

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

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 in 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.



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.

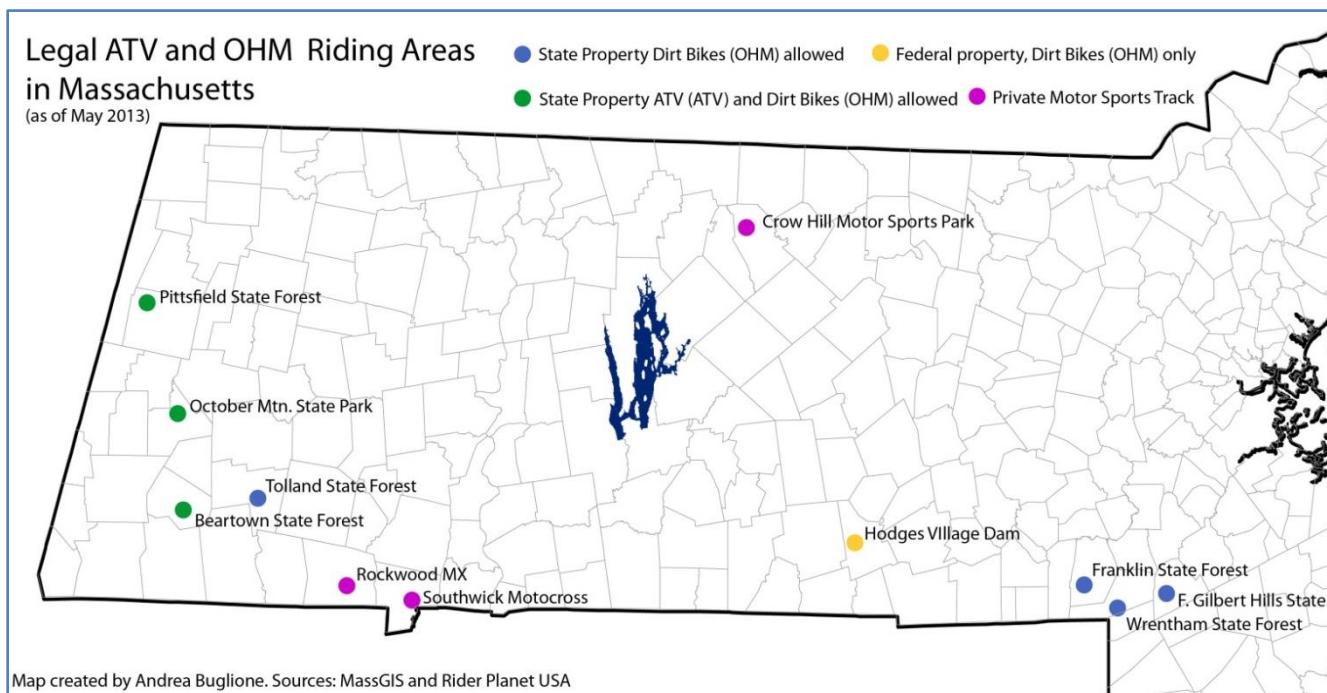
This Working Group recommends the creation of a “How-To” manual designed for land trusts, municipalities, and the EOEEA. The manual will contain best practices for conservation negotiations with a broad range of institutions. This could be a good candidate “Phase II” project for the *Greater Quabbin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

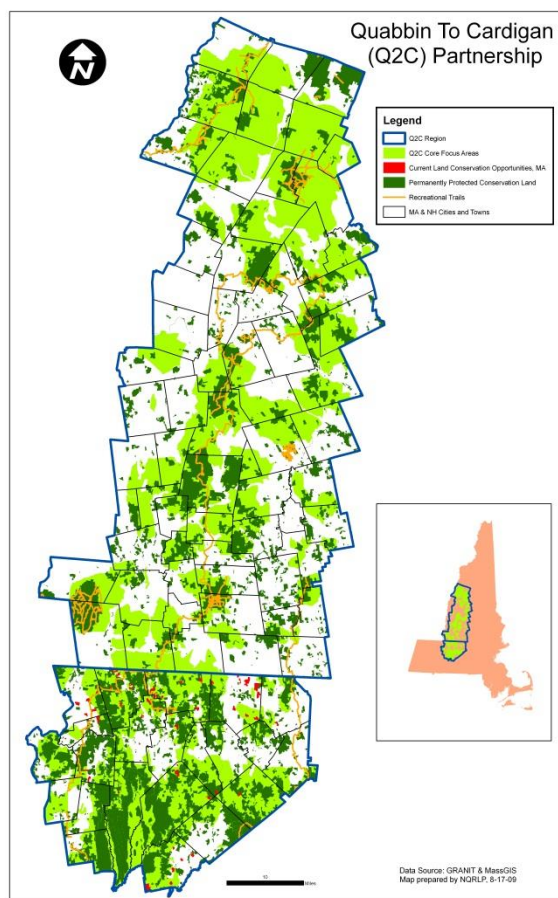
In the meantime, the Commonwealth is considering a grant program that municipalities can apply to in order to receive funding and technical assistance for an OHV site. This is still in the beginning stages of development.

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.



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



Source: Mount Grace Land Conservation Trust

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.^{xlii} 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.^{xliii}