

# Forests in Massachusetts: A Tool to Prevent and Prepare for Climate Change June 2015

## **Background**

Forests are a defining feature of Massachusetts, with 3.2 million acres of forestland (over 60% of the state's land area)<sup>1</sup>. From the Berkshires to Cape Cod, there are many different types of forests, but all provide important natural and economic values including clean air and water supplies, recreational opportunities, habitat for fish and wildlife, timber and other forest products, and community character that contributes to quality of life and property values. The ecosystem service value of forests in Massachusetts is estimated at more than \$3.8 billion annually<sup>2</sup>.

Forests also play critical roles in addressing climate change, both by reducing heat-trapping greenhouse gases (preventing climate change) and helping nature and people adapt to unavoidable climate changes already underway (preparing for climate change). Forests in Massachusetts:

- Sequester 14% (11.3 million metric tons CO<sub>2</sub>e) of the state's gross annual carbon emissions annually<sup>3</sup>;
- Store 85 tons of C (312 metric tons CO<sub>2</sub>e) on the average acre<sup>4</sup>;
- Continue to increase the mass of carbon storage over time as forests mature.

Most forests in Massachusetts are in a period of re-growth after intensive clearing historically. The extent of land coverage in forests peaked around 1980, and is now declining again due to conversion to development. About 38,000 acres of forestland were developed between 2005 and 2013<sup>1</sup>. Most of this development is low-density residential development (sprawl), which impacts more acres and has higher road and community services costs than more compact development.

## **Massachusetts Clean Energy and Climate Action Plan**

Massachusetts is a leader in recognizing the serious threats climate change presents to humans and the environment upon which we depend. Under the Global Warming Solutions Act, the state has established goals of reducing greenhouse gas emissions (GHG) by 25% by 2020 and 80% by 2050. The Action Plan to achieve the 2020 goal includes several mentions of the role of forests in reducing emissions, and the 2015 update of the plan offers an opportunity to more fully value the contribution of forests to reducing emissions. **The substantial benefits of protecting forests and urban trees for their values in both climate change adaptation and mitigation should be highlighted in the Commonwealth's efforts to reduce emissions and to adapt to a climate-changed future.**

## **Cross-Cutting Benefits of Forest Conservation:**

**Emissions reduction:** Protection and enhancement of forested areas through land conservation, smart growth, tree planting in urban and suburban areas, and good forest management practices are necessary for Massachusetts to reduce emissions enough to achieve its Global Warming Solutions Act goals.

- Forested land stores and continues to sequester additional carbon, with the capacity to offset even more of Massachusetts' greenhouse gas emissions through additional land protection and well-planned forest management.
- Keeping forest as forest avoids carbon emissions from land use conversion.
- Trees in the right location around buildings and streets reduce heating and cooling costs and urban heat island effects.
- Sustainable management of forests yields wood products that can substitute for more carbon-intensive energy sources and building materials.
- Where forestland conversion is necessary, management of agricultural soils, suburban yards, and road right-of-ways with carbon in mind can impact to what extent land is a greenhouse gas source versus sink.

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<sup>1</sup> Mass Audubon, *Losing Ground: Planning for Resilience*, 2014.

<sup>2</sup> The Trust for Public Land, *The Return on Investment in Parks and Open Space in Massachusetts*, 2013.

<sup>3</sup> MassDEP, 2008-2010 Massachusetts Greenhouse Gas Emissions Inventory, 2013; emissions figures are for 2010.

<sup>4</sup> Avril L. de la Crétaz, et. al. *An Assessment of Forest Resources of Massachusetts*, UMass Department of Natural Resources Conservation and Massachusetts Department of Conservation and Recreation for the U.S. Forest Service, 2010.

<sup>5</sup> For additional detail on specific policy opportunities to enhance the use of forests to address climate change, see: Lambert et. al. *Addendum: A Summary of Policy Implications of Changes to the Land*, 2013.

<sup>6</sup> See forest cores and landscape blocks in: MA Department of Fish and Game and The Nature Conservancy, *BioMap2*, 2010

Adaptation: Forests and other vegetated areas also play critical roles in climate change adaptation. Their impact on water resources is particularly vital in light of predictions of increased frequencies of both droughts and intense storms that cause floods, and more precipitation falling as rain than as snow in winter.

- Precipitation infiltrates better into forests than virtually any other land cover, providing recharge to drinking water supplies and rivers, and reducing flood peaks and drought impacts.
- Forests, wetlands, naturally vegetated buffers along streams, and trees and constructed wetlands in developed areas filter and infiltrate stormwater runoff, reducing erosion, pollution, and flooding.
- The use of natural (green) versus constructed (grey) infrastructure in preparing for severe storms and flooding reduces costs as well as carbon emissions associated with concrete and other construction practices.

Action Recommendations:

**Recognize the role of forests in climate change adaptation and emissions reduction, in policies and carbon accounting stemming directly from the Global Warming Solutions Act as well as in state agency actions across the board.** Align policies across agencies, and increase attention on and support for action at the municipal level<sup>5</sup>. New programs should be considered to assist communities, land trusts, and landowners, support cooperative efforts, and incentivize local actions in order to retain trees wherever they occur.

Specific areas recommended for focus include the following:

1. Protect forest blocks, especially those that are large or interconnected<sup>6</sup>, with the most carbon stored and the best ability to be resilient.
  - Continue state land protection and landowner conservation assistance programs at current or increased levels.
  - Require compensatory mitigation for disturbances to large, intact forests that accounts for fragmentation and edge effects, and the loss of future carbon sequestration.
2. Support more compact forms of development and protect areas that act as Green Infrastructure:
  - Assist municipalities in adopting innovative land use regulations and incentives, e.g. Natural Resource Protection Zoning, Mixed-use and Infill/Redevelopment zoning, and Low Impact Development regulations.
  - Revise the MEPA greenhouse gas thresholds to address greenhouse gas impacts of development projects smaller than 50 acres, including requiring accounting of both aboveground carbon and carbon in soils.
3. Reduce energy usage by maintaining trees around buildings and planting where needed, and by substituting wood for non-renewable materials:
  - Enhance funding for tree planting programs.
  - Support municipal land use regulations and incentives to retain trees on building sites.
  - Promote sustainable and local uses of wood for construction and thermal energy.
4. Consider carbon sequestration and climate change adaptation in state-funded forest management plans and outreach materials, and in the type of forest management promoted to private landowners and implemented on public lands.

For more information, contact:

Steve Long  
617-532-8367  
slong@tnc.org

E. Heidi Ricci  
781-259-2172  
hricci@massaudubon.org

