and information management. Massachusetts utilizes Federal funds as an incentive to leverage local support and as a catalyst for action on behalf of comprehensive urban resources management and environmental equity. Forest Service program goals provide the framework for program implementation in conjunction with our five year plan. Northeast Area staff; Forest Service research and resources enhance DCR's capacity to more effectively assist communities. The Forest Service's regional Urban Forester, regional trainings, and the Northeast Center for Urban and Community Forestry provide critical tools, information, resources and assistance to our program and directly to communities. Through Urban Forestry Challenge grants and technical assistance, DCR strives to strengthen local capacity for work towards program goals. Federal funds support staff outreach to diverse communities and support public awareness efforts. Federal funds are also used to support the efforts of key partners including the University of Massachusetts, School of Natural Resources, the Boston Urban Forest Coalition, the Massachusetts Tree Wardens & Forester's Association, the Worcester Tree Initiative, and many municipal program partners.

3. Strategies for Monitoring Outcomes Within Priority Landscape Areas

DCR will record and monitor progress of communities within priority areas working to achieve higher levels of forestry program capacity as measured by the 6 program criteria of the Massachusetts Sustainable Community Forestry Score. DCR will work with communities in the priority areas to establish canopy cover goals, create urban and community forestry coalitions and establish management goals (e.g. tree planting goals). Adaptive management will be used; revising actions based upon the outcomes achieved from the actions taken.

A Case Study –How Much Tree Canopy Does Lawrence Have?

Urban Tree Canopy (UTC) analysis is a valuable tool that offers managers highly detailed data about the extent, health, and ownership of the community forest resource. Based upon highly accurate aerial photography or satellite imagery and peer reviewed analysis methodologies, the data provided in a UTC report can form the basis for both long term strategic and short term operational urban forest management decisions. DCR has worked with the Cities of Boston, Lawrence and Chelsea to conduct full analyses of the urban forest in each city and now seeks to bring this powerful tool to the high priority communities identified in this report. The utility of the UTC analysis is exemplified by the following case study which is a section of the UTC report created for the City of Lawrence.

A Report on Lawrence, Massachusetts's Existing and Possible Urban Tree Canopy

Why is Tree Canopy Important?

Urban tree canopy (UTC) is the layer of leaves, branches, and stems of trees that cover the ground when viewed from above. Urban tree canopy provides many benefits to communities, including improving water quality, saving energy, lowering city temperatures, reducing air pollution, enhancing property values, providing wildlife habitat, facilitating social and educational opportunities, and providing aesthetic benefits. Establishing a UTC goal is crucial for those communities seeking to improve their green infrastructure. A UTC assessment that estimates the amount of tree canopy currently present (Existing UTC), along with the amount of tree canopy that could theoretically be established (Possible UTC), is the first step in the UTC goal-setting process.

How Much Tree Canopy Does Lawrence

An analysis of Lawrence's urban tree canopy based on land cover derived from high-resolution aerial imagery (Figure 1) found that more than 1,171 acres of the city were covered by tree canopy (termed Existing UTC), representing 26% of all land in the city. An additional 39% (1,757 acres) of the city could theoretically be modified (Possible UTC) to accommodate more trees (Figure 2). In the Possible UTC category, 16% (713 acres) of the city was Impervious Possible UTC and another 23% (1,043 acres) was Vegetated Possible UTC. Vegetated Possible UTC, or grass and shrubs, is more conducive to establishing new tree canopy, but establishing tree canopy on Impervious Possible UTC will have a greater impact on water quality.

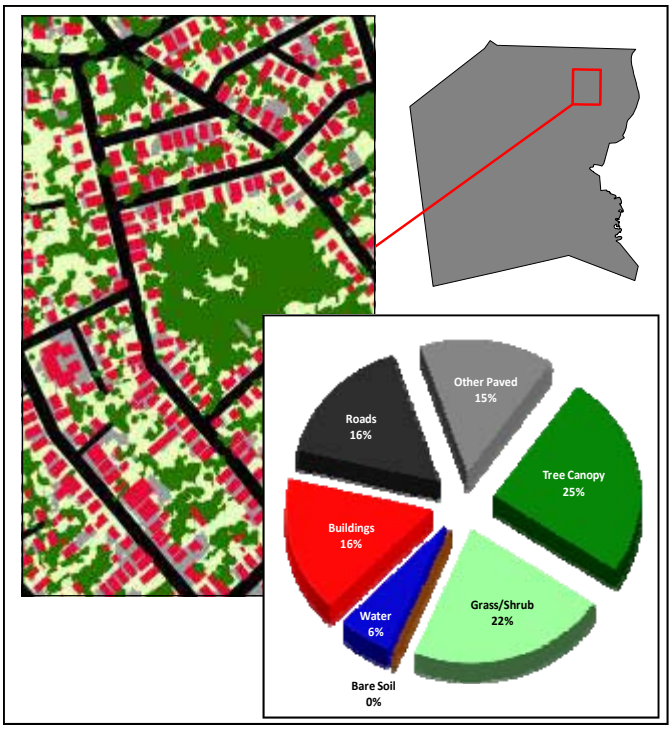


Figure 1: Land cover derived from high-resolution aerial imagery for the City of Lawrence.

Project Background

This analysis of Lawrence's urban tree canopy (UTC) was a collaborative effort between the City of Lawrence and the USDA Forest Service. It was performed by the Spatial Analysis Laboratory (SAL) of the University of Vermont's Rubenstein School of the Environment and Natural Resources, in consultation with the USDA Forest Service's Northern Research Station.

The goal of the project was to apply the USDA Forest Service's UTC assessment protocols, methods successfully used and refined with a diverse set of U.S. cities, to Lawrence, Massachusetts. This analysis was conducted based on year 2008 data.

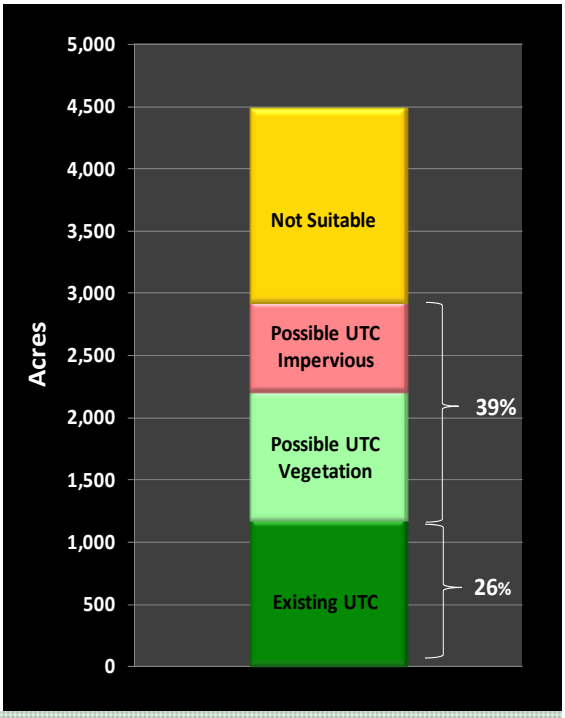


Figure 2: UTC metrics for Lawrence based on % of land area covered by each UTC type.

Key Terms

UTC: Urban tree canopy (UTC) is the layer of leaves, branches, and stems of trees that cover the ground when viewed from above.

Land Cover: Physical features on the earth mapped from aerial or satellite imagery, such as trees, grass, water, and impervious surfaces.

Existing UTC: The amount of urban tree canopy present when viewed from above using aerial or satellite imagery.

Impervious Possible UTC: Asphalt or concrete surfaces, excluding roads and buildings, that are theoretically available for the establishment of tree canopy.

Forest Products Marketing & Utilization

An Ash tree cut and ready for loading DWSP

MISSION STATEMENT:

- To promote economic development based on sustainably managed forests, while conserving the full range of ecosystem services to society.

PROGRAM OVERVIEW:

The Forest Products Marketing and Utilization Program (M&U) assists landowners, foresters, timber harvesters, sawmills and business entrepreneurs in the promotion and expansion of the forest products industry in Massachusetts and the Northeast.

Our assistance ranges from evaluating and developing business opportunities to general technical assistance in all phases of wood product use and manufacturing. Past projects include timber bridges, wood industry directories, concentration yards for low-grade logs and biomass energy project development.

Currently, the program has a staff of one working from the Holly Moore House office in South Amherst, Gordon Boyce, Marketing and Utilization Forester.

Below are listed program priorities and strategies to address those priorities. The effectiveness of the program will depend significantly on available funding and staffing. Most of these program priorities will need resources above and beyond what are available now to be successful.

PROPOSED PROGRAM PRIORITIES FOR AREAS IDENTIFIED THROUGH THE STATE ASSESSMENT PROCESS:

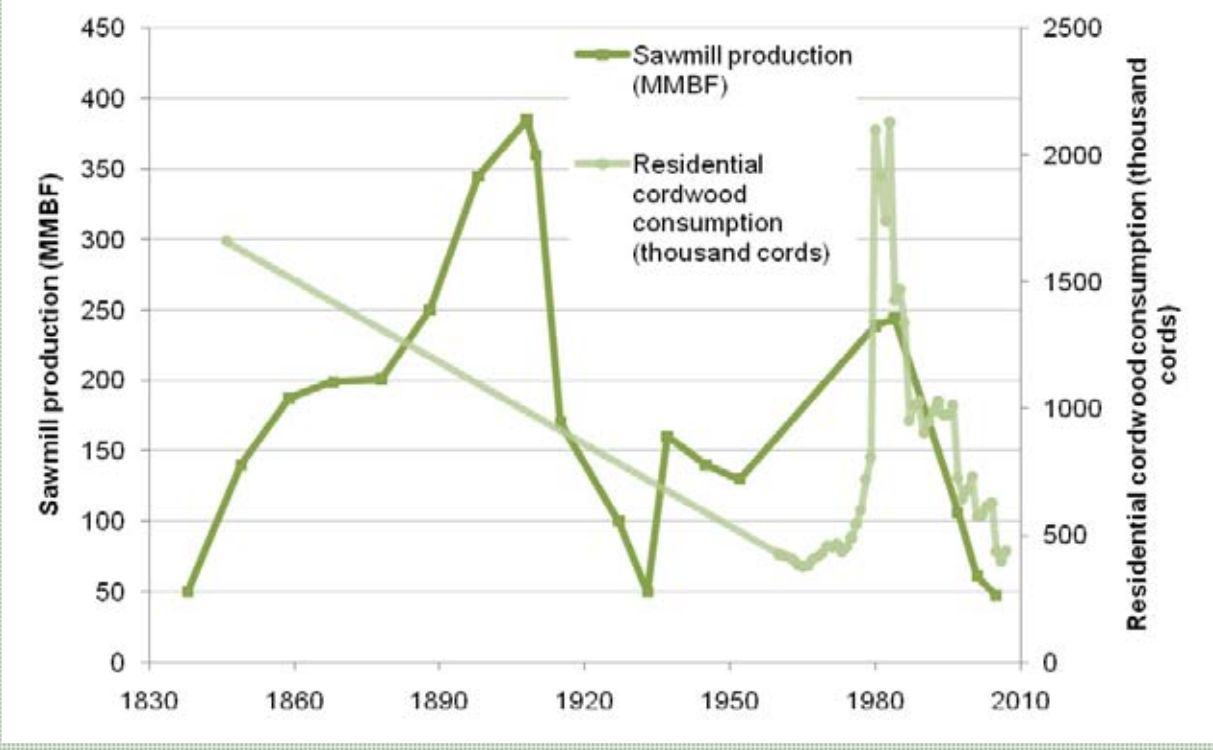
- Summary from assessment:
    - Priority areas are: Southeastern MA because of forest health risks and options for the utilization of woody material in conjunction with the significant mortality from the insect and pest issues in that region as well as the significant fire loads created from all of the down woody materials. This area also seems to be underserved by the industry.
    - The five western most counties in MA (Berkshire, Franklin, Hampshire, Hampden, and Worcester) which represent the bulk of the forest resource in the state.

- Program priorities:

  Economic development of the forest products industry in Massachusetts. The tasks listed below are aimed at maintaining and building the MA forest products industry infrastructure.

  - Enhance Green Certification of woodlands, harvesters, sawmills and foresters
    - Criteria
      - 6: Maintenance and enhancement of long-term multiple socioeconomic benefits to meet the needs of societies
      - 7: Legal, institutional, and economic framework for forest conservation and sustainable management
      - 2: Maintenance of productive capacity of forest ecosystems
    - National Themes
      - Enhance public benefits
      - Conserve working forests
    - Strategy
      - Massachusetts broke ground in June, 1997 when the 58,000 acres of forest lands surrounding the Quabbin Reservoir managed by the Massachusetts Metropolitan District Commission (now part of DCR) became the first publicly-owned certified forests in the

Figure 1. Massachusetts sawmill production and residential cordwood consumption, 1830-2007.
Sources: Steer (1948), Massachusetts Sawmill & Dry Kiln Directories (1980, 1984, 1997, 2003, 2006), U.S. Energy Information Administration State Energy Data System, 1846 Report to Massachusetts Legislature.



U.S., under the NWF/SmartWood forest certification program. Since then a total of over 500,000 acres of public and private forest lands have become green certified. Unfortunately, the Massachusetts primary processing sector has been slow to adopt green certification – for a variety of well founded reasons, not the least of which is the extensive cost. Because of this missing link in the chain of custody (CoC) chain we are not maximizing benefits of the green certification programs for landowners or the forest products industry in state. In contrast, 19,766 ac is certified through the state's private lands group FSC certificate, and the Tree Farm program has approximately 125,000 certified tree farm acres. Since state lands comprise the bulk of green certified lands in the commonwealth, it would be a shame to have all the state's money spent on green certification of its woodlands be for naught since the in-state CoC certified capacity is minimal.

- Massachusetts primary processing industry is sawlog-based, and sawlogs have an extremely high procurement cost relative to other wood fiber procurement costs. Massachusetts sawmill production has steadily declined since the 1980s (Figure 1). There is very little industrial forest in Massachusetts, meaning sawmills are heavily reliant upon procurement from NIPF owners. NIPF and general public attitudes toward harvesting are marginal at best here, but research (Harris, Germain, Zhang, 2003. Forest Products Journal 52(2) p17) shows that certification is one factor in improving industry image and professionalism, and potentially enhancing procurement success rates in a landscape dominated by skeptical NIPF owners. Green certified lumber, while not necessarily offering a price premium at this point, is often requested by wholesales thereby gaining access to markets that may have been closed before.
- Approximately 75% of Massachusetts lumber production is by mills that produce more than 2 MMBF annually; these mills often are set up to sell to wholesale markets and have limited capability to offer retail sales and capitalize on the buy-local movement. Also, due to adverse state insurance regulations, very few mills employ harvesters – most are private contractors, thereby increasing the overall industry cost of certification. By offering incentives for CoC and Forester Green certification, M & U can help these mills overcome barriers to entering the green certified marketplace.
- Several articles of proposed legislation would have offered tax credits and low-interest loans for forest-based industries. Until such time as legislation is passed, M & U will look for opportuneties to provide grants to harvesters, sawmills, and foresters to offset the intitial cost of green certification, which can often be sub-

stantial - $5,000 or over 10% of the average non-employer forester wages (2007 economic census). This will help alleviate one of the barriers identified in a report titled "Finding and removing barriers to sustainable harvest and primary processing of Massachusetts native woods March, 2008" by Damery et al. At the same time M & U will work to help improve brand recognition among NIPF owners of green certification. The state's FSC green certification of private lands is tied to participation in the Forest Stewardship program and to some extent current-use programs, in which participation in both programs is relatively low.

- Both the green certification status and annual timber output on state owned lands are in question (since the recently released Vision/Heritage plan states the primary purpose of timber harvesting on DCR Division of State Parks and Recreation land should be for "demonstration" purposes). Therefore, to expand the green certified land base, M & U will support green certification of private lands through (A) the state's Forest Stewardship/Ch. 61/A/B FMP program and (B) Tree Farm, and increase the numbers of private foresters having certification and harvesters and mills with CoC certification.

- Funding
  - M & U will look for opportunities to fund a program to pay the costs associated with both forester certification and CoC certification of harvesters, and sawmills. M & U will explore cost-efficient group certification options through Massachusetts Wood Producers, MAPF/Massachusetts SAF, and others to help extend the impact of every dollar spent on certification.
- Measurables
  - The cost also includes a funding for another (Finding & Removing Barriers) study. This study identified certification as a possible way to enhance the level and image of local production of forest products in the Commonwealth. The initial 2008 study will serve as a baseline, and repeating this study in 5 years (by 2013) will help to assess (1) the direction of certified markets and their effect on Massachusetts primary wood processing industry, and (2) changes in the number of green certified forest-based businesses in Massachusetts, and (3) changes in woods worker perceptions and attitudes toward green certification.
- Partnerships: Existing and new partnerships will help with this Economic Development effort. Some of those partnerships include:
  - MA association groups representing Forest Landowners, Foresters, Wood Producers, Secondary Manufacturers, Architects, and wholesale and retail lumber.
  - Farm Bureau
  - Department of Agricultural Resources
  - MA Office of Business Development

- NAASF Utilization and Marketing Committee
- U.S. Forest Service State and Private Forestry
- UMASS Dept. of Natural Resources Conservation

Policy-MA needs to work on a policy which creates incentives for attracting and maintaining Forest Products manufacturing business to utilize our low-grade forest resources in-state. To date Massachusetts has not been competitive with surrounding states in attracting pellet manufacturing and other biofuels production facilities. Legislation has been proposed to create a forest industry economic stimulus program which would create tax credits for sustainable biomass production, help pay for business and forest management plans, and provide funding for industry equipment purchases for modernization and energy production facilities and allows for net metering. The goal of gaining net metering was partially met with the recent passage of a comprehensive energy law but it applied net metering only to "agricultural facilities" which generally limits the benefit to sawmills that process wood from sawmill-owned lands.

Better Utilization of our significant resource.

- Enhancement of low-grade markets
  - Criteria:
    - 1: Conservation of biological diversity (allows for more cost-effective creation and/or maintenance of early-successional habitat.6: Maintenance and enhancement of long-term multiple socio-economic benefits to meet the needs of societies
    - 2: Maintenance of productive capacity of forest ecosystems
    - 3: Maintenance of forest ecosystem health and vitality (allows better utilization of dead, dying, and salvage material in a preemptive fashion)
    - 4: Conservation and maintenance of soil and water resources (makes true patch selection more likely on private lands, increasing landscape-scale diversity of species & age class and forest resiliency
    - 5: Maintenance of forest contribution to global carbon cycles (low growth may accrete and sequester large amounts of carbon, but NIPF owners very unlikely to manage for late-seral forests; low grade markets make management for late-seral conditions and increased carbon accretion more feasible).
    - 6: Maintenance and enhancement of long-term multiple socioeconomic benefits to meet the needs of societies
    - 7: Legal, institutional, and economic framework for forest conservation and sustainable management
  - National themes:
    - Conserve working forests
    - Protect forests from harm
    - Enhance public benefits

- Strategy
  - Massachusetts foresters have long lamented the lack of low-grade markets. Massachusetts forest industry is sawlog-based. With recent declines in lumber values, many sawmills now export low-grade logs. Foresters sometimes find it difficult to implement good silviculture due to lack of low-grade markets and harvesters cannot be expected to handle large quantities of unprofitable trees (Damery et al., 2008). Exemptions in the state building code allow for use of native lumber such as hemlock, but stumpage and production costs are higher than competing products and native timber has remained uncompetitive in the marketplace for this and other reasons. Firewood use peaked in the late 1970s and early 1980s at over 2,000,000 cords per year and has been declining since (Figure 1). The recent economic downturn may be responsible for somewhat increased demand, though this was offset in many areas by a glut of firewood produced from salvage of the Dec. 2008 ice storm.
  - One conclusion of a recent study is that timber harvesting alone is not enough to offset the cost of owning woodland in Massachusetts in the face of rising property taxes and enrollment in current-use programs or sale of a CR is also necessary. Another way of looking at the results is that sound forest management is an integral part of offsetting the cost of owning forestland, while at the same time contributing to local economies and ensuring the land remains on the tax rolls to support municipalities. Many foresters and landowners feel that enhancement of low grade markets would increase harvest activity and enhance the productive capacity of Massachusetts' privately owned forest lands.
  - Massachusetts no longer has a diverse array of low grade markets such as pulp and paper companies, and public resistance to biomass for a variety of reasons has slowed development of those markets. Therefore, M & U will work to support a diverse array of markets for low grade wood. Low grade market expansion opportunities include
    - Biomass – large & small scale
    - Firewood
    - Softwood grinding for agricultural users (decrease in sawmill production has left farmers facing skyrocketing sawdust bedding costs – stability in sawdust prices will only help softwood utilization, primary wood producers, and farmers alike.
    - Tie/heat treating – help allow these low-grade logs to stay in state and allow producers to not lose money on low-value lumber production
    - Pellet production

- According to some sources there may be more support for small scale "Fuels For Schools" type programs but we need at least one large plant to support the harvesting, processing, and trucking infrastructure and we need citizen & government support of a vibrant forest products industry.
- In order to successfully implement this strategy, a detailed wood flow study must be done to understand where (both in "marketspace" and physical space) Massachusetts roundwood markets are failing. There is considerable variation in market access, roundwood logistic capacity, and transportation infrastructure across Massachusetts geography.

▪ Funding
- M & U will look for opportunities to fund studies involving siting, availability of feedstock, and educational campaigns expressing the benefit of such facilities. Operations of an appropriate scale that enhance the use of local materials will be sought, as will expanding operations at existing facilities.

▪ Measurables
- Included in this strategy is funding for another (Finding & Removing Barriers) study. This study identified certification as a possible way to enhance the level and image local production of forest products in the Commonwealth. The initial 2008 study will serve as a baseline, and repeating this study in 5 years (by 2013) will help to assess (1) the direction of certified markets and their effect on Massachusetts primary wood processing industry, and (2) changes in the number of green certified forest-based businesses in Massachusetts, and (3) changes in woods worker perceptions and attitudes toward green certification.

▪ Partnerships: Existing and new partnerships will help with this Economic Development effort. Some of those partnerships include:
- MA association groups representing Forest Landowners, Foresters, Wood Producers, Secondary Manufacturers, Architects, and wholesale and retail lumber.
- Farm Bureau
- Department of Agricultural Resources

o Promotion of small-scale forestry

▪ Criteria:
- 2: Maintenance of productive capacity of forest ecosystems
- 6: Maintenance and enhancement of long-term multiple socioeconomic benefits to meet the needs of societies
- 7: Legal, institutional, and economic framework for forest conservation and sustainable management

▪ Strategy
- Average forest tract sizes in Massachusetts have been steadily declining, especially in the eastern part of the state at the sprawl frontier. Access to good quality timber, and improving stands

with poor quality timber for future utilization, is difficult because procurement costs increase with every landowner that must be approached. Encouraging landowners to work their own woodlots and improve them through TSI and cordwood operations will be crucial for maintaining a vibrant forest products industry at the interface with suburbia.

- Demonstrations of equipment that landowners can use on their own 5-10 ac. parcels will be an important part of this process. Small log loaders able to run off homeowner-level tractors, innovative new log-splitting equipment, human-powered skidding equipment and log arches will all be demonstrated in partnership with UMASS extension, MFLA, and a network of engaged landowners with model small-scale woodlots. Developing woodlot neighborhoods of 5-10 landowners with 3-5 acres each, all committed to woodlot management and sustainable harvesting practices the primary processing industry will gain a source wood at the fringes of suburbia. Suburban arboriculture firms can also work with municipalities to site small sawmills to process wood from tree work and to encourage small suburban landowners to do forestry work in their small wood lots beyond the trees near their homes.
- This program will have the added benefit of reconnecting landowners and broader society with nature and the forest products industry.

- Funding
  - M & U will seek opportunities to acquire or match gifts of demonstration small-scale forestry equipment. Funding will also be sought to establish a "Small Scale Forestry Demo Day" event where equipment is demonstrated on public land or a willing private lands cooperator. DCR currently is funding town forest Stewardship Plans in 25 communities. These locations will also be considered for demonstration-scale projects.
- Measurables
  - Within five years the above "Demonstration Day" idea will have been executed at least once, and visitor feedback will be incorporated into planning and designing future events in the series. Areas highlighted by the Assessment as being dominated by small parcel sizes will be prioritized for hosting these events.
- Partnerships: Existing and new partnerships will help with this Economic Development effort. Some of those partnerships include:
  - MA association groups representing Forest Landowners, Foresters, Wood Producers, Secondary Manufacturers, Architects, and wholesale and retail lumber.
  - Farm Bureau
  - Department of Agricultural Resources

- Reinvigoration/re-professionalization of the primary processing infrastructure
  - Strategy
    - The average harvester responding to the survey in the Finding & Removing Barriers study was over 48 years old with an average of 23 years in the business. Coupled with a general trend toward high-tech careers and away from blue-collar, manual labor, the forest workforce is likely to shrink in the coming years. Barriers to entry include regulatory uncertainty, both environmental and business/insurance; uncertain wages; and high equipment costs. As noted above, robust competition for NIPF stumpage is an important component of offsetting the increasing cost of owning woodland in Massachusetts. In addition, maintenance of a strong primary processing infrastructure is vital for clean up after large natural disturbances such as ice and wind storms. While there are certainly areas where ice, wind, and pathogen-damaged forests should be allowed to recover via natural processes, there will always be a need for some salvage operations – whether to mitigate fire risk or further spread of pathogens.
    - Egan et al. identified lack of public respect as a concern among established harvesters in the north woods; likely the issue is important in Massachusetts as well. Efforts to repair this will begin in the schools and homes.
    - We will explore opportunities to partner with existing agricultural and vocational schools to support forestry curriculums. While several agricultural schools offered forestry-specific tracks or "majors" in the early 1980s, there are currently no vocational schools that offer such a track. Several do offer forestry/ horticulture programs, but most have relegated forestry to a single course. It is important to assess the demand for such partnerships first.
    - Addressing these regulatory concerns and education of a new generation of professional woods workers are the primary goals of this strategy.
  - Funding
    - M & U will seek opportunities to:
      - Fund ongoing research on the interaction between timber harvesting and endangered species regulation. David Kittredge (UMASS Amherst) has looked at the issue and concluded that the impact of NHESP on timber harvesting was minimal. The industry has recently stated that NHESP impacts have impacted their operations and it seems that funding another study is critical in light of the work of Damery et al. (2008) that shows all sectors of primary processing (foresters, harvesters, and lumbermen) have great concern over regulation by NHESP.

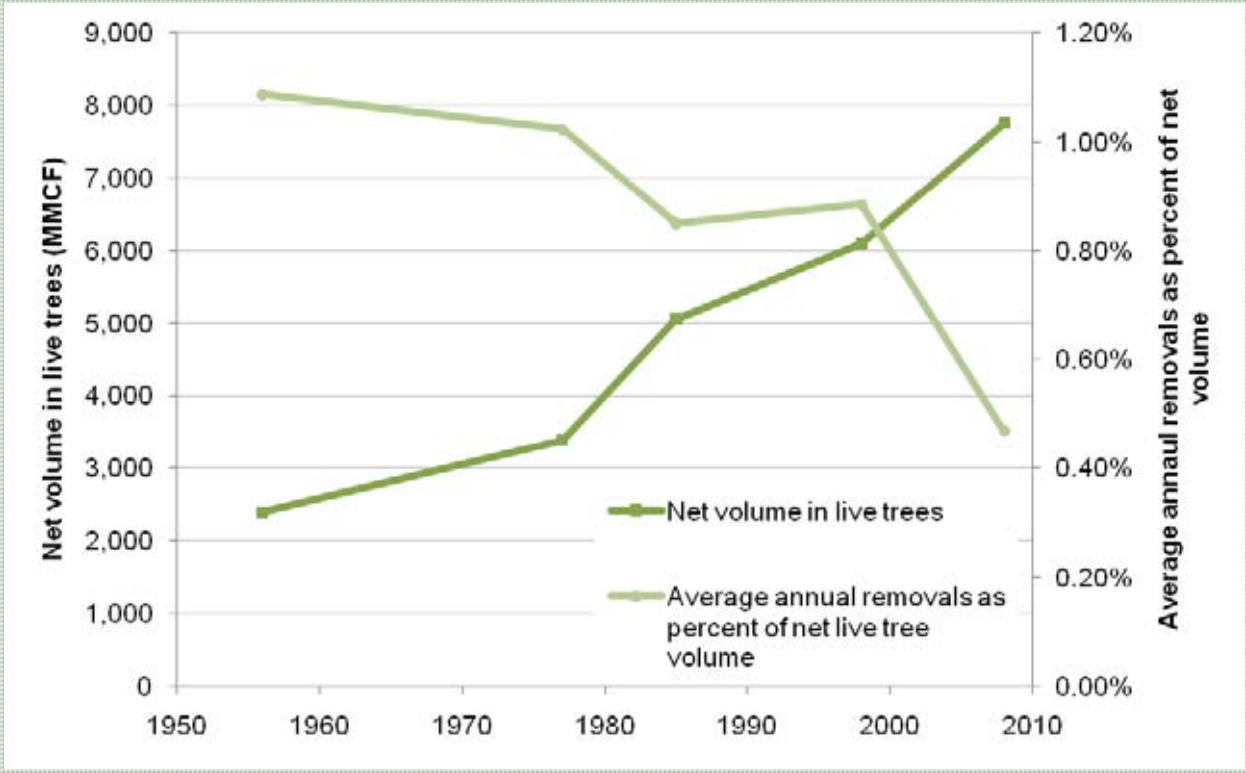
- Fund research into local regulation – the last time municipalities were surveyed for bylaws affecting timber harvesting was over 10 years ago. Local regulations change rapidly and often with little or no input from NIPF or public landowners, and the wood-using industries of the commonwealth. Annual telephone and email surveys of selectmen, planning & zoning departments, and conservation commissions could help to keep a directory of local bylaws up-to-date and available to the wood-using industries. This would also help to avoid conflicts and improve the professionalism of the industry by allowing woods workers to acquire permits *before* harvesting begins and budget costs into procurement, as opposed to when the police arrive on the landing to shut the job down.
- Provide grants for developing business plans for young harvesters/foresters/lumbermen looking to start their own firms and increase professionalism of harvesting and forestry activities in general.
- Fund studies of ways to enhance the trucking infrastructure in rural parts of the state. Road construction, bridge weight limitations, and truck weight constraints often drive the cost of hauling logs excessively high.
- Provide information to interested parties on the importance of economic stimulus programs for the industry. These programs will allow the relatively low-tech Massachusetts primary processing infrastructure to increase utilization, yield, recovery, and efficiency (across all woods workers sectors – sawmills, harvesters, and foresters).

- Measurables
  - Within five years we will have completed another NHESP timber harvesting study, completed and disseminated an up-to-date compendium of local bylaws to licensed foresters and timber harvesters, and completed a feasibility study of a grant program for developing business plans for interested woods workers. Log truck drivers may be included in the next "Finding and Removing Barriers" study by Damery et al.
- Partnerships: Existing and new partnerships will help with this Economic Development effort. Some of those partnerships include:
  - MA association groups representing Forest Landowners, Foresters, Wood Producers, Secondary Manufacturers, Architects, and wholesale and retail lumber.
  - Farm Bureau
  - Department of Agricultural Resources

Education

- "Marketing outside the box" – Early school age attitude intervention
  - Strategy
    - We will support forestry education at all levels, partnering with schools willing to devote one week of curriculum to learning about forestry in southern New England. This represents an opportunity to cover ecology, sociology, civics, and economics as forestry in Massachusetts deals as much with landowner attitudes and preferences, local regulation and state law as it does traditional silviculture, mensuration, and harvesting. This represents an opportunity to reach the next generation of forest landowners, help them understand where forest products come from, and so on (i.e. a Keystone Cooperators Jr. program).
    - Massachusetts supports a wide range of summer camp programs, many of which have a large land base. Reaching to these camps to develop nature education programs that include a component about understanding forest management will be appropriate. Drawing on Tom Wessels "Reading the forested landscape" and similar publications with geocaching will be an important part.

Figure 2. Net live tree volume and average annual removals as a percent of live tree volume, 1952-2006.
Source: USFS FIA data.



- Misguided public perception of the forest products industry has heart Massachusetts forestry significantly in recent years. The industry tends to do a poor job of promoting itself and educating the public on what we do and why we do it. Harvest levels have declined greatly relative to growing stock over the past half-century (Figure 2). Topics that need to be addressed are:
  - Forest Management: Why we do it and why it's important (i.e. demonstration areas).
  - Energy: the use of our local resource in providing a percentage of what we consume.
  - Buy Local: the benefits of producing and consuming locally.

- Funding:
  - M & U will seek opportunities to secure funding for:
    - Development of educational literature to be distributed by and at partner organizations including outdoor education centers, summer camps, and so on.
- Measurables
  - Within five years M & U will have developed an educational brochure on at least one of the above topics (Forest management, Energy, and/or Buy Local).
  - M & U will also have developed a pilot program, creating a one-afternoon component to be integrated into a willing cooperator summer camp youth program. This program will discuss forests, forest products, forest management, and reading forested landscapes.

Marketing

- Enhance brand recognition of locally produced forest products
  - Criteria:
    - 2: Maintenance of productive capacity of forest ecosystems
    - 5: Maintenance of forest contribution to global carbon cycles
    - 6: Maintenance and enhancement of long-term multiple socioeconomic benefits to meet the needs of societies
    - 7: Legal, institutional, and economic framework for forest conservation and sustainable management
  - National themes:
    - Enhance public benefits
    - Conserve working forests
  - Strategy
    - The above strategy primarily addresses concerns of larger, whole sale oriented mills. However, Massachusetts has been a hotbed

for the development and success of the locally grown agricultural movement, whereby farmers sell some or their entire product directly to consumers. Agriculture in Massachusetts had been in decline for some time. Farmers, faced with the high cost of owning land and doing business had been selling out. However,– Massachusetts actually saw an *increase* in the number of farmers and the income per farm in the most recent USDA survey .

- The forest products industry, though classified as agriculture in the language of much legislation, has not been able to realize similar successes. Conventional metrics such as number of licensed timber harvesters are not applicable as enforcement efforts have varied considerably since licensing of harvesters became law. However, anecdotal evidence suggests a precipitous decline in the number of harvesters in the early 1990s from which the industry hasn't recovered. Massachusetts sawmill production declined faster than annual harvesting over a similar time period, and Massachusetts has become a net exporter of increasingly higher-value roundwood.
- Portable and smaller to mid-sized stationary sawmills will be better able to capitalize on the buy-local movement without incurring as significant capital costs restructuring their business for retail operations (random width, room for sorts, etc.). M & U will support and further (1) the ability of primary producers to participate in buy-local programs, and (2) the brand recognition of native lumber.
- There are currently several programs underway to support this effort. One of the first "Buy Local" campaigns in the nations was introduced by Community Involved in Sustaining Agriculture (CISA) in the Pioneer Valley of Massachusetts, which contains listings for wood, firewood, and wood products. The Massachusetts Department of Agricultural Resources (DAR) is initiating a Commonwealth Quality Program (CQP) whereby producers of local agricultural products may brand those products with a seal. Standards are being developed for forest and wood products, and DAR will handle marketing and consumer recognition of the seal. The program is scheduled to be launched in mid-2010. The Massachusetts Farm Bureau Federation has received funding from USFS to support a forest marketing position in support of the CQP program. M & U would like to expand on the success of these programs.
- Government Procurement: our state and municipal governments consume huge quantities of forest products with very little incentive to buy from in-state producers. With products like railroad ties, guard rails, and wooden bridges for our state's transportation system there has been minimal effort to connect the buyers and sellers. Pending legislation attempts to prohibit state government from purchasing wood products from tropical forests. M & U

will use CoC and CQP programs (see above) to market MA produced forest products into new government and municipal markets. M & U will find ways to offset the significant costs of these programs away from the industry which is not in a position to bear them (see above).

- Funding
  - M & U seeks to develop a marketing campaign in support of native lumber. It has long been recognized that Massachusetts red oak has some of the finest color of oak anywhere, but this recognition has traditionally been limited to wholesale and high-end woodworking markets. This program will not only lavish attention upon the high quality of Massachusetts wood, but also on the local nature of its production and high/stringent legal standards under which it is produced, thereby enhancing it's sustainability. Efforts include development of local interest stories to run in newspapers, booths and advertisements at trade and agricultural shows such as the Big E (attendance 1 Million+) to promote CQP and other local wood programs. Another component of this effort will be funding to (1) update the 2006 sawmill directory and (2) develop a secondary wood products directory, and (3) port them to an online, web-searchable, location sensitive website so consumers and industry have easy access to this information.
- Measurables
  - We will with necessary funding and staffing:
    - Develop promotional materials.
    - Work closely with the Dept. of Agricultural resources on the forest and wood products CQP.
    - Develop a talking points list on which to draw when writing local interest stories for newspapers.
    - Encourage attendance at 5 home shows in support of native hardwood and softwood dimension lumber (Big E, Berkshire Co., Franklin Co., Boston, Worcester).
    - Update the Massachusetts sawmill directory.
    - Develop a secondary wood products manufacturers directory.
    - Increase the number of wood listings in CISA and other buy-local publications.
    - Promote native lumber to the secondary market of cabinetmakers & carpenters & home designers (Advertise in Berkshire Living, Yankee Magazine, etc.).
    - Promote a "Local Forests – Local Families" week supporting and promoting a range of locally and family produced traditional and non-traditional forest products.

Trend Analysis-State of the Industry

- There is an increasing need to track forest products market trends, innovations, and opportunities and transfer that knowledge to the industry. Lack of staffing has not allowed the U & M program to keep up with needed updates and new reporting
  - Criteria:
    - 6: Maintenance and enhancement of long-term multiple socioeconomic benefits to meet the needs of societies
    - 7: Legal, institutional, and economic framework for forest conservation and sustainable management
  - National themes:
    - Enhance public benefits
    - Conserve working forests
  - Strategy
    - M & U has traditional been able to keep up-to-date and provide current information to the Massachusetts primary processing sector. However, lack of staffing has meant that needed updates to and development of new materials has not occurred, especially of the items below:
      - MA Directory of Sawmills & Dry Kilns
      - MA Secondary Manufacturers Directory
      - Wood Flow Reporting on primary products entering and leaving the state
      - Firewood Usage surveys including the use of resource professionals in the sourcing of wood
      - Analysis and reporting on recent FIA data
  - Funding
    - M & U will seek the necessary funding to accomplish the updates to and development of the above publications within 5 years.
  - Measureables
    - Within 5 years, M & U hopes to update the MA Directory of Sawmills & Dry Kilns, and would like to have begun the process of developing a detailed wood flow analysis, secondary manufacturer's directory, Firewood Usage Survey, and FIA interpretation.
  - Partners:
    - UMASS Department of Natural Resources Conservation

Technical Assistance

- This is an important part of the U&M program and seems to be well received by the industry served.
  - Criteria:
    - 6: Maintenance and enhancement of long-term multiple socioeconomic benefits to meet the needs of societies

7: Legal, institutional, and economic framework for forest conservation and sustainable management

- National themes:
  - Enhance public benefits
  - Conserve working forests
- Strategy
  - The work of the M & U department here ranges from calls where an immediate answer is needed to resolve a pressing question or issue, to research requested on potential new product lines or plant locations. Site visits to stay in touch with the industry served are easily dropped as the workload increases. It is the goal of the M & U program to increase staffing to be able to accommodate industry requests for assistance in a timely manner.
- Funding
  - M & U will seek the necessary funding, perhaps as part of the above outlined strategies, to allow additional staff to respond to industry needs.
- Measureables
  - Within 5 years, M & U hopes have secured stable funding for and hired at least one additional part-time staff member.
- Partners:
  - UMASS Department of Natural Resources Conservation/ Extension
  - Massachusetts Wood Producers Association
  - Farm Bureau
  - Massachusetts Department of Agricultural Resources

Logs loaded and ready for market

DWSP

Forest Legacy

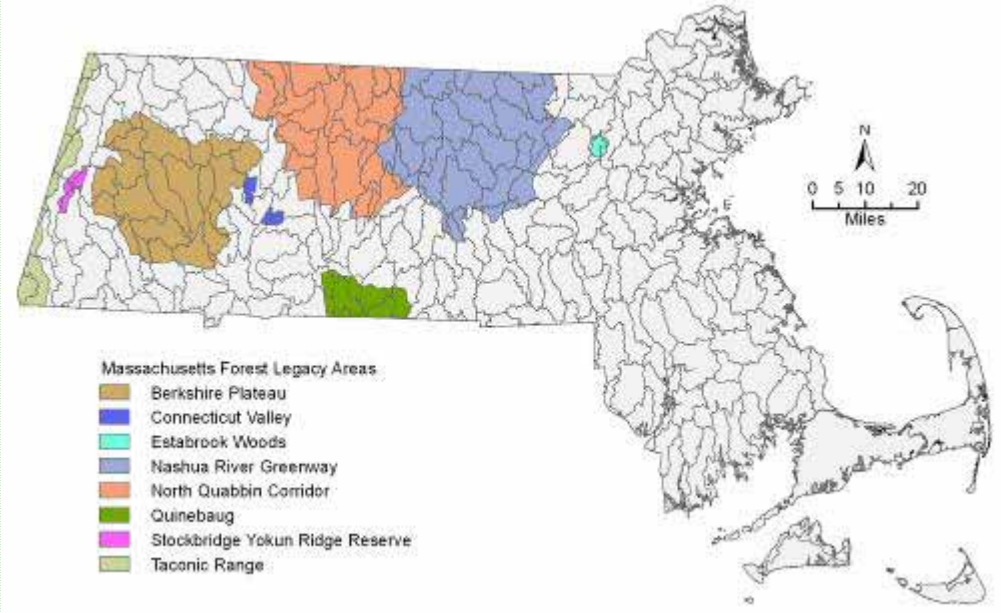
MISSION STATEMENT:

To ascertain and protect environmentally important forestlands threatened by conversion to non-forest uses.

PROGRAM OVERVIEW:

The 1990 Farm Bill, Section 1217 of Title XII of the Food, Agriculture, Conservation and Trade Act of 1990 (Public Law 101-624:104 stat. 3359), authorizes the Secretary to implement the Forest Legacy Program and to select appropriate areas to include in the program. The Forest Legacy Program began with an Initial Program in the Northern Forest Lands Study States of Maine, New Hampshire, Vermont, and New York. The Initial Program also included Washington and Massachusetts with the stipulation that they complete an Assessment of Need (AON). The development of the Massachusetts AON began in 1991 before the Forest Legacy Program Implementation Guidelines were finalized. Two drafts were prepared in 1992 (March and October) and submitted the final version in May 1993. The Secretary of Agriculture approved the Forest Legacy Needs Assessment for Massachusetts on August 5, 1993. The AON provides a comprehensive, long range process to identify and protect privately-owned woodlands that are under threat of fragmentation and conversion to non-forest uses. Subsequent Expansions (Nashua River Greenway and North Quabbin Corridor) and Amendments (Taconic Range, Quinebaug, and Berkshire Plateau) have been submitted. The Nashua River Greenway Forest Legacy Area Expansion was approved on June 1, 2001 and the Taconic Range Forest

MASSACHUSETTS FOREST LEGACY AREAS



Legacy Area Amendment was approved on December 7, 2000. The North Quabbin Corridor Forest Legacy Area Expansion, Quinebaug Forest Legacy Area Amendment, and Berkshire Plateau Forest Legacy Area Amendment are pending approval. Massachusetts will update the AON once the three FLAs (Expansion and Amendments) have been approved. Key findings of the new State Forest Resource Assessment will be considered in future AON Updates.

The USDA Forest Service administers the Forest Legacy Program in cooperation with the State Foresters. On October 3, 1991, the Governor of Massachusetts designated the Department of Environmental Management, Bureau of Forest Development (now the Department of Conservation & Recreation, Bureau of Forestry) as the "State Lead Agency" to cooperate with the USDA Forest Service in the administration of the Forest Legacy Program. The Massachusetts Forest Stewardship Committee created the Forest Legacy Committee (FLC) sub-committee and delegated its Forest Legacy Program responsibilities to the FLC.

Each year, the Forest Service announces the project selection process and scoring guidance for the Forest Legacy Program (FLP). The Massachusetts FLC reviews and ranks the submitted project proposals, and recommends to the State Forester those project proposals that should be forwarded to the Forest Service for consideration by the National Review Panel. The Massachusetts Forest Resource Assessment (Federal Funding and Federally Funded Programs / Pages 119 - 121) provides an overview of the forest lands conserved in Massachusetts through the Forest Legacy Program.

Each Forest Legacy Area (FLA) has a "Sponsor" organization. All project proposals are submitted to the Sponsor and reviewed. Sponsors encourage partners to work together and develop multiple project proposals into larger, landscape-scale projects.

MASSACHUSETTS FOREST LEGACY AREA SPONSORS

_	Forest Legacy Area	Sponsor
1	Berkshire Plateau	Berkshire-Pioneer RC&D
2	Connecticut Valley	Department of Conservation & Recreation
3	Estabrook Woods	Concord Land Conservation Trust
4	North Quabbin Corridor	Mount Grace Land Conservation Trust
5	Nashua River Greenway	Nashua River Watershed Association
6	Quinebaug	The Trustees of Reservations
7	Stockbridge Yokun Ridge	Berkshire Natural Resources Council
8	Taconic Range	Berkshire Natural Resources Council

STAFFING:

The Forest Legacy Program is currently staffed by one "Regional Planner V". This individual is responsible for all aspects of the administration of the Forest Legacy Program in Massachusetts.

PROGRAM PRIORITIES:
Within the next 5-years:

1. Increase the acres of forest land protected through the Forest Legacy Program and improve effectiveness and efficiency of the program.

- *Criteria*: All Criteria Apply
- *National Themes*: All National Themes Apply
- *Strategy*: There is an opportunity to propose landscape-scale projects of greater size, composed of multiple tracts of lands needing protection. Landscape-scale, multi-tract projects have higher probability of being funded. This strategy will result in more forest land protected with the potential for reduced program and administrative costs.
- *Funding Source*: Federal, State, and Local Government, NGOs, Landowners, Philanthropic support.
- *Funding Needs*: Additional Staffing. One position to assist with the coordination of funded projects and project closeouts.
- *Partners and Stakeholders*: FLC, FLA Sponsors, NGO's, State / Local Government, and Project Partners.

2. Finalize funded Forest Legacy projects to Forest Legacy Standards

- *Criteria*: All Criteria Apply
- *National Themes*: All National Themes Apply
- *Strategy*: Refine Project Tracking/Status/Budget spreadsheets with partners to increase tracking efficiencies. Continue to coordinate with project partners to complete funded Forest Legacy projects within 2-years of Forest Service award of projects.
- *Funding Source*: Federal, State, and Local Government, NGOs, Landowners, Philanthropic support.
- *Funding Needs*: One position to assist with the coordination of funded projects and project closeouts.
- *Partners and Stakeholders*: FLC, FLA Sponsors, NGO's, State / Local Government, and Project Partners.

3. Comply will all Forest Legacy administrative requirement and procedures

- *Criteria*: All Criteria Apply
- *National Themes*: All National Themes Apply
- *Strategy*: Forest Legacy program has specific steps, processes, requirements, committee, reporting, filing and etc. requirements that must be met. Efforts will be made to continue meeting all Forest Legacy program requirements. Coordinate with State agencies, local governments, NGO's, and others to develop Conservation Easement Monitoring efforts. Develop monitoring program and train state and local government staff, NGO's and other partners.
- *Funding Source*: Federal, State, and Local Government, NGOs, Landowners, Philanthropic support.
- *Funding Needs*: One position to assist with the coordination of funded projects and project closeouts.
- *Partners and Stakeholders*: FLC, FLA Sponsors, NGO's, State / Local Government, and Project Partners.

4. Identification and Development of Proposed Forest Legacy Projects:

- *Criteria*: All Criteria Apply
- *National Themes*: All National Themes Apply
- *Strategy*: The MA Forest Legacy Program has developed a process to identify, rank by priority, and propose to the Forest Service Forest Legacy Projects. This process needs to continue and focus on the identification of larger projects that best meet the national criteria for inclusion into the Forest Legacy program. Close coordination and communications need to occur with our project proponents, Legacy (Stewardship) Committee, Land Trusts, organizations interested in the protection of forest lands, and elected officials.
- *Funding Source*: Federal, State, and Local Government, NGOs, Landowners, Philanthropic support.
- *Funding Needs*: One position to assist with the coordination of funded projects and project closeouts.
- *Partners and Stakeholders*: FLC, FLA Sponsors, NGO's, State / Local Government, and Project Partners.

5. Recognizing and celebrating the protection of forested land via the Forest Legacy Program.

- *Criteria*: All Criteria Apply
- *National Themes*: All National Themes Apply
- *Strategy*: When Forest Legacy projects are completed, the Forest Legacy program in cooperation with our partners, need to celebrate and dedicate protected forest lands. The celebration needs to recognize our partners, and efforts of others who made the land protection possible, including recognition of the Forest Service who administer the Forest Legacy program and provide federal funds.
- *Funding Source*: Federal, State, and Local Government, NGOs, Landowners, Philanthropic support.
- *Funding Needs*: One position to assist with the coordination of funded projects and project closeouts.
- *Partners and Stakeholders*: FLC, FLA Sponsors, NGO's, State / Local Government, and Project Partners.

6. Update the Massachusetts Assessment of Need

- *Criteria*: All Criteria Apply
- *National Themes*: All National Themes Apply
- *Strategy*: Massachusetts will update the AON once the three FLAs (Expansion and Amendments) have been approved. Key findings of the new State Forest Resource Assessment will be considered in future AON Updates.
- *Funding Source*: Federal, State, and Local Government, NGOs, Landowners, Philanthropic support.
- *Funding Needs*: One position to assist with the coordination of funded projects and project closeouts.
- *Partners and Stakeholders*: FLC, FLA Sponsors, NGO's, State / Local Government, and Project Partners

7. Continue participation in the following ongoing Forest Conservation related discussions:

Financing Forest Conservation Initiative (CONSERVATION INNOVATION**)**

Forest Forum

Wildlands and Woodlands
A Vision for the New England Landscape (2010)
A Vision for the Forests of Massachusetts (2005)

Landscape Scale Conservation in the Northeast and Midwest: A Position Paper from the Three Mission Areas of the USDA Forest Service: Eastern Region, Northeastern Area, and Northern Research Station; and the Northeastern Area Association of State Foresters.

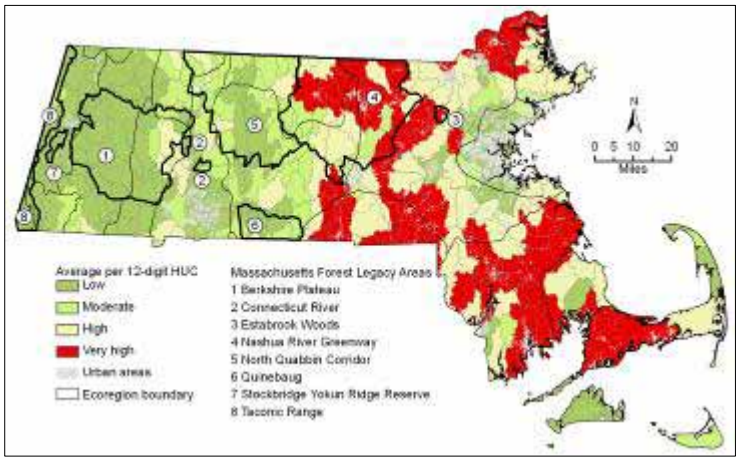
Massachusetts Forest Futures Visioning - Technical Steering Committee (TSC) Final Recommendations

- *Criteria*: All Criteria Apply
- *National Themes*: All National Themes Apply
- *Strategy*: Participation and involvement in these ongoing discussions provide innovative ideas and insight from many other Forest Conservation Stakeholders and has been found to be beneficial in the advancement of the Massachusetts Assessment of Need and the Forest Legacy Program.
- *Funding Source*: Federal, State, and Local Government, NGOs, Landowners, Philanthropic support.
- *Funding Needs*: One position to assist with the coordination of funded projects and project closeouts.
- *Partners and Stakeholders*: FLC, FLA Sponsors, NGO's, State / Local Government, and Project Partners.

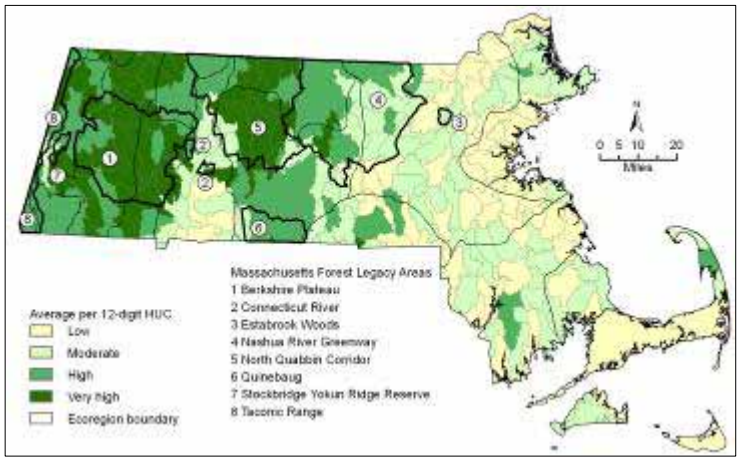
PROGRAM PRIORITY AREAS:

The Massachusetts Forest Resource Assessment has produced numerous findings that will be beneficial in the future update of the Massachusetts Assessment of Need and the implementation/administration of the Forest Legacy Program. The maps below show how the current Forest Legacy Areas overlap with some of the analysis/findings in the Assessment:

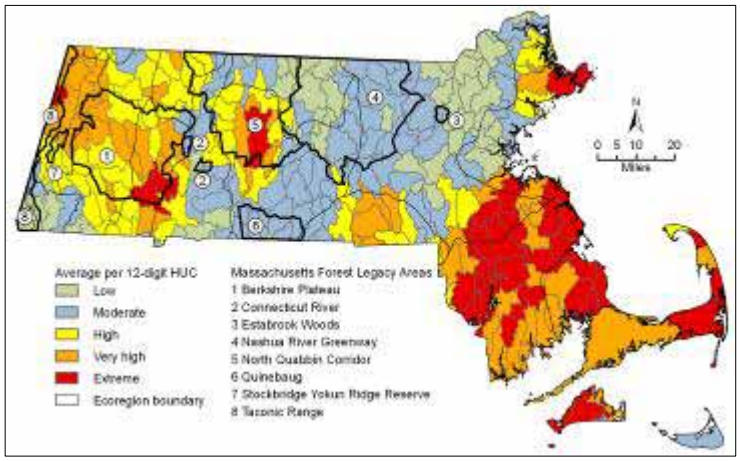
FOREST VULNERABILITY



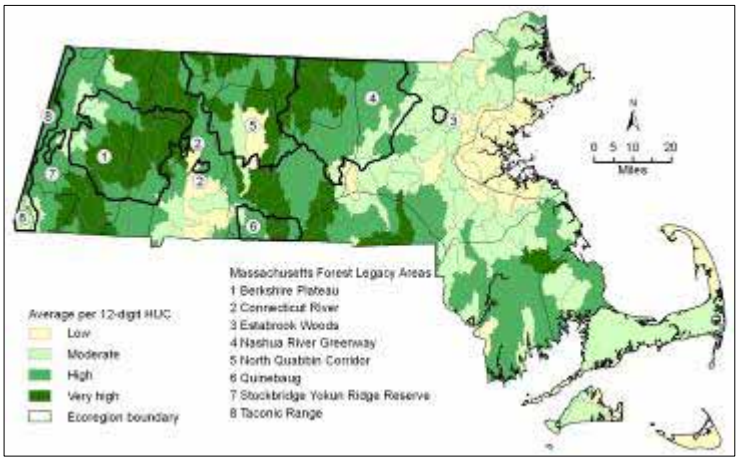
FOREST FUNCTIONS, BENEFITS AND VALUES



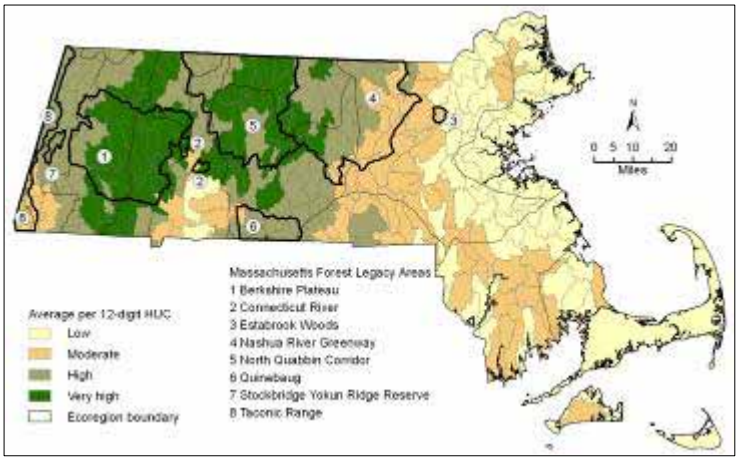
PROTECT FORESTS FROM HARM



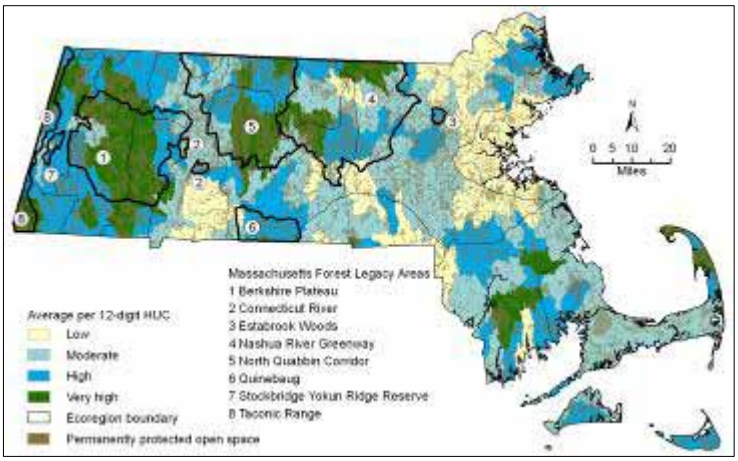
CONSERVE WORKING FORESTS



ENHANCE PUBLIC BENEFITS FROM TREES AND FORESTS - LOCAL WOOD PRODUCTION AND FOREST SECTOR EMPLOYMENT



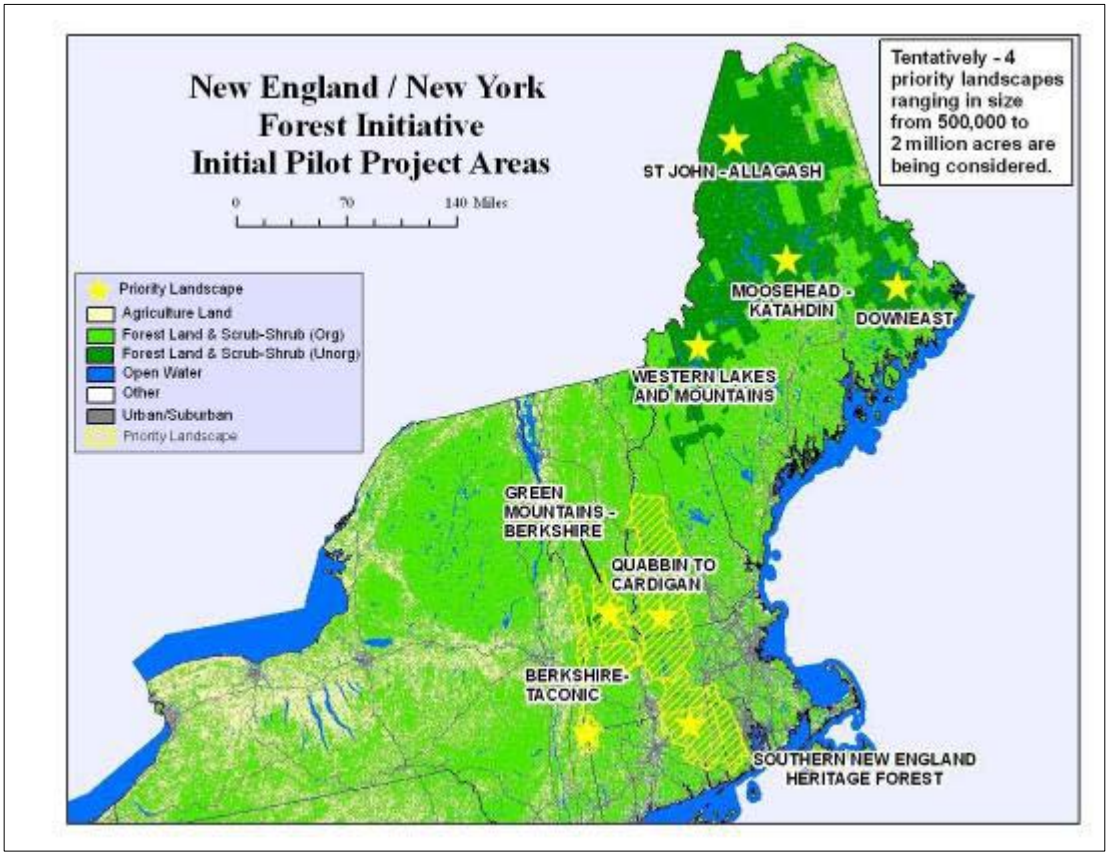
ENHANCE PUBLIC BENEFITS FROM TREES AND FORESTS - WATER RESOURCES AND BIOLOGICAL DIVERSITY



MULTI-STATE COOPERATIVE PRIORITY AREAS:

The following will be carefully considered in any project proposals submitted to the Massachusetts Forest Legacy Committee and in any future update of the Massachusetts Assessment of Need:

NEW ENGLAND GOVERNOR'S CONFERENCE
COMMISSION ON LAND CONSERVATION (CLC)
4 GROUPS INCLUDING
"KEEPING FORESTS AS FORESTS"



Forest Fire Control

MISSION STATEMENT:

Perform fire management activities such as wildfire: pre-suppression, suppression, detection, prevention and hazardous fuel mitigation; inspect and enforce the Massachusetts open burning regulations and slash laws; investigate arson wildland fires; maintain and manage fire tower and high ground communication sites; maintain and construct fire roads throughout DCR properties; conduct programs and activities to protect forests, natural resources, life safety and property in the Commonwealth, aid and assist the 351 communities during wildfire and when approved other natural disaster events, and perform DCR recreation, forestry, and other activities during period of low or moderate fire risk danger. As defined by Massachusetts general law chapter 48 sections 8 through 28c.

The Bureau of Forest Fire Control (BOF) is charged with providing assistance to cities and towns in the Prevention, Detection, and Suppression of wildland fires throughout the Commonwealth of Massachusetts' 3.1 million acres of state, public, and private forested land. As stated in Chapter 48, Section 28 of the General Laws of the Commonwealth of Massachusetts: *"The State Fire Warden, appointed under section five of chapter twenty-one shall aid and advise the forest wardens and their deputies in towns and the municipal officers exercising the functions of forest wardens in cities in preventing and extinguishing forest fires and enforcing the laws relative thereto. The forester may designate not more than fifteen assistants to aid the warden. The state fire warden shall report annually to the forester upon his work and upon the forest fires occurring in the commonwealth. This report shall be included in the report of the commissioner of environmental management relative to the acts of the forester."*

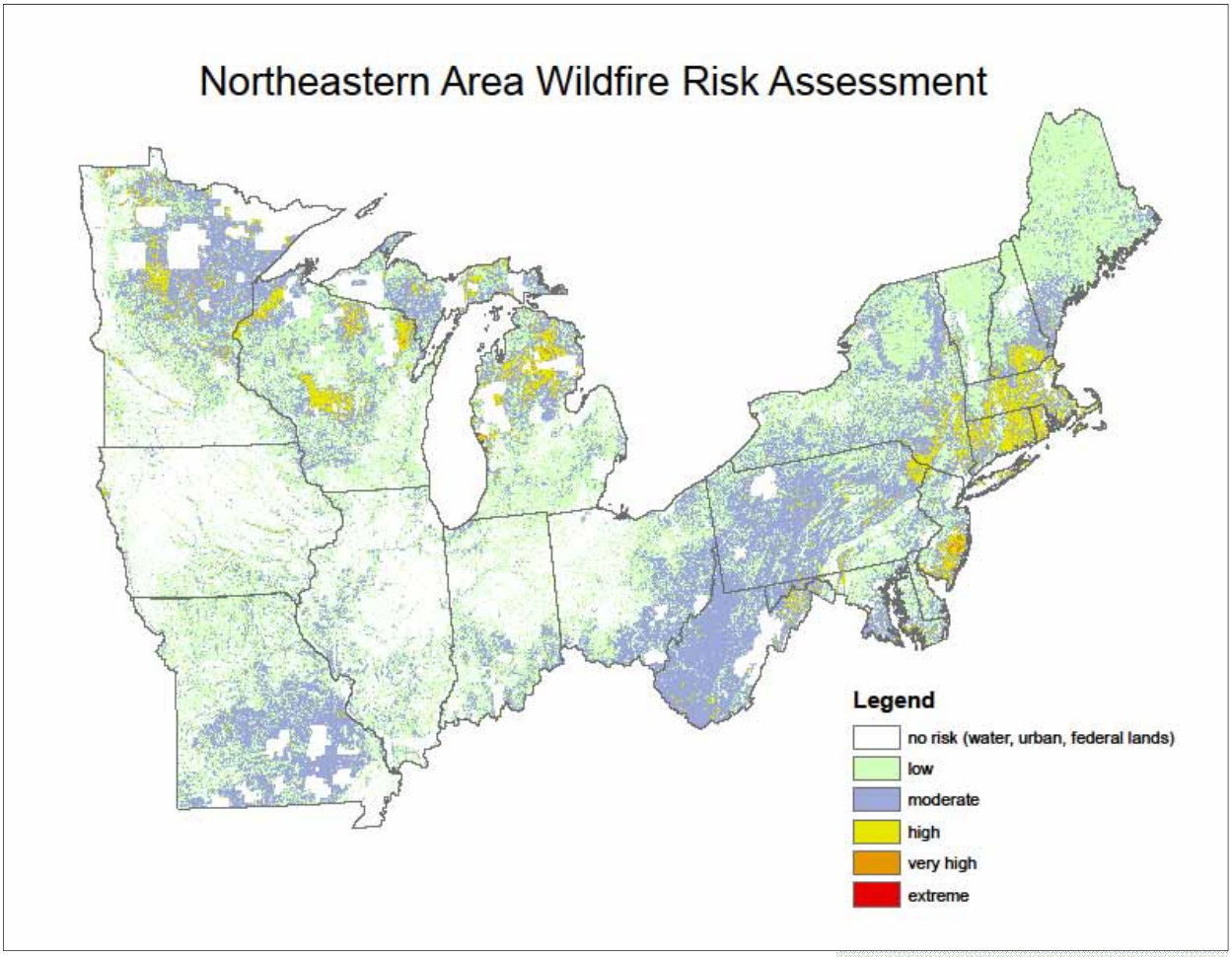
HISTORY:
Chapter 722, Acts of 1911 created the position of the Commonwealth's first State Fire Warden, to which Maxwell C. Hutchins was appointed. The Chief Fire Warden was also permitted the authority to appoint up to fifteen deputies to assist with the statewide responsibilities. These fifteen deputies has since become the thirteen District Fire Warden's situated throughout the Commonwealth.

Federal Legislation, entitled The Weeks Law, was enacted on March 1, 1911. This act provided, among other things, for the Federal Government to cooperate with states in forest fire control programs. Massachusetts was one of eleven original states to enter into an agreement with the Federal Government to cooperate in forest fire control. The fire tower system followed, as did fire suppression assistance to cities and towns.

In 1978, Section 2 of the Clark-McNary Act was superseded by Section 7 of the Cooperative Forestry Assistance Act. This act provided for the Federal Government to provide technical assistance and grants to states for purposes of wildland and rural community fire prevention and suppression control. Today this is called the Rural Fire Prevention and Control Program (RFP&C).

FUELS TYPES, FIRE BEHAVOIR AND FIRE HISTORY;

Massachusetts comprises a very diversified landscape when considering fuel types and potential threat from wildland fires. Fuel types are mainly hardwood timber litter and shrubs throughout most of the state with mixed areas of open shrub and grasslands. Northern hardwoods, oak and mixed softwoods dominate the landscape across much of the mainland, from Norfolk county to the western Berkshires. Fire potential varies in these areas dependent on soil types. Soils west of Worcester County tend to be moist, more clay based soils creating less of an overall fire risk except for the dry periods, such as spring and periods of drought. Soils in Worcester County and east tend to be drier sandy outwash allowing for more rapid drying and longer periods of dry conditions. This increases overall fire risk, as fine surface fuels, such as leaf litter and downed 100 and 1000 hr fuels are affected by these conditions. Fire risk in this eastern half of the state is considered high. Southeastern Massachusetts is dominated mainly by softwood, oak and shrubs. Pitch pine and schrub oak provide the states most volatile fuel type. Found in Plymouth, Barnstable counties and on Martha's Vineyard and Nantucket, this fuel is not only the states most dangerous fuel type, but considered the second most volatile in the country, second only to California Chaparral. Fire history is rich in Massachusetts. Although the past 30 yrs have seen only moderate fire activity, the drought induced fires of the 1940's through the mid 60's exemplified the potential of these fuels. In May of 1957 a fire in Myles Standish State Forest, Plymouth County burned over 15,000 acres in less than 14 hours. In that same era it was not uncommon to see fire growth in the area of 1,000 to 5,000 acres in short periods of time. These fires are weather and fuel dependent. The fuel types across the state demonstrate every spring how reactive they become to low relative humidity's, wind and low fuel moistures.



Source: U.S. Forest Service

CURRENT PROGRAM OVERVIEW:

DCR Bureau of Forest Fire Control currently maintains its original mission, providing assistance to cities and towns throughout the Commonwealth of Massachusetts in Detection, Suppression and Prevention of forest fires on both public and private lands in addition to managing the U.S. Forest Service Federal Excess Property program for Massachusetts fire resources, providing fire resources for out-of-state national incidents, and managing and supporting prescribed fire projects on both state and privately owned partnership lands throughout the state.

STAFFING:

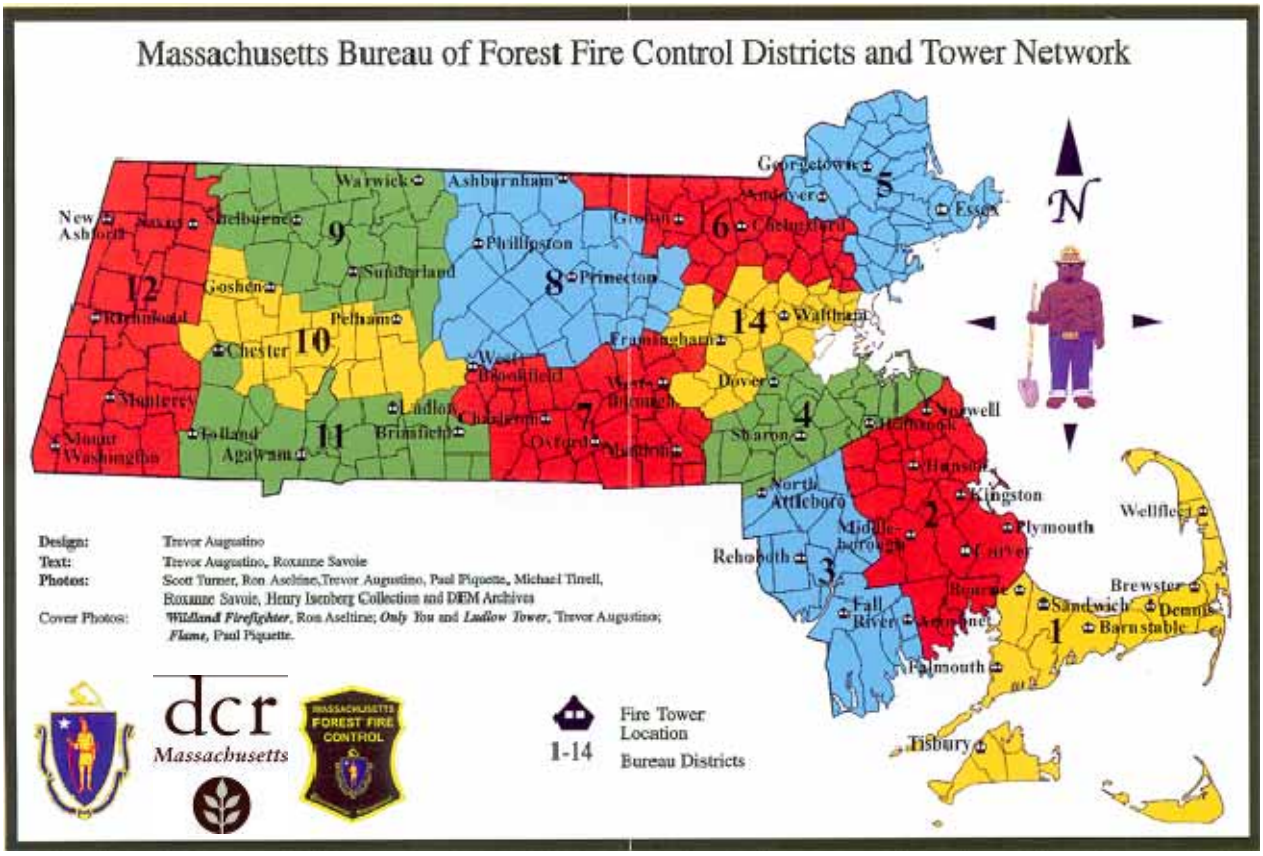
The bureau currently consists of 27 year round staff, including a Chief Fire Warden, 13 District Fire Wardens, 6 District Patrolman, 1 Prevention coordinator, and 3 Dispatchers, and 1 High Ground Carpenter. Seasonal fire fighters totaling 51 were hired for the current 2010 calendar year from March 22 through October 1. These staffing levels have been reduced from 2002, when the bureau had 60 year round staff and 63 seasonals. Most recent staff reductions

BUREAU OF FOREST FIRE CONTROL STAFFING:

	Position	Current	Growth	Ideal
FOREST FIRE CONTROL	Chief Fire Warden	1	1	1
	Deputy Chiefs	0	1	3
	Program Coordinator	1	2	2
	Admin Assistant*	1	1	1
	Clerk	0	1	1
	Bureau IT Staff	0	0	1
	District Wardens	13	13	13
	District Patrolmen	6	16	18
	Firefighter III	0	6	26
	Heavy Equip Operators	1	1	4
	Fed. Excess Equip Prop Program Coord*	0	1	1
	Inventory Cont Specialist	0	0	1
	High Ground Coord	0	1	1
	Construction Foreman	0	1	1
	Carpenter	1	1	2
	Seasonal Laborers	2	2	2
	Seasonal Staff	51	54	90
	Radio Room Dispatchers	3	4	7
	Total Permanent Staff Total Seasonal Staff	27 51	52 56	73 92

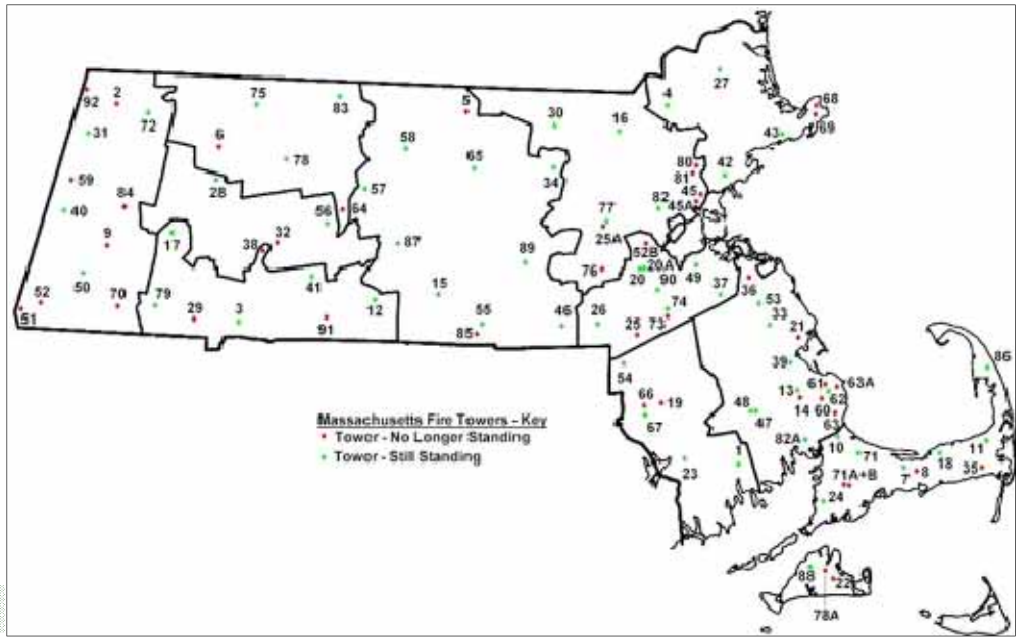
TRAINING:

Bureau staff play an ever increasing role in wildland fire preparedness by delivery of training courses to local fire departments and state agency staff. These staff are trained at National Wildland Coordinating Group (NWCG) standards and provide an excellent conduit for delivering the most up to date training in wildland fire management. The bureau trains in excess of 300 local fire fighters annually, and participates in the training of at least 500 wildland firefighters from around the northeast area.



FIRE TOWER PROGRAM:

The Bureau's fire tower program is the oldest in the country. In 1925, 61 fire lookout towers were active in the Massachusetts system. This has since been reduced to 43 still in existence, of which approximately 22 can be manned during high fire indices with current staffing levels. Detection through the fire tower network has consistently been identified by state fire chiefs as a critical tool for early detection of wildland fires in Massachusetts.



Source: MA DCR

SUPRESSION ASSISTANCE:

Each of the 13 districts provide varying levels of suppression assistance and support to cities and towns, dependent on staffing levels at any given time. Each District is equipped with at least 1 type 6 engine (brush truck) and several support type vehicles, such as tankers. Average fire totals for Massachusetts are found to be 1,200 to 1,800 fires for 1,500 to 3,000 acres burned. Each district is also responsible for collecting wildland fire data as part of our reporting responsibility to the Forest Service.

Source: MA DCR

FEDERAL EXCESS PROPERTY:

The Bureau is responsible for the management of the Federal Excess Property program, a program administered by the Forest Service and managed on the state level by state forestry agencies. DCR Forest Fire Control facilitated the transactions of over 7 million dollars worth of fire fighting equipment for both state and local fire departments in 2009.

Source: MA DCR

VOLUNTEER FIRE ASSISTANCE:

The Bureau administers the Volunteer Fire Assistance program to towns in Massachusetts with populations under 10,000.

PREVENTION PROGRAMS:

Perform Fire Management Prevention activities such as administer and deliver fire prevention and control educational programs; cooperative fire prevention program (Smokey Bear Program); maintain and staff weather stations; fire danger signage program; Fire-wise program; exhibits at conferences, exhibitions, fairs, parades, and other civic events; DCR visitor fire prevention programs and individual contacts. Fire Prevention program will be developed based on prioritization and focused objectives, messages, and moderate to high risk wildfire and wildland-urban interface areas.

PRESCRIBED FIRE:

Over the last 10 years, this bureau has been building a prescribed fire program mainly aimed at hazard fuel mitigation initiatives in the pitch pine and scrub oak fuel types of southeastern Massachusetts. Most recently and with funding assistance from the Forest Service, DCR has treated almost 1,000 acres both mechanically and with prescribe fire on state lands and leveraged support to treat privately owned partnership lands. During 2010, the bureau is poised to record the most acres treated with prescribed fire since the inception of this program.

Prescribed fire at Myles Standish State Forest for Hazard Fuel Reduction

Source: MA DCR

FIREFIGHTING ASSISTANCE TO FEDERAL AND PROVINCIAL AUTHORITIES:

Massachusetts DCR through the Bureau of Forest Fire Control maintains a yearly cooperative agreement with the U.S. Forest Service and the Northeast Forest Fire Protection Compact to assist in fire suppression on both Federal incidents and the eastern Canadian Provinces. BOF has been mobilizing highly qualified wildland fire crews since 1985, and most recently mobilized its first ever fire crew to Quebec in 2009. Crews are made up of both state and municipal firefighters, who meets the qualifications set forth the National Wildland Coordinating Group for participation on federal incidents.

Massachusetts Type 2IA Wildfire Crew on assignment in Idaho

Source; MA DCR

FUNDING:

The fire program relies on both federal and state funding to support this extensive mission. Funding sources include State Fire Assistance, Hazard Fuels Mitigation, and most recently, ARRA Stimulus Funding of a Southeast Hazard Fuels Mitigation project for southeast Massachusetts. Currently 6 of the full time staff and 9 seasonal staff are supported from these federal grant programs

PROGRAM PRIORITIES FOR AREA
IDENTIFIED THROUGH THE ASSESSMENT PROCESS:

Meet DCR and private lands fire management needs according to appropriate risks.

Criteria 3

National Themes: All National Themes Apply

Strategy:

Support municipal fire agencies across the state with quality assistance in the form of detection, suppression, prevention and intelligence sharing. DCR will continue to support this effort by maintaining a strong fire tower detection program, providing suppression ground resources and facilitating helicopter operations, providing sound fire weather and fuels intelligence data, and assisting fire officers with wildfire management and tactics. Cooperate with other DCR agency staff in planning and implementing fire management strategies for long term benefit to the forest resources on both state and private lands.

Partners and Stakeholder:

- Municipal Fire Departments
- Massachusetts Department of Fire Services
- The Nature Conservancy
- Massachusetts State Police
- National Guard

Provide a strong prescribed fire program that supports both hazard fuels mitigation, while at the same time providing a tool for ecosystem restoration in fire dependent ecosystems.

Criteria 3,1

National Themes: All National Themes Apply

Strategy:

This accomplishment demands continued training and development of staff as prescribe fire professionals. Development of strong prescribed fire standard operating procedures will ensure effective and safe application of this practice as a management tool.

Funding: Will require a combination of both federal and state funding sources to provide both staffing and mechanical resources.

Partners and Stakeholders:

- Municipal Fire Departments
- The Nature Conservancy
- Mass Fish and Wildlife
- U.S. Fish and Wildlife Service

Maintain a strong, highly trained resource base of both state and municipal firefighters for both in state response and national response within the wildland fire arena.

Criteria 3

National Themes: Protect Forests From Harm

Strategy:

Work closely with federal, state and compact partners and associations to promote training programs and qualification opportunities for wildland fire resources in Massachusetts.

Partners and Stakeholders:

- Municipal Fire Departments
- All Federal Fire Agencies
- Northeast Forest Fire Protection Compact

Maintain a strong wildland fire training program for both state and municipal firefighters.

Criteria: 3

National Themes: Protect Forests From Harm

Strategy:

DCR Forest Fire Control will deliver national standard training courses to state and local firefighters in the areas of:

- Basic Wildland Fire suppression
- Wildland Fire Behavior
- Wildland Fire in the Urban Interface
- Air Operations on Wildland fires
- All levels of Incident Command Training

Partners and Stakeholders:

- Municipal Fire Departments
- Northeast Forest Fire Protection Compact