THE ECONOMIC CASE FOR CONSERVATION:

A Synthesis of the Economic Impacts of Natural Resources and Conservation in New England

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Key Findings

- Every $1 of state funding spent on land conservation in New England returns between $4 and $11 in economic value from natural goods and services.
- New England's forests remove more than 760,000 tons of air pollution each year, resulting in an estimated $570M in avoided health care costs.
- 432,000 jobs, $51.6B in consumer spending, and $7.6B in state and federal tax revenues are attributable to New England's outdoor recreation industry, which relies heavily on public access to protected areas.
- New England's forest products industry—much of which is conducted on protected land—provides 62,500 jobs and $13.5B in economic output each year. The industry's indirect impacts generate double those amounts in the three northern states alone.
- In 2012 New England's agricultural sector (including forestry and fishing) employed 225,500 people and accounted for $41.5B in sales.
- 39 separate studies conducted across New England show that open space is not a tax burden on municipalities. On average open space requires $0.36 of municipal services for every $1 of property tax paid, while residential properties require $1.16.

Highstead

Executive Summary

Investments in land protection are investments in clean air and water, climate mitigation, human health, recreation, and economic development. New England forests provide robust natural services, including maintenance of air and water quality, carbon sequestration, protection of wildlife habitat, soil stabilization, and flood control. Forests and farmland contribute to key industries in New England, including logging, wood products manufacturing, maple syrup tapping, agriculture, outdoor recreation, and tourism. Land protection is the primary process through which public and private landowners can ensure their land will remain as forest and farmland, thereby continuing to make these important economic and ecological contributions. The goal of this report is to synthesize the best available information about the contributions land conservation make to our economic system, and to identify gaps that should be explored further.

Undeveloped forests and well-managed farmland act as safeguards to air, water, and soil quality and serve as carbon sinks. Natural lands, whether privately or publicly owned, typically provide positive externalities, yielding significant economic benefit without compensation, or often even valuation. According to work conducted by the Trust for Public Land, every $1 of state funding invested into land conservation in New England returns between $4 and $11 in economic value from natural goods and services. The natural water filtration from New England forestland is estimated to be worth $157 million annually. The Quabbin and Wachusett watersheds in Massachusetts supply clean drinking water to nearly 40 percent of the Commonwealth's residents while the Sebago Lake watershed serves 15% of the entire population of Maine. New England trees remove over 762,000 tons of air pollution per year, leading to annual health benefits of around $570 million, and offset more than 20 percent of the region's carbon dioxide emissions, which would otherwise exacerbate global climate change.

Protected lands draw residents and visitors alike to New England's abundance of areas of natural beauty to hike, camp, paddle, ski, hunt and fish, and enjoy the scenic vistas. Recreation occurs on nearly all modes of land protected from development in the region, from iconic publicly owned landscapes such as the White Mountain National Forest to local trail systems that cross private lands. Outdoor recreation in the region provides 432,000 jobs and prompts $51.6 billion in consumer spending. Annual federal tax revenue attributed to outdoor recreation is estimated at $1.1 billion and state and local tax revenue at $3.5 billion. Tourism eclipses forestry and farming as a source of employment in the region's rural places, with 14.2% of employment in travel and tourism related trades. In 2016, 13.6 million visitors spent an estimated $805.8 million in local gateway regions while visiting New England's National Park Service lands such as Acadia National Park, Boston Harbor National Recreation Area, and the Cape Cod National Seashore.

The protection of working forests and farms across New England ensures that housing and development sprawl don't displace these industries vital to New England's economy and

sustenance. The region's forest products industry – including forestry, logging, wood products and paper manufacturing, wood energy, and Christmas tree farming – accounts for 62,500 jobs and $13.5 billion in economic output annually. The agricultural sector (excluding forestry and commercial fishing and aquaculture) employed approximately 165,000 people, with $13.4 billion in sales and a total economic impact of $17.2 billion.

Farmlands and open spaces contribute fiscally to communities. For every $1 generated in revenues from open land, only $0.36 were required in services. Residential lands consistently required more in services than was generated in revenue, necessitating $1.16 in community services for every $1 generated in revenue. On average, commercial and industrial lands required $0.06 more than working and open land. Research shows that protected open space drives up property values, and subsequently increases tax revenues, supporting local economic development.

Permanent land protection is a major way to ensure these vital assets continue to contribute to the region's economy, yet there are many challenges associated with quantifying the specific economic uplift of land protection. In particular, there is very little research that directly attributes the economic benefits to land protection itself. While we are aware of the natural services provided by forests, including water and air filtration and carbon sequestration, what is the value of those services coming directly from protected land? What is the role of forests remaining as forests in sequestering carbon, filtering water for downstream users, and controlling air pollution regionally? Or farmland remaining as farmland in securing jobs, wages and salaries, direct sales, and tax revenues? Although the benefits provided by goods and services emanating from natural lands are well acknowledged – we all appreciate clean air and water, access to trails and beautiful scenery, and farm and forest products (our Christmas trees, maple syrup, dairy, and apples) – the value of these services stemming from protected lands is unaccounted for.

Land conservation has traditionally occurred via bottom up, community-based initiatives. State and local government have an opportunity to push policy to not only create effective programs to enhance the protection of forests and farms, but provide guidance to make better investments in land protection on a regional scale. Economic impact studies will demonstrate value in terms understandable by legislators, community and economic development authorities, and other entities responsible for allocating increasingly limited resources, as well as the individuals and governments positioned to receive these benefits. We see economic opportunities in land conservation by way of natural services and natural-resource based industries while recognizing the challenge of maintaining these benefits in their scope and impact on New England's economy and quality of life and need guidance to make better investments. In not only conserving land but linking economic benefits to land conservation, we can spur investment into the vitality of the region and generations to come.

The State of Conservation in New England

Forest cover in all six New England states continues to decline as residential and commercial development fragments forests and consumes farmland. New England has a rich history of protecting its forest and farmland for future generations. Conservationists have operated largely on a moral argument to protect the beauty and natural resources for those to come. While conservationists have begun to make an economic case for land conservation, benefits we derive from our land continue to be undervalued. Consequently, protection is hampered by inadequate public and private funding. The goal of this report is to synthesize the best available information about the contributions land conservation make to our economic system, and to identify gaps that should be explored further.

State and federal funding for land protection is declining across all six New England states, dropping nearly 50 percent from its peak of $119 million to $62 million between 2008 and 2014.[1] These state and federal investments are augmented by private philanthropy, landowner donations, municipalities, and private financing. Along with public funding, the pace of conservation slowed from more than 150,000 acres per year in the early 2000s to about 50,000 acres per year since 2010. Even with investment in open space, development pressures threaten unprotected areas throughout the region. Between 1990 and 2015 New England lost an average of 24,000 acres of forestland on an annual basis. [2] If this rate of loss continues, New England will lose an additional 1.2 million acres of forest over the next 50 years.

The costs and quantities of land conservation are well documented and the value of natural lands, working farms, and forests to our society are well understood conceptually.[3] However, the documentation of the benefits, particularly in economic terms, derived from land conservation is less robust. Conservationists may object to trying to reduce the value of conservation to a dollars-and-cents calculation, and doing so should be met with a healthy dose of skepticism. But, in order to shift the dialogue of conservation as a luxury to conservation as a partial solution to our resource-constrained world, the economic argument for land protection must be more robust. Calculating the return on investment (ROI) of land conservation, a quantitative analysis of a land conservation investment's costs compared to some measure of benefits, allows for conservation managers to inform decision-making and for the public to understand the benefits they receive from their investments. Conservationists can make use of these findings to best allocate scarce resources and identify opportunities to work with private investors, for whom there is evidence of growth and increasing interest in the market.[4]

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[1] Foster, D.R. et al. 2017. Wildlands and Woodlands, Farmlands and Communities: Broadening the Vision for New England. Harvard University Press. Cambridge, MA.

[2] Foster et al.

[3] Buchanan, M. *Public Conservation Funding in New England: An Overview of Recent Trends in Government Spending on Land Protection*.

[4] NatureVest, & EKO Asset management Partners. (2014). *Investing in Conservation: A landscape assessment of an emerging market* (Publication).

Public and private investment in land protection result in a range of positive economic and ecological impacts. New England forests provide robust natural services, including maintenance of air and water quality, carbon sequestration, protection of wildlife habitat, soil stabilization, and flood control. These services establish reduced, avoided, or deferred costs by improving water and air quality and in turn minimizing costs relating to water treatment, air pollution control, property damage, and healthcare. Land protection supports key industries in New England, including logging, wood products manufacturing, maple syrup tapping, agriculture, outdoor recreation, and tourism. These natural-resource based sectors contribute directly to the regional economy through goods and services, worker wages, and through the tax revenues and indirect spending that bolster local economies. Open space protection can also increase neighboring property values while minimizing costs of community services and associated tax bills. Investments in land protection are investments in clean air and water, climate mitigation, human health, and rural economic development.

Quantifying Returns on Investment

We organized the benefits of conservation by the following broad categories: natural services, outdoor recreation and tourism, forestry, agriculture, and property values, costs of community services, and tax base. For each category, we synthesized what is known about the economic returns using existing studies. We also identified gaps where our current understanding of the economic contributions of conservation are poor and made suggestions for future investigation.

Natural Services

Undeveloped forests and well-managed farmland act as safeguards to air, water, and soil quality, prevent flooding and erosion, and serve as carbon sinks. Natural lands typically provide positive externalities, essentially yielding significant economic benefit without compensation. Without these services the costs related to water treatment, stormwater management, and air quality control could be magnitudes greater.

Water Filtration

Healthy and functioning watersheds naturally filter pollutants and moderate water quantity, resulting in less flooding and soil erosion, cleaner water downstream, and greater groundwater reserves. The high infiltration rates of forest soils in New England significantly attenuate surface runoff in the region; virtually all water comprising New England streams and rivers has undergone the forest filtration process. Allowing untreated water quality to degrade increases treatment and capital costs, and therefore suppliers can minimize costs through the prioritization of conservation and management of forests in source watersheds. The USDA Forest Service's Forests to Faucets project uses GIS to model land areas most important to

surface drinking water and the role forests play in protecting these areas (Figure 1). New England forests stand out nationally in terms of importance to drinking water and as threatened by development.[5] The New England Forestry Foundation estimated the value of natural water filtration from forestland in New England to be $157 million annually or $3.9 billion in perpetuity (using a discount rate of 4.4%, the approximate cost of capital for New England states and municipalities).[6] With population and water consumption growth over the next 50 years, that value is expected to increase to $5.4 billion (in 2014 dollars).

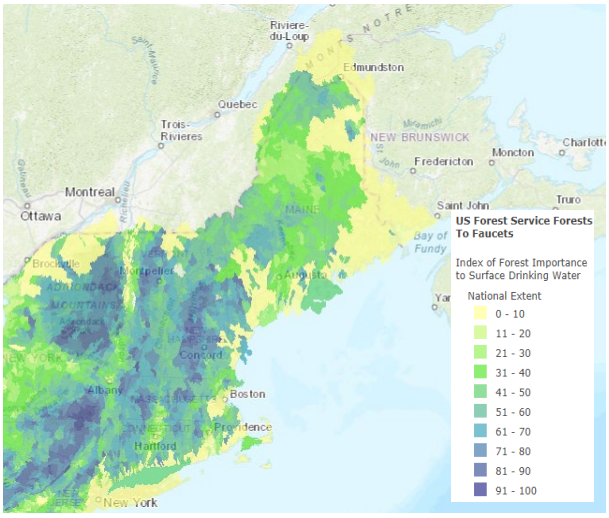


Figure 1. U.S. Forest Service Forests to Faucets Index of Forest Importance to Drinking Water.

The costs – both realized and potential – of water treatment are evidenced in case studies across New England. In Maine, residential development, deforestation, and population growth threaten the exceptional water quality of Sebago Lake, jeopardizing the Portland drinking water supply for 15% of the state's population. The local utility is currently exempt from the federal requirement to filter drinking water; the loss of this waiver due to reduced water quality would force the utility to install a conventional filtration system at an estimated cost of $97 to $155 million over 20 years.[7] The Trust for Public land identified significant cost-saving trends for 27 water suppliers in Connecticut through buffering drinking water sources by protecting surrounding forestland and other natural areas.[8] Approximately 50 to 55 percent of the variation in treatment costs amongst the plants was explained by the percent of the forest cover in the source area. For every 10 percent increase in forest cover in the source area, treatment and chemical costs decreased approximately 20 percent.

Air Quality and Health

Forests play an essential role in air quality across New England, removing air pollution by intercepting particulate matter and absorbing gaseous pollutants. A single hectare of forestland can store 50 kilograms of nitrogen, 40 kilograms of calcium, 20 kilograms of potassium, 6

[5] Forests to Faucets: U.S. Forest Service and Denver Water Watershed Management Partnership. http://www.denverwater.org/supplyplanning/watersupply/partnershipuSFS/

[6] New England Forestry Foundation. New England Forests: *The Path to Sustainability.* 2004. http://newenglandforestry.org/wp-content/uploads/2016/04/Path-To-Sustainability.pdf

[7] Gartner, T., DiFrancesco, K., Ozment, S., Huber-Stearns, H., Lichten, N., & Tognetti, S. (2017). Protecting Drinking Water at the Source: Lessons From US Watershed Investment Programs. *Journal-American Water Works Association*, *109*(4), 30-41.

[8] Trust for Public Land (TPL). *Protecting the Source. Land Conservation and the Future of America's Drinking Water.* 2004. https://www.tpl.org/sites/default/files/cloud.tpl.org/pubs/water-protecting_the_source_final.pdf

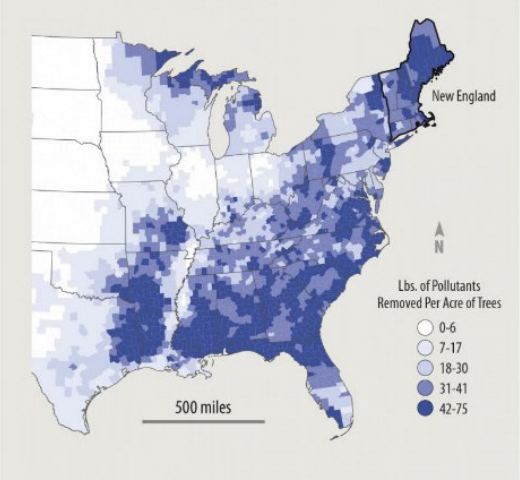


Figure 2. Pounds of pollutants removed per acre of trees. Wildlands and Woodlands. Data from Nowak, D. J., S. Hirabayashi, A. Bodine, and E. Greenfield. 2014.

kilograms of magnesium, and 4 kilograms of phosphorus each year.[9] Forests also promote cloud cover that increases precipitation, helping to clean the air of particulates, ozone, and other pollutants. New England trees (both urban and rural) remove 762,100 tons of air pollution per year, with 96.3 percent of pollution removal on rural land (Figure 2). The removal of air pollutants by New England's trees leads to annual health benefits of around $570 million, with state values ranging from $22 million in Vermont to $250 million in Massachusetts.

Increased particulate and ozone pollution is associated with increased cardiovascular and respiratory disease. A study of 13 Connecticut towns in New Haven County along a strong rural-urban gradient found that reduced disease prevalence of three chronic diseases (hypertension, heart disease, and diabetes) attributable to access to open space translates to an annual avoided healthcare cost of $37 million – a 40% reduction in healthcare expenses and economic losses.[10]

When considering both health care costs and lost agricultural productivity, the New England Forestry Foundation estimated that maintaining forests would save New Englanders nearly $700 million per year. [11] Discounted at the average cost of capital for New England municipalities, the net present value of these benefits is approximately $17.8 billion. Without forests and urban trees, New England would be hotter, more arid, and smoggier and consequently both less healthy and less productive as a population and a landscape.

Carbon Sequestration

Forest ecosystems are the largest terrestrial carbon sink on Earth, with more than half of their net primary production moving to the soil via decomposition of litter biomass. The absorption and storage of carbon removes it from the atmosphere, providing the critical service of mitigating global climate change. New England forests, which comprise 4.2% of all the forests in the U.S., offset more than 20 percent of the region's carbon dioxide emissions.[12;13] Forests in

[9] Nowak, D.J., S. Hirabayashi, A. Bodine, E. Greenfield. *Tree and forest effects on air quality and human health in the United States.* 2014. https://www.fs.fed.us/nrs/pubs/jrnl/2014/nrs_2014_nowak_001.pdf
[10] Meyer et al, in review.
[11] New England Forestry Foundation. New England Forests: *The Path to Sustainability.* 2004. http://newenglandforestry.org/wp-content/uploads/2016/04/Path-To-Sustainability.pdf
[12] USDA Forest Service. (2012). *Forest and Woodlands Area in the United States.* Retrieved from https://www.fia.fs.fed.us/
[13] Foster et al.

the region are currently sequestering atmospheric CO_2 at about 78 to 111 gC/m^2 per year.[14] In 2015, New England forests stored 1.6 million metric tons in aboveground carbon in live trees.[15] When multiplied by recent weighted-average global carbon prices, the monetary value associated with aboveground carbon storage for New England forests was $102 billion.[16] Urban and community forests in New England alone stored 88.9 million metric tons of carbon valued at $1.2 billion and removed 2.4 million metric tons of carbon annually, a service worth $66.7 million.[17] A model of net primary production, soil heterotrophic respiration, and net ecosystem exchange in New England forests indicated that New England forests are currently acting as carbon sinks, however this status is dynamic.[18] If forest destruction continues at the current rate, New England will lose a significant portion of this service and its associated economic benefits. Reforestation and a reduction of the rate of deforestation via land protection is one method of maintaining New England forests' status as carbon sinks.

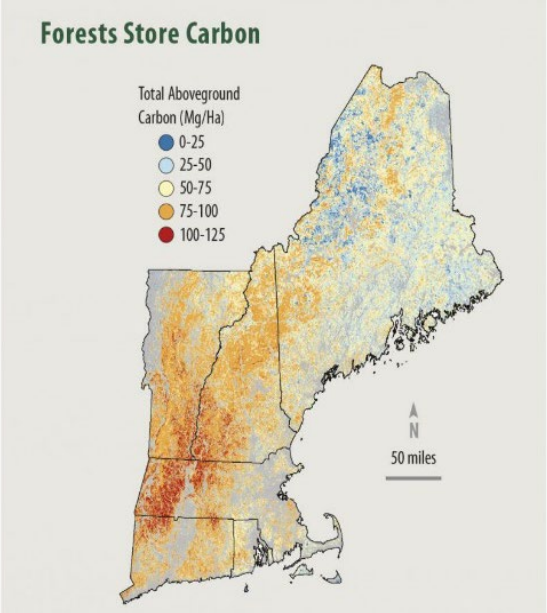


Figure 3. Wildlands and Woodlands. Kellndorfer, J., Walker, W., LaPoint, E., Bishop, J., Cormier, T., Fiske, G., Hoppus, M., Kirsch, K., and Westfall, J. 2012. NACP Aboveground Biomass and Carbon Baseline Data.

Carbon is one of the few ecosystem services for which a market has been created, bringing the theoretical economic value to market by compensating landowners who agree to avoid carbon emissions via sustainable forest management. In New England about $25 million of carbon offsets were sold in the California compliance market since 2013.[19] Another approximately $75 million worth of carbon offset projects have been listed with the California Air Resources Board, indicating significant demand from landowners to sell more offsets in the next few years.

Natural Services Return on Investment Studies

Every $1 of state funding invested in land conservation in New England, returns between $4 and $11 in natural services were generated. These figures were found using a benefits transfer

[14] Williams, C. A., G. J. Collatz, J. Masek, and S. N. Goward (2012), Carbon consequences of forest disturbance and recovery across the conterminous United States, Global Biogeochem. Cycles, 26, GB1005, doi:10.1029/2010GB003947.
[15] USDA Forest Service Forest Inventory and Analysis. (2015). Aboveground carbon in live trees on forest land.
[16] Zheng, D., M.J. Ducey, and L.S. Heath. (2012). Assessing net carbon sequestration on urban and community forests of northern New England, USA.
[17] Nowak, D.J. & Greenfield, E.J. (2008). Urban and Community Forests in New England. USDA.
[18] Tang, G., B. Beckage, B. Smith. *Potential future dynamics of carbon fluxes and pools in New England forests and their climatic sensitivities: A model-based study.* 2014. http://www.uvm.edu/~bbeckage/Manuscripts/Tang_etal.final.2014.pdf
[19] North, B., & Meyer, S. (2016). *Conservation Finance Pathways: An Examination of Conservation Finance Strategies for New England*.

methodology (in short, estimating benefits for one context by transferring available information from studies already completed in another location and/or context) by the Trust for Public Land (TPL). In New Hampshire's Land and Community Heritage Investment Program, every $1 invested returned $11 in economic value when considering the benefits of air pollution removal and carbon sequestration.[20] Every $1 invested between 2001 and 2011 also leveraged at least $4.95 in additional contributions from federal, local, private, and nonprofit sources. Land conserved by Land for Maine Futures (LMF)—one specific state funding program in Maine—returned $11 in natural goods and services for every $1 invested considering the services of air pollution removal, carbon sequestration, water quality protection, water supply, and food production and livestock goods.[21] The total economic value of natural goods and services generated by LMF lands between 1980 and 2010 was estimated at $833 million. Finally, a $4 return was found for land conserved in Massachusetts by the Commonwealth to be used for parks and open spaces, providing $3.17 billion in total economic value from date of purchase to 2023.[22]

The $7 range of returns between the Maine and New Hampshire ($11 returned per $1 invested) and Massachusetts reports ($4 returned per $1 invested) is likely due to the higher real estate prices in Massachusetts, reflected in the average cost of land acquisition for the three states determined using data from the Conservation Almanac. The average cost of lands conserved using public funds between 1998 and 2015 (both by easement and simple fee) in Massachusetts was $6,380 per acre, compared to $251 per acre in Maine and $1,292 per acre in New Hampshire.[23] The acquisition cost of land in Massachusetts was 159% greater than that of Maine and New Hampshire averaged.

The annual value of non-market ecosystem services across the state of Massachusetts alone was estimated to be over $6.3 billion per year, as found in a 2003 study by MassAudobon. [24] Services include climate regulation, freshwater regulation and supply, water assimilation, nutrient regulation, habitat refugium, soil retention and formation, disturbance prevention, pollination, and recreation and aesthetics). Services provided by forests specifically comprised the largest portion of the $6.3 billion figure (46%), valued annually at $2.9 billion. Based on net forest and agricultural land lost to all forms of development between 1985 and 1999, the state lost over $200 million annually in ecosystem services, in 2001 dollars. These findings suggest that if the same amount of development had occurred through denser and more brownfield

[20] Trust for Public Land (TPL). *New Hampshire's Return on Investment in Land Conservation*. 2014. https://www.tpl.org/sites/default/files/nh-state-roi-report.pdf
[21] Trust for Public Land (TPL). *Return on the Investment in Land for Maine's Future*. 2012. https://www.tpl.org/sites/default/files/cloud.tpl.org/pubs/local-maine-conseconomics-2012.pdf
[22] Trust for Public Land (TPL). *The Return on Investment in Parks and Open Space in Massachusetts*. 2013. http://cloud.tpl.org/pubs/benefits-ma-roi-report.pdf
[23] Trust for Public Land (TPL). *Conservation Almanac.* 2017. http://www.conservationalmanac.org/secure/
[24] MassAudubon. *Losing Ground: At What Cost? Changes in Land Use and Their Impact on Habitat, Biodiversity, and Ecosystem Services in Massachusetts.* 2003. https://www.massaudubon.org/content/download/8599/149714/file/LosingGround_All.pdf

development, so as to reduce impact on forest and agricultural land, the state could have enjoyed the economic benefits of both development and ecosystem services.

This $6.3 billion annual estimation is likely twofold to that of the Trust for Public Land's $3.17 billion estimation for total economic value of natural goods and services due simply to the greater land base included in the MassAudubon study. The 131,000 acres conserved by the Commonwealth comprise only 2.6% of the nearly 5 million acre state. Both reports provide per acre annual values within a relatively similar range (MassAudubon $0 - $6,253 per acre; TPL $0 - $2,570 per acre). A recent study by the Nature Conservancy found that the Northern Appalachian-Acadian Ecoregion, which extends from the Adirondacks of New York across the Green Mountains of Vermont to the White Mountains of New Hampshire into Maine, to have a natural capital value ranging from $1500 to $4200 per acre per year, falling again within a similar range to the two prior studies.[25] Authors included the services of carbon storage, flood control, and air filtration.

The total ecosystem service flow for the state of Maine was estimated at a value of $14.67 billion per year, in a similar valuation study.[26] Authors included services of aesthetic and amenity, disturbance regulation, gas and atmospheric regulation, other cultural services, pollination and seeding, recreation, soil regulation, and water supply and regulation. The highest value cover types were consistently the urban and suburban types, including rivers, wetlands, forests, and herbaceous open space. When combining estimated values of forest services, the forest land cover provides by far the highest value of ecosystem services. The largest value per year by land cover category comes from non-urban forests, at $5.7 billion. Again, the annual estimation of $14.67 billion is much larger than the TPL's total economic value of $833 million for LMF lands. As was the case in Massachusetts, this difference is likely due to the greater land base included in the statewide study. Lands conserved by the Land for Maine Futures program make up 2.4% of the total state area.

Gaps

All of the studies mentioned above noted that their respective value estimates should be considered conservative due to reasons including: lack of available research for many service and land cover combinations, poorly understood and poorly valued understanding of ecosystem services in general, and the compound value of different natured outcomes. While some estimates of natural services provided by forest systems are available, scale and input variables are inconsistent. For example, while carbon sequestration has become recognized as a forest management objective, the full carbon storage potential of forests is not well understood, yet alone the economic value of this capacity. The same can be said for many of

[25] *Putting a Value on the Ecosystem Services Provided by Forests in the Eastern United States: Case Studies on Natural Capital and Conservation* (Rep.). (2017). The Nature Conservancy. https://www.nature.org/about-us/working-with-companies/companies-we-work-with/value-on-ecosystem-services-provided-by-forests-in-the-eastern-united-states.pdf?utm_campaign=social.nature&utm_medium=social&utm_source=twitter&utm_content=1512682588

[26] Troy, A. *Valuing Maine's Natural Capital.* Spatial Informatics Group. https://www.manomet.org/sites/default/files/publications_and_tools/Troy_2012_Value_of_Maine_FullReport.pdf

the natural services included in this synthesis, including water and air filtration, storm water management, and others. Ecosystems in close proximity to large groups of humans yield larger calculable benefits than ecosystems with only limited connectivity to beneficiaries, demonstrated in the MassAudobon study. This may skew the perceived value of rural protected lands.

Even with extensive research on ecosystem services and their perceived values, there is a disconnect between ecosystem services and their actual marketable values. Very few markets exist and therefore markets must be developed in order for our economic systems to internalize the services that are now only externalities. The carbon credit market is one of the few examples of a realized market delivering conservation benefits from ecosystem services.

At the current rate of development, another 1.2 million acres of farms and forestland will be lost in New England in the next 50 years, a transformation that will largely undermine the forests' capacity to yield clean water, mitigate flooding, and provide other necessary services.[27] This could necessitate massive public investments to compensate for impaired and lost natural services. A better overall understanding of the value of natural services is needed in order to quantify gains and potential future losses. A baseline of the economic value of natural goods and services promises to provide investors with current information necessary to make smart and effective investments in conservation.

Outdoor Recreation and Tourism

Conserved lands draw resident and visiting pleasure travelers to the White Mountains, Maine coast, and other areas of natural beauty in New England to hike, camp, paddle, cycle, ski, snowmobile, fish and hunt, and enjoy the region's many scenic vistas. In attracting visitors, conserved lands stimulate local economies, providing economic benefit via increased employment and visitor spending on accommodations, dining, transportation, and recreation activities. Outdoor recreation is occurring on both private and public lands, an important case as our population grows and outdoor recreation resources decline on a per-person basis, constrained by resource limits. In a recent analysis of 340 conservation easements of various sizes in all six New England states, Moore, Meyer and Thompson found that 38% of easements required some level of public access.[28] Public lands, often held and managed by the state, National Parks Service, and the USDA Forest service, are governed for multiple purposes including recreational use for wildlife watching, hiking, and hunting.

Outdoor recreation is by far the single greatest use of the National Forest System. It is also the single greatest employer, and provides the single greatest stimulus for local economies. Americans get tremendous economic benefits from the various activities on the National Forest System, including outdoor recreation, but also from investments in recreational infrastructure

[27] Foster et al.
[28] Moore, Meyer and Thompson (in preparation).

and in healthy, resilient forests and grasslands.[29] In fiscal year 2011, all activities combined on all units of the National Forest System contributed over $36 billion to America's gross domestic product, supporting nearly 450,000 jobs. Around 45 percent of those jobs were connected to hunting, fishing, wildlife viewing, and other forms of outdoor recreation on the National Forest System. Outdoor recreation alone in the National Forest System supports about 205,000 jobs, contributing about $13.6 billion to the Nation's gross domestic product each year. New England is home to both the White and Green Mountain National Forests. The direct spending of visitors to ski areas on the national forests amounts to about $4 billion annually, with the White Mountain National Forest hosting about 1 million skiers every year on Nordic and alpine ski areas in New Hampshire. The average economic value of recreation benefits (use value) for the Eastern Forest Service region, containing New England, was $55.93. This number, in other words represents the consumer surplus, or average economic value of recreation benefit per activity day that accrues to an individual engaged in a type of recreation activity within the Forest Service region.[30]

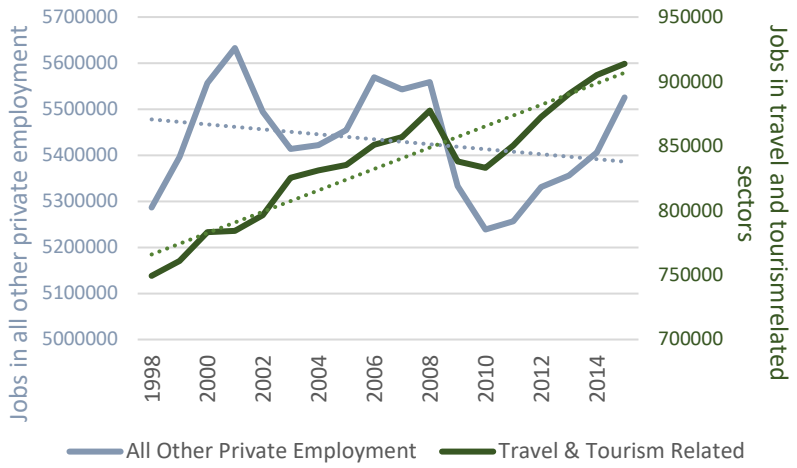


Figure 4. Total jobs in industries that include travel and tourism, New England, 1998-2015 (data adapted from U.S. Department of Commerce).

Tourism, directly dependent on the conservation of lands and waters, now eclipses forestry and farming as a source of employment in New England's rural places.[31] Across New England, 14.2% of employment occurs within the travel and tourism related trades.[32] In Maine alone, tourism puts $10-14 billion into the state economy each year and employs 140,000 workers – almost 22% of the state's work force.[33] From 1998 to 2015, employment in travel and tourism in the region grew from 749,368 to 913,783 jobs, a 21.9% increase. All other private employment grew only by 4.5% in that same period. Growth in the

[29] Wagner, M. (n.d.). *Outdoor Recreation on the National Forest System*. Speech presented at National Outdoor Recreation Conference in Michigan, Traverse City.
[30] Rosenberger, R. S., White, E. M., Kline, J. D., & Cvitanovich, C. (2017). Recreation Economic Values for Estimating Outdoor Recreation Economic Benefits From the National Forest System. *United States Department of Agriculture*.
[31] New England Governors' Conference, Inc. *Report of the Blue Ribbon Commission on Land Conservation.* 2009. http://efc.muskie.usm.maine.edu/docs/NEGCLandConservationReport.pdf
[32] United States Department of Labor. 2017. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Washington, D.C., as reported by Headwaters Economics' Economic Profile System (headwaterseconomics.org/eps).
[33] Moholland, DD. Perfect Weather Sparks New England Tourism Rebound. WBZ 1030 Radio, 10/30/10

tourism and travel sectors appeared to be steadier than that in other private employment trends, with minimal fluctuations during the Great Recession (Figure 4; note separate scales).

In New England, an important sector of tourists travel specifically for outdoor recreation, visiting communities to hunt, fish, hike, and boat while spending on meals, accommodations, and specialized equipment. The Outdoor Industry Association estimates that outdoor recreation provides 423,000 jobs across New England and prompts $51.6 billion in consumer spending each year.[34] Federal tax revenue attributed to outdoor recreation is estimated at $1.1 billion across the six states; state and local tax revenue is approximately $3.5 billion. For a state-by-state breakdown of these figures, refer to Table 1.

Table 1. The spending, direct jobs, wages and salaries, and tax revenues attributed to outdoor recreation in New England.

	Spending ($ billion)	Direct Jobs	Wages and Salaries ($ billion)	State and Local Tax Revenues ($ million)
CT	$9.00	69,000	$2.90	$743
ME	$8.20	76,000	$2.20	$548
MA	$16.20	120,000	$5.90	$911
NH	$8.70	79,000	$2.60	$528
RI	$4.00	37,000	$1.20	$293
VT	$5.50	51,000	$1.50	$505
New England	$51.60	$432,000	$16.30	$3,528

Investment into the outdoor recreation industry is also investment into gateway communities (cities or towns that lie just outside major tourist attractions such as national parks, wilderness areas, or nature resort areas.) In 2016, 13.6 million visitors spent an estimated $805.8 million in local gateway regions while visiting National Park Service lands in New England alone, including Acadia National Park, Boston Harbor Islands National Recreation Area, and the Cape Cod National Seashore.[35] A USDA study of 311 rural recreation counties across the United States found that recreation and tourism resulted in lower local poverty levels as well as improvements in education attainment and health measures.[36]

Participation levels in outdoor, wildlife-associated recreation are high. A U.S. Fish and Wildlife Service study conducted in 2011 found that across New England, 40.5% of residents had participated in-state and/or out-of-state.[37] The highest rate, at 61%, came from Vermont, followed by Maine at 48%.

[34] Outdoor Industry Association (OIA). *The Outdoor Recreation Economy.* 2017. https://outdoorindustry.org/wp-content/uploads/2017/04/OIA_RecEconomy_FINAL_Single.pdf

[35] National Park Service. U.S. Department of the Interior. *2016 National Park Visitor Spending Effects.* 2016. https://www.nps.gov/subjects/socialscience/vse.htm

[36] United States Department of Agriculture (USDA). *Recreation, Tourism, and Rural Well-Being.* 2005. https://www.ers.usda.gov/webdocs/publications/46126/15112_err7_1_.pdf?v=41056

[37] United States Fish and Wildlife Service. 2011. *National Survey of Fishing, Hunting, and Wildlife-Associated Recreation.* https://www.census.gov/prod/2012pubs/fhw11-nat.pdf

Tourism and outdoor recreation are both strong economic engines that depend heavily on natural beauty and conserved lands. While the numbers included in this report reflect both sectors as a whole, there is no literature quantifying visitor spending and employment directly tied to conserved lands. More than 80 percent of funding for recreation and conservation is generated at the state and local level and four out of six New England states have outdoor recreation funding programs of their own, including Land for Maine's Future and Vermont Housing and Conservation Trust Fund.[38] State-based funding sources play an important role in acquiring the economic, quality of life, and health benefits associated with recreation and tourism outlined above. If it is shown that land conservation can lead to economic growth in the form of tourism and outdoor recreation, regional planners, the tourism industry, and policy makers can promote conservation as a contributor to economic development.

Forestry

The protection of working forests across New England—largely through conservation easements—reduces the risk that these lands are converted to other uses and fragmented into smaller ownerships. Protected forests provide direct economic contributions via employment, wages, and timber and non-timber product sales. They also provide the many other economic benefits discussed in this report (natural services, recreation, etc.), especially when they guarantee public access. A recent analysis of 24 large working forests easements in New England found that 75% required at least some level of public access.[39] Knowledge of the relative size of the timber industry and its components, how these have changed over time, and how local trends compare to trends in other geographies is important in analyzing how a proposed conservation plan would stimulate growth or decline in industry, whether some geographies would be affected more than others, and given the relative size of the industry if changes to it will affect the broader economy.

The Northeast State Foresters Association (NEFA) estimates that the region's forest products industry – including forestry, logging, wood products and paper manufacturing, wood energy, Christmas tree farming, and maple syrup tapping – accounts for 62,500 jobs and $13.5 billion in economic output annually.[40] Maine alone generates $8.2 billion of economic output, and when combined with New Hampshire and Vermont, the indirect impacts of the forest products industry account for an additional 62,000 jobs and $11.9 billion in economic output. According to 2015 data from the U.S. Department of Commerce, Maine had the largest percent of total timber employment (2.64%) and Connecticut had the smallest (0.25%).[41] The percent employment in timber across New England was around 0.5 percent. Between 1998 and 2015

[38] *State Funding Mechanisms for Outdoor Recreation* (Rep.). (2017). Outdoor Industry. https://outdoorindustry.org/wp-content/uploads/2017/08/Headwaters-Economics-v4-Screen.pdf

[39] Moore, Meyer, Thompson, in preparation.

[40] Northeast State Foresters Association (NEFA). *Economic Importance of CT's/MA's/ME's/RI's/NH's/VT's Forest Based Economy 2015*. 2015. http://www.ct.gov/deep/lib/deep/forestry/ct_forest_based_economy.pdf

[41] United States Department of Commerce. 2014. Bureau of Economic Analysis, Regional Economic Accounts, Washington, D.C., as reported in Headwaters Economics' Economic Profile System (headwaterseconomics.org/eps).

there was a 50 percent decrease in the number of timber jobs from 1.14 percent employment to 0.53 percent.

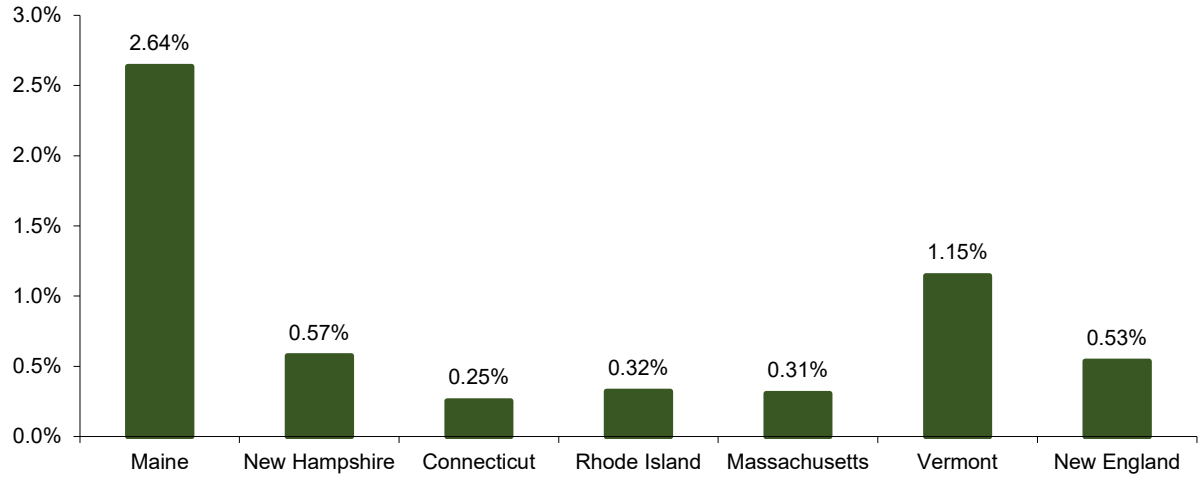


Figure 5. Percent of private employment in timber, 2015 (data adapted from the U.S. Department of Commerce).

Timber harvest on national forest is done under strict environmental law, unlike the harvesting that occurs on private lands. In addition to providing paper and lumber products, sustainable forest management facilitates emerging technology such as bioenergy, biofuels, and substituting wood for products that require high amounts of fossil fuel. Receipts from timber harvesting on the National Forest provide significant income to local communities.[42] Of the nearly 800,000 acres of White Mountain National Forest, approximately 35% is considered suitable for timber operations, and on average each year around 1% of the suitable area is harvested.[43] The Green Mountain National Forest also supports a small but active and growing timber management program that emphasizes community involvement and collaboration.[44] Maine is a national leader in forest sustainability certification, with upwards of 10 million acres, or more than 50% of its timberland, certified by the Forest Stewardship Council (FSC) or the Sustainable Forestry Initiative (SFI).[45] Tracking economic output from forestry on conserved lands and certified sustainable practices will provide a better understanding of the full economic uptake associated with the sector attributable to protected lands.

Agriculture

Like land dedicated to the forest-based industry, development threatens agricultural working lands as well. Farming holds a significant portion of the landscape and local economy in areas of

[42] Wagner, M. (n.d.). *Outdoor Recreation on the National Forest System*. Speech presented at National Outdoor Recreation Conference in Michigan, Traverse City.
[43] White Mountain Forest Management Story Map. https://www.fs.usda.gov/detail/whitemountain/landmanagement/resourcemanagement/?cid=FSEPRD542923
[44] *Green Mountain National Forest Land and Resource Management Plan* (Rep.). (2006). Milwaukee, WI: USDA Forest Service.
[45] Seymour, R., & Sherwood, D. (2014). *Assessing Maine's Certified Sustainable Timber Harvest*(Rep.). https://nsrcforest.org/project/assessing-maine%E2%80%99s-certified-sustainable-timber-harvest

New England, produces the food New Englanders consume, generates billions in sales, jobs, and related industry, and often employs good stewards of the land. Farmers hold a stake in land conservation as crop production often relies on upstream public lands that provide water for irrigation, where highly forested parcels and proper management techniques would provide better quality water, affecting yield and output.

The protection of working farms across New England ensures that housing and development sprawl don't displace these industries, which remain important drivers of job and economic activity. Researchers at University of Connecticut found that in 2012, the total sales from agriculture (excluding forestry and fishing) amounted to $13.4 billion, with a total economic impact of $17.2 billion and 165,376 jobs supported.[46] According to the Census of Agriculture, direct-to-consumer sales in New England increased 62 percent from 2002 to 2007, helping to increase by 30 percent the total market value of agricultural products sold.[47] In 2015, the percent of total farm employment across New England was 0.5 percent. The highest percent of farm employment was in Vermont (2.3%).

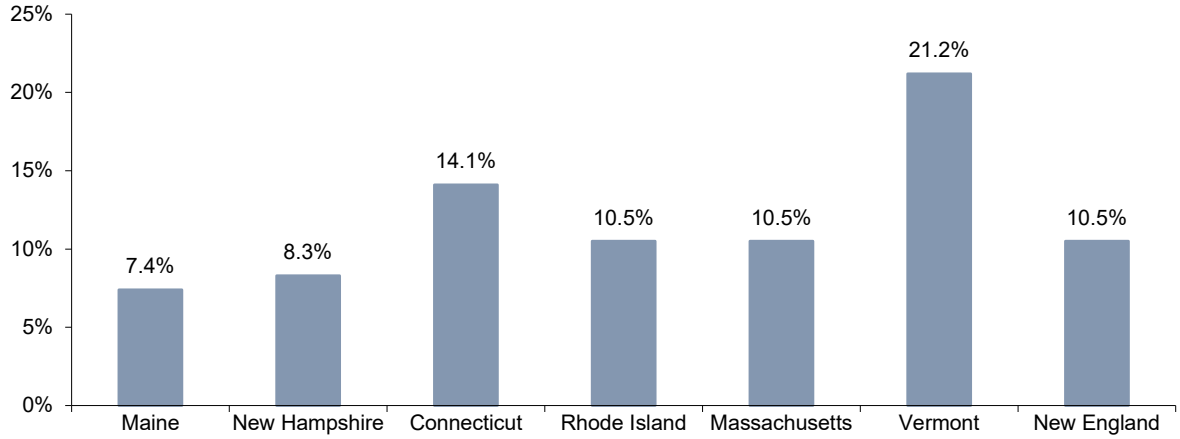


Figure 6. Approximate percent of land area in farms, 2012 (data adapted from the U.S. Department of Agriculture).

Expanding these figures backwards to a 45-year range, more complex trends can be observed. From 1970 to 2015, farm employment shrank from 63,775 to 51,634 jobs, a 19 percent decrease. Like employment, net income shrank from $1,202.3 million to ($133.6) million, a 111.1 percent decrease.[48] With these figures in mind, the size and scope of the farm sector appears to be shrinking in New England, however, the land in farms is valuable for a number of reasons, including food production and the preservation of open space, scenic views, and wildlife habitat. Even with agriculture as a declining component of the regional economy, the

[46] Farm Credit East. *Northeast Economic Engine*. University of Connecticut. http://www.are.uconn.edu/index_42_1981703122.pdf

[47] United States Department of Agriculture (USDA). 2014. National Agricultural Statistics Service, Census of Agriculture, Washington, D.C., as reported by Headwaters Economics' Economic Profile System (headwaterseconomics.org/eps).

[48] USDA

industry represents a significant portion of the land base. In 2012, approximate percent of land area in farms was 10.5 percent in New England, with the highest portion of farmland in Vermont (21.2%) and the lowest in Maine (7.4%) (Figure 6). [49]

Accessible and healthy food is vital to social, economic, and environmental health in New England. Today it takes an estimated 16 million acres to feed New England's 14.5 million people.[50] In acreage terms, New England grows just under half of its vegetables, mainly potatoes and sweet corn, about one quarter of what it consumes in fruit, and over half of its dairy products. Protecting valuable farmlands from development will allow not only for the continuation of existing revenues, but an expansion of the economic sector (with the potential to maximize New England food production) and associated returns. Today, 12% of the existing farmland in New England is permanently protected from development.[51] However, agricultural conservation easements do not ensure that the land will continue to be farmed.[52] The persistent threats to working lands and open space are clear and two-fold: residential sub-divisions and commercial development. The conversion of working lands and open space to residential and commercial properties has significant economic implications, including the loss of direct sales, economic impact, and employment from agriculture.

Property Values, Cost of Community Services, and Tax Base

Farmlands and open spaces, many of which are conserved properties, are helping to maintain fiscal balance, sustaining local economies, and contributing to economic diversity, while shaping overall quality of life in the region. Although from a highest and best use perspective working and open space lands may generate less monetary revenue than residential, commercial, or industrial properties, they require less public infrastructure and fewer community services, including spending on education, public works, and town services, on top of contributing value through natural services, recreation, and other features highlighted in this report. The commonly held belief that residential growth and development are consistently beneficial for the local economy is disproven, with development requiring the extension of costly infrastructure into outlying rural areas leading to higher local taxes or a decreased level of public services, and in some cases both.[53] Along with the increased cost of services, open

[49] USDA

[50] Donahue, Brian, et al. *A New England Food Vision*. Durham, NH: Food Solutions New England, University of New Hampshire, 2014. http://www.foodsolutionsne.org/sites/default/files/New-England-Food-Vision.pdf

[51] Foster et al.

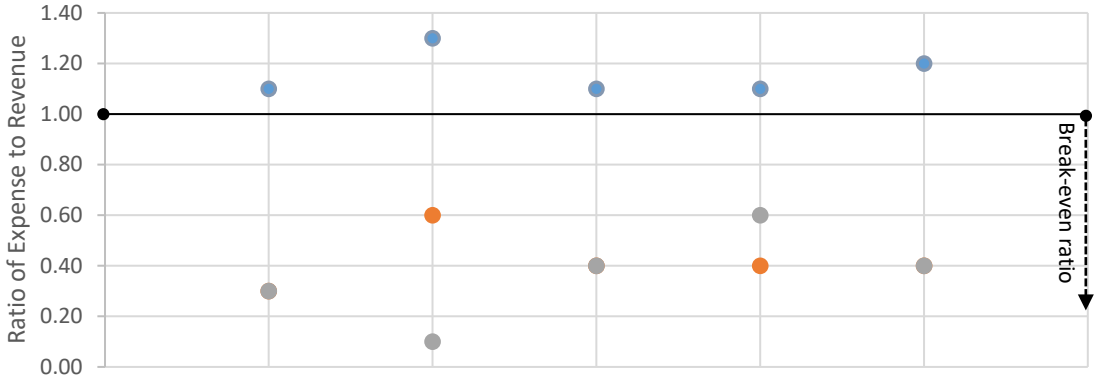
[52] Schwartz, S., Shute, L. L., Ackoff, S., & Kane, E. (2013). *Farmland Conservation 2.0: How Land Trusts Can Protect America's Working Farms* (Publication).

[53] Knaap, G. J. 1985. The price effects of urban growth boundaries in metropolitan Portland, Oregon. Land Economics, 61:26-35.; Tang, M. 1995. The effect of an urban growth boundary on property prices: the case of Virginia Beach, Virginia. Masters Thesis. Blacksburg, VA: Department of Agricultural Economics, Virginia Polytechnic Institute and State University.; Hushak, L. J.; and Sadr, K. 1979. A spatial model of land market behavior. American Journal of Agricultural Economics, 61: 697-701.; Chicoine, D. L. 1981. Farmland values at the urban fringe: an analysis of sale prices. Land Economics, 57:353-62.; Correll, M. R.; Lillydahl, J. H.; and Singell, L. D. 1978. The effects of greenbelts on residential property values: some findings on the political economy of open space. Land Economics, 54:207-217.

space studies have shown land prices decrease when outside an urban growth boundary and increase when inside a greenline.

Cost of Community Services

The American Farmland Trust used a Cost of Community Services (COCS) approach to determine fiscal contributions of local land use, examining local revenues and expenditures and calculating revenue-to-expenditure ratios for residential, commercial/industrial, and open lands (including productive farms and forests). In the five New England states in which COCS studies had been conducted, working and open lands always generated more public revenues than they received back in public services. For every $1 generated in revenues from open land, only $0.36 were required in services, averaged across Connecticut, Maine, Massachusetts, New Hampshire, and Rhode Island,.[54] Residential lands consistently required more in services than was generated in revenue, necessitating $1.16 in community services for every $1 generated in revenue. On average commercial and industrial lands required $0.06 more than working and open land. These values represent averages from 39 COCS studies conducted across New England (Figure 7).



	Residential	Commercial/Industrial	Working and Open Land
CT (average of 11 towns)	1 : 1.11	1 : 0.26	1 : 0.34
ME (1 town)	1 : 1.29	1 : 0.59	1 : 0.06
MA (average of 13 towns)	1 : 1.10	1 : 0.45	1 : 0.4
NH (average of 11 towns)	1 : 1.12	1 : 0.35	1 : 0.56
RI (average of 3 towns)	1 : 1.20	1 : 0.42	1 : 0.38
New England	1: 1.16	1: 0.42	1: 0.36

Figure 7. Cost of community service studies conducted by the American Farmland Trust (below) and a visually represented (top).

Like agricultural land, forest land generally contributes more in taxes than is consumed in public service costs. This is evidenced by selected case studies throughout New England: In evaluating

[54] American Farmland Trust (AFT). *Cost of Community Services Studies.* 2010. http://www.communitypreservation.org/community_services.pdf

whether to protect a 1,250-acre parcel in Wayland, Massachusetts, the town found developing the property would cost taxpayers $328,350 a year more than they would receive in added tax revenues from new homes and lead to a $7.75 per capita increase in the tax rate, whereas purchasing the property for open space would only add $4.25 to the tax rate.[55] A 1989 study by Statewide Program of Action to Conserve the Environment (SPACE) compared taxes generated and community costs of a 330 acre Londonderry apple farm to those generated if the open space were converted to a 290 single family residential housing development. As a working farm, it was generating $18,830 per year above the cost of services it required from the town. By contrast, the development would have cost the community $643,710 per year above and beyond taxes and fees generated.[56]

It is important to keep in mind that COCS studies do not provide a full picture of the costs and benefits of urban growth, and consequently are subject to criticism. New residents do not just pay taxes and demand services; they contribute to the economic base of the community. Population changes affect the local labor force, which in turn changes employment, income, income taxes, business activity, and property and sales taxes. This economic multiplier effect, not captured in COCS studies, can generate significant revenues in the form of additional sales and services.

Tax Base

While a common concern is that land conservation, in preventing development that pays more in property taxes than conserved lands, leads to a smaller tax base and therefore higher tax bills for other landowners, the demand for services discussed in the previous section means that tax bills are actually lower. A study conducted by the Vermont Land Trust across all cities and towns in Vermont concluded that more development tends to lead to higher taxes, and on average, tax bills are lower – not higher – in the towns with the most conserved land.[57] This is not to suggest that conservation will always trump development in terms of economic good. However, a more complex relationship between conserved lands and fiscal health exists.

These findings are supported in other geographies. Studies conducted by Ad Hoc Associates analyzing the relationship between land conservation, development, and property taxes in New York, Maine, Vermont, Massachusetts, and Connecticut show both the long-term and short-term impacts.[58] In the short term, development increased the tax base by increasing property values, whereas land protection did not provide additional tax revenue and may have reduced the tax base. However, in the long term, the lower level of services required on open land versus developed land means increases to municipal budgets and spending are limited over

[55] American Farmland Trust (AFT). *Review of Fiscal Impact Studies: Relevant to the Highlands Region of Massachusetts.* 2001. http://www.thetrustees.org/assets/documents/highland-communities-initiative/Fiscal-Impact-Study.pdf
[56] Auger, P. A. (1996). *Does Open Space Pay?* Natural Resource Network.
[57] Brighton, D. *Land Conservation and Property Taxes in Vermont.* 2009. Vermont Land Trust. http://www.farmlandinfo.org/sites/default/files/Land_Conservation_and_Property_Taxes_in_Vermont_1.pdf
[58] Northeast State Foresters Association (NEFA). *Forest Land and Public Finance: The Right Balance (Tax Implications of Forest Land versus Development).* 2000. http://www.nefainfo.org/uploads/2/7/4/5/27453461/taximplication900.pdf

time. A 1997 case study across seven sample towns in Massachusetts examined the extent of tax shift given the hypothetical removal of $500,000 in property value from town tax rolls.[59] In the short term, the average property tax bill increased between $0.00 and $4.94, assuming no payment in lieu of taxes. In the long term, across the same seven towns, the tax bills were lowest in towns with the most land per capita and the most area classified as open land. Similarly, the towns with the most permanently protected land had the lowest tax rates, on average.

Although properties conserved by land trusts are eligible for tax exemption, in some cases land trusts are electing to pay property taxes. In these instances, open space is not only minimizing services and associated tax bills, but the land trusts are continuing to contribute by paying taxes. In Maine, nearly 95% of all land trust conserved lands (1.9 million acres with conservation easements and 460,000 acres owned by land conservation organizations) remain on the Tax Rolls.[60] Most of this acreage provides multidimensional benefits, managed as working forests and available to the public for hiking, hunting, fishing, and other outdoor activities.

Property Values

Open space protection supports economic development by driving up property values and subsequently increasing tax revenues. An analysis of property value appreciation rates (as measured by resales over time) for open space subdivisions in Concord and Amherst, Massachusetts demonstrated that enhancement value can be important in offsetting negative effects of removing the market value of open space (either exempt from taxes or taxed at a lower rate) from the tax base.[61] In Concord, properties in open space subdivisions appreciated 167.9% between 1980 and 1988, compared to 146.8% as a town, an increase of 14%. In Amherst, houses in an open space development appreciated 462% between 1968 and 1989 while houses of similar size and price not in an open space subdivision appreciated 410% in the same period, an increase of 13%.

Parcels located in towns that contain wilderness near the Green Mountain National Forest have per-acre sales prices that are 13 percent higher than towns without wilderness. Furthermore, the price of parcels decreases by 0.8 percent per acre with each kilometer farther away from the nearest wilderness boundary. Other things being equal, a parcel that sells for $1,000 per

[59] Trust for Public Land (TPL). *Community Choices: Thinking Through Land Conservation, Development, and Property Taxes in Massachusetts.* 1999. http://www.farmlandinfo.org/sites/default/files/CommunityChoices_pp1_1.pdf

[60] *Land Trusts Work for Maine* (Rep.). (2017). Maine Land Trust Network.

[61] Lacy, J. (1990). *An Examination of Market Appreciation for Clustered Housing with Permanent Open Space* (Rep.). Amherst, MA: Department of Landscape Architecture and Regional Planning. http://www.ehsa.info/ehsa.info/Echo_Hill_South_files/OpenSpace%20%26%20RE%20Value.pdf

acre in a town without wilderness would be expected to sell for $1,130 per acre if it were in a town with wilderness.[62]

There are clear implications for town planning with regard to community services, tax base, and property values. Even larger significance exists within the context of the return on investment from conserved lands. This synthesize has showcased existing studies across New England, however knowledge is both limited and outdated, particularly regarding the cost of community services. With the commission of further studies, the balance between loss of revenue, gains in property values and taxes, and savings on community services would be better understood within the context of land protection.

Challenges

Permanent land protection is a major way to ensure that the vital assets of forest and farmland continue to contribute to the region's economy, yet there are many challenges associated with quantifying the specific economic uplift of land protection. In particular, there is very little research that directly attributes the economic benefits to land protection itself. This is applicable in the case of outdoor recreation, tourism, forestry, and agriculture in terms of the provision of natural services and economic impacts. Protecting land ensures the current land use, be that forestry, agriculture, public trails, etc., is continued and the current economic contributions associated with that land use are preserved. While extensive research has been done on natural services provided by the landscape of New England, the value attributed to protected areas, both public and private, is unknown. While we are aware of the natural services provided by forests, including water and air filtration and carbon sequestration, what is the value of those services coming directly from protected land? What is the role of forests remaining as forests in sequestering carbon, filtering water for downstream users, and controlling air pollution regionally? Or farmland remaining as farmland in securing jobs, wages and salaries, direct sales, and tax revenues? Although the benefits provided by goods and services emanating from natural lands are well acknowledged – we all appreciate clean air and water, access to trails and beautiful scenery, and farm and forest products (our Christmas trees, maple syrup, dairy, and apples) – the value of these services stemming from protected lands is unaccounted for.

Moving Forward

Land conservation has traditionally occurred via bottom up, community-based initiatives. State and local government have an opportunity to push policy to not only create effective programs to enhance the protection of forests and farms, but provide guidance to make better investments in land protection on a regional scale. Economic impact studies will demonstrate

[62] Phillips, S, 1999, "Windfalls for wilderness: land protection and land value in the Green Mountains", paper presented at the Wilderness Science Conference, Missoula, Montana; copy available from the author, The Wilderness Society, PO Box 10, West Charleston, VT 05827. http://wilderness.net/library/documents/science1999/Volume2/Phillips_2-33.pdf

value in terms understandable by legislators, community and economic development authorities, and other entities responsible for allocating increasingly limited resources, as well as the individuals and governments positioned to receive these benefits. We see economic opportunities in land conservation by way of natural services and natural-resource based industries while recognizing the challenge of maintaining these benefits in their scope and impact on New England's economy and quality of life and need guidance to make better investments. In not only conserving land but linking economic benefits to land conservation, we can spur investment into the vitality of the region and generations to come.

Investing in New England's Future

Future investment in land protection across New England is essential to the maintenance of ecosystem function, sustainable economic growth, and healthy communities in the face of forest conversion, climate change, and other disturbances. Based on the economic impacts identified in this report, we expect a full accounting of the returns from both public and private conservation investments will show land protection is a prudent long-term investment in our communities and natural resources. Investments in conservation will help sustain and grow important economic sectors including sustainable timber harvesting and agriculture, encourage investment in rural areas, avoid future government and individual costs for basic services such as clean air and water, and promote health and wellbeing. Expanding the knowledge base of goods and services directly attributable to conserved lands will drive significant investment, development, and policy decisions.

About Highstead

Highstead is a non-profit conservation organization dedicated to conserving the New England landscape and achieving the Wildlands and Woodlands Vision. Highstead applies science and catalyzes regional collaboration in conservation, conservation finance, ecological research, policy analysis, and land stewardship. Highstead, founded in 1982, is an independent operating foundation based in Redding, CT.

Isabel Holland
Isabel Holland is a conservation intern at Highstead. She graduated from Colby College in the spring of 2017 with a degree in Environmental Science, focusing in Conservation Biology, and a minor in Managerial Economics. Prior to Highstead, she gained experience while interning with a grant writer focusing on food sustainability, healthy living, and quality of life care across the state of Maine, volunteering at an adaptive sports and recreation center, and researching highland hummingbirds in Costa Rica.

Spencer Meyer