

The Greater Quabbin Conservation Investment Zone Assessment



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Executive Summary

The Greater Quabbin region of Massachusetts, a largely forested part of the Commonwealth that reaches from the Nashua River watershed in the east to the Connecticut River Valley in the west, has a remarkably rich endowment of natural resources. The region provides a critical supply of fresh water to metropolitan Boston, hosts abundant recreational opportunities, includes expansive wildlife habitat, offers fertile ground for sustainable farms and forestry operations, and gives access to a wide variety of affordable and livable places to learn and work. Furthermore, land conservation efforts in the area have been measurably successful in protecting these irreplaceable resources for the future.

Yet, the region in recent decades has experienced only modest growth in economic activity. While it is the home to myriad sites that are very attractive, there are few well-known attractions and events that draw a steady stream of visitors -- and tourism revenue -- to the area. Opportunities in the region to produce sustainable sources of food, fiber, and energy are still emerging.

The purpose of this report is to suggest that a coordinated and more integrated approach to conservation and economic development in the Greater Quabbin is not only feasible, but holds considerable promise. We recommend that a Greater Quabbin *Conservation Investment Zone* approach be advanced by the citizens, towns and civic institutions in the area, based on a set of complementary strategies for both conservation and development. These strategies will build upon one another to make the region an even more distinctively green and welcoming part of the Commonwealth, a place where present and future generations will increasingly want to invest time and energy.

The Conservation Investment Zone approach that we recommend is based on four pillars that are already being pursued to varying extents in the area. These strategies are:

- *Aggregation* for conservation
- *Mitigation* for conservation
- *Compact Development*, and
- *Rural Economic Development*.

Several examples offered here can illustrate how these aforementioned strategies have been employed in existing or ongoing initiatives, and can in the future be employed in emerging initiatives.

Aggregation for Conservation

The Greater Quabbin has already benefited from a series of aggregation projects, largely with leadership from the Mount Grace Land Conservation Trust in partnership with local, state and federal government agencies, as well as non-profit conservation organizations and academic institutions. For example, the state-funded Tully Initiative, completed in 2002, protected 9,100 acres in the vicinity of Tully Lake, an area providing spectacular views of the local landscape via the Tully Trail. More recently, Mount Grace received news that the federal Forest Legacy Program administered by the United States Forest Service will provide in Fiscal Year 2013 roughly \$5.1 million to acquire easements from 23 landowners on as much as 3,275 acres of land that will help connect conservation tracts stretching from the Quabbin Reservoir to Mount Wachusett. This is the fifth multi-landowner, or aggregation, project funded by the Forest Legacy Program. Prospectively, Mount Grace is awaiting word on its application for funding from the 2014 round of Forest Legacy awards, which will go further to assure that the Greater Quabbin area is perpetually endowed with a contiguous mosaic of protected lands. Also this year, in the Town of Leyden, the Working Farms and Forest Conservation Initiative will receive over \$1 million to protect an aggregation of 800 acres of picturesque landscape, under eleven separate ownerships. The Leyden Working Lands Initiative is a true partnership

between land trusts, landowners, town officials, and state agencies; indeed, in combination with other sources, funding from the state's new Landscape Partnership Program was a key catalyst for the successful orchestration of the Leyden project.

Building on the Greater Quabbin's solid foundation in landscape-scale conservation, a number of initiatives discussed in this report could further leverage private and public funding for land conservation. Strong partnerships with institutional landowners – civic, educational, and religious – can do a great deal for conservation. Many religious groups share the same environmental goals for protecting cherished natural landscapes, as was the case with the 2010 conservation project at St. Scholastica Priory & St. Mary's Monastery in Petersham. At the other end of the spectrum, a seemingly less likely partner in the Conservation Investment Zone might in fact be recreational motorists. By working with the Massachusetts Off-Highway Vehicle Advisory Committee, interested towns, and groups like the North Quabbin Trails Association, a possible acquisition of non-environmentally sensitive land can potentially: a) help to control illegal riding incidences on existing conservation land; b) expand future conservation alliances, c) favorably impact the regional economy, and d) retain additional land in forest cover with new funding sources.

Mitigation for Conservation

Massachusetts has been using mitigation funds from potential or actual environmental impacts to address environmental and conservation challenges for several decades. The Massachusetts Environmental Trust, founded by the Commonwealth in 1988, has used a combination of funding sources, including environmental damage assessment fees, license plates sales and appropriations by the state legislature to dispense “over \$17 million through nearly 650 grants to organizations which have in turn made a remarkable impact on protecting and enhancing the state's water resources.”ⁱⁱⁱ More recently, initiatives in Southeastern Massachusetts have focused mitigation funds from disparate development projects that disturb box turtle habitat to protect large parcels of suitable habitat for that species.

In the Greater Quabbin region, there is at present a substantial emerging opportunity for mitigation in connection with the relicensing of the Northfield stored-hydro project along the Miller's River. Past efforts to secure mitigation resources for a similar Federal Energy Regulatory Commission relicensing site along the Connecticut River, described in the body of this report, resulted in substantial and ongoing funding for restoration and conservation in New Hampshire and Vermont.

Another emerging development for forest mitigation is the expanding market for carbon credits. Maintaining intact forests supports sequestration of greenhouse gas emissions (carbon) from the atmosphere. The Regional Greenhouse Gas Initiative (RGGI) recently voted to adopt more inclusive standards that allow eligible forest conservation projects to qualify as carbon offsets, based on the California model. Now, carbon emitters can buy credits from landowners who protect their land or demonstrate better land management practices. For landowners in Massachusetts, the eligibility for selling carbon credits is still challenging to attain, and the potential income generated from carbon credits is still relatively small, due to the price of carbon. However, the new RGGI inclusion of forest retention (i.e. land conservation) as an allowable offset is a step in the right direction and a potential source of funding for conservation.

Compact Development

The idea of compact rural development (and the related concept of “conservation design”) was brought to the attention of a national audience by the work of the Center for Rural Massachusetts (CRM) at the University of Massachusetts at Amherst and other landscape design and planning centers in the 1980s and 1990s. Randall Arendt, a planner at CRM in that era, wrote a book focusing on the topic, *Rural by Design: Maintaining Small Town Character*, which has become a classic in the field.ⁱⁱ Since that time, several towns in the Greater Quabbin and Connecticut River Valley have implemented these and similar ideas in town design and approved development projects. In the past several years, several towns in the region, including

Shutesbury, Wendell, and New Salem, have adopted in town meeting a form of zoning that more affirmatively protects open space and streamlines compact residential design. Applications for developments using such zoning in the towns of Shutesbury and Wendell are currently in preparation. Synergistically, compact communities are also ideal for district-style biomass heating. Biomass (wood pellets, wood chips, or scrap wood) is a renewable energy source that can be harvested directly from the property. Using wood fuel helps the forestry industry and keeps dollars circulating locally. This report proposes the pursuit of incentives for developers who integrate biomass heating in their compact designs.

Rural Economic Development

There are several excellent examples of natural-resource based economic development emerging in the Greater Quabbin. At places such as the Red Apple Farm in Phillipston and the Johnson's Farm Restaurant & Sugarhouse in Orange, business entrepreneurs are highlighting the agricultural and forest-based heritage and potential future of the area. Tourists to the region are reportedly looking, in increasing numbers, for a unique "country" experience that is hands-on, educational, and connects them to the natural world. This form of "immersion tourism" is directly related to eco-tourism, outdoor recreation, culinary adventure, and other "outside the box" experiences that the Greater Quabbin has potential to offer.

The Garlic and Arts Festival held each October in Orange exemplifies the growing number of people -- young and old -- looking for a fun outdoor experience that celebrates the region's natural heritage. The event helps brand the region as a tourist destination and a hotspot for artisanal, natural resource-based innovation. Events like the Garlic and Arts Festival, in collaboration with online information sources such as the North Quabbin Woods website sponsored by the North Quabbin Community Coalition, as well as local tourism organizations, can in the future be even more effectively leveraged to stimulate sustainable economic growth in the area.

New Markets Tax Credits are also considered in this report as a way to finance natural resource-based enterprises. One idea, described in more detail in the report, would catalyze a rot-resistant lumber facility to treat Massachusetts grown wood.

An innovative idea to enhance the visibility and accessibility of sustainable enterprises and conservation assets in the Greater Quabbin region is the creation of a Quabbin Byway Trail -- a marked cycle and automobile pathway along existing roads and trails from, say, Wachusett Meadow Nature Sanctuary in Princeton, Massachusetts to Great Falls Discovery Center in Turners Falls. Done well, such a trail could highlight *known attractions, linked by a well-publicized trail* for visitors and local residents alike. Attractions might include inns, eating establishments, hiking trails, wildlife viewing areas, pick-your-own apple orchards, renewable energy facilities and museums that exist in the region. In doing so, the Quabbin Byway Trail, complete with such informational resources as: a concise brochure distributed by local gas stations, restaurants and stores; a dedicated website; and a smartphone app, could help to elevate the public image of the Greater Quabbin region.

While tourism holds promise for economic development, a number of other emerging strategies will help build the regional economic assets, particularly the forest economy. For example, community-scale biomass heating and solar photovoltaic installations have the potential to increase the value of woodlands, farmland and roadside corridors as demand grows for local, renewable energy sources. A grant model based on the Northern Forest Zone's work in biomass could leverage more private funding for energy efficient wood pellet boilers for homeowners. Furthermore, community biomass projects could partner town and institutional forest resources with municipal heating needs.

For high-quality wood markets, the new Commonwealth Quality Program has potential to transform consumer habits. In order for a Buy Local Wood movement to be as successful as the Buy Local Food movement, however, targeted educational outreach to architects, homeowners, and contractors is needed. A well-coordinated campaign for local wood, from artisanal

products to lumber, ought to build off the Commonwealth Quality Program and get support from groups like the Massachusetts Forest Alliance and the construction industry.

Looking Ahead

None of the ideas and initiatives highlighted in this report is without precedent. The strategies discussed in this report -- aggregation for conservation, mitigation for conservation, compact development and rural economic development -- have all been explored, with some notable successes, across Massachusetts and in the Greater Quabbin region. What we are recommending is a more integrated approach to conservation and development that has not yet been fully deployed in the region. We hope to see how each of these strategies can be linked together, so that they build upon one another. How, for example, can the presence of the Red Apple Farm enhance visitors' appreciation of the Quabbin-to-Wachusett open space corridor? How might a compact development in Shutesbury provide economic activity and add to the remarkable open space legacy of the town? And how can a thoughtful mitigation strategy at Turners Falls add to the viability of fish and floodplain forest habitat and the accessibility to the river for visiting hikers, kayakers and anglers there? Questions such as these present exciting challenges for the citizens and decision-makers who will shape the future of the Greater Quabbin region.

Acknowledgements

This report was made possible by a generous grant from the Jessie B. Cox Charitable Trust. Andrea Buglione, Leigh Youngblood and Jay Rasku's work benefits from the insight and advice of their colleagues at the Mount Grace Land Conservation Trust. Jim Levitt appreciates all of the support and advice he gets from colleagues at the Harvard Forest, and at Highstead, a non-profit that works to conserve the forested landscape of New England through science, sound stewardship, and as a leader in the Wildlands & Woodlands Initiative. Many of the concepts considered in this report were previously explored in the *Report of the Massachusetts Commission on Financing Forest Conservation*, presented to Richard Sullivan, Massachusetts Secretary of Energy and the Environment, in February 2012 (see a press release from the Massachusetts Executive Office of Energy and Environmental Affairs regarding the Commission's work at <http://www.mass.gov/eea/pr-2012/120213-pr-forest-consv-comm-rpt.htm>; also see the report itself at <http://www.mass.gov/eea/docs/eea/land/forest-consv-financing-rpt-jul15-2011.pdf>). The report is also contained in Appendix D of this report (page 60). That report, in turn, was informed by an earlier report on Financing Forest Conservation published in June 2010 with the sponsorship of the Massachusetts Environmental Trust (available in the Appendix, E, page 77).

The findings in this report are based in part on the foundation laid by those two earlier reports, the advice of committees, and field research. The report co-authors had help from a number of advisors and interviewees, including Sarah Wells (Mount Grace Land Conservation Trust), David McKeehan (Johnny Appleseed Country), Sean Mahoney (Mass DCR), Bruce Spencer and Pat Larson (North Quabbin Energy), Laura Marx (The Nature Conservancy), Gordon Boyce (Mass DCR), Congressman John Olver (retired United States Congressman from Massachusetts), and many more.

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INTRODUCTION

The purpose of this report is to suggest that a coordinated and more integrated approach to conservation and economic development in the Greater Quabbin region is not only feasible, but holds considerable promise. We recommend that a Greater Quabbin **Conservation Investment Zone** approach be advanced by the citizens, towns and civic institutions in the area, based on a set of complementary strategies.

This report summarizes ideas— existing and emerging -- relating to land conservation, mitigation, compact development, and rural economic development. It identifies a number of ways to leverage private investment and influence public policy for natural resource-based economic development and conservation. Economic viability for forest landowners is an overarching goal. To achieve forest conservation goals, it is critical to maintain and enhance the economic potential and asset value of forest land.

Based on work done by the Massachusetts Governor's *Commission on Financing Forest Conservation*, and thanks to a generous grant by the Jessie B. Cox Charitable Trust Fund at the Boston Foundation, the Greater Quabbin Conservation Investment Zone Working Group has met to discuss bringing rural economic development and conservation to the forefront in this region.

What is a Conservation Investment Zone?

To clarify, *CIZA* refers to the assessment (this report), while *CIZ* refers to the actual zone. A Conservation Investment Zone can be loosely defined as a specific region or territory actively working toward the following:

- Sustainable conservation and development of cities and towns, neighborhoods, working landscapes, and wildlife habitat within the defined region or territory.
- Seeking to provide and attract the natural, social, and financial resources that allow sustainable physical and economic development.
- Is led by a working group, coalition, or appointed commission, of individuals associated with federal, state and local agencies, non-profits, private businesses, academic institutions, and others.

There are several examples of large-scale Conservation Investment Zones in the United States. These include the **Northern Forest Zone** (Northern New England), the **Dry Forest Investment Zone** (Oregon and Northern California), and the **Central Appalachian Forest Zone** (five states in the Appalachian Mountain region). Each has had unique successes over the past 5-10 years in promoting rural forest-based enterprise and landscape-scale land conservation.

Assessment Goals

1. **Catalog** ongoing efforts in the Greater Quabbin region relevant to landscape-scale aggregation, mitigation, compact residential development, and rural economic development.
2. **Identify the most significant measures** to implement *in the next 3-5 years* to increase the pace of forest conservation and promote innovative sustainable development initiatives.

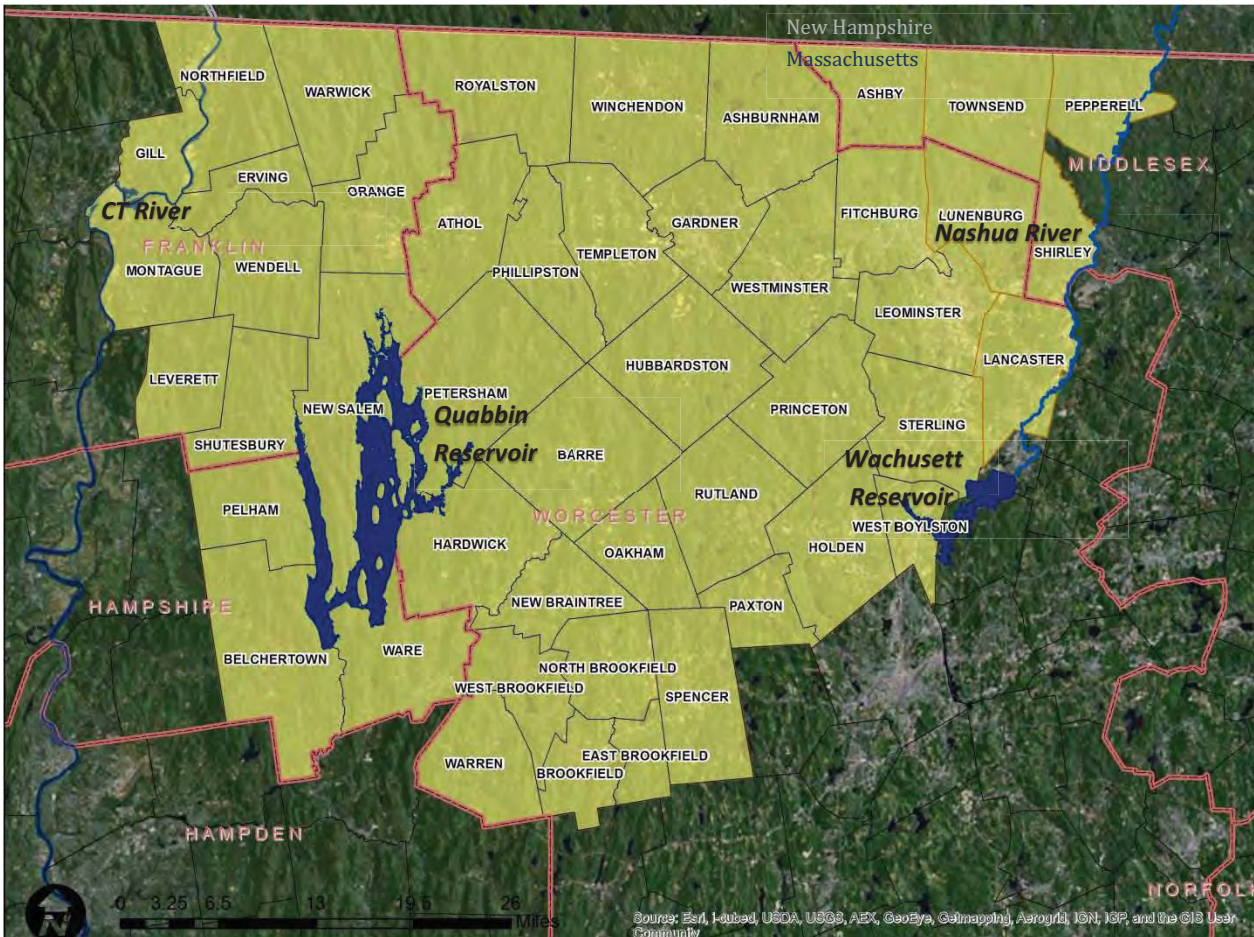
Example goals and elements of Conservation Investment Zones.

Northern Forest Zone (Northern New England and New York) ⁱⁱⁱ	Dry Forest Investment Zone (Oregon and Northern California) ^{iv}	Central Appalachian Forest Zone (KY, TN, OH, VA, WV) ^v
Innovation in the wood industry Carbon credits Community-scale biomass and education on renewable energy Building regional capacity, including tourism	Improve forest health Community-based natural resource management Biomass from small-diameter trees Creation of business related to land management/sustainability	Improve forest management Increase income for landowners and forest workers Locally produced wood products industry Revenue from carbon markets

The goals of the Greater Quabbin Conservation Investment Zone overlap with those of the three larger CIZs. One common denominator is that all deal with *natural resource-based economic development*. The Greater Quabbin is much smaller geographically and may not be able to leverage investment to the same extent, but, where the larger CIZs have greater prospects for involvement in carbon markets, for example, the Greater Quabbin has great potential for working with private landowners to aggregate parcels for conservation.

The Greater Quabbin Region

Figure 2. Map of the proposed Greater Quabbin Conservation Investment Zone.



The Greater Quabbin Conservation Investment Zone pilot area is located within the central part of Massachusetts, from the Connecticut River in the west to the Nashua River in the east, and from the New Hampshire border in the north, to Route 9 in the south. The communities in the Greater Quabbin region have historical, cultural, and economic similarities. There is significant political and organizational overlap within the region. For example, the Greater Quabbin CIZ region includes parts of Worcester, Franklin, Hampshire, and Middlesex counties. Regional planning entities that serve the region include Montachusett Regional Planning Commission, Franklin Regional Council of Governments and Central Massachusetts Regional Planning Commission.



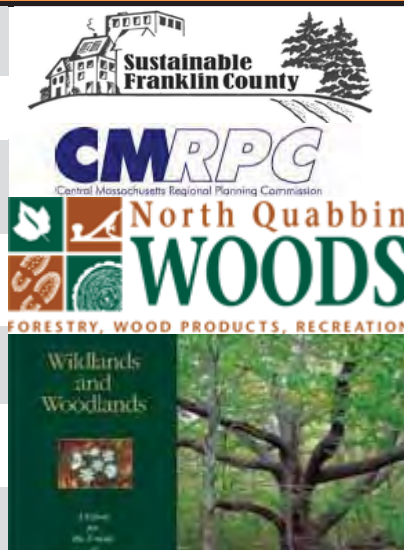
Regional context of the CIZ.

This region is an exciting place to pilot a Conservation Investment Zone, for a few principal reasons:

- There is a high concentration of organizational resources and a strong track record to pursue the idea (e.g. regional land trusts, regional tourism councils, and sustainable energy advocates).
- Considerable activity in the fields of aggregation, mitigation, recreation, compact development and rural economic development has already been launched and is ongoing in the region. Focused conservation interest in the area is also established at the federal level, with the Forest Legacy program.
- Emergence of collaborations in sustainable development, tourism, conservation, and food systems.

Examples of Sustainable Development Collaborations in the Greater Quabbin

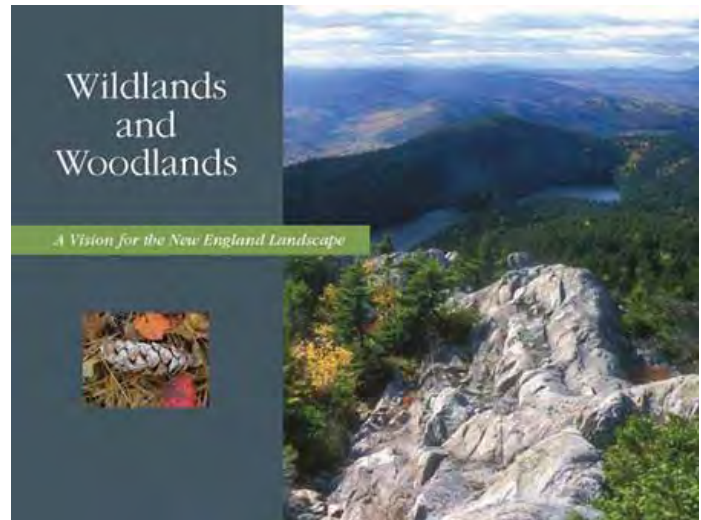
- Franklin County Sustainability Plan
- Quaboag Valley CDC Tourism Promotion
- Rural 11 Prioritization Project – Central Massachusetts Planning Commission
- North Quabbin Community Coalition, North Quabbin Woods – Economic Development Task Force
- Tier I Economic Assessment
- Wildlands & Woodlands: A Vision for the Forests of Massachusetts
- Forever Farmland Initiative of the Pioneer Valley



Background of the CIZ Idea and the Working Group

Between 2010 and 2012, the Governor’s Commission on Financing Forest Conservation (made up of private, public, and non-profit sector leaders) met to consider a wide range of options for financing of forest conservation in the state. In 2012, the Commission made a series of over 35 recommendations for bolstering initiatives in land aggregation, mitigation, compact development and rural economic development. These same four “pillars” are the basis for topics discussed in this report.

The Commission got its start from a roundtable meeting, held at Harvard Forest in Petersham MA, to discuss the Wildlands & Woodlands initiative. According to Jim Levitt, “the launch of the Wildlands and Woodlands visions for Massachusetts and New England has defined a new conservation paradigm for the region – one that brings together scholars, conservationists, and private sector interests to double the pace of forestland conservation in New England.” The Greater North Quabbin is one of the best places in the state to put the Wildlands and Woodlands vision to action.



The Wildlands & Woodlands Initiative, piloted by Harvard Forest, is an important foundation for the Conservation Investment Zone.

Since January 2013, the Greater Quabbin CIZA Working Group has been meeting monthly to brainstorm ideas and discuss the feasibility of the Conservation Investment Zone. Members of the Working Group include Leigh Youngblood (Mount Grace Land Conservation Trust), Jim Levitt (Harvard Forest Program on Conservation Innovation), Jay Rasku (North Quabbin Regional Landscape Partnership), Andrea Buglione (MassLIFT AmeriCorps), Al Rose (Owner, Red Apple Farm, Phillipston, MA), Peter Gerry (Owner, Pete’s Tire Barn, Orange, MA), Bob O’Connor (Massachusetts EOEEA Director of Land & Forest Conservation), Cinda Jones (President, W.D. Cowls, Inc., Land Company, Amherst, MA), and Jeff Lacy (Massachusetts DCR, Division of Water Supply Protection)

The Four Assessment Categories

We have followed the four categories used in the *Report on Financing Forest Conservation: Aggregation, Mitigation, Compact Development, and Rural Economic Development*. Many of the *implemented projects and emerging innovations* contained in the report fall into more than one category. In fact, the most significant ideas are those that are not easily partitioned into one category, but rather, tie into multiple categories synergistically.

Aggregation. “Bundle together for conservation multiple parcels of land.”^{vi}

Protecting multiple parcels of land in one initiative has been conducted successfully in the Greater Quabbin. It uses funding and organizational resources most efficiently and shows the most promise for creating corridors of protected habitat and scenic landscapes.

Mitigation. “Avoid, minimize, and then mitigate procedures for development of forestland.”^{vii}

Compensatory measures to offset forest conversion with conservation progress. Examples include forest carbon credits and a conservation fund through dam relicensing negotiations.

Compact Development.

“Development mechanisms that conserve forestland.”^{viii}

This component promotes sustainable development through incentives and zoning codes aimed at reducing disproportionate land consumption.

Rural Economic Development.

“Enhance the economic viability of woodland communities through systematic programs.”^{ix}

Rural economic development grows on landscape-scale conservation, community-scale biomass, natural-resource based businesses, eco-tourism and regional branding.

Criteria for Selecting the *Best Emerging Ideas*

The most promising ideas for advancing public and private investment in conservation, mitigation, compact development and economic development were selected based on a number of criteria, including:

- Regionally appropriate
- Most synergistic – i.e. address multiple objectives
- Precedents exist (in Massachusetts or elsewhere)
- Requires both public and private participation
- Relates to economic potential and asset value of forest land
- Considered feasible

The most promising emerging ideas that meet these criteria, as indicated by the Working Group, include:

Aggregation

1. Institutional Landowner Partnership, p. 16
2. Off Highway Vehicle Land Partnership, p. 17
3. Due Diligence Fund, p. 19

Mitigation

4. Forest Carbon Credits, p. 22
5. FERC Dam Relicensing: Mitigation Fund, p. 23

Compact Development

6. Continue Outreach to Towns about Zoning Options, p. 28
7. Incentivize Compact Developments with Biomass, p. 28

Rural Economic Development

8. Increase Demand for Local Wood Products, p. 37
9. Rural Tourism: New Possibilities, p. 40
10. New Markets Tax Credits, p. 43

AGGREGATION

Aggregation is a conservation strategy that deals with the conservation of multiple land parcels simultaneously in order to increase landscape-scale conservation. Aggregation allows larger areas of land owned by multiple landowners to be voluntarily conserved while using organizational and financial resources in a focused manner. It requires working partnerships between private landowners, state and municipal organizations, and non-profit land trusts. While it is a relatively new concept in practice, the Greater Quabbin region has already had some of the most tangible successes with land aggregation in the country.

The Tully Initiative (Nov. 2000-Dec. 2002) was one of the first success stories of aggregation in the state. The initiative was spearheaded by the Commonwealth of



Massachusetts and Mount Grace Land Conservation Trust, when then Secretary of Environmental Affairs Bob Durand set out to protect the highly intact Tully watershed in the North Quabbin towns of Royalston, Athol, Orange, and Warwick. In the end, over 9,000 acres were protected through conservation easements on more than 100 properties.^x

“Indeed, without action at a landscape scale, the conservation gains made over the past 150 years could be permanently lost to hardscape development that threatens regional water supplies, wildlife habitat and sustainable development prospects that shape the exceptional quality of life in the state’s 352 cities and towns.”

-Jim Levitt, Harvard Forest



Photo Credit: John Burk



Mount Grace Land Conservation Trust

“Massachusetts is an early and successful testing ground for aggregation initiatives that bundle together for protection, as working woodlands and relatively unmanaged wildlands, multiple parcels of land that may be owned or managed by individuals or organizations in the public, private and non-profit sectors. Such aggregation initiatives help to finance the acquisition, easement and stewardship of properties across sectoral, jurisdictional and even national boundaries. These properties, managed in coordination at a landscape scale, can play critical roles in achieving regional conservation objectives.”

Report of the Massachusetts Commission on Financing Forest Conservation

For a complete list of land trusts and partner organizations working on aggregation projects in Massachusetts, visit www.massland.org

Existing Initiatives in Aggregation

Quabbin to Wachusett (Q2W) Forest Legacy Initiative

Forest Legacy is a program administered by the USDA Forest Service that has enabled a number of landscape-scale conservation efforts across the country. The program offers eligible projects up to 75% of the costs needed for acquisition of easements and fee properties, plus other administrative costs. Project scoring is based on the prospect of attaining multiple objectives through the conservation efforts, including water quality



Mount Grace Land Conservation Trust

protection, working landscapes, and meaningful wildlife habitat conservation.

The Quabbin to Wachusett (Q2W) Forest Legacy application was ranked #2 in the nation by the Forest Service and Phase I of the project is slated to receive over \$5 million dollars in funding in 2013. When all is said and done, this visionary public-private partnership will conserve an aggregation of parcels within a twenty-mile forested corridor, from the Quabbin

Reservoir toward Mt. Wachusett in Phase I, and from the Quabbin Reservoir to the Wachusett Reservoir in Phase II. The forests in this corridor are particularly important for the larger Massachusetts population, playing a critical role in filtering drinking water consumed by 2.5 million people in metropolitan Boston. Phase I Q2W land conservation efforts will engage 23 landowners in permanent conservation of their properties. Project coordination will be shared between seven towns, four land trusts, one watershed group, and two different state agencies.

Protecting land in the Q2W region has important implications for the overall forest economy. The Massachusetts Forest Action Plan^{xi} designates the region as a "core area for wood production", naming it a "Priority Landscape Area" that "must be protected to support existing employment, foster job creation, and sustain rural economies."^{xii}

According to the Q2W Forest Legacy application, the area is home to "42 licensed foresters and 20 timber harvesters" and (within 10 miles of the Q2W project area) are "3 dry kilns, 8 saw mills and MA's only freestanding commercial biomass power plant, which provides 120 jobs and procures wood from area landowners,"^{xiii} as well as three major maple sugar producers. The tourism economy also benefits from land conservation in such a large corridor in central Worcester County, by providing more places for visitors and residents to hunt, fish, ski, and hike.

By reinforcing the connection between conservation, recreation, water quality, and the forest economy, the Q2W Forest Legacy project is a model for aggregation projects. The US Forest Service is an invaluable partner is making aggregation projects a reality.

"Q2W tracts sit in watersheds ranking 1st, 10th, and 19th out of 540 in the Northeast and Midwest as those most important for drinking water and most threatened from development."

Q2W Forest Legacy
Application 2013

The Leyden Working Lands Conservation Partnership

The successful design of the Leyden Working Lands initiative is the result of community members, farmers, forest landowners, and land trusts coming together to protect a cherished landscape. Over 800 acres of land in picturesque Leyden will be protected thanks in part to a \$1.07 million grant from the state as part of its new Landscape Partnership Program. The grant will pay for 50% of the project costs, requiring other partners to come up with the remaining 50%. Many landowners agreed to do a 50% bargain sale in order to help the project meet its budget goals.

Other partners in the Leyden initiative include Mount Grace Land Conservation Trust, Franklin Land Trust, the Town of Leyden, the USDA Farm & Ranch Land Protection Program, Massachusetts Department of Agricultural Resources, and other state agencies.^{xiv}

In addition to protecting one of Massachusetts' most scenic rural landscapes, the project will have a number of economic and environmental benefits. Bree-Z-Knoll Farm, one of the last working dairy operations in Leyden and founding member of the *Our Family Farms* milk cooperative, can continue to operate as a result of the land conservation efforts. The City of Greenfield will benefit from the continued protection of their water supply. Moreover, the south-north wildlife migration corridor that passes through Leyden will be secured from development in perpetuity.^{xv}

Another key element of the Leyden Working Lands project is the inclusion of open space and cluster development zoning in the project scoring. The state gives more points to Landscape Partnership Grant applications in which the town has or is at least pursuing the idea of zoning that protects natural features (such as Natural Resource Protection Zoning, NRPZ). This underscores the connection between zoning and conservation. Encouraging compact residential design that requires open space conservation is a key supplement to the land conservation movement.



Pictured: Warren Facey, Bree-Z Knoll, and Celt Grant.

The Landscape Partnership Grant requires an aggregation of at least 500 contiguous acres.



Mount Grace Land Conservation Trust



Mount Grace Land Conservation Trust

Emerging Innovation *in Aggregation*

1 Institutional Landowner Partnership

2 Off Highway Vehicle Lands Partnership

3 Due Diligence Fund

1 Institutional Landowner Partnership

One promising approach to landscape-scale conservation is to focus new conservation efforts with *institutions* as partners. Institutions (religious, non-profit, academic, civic, and businesses) have sizable landholdings in the state, and some of the largest remaining parcels in the Greater Quabbin CIZ. Often, institutions like religious groups share some overlapping goals with conservation groups, and yet institutions have not been actively engaged to the extent necessary.

A few important conservation deals with institutions have occurred in the Greater Quabbin region. Examples include:

Morgan Memorial Goodwill Camp, Athol, MA.

With assistance from Mount Grace Land Conservation Trust and funding through the Forest Legacy program and Massachusetts DCR, the Morgan Memorial Goodwill Industries protected 330 acres in 2007.^{xvi} Since 1906, the Morgan Memorial Goodwill Industries have been operating a summer camp for children from disadvantaged communities. As early as 1998, the North Quabbin Regional Landscape Partnership sought to protect this very important South Athol landscape. In addition to safeguarding an important cultural resource, this coordinated land conservation effort safeguarded a mile of shoreline on Eagleville Pond and a vast network of wetland systems.



Morgan Memorial Goodwill Industries conservation land, protected through a partnership in 2007.

Gould Woodlot/Harvard Forest & St. Scholastica Priory, Petersham, MA. This project involved a number of non-profit groups and agencies in order to protect adjacent woodland properties in Petersham, MA. The Gould Woodlot, across from Harvard Forest campus, was slated for a 44-unit housing development, eliciting concern among conservationists and townspeople. Robert Clark, chair of the Petersham Open Space Committee, as well as Keith Ross of LandVest, and Cynthia Henshaw of East Quabbin Land Trust (EQLT) led the campaign to help Harvard Forest raise the nearly half of a million dollars needed to buy and conserve the Gould Woodlot. Moreover, through the state Division of Conservation Services' LAND grant program, a sizable state contribution was given to help with Conservation Restriction cost. Private foundations including Fields Pond, Cricket Foundation, and Bafflin were also instrumental in fundraising for the project.^{xvii} EQLT purchased the property and conveyed a conservation restriction to the Town.^{xviii}

Institutional landowners adjacent to Harvard Forest and the Gould Woodlot are the “twin communities” of St. Mary’s Monastery and the St. Scholastica Priory, Benedictine Monks and Nuns. The town of Petersham, Harvard Forest, and EQLT worked with St. Scholastica Priory and St. Mary’s Monastery to buy a conservation restriction on 150 out of 180 acres of forest in 2010.^{xix} Together with the protected Gould Woodlot, these properties provide a new recreational



“Religious and spiritual communities are at a historic moment when many are anticipating the transfer or sale of community-owned lands. People of faith over the past centuries have considered that they hold community lands in trust or stewardship for the purpose of mission and ministry. We must address that trust now as we foresee the coming change in our relationship to lands and ministry.”

Crystal Spring Earth website

link for hikers through the creation of the Bob Marshall trail. The organizations have agreed to allow public access on parts of their conserved land. The nuns are working with trail designers to create “prayer stops” at certain sections of the trail, which celebrates the spiritual connection to nature inherent in the Benedictine order.^{xx}

Partnerships with religious institutions for land conservation underscore an important link between conservationists and religious groups. *The Religious Lands Conservancy* was formed in Massachusetts to bring conservationist and faith-based institutions together, demonstrating that conservationists and spiritual groups share important values. The Religious Lands Conservancy is a collaborative between the Crystal Spring Earth Learning Center (based in Plainville, MA) and the Massachusetts Land Trust Coalition.

Though institutional partners can bring a new energy to conservation because of shared values, institutions can be more challenging to work with than private landowners. Typically, institutions are governed by a committee or board of directors, making decision-making slow and unpredictable when deciding the future of land assets. The land trust or conservation advocate would need to devote extra time to making sure all voting members of the board were familiar with and supportive of the idea of conservation.

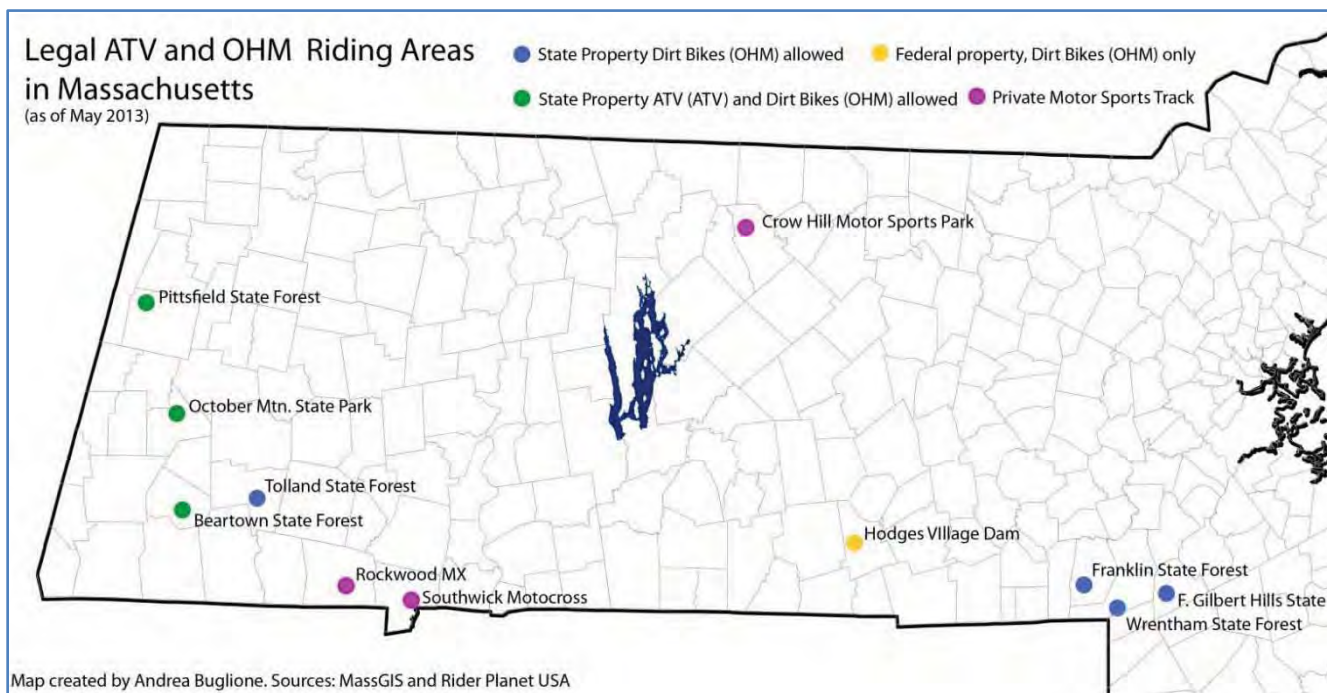
This Working Group recommends the creation of a “How-To” manual designed for land trusts, municipalities, and the EOEEA. The manual will contain best practices for conservation negotiations with a broad range of institutions. This could be a good candidate “Phase II” project for the *Greater Quabbin Conservation Investment Zone*.

2 Off Highway Vehicle Partnership

Building a partnership with the Off-Highway Vehicle (OHV) community may, at first glance, seem at odds with conservation goals. ATV (All-Terrain Vehicles) and OHM (Off-Highway Motorcycles, or dirt bikes) often solicit negative reactions among landowners who are irritated by riders using their woods illegally and tearing up trails. Many people would rather ban OHV activity outright than work with the OHV community to find solutions. Partnering with the Massachusetts OHV Advisory Committee to find land suitable for a public ATV/OHM site (or at least draft guidelines for the hypothetical site) might, in fact, be a solution that can create positive outcomes for many stakeholders.

A partnership with the motorized recreationists would accomplish a few things. First, it has potential to bridge the gap between the OHV community and the conservation community. Second, conservationists might be able to leverage the ATV community to agree to help protect “x” number of acres in exchange for creating a public ATV riding area. Based on

preliminary meetings with ATV users in the region, there is high interest in creating a self-contained, sustainably designed riding area. The conservation community ought to be a stakeholder in order to ensure that the least environmentally sensitive lands are selected, given a hypothetical acquisition. In addition to retaining additional land in forest cover, a legal riding area *may* help reduce instances of illegal riding on our *existing* conservation land. Moreover, new riding opportunities could possibly create a new source of revenue for towns and supporting local businesses.



As a result of the new new OHV laws passed in 2010, OHV riding is explicitly illegal on all properties except personal property and the few state-designated areas. In Massachusetts, only three public lands offer a place to ride ATVs legally, and all are located in the Berkshires region (Beartown State Forest, October Mountain State Forest, and Pittsfield State Forest). There are five public locations that permit OHM use (four state forests and one federal property). Based on quantitative data (OHV registrations) and qualitative data, a large number of ATV and OHM users reside in the Greater Quabbin, yet there is no readily accessible riding facility except for the small Crow Hill Motor Sports track. According to Massachusetts Environmental Police serving in the North Quabbin, when citations are issued, the officers have no alternative place to suggest where riders legally ride.^{xxi} There are also a disproportionate number of OHV accidents in the North Quabbin and Central Massachusetts when compared the the Berkshires. Many members of the state OHV Advisory Committee believe that offering more legal places to ride can help reduce instances of lethal OHV accidents.

The Massachusetts OHV Advisory Committee, made up of ATV representatives, Massachusetts Environmental Police, riders, safety advocates, environmentalists, and state agencies, was formed after the OHV Bill was passed. Through the OHV Trust Fund, some funds may be available for the potential purchase of land for a sustainable, multi-use, self-contained ATV park.

There are a number of case studies from New Hampshire and West Virginia that point to economic benefits associated with public ATV riding areas. However, more research is needed to determine the potential economic and environmental effects we might expect in the Greater Quabbin. There may not be enough non-sensitive (environmentally) land in the Greater Quabbin (particularly the North Quabbin) to support the type of facility that some envision.

The Working Group proposes that more work be done to explore a) political feasibility, b) possible location of site using GIS analysis, and c) research on economic development impacts. The project leaders propose that a detailed GIS study be carried out to determine if the Greater Quabbin has any appropriate segments of land suitable for this use.

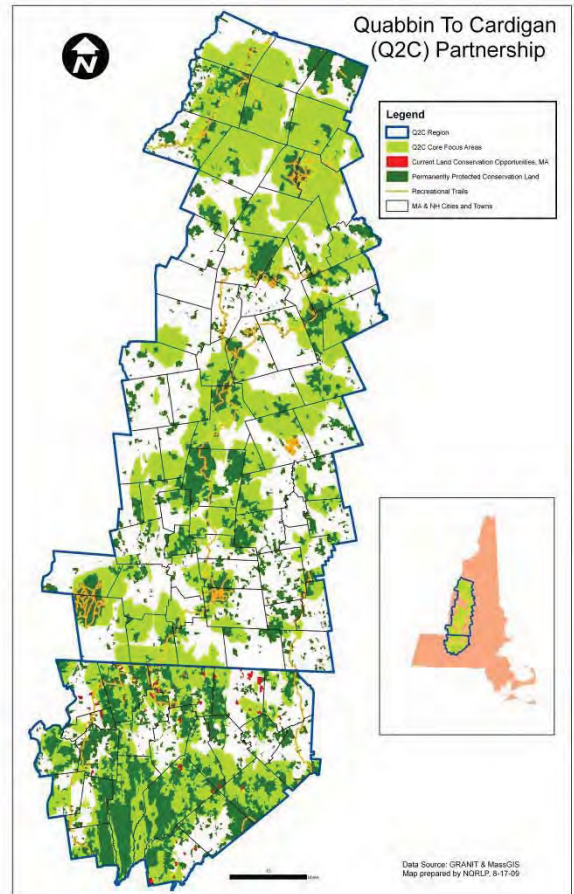
In the meantime, the Commonwealth is considering a grant program that municipalities can apply to in order to receive funding and technical assistance for an OHV site. This is still in the beginning stages of development.

3 Due-Diligence Fund

One of the biggest roadblocks to moving multi-landowner conservation projects forward is the money needed for up-front due diligence like appraisals, title reviews, and legal fees. Most landowners are reluctant to expend the thousands of dollars needed before a project can go forward, and land trusts have few resources to help cover them. The land conservation community has identified the establishment of a due diligence fund as a critical need to allow more projects to happen by covering these start-up costs.

In previous years, the North Quabbin Regional Landscape Partnership had a Small Grant Program for due diligence costs that benefited greatly from a foundation's fiscal contribution, and led to numerous conservation projects that would not have occurred otherwise. The Partnership designed, directed and administered grants ranging from \$1,000 to \$4,000 to jumpstart conservation projects, leading to the permanent conservation of 5,469 acres.^{xxii} Similarly, the Society for the Protection of New Hampshire Forests (SPNHF) received a \$500,000 private donation to be used to fund due diligence costs for projects in the Quabbin to Cardigan (Q2C) corridor.

While the Commonwealth's new due diligence program is beneficial for landowners who meet certain requirements (donation of land or conservation restriction), we recommend that, through the support of a private donor(s), additional funds within the CIZ be established to help a broader range of landowners decide and take action on the future of their land. Small grants can have a surprising impact on land conservation.



Conservation projects in the Quabbin to Cardigan (Q2C) corridor benefit from the Society for the Protection of New Hampshire Forest's due diligence fund.

MITIGATION

For land that cannot feasibly be conserved on a permanent basis, mitigation offers a way to avoid a dramatic loss of forest land in our state and region. Massachusetts currently has some policy measures in place that indirectly deal with mitigating forest loss. Potential development projects, for example, that will harm or deplete wetland ecosystems must “avoid, minimize, then mitigate” those impacts. For unavoidable impacts, compensatory mitigation means that losses must be made up for in some other way. As will be explored in this section, however, more public and private sector initiatives for mitigating forest loss – particularly those that don’t harm the asset value of forest land -- are needed if the Conservation Investment Zone is to realize its goals for sustainable development.

Background on Mitigation Policy in Massachusetts

Since the adoption of the 1972 National Environmental Protection Act (NEPA), the existence of wetlands on development sites has been the biggest trigger for mitigation. On-site restoration of wetlands was the standard requirement until the late 1980s when more flexible options were made available, like a fee-in-lieu payment for a third party or government agency to take care of off-site replication, or mitigation banking.^{xxiii} Like carbon offsets markets, mitigation banks allow developers to buy credits from a non-profit that restores and recreates wetlands. Wetland banking is a successful model in many states. In 2004, Massachusetts was unsuccessful in passing a mitigation banking protocol.^{xxiv}

One promising example of a mitigation solution that Massachusetts *has* endorsed is the Enhanced Mitigation Program (EMP), a collaborative effort between MassWildlife, the Massachusetts Natural Heritage & Endangered Species Program (NHESP) and The Nature Conservancy. EMP uses money collected for mitigation compensation to be used for land conservation. The program has a geographic focus on Southeastern Massachusetts and a species focus on the box turtle.^{xxv} In 2010, one of the first land conservation projects assisted by EMP funds was an 89-acre project in Middleborough, MA that used \$300,000 in EMP funds and the remainder from state and town sources.^{xxvi}

The emerging initiatives in mitigation included in this report, such as forest carbon credits and dam mitigation deal with participation from both public and private entities.



Mount Grace Land Conservation Trust



“In a more narrow sense, the word ‘mitigation’ is today used by environmental regulators and practitioners to refer to the third step in this process, [avoid first, minimize second, and mitigate third] the provision of compensatory mitigation, creating new or substitute resources that compensate for unavoidable environmental impacts”

Report of the Massachusetts Commission on Financing Forest Conservation

Since 1988, The Massachusetts Environmental Trust has been funding mitigation projects partly through proceeds from special license plates. The trust provides grants to conservation groups to restore and protect ecosystems.

Emerging Innovation *in Mitigation*

4 Forest Carbon Credits

5 Federal Energy Regulatory Commission (FERC) Relicensing

4 Forest Carbon Credits

The recent Regional Greenhouse Gas Initiative (RGGI) inclusion of forest conservation in the carbon credit market is working toward the same goal of mitigating forest loss. Forests, being incredibly important natural carbon sequesters, will increase in value as the regional carbon market evolves. Forest carbon protocols may help landowners voluntarily practice restraint and find economic benefits from keeping their land intact and well managed.

The new RGGI Model Rule (adopted February 2013) is based on the California Air Resources Board (CARB) rules for carbon offsets. Whereas previously only reforestation efforts counted as an eligible carbon offset, now permanent land conservation efforts are eligible carbon offsets.^{xxvii} The new *Avoided Conversion* category requires a permanent conservation restriction. Another forest retention measure, *Improved Land Management*, can potentially count toward carbon offsets. Advocates have been working for years to get these improved standards adopted in the hopes that forest landowners would benefit.^{xxviii}

“Offsets are an important component of each state's CO₂ Budget Trading Program. By recognizing CO₂-equivalent emissions reductions and carbon sequestration outside the capped sector, offsets provide compliance flexibility and create opportunities for low-cost emissions reductions and other co-benefits across sectors.”

RGGI 2013, website

The Regional Greenhouse Gas Initiative is a cooperative made up of Maryland, Delaware, New York, and the New England states. In the RGGI states, carbon-emitters have a certain allowed level of carbon they can emit. Emitters that do an acceptable job curbing emissions can sell their credit allowance to those that are non-compliant. A non-compliant emitter can also opt to buy credits from other sources, like a government program or private entity that invests in carbon sequestration or energy efficiency projects, to make up for some of the greenhouse gas emissions they are imparting on the atmosphere (up to 3.3% of a power plant's total compliance may be satisfied by buying carbon offsets, but may be expanded to 10%).^{xxix}

Summary of Revised RGGI Model Code (Feb 2013):

- 1. Raise Carbon Cap** (which will decline 2.5% each year from 2013 until 2020)
- 2. Permanent Land Conservation (Avoided Conversion)** and Improved Land Management count as eligible carbon offset activities

RGGI's entrance into the forest carbon credit market follows very closely the guidelines from the recent launch of the California Air Resource Board's Forest Carbon Credit program. One major hurdle for forest landowners for these two programs is that they require a 100-year contract commitment which would limit projects to land with permanent conservation restrictions. A recent Manomet Center publication summarizes other forest carbon credit market options.^{xxx} The remaining voluntary market programs (American Carbon Registry and Verified Carbon Standard) offer forest carbon credits but with commitments of 40 and 20 years respectively with the option to re-sign. Landowners already committing their land to forestry purposes for ten years under the MA Forest Tax Law (G.L. Chapter 61) may be open to 20 or 40-year commitments for the benefits. Perhaps the new RGGI program can find a creative way to increase the use of forest carbon credits through increased flexibility in the commitment (the final program design is open for comment over the summer of 2013). One possibility would be to reimburse the carbon credit program for lost forest stock beyond the original baseline for a time period beyond the first 20 years or so.

As a new program, there are still some unknowns about how this program will actually play out. It may be worth preparing woodland owners for these (potential) new incentives for conservation. The financial benefits landowners can expect immediately from these new RGGI developments are not necessarily great (mostly because of the price of carbon), but the political landscape is changing in the right direction.^{xxxi} Carbon will hopefully continue to rise in value, and landowners are starting to think differently in terms of the economic assets of their land.

5 Federal Energy Regulatory Commission (FERC) Dam Relicensing: Mitigation Fund

The Greater Quabbin region contains major hydroelectric power stations, including the Turners Falls Hydroelectric Dam and the Northfield Mountain Pumped Storage Station. Both of these hydroelectric facilities are powered by the Connecticut River. On April 30, 2018, the federal license required to operate these two facilities will expire. FirstLight Power Resources, the current operator of the facilities, has begun the relicensing process, with the first public hearing scheduled this year on July 15, 2013. The Turners Falls Dam and Northfield Pump Storage Station cause significant adverse impacts to the Connecticut

River. As part of the relicensing process, FirstLight must implement programs and measures that mitigate these negative effects on the river and the environment.

The Connecticut River Watershed Council (CRWC), a non-profit organization that advocates for the health of the River, is coordinating outreach and involvement of the public and other groups in the relicensing process. Land conservation and stewardship organizations have an opportunity to engage with CRWC and participate in the upcoming relicensing process. One important proposal for mitigation is establishing of a new grant source funded by FirstLight Power that would be used for land conservation in the Connecticut River watershed.



Figure 1. FirstLight Power dam in Turners Falls MA.

A similar mitigation fund was required as part of the relicensing of the Fifteen-Mile Falls Hydroelectric Dam along the Vermont and New Hampshire border. Negotiations between the public (facilitated by CRWC) and the dam operator resulted in a settlement agreement that set up a fund for conservation and restoration. The Fifteen-Mile Falls Mitigation and Enhancement Fund has supported river restoration and conservation of wetlands, shoreline, farmland and uplands along the Connecticut River in Northern Vermont and New Hampshire since 2002. CRWC was instrumental in negotiating the \$15 million dollar Mitigation & Enhancement Fund.^{xxxii} The dam operator agreed to pay \$3.3 million to the Fund the first year (2002) and makes payments of no less than \$100,000 each year, until 2017 (actual amount is tied to the revenue that year).^{xxxiii}

The types of projects eligible for grant funding by the Fifteen-Mile Fund include: river restoration, wetland enhancement/protection, and shore land conservation projects. The Advisory Committee chose to dedicate the bulk of funding to river restoration projects. One grantee was the Upper Valley Land Trust's Connecticut River Farmland Protection Program, which used its grant to protect farmland and habitat through the purchase of conservation restrictions.^{xxxiv}

In a hypothetical Turners Falls Mitigation Fund, a higher proportion might go to land conservation projects. The Fund could be used to help protect forested landscapes in the CIZ region, including the landscapes that are directly impacted by hydropower dams. Floodplain forests are unique landscapes adjacent to the river, which once covered large section of the Connecticut River.^{xxxv} Due to the widespread damming of our region's rivers, floodplain forests have not fared well. However, they are important ecosystems that aid in water filtration, remove pollutants and trap sediments. Greenfield, Northfield, and Montague, to name a few, have significant floodplain forests. The Working Group supports a collaboration engaged in the Turners Falls dam FERC negotiation process over the next few years.



Source: Mount Grace Land Conservation Trust

COMPACT DEVELOPMENT

Land conservation *can* work in tandem with land development. Influencing zoning policy at the town level in Massachusetts is an effective way to ensure that towns in the Greater Quabbin maintain momentum in the housing market while protecting the landscape that distinguishes this part of the state. Zoning reform is a critical tool for providing new housing options while conserving the rural landscape.

Guided by archaic state statutes, Massachusetts towns have notoriously sprawl-inducing zoning codes, many put in place in the 1980s to comply with Title 5 (the state’s regulation dealing with septic system siting).^{xxxvi} The 2-acre minimum lot size has become the boiler plate zoning standard. As a result, an average of 22 acres per day was lost to development across Massachusetts between 1999 and 2005.^{xxxvii} Most of those acres were consumed by new subdivisions built along the rural-suburban fringe. Massachusetts Audubon’s *Losing Ground* Report refers to these vulnerable areas as the “Sprawl Danger Zone” and “Sprawl Frontier,” prevalent along the I-495 beltway and spreading into Worcester County. While parts of the North Quabbin have seen less development pressure, other towns closer to the Danger Zone (Paxton, Oakham, Templeton) saw forestland convert to new development at the rate of 15 – 34% from 1999-2005.^{xxxviii}

“NRPZ is a protective local zoning regime designed for areas of high natural resource value where public interest in retention of those resources is predominant.”
Jeff Lacy AICP, 2013

In a way, the Recession of 2008 may be a blessing in disguise for smarter housing development^{xxxix}. While the market is temporarily slowed, we have an opportunity to consider adopting smarter zoning laws before the next residential development push impacts the landscape. A new model subdivision zoning bylaw, Open Space Design (or, Natural Resource Protection Zoning) is providing a new option for communities and is appealing to a growing

By Right vs. Special Permit

“Many Massachusetts communities – over 50% – already have cluster, open space residential design, conservation subdivision, or some other variant of cluster zoning. However, very few cluster subdivisions are built due in part to flaws in these bylaws/ordinances. For example, many communities require a special permit for a cluster subdivision, but not a conventional one. Other local bylaws have unreasonable minimum parcel requirements, complicated and time consuming procedures for determining allowable development rights, or other significant flaws”

Massachusetts Smart Growth Toolkit, Model Open Space Design/Natural Resource Protection Zoning

number of people by encouraging the development homes in a more clustered community, closer to neighbors, with a large expanse of protected open space adjacent to development for recreation.

The Greater Quabbin is home to three of the four towns in the state that have passed some version of Natural Resource Protection Zoning (Shutesbury, New Salem, and Wendell). These recently passed bylaws will be discussed in the “Existing Initiatives” section below.

Existing Initiatives in Compact Development

Natural Resource Protection Zoning (NRPZ) – also known as Open Space Design

The Greater Quabbin is home to some of the only towns in the state that have adopted Natural Resource Protection Zoning (NRPZ). Wendell, Shutesbury, New Salem (all three in the region) and Brewster (outside of the region) have all adopted some form of NRPZ (or OSD, Open Space Design), with more towns in the pipeline.

As a new zoning model, NRPZ hasn’t been accepted universally due to the hypothetical “downzoning” that can take place, meaning the total number of housing units allowed can decrease under the new regulations and the landowner loses some values. Yet, none of the towns that have adopted NRPZ so far have written bylaws that would incur downzoning. As a matter of fact, “up-zoning” (an increase in housing lots allowed) can also occur under NRPZ. NRPZ (also known as Open Space Design, or OSD) is a concept, not a rigid model. Towns adopting it may prescribe the number of housing lots allowed in the new development, anywhere from an up-zoning, neutral, to downzoning. Wendell and Shutesbury, two towns that recently adopted an NRPZ bylaw, have already seen three landowners submit design proposals. All three owners have a better opportunity to create a profitable new community after NRPZ than before it was adopted, because of lower infrastructure costs, greater design flexibility and changing consumer demand, according to experts on zoning. At the same time, 75-80% of these project sites will be conserved.

A 100+ acre site in Wendell is one of the first design proposals for a new development under the new Natural Resources Protection Zoning. The landowner of Swallow Rise has always envisioned a tight-knit community with ample protected space, and now the town’s zoning allows this compact development by right, rather than through the unpredictable special permit process.

What is the difference between NRPZ/OSD and OSRD (Open Space Residential Design)? NRPZ is now referred to as Open Space Design (OSD) by the the Massachusetts EOEEA,^{xi} so NRPZ and OSD can generally be used synonymously. OSRD, however, has generally been thought of as a tamer version of NRPZ/OSD. Compared to NRPZ/OSD, OSRD communities as seen in practice to date are typically less stringent with open space requirements and have less intention to keep the conserved areas as *working* forest or farmland. The NRPZ model is appropriate for more rural towns, whereas OSRD is used more readily in suburban communities.

As early as 1990, one of the region’s towns – Orange MA – passed an Open Space Residential Design Bylaw, based on the early Randall Arendt model.^{xii} Shutesbury is an example of a town that saw an open space community spring up long before the zoning itself was adopted. Old Peach Orchard is a community developed in the early 1990s in Shutesbury, with six houses and two-thirds of that total land protected in perpetuity.

The strength of an open space bylaw depends in large part on the minimum percentage of open space required. Ashby, MA passed an bylaw in 2007 that only requires 35% of the subdivision be permanently protected open space. On the other end of the spectrum, the Shutesbury and New Salem bylaws have the strongest zoning stipulations with their 80% minimum open

space requirement. Both bylaws also allow the original landowner to retain ownership over that 80% and continue low-impact activities like forestry, farming, and recreation, to help boost the economic benefits for the landowner.

While NRPZ/OSD has potential to reshape many of Massachusetts's rural towns, other municipalities with more suburban land use patterns might opt for OSRD.

An indicator of bylaw strength is whether it allows compact development/open space design **“by right”** or **“by special permit.”** For example, Pepperell MA has zoning regulations for open space developments, but developers need to request a special permit; the underlying zoning is still based on conventional 2-acre lots. Still, having that option available to developers and homeowners is better than having no option at all. One way to incentivize developers is to allow flexibility in design, resulting in infrastructure cost savings. Enough case studies now exist that show home values increasing in open space subdivisions when compared to conventional subdivisions, so people will be willing to pay a premium for a home in an Open Space neighborhood.

Westminster, MA is a Greater Quabbin town that does not have an OSRD or NRPZ bylaw, but uses a cluster housing exception in its zoning regulations to achieve similar goals.^{xiii} Since 2004, at least three separate communities have been built or approved (Woods at Westminster, Harrington Heights, and Rabana Road), each with over 15 lots and ample open space set aside. The zoning language essentially states that for residentially zoned parcels of land containing over 5 acres, the developer has to adhere to certain open space requirements. The language is vague; no exact proportion of required open space is spelled out. Instead, the zoning states only that the open space shall be “as large contiguous areas whenever possible”, should be arranged to protect natural and cultural resources; can be recreational land, working agricultural land, or habitat; and that floodplains, steep slopes, and wetland do not count as open space since they're already undevelopable. In this more loose set of regulations, the Planning Board ultimately has flexibility and control over how the development impacts the natural environment.^{xiii}

Emerging Innovation in Compact Development

6 Continue outreach to Towns about Zoning Options

7 Incentivize Compact Developments with Biomass

6 Continue Outreach to Towns about Zoning Options

As natural resource conservation codes are developed and gain traction, municipalities will need consulting to assist in the zoning language of the bylaw and help facilitate dialogue. A “circuit rider” consultant that specializes in zoning could help interested towns write a by-law. The consultant would also be in charge of hosting educational forums in each town, where town officials and residents could learn about the implications of model codes and variations. Presently, Jeff Lacy of the DCR Division of Water Supply Protection works in this capacity for towns in the Quabbin watershed. Mass Audubon is also currently an active resource and advocate. Another full or part time consultant would be beneficial to have.

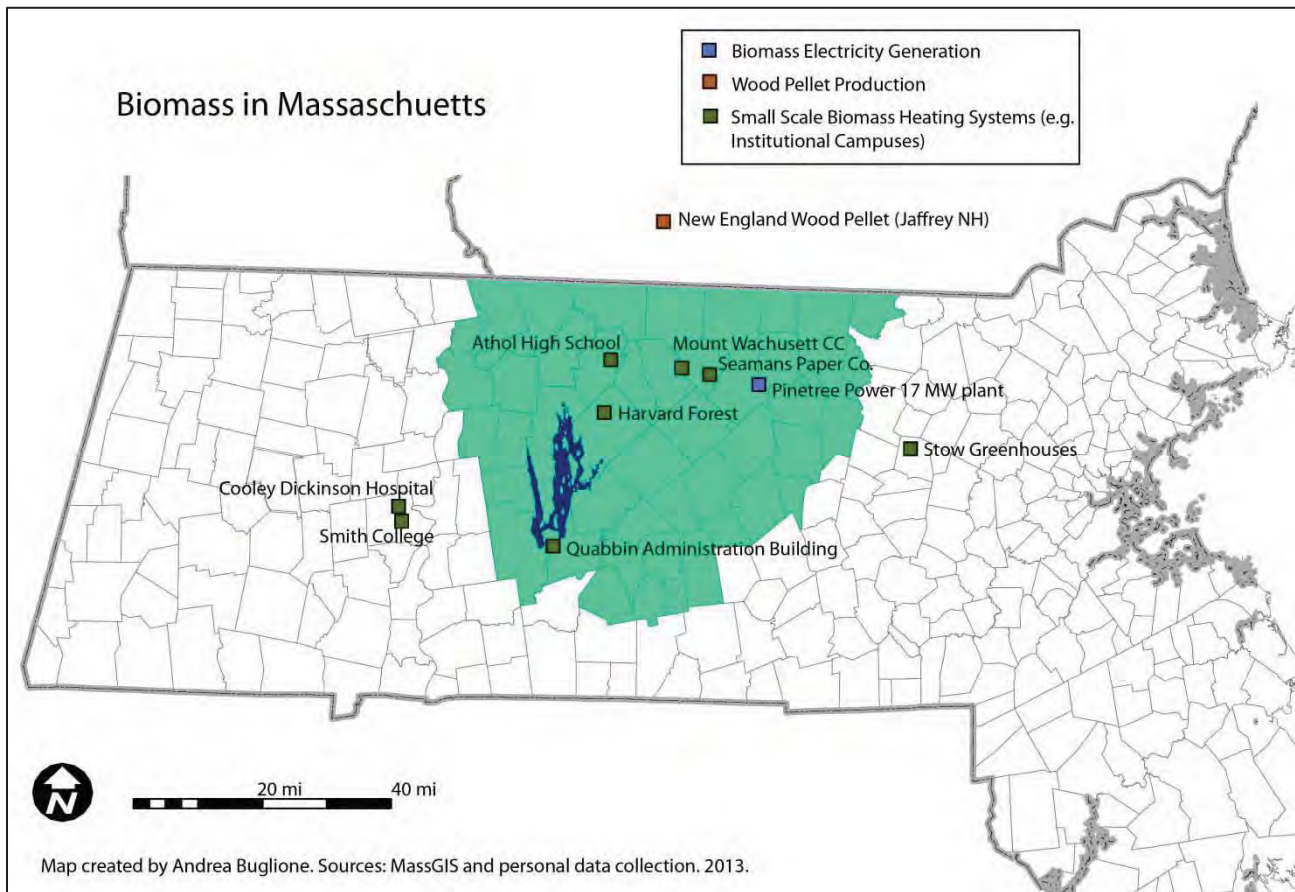
Example by-laws are currently hard to find because the concept is relatively new, but the state’s Executive Office of Energy and Environmental Affairs has created a model bylaw and guidance materials based on best practices so far. An OSD/NRPZ guide is available at http://www.mass.gov/envir/smart_growth_toolkit/bylaws/model-osd-nrpz-zoning-final.pdf. At the same time, it is important to discourage a cookie cutter approach to the zoning. Each town has different land use patterns, community goals, demographics, and political will, and open space bylaws can be flexible enough to address that reality.^{xiv}

7 Incentivize Compact Developments with Biomass

Biomass as a viable (and sustainable) energy source for New England has been a hotly contested issue in recent years. For large-scale power plant energy production, biomass is not necessarily very feasible or environmentally-friendly. However, a number of reports, including the Manomet Biomass Sustainability and Carbon Supply Study^{xiv}, have suggested that biomass is appropriate for small, localized wood fuel boilers in rural communities. Supplementary reports indicate that the total amount of low-grade wood that can be harvested sustainably from Massachusetts’ public and private forests is not quite enough to make it a *major* energy source statewide – we fully support investment in other renewables like solar, wind, and geothermal – but that wood fuel is very sustainable for heating homes, schools, and campuses. Creating a market for low-grade wood would also help sustain the forestry economy and encourage more sustainable harvesting practices.

- Wood fuel is generally cleaner to burn than oil
- Wood fuel is renewable
- Investing in biomass helps money recirculate in the local economy and helps maintain jobs in the forestry sector.
- Wood pellets cost homeowners half as much as heating oil

Throughout Europe and increasingly in the United States, compact developments (residential communities, school campuses, etc.) save on energy bills by using a centralized “district heating” system. As far as biomass in Massachusetts is concerned, the Greater Quabbin region is home to most of the community biomass, as seen in the map below.



The green area on map represents the Conservation Investment Zone.

Mount Wachusett Community College. In 2002, Mount Wachusett’s main campus in Gardner, MA, had an 8 MMBtu boiler unit installed to replace an all-electric heating and cooling system, which was funded in part by the US Department of Energy and the Massachusetts Department of Energy Resources. By switching from heating oil, the college saves about \$270,000 dollars per year.^{xlvi}

Quabbin Administration Building. In 2008, the Department of Conservation & Recreation’s Quabbin Administration complex installed a boiler that burns about 350 tons of wood chips per year and displaces 85% of the fuel oil previously being used. The total cost of installation was \$480,000, with the payback period at 6 years. Initial funding was provided in part by the State Department of Energy Resources.^{xlvii}

New residential, commercial, and institutional compact developments are ideal for district biomass heating systems. The Working Group supports measures to make community-scale biomass heating viable in the region.

Incentives for developers to include biomass heating systems could include density bonuses and provisions to allow more flexibility in the design process. Additionally, the Community Wood Energy Program, a federal grant program that provides local governments with money to help cover installation costs of efficient biomass heating systems, could enable an eligible town to use a proposed compact development as a pilot community-scale biomass project.



RURAL ECONOMIC DEVELOPMENT

The Case for Rural Economic Development + Conservation

Conserving the rural landscape and promoting the regional economy are related endeavors. Here are some reasons:

- The value of woodlands and thus the local economy is related to the demand for locally harvested wood.
- Awareness is growing that land conservation can contribute to a sense of place and help a community reduce overall cost of services.^{xlviii}
- Tourism infrastructure needed to sustain local economies also helps draw attention to protected recreation land. As the tourism strategy for the region is largely based on the availability of natural resource amenities, ensuring the protection of the landscape is vital.
- In addition to the more obvious outdoor activities tourists enjoy through the forested landscape (hiking, boating, cross-country skiing), growing trends in immersion tourism (farm-stays, culinary adventures, pick-your-own, historic tourism) will rely on a well-preserved and well-marketed rural landscape.

One observation about the future of this region's economic and tourism draw is that in order to move forward, we are, more and more, looking toward the past to find some of the answers. As will be explored in this chapter's sawmill education center idea and immersion tourism proposals, there is much to gain from re-orienting ourselves to sustainable living models from the past. Agritourism is a perfect example of the growing need people see in learning the ways of the past, embracing simplicity and increased physical activity. People desire an escape from technology and chance to reconnect with the natural world.

Here is why more people will visit, retire, and raise their families in the Greater Quabbin:

- proximity to major metropolitan areas
- clean air and water; availability of local food from local farms
- beautiful scenery and unlimited opportunities for outdoor recreation
- quaint towns
- relative low cost of living
- emergence of wood and other resource-based enterprises will add employment opportunities
- opportunity to develop compact communities that provide an alternative to the suburban neighborhoods typical of other parts of Massachusetts
- improved internet services for home-based businesses

Through this list of existing innovation and new recommendations, we hope to underscore the ways that conservation and economic development can better work together.

Existing Initiatives in Rural Economic Development

Commonwealth Quality Program

The Commonwealth Quality Program is a brand new state certification created to market products grown or produced sustainably in Massachusetts. Sectors include aquaculture, produce, and forestry. In order to qualify for the Commonwealth Quality Program (CQP) seal, participants must adhere to the Commonwealth's set of Forestry Best Management Practices, among other requirements. This means that the forester and logger must work together to create a comprehensive plan for harvesting that considers long-term impacts on the environment. These forest products need to be grown and harvested according to Massachusetts Forest Cutting Practices Act guidelines (also known as Chapter 132), which hold forestry to high standards of protecting natural resources and cutting timber selectively and improve the residual forest. Local wood that is also sustainably harvested has the potential to positively impact the regional economy as well as the integrity of our natural systems

There are 11 CQP Forestry Producers currently enrolled in the program, including a handful of producers in the Greater Quabbin. According to one of the program managers, participants "have been happy to be involved and feel that their businesses have gotten good exposure to consumers that they wouldn't have been able to achieve on their own."^{xlix} Yet a few realities of the business make it difficult for other forest producers to take the leap and join the program. Some potential participants are businesses that have established wholesale trade markets outside of the state, in which the CQP seal would not be of much use. Also, the industry is traditional and can be slow to change. Some feel that requirements like record keeping would be burdensome. Others feel that their company name and reputation is all they need to be successful in the business. As the program becomes more established, however, more producers involved in the supply chain— including logging businesses and finishing mills - will likely be inclined to join the Commonwealth Quality Program.

Red Apple Farm: Model for Conservation and Tourism

Red Apple Farm is an agritourism business that truly captures the essence of the economic development + conservation synergy. A family-owned orchard for more than 100 years, with a recent emphasis on retail activity, it has become a local landmark and destination that repeatedly attracts people from the Boston area and beyond. With activities like apple picking, hayrides, festivals, hiking, and even "dig your own" potatoes, Red Apple Farm provides the quintessential New England country experience that we all enjoy. The farm is 100% solar and wind powered and sells local wood products.



Map from <http://www.mass.gov/agr/cqp> showing the 11 Forest Sector participants in Massachusetts.

"Purchasing Massachusetts wood products not only supports local businesses, it connects us with the land and helps us understand the significance of responsibly managing it"

Commonwealth Quality website, 2013



Bill Rose, left, and his son Al Rose, outside of the Red Apple Farm store.

Many of the farm’s upgrades were made possible through the sale of an Agricultural Preservation Restriction (APR). The APR program, initiated in 1979 and administered through the MA Department of Agricultural Resources (DAR), permanently protects eligible farmland by paying for the fair market value of the development rights. Eligible lands must contain prime farm soil types.

Red Apple Farm received payment for the development rights on 70 acres of farmland through the APR program. Then, in 2007, the Rose family protected another 103 acres by donating a Conservation Restriction to Mount

Grace Land Conservation Trust. The APR and the tax benefits of CR donation helped secure the financial future of Red Apple Farm and allowed the Roses to invest in the farm’s tourism amenities. Other farms have used conservation proceeds to improve their business. Johnson’s Farm in Orange, MA is one example.

Red Apple Farm has also benefited from the USDA’s WHIP (Wildlife Habitat Incentive Program) and EQIP (Environmental Quality Incentives) grant programs. The landowners are in the process of creating an early successional habitat to attract certain species to the area. Through cost-share and technical assistance, this program allows landowners like the Roses to conduct habitat enhancements on their property and take an active role in land stewardship.

Farmland and forest conservation – plus tourism in these landscapes – are well integrated. Most farm properties are mostly forested.

From Forest to Fuel: Incentives for Household Biomass Heating

Biomass has potential to improve the economic viability of the region’s woodlands. While large-scale biomass power plants are unpopular, the state’s leading experts on forestry and energy all agree that using low-grade wood for community-scale biomass heating is important as a viable energy source.ⁱ Section II, Compact Development, illustrates the number of biomass heating systems in campuses and industries in the Greater Quabbin.

Wood pellets create the same amount of heat for half the price of oil.

Mass EOEEA

Since the passing of the Green Jobs Act of 2008, the Commonwealth has piloted several grant programs that provide assistance for homeowners wishing to upgrade to more efficient, wood-based heating systems. The **Small Pellet Boiler Pilot** grant awarded funding for high efficiency wood-pellet boilers for new home construction (or major retrofits). The improved boiler program promises rebates up to \$15,000 for the purchase of new boilers (which covers roughly 75% of the boiler cost including installation).ⁱⁱ Concurrently, the **Commonwealth Woodstove Change-Out Program**

offers incentives for homeowners to trade in their older woodstoves for higher-efficiency and cleaner burning stoves (\$2,000 voucher for low-income families, \$1,000 for other families).ⁱⁱⁱ These programs are a good start for incentivizing modern biomass, and their popularity shows the increasing demand for wood pellets and small-scale biomass heating systems.

The Neighborhood Forestry Project in Warwick, MA

The Greater Quabbin landscape is highly parcelized and fragmented, with many thousands of private landowners owning small pieces of the forest. Statewide, approximately 31,000 landowners own 1.8 million acres of forest in parcel sizes of ten acres or more,^{liii} and many more thousands own forestland in parcels under ten acres in size. With forested parcels of this small size statewide and in the CIZ landscape, implementing sound forestry becomes more and more difficult.

Particularly on small parcels of ten acres or less, the cost of engaging a licensed professional forester is more expensive. The cost of hiring a timber harvester is often prohibitive: a logger has fixed costs related to moving equipment to a site, and preparing a site for harvesting. The value a landowner might receive from selling harvested trees cannot overcome the costs of engaging these forestry professionals.

Mount Grace Land Conservation Trust's Neighborhood Forestry Project set out to address some of the barriers to forestry on small parcels. The goal of the Project, funded in part by a US Forest Service grant, was to enable landowners to get forestry work done on their small parcels by creating an incentive for foresters and loggers to work with the landowner. By aggregating or packaging a number of smaller forested lots into a joint harvesting effort, the number of acres of woods available for management increases, thereby increasing the interest of forestry professionals like timber harvesters to do the work. The Project looked to create an additional incentive to forestry professionals by building the joint harvesting effort around one large forested "foundation" parcel that was viable in its own right as a forestry project.

Implementing the Project proved challenging initially. First, the Project proponents faced the difficulty of finding a group of landowners living close enough together with a similar interest in actively managing their woods. Second, foresters were hesitant to participate because of the likelihood of uncompensated hours of work from investigating multiple small parcels and managing multiple landowners.

Eventually, a start-up grant of \$1,000 offered to foresters encouraged participation. The chosen forester knew five landowners of small acreage who hoped to do forestry on their land. Together with Mount Grace Land Conservation Trust's connections, the



number of possible landowners increased to eight. All were within two miles of a 65-acre conservation area owned by Mount Grace that would serve as the foundation parcel for the neighborhood project. Eventually, three landowners owning parcels of four, five, and fifteen acres agreed to participate, with another landowner of nineteen acres agreeing to provide a landing and access for the Mount Grace parcel.

As of May 2013, the forester is soliciting timber harvesters to participate in the joint project and the actual management of the land is anticipated over the next twelve months. The five-acre parcel is the most marginal, with most of the landowner's management goals more appropriate for an arborist. But a small stand (seven trees) of white pine may be harvested, the sale

of which will cover the timber harvester's expense. The forester will mark 20 hardwoods best suited for harvesting by the landowner to provide the one-to-two cords of wood per year for the homestead.

The four acre parcel contains a half-acre stand of white pine that will open up more solar to the garden, field and home once harvested. Harvesting this stand will likely pay for the forestry professionals expenses and possibly leave some remaining funds for the landowner. The fifteen-acre parcel has good white pine crowded by hardwood. A cordwood cut of the hardwood will provide some wood to heat the landowner's home and business, with the sale of the remaining cordwood paying the professionals. Harvesting on the Mount Grace property could likely happen on its own. But the forester has stressed that the other parcels would not be viable projects without grouping them in the project.

Rural Tourism: Existing Capacity

In addition to some examples previously cited (Red Apple Farm), the Greater Quabbin has a solid foundation of tourism-related initiatives, businesses, and organizational resources dedicated to securing the region as an eco-destination. The following is a partial list of tourism-based initiatives, businesses, and opportunities in the region:

Popular Tourist Attractions (just a few examples)

Outdoor Recreation	Visit and See	Stay
Quabbin Reservoir and Reservation	Harvard Forest & Fisher Museum, Petersham	1830 Elijah Haven Homeplace, Ashburnham
Tully Trail and Tully Lake	Red Apple Farm, Phillipston; Hamilton Orchards, New Salem.	Hartman's Herb Farm, Barre
Mid-State Trail	Antique shops, Athol & Orange	Stevens Farm B&B, Barre
New England Scenic Trail	Johnson's Farm & Sugarhouse, Orange	The Jenkins Inn & Restaurant, Barre
Miller's River Blue Trail: Athol to Orange	French King Bridge, Erving	Harding Allen Estate B&B, Barre
Walnut Hill Tracking & Nature Center, Orange	Leverett Peace Pagoda	Dragonfly B&B, W. Brookfield
Skydive at Jumptown, Orange	Performing Arts at Barre Players Theatre	Brookfield Inn B&B, Brookfield
Vast network of state and town forests for hiking, mountain biking, and camping	Petersham Craft Center	Centennial House, Northfield
Otter River State Forest & Lake Dennison, Winchendon	1784 Meetinghouse, New Salem	Colonial Hill Alpaca Farm + B&B, Petersham
Crimson Acres, horseback riding, Orange; New England Equestrian Center, Athol	Cultural Center at Eagle Hill, Hardwick	Clamber Hill Inn & B&B, Petersham
Brooks Woodland hiking, Petersham	Gardner Ale House, Gardner	Winterwood at Petersham B&B
Fox Valley Wildlife Sanctuary, Phillipston	Colonial Hill Alpaca Farm, Petersham	The Harrington Farm B&B, Princeton
Wachusett Mountain Ski Area, Westminster	The Montague Book Mill, Montague	Bona Vista Farm B&B, Winchendon

Institutions and educational centers

The Farm School & Maggie's Farm, Orange/Athol	Mount Wachusett Community College, Gardner
Seeds of Solidarity Farm & Education Center, Orange	Fitchburg State College, Fitchburg
Harvard Forest, Petersham	The Village School, Royalston
The 5 colleges in Amherst and Northampton	Earthlands Sustainable Living Institute, Petersham

Unique businesses/ventures

Dean's Beans, organic coffee roasters, Orange	North Quabbin Community Co-op
North Quabbin Woods Gifts, Orange	Western Mass Food Processing Center, Greenfield
Orange Innovation Center, Orange	Trail Head Outfitters & General Store, Orange

Organizations working toward rural economic development and outdoor promotion

North Quabbin Woods	Quaboag Valley Community Development Corporation
North Quabbin Trails Association	North Quabbin Community Coalition
North Quabbin Country Roads	Johnny Appleseed Country (formerly Johnny Appleseed Trail Association)



The River Rat Race along the Millers River draws tourists from across the Northeast.



The Garlic & Arts Festival in Orange attracts thousands of tourists each October.

Emerging Innovation in Rural Economic Development

8 Creating Demand for Local Wood Products

9 New Possibilities in Rural Tourism

10 New Markets Tax Credits

8 Creating Demand for Local Wood Products

Massachusetts exports 98% of its raw wood products. Some of the reasons wood producers are exporting to other states and abroad – and why we’re importing so much finished wood from outside the state – include:

- Lack of a strong value-added market locally
- Consumer preferences for non-native tree varieties prevail; for example, the dark Mahogany look is in style and is rot-resistant
- Cheaper to buy from overseas sources (like Indonesia)
- Fewer sawmills to process wood in state because it is becoming less economically viable; Massachusetts has lost 50% of its sawmills in the last 20 years
- Wood production (from forest to crown molding, for example) is a bit more complicated than food production, so it’s harder for the public to get behind a concerted Buy Local Wood movement



According to the director of the former Massachusetts Woodlands Cooperative, Suzanne Webber, the two most effective strategies for expanding wood markets and improving forest management are consumer education about local forest resources and tangible small-scale biomass production.^{liv}

The follow are five categories of innovation in creating demand for local wood:

1. Capitalize on existing niche markets. Since Massachusetts will most likely not be competitive in the “2 x 4” lumber market, we should focus marketing on the products we are good at producing with local wood:

- Timber framing
- Architectural millwork (cabinets, molding decking, etc.)
- Specialty wood products (artistic tabletops, furniture, bowls, etc.)

2. Promote more local wood in the construction industry. While not all of the trees common to Massachusetts make for good construction materials due to a relative tendency to rot and fluctuating consumer preferences, there are a number of species that do well for timber framing, flooring, and exterior siding.

- **Educate contractors, architects, and homeowners about using local wood.** Architects don't typically think about where the wood they use comes from.^{lv} Homeowners and architects need more *targeted outreach* on buying local wood. The Commonwealth Quality forest products participants have seen a boost in local wood sales thanks to knowledge-sharing events like the ArchitectureBoston Expo. Here architects and contractors learn that specifying locally grown wood for construction projects is the first step in increasing the prominence of local wood in the industry.
 - Continue to Sponsor events with the Home Builders Association of Massachusetts. Continue to promote the local wood concept at the ArchitectureBoston Expo
 - Sponsor smaller outreach events in different parts of the state specifically addressing local wood in construction and architecture, by partnering with the Massachusetts Forest Alliance, among others
- **Invest in a thermal rot-resistant wood treatment facility or a Cross-Laminated Lumber facility** – these are potential opportunities to use New Markets Tax Credits (see page 42).

3. Educate consumers. Through CQP and informational materials about the process of “tree to table,” more people will become aware of the importance of buying local wood. Part of this is about changing perceptions. For example, Michael Humphries (Michael Humphries Woodworking) deals with customers that want custom cabinetry in a certain color because of design trends, which means that it might not be available in a local wood option. Yet, using native wood and stain finish can produce virtually the same effect. At the same time, the more rugged “character grades” of wood are becoming more popular among consumers who desire more rustic looking floorboards, for example, but there are architects that don't like “blemishes.”^{lvii} More broadly, we might be able to educate consumers by:

- Making native wood (blemishes and all) an attractive option
- Reminding people of the historical importance of forestry in the regional economy
- Sponsor “local wood construction” tours
- Distribute informational brochures with info graphics describing the tree-to-product process
- Sponsor face to face events to meet and learn from wood producers in person^{lvii}

In the early stages of developing these campaigns, it was common to remind consumers of the many benefits of the farm landscapes that produce food. **It was necessary to list these seemingly obvious benefits** because in the last one or two generations citizens had disconnected from the land and simply stopped thinking about where their food comes from. In developing a “Buy Local Wood” commitment within the region it will be necessary to **re-educate consumers about the potential flow of resources from well managed forests, and connect citizens to the forested landscape.**

Suzanne Webber, Former President of the MA Woodlands Cooperative, 2009



Source: Fred Hayes



4. Expand market for community-scale biomass. Harvesting low-grade wood from the region's forests has a role in improving the stock of high-quality trees by allowing the latter to grow straight. However, we need a stronger market-driven imperative to selectively harvest low-grade timber – and biomass is a great way to use low-grade wood. According to Suzanne Webber, expanded markets for low-grade wood are essential to the economy and forest health because during the past century, “forest regeneration over former pasture land has evolved crowded stands of low-quality trees which need to be thinned. Without local markets to sell the high volumes of low-grade material into, local mills cannot afford competitive bids and so are unable to acquire the high quality saw logs for which there is a market.”^{lviii} Thus, the markets for low-grade wood (for biomass) and high-quality wood are both important and related.

- **Expand incentives for wood heat.** One way to help sawmills stay economically viable is to expand the market for biomass. As discussed previously, the Commonwealth has a number of assistance programs available for Massachusetts homeowners. However, to get a critical mass of landowners to leave behind their oil-based heating systems, more work is needed. Using wood harvested in the region for home heating is much more economically and environmentally sensible than using oil extracted abroad.^{lix}

The Model Neighborhood Project (Berlin, NH) is a project organized in part by the Northern Forest Center in New Hampshire. It is similar to Massachusetts programs except that it involves the participation of private sector sponsors. Over the last few years, over 23 new pellet boilers have been installed in Greater Berlin, NH, with 40 total eligible homeowners. Financial assistance comes from local and state banks, timber companies, the State of New Hampshire and philanthropic supporters like Stoneyfield.^{lx} Most of the assistance is in the form of direct cash subsidy from the aforementioned sponsors. The other component, however, is low-interest lending (1% interest) from banks and community development entities.

Besides public-relations incentives, private companies have an incentive to contribute to the fund through a tax credit program. The tax credit amount awarded is equal to 75% of the cash investment. Federal tax benefits on top of the tax credit sweeten the deal.

Communities in the Greater Quabbin could use the Berlin, New Hampshire model as inspiration to get more homes retrofitted with new high efficiency pellet boilers. The public-private model, especially when community-driven, could be an effective supplement to existing Commonwealth energy programs.

- **Community biomass.** Athol High School in Athol, MA is an example of an institutional facility that has been utilizing wood heat for decades now. To be more proactive about connecting community facilities with biomass, we ought to look to Vermont, a pioneer in community-scale biomass. The Vermont Fuels for Schools program is part of the reason that 30% of the state's public schools use wood fuel for heating. They have found that using wood helps money re-circulate in the local economy, and it is more cost-effective than conventional modes of heating. According to the Vermont Fuels for Schools Factsheet, “Large schools usually find the combined costs of installing fully automated wood systems, the bond payment, and the wood fuel far less than what they were paying using oil, gas, or electric heating.”^{lxi} Vermont has another program, the Vermont Family Forests, which helped put in place the Community Supported Biomass program. Like an agricultural CSA (Community Support Biomass), participants pledge to buy monthly shares of firewood.

A partnership between town forests and land trusts to use wood harvested on those properties for community biomass initiatives would be a win-win for municipalities. When all is said and done, increasing demand for low-grade forest products helps loggers stay in business and improves forest health in the long term. As literature on community

biomass suggests, “increased use of energy from forest biomass has the potential to increase the value of low grade wood to the point where forest owners can afford good management practices and loggers can earn a living serving both the timber and biomass markets.”^{xii} In addition to economic benefits for private forest landowners, towns and land trusts could gain extra income with the expansions of the low-grade wood for biomass market. Using wood from nonprofit land (land trusts) and town-owned forests for heating schools – and other municipal buildings – would be a true partnership in community biomass.

5. Encourage business participation in the Commonwealth Quality Program. Currently, 10 out of the 11 participants in CQP are sawmills. We ought to encourage more wood producers in *all components of the supply chain* to join the Commonwealth Quality Program. In order to make a true impact on the local wood market, more businesses throughout the supply chain are needed to participate in the program. For example, logging businesses, kiln operations and finishing mills are eligible participants. To really ensure that the finished wood products we’re buying (at Home Depot or the lumberyard or other retail locations) are 100% Massachusetts grown and produced, it will be necessary to certify more than just sawmills.

6. Change perceptions about loggers and foresters. A thriving forest economy requires loggers and foresters that are well-trained, well-paid, and well-respected. In addition to education and training, the logging industry – and ultimately the forest economy – would benefit from some of the following interventions:



- Equipment – is a large up-front expense for loggers. However, the right equipment can help reduce workplace safety risks as well as reduce stand damage. A small grant program for loggers, to help procure new equipment, might be an idea to explore further.
- Marketing – loggers need to market themselves better, especially with an online presence. CQP enrollment for logging businesses can offer a great deal of marketing assistance.

In summary, there are a number of approaches to educate consumers – particularly architects, contractors, and homeowners – about the importance of buying locally grown lumber. These coinciding campaigns may need a centralized marketing campaign, which could be coordinated by the state’s Commonwealth Quality Program and facilitated by groups such as the Massachusetts Forest Alliance and regional land trusts like Mount Grace. In addition to permanent conservation, one of the best ways to protect our region’s forest assets is to keep the forest economy productive.

9 New Possibilities in Rural Tourism

The connection between conservation, economic development and rural tourism is becoming clearer. More dollars spent in the Greater Quabbin can help bolster land conservation initiatives, and vice versa. The following recommendations are based on the proposition that the Greater Quabbin brand itself as a destination of **eco-tourism** and **immersion tourism**.

Eco-tourism is generally defined as a form of tourism that depends on and celebrates fully intact ecosystems. Outdoor adventure-based excursions, like white-water rafting, zip-lining, hiking, and camping are examples we often think of that meet the definition of eco-tourism.



The Working Group proposes to highlight potential for better marketing opportunities outdoor adventure, but also the hotels, restaurants, institutions, and other supporting amenities that will benefit the region. Immersion tourism spans from culinary festivals to overnight educational farm-stays to high-adrenaline adventure tourism. Educational immersion experiences (farm-stays, B&B in historic, culinary etc) could be a particular brand of eco-tourism that are suited to the region.

Red Apple Farm in Phillipston is an example of a tourism-related business that really takes advantage of the North Quabbin's proximity to metro areas like Worcester and Boston. During apple and pumpkin seasons, people frequently drive from Boston just to experience the New England countryside at Red Apple Farm. However, the lack of hotel accommodations and supporting businesses (restaurants) limits the extent to which tourists can stay in the region longer.

Parts of the Greater Quabbin are better served by tourism infrastructure than others. The North Quabbin, for example, seems to be overlooked as a real tourist destination, even though it has the natural resources, conservation land, and character to be a potential hot spot for tourism in the future. While the Quaboag Valley and Berkshires have a well-established tourism economy, as do Southern Vermont and eastern parts of Massachusetts, northern Worcester County and parts of Northern Franklin County are in a tourism "gap."

The Johnny Appleseed Country is a recently formed Regional Tourism Council. It has traditionally served the Fitchburg and Gardner areas, but is interested in making a bigger impact in the Athol/Orange and North Quabbin areas. Johnny Appleseed has suggested a more cohesive alliance form between the Franklin County tourism and Johnny Appleseed in Worcester County.

According to experts like David McKeehan of Johnny Appleseed Country, adventure-immersion tourism is what many people now seek and expect from a rural destination. In both the fields of psychology and tourism, emerging studies point to the growing need for new types of connections between us and the natural world. In Richard Louv's *The Nature Principle*, the author argues that exciting new ways to experience nature are emerging: "sensory immersion in nature rather than spectatorism; doing outdoor sports in unusual ways and unexpected locales; doing more than one outdoor activity at the same time (fishing plus birding = bishing...); combining recreation with conservation ... And most of all, unplugging the iPod and opening one's senses to the full experience."^{xiii}

Not only are immersion activities good for the tourists, they're good for the business owners and the greater community. For example, farmers might generate extra income by providing "hands-on business retreats, nature therapy, or education and rural experiences for young city



Mount Grace Land Conservation Trust

dwellers,^{lxiv} thereby helping rural families retain their land and livelihoods.

A few examples of this burgeoning form of tourism already exist in the region.

- *The Blue Heron* restaurant in Sunderland, MA has events and classes centered around sustainable cooking.
- *Sholan Farm* in Leominster, MA is a community-owned 169-acre farm focused on apple production; it also hosts a number of education conferences and workshops, in addition to festivals, hayrides, and live entertainment.^{lxv}
- *Active By Nature* is an adventure tourism business based in Hubbardston, that specializes in trips “that seek to enhance the body, mind, and spirit of its participants. Offering personal growth experiences through physical activity, hands on learning, and being immersed in nature, all which fosters the human spirit.”^{lxvi}

● **The Quabbin Byway Trail.** A proposed trail between Worcester and North Quabbin – and beyond (maybe the Turners Falls Discovery Center) – would use existing road infrastructure to create a route for drivers and bikers wishing to experience rural Central Massachusetts. This backroads tour would highlight historic, cultural, recreation, and farm-related points of interest. To really make this idea exciting and universally accessible, a smartphone application could help users find points of interest. Moreover, a concise brochure would be distributed by local gas stations, restaurants and stores.

One demographic to market the Byway Trail to is the population of young urban professionals in Boston looking for day-trip ideas.

Key stops to feature might include:

- Breweries/wineries/bars
- Historic sites
- Antique/thrift shopping
- Farms and orchards
- Farm stands
- Nice drives and views
- Places to rent outdoor equipment
- Bed & Breakfasts
- Nature centers
- Trail heads
- Native American heritage sites
- Renewable energy facilities

The points of interest would build off information available through the Massachusetts Association of Roadside Stands and Pick-Your-Own, and the Mass.gov/agr site, to create a comprehensive map.

A large component of the trail would be marketing for Bed and Breakfast stays. There are a number of towns in the Greater Quabbin that are existing B&B destinations, such as Petersham. The wealth of beautiful scenery and potential for more tourists means that more B&Bs and unique hotels could be supported. Moreover, the B&Bs, unique hotels, and budget accommodations could be connected by a *pedestrian and bike* trail network. In Northern England, there is a walking tour that connects to different towns; we could use that model to do something similar here. This type of proposal has been in the works for over 30 years, when individuals envisioned a walking trail system between Bed & Breakfasts, based on the walking trails throughout England.^{lxvii} The trail network would be supported by the thousands of acres of already protected land.



The Central MA Rail Trail has potential to connect Western and Eastern MA, but there is no existing trail across the North Quabbin, only trails going from north to south. While there is a “Massachusetts Route 2 Historic Self-Drive Tour,” it only mentions a few North Quabbin destinations.”^{xviii}

More generally, the region would benefit from an updated, comprehensive tourism website. In 2013, the need for accessible, comprehensive and well-designed web promotion has never been more crucial. The North Quabbin Woods has an impressive website with information on outdoor recreation and local artisans. This could be the basis for creating a Greater Quabbin Tourism website.

Resource-based enterprises. A handful of community development entities in the region would be integral partners in providing a low-interest loan program to help jumpstart natural resource-based enterprises. Johnny Appleseed Country has already agreed to better market its low-interest lending program. Another opportunity is the creation of an enterprise fund to help cutting edge natural resource-based enterprises needing an initial capital investment.

Examples of a natural resource based businesses might include:

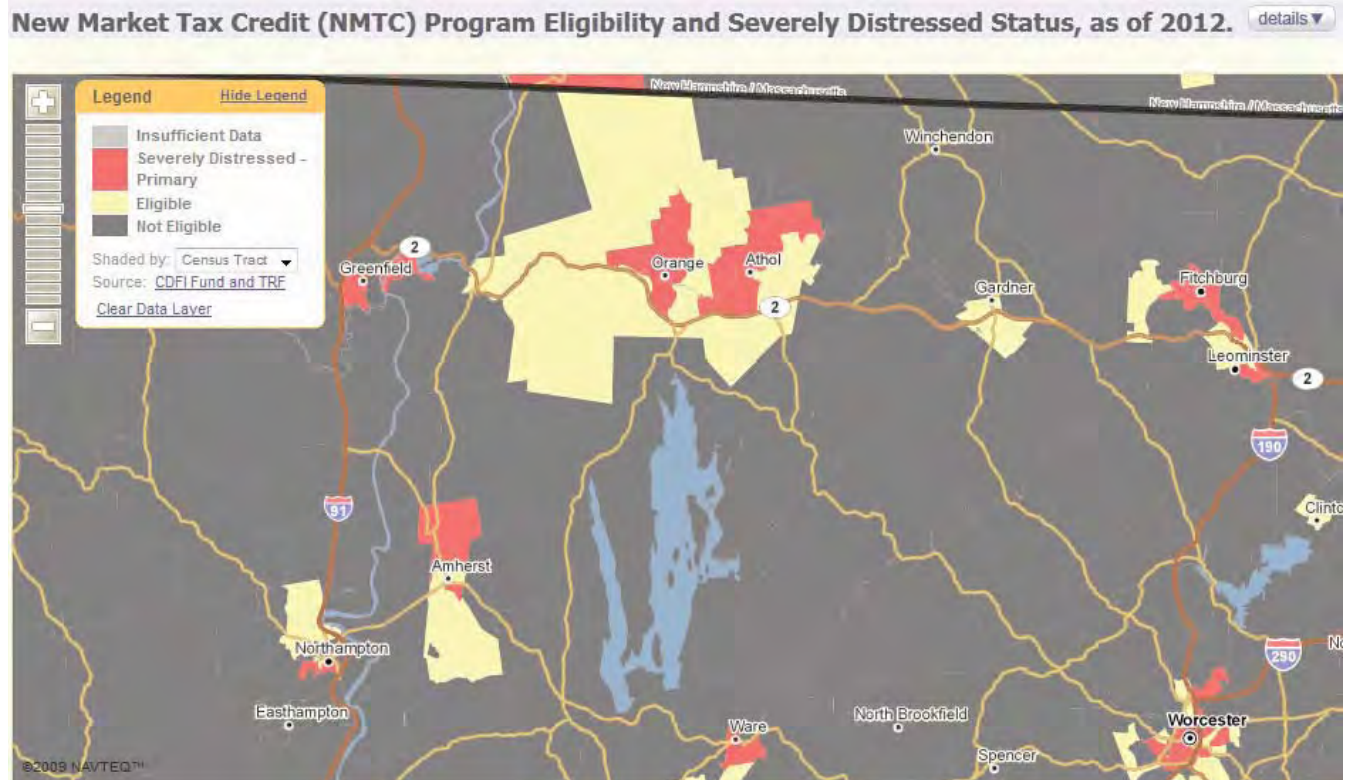
- Value-added wood product businesses
 - Timber frame construction
 - Artisanal wood products
- Value-added food product businesses
 - Aquaculture
 - Wineries
 - Specialty products (for example, the Real Pickles company in Greenfield got its start from low-interest lending by Franklin County CDC).
- Outdoor Recreation
 - Ziplining or tree canopy tours
 - Fishing excursions
- Nature retreat conference center
- Native plant landscaping company



10 New Markets Tax Credits for Innovative Business Development + Conservation

New Markets Tax Credits (NMTCs) are federal tax benefits that encourage the investment of private capital in communities with high poverty and unemployment. Investors receive a tax credit against their federal income tax in exchange for their investment in a designated Community Development Entity. In 2006, Congress authorized money to rural as well as urban communities.

Screenshot of NMTC Eligibility by Census Tract, www.novoco.com



As indicated by the yellow and red census tracts on the map above, the region has a number of concentrated areas of poverty and disinvestment.^{ix} Similar to the Northern Forest Zone, the Greater Quabbin has a struggling forest products economy and a need for more investment in conservation-related endeavors. The region could really benefit from an impactful NMTC-backed undertaking.

The *Northern Forest Center* (based in Concord NH), for example, has facilitated four NMTC projects that have involved financing forestland conservation (315,000 acres) and promoting the rural economy, including:

- 13 Mile Woods Community Forest (2005) – NMTCs made possible the acquisition of 5,269 acres to create a Community Forest in Errol NH.
- East Grand Woodlands project used Forest Legacy funding plus NMTC financing to protect thousands of acres and also to make *small grants* (\$5,000 – \$50,000) available for qualified businesses in the region, particularly those involved in the forest economy.

The idea of using the tax credits for investments in natural-resource based businesses in the region is certainly an idea worth pursuing. In addition, the Working Group has come up with some compelling proposals for the use of New Markets Tax

Credits. Each contains a proposed business or community facility, in addition to funding for land conservation. The following proposals are just some options; there may be others.

- **Sawmill + Education Center**—In an eligible NMTC zone (e.g. Athol or Orange), the community could create a place to teach traditional skills in a working sawmill facility. It would also serve as a forestry “hub.” Just as *food hubs* provide low-rent space for food-related microenterprises, the sawmill center could provide space for wood-related artisans and craftsmen. As more people, particular younger generations, seek hands-on experiences (farming, woodworking, etc), there is likely a demand for an educational center that teaches these skills. Similar to a “back to the land” mentality, more people see the value in acquiring practical, survival-type skills. Sawmills are important components of the region’s economy. The Sawmill + Education center could reinvigorate the industry, put the region on the map for innovation and education, and provide a unique community service.
- **Rot-Resistant Wood Treatment Facility**— Some of the wood produced in Massachusetts is not ideal for use in exterior home construction due to its relative tendency to rot. One way to increase use of native wood products is to invest in environmentally-friendly rot-resistant heat modification technology. Heat treatment (HT) is an emerging natural preservation technology that uses heating and steam to make wood impervious – and thereby rot-resistant – by heating it to the point of changing the cell structure.^{lxx} The technology is being pioneered in Canada. Lashway Lumber in Williamsburg, MA may be one of the first sawmills in Massachusetts to install a heat treatment kiln. With a \$300,000+ price tag, bringing this technology to Massachusetts could be successfully carried out with the help of NMTCs. Once the HT facility is set up in Massachusetts, we can produce ThermalWood, which would be 100% grown and manufactured in the state. ThermalWood is the most environmentally friendly option in wood preservation.^{lxxi} As an added bonus, the heat treatment produces darker colored wood, meeting the consumer half-way between their taste for exotic Mahogany and their desire to support the local economy.
- **Cross-Laminated Timber (CLT) Facility** – Like heat treated wood, Cross-Laminated Timber manufacturing could also spur the local timber market by providing a high quality building product. As a wood composite material, Cross-Laminated Timber (CLT) has insulation qualities that help reduce heating and cooling costs. In addition to its thermal efficiency, CLT is non-toxic, light-weight, and appropriate for modular construction. According to the Massachusetts Executive Office of Energy & Environmental Affairs, CLT makes sense for a flexible, small-scale production: “this operating structure is ideally suited to small-scale operations and forest landowner cooperatives....and will allow value-added products to be produced closer to our forests, providing economic incentives where they are most needed.”^{lxxii} CLT has potential to spur investment in local wood but also to bring about more passive design, zero-net energy homes.
- **Water Bottling Enterprise**—Protecting forestland and ensuring adequate water supply go hand-in-hand. Healthy, intact forests play a critical role in slowing the rate of runoff in a watershed, reducing soil erosion, and most importantly, filter contaminants. This is why major metropolitan areas choose to invest in watershed-scale forest conservation (Quabbin Watershed in Massachusetts, Catskills Watershed in New York) rather than invest many times that amount in water filtration plants.^{lxxiii}



The same forest conservation principles apply for private water bottling companies. A water bottling venture in the Greater Quabbin could profit from bottling clean water from protected lands, and further make a positive impact by donating a certain percentage of the proceeds to fund land conservation.

The value of clean water will only increase as the population grows. With the right marketing and branding, Massachusetts water could be marketed to New England and beyond. Even a small percentage of profits going toward a conservation fund would be a direct benefit for the future of land conservation in the region. As public-sector funding sources in the Commonwealth are becoming less secure, this public-private strategy for financing forest conservation has some great potential.

- **Wood Pellet Plant** – The closest wood pellet plant is located in Jaffrey, New Hampshire. There is an opportunity to bolster the local wood economy through the creation of a facility in the Greater Quabbin. This proposition would need extra feasibility studies, as the production of wood pellets is relatively energy intensive. Wood pellet plants are also prone to fires, as the wood dust is highly flammable.^{lxxiv} However, wood pellets are a renewable, clean-burning fuel source that more and more homeowners are making the switch to. With financing from New Markets Tax Credits, a wood pellet producing facility could potentially utilize solar power to partially operate the factory. Another idea expressed – but not fully vetted – is to use existing mills along the Millers River, in Athol for example, to take advantage of hydropower *and* to help reinvest in post-industrial communities like Athol.^{lxxv}

CONCLUSION

Finding synergy between economic development, tourism, land conservation, residential development, and mitigation is no easy task. Yet the the world is moving toward an integration of multiple disciplines and the most promising way to effect change is through collaboration and “outside the box” thinking. A hybrid approach to building community resiliency is undoubtedly the most effective approach for the Greater Quabbin Conservation Investment Zone.

We hope this report will serve as a catalyst for coordination among conservation, zoning, and rural economic development.

The time is now to innovate and to bring some life back to the region, economically and culturally. The *foundations* for ideas like smarter land development and enhanced eco-tourism *are* here. Plus, our proximity to major metropolitan centers, wealth of natural resources, and quaint New England charm will continue to draw people to visit, live, and invest in the region.

The existing conserved land in the Greater Quabbin, from the Connecticut River to the Nashua River Watershed is the building block for a sustainable region. By protecting ever more vulnerable landscapes, the region can strive to create corridors of conserved land, suitable for wildlife habitat, wildlife migration, and outdoor recreation. As the various threats of climate change are becoming ever-present in the Northeast, ensuring the fortification of resilient ecosystems is vital to the survival of all species, including our own.

Forest conservation is tied to smarter land development codes that allow cluster housing by-right. Although not a perfect system, EOEEA’s model bylaw has tremendous promise to guide future housing developments in the right direction. Instead of sprawling, large acre lots that are all too common around New England, the Greater Quabbin can be the pilot area for compact residential communities that safeguard ample open space, preferably open space where active forestry can persist. These same developments are ideal locations for district heating through biomass, an energy efficient system powered by a local fuel source. Incentives for biomass would include more site plan flexibility for the developer. Ultimately, protecting land through compact development can protect scenic value and maintain community character.

Reinvigorating the forest products industry is related to the zone’s conservation value in a number of ways. By adding value to low-grade wood—biomass and new wood products – there is more incentive to practice selective cutting and to manage forests sustainability. Native high-quality wood used for architectural features is on the verge of becoming more noticed, with the emergence of the Commonwealth Quality Program for Massachusetts grown products, but there are still opportunities to



spread the word about the benefits of buying local. Homeowners, architects, and contractors, are an important sector to market to. As the markets for low-grade wood and high-quality wood expand, forest land values increase, forestry jobs become more secure, and the sustainable management of forests is more easily piloted.

Working Group Recommended Next Steps

The region is facing an immediate opportunity to participate in dam relicensing negotiations. Through the Connecticut River Watershed Council's (CRWC) 2002 model, citizens have the power to influence the outcome of current negotiations by requesting a Conservation Fund to mitigate the environmental impacts of two dams on the Connecticut River. The Fifteen Mile Falls Mitigation and Enhancement Fund is a good model for using dedicated funds to make grants to a variety of land protection projects. A citizen group like CRWC might be an appropriate group to tackle the issue of FERC negotiations in our region moving forward.

Another signature Conservation Investment Zone project we think has great potential is the Quabbin Byway Trail. This is a way to raise the profile of local businesses while highlighting the beauty of the highly intact Greater Quabbin landscape through a Quabbin Byway driving and biking trail, complete with a smartphone "app," that allows visitors to discover all the region has to offer. City dwellers in Boston and Worcester would be eager to take an easy day (or two) trip to the Greater Quabbin to find fresh food at farm stands, stumble upon museums like Fisher Museum at Harvard Forest, indulge in wineries and restaurants, and learn about the natural and industrial history of the region. This route coupled with the proposed Bed & Breakfast trail network, could do much to bring tourists to the Greater Quabbin. Indirectly, more tourist money flowing into the region would increase the capacity for land conservation.

As a strong demonstration of the relationship between economic development, recreation, and conservation, the Quabbin Byway Trail idea could be orchestrated collaboratively by a subsequent working group. This collaboration would include regional planning agencies such as MRPC and CMRPC, regional tourism councils like Johnny Appleseed Country, and town planners and business leaders within the region, along with land trusts, other conservation organizations and home-based businesses.

The examples and recommendations in this report illustrate significant potential for increasing economic opportunities and raising awareness about the role of the conserved natural and working landscape in the regional economy. To more fully realize the region's potential, we recommend a more thorough, town by town, assessment of the economic and natural resources that exist here to reveal more potential synergies for sustainable economic development. This might be accomplished for the region as a whole or in clusters of towns, depending on interests of local participants and potential funders for this work.

With existing organizational capacity for landscape-scale aggregation projects, land trusts like Mount Grace are poised to further the conservation vision of the Greater Quabbin. By partnering with the state Landscape Partnership program and federal Forest Legacy program, landscape-scale conservation in the Greater Quabbin region is being solidified. As community needs are evolving, the mission and role of land trusts can broaden. They are a key partner for promoting compact development model codes, influencing mitigation outcomes, promoting local food and wood, and mobilizing rural economic development strategies in tourism. Synergies between conservation and economic development will help strengthen the mission of land trusts, state agencies, regional planning entities, business leaders, economic development organizations, and communities.

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