NEFF's Exemplary Forestry Initiative:

Supporting and Enabling Wood Construction and Land Conservation

Frank Lowenstein, Robert Perschel, Alec Giffen, Sophie Traficonte, Lisa Hayden and Ray Lyons

April 10, 2019

NEFF's Mission

Through the application of our core expertise in conserving forestland and advancing Exemplary Forestry, New England Forestry Foundation helps the people of New England to sustain their way of life, protect forest wildlife habitat and ecosystem services, and mitigate and adapt to climate change.

Encourage diverse markets

Before thinning

After thinning to reduce mortality and increase growth on crop trees

1964—before harvest

1964—after harvest

1984

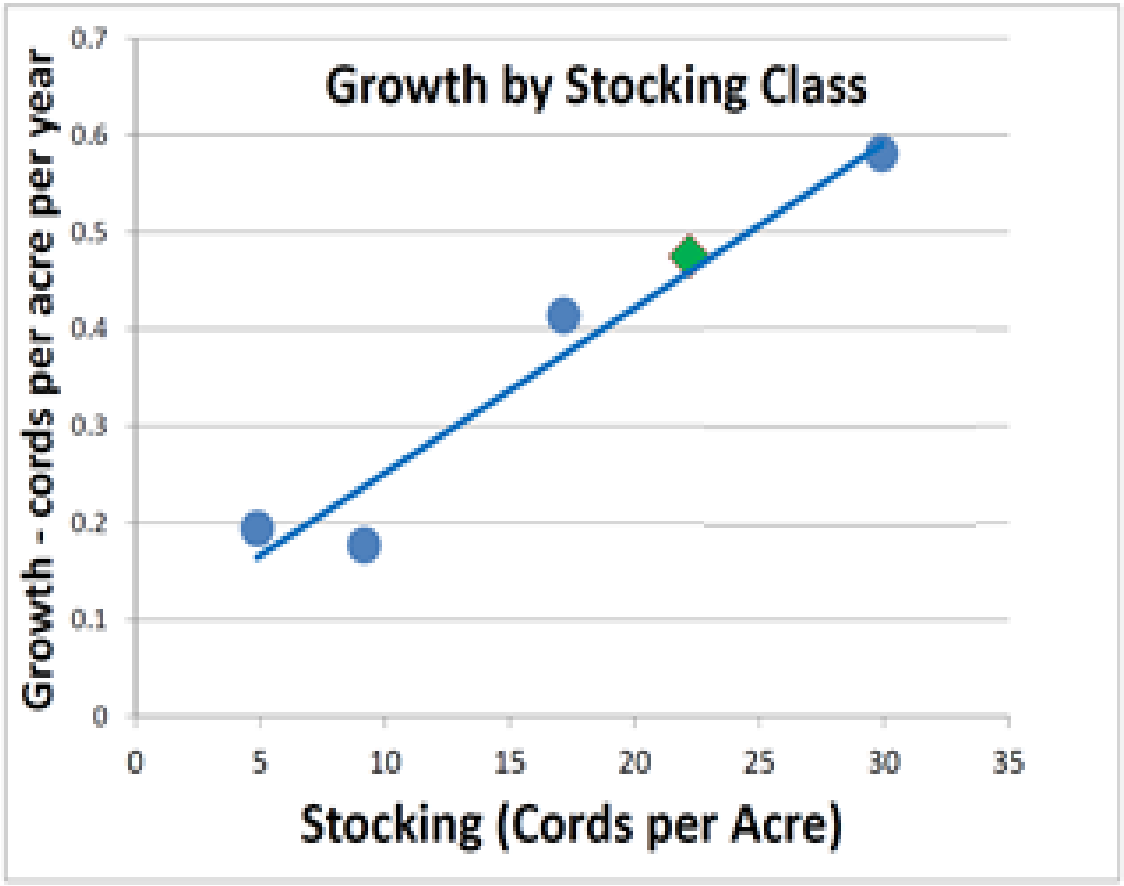
2004

Figure 1. The sequence above captures 40 years of change from a permanent camera (CP 03 in Compartment 18A). The sequence depicts pre- and post-harvest stand development following a 0.4 acre patch cut. The technician in the photographs is standing by the same tree in 1984 and 2004.

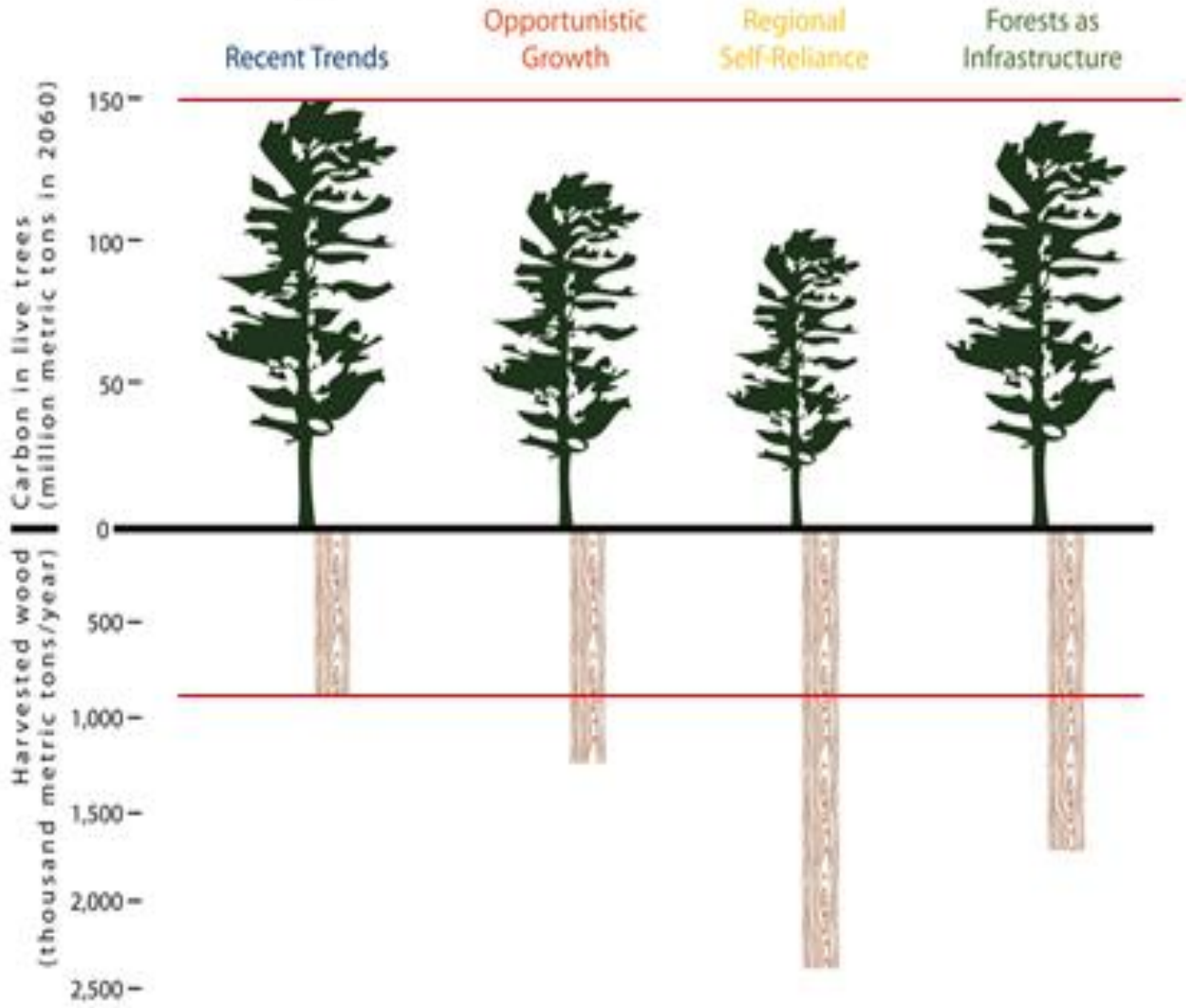

We all like big trees

Increasing stocking increases growth

R.S. Seymour - March 17 2015



Carbon Storage and Wood Harvest



Double the production of wood from New England forests while protecting other values

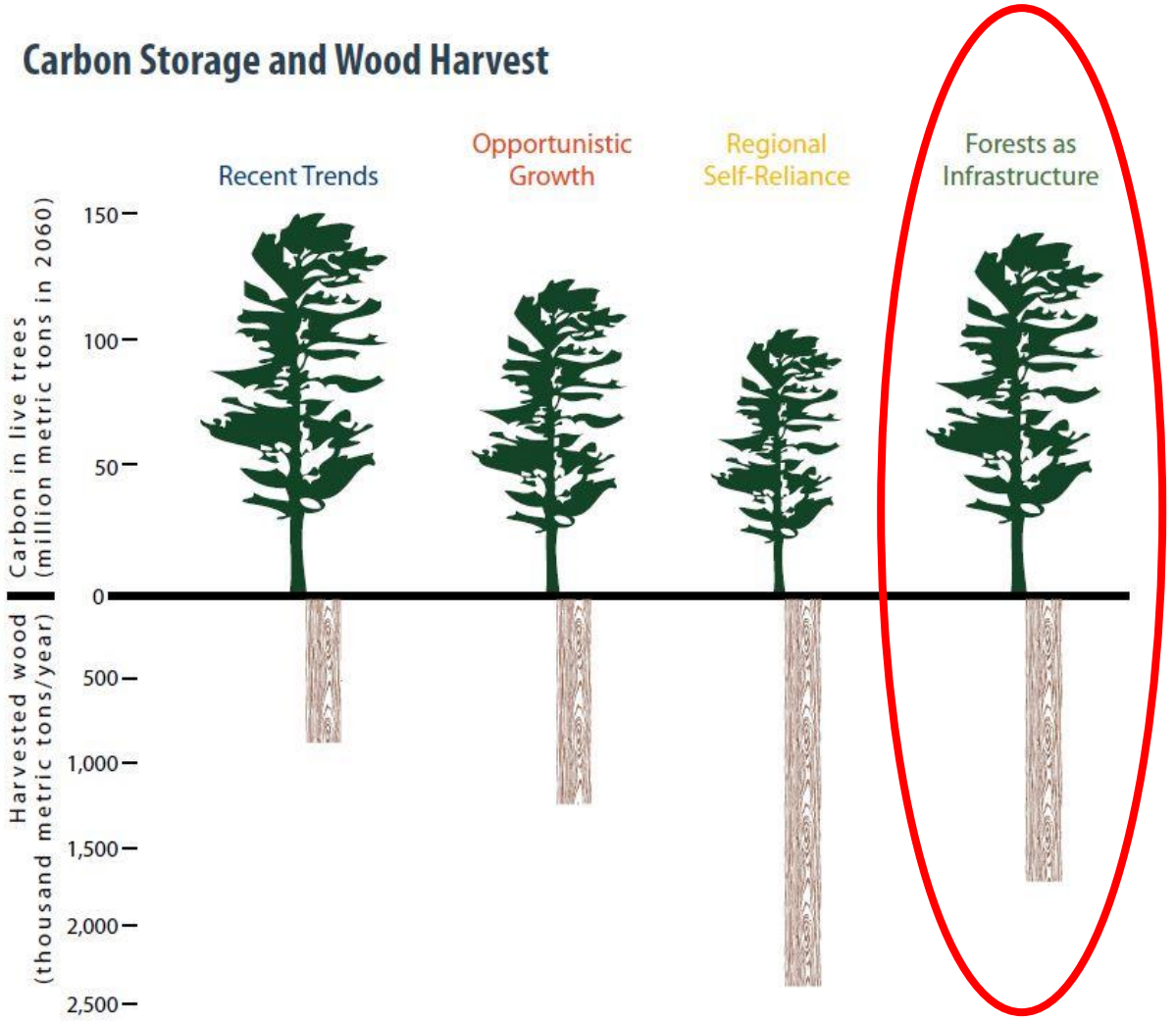


FIGURE 3: *Each scenario harvests a different amount of wood using a range forestry practices.* Forests as Infrastructure *harvests twice as much wood but maintain nearly the same amount of carbon stored in living trees as* Recent Trends *due to the widespread adoption of "improvement" forestry.*

Differentiate: Urban form and density

A Climate Mitigation Resolution Could Offset 31% of Human Emissions.

Journal of Sustainable Forestry, 33:248–275, 2014
ISSN: 1054-9811 print/1540-756X online
DOI: 10.1080/10549811.2013.839386

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Carbon, Fossil Fuel, and Biodiversity Mitigation With Wood and Forests

CHADWICK DEARING OLIVER[1], NEDAL T. NASSAR[1], BRUCE R. LIPPKE[2], and JAMES B. McCARTER[2]
[1]*School of Forestry and Environmental Studies, Yale University, New Haven, Connecticut, USA*
[2]*College of the Environment, University of Washington, Seattle, Washington, USA*

Life-cycle analyses, energy analyses, and a range of utilization efficiencies were developed to determine the carbon dioxide (CO_2) and fossil fuel (FF) saved by various solid wood products, wood energy, and unharvested forests. Some products proved very efficient in CO_2 and FF savings, while others did not. Not considering forest regrowth after harvest or burning if not harvested, efficient products save much more CO_2 than the standing forest; but wood used only for energy generally saves slightly less. Avoided emissions (using wood in place of steel and concrete) contributes the most to CO_2 and FF savings compared to the product and wood energy contributions. Burning parts of the harvested logs that are not used for products creates an additional CO_2 and FF savings. Using wood substitutes could save 14 to 31% of global CO_2 emissions and 12 to 19% of global FF consumption by using 34 to 100% of the world's sustainable wood growth. Maximizing forest CO_2 sequestration may not be compatible with biodiversity. More

Mjösa Tower, the world's tallest wooden building, under construction in Brumunddal, Norway. ANTI HAMAR

As Mass Timber Takes Off, How Green Is This New Building Material?

Mass timber construction is on the rise, with advocates saying it could revolutionize

But some are

NEFF's Exemplary Forestry

Leads Alec Giffen, Robert Perschel, and Lisa Hayden

- Differs from certification in several key ways:
  - *Landscape context is involved in developing plans on any one parcel*
  - *Practices are defined based on needs of umbrella wildlife species at a landscape scale*
  - *Average stocking across the landscape (for wood and therefore for carbon) is prescribed and high relative to typical commercial practices*
  - *Aims to increase growth and harvest*

75 YEARS NEW ENGLAND FORESTRY FOUNDATION

Exemplary Forestry includes:

Management for umbrella wildlife species

Den Trees

Big Reed. Source: MFS

Closed Crowns

Source: Conservation Foundation

The kind of habitat needed by American (Pine) marten

Exemplary Forestry includes:

A stand size class distribution recommended by ecologists

Sawtimber (40-50%)

Seedlings (5-15%)

Saplings & Poles (30-40%)

Source of all photos:
Maine Forest Service

Exemplary Forestry includes:

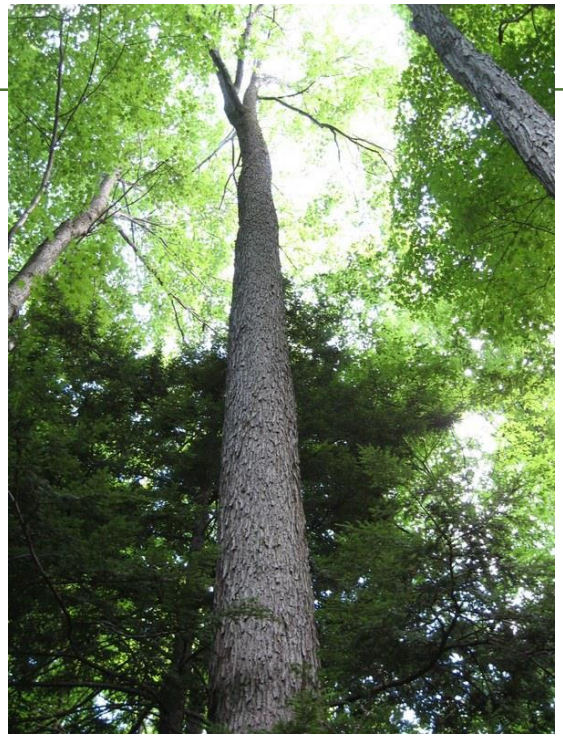
Management that provides den trees, snags, and downed logs, as well as protects ecological reserves, soils, water quality, riparian areas

Exemplary Forestry Includes

Growing and harvesting *more* wood – a central idea

Exemplary Forestry includes:

Growing better quality timber

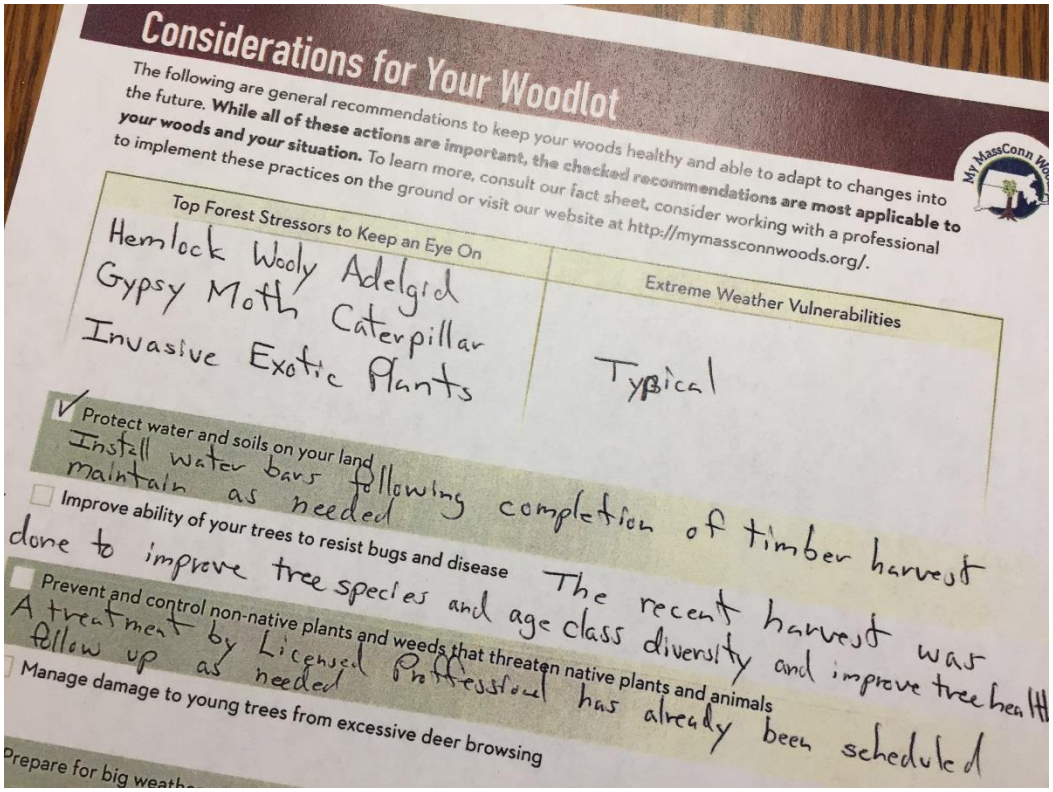


Source: jeffjosephwoodworker.com.

In terms of stumpage, 2 cords of sugar maple or red oak veneer (approximately 1,000 bd ft) can equal the value of 40 cords of hardwood pulp

Increasing both growth and quality can make management more profitable

Exemplary Forestry… Addresses Climate



Considerations for Your Woodlot

The following are general recommendations to keep your woods healthy and able to adapt to changes into the future. **While all of these actions are important, the checked recommendations are most applicable to your woods and your situation.** To learn more, consult our fact sheet, consider working with a professional to implement these practices on the ground or visit our website at http://mymassconnwoods.org/.

Top Forest Stressors to Keep an Eye On	Extreme Weather Vulnerabilities
Hemlock Wooly Adelgid Gypsy Moth Caterpillar Invasive Exotic Plants	Typical

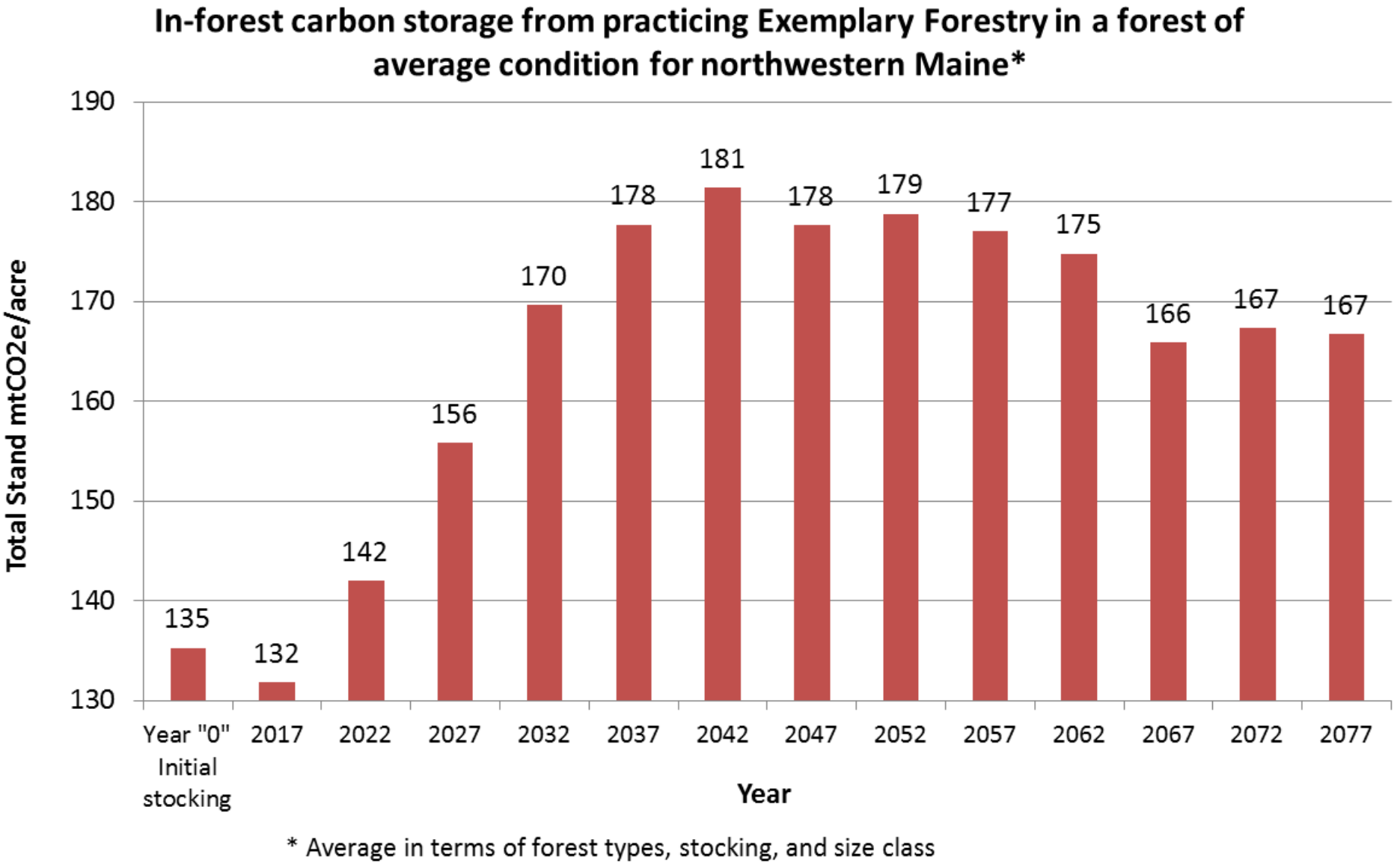
- ✓ Protect water and soils on your land — Install water bars following completion of timber harvest maintain as needed
- ☐ Improve ability of your trees to resist bugs and disease — The recent harvest was done to improve tree species and age class diversity and improve tree health
- ☐ Prevent and control non-native plants and weeds that threaten native plants and animals — A treatment by Licensed Professional has already been scheduled follow up as needed
- ☐ Manage damage to young trees from excessive deer browsing
- ☐ Prepare for big weath…

Exemplary forestry maintains high levels of forest stocking

And provides for adaptive management to incorporate knowledge as it becomes available, for **increasing resilience to, adaptation for, and mitigation of, climate change.**

Opacum Land Trust's property – climate-informed forestry Checklist

Exemplary Forestry includes:

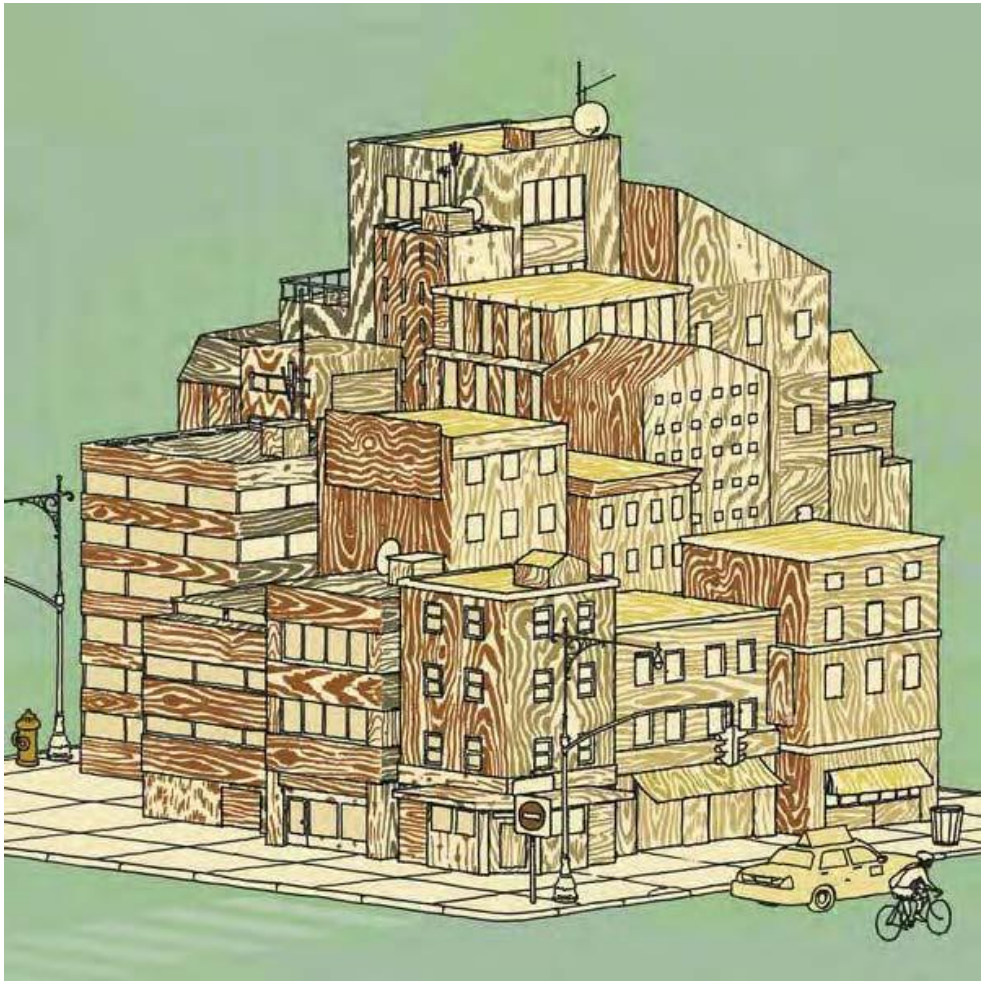


more profitable

Opinion

Let’s Fill Our Cities With Taller, Wooden Buildings

Trees are some of our best allies in solving the climate crisis.



The Forest to Cities Challenge: Securing the Future in an Era Dominated by Climate Change

Leads: Frank Lowenstein, Robert Perschel, and Alec Giffen

GROW

Exemplary Forestry helps landowners grow more and better-quality wood while preserving forest health.

CO_2 is stored in the harvested wood

MANUFACTURE

Local wood is used to make massive engineered timber products like **cross-laminated timber (CLT)** at facilities staffed by New Englanders.

BUILD

CLT provides a more sustainable alternative to steel and concrete, whose production processes churn out greenhouse gasses. It is also strong enough to replace these materials in taller buildings.

CLT

Composition: small pieces of wood glued together in perpendicular layers to create large panels

Characteristics: lightweight, fire resistant, strong, and safe..

Usage: steel and concrete substitute for wall, floor and ceiling construction.

LIVE

CLT is a naturally beautiful material, and when left exposed, its warm colors are particularly striking in grey urban areas. Around the world, schools, apartment complexes and visitor venues are using exposed CLT to create welcoming, aesthetically striking shared spaces.

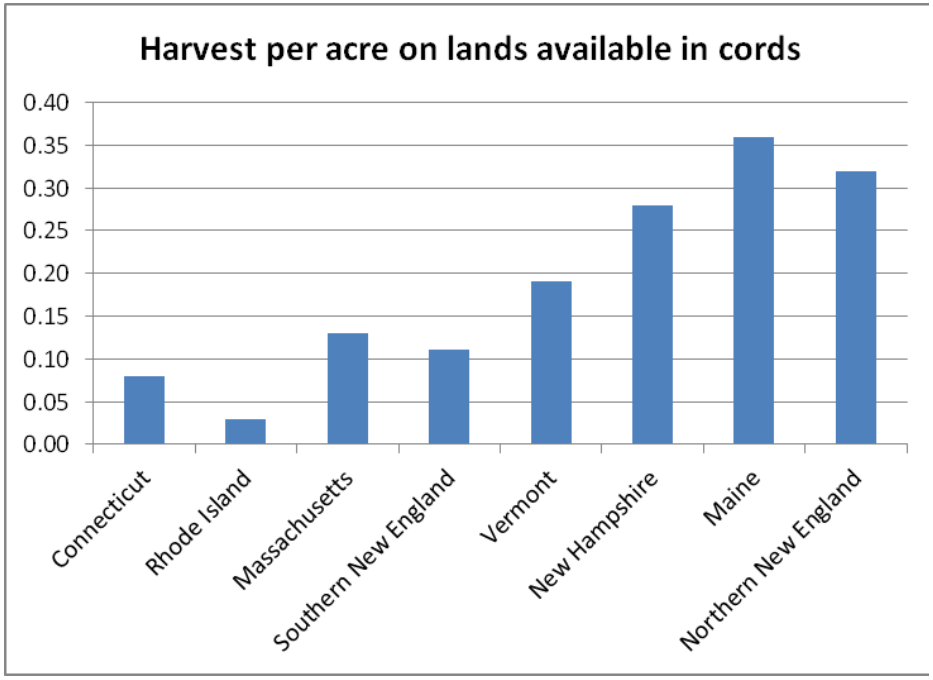
NEW ENGLAND FORESTRY FOUNDATION

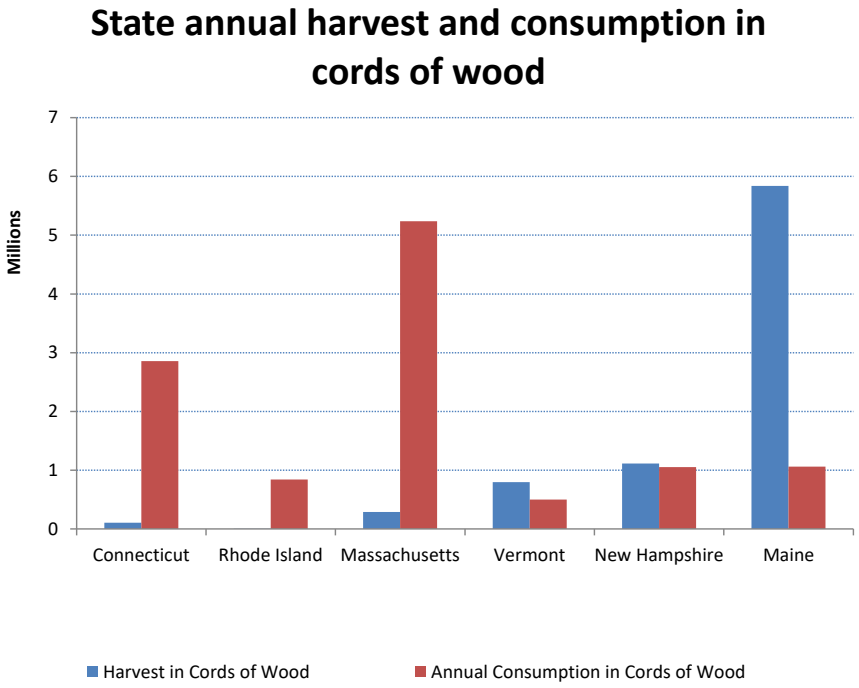
FOREST-TO-CITIES CLIMATE CHALLENGE

We support using New England's forests and building with wood to fight climate change. Please count on us to be part of a community of interest—from our forests to our cities—that is committed to maximizing the climate benefits of forests and wood construction. We pledge to support sustainable mass timber as a climate solution because it is a win for the forest, a win for the rural economy, a win for urban quality of life, and a win for the planet's health.

Half of New England Forests Harvest Little Wood But Consume a Good Deal

Diverse values can be served simultaneously by exemplary forest management





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IPCC report

It's the diagnosis you don't want to hear from your doctor:

> "Every possible test has been done and the news is not good"
>
> --Katherine Hayhoe, Texas Tech University

Scientific view regarding forests, from National Geographic:

> "Existing forests must be protected to avoid dangerous climate change, warn a coalition of forest scientists in a statement."

Carbon pricing --up to $5500 per ton of carbon by 2030– equivalent in Massachusetts to perhaps $100,000 to $150,000 per acre.

What's in the report

- Cut concrete emissions– but only by using carbon capture and storage.
- Plant up to 2.5 billion more acres of forests by 2050– but little focus on management of existing forests
- Rapid transformation of urban infrastructure including deep reductions in energy use in buildings– but only focused on operational energy

What's not in the report: Forest products as a climate solution

Potential to reduce carbon emissions by substituting mass timber for steel and concrete– could reduce global CO2 emissions by 14% to 31%.

- Equivalent to other major climate wedges
- Reduces need for unproven technologies
- Provides an incentive to reduce deforestation

Photo by John Stanmeyer, National Geographic

What's not in the report: Better forestry as a climate solution

Potential to address climate change through improved forest management on existing forest lands

- Higher stocking and productivity
- Addressing non-carbon effects of forest on albedo, water vapor and other critical climate variables

Photo by John Brissette, Northeastern Research Station

From carbon source to carbon sink.

About 5000 tons C02 emissions avoided.
Typical mass timber mid-rise building
+C sequestered in the wood.
+C sequestered in the growing forest.

Rendering, façade detail.
SHoP Architects, NY, NY
From Timber City exhibit

Mjösa Tower, the world's tallest wooden building, under construction in Brumunddal, Norway. ANTI HAMAR

As Mass Timber Takes Off, How Green Is This New Building Material?

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Differentiate: Urban form and density

“the Metro Mayors Coalition will need to add 185,000 housing units from 2015 – 2030 in order to meet demand and reduce – or at least stabilize -- housing costs.”

What's being built now: 5+1 stories, about 60 feet tall

What could be built Mjøstårnet– 280 feet tall

Includes apartments, offices, a hotel, a restaurant and adjoining swimming pool

Differentiate: Construction

Good neighbor construction: Less pollution, waste, noise, disruption on-site.
Less heavy moving equipment needed.
Faster. Certain amount of pre-fab.

Results

- Forest products at the center of climate-driven development
- Create jobs throughout the forest products sector
- Create more housing
- Improve mobility and reduce future sprawl
- Help solve the climate crisis

What's needed to make mass timber work here in New England?

Build Supply

Build Demand

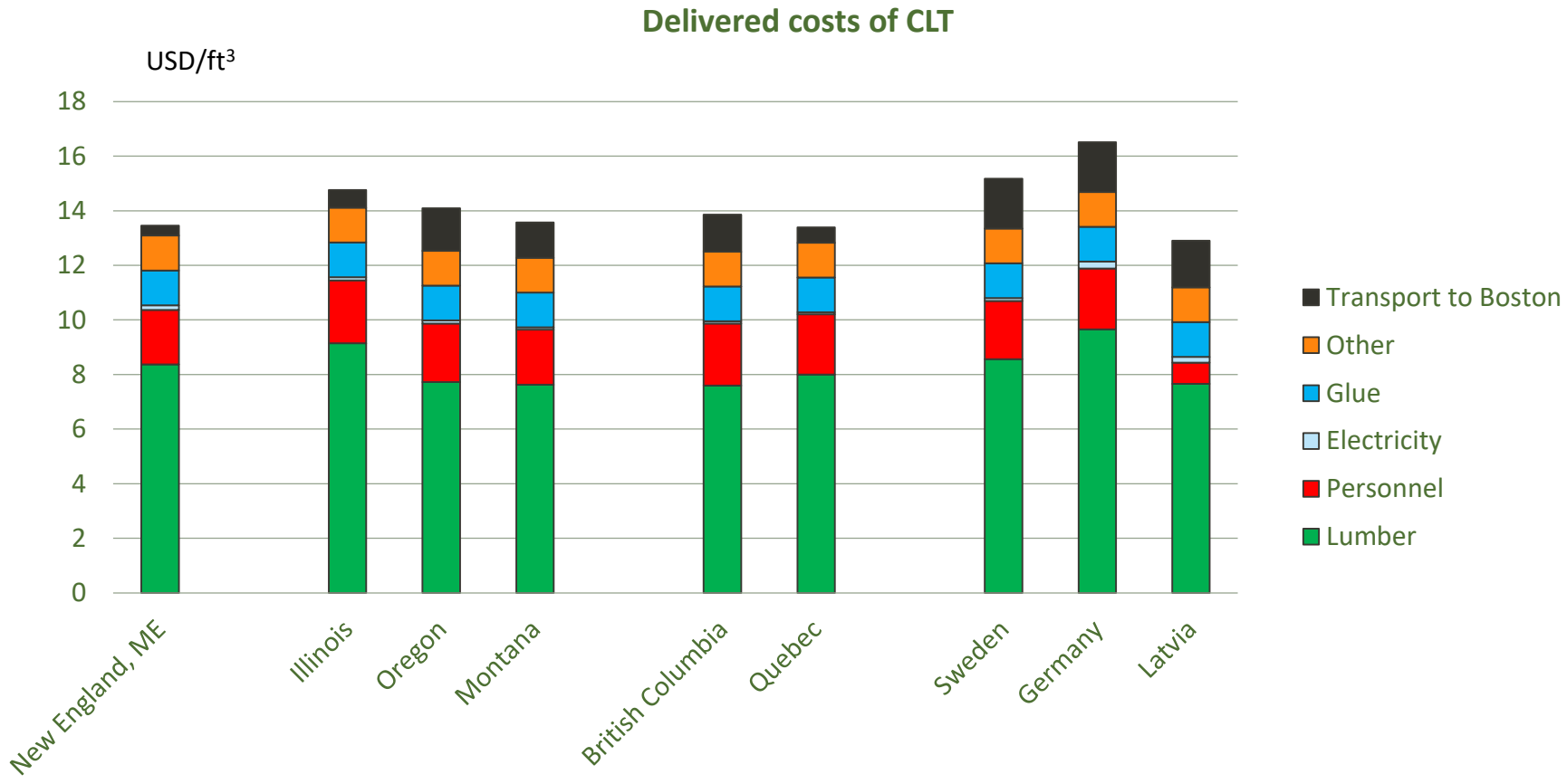
ASSESSING THE WOOD SUPPLY AND INVESTMENT POTENTIAL FOR NEW ENGLAND ENGINEERED WOOD PRODUCTS MARKETS AND MILL

July, 2017

Download the full Pöyry report at
http://newenglandforestry.org/connect/publications

CLT – International cost comparison

When taking into account transport costs, the costs of New England are on par with or better than competitors for delivery to a construction project in Boston.



Build It With Wood

Forest to Cities Climate Challenge

- Link a carbon value chain from sustainably managed forests to urban buildings
- Secure “commitments” from key stakeholders at each step of that value chain
- Publicize commitments to build social license

NEFF is hiring now for a position to lead this challenge.

Social license could lead to incentives to build demand

- Wood first/wood alternative policies
  - Public sector
  - Private sector
- Public policies that would scale state aid for housing and/or schools based on climate impact
- Investor-based strategies
  - Investment tax credits
  - Carbon credits
  - Recruiting climate-interested investors
- Reducing interest costs based on climate benefits