Section Three:
Forests as an Economic Driver

Forests play a pivotal role in the region's economy, as they have for generations. The 2011 *Massachusetts Climate Change Adaptation Report*[1] notes that each acre of forest in the State provides approximately $1,500 annually in economic value from forest products, water filtration, flood control, and tourism. By this measure, forests contribute more than $540 million in value to the 21-town Mohawk Trail Woodlands Partnership region per year.

Responses to local public outreach for the Woodlands Partnership have shown strong support for natural resource-based economic development that is consistent with the region's rural character. More local jobs are needed to help replace lost jobs within the manufacturing sector in recent years, and to retain more of the region's young people to work and raise families in the places where they grew up. It was noted at one community meeting that even the addition of a handful of jobs could provide a huge benefit to a small town. The MTWP has an opportunity to create rural economic development initiatives that will benefit the 21-Town region, which could also serve as a model for other rural regions.

Economic Overview of the Region

Overall, the 21-town region has experienced a decline in population, jobs, and its labor force in recent years, and experiences lower per capita incomes than Franklin and Berkshire Counties and the state as a whole (Table 4-1).

Table 4-1: Income, Wages, and Unemployment Rate in the 21-Town Region, Compared to Berkshire and Franklin Counties and the State

Geography	Per Capita Income (2019)	Average Weekly Wage (2020)	Unemployment Rate (2015)	Unemployment Rate (2020)
21-Town Region	**$33,961**	**$935**	**5.6**	**8.7**
Berkshire County	$36,759	$1,034	5.4	9.8
Franklin County	$35,575	$911	4.4	7.9
Massachusetts	$46,241	$1,609	4.8	9.4

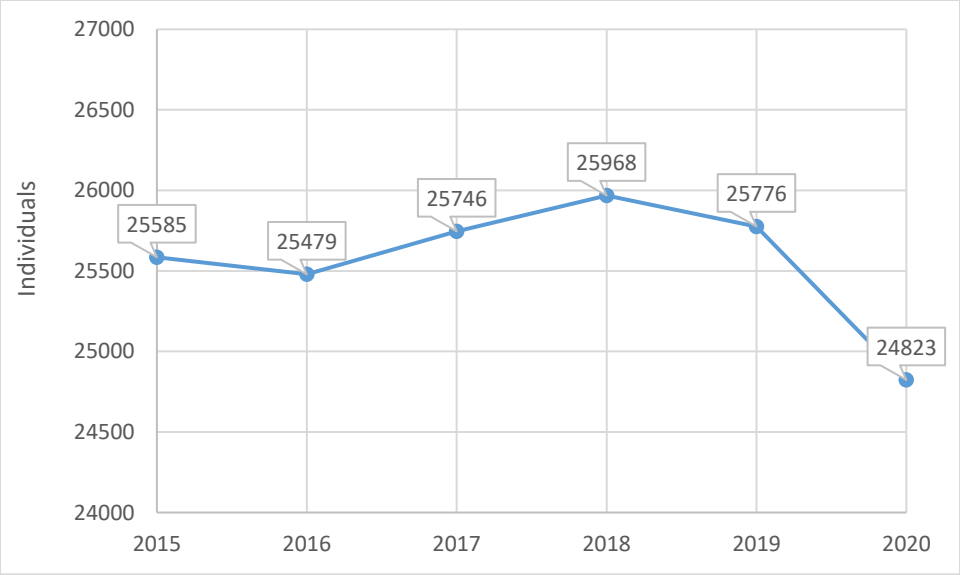
Sources: 2020 US Decennial Census; Massachusetts Executive Office of Labor and Workforce Development, ES-202, Labor Force, and Unemployment Data.

[1] Executive Office of Energy and Environmental Affairs; Adaptation Advisory Committee. 2011. Massachusetts Climate Change Adaptation Report.

Between 2010 and 2020, the 21-town region experienced a 3.6% decrease in total population (slowing a bit from the 4.9% decrease over the previous decade).[2] The region currently has a labor force, defined as people ages 16 and over who are either employed or actively seeking employment, of 24,823 (down from 26,285 circa 2013).[3] Between 2015 and 2020, the labor force in the region declined overall by 762, or 3% (Figure 4-1).[4] Average annual employment within the 21 towns has also fallen in the last decade, with a loss of approximately 1,483 jobs between 2010 and 2020.[5] Tables with data for each individual town can be found in Appendix C.

Per capita income in the 21-town region is less than in Berkshire and Franklin Counties and the state (Table 4-1).[6] The average weekly wage for all industry sectors in the 21-town region is slightly higher than the Franklin County average, lower than the Berkshire County average,[7] and far lower than that of the state—wages in the region are 58% that of the state average weekly wage. The unemployment rate in the 21-town region jumped from 5.6% in 2015 to 8.7% in 2020, likely due largely to the COVID-19 pandemic. However, this unemployment rate was lower than in Berkshire County and in the State as a whole.[8]

Figure 4-1: 21-Town Labor Force, 2015-2020



Source: Massachusetts Executive Office of Labor and Workforce Development, labor force data.

Forest Products

[2] 2010 and 2020 U.S. Decennial Census.
[3] Massachusetts Executive Office of Labor and Workforce Development, Labor Force and Unemployment Data 2010-2020.
[4] Ibid.
[5] Ibid.
[6] Esri 2021 estimates of per capita income derived by dividing aggregate income by the total population.
[7] Massachusetts Executive Office of Labor and Workforce Development, ES-202 Data, 2020.
[8] Massachusetts Executive Office of Labor and Workforce Development, Labor Force and Unemployment Data, 2020.

The forest products industry includes jobs in the areas of forestry, logging, primary manufacturing (such as lumber and veneer products), and secondary manufacturing (finished consumer products) – and this sector has been a pillar of the region's economy. The industry includes paper manufacturing, which utilizes pulp, as well as wood for energy for heating and/or electric energy production[9]. Although demand for wood and paper products are high in the state, only approximately 2% of the wood used in the state is actually grown, harvested, and manufactured within Massachusetts, while the remaining 98% of wood products consumed in Massachusetts are imported from out-of-state.[10]

Forest Product Industry Trends in the State

Forestry and forest products are an important part of the regional and state economy: in 2020, the forest products sector provided Massachusetts with 27,566 jobs, consisting of 351 jobs in forestry and logging, 7,197 jobs in wood products manufacturing, and 20,018 jobs in paper manufacturing. However, trends point to more wood being processed out-of-state over time, with sawmills, paper mills, and other processing facilities declining in number and jobs (Figure 4-2). A 2007 survey of licensed harvesters in Massachusetts revealed that the majority (roughly 2/3rds) of logs harvested in Massachusetts are sent out-of-state for processing.[11] In a 2020 NEFF survey of Massachusetts licensed timber harvesters, 147 responded that said they had worked on an active logging job in the past 18 months.[12] The number of sawmills in Massachusetts has declined over the past several decades, from 94 sawmills in 1993 to 61 in 2006; these mills are concentrated in the western part of the state.[13]

A steep decline in paper manufacturing in the past two decades has resulted in a loss of jobs and local markets for low-grade wood. Between 2001 and 2019, the number of business establishments in the state in the paper products sector declined by 50%, from 470 to 234, and jobs in this sector declined by 58% in the same time period. More recently, however, there has been a shift in this trend, with a significant increase in jobs in the paper products and wood products sectors between 2019 and 2020 (Figure 4-2). This may be due in part to increased demand for cardboard boxes and other packaging materials during the COVID-19 pandemic. In 2020, shipments of folding cartons increased by 5.5% in the United States.[14] In addition, forestry and logging jobs have remained relatively steady throughout the past two decades, with an increase seen over time (200 jobs in 2001 vs. 351

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[9] MTWP enabling legislation states: "No funding received or expended by the partnership shall be used for: (i) the construction or operation of a wood pellet or biomass manufacturing facility."

[10] *Massachusetts Forest Action Plan: An Assessment of the Forest Resources of Massachusetts*, UMass Amherst and MA DCR, June 2010.

[11] *Finding and Removing Barriers to Sustainable Harvest and Primary Processing of Massachusetts Native Woods*. Damery, Dr. David T., University of Massachusetts, Amherst. March 2008.

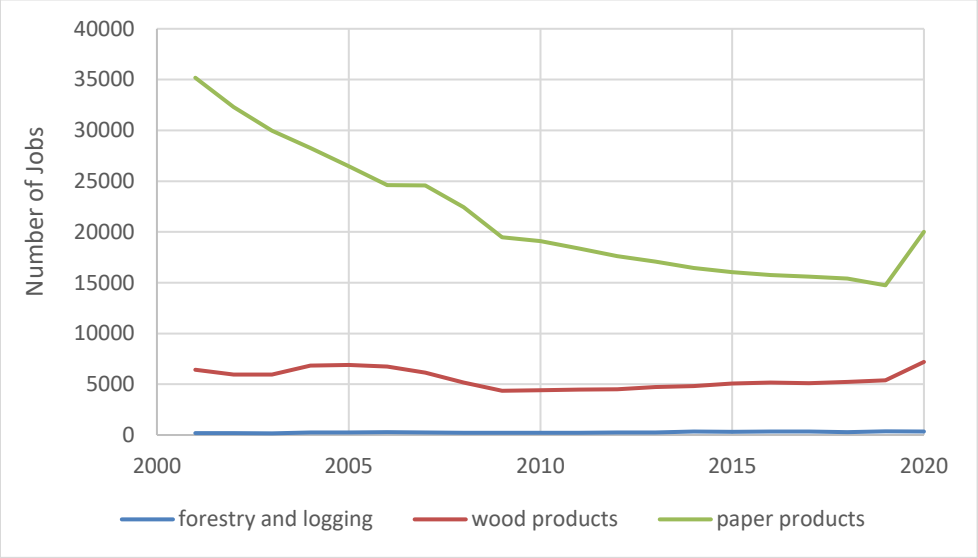
[12] Shakun, Jennifer and Jennifer Fish. 2020. *2020 Massachusetts Licensed Harvester Survey.* New England Forestry Foundation and Massachusetts Department of Conservation and Recreation.

[13] Massachusetts Directory of Sawmills & Dry Kilns, 2006. MA Department of Conservation and Recreation Marketing and Utilization Program.

[14] Paperboard Packaging Council. 2020-21 Industry Outlook and Market Data Report.

in 2020). Support activities for forestry[15] have also grown, from four establishments in 2001 to 29 in 2020.[16]

Figure 4-2: Massachusetts Forestry and Forest Product Jobs, 2010-2020



Source: Massachusetts Executive Office of Labor and Workforce Development, employment and wage industry data (ES-202).

Forest Product Industry Trends in Berkshire and Franklin Counties

Local processing and sale of wood products increases the economic benefit to the local and regional economy, but these sectors have declined over time in Berkshire and Franklin Counties even more steeply than in the state as a whole. Declines in local wood processing and sales have translated into a drastic decline in jobs in these sectors in Berkshire and Franklin Counties in the past two decades. Between 2001 and 2020, the number of business establishments in the wood product and paper manufacturing sectors in the two counties declined by 78% (Table 4-2), and average monthly employment in these sectors declined by 80% during the same period.[17]

One example is Deerfield Specialty Paper (formerly the Deerfield Glassine Company), a paper mill poised on the edge of the Deerfield River at the site of the former Ramage Paper Co., founded in 1887. Once producing 10 tons of paper a day[18] and the town of Monroe's main employer, the plant shut down in 1996. The town and FRCOG received a grant to remove the

[15] This industry comprises establishments primarily engaged in performing particular support activities related to timber production, wood technology, forestry economics and marketing, and forest protection. These establishments may provide support activities for forestry, such as estimating timber, forest firefighting, forest pest control, and consulting on wood attributes and reforestation.
[16] Massachusetts Executive Office of Labor and Workforce Development, ES-202 Data, 2001-2020.
[17] Massachusetts Executive Office of Labor and Workforce Development, ES-202 Data, 2001, 2010, 2020.
[18] The former Ramage paper mill: Monroe is still working to rebound after the closing of their paper mill. Chronicle. Updated: Mar 14, 2019. https://www.wcvb.com/article/the-former-ramage-paper-mill/26829021

deteriorating building in 2016 and clean up the site, which is now a launching area for whitewater rafting excursions.[19]

Still, employment within the wood product and paper manufacturing sectors continues to represent 1.2% of all employment within the two counties, a higher percentage than within the state as a whole (0.8%). Western Mass Wood, which maintains an unofficial directory of local wood supplies, lists 32 active sawmills (stationary and portable) in Berkshire County and 22 in Franklin County; this includes 16 mills in the 21-town region.[20] Currently, local mills tend to manufacture products for local markets, and compete well primarily in two areas: niche, high-value products, and bulky products that are difficult to ship, such as industrial sawn wood, firewood, and mulch.[21]

Agriculture is an important sector of the economy in Berkshire and Franklin Counties, and woodlots are a vital part of many farms. The U.S. Census of Agriculture reported that in 2017 there were 208 farms in Berkshire and Franklin Counties selling forest products (not including Christmas trees, short rotation woody crops, or maple syrup), an increase of 68 since 2012, with total income from these sales amounting to $1,337,000.[22] Within the 21-town region, wood products offered by farms includes firewood, framing timbers, siding, and lumber.[23]

The decline in local wood processing has translated to fewer jobs in wood product manufacturing in Berkshire and Franklin Counties.

[19] FACT SHEET: Brownfields Clean-up Project for the Former Ramage Paper Mill – Wood Structure, Depot Street, Monroe, MA. https://frcog.org/wp-content/uploads/2016/11/Ramage-Wood-Structure-Fact-Sheet.pdf
[20] Massachusetts Woodlands Institute. 2018. Western Mass Wood. Find Local Wood: A Directory of Local Wood Suppliers. http://www.westernmasswood.org/find-local-wood/
[21] Massachusetts State Forest Action Plan, 2020. Massachusetts Department of Conservation and Recreation.
[22] United States Department of Agriculture (USDA) 2017 and 2012 U.S. Census of Agriculture. County-level data, Table 6: Income from Farm-Related Sources.
[23] From a search of farms on the Community Involved in Sustaining Agriculture (CISA) and Berkshire Grown websites: http://www.buylocalfood.org/; http://berkshiregrown.org/.

Table 4-3: 2001, 2010, and 2020 Number of Establishments and Average Monthly Employment, Berkshire and Franklin Counties

Sector	2001	2010	2020	2001-2020 Change	2001-2020 % Change
Number of Establishments					
Wood Product Manufacturing	54	10	11	-43	-80%
Paper Manufacturing	42	26	10	-32	-76%
Total	96	36	21	-75	-78%
Average Monthly Employment					
Wood Product Manufacturing	574	133	45	-529	-92%
Paper Manufacturing	4,597	2,189	968	-3599	-79%
Total	5,141	2,322	1013	-4128	-80%

Source: Massachusetts Executive Office of Labor and Workforce Development, ES-202 Data.

SIDEBAR

LEVER Supports Entrepreneurial Spirit

Lever, Inc., a business incubator based in North Adams with a seat on MTWP's Board, has conducted two separate Mohawk Trail Entrepreneur Challenges focusing on woodland-related tourism or natural products businesses based in Partnership member towns. Through the Challenges, funded by a $60,000 EOEEA grant, owners of regional businesses that are creating jobs receive expert advice on business plans and compete for a $25,000 grant to invest in their venture. The owners of Foolhardy Hill, a new campground in Charlemont seeking to attract eco-tourists, won the first Challenge and shared their story at the June 2021 MTWP Board meeting. The 2022 Challenge is focused on companies developing sustainable wood and forest product businesses (not including wood-based fuels). The competitions prioritized business models that 1) serve customers from within and outside of the Mohawk Trail region, 2) have high potential to create new jobs, 3) are capable of attracting grant, debt or equity financing.[24]

[24] Lever, Inc. https://leverinc.org/challenges/

Factors of Decline and Community Needs

There are a number of factors that have likely contributed to the decline in the forest products industry in Massachusetts over time, including:[25] Globalization imported and development of low-cost shipping methods that allow for shipment to international markets; competition from high-production mills in northern New England and Canada; steep energy, insurance, and equipment upgrade costs that act as hurdles to smaller companies and mills; and the small parcels and diverse private land ownership patterns that characterize Massachusetts and create challenges to forestland management. Public outreach for the Woodlands Partnership highlighted some of the concerns and needs of local forest product businesses, including:

- the need for more processing facilities in the region;
- assistance for locally-owned sawmills to upgrade equipment and meet regulations;
- assistance for businesses to upgrade equipment to conduct low-impact logging;
- the need to develop more local markets for low-grade wood and wood products and provide marketing assistance to businesses;
- the need to assist harvesters with equipment (timber mats, etc.) to deal with significant reductions in frozen-ground conditions due to climate change; and,
- the need to conduct additional outreach, education, and coordination among landowners.

A need to develop local markets for low-grade wood was heard at several early Partnership community meetings. This wood has little to no marketable value for lumber and is not cost-effective to ship long distances, necessitating the need for local markets. It can be used for firewood, pallets, wood pellets, and potentially for flooring and other products if local mills are set up to process small-diameter logs. Establishing more local markets for low-grade wood would help to support sustainable forestry, improve long-term timber management, increase the value of harvests and income to landowners, and support local jobs.

This need to develop better markets for low-grade wood also emerged as a theme in the 2020 state timber harvester survey, in which 76% of respondents said they made adjustments due to weather, and respondents reported stopped work during logging season an average of 47 days a year due to weather conditions (thawed or wet soils), a situation that appears to be more common due to warmer winters.[26]

Harvesting and Stumpage Trends

Despite the challenges and declines seen in the forest products industry in recent decades, markets and prices for sawlogs and some low-grade wood (firewood, roundwood, and chips) in

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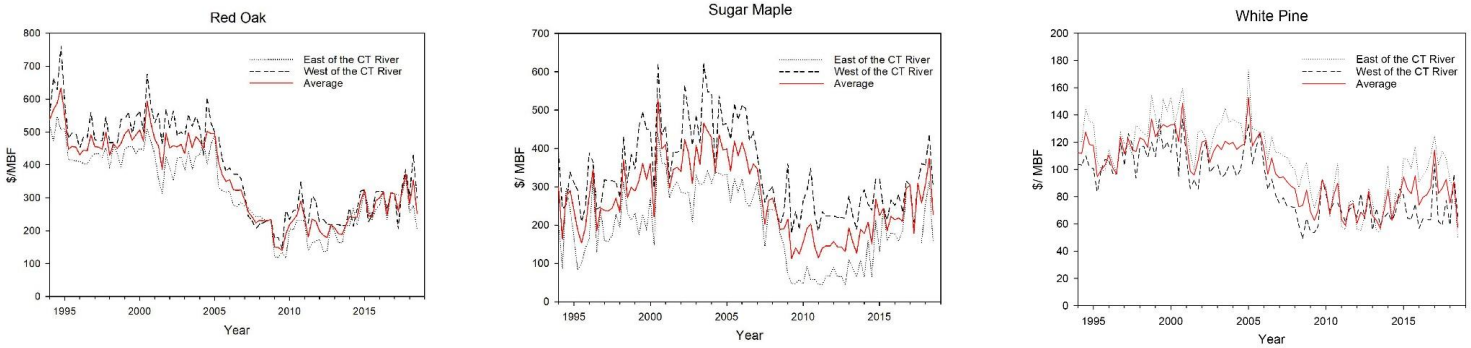
[25] Summarized from *Finding and Removing Barriers to Sustainable Harvest and Primary Processing of Massachusetts Native Woods*. Damery, Dr. David T., University of Massachusetts, Amherst. March 2008; 2020 Massachusetts State Forest Action Plan; and from input from the Massachusetts Department of Conservation and Recreation, January 2015.

[26] Shakun, Jennifer and Jennifer Fish. 2020. *2020 Massachusetts Licensed Harvester Survey.* New England Forestry Foundation and Massachusetts Department of Conservation and Recreation.

the state are strong and demand is very high.[27] The 2020 Massachusetts Forest Action Plan notes that Forest Cutting Plans filed with the DCR over the last decade indicate there has been a trend of increasing harvest volume planned in the state, with an average of 15,547,000ft^3 planned for harvest between 2010 and 2017.[28] This volume is higher than the average volume planned for harvest from 2003-2009 and includes an increase in volume of chips and pulp. Stumpage prices (prices paid for harvest rights of standing timber), which slumped during the nationwide recession of 2007-2009, have rebounded strongly in the last decade (Figure 4-3), although they have not returned to pre-downturn levels for every species.[29] The most recent available stumpage reports (2021, quarters 1-3) indicate average median prices of $313, $295, and $58 per thousand board feet for red oak, sugar maple, and white pine, respectively.[30] On its estimated 2.9 million acres of timberland,[31] the annual net growth of forests in Massachusetts well exceeds annual harvest levels, with a growth-to-harvest ratio of 12.7-to-1 estimated on timberlands in Massachusetts in 2008,[32] and a 6.8-to-1 growth to harvest ratio estimated in 2017.[33] Harvest levels have the potential to be sustainably increased in the 21-town region through programs of DCR's Working Forest Initiative (Forest Stewardship, Foresters for the Birds and climate-smart forestry practices identified by Mass Audubon and other experts), or the Exemplary Forestry approach developed by the New England Forestry Foundation, which balances climate mitigation and growing more and better quality wood with habitat needs for a region's umbrella wildlife species.[34]

Figure 4-3: Stumpage Price Trends Over Time (1994-2018) for Red Oak, Sugar Maple, and White Pine



Prices are adjusted for inflation and are represented in 2018 dollars. Source: UMass Amherst, MassWoods. 2022. Price Trends over Time by Species (1994-2018). https://masswoods.org/stumpage/trends

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[27] Input for the Massachusetts Department of Conservation and Recreation, January 2015.
[28] Massachusetts State Forest Action Plan, 2020. Massachusetts Department of Conservation and Recreation.
[29] UMass Amherst, MassWoods. 2022. Price Trends over Time by Species (1994-2018). https://masswoods.org/stumpage/trends
[30] Ibid.
[31] Massachusetts State Forest Action Plan, 2020. Massachusetts Department of Conservation and Recreation.
[32] Cretaz et al. 2010. *An Assessment of the Forest Resources of Massachusetts*. USDA Forest Service. Ratio estimated from 2008 Forest Inventory Analysis data. The U.S. Forest Service defines timberland as "forest land that is producing or is capable of producing crops of industrial wood over 20 cubic feet per acre, per year, and not withdrawn from timber utilization by statute or administrative regulation."
[33] Massachusetts State Forest Action Plan, 2020. Massachusetts Department of Conservation and Recreation.
[34] For more on Exemplary Forestry, visit https://newenglandforestry.org/learn/initiatives/exemplary-forestry/

Increasing Sustainably Harvested and Processed Wood in the Region

Increasing the amount of wood sustainably harvested and processed in the region could result in more businesses and jobs within the forestry, logging, and primary processing sectors. This could in turn provide additional tax revenue to towns. Additionally, sustainable timber harvests can be a valuable source of income for landowners, thereby reducing pressures to sell forest land for development and supporting continued ownership and stewardship of the land.

Poor harvesting practices such as high-grading, which removes the most valuable trees and leaves the rest, reduces the future value for wood production, reduces growth rates, damages the forest aesthetics and gene pool, increases vulnerability to disturbances such as invasive species, and reduces the long-term ability of the forest to sequester carbon.[35] Sustainable forestry means keeping forests healthy, dynamic, and productive for future generations. It addresses all of the resources provided by forests, including habitat, clean water and air, carbon sequestration, recreation, timber, jobs, and scenic beauty, and seeks to keep viable all of these options and opportunities.[36] While active management is not suitable for all lands, sustainable forestry can increase resilience to climate change through the addition of diversity to the forest structure, management of invasive species and diseases, creation and improvement of wildlife habitat, and by enhancement of a forest's capacity to sequester carbon.[37] Having a healthy harvesting and processing infrastructure will help the region better respond to the changing conditions in the forests from climate change.

Increasing Local Markets for Wood Products

Increasing the percentage of wood that remains in the state for consumption could support primary processing facilities such as sawmills that are set up to sell to local markets, and small businesses and craftspeople who sell finished consumer products locally and will keep more dollars circulating in the local economy. The "Buy Local" movement has steadily grown in popularity in the region and offers an opportunity to increase the production and sale of local wood products in Massachusetts.

By using more wood from its own forests, Massachusetts could reduce costs and emissions associated with long-distance shipping and reduce environmental impacts from incentive for illegal logging or destructive practices in regions where the wood is being imported from, which

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[35] *Climate Change, Carbon, and the Forests of the Northeast*. Robert T. Perschel, Evans, Alexander M., and Summers, Marcia J. Forest Guild, December 2007; *High Grade Harvesting: Understand the Impacts, Know your Options*. Paul Catanzaro, Anthony D'Amato, University of Massachusetts Amherst.

[36] *Diameter Limit Cutting and Silviculture in Northeastern Forests: A Primer for Landowners, Practitioners, and Policy Makers*. USDA Forest Service, 2005; *What is Sustainable Forestry?* Peter J. Smallidge, NYS Extension Forester, Cornell Forestry Extension Program.

[37] Hines, S.J.; Daniels, A. 2011. Private Forestland Stewardship. (October 10, 2011). U.S. Department of Agriculture, Forest Service, Climate Change Resource Center. www.fs.usda.gov/ccrc/topics/forest-stewardship/.

are often areas with less environmental oversight than in Massachusetts.[38] There is a burgeoning "green" construction business sector in the region, which could tie into a Buy Local Wood movement for construction materials. The State Building Code allows for the use of ungraded native wood produced by registered mills in the building of one- and two-story dwellings, barns, and sheds.

Mass Timber

A recent focus of the climate and sustainability movement, through initiatives like WoodWorks[39] and the New England Forestry Foundation's Forest-to-Cities Climate Challenge,[40] has been replacing energy-intensive structural building materials like steel and concrete with mass timber (large, strong, multi-layered building elements created by joining smaller pieces of lumber together). Replacing steel and concrete with long-lived wood products has substantial potential climate benefits.[41] Trees, a renewable resource, remove carbon dioxide from the atmosphere through photosynthesis while growing, and this carbon remains stored in wood, or products like mass timber, for decades after harvest (as long as the building stands, and often much longer).[42]

An increased demand for mass timber in the area could support sustainable forest management on land in the region as well as the forest products industry. The 2021 International Building Code (IBC) allows the use of mass timber in structures up to 18 stories and there are now more than 1000 U.S. mass timber buildings completed or in design. The Mass Timber Dialogue[43] was a year-long discussion among scientists, NGO's and state policy staff from Massachusetts, New Hampshire, Vermont and New York which agreed upon a blueprint to move forward with sustainable forestry in the region to support more use of mass timber.

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[38] *The Illusion of Preservation: A Global Environmental Argument for the Local Production of Natural Resources.* Mary M. Berlik, Kittredge, David B., and Foster, David R. Harvard Forest. Harvard University Press. 2002.

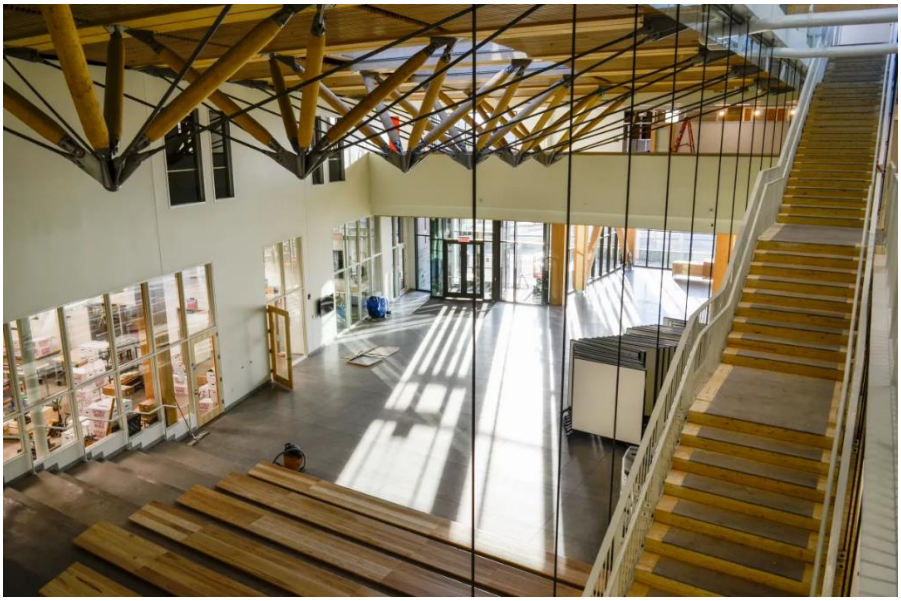
[39] Woodworks: https://www.woodworks.org/why-wood/sustainability/

[40] New England Forestry Foundation. 2022. Forests-to-Cities Climate Challenge. https://foresttocities.org/

[41] National Alliance of Forest Owners (NAFO). https://www.forestcarbondataviz.org/

[42] *Build It With Wood*. https://builditwithwood.org/

[43] Mass Timber Regional Dialogue: https://www.masstimberregionaldialogue.com/



John W. Olver Design Building, UMass Amherst. Photo: https://bct.eco.umass.edu/about-us/the-design-building-at-umass-amherst/

With support from a U.S. Forest Service Wood Innovations grant, the New England Forestry Foundation commissioned an assessment of the potential for a mass timber mill in New England, which concluded that regional mass timber production could be competitive in the U.S. Northeast market.[44] Analysis done by the University of Massachusetts Amherst in their wood construction lab in the Olver Design building (the largest modern institutional wood building in the East), has shown that eastern hemlock and white pine grown in Western Massachusetts can be used to make Mass Timber panels. A current project is producing eastern hemlock wood panels for use in Boston's first mass timber building this summer.

Wood Energy for Home Heating

Currently, an estimated 10.8% of homes (2,759) in the 21-town region heat with wood, compared to 12.3% in Franklin County and 4.4% in Berkshire County.[45] These numbers are high compared to the state as a whole—about 1.3% of all homes in the state use wood as a heating source. In the 21-town region, the use of wood for heating homes is the third most common method, after gas and fuel oil; about 40% of homes (10,166) use gas as a heating source, and about 38% (9,777) use fuel oil. Other methods used in the region include electricity (8%), coal or coke (0.3%) and solar energy (0.3%).

Wood Building Insulation

Using low quality wood to make sustainable building insulation has a nearly $1 billion market in Europe and the U.S. is opening its first wood insulation mill in central Maine.[46] This technology has many environmental advantages over energy intensive fiberglass, plastic or rock wool insulation which currently make up all building insulation. Building insulation cannot be

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[44] Poyry and New England Forestry Foundation. 2017. Assessing the Wood Supply and Investment Potential for a New England Engineered Wood Products Mill.

[45] U.S. Census Bureau, 2010 Decennial Census.

[46] https://golab.us/

economically shipped long distances, so locally grown and manufactured wood insulation may be a potential new market for the MTWP.

Climate Change, Payments for Ecosystem Services, and Carbon Markets

Future climate change scenarios, about which there is broad scientific consensus, predict generally hotter, drier conditions in the northeastern United States in the next 50–100 years,[47] marked by increased variability and intensity of events. Generally, shorter, warmer winters with less snowfall are predicted, as well as hydrological changes including an increase in extreme rain events and flooding, increased precipitation during winter, earlier peak stream flows in spring, and drier conditions and increased drought during the growing season. An increase in other extreme weather events like windstorms, hurricanes, and ice storms are also predicted, as well as species range shifts and growing impacts from invasive insects and diseases.[48]

As climate change progresses, payments for ecosystem services, particularly those services that can help mitigate the effects of climate change, will likely continue to gain momentum in the state and could greatly benefit the 21-town region. Forests provide a wide range of ecosystem services in addition to wood products and outdoor recreation—they clean the air, filter water supplies, control floods and erosion, sustain biodiversity and genetic resources, and sequester and store carbon from the atmosphere.[49] These services have tremendous economic value—in their absence, humans are forced to engineer costly systems to perform the same functions that otherwise occur naturally. The Massachusetts Audubon Society has estimated the nonmarket value of the services natural areas provide within the state (i.e., flood control, climate mitigation, water filtration) at billions of dollars annually.[50]

The MTWP has the potential to facilitate a shift towards increased payments for ecosystem services in the 21-town region by advocating with local and state representatives securing climate-focused grants, and promoting or connecting municipalities and other landowners with initiatives such as the:

- Pilot Forest Climate Resilience Program (Mass Audubon) and related climate-smart forestry practices developed with DCR and numerous conservation partners to address climate adaptation and managing forests for carbon;

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[47] Kunkel, K.E., et al. 2013. *Regional Climate Trends and Scenarios for the U.S. National Climate Assessment*. Part 1. Climate of the Northeast U.S. US Department of Commerce, National Oceanic and Atmospheric Administration: Washington, DC.
[48] Janowiak, Maria. 2019. *What's at Risk? Implications of Climate Change in Massachusetts' Forests*. Presentation to Massachusetts Department of Conservation and Recreation (Forestry Division); Swanston et al. 2018. *Vulnerability of Forests of the Midwest and Northeast United States to Climate Change*. Climatic Change 146: 103–116.
[49] Balloffet, N; Deal, R; Hines, Sarah; Larry, B; Smith, N. 2012. *Ecosystem Services and Climate Change*. (February 4, 2012). U.S. Department of Agriculture, Forest Service, Climate Change Resource Center.
[50] Mass Audubon. 2020. *Losing Ground: Nature's Value in a Changing Climate*.

- Exemplary Forestry practices developed around the needs of umbrella wildlife species and to sustainably grow more wood (NEFF);
- Forest Legacy Program, for which DCR is submitting an application to make the 21-town Partnership region eligible for this federal competitive conservation funding program in which easements can be purchased from willing sellers, and;
- Wild Carbon Credits program (Northeast Wilderness Trust).

Forest Carbon Offset Projects for Municipalities and Landowners

A growing field in the realm of payments for ecosystem services are carbon markets. In the 21-town region, developing and increasing access to carbon markets could result in job growth in the inventory, qualification, verification, marketing, and sale of carbon credits,[51] and carbon markets can provide additional income to landowners and create an incentive for private landowners to sustainably manage their forests. Forest management for carbon sequestration and storage may also include harvests to improve forest health or specific wildlife habitats, which could support wood products businesses.

Through carbon markets, landowners who manage their forests for increased (additional) carbon storage have the potential to sell this additional stored carbon as "carbon credits." Landowners can sell these credits to companies or individuals interested in offsetting their own carbon emissions. A successful forest carbon project can create sustainable revenue for a town or individuals over many years. Currently, a carbon project in New England typically needs at least 3,000 acres of well-stocked forest for revenue to exceed the initial development costs, meaning that aggregate projects are often needed, in which several landowners or municipalities bundle multiple landholdings to make the project viable.[52] However, there are several emerging companies and initiatives focused on making carbon projects accessible to smaller landowners, which may gain traction over time, e.g., the Family Forest Carbon Project, developed by The Nature Conservancy and American Forest Foundation, Forest Carbon Works, and Natural Capital Exchange (NCX). In Massachusetts, Mass Audubon provides technical assistance and outreach to municipalities interested in forest carbon offset projects through their Climate-Smart Forestry program.[53]

There are several examples of successful aggregate carbon projects in New England, although, to date, there are no established projects located in the 21-town region (though a state grant helped to fund the towns of Williamstown and Conway to explore the potential for a carbon credit program with local landowners).

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[51] Wildlands and Woodlands, A Vision for the New England Landscape. http://www.wildlandsandwoodlands.org/home

[52] Mass Audubon. 2022. Climate-Smart Forestry. *Carbon Offset Case Studies*. https://www.massaudubon.org/our-conservation-work/ecological-management/habitat-management/climate-smart-forestry

[53] Mass Audubon. 2022. Climate-Smart Forestry. https://www.massaudubon.org/our-conservation-work/ecological-management/habitat-management/climate-smart-forestry

Initiated in 2014 by the cities of Holyoke, West Springfield, and Westfield, the Tri-City Carbon Sequestration program, centered at Bear Hole Reservoir, is the first municipal aggregate carbon project in the U.S.[54] The project covers 13,500 acres of forest and reservoir land and is expected to offset about 242,000 tons of carbon and generate more than $2 million in income for the cites between 2019 and 2029.[55]

In Vermont, the Cold Hollow Carbon project, initiated in 2019, has been a successful aggregate project involving 10 private landowners and covering 7,500 acres.[56] Landowners are expected to receive $25-$47 per acre from an initial carbon credit sale, and revenue from carbon storage sales will be shared among participants based on acreage, stocking levels, and harvests, with a small percentage allotted to Vermont Land Trust, the administrator of the project.[57]

Tourism

Tourism is an important component of the economy in Berkshire and Franklin Counties and in the 21-town region. In 2018, visitors to Berkshire and Franklin Counties spent roughly $535 million in expenditures, generating $16 million in local tax receipts.[58] The majority of spending occurred in Berkshire County, which attracts an estimated 2.6 million visitors a year.[59] Travel-generated employment for both counties amounted to 4,400 jobs, with a total payroll of $137.6 million. Tourism-related expenditures and employment within the two counties represented approximately 2.6% of expenditures and 3.5% of employment statewide.[60]

The Massachusetts Office of Travel and Tourism provides state funds to Regional Tourism Councils (RTCs) through its Regional Grant Program. In 2019, $362,964 in grants were allocated to the Berkshire RTC and $176,360 to the Franklin RTC. The program requires that RTCs match all grants with a minimum of one-to-one nongovernmental funds.

In a visitor survey conducted by the Berkshire Visitors' Bureau, scenic beauty was the principal reason 88% of all visitors cited for having selected the region as their destination, and 42% of visitors engaged in some form of outdoor recreation during their stay.

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[54] Kinney, Jim. *West Springfield, Holyoke, Westfield Anticipate $2M from Carbon Credit Program Preserving Forests, Watershed*. MassLive. July 15, 2019.
[55] Mass Audubon. 2022. Climate-Smart Forestry. *Carbon Offset Case Studies*. https://www.massaudubon.org/our-conservation-work/ecological-management/habitat-management/climate-smart-forestry
[56] Ibid.
[57] Ibid.
[58] Massachusetts Office of Travel & Tourism, 2019 Annual Report (published May 2020).
[59] Housatonic Heritage. 2021. Berkshire Visitors Bureau. https://housatonicheritage.org/Places/berkshire-visitors-bureau-the-berkshires-in-western-massachusetts/
[60] Massachusetts Office of Travel & Tourism, 2019 Annual Report (published May 2020).

The 21-town region provides an array of outdoor recreation options for visitors and residents on state-owned lands, municipal, non-profit and land trust properties, and on private properties that allow for public access. Activities include bird watching, hiking, cross-country skiing, snowshoeing, hunting, snowmobiling, kayaking and canoeing, fishing, swimming, camping and mountain biking. Maintaining properties and balancing recreational use demands remain a challenge for state and other conservation agencies to sustain. Growing and enhancing the network of recreational offerings will require a strategy for ensuring maintenance is sustainable over the long term.

The region contains segments of three long-distance hiking trails, including the Appalachian National Scenic Trail (AT), which sees 2 to 3 million visitors on its various stretches from Georgia to Maine each year. Recreation companies also contribute greatly to the recreational assets of the region. The three largest recreation companies in Charlemont collectively attract approximately 120,000 to 145,000 visitors to town each year.[61]

Potential Impacts of Increasing Forest-Based Tourism in the 21-Town Region

A potential advantage of increasing forest-based tourism in the region includes stimulating local economies by bringing in outside dollars, which in turn will benefit both recreation and tourism businesses as well as a variety of other businesses that support those industries. Towns would benefit through increased tax revenues, and residents would gain greater access to recreational and cultural amenities.[62]

Tourists to rural areas are looking for a broader experience that combines outdoor recreation with quality accommodations, shopping, and cultural opportunities.[63] This type of tourism potentially supports the preservation and enhancement of rural communities' quality of place, which can both attract more visitors and benefit existing residents.[64] The quality of the natural environment plays a key role in drawing visitors to rural areas.

Participants at Partnership outreach meetings in 2013 and 2014 expressed the need to better market the region to tourists; participants were also interested in having a visitor center where local wood products could be marketed. Keeping recreational tourists in the area longer to support local businesses and improving tourism infrastructure and access to some recreational sites were also identified as needs. At the same time, some communities were concerned about

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[61] *Town of Charlemont Economic Development Chapter*. September 2011.
[62] Reeder, Richard J., and Dennis M. Brown (2005). *Recreation, Tourism, and Rural Well-Being*. United States Department of Agriculture Economic Research Service. Economic Research Report Number 7.
[63] Ibid.
[64] Reilly, Catherine J., and Henry Renski (2007). *Place and Prosperity*. Maine State Planning Office. Prepared for Governor's Council on Maine's Quality of Place.

how an influx in tourists would impact the character of their town, and that towns don't have the capacity to deal with emergencies, traffic, and other issues that may arise from more visitors.

While increased access to and promotion of natural amenities can lead to increased tourism and economic growth, at the same time the integrity of the natural resource must be protected in order to sustain a healthy tourism industry into the future. The region would appear to need a balanced, and sustainable, management of tourists as well as of the natural landscape they interact with. In addition, jobs in the tourism industry are typically seasonal, and have traditionally been low wage, although this may be changing due to shifting tourist demands towards higher-quality experiences.[65]

Recreation

Recreational Assets in the 21-Town Region

The Franklin Regional Council of Governments completed a recreational assets inventory and mapping project in 2021, focused on the MTWP region. Recreational sites were inventoried by town, with acreage, public access information, handicapped accessibility, and specific recreation types tabulated. Sites included state- and town-owned recreational areas, wildlife management areas, and properties owned by land trusts, as well as campgrounds, school grounds and athletic fields, playgrounds, picnic areas, and boat launches. 185 recreational sites were identified in the MTWP region, covering approximately 93,393 acres. The public has access to a diverse array of outdoor recreational opportunities through these sites. Opportunities include, but are not limited to: bird watching, disc golf, camping, cross-country skiing, downhill skiing, fishing, golf, hunting, hiking, rock climbing, mountain biking, paddling (kayaking and canoeing), snowshoeing, and swimming.

As part of the project, broad issues and needs were identified concerning recreational resources in the region. This included needs for:

- Trail maintenance to improve issues like degraded trails and inconsistent or faded trail markings;
- Improvements to and expansion of parking areas;
- Paving and signs at some boat launches;
- More public restrooms and waste management facilities;
- Additional Americans with Disabilities Act (ACA) accessible recreational facilities;
- Improvements to playgrounds;
- More on-site information available for visitors;

[65] Vail, David (2010). "Economic Development Investments to Realize Rural Maine's Tourism Potential." Maine Center for Economic Policy. Augusta, Maine. *Choices*, Volume XI, No. 7. http://www.mecep.org/publications.asp.

- Online maps and consistent signage for state properties managed by Department of Fish and Wildlife and Department of Conservation and Recreation;
- More information about recreation opportunities, rules, regulations, and accessibility on town websites;
- Better cellular service in some areas;
- Improved options for using public transit to reach recreational sites, such as shuttling from parking lots.

Summary and Key Findings

- Forests play an important role in the region's economy, and have done so for generations. A focus on rural economic development could benefit the region's communities, forestry industry, and support the sustainable management of forests.

- Response to public outreach shows strong support for pursuing natural resource-based economic development consistent with the 21-Town region's rural character, which could serve as a model for other rural regions experiencing similar issues.

- Over the last 10-15 years, jobs within the wood product and paper manufacturing industries declined in the State and 21-Town region. At the same time Massachusetts imports 98% of its wood products from out-of-state. An opportunity exists to increase the amount of wood that is sustainably harvested, processed, and used within the State and region, resulting in business and job growth, reduced transportation costs and environmental impacts, and improved forestry.

- The 21-town region has a higher concentration of employment in forest product jobs than the State, representing an opportunity to build upon the industry in the region. Funding and technical assistance through could provide support for the forest products industry, such as assistance for local sawmills and loggers to upgrade equipment, help develop more local markets for low-grade wood and other wood products, and assist marketing efforts of wood product businesses.

- Forests provide a wide range of ecosystem services, such as clean air and water that have tremendous economic value. Support and technical assistance in accessing or developing ecosystem services markets, such as carbon markets, could provide job growth, increase income to landowners, provide an incentive to sustainably manage forests, and contribute to forest products businesses.

- Increasing forest-based tourism in the 21-town region could result in an influx of dollars into the local economy, support for recreation and tourism businesses, an increase in local tax revenues, and improved recreational amenities for residents. There is a need for better marketing of the region to help keep recreational tourists in the area longer. Improved tourism infrastructure and access to recreation sites is also needed.

MTWP STANDING COMMITTEE:
Natural Resource-Based Economic Development

After meeting five times over the course of 2021, this Committee of the Board, chaired by Board member Andrew Kawczak of the Hoosic River Watershed Association, voted to include the following potential activities on a list of job-creating activities or projects that could be pursued in the coming years.

Potential Programs/Projects for Further Study

Note: All these ideas would require additional evaluation and assessment for: usefulness, market forces/prices, transportation/energy/manufacturing costs, environmental/safety issues, sustainability, employment value, funding and finally - MTWP and community acceptance.

Sustainable Forestry and Wood Products related

- Supporting existing sawmills and forest products businesses in the region
- Protecting /promoting rural jobs among foresters, loggers and sawmill operators
- Creating or piloting a forest viability program that would include business advising and succession planning for woodland owners;[66]

Waste wood related

- Fuel – after wood debris re-sizing – such as direct heat in wood processing facilities?
- Wood Mulch?
- Animal Bedding?
- Oriented Strand Board (OSB) (low quality plywood) raw stock/ production?
- Raw stock/production for engineered laminated beams?
- Small wood items (e.g., dowels, stakes, etc.)?
- Disposable wood items (e.g., matches, tooth picks, chopsticks)?

[66] Vermont Farm & Forest Viability Program: https://www.vhcb.org/viability

- Raw material for fiber* for disposable paper products (e.g., paper towels, tissues, toilet paper, paper bags, egg cartons, disposable diapers)?
- Some combination of the above to utilize all parts of the waste wood

* Note: Current fiber for disposable paper is now coming from boreal forest that are hundreds of years old and their harvest is releasing large amounts of carbon into the atmosphere, especially from soils.[67]

Tourism / Recreation related

- Mountain biking – with appropriately constructed and maintained trails, events?
- Demonstration forest w/educational out-reach?
- Glamping? (i.e., glamour camping)
- Full service (e.g., sewer, electricity, water) RV/trailer camping?

[67] Committee Chair: Personal Communication with William Moomaw, Professor Emeritus of International Environmental Policy at the Fletcher School, Tufts University.