

CAN MONEY GROW ON TREES?

A Path to Carbon Trading in Williamstown, MA

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Adrienne Joe, Ariel Koltun-Fromm, Jared Strauss, & Rachel Porter

Professor Hank Art, Environmental Planning Workshop, Fall 2019

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1. INTRODUCTION

A. PURPOSE STATEMENT

The overarching goal of this project is to create a unified management plan for all of Williamstown's disparate forested properties, which currently operate under various states of management. Each of the pieces of land have their own unique characters and properties (size, timber value, biodiversity, etc.). The central task of this report is identifying best practices for collective management through a potential carbon sequestration program.

The report proceeds as follows: in Section I, we introduce our methodologies and give background on carbon sequestration and the carbon market. In Section II, we provide a community profile, identifying and describing the town-owned forests of Williamstown, and elaborating on regional precedents, practice, and law. In Section III, we deliver our process diagram, which clearly lays out the steps necessary to enter the carbon market. In this section we detail these stages and the resources necessary to undertake them. In Section IV, we outline possible final options in the process and evaluate them. And, in Section V, we conclude with next steps and areas for further research.

B. METHODOLOGY

I. GIS ANALYSIS

Geographic Information Systems (GIS) is a computerized system that allows us to analyze and manipulate spatial data on Williamstown-owned lands. In our research, we employed GIS analysis on base layers of Williamstown to gain a greater understanding of the land types, landowners, and parcel sizes in Williamstown. For more details, see Section II.B.

II. INTERVIEWS

A significant portion of the research conducted was through interviews with experts in fields relating to forestry and carbon sequestration. This included interviews with professional foresters, town employees, board members of land trusts, employees of the Department of Conservation and Recreation, biometric scientists, and those with experience on other forest carbon sequestration projects. A complete list of interviews conducted can be found in Appendix C.

III. DOCUMENTATION

We have consulted many forms of documentation to round out our research on the subject of carbon sequestration and the carbon market, as well as to get a better understanding of past work in related fields and the history of Williamstown. Included among the sources consulted are past Williams College Center for Environmental Studies student reports, research conducted at other universities such as the University of Vermont and Boston University, protocol documentation provided by carbon registries, reports on precedent projects, legal and grant documentation, and other relevant articles and reports. Included in our research was an inventory of the documents on file in the Community Development Office, Town of Williamstown in Town Hall, which includes historical memos and files concerning town-owned properties.

C. PROJECT BACKGROUND

I. QUANTIFYING CARBON OFFSETS

To guide us in our process methodology and evaluative procedures, it is helpful to lay out rudimentary definitions and explanations for the various components involved in carbon offset production and management practices. Of course, that means examining exactly what carbon sequestration constitutes within the context of our proposed practice. *Carbon sequestration* is defined as the long-term process of removal, storage or sequestration, of carbon dioxide from the atmosphere in order to slow atmospheric carbon dioxide pollution. Carbon dioxide is naturally captured from the atmosphere as a result of various biological, chemical, and physical processes.

Because carbon dioxide greatly contributes to the exacerbation of climate change and land use changes (especially deforestation), it warrants special scrutiny in the context of land management protocol and best practices implementation plans. There are multiple sites, known as *carbon sinks* that mitigate the negative influence of excess carbon dioxide into the atmosphere, namely the terrestrial biosphere and the oceans. Developmental use in the terrestrial biosphere affects the ability of forests to successfully sequester atmospheric carbon dioxide into living biomass as well as down trees, dead trees, and soils. Drastic changes in forest cover potentiates negative effects on local climate, as the land-atmosphere fluxes of energy and water become irrevocably problematic. Increasing levels of carbon dioxide in the environment can have detrimental effects on the ecology of New England Forests especially, by creating or exacerbating fires, insect outbreaks, drought, and the destructive loss of biodiversity. The preservation of carbon sinks and general carbon emissions

reduction practices are necessary to reverse the globally-detrimental effects of rising carbon emissions.

One way of preserving carbon sinks is implementing a Cap-and-Trade system focused on utilizing carbon credits to reduce carbon emissions. A *carbon credit* is any tradable certificate or permit representing the right to emit one metric tonne of carbon dioxide or the equivalent amount of a different greenhouse gas, such as methane. In addition, a carbon credit is generally associated as an important unit within *carbon markets*, which have varying types of registries and organizations involved. Carbon credits and *carbon offsets* differ, as purchasing a carbon credit can relinquish an emitter's right to emit a ton of carbon whereas purchasing a carbon offset supports a prior reduction of a ton of carbon. Carbon credits are used to encourage carbon reduction schemes between both specific trading partners and around the world. Carbon credits and carbon markets are exemplary of national and international efforts to control and potentially mitigate the growth of greenhouse gases. Of course, carbon emissions reductions through carbon markets are needed in the current state of affairs of the Anthropocene. Yet, source reductions are not necessarily the endgame solution unless global combustion and overall GHG emission reductions occur. Still, the idea behind carbon markets is that market mechanisms drive industrial companies in the direction of lower emissions by incentivizing them to invest in credits from a carbon development company that has aggregate carbon credits, which contain carbon sinks that protect the atmosphere. Buyers and sellers can use exchange platforms to trade carbon credits, which is similar to a kind of stock exchange for carbon credits. There are international carbon credit markets (as formalized by the Kyoto Protocol), but there are only smaller regional carbon credit markets in the United States.

II. ADDITIONALITY

Additionality is essential in the context of carbon credit schemes. A credit will be considered additional if the emissions reductions that define the credit would not have occurred in the absence of activity that generates the credit (the "business-as-usual" or "status quo" scenario) (EPA 2011). A credit is additional if in the absence of incentives established by the crediting scheme, the mitigation action would not have occurred. The incentive is related to the price, which results from the supply and demand market for programs that demonstrate credible carbon emissions reduction. Additionality is important in the context of carbon credits because it enables offset buyers to make claims surrounding their reductions of carbon emissions. Carbon emissions projects with additionality are profitable as long as the certification costs, and thus implemented project actions, are lower than the prevailing price. Projects are deemed additional as long as the project reduces emissions from a *baseline scenario*. The baseline scenario is the "status quo," or "business-as-usual" in which no carbon emissions reduction action is taking place by a particular company. An important issue related to additionality is of what time interval in the past does one use to establish the baseline above in which there is additionality going forward as the behavior of the system is changed to increase CO₂ uptake.

One central criticism of additionality is that additionality contains the implicit notion that all low-emission practices either face a kind of barrier and will not occur in the baseline or even that if they would occur in the baseline, they would benefit from the consideration of being additional. However, the validity of additionality, especially in terms of temporal concepts of additionality, would require an accurate assessment of the reference condition, which

is the baseline scenario. Rigorous analysis requires baseline specification, which provides comfortably accurate cost and benefit estimations for carbon credit schemes.

Careful and diligent baseline specifications require an investigation of analytical sources (like facilities, economic sectors), geographic detailing and resolution (like census blocks, GIS cells, regional locations) and environmental objectives (i.e. emissions reductions scheme versus pollutant concentrations). The level of detail in baseline specification is incredibly important in conducting procedures related to proposed regulatory options. If the baseline scenario is accurately assessed, then achieving additionality is as stringently applicable in the context of carbon credit schemes as any other concept.

There are a variety of steps that need to be taken in order to quantify carbon, and thus provide accurate evaluations of the financial elements of a carbon credit scheme. Carbon quantification requires in-depth documentation of the inventory on the forested properties that a trading partner, who is responsible for managing the sale of the offsets, must analyze. For example, data collection includes surveying the number, species, and sizes of trees located in a plot of land. Organizational procedures include analyses and calculations on the above-ground and below-ground biomasses of the tree species within a plot that is then converted into a unit of measurement of metric tons of carbon.

III. COMPLIANCE VS. VOLUNTARY MARKETS

Carbon trading takes place in one of two markets: the compliance market or voluntary market. The compliance market (Cap-and-Trade Market) is established by a regulatory body that sets a cap on greenhouse gas emissions from a source. The cap gets stricter over time in order to reduce GHG emissions. Allowances in the form of Certified Emission Reductions (CER) credits are

issued to a company allowing them to emit a certain limited amount of GHGs per year. These allowances are sold through auctions and proceeds are invested in renewable energy projects, energy efficiency advancements, and other consumer benefit programs. A company subject to the mandatory market can choose to either sell or buy allowances. For instance, if a company improves their sustainable management practices and their emissions are below the cap, then they can choose to store their carbon credits for future use or sell them to other companies who have exceeded their emissions limit. The Regional Greenhouse Gas Initiative was the first regulatory program set up in the United States that limited carbon dioxide emissions amongst the power sectors of 10 eastern states (Regional Greenhouse Gas Initiative 2019).

The voluntary market is made up of voluntary buyers who are not subject to caps under the regulatory body. Instead they buy Verified Emission Reduction (VER) credits for socially responsible investing and ethical reasons. Lower development/transaction costs make the voluntary markets more attractive to smaller sustainable projects such as the scale of this Williamstown project (Verified Emission Reductions 2019).

IV. CARBON REGISTRIES

Carbon registries are independent organizations that issue offset units for any carbon sequestration project, which can then be listed on the compliance and voluntary markets. There are many such registries, and each registry has its own specific process and protocols in place to register projects and receive sellable offsets. Each registry offers a set of methodologies. A methodology is a specific project type, such as a reduced harvest rotation cycle methodology. For each methodology, a registry will have specific protocols,

which are the standards and processes necessary to follow to register a project with the registry. There are costs and benefits to using any specific registry, and these depend largely on the project itself. A project that may be easy to register under one registry may be difficult and more expensive under another. Following is a brief review of two of the most widely-used carbon registries, Verra, and the American Carbon Registry. Each registry provides extensive documentation on their protocols that is publicly available. References to this documentation can be found in the bibliography.

1) VERRA

Verra is the world's most widely-used voluntary greenhouse gas program. It has very rigorous standards, and those who meet them are issued offsets in the form of VCUs, or Verified Carbon Units, that can be sold on the open market. Verra requires a project take a minimum of 20 years, which can be renewed up to four times for a maximum of 100 years. Verra has systems in place that allow for the combination of multiple projects into one, making aggregation an easier process under Verra. Verra's baselines tend to be more constricted and less flexible, and often incur more expensive upfront costs. However, Verra sometimes yields more offsets from its projects than other registries, though over a longer period of time.

Verra has a very large library of methodologies to choose from when it comes to forest management projects. These include methodologies for extended rotation age, conversion of forest from logged to protected, avoided unplanned deforestation, and reduced impact logging. Each methodology has its own eligibility requirements. For instance, for a property to be used towards an extended rotation age project, the property must be subject to

regular timber harvesting. As many of the Williamstown-owned properties are not, this may preclude the town from choosing this methodology.

When choosing a baseline with Verra, one first goes for the historical baseline, which is the well documented history of use of the site. If such documentation is not available, one reverts to the legal baseline, which refers to the logging practices allowed under the law or local regulations. If no such laws exist, or if they are not enforced, the project defaults to the common practice baseline, which is established by a third-party expert. It should also be noted that Verra requires the hiring of a third-party verification body for the verification process so as to register a project with them and receive VCU's ("Methodology for Improved Forest Management" 2016).

2) AMERICAN CARBON REGISTRY (ACR)

Founded in 1996, the American Carbon Registry was the first private voluntary greenhouse gas registry introduced to the world and in 2012 was approved by the California Resources Board (ARB) to be an Offset Project Registry for the California Cap-and-Trade Program as well. Similar to Verra, ACR is designed to quantify GHG emission reductions resulting from carbon offset projects that reduce emissions by exceeding baseline management practices and is a viable option for a registry for a forest management practice.

ACR follows a stringent procedure for verification of credits given that it was approved by the ARB. Management sequestration practices are only acceptable through specific types of lands. Some of these requirements are as listed: the land has to be non-federal land within the US, certain specified certifications depending on the land are required through

the Forest Stewardship Council, Sustainable Forestry Initiative, or the American Tree Farm System, it is prohibited to use non-native species, and lastly the draining or flooding of a wetland is prohibited.

In order to meet these standards, the management must provide a detailed description of the geographic area and projected measurements. The project area must be depicted on a USGS topographic map, along with a general location map and a property parcel map.

The ACR is also responsible for determining the baseline and measuring additionality in order to quantify the carbon credits sold on the markets. The registry sends foresters to verify the original inventory reports of the land. If the project area is heterogeneous, stratification will be used to accurately measure carbon stock estimates. In this scenario ACR takes into account the management regime, species or cover types, size and density class, and age class. After carbon credits are measured baseline and additionality is measured from current practices, historic practices, neighboring land practices, and regulations set on the forestry business (ACR Validation, 2019).

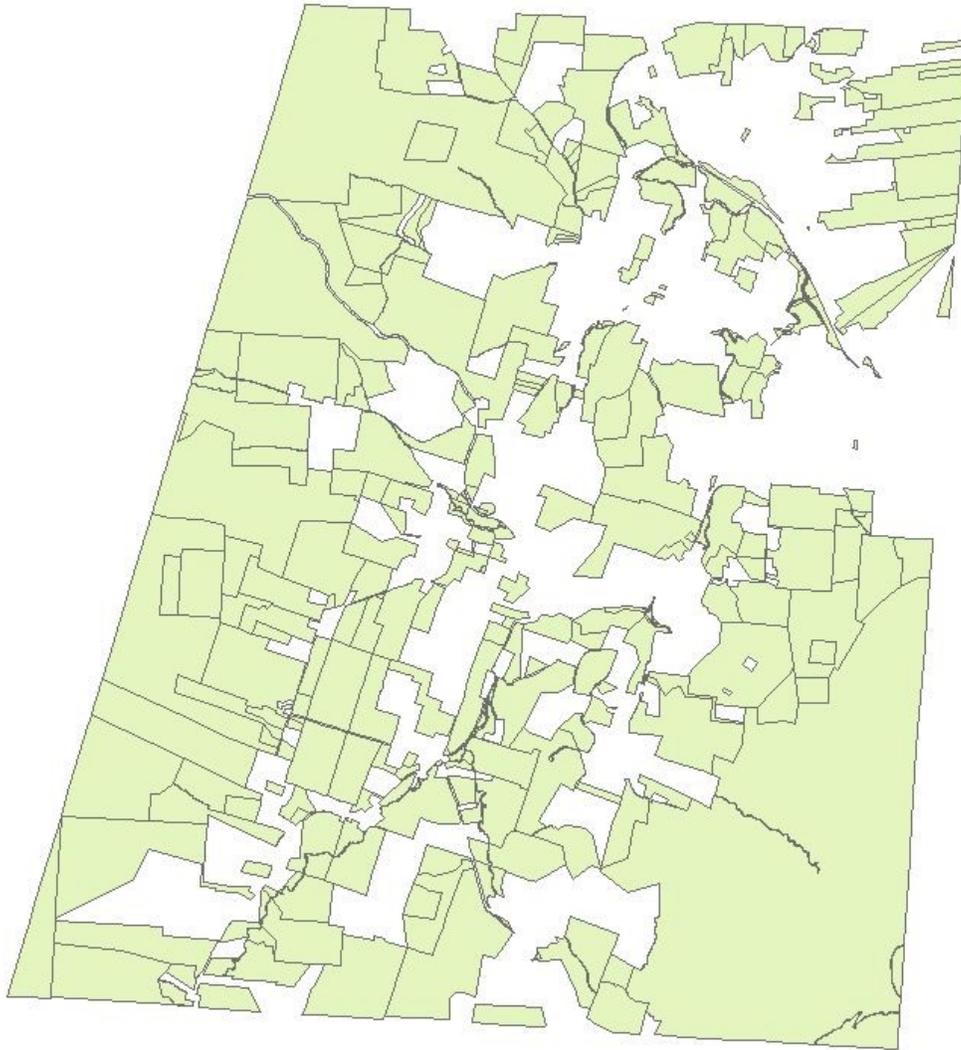
2. COMMUNITY PROFILE

At the time of the 2010 census, there were 7,754 people residing in the town (U.S. Census Bureau 2010). The 2010 census also found that Williamstown was predominantly white at 83.1%. The median household income was \$72,125. However, 7.3% of the population is still below the poverty level (U.S. Census Bureau 2010). The primary employer in the region is Williams College.

A. OVERVIEW OF LANDS

Williamstown, Massachusetts was founded in 1753, and in 1793, it became the home to Williams College. Williamstown began as a predominantly rural region until the mid-19th century, when the Industrial Revolution brought about agricultural development in the area. The scenic hills that are central geological features of the landscape are owed to the erosion of local mountains over hundreds of millions of years. Williamstown, Massachusetts is comprised of 46.84 square miles of land. In acreage, this is roughly 30,000 acres of land. The town rests in the valley of the Hoosic River and is entirely surrounded by mountains. The landscape is composed of a mixture of elements ranging from forested mountains and flat land, small streams and larger rivers, and open farmland, which are used for dairy, vegetable, and hay production. The town center is Williams College, which controls much of the traffic that flows in and out of the local business district as well. Williamstown's aesthetic is rural in nature primarily because of its location and cultural values.

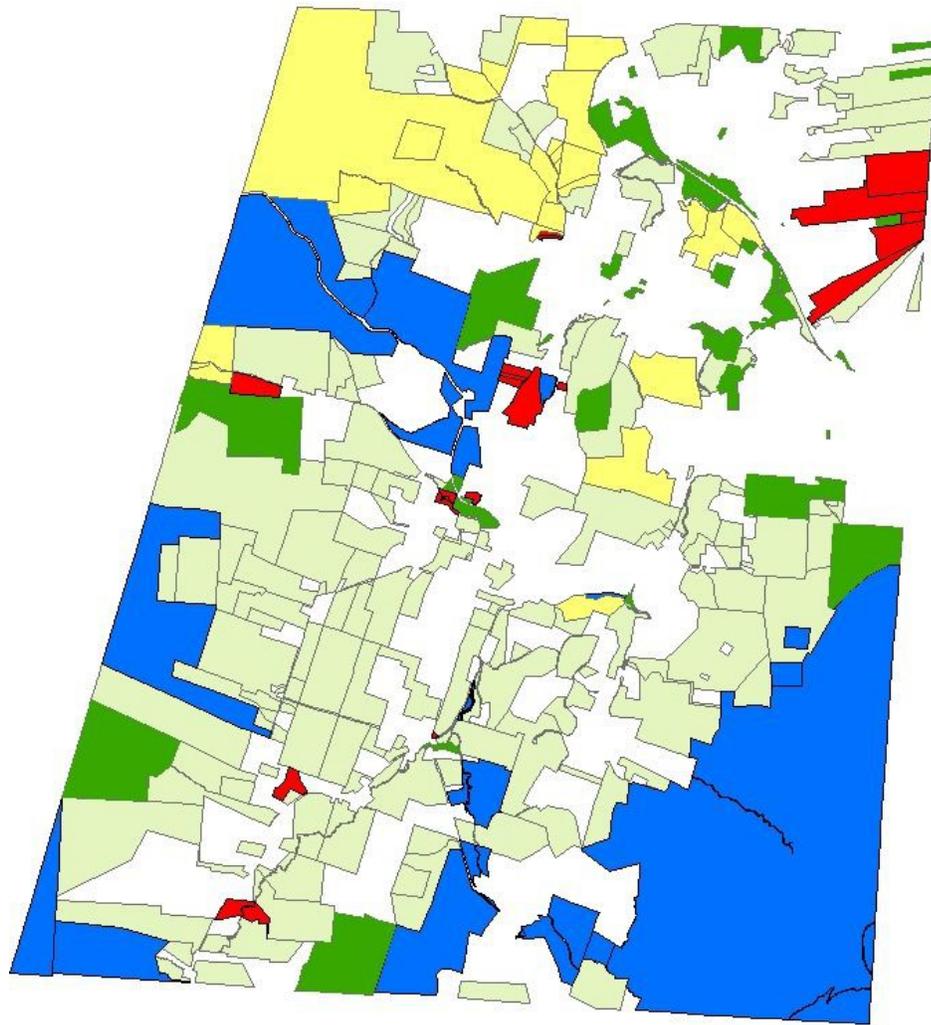
FIGURE 1--WILLIAMSTOWN LANDS MAP



From 2015 Williamstown Open Space and Recreation Plan

Figure 1 is a base map produced in the most recent open lands study conducted in Williamstown. All the lands in green represent all of the open (non-developed) lands in Williamstown. These are the lands that are potentially available for use towards a forestry carbon sequestration project.

FIGURE 2--LANDOWNERS

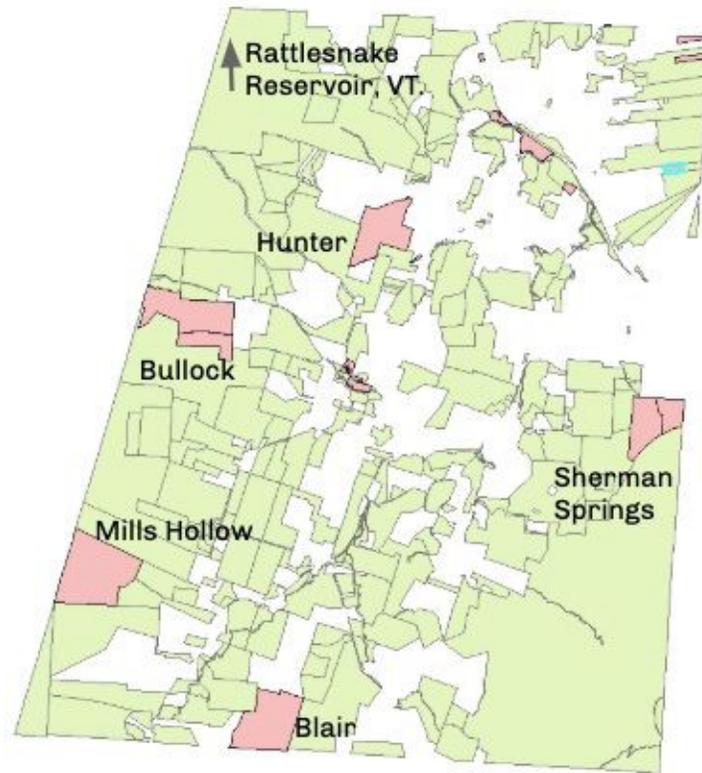


Legend

- Williams College= 2500.53 Acres
- Williamstown Rural Lands Foundation=837.76 Acres
- Town of Williamstown=1775.51 Acres
- Commonwealth Of Massachusetts=6334.90 Acres
- Other Parcels=22686.42 Acres

Figure 2 colors in the lands by some of the town's largest landowners. All the properties that are not filled in belong to various small landowners, and therefore for administrative reasons shouldn't be considered in a larger town carbon sequestration project at this time. The largest tracts of land are owned by the state, but legal complications with state ownership make counting them among the town's acres near impossible. The forested lands of Williams College and the Williamstown Rural Lands Foundation could be factored in, and the latter has expressed direct interest in entering its lands into a carbon sequestration project, but most of the properties are too small and contribute little in acreage for the large administrative costs that would be necessary to aggregate them into a larger project. The one exception is the college's Hopkins Memorial Forest, which is a significant tract of forested land, but the college has already decided not to use it any way that counts it for carbon offsets, since it would not represent any additioality. Therefore the town is left with the larger tracts of land it owns itself.

FIGURE 3--TOWN-OWNED LANDS



<u><i>Property</i></u>	<u><i>Acreage (acres)</i></u>
Blair	224
Bullock	275.5
Hunter	176.5
Mills Hollow	309
Rattlesnake	373
Sherman Springs	162.8
Total	1,520.8

Table 1-- Acreage of Williamstown Lands

Figure 3 highlights in pink all of the town owned lands in Williamstown. The specific properties with large enough acreage are labeled on the map. These are: the Blair property, the Bullock property, the Hunter property, Mills Hollow, Rattlesnake Reservoir, and Sherman Springs (some of these sites are the grouping of two adjacent parcels). It should be noted that Rattlesnake Reservoir, which is indeed the largest property owned by the town, is not in Williamstown at all, but rather just over the border in Vermont, and is therefore not visible on the map. The acreage for each individual site is listed in the table in Table 1. While other forested town-owned properties could be factored into the total acre count, none is significant enough to justify the complexity of aggregating into the larger pool or lands, though they should not be discounted entirely. This report will however focus on the six aforementioned properties as the town's potential carbon sequestration assets. Altogether, the town has approximately 1,500 acres of land that could be used for a carbon sequestration project. Bill Van Doren, a biometrician specializing in carbon projects, states that this is the bare minimum number of acres necessary to consider for a forestry carbon sequestration project. However, some environmental consultant firms such as BlueSource require a 3,000 acre minimum, which Williamstown alone does not meet.

As a note, there is also the Stone Hill Town-owned woodlot, which is of significant acreage. However, logging is forbidden on the site, and therefore there is no potential for additionality in the sequestration of carbon in the trees on the site, as that is being maximized in practice already. Therefore, this site cannot be considered for a carbon sequestration project.

Little documentation is available on these six properties. The Hunter property is the only one under the purview of the Conservation Commission. When the site was donated to the town decades ago, there was much excitement about constructing trails through the site,

and plans have been conceived for this in past CES student reports. However, none have become a reality. The only restriction on the site is that hunting is forbidden. The Bullock site is governed by the Bullock Trust, and the Sherman Springs and Rattlesnake Reservoir properties fall under the purview of the Water Department.

The Blair and Rattlesnake Reservoir sites are the only two properties with any sort of formal management plans. Both are being managed for limited logging by Mr. Ed Denham, New England Woodland Management, Inc. and his forestry crew. All other sites are completely unmanaged. Limited documentation reveals evidence of past logging operations on the Hunter and Bullock properties. There is no documentation whatsoever for Mills Hollow and Sherman Springs.

Currently on the unmanaged properties, there is no regular logging operation taking place. But there is nothing to prevent large harvests to occur at any moment, be that the will of the Town. The potential for additionality on these sites lies in ensuring that the lands will be logged very infrequently on very long rotations, if logged at all. These assurances would be given in a certified management plan or a conservation easement. For the managed properties, additionality lies in the reduction or elimination entirely of the regulated logging practices currently in place.

Therefore, the ability for a piece of land to contribute to a forestry carbon sequestration project depends on its potential for harvesting. While the town owns upwards of 1,500 acres of forested lands, not every acre is harvestable due to excessive slope, inaccessibility, or poor stocking. More data is needed on each property to proceed on the process towards entering the carbon market (see “Needs Assessment” 3.B.I).

B. LOCAL PRECEDENTS

I. TRI-CITY CARBON SEQUESTRATION PROGRAM

A relevant precedent for this report is the Tri-City Carbon Sequestration Program, which was established in July of 2019. This plan is an aggregated carbon offset management plan for the three municipal stakeholders: West Springfield, Holyoke, and Westfield. The project was led by environmental consulting company Bluesource. The project was registered under the American Carbon Registry Standard as an Improved Forest Management project, the American Carbon Registry Forest Carbon Project Standard, and an approved ACR Improved Forest Management Methodology. The project ownership is non-federal U.S. forestland for three separate entities, and the company BlueSource served as the Project Proponent. Greenhouse gas emissions reductions generated by the project activity are generated from forested lands over which the cities have management and ownership rights.

The project proposal states that they are “committed to maintaining forest CO₂ stocks above the regional baseline level” and “ensure long-term continuance of all environmental benefits provided by the conservation of this forestland” (Bluesource 2019). Project action means allowing the forest to progress with conservative sustainable harvesting practices in Holyoke and no commercial harvesting in West Springfield and Westfield. The total projected GHG removal is 996,248 mtCO₂e over the first crediting period of 20 years. The risk assessment was conducted using the ACR tool for risk analysis and buffer determination. The general monitoring method is done through inventory samples and forest growth and yield monitoring. There are also ecological studies and observations of

scale and the ecological landscape in the region. Quantification was done using an analysis of the inventory development and a growth model that compares a baseline harvest schedule scenario to the project scenario of future inventories of carbon offsets, which also includes leakage and uncertainty considerations.

The project is projected to bring in approximately 2 million dollars in revenue over the next ten years (Knight 2019). Williams College is among those who purchased offsets from the Tri-City project, purchasing 600 tonnes at \$10.98 per tonne. This shows that there is local interest in projects like these, and Williamstown may have much to gain by putting its lands towards a carbon sequestration project.

C. FOREST MANAGEMENT BEST PRACTICES

It is important to consider best practices in ecological forest management. On this subject, we have consulted with Ed Denham. Mr. Denham, founder of New England Woodland Management, Inc., is a professional forester, who helps manage forested properties for harvest in Massachusetts, Vermont, and New York. He has worked on various projects for private landowners in Williamstown. He has recently completed work for the Town's Rattlesnake Reservoir property, which will be harvesting within the month, as well as for the town-owned Blair Lot. Mr. Denham runs a very ecologically sound practice, encouraging harvests on much longer cycles, such as 15 to 25 years, and taking into account biodiversity, wildlife, invasive species, and generally the health of the forest and productivity for the next harvest.

Mr. Denham is skeptical of the idea that simply reducing or eliminating the amount of harvesting that might occur on a piece of land over a 100 year period will allow for the

sequestration of more carbon in living trees. He believes that harvests that occur every 25 years or so, when done correctly, open up a forest and allow for regeneration and growth of new trees. Mr. Denham specifically referenced the Hunter property, which he believes is not being managed properly. He has noticed large amounts of dying ash, which once fully dead and start decomposing, will release CO₂ into the atmosphere. He believes if the ash were to be harvested while still viable, the property could regenerate with oak or other species that will actively sequester carbon. He also believes in the forester's responsibility to scarify the soil when harvesting, to help create the best conditions for regeneration. Thus, Mr. Denham is of the opinion that responsible harvesting can be a means to increase the amount of carbon sequestered in a forest over 100 years, not reduce it.

Under some carbon registries, there are methodologies outlined specifically for projects that increase rotation age of harvests. These would be the type of carbon sequestration projects most in-line with Mr. Denham's philosophy of forestry practice.

However, the question of which forest management practices allow for a forest to store the most carbon above ground is a rather contentious one. The public presentation of this report spurred a certain debate about the merits of involving forestry practice in the pursuit of greater carbon sequestration in trees. Some community members expressed concerns that the forestry industry is attempting to take advantage of new market opportunities with carbon sequestration, with the end goal of increased profits, and thus increased levels of logging, which might harm the level of carbon stored in forests. These are genuine concerns, and the town should always be sure to prioritize environmental gains over logging revenue when pursuing a project. It will be the responsibility of the town to use its judgment wisely when engaging with the forestry industry.

Forests are extremely complex structures, and it can therefore be somewhat simplistic to say that infrequent logging will sequester more carbon in a forest over time without being more specific about the logging practice. Here the research of Bill Keaton, Professor at the University of Vermont's Rubenstein School of Environment and Natural Resources, becomes useful. He and his students have been conducting research on forestry practice in Northeastern forests on the University of Vermont's 476-acre Jericho Research Forest in Richmond, Vermont. Specifically, he has been exploring the effects on forest carbon sequestration of a certain forestry practice called "structural complexity enhancement," or SCE. The goal of SCE is to increase the complexity of wooded structures in trees and plants, living and dead, up towards the canopy and on the forest floor. SCE involves loggers thinning out around larger trees, opening very small gaps in the canopy, leaving logs on the ground, girdling to create standing dead trees, and pulling down trees to form tip-up mounds. Research by students has shown that SCE allows for successful regeneration of forest growth, and that significantly more carbon is stored in the trees and coarse woody material of forests managed with SCE than those through conventional logging methods.

However, it is important to note that forest management under SCE does not allow for greater carbon sequestration than no-treatment management. SCE forests store 16 percent less carbon above ground than no-treatment forests. SCE remains the best option if any logging practice is going to occur, as forests logged under conventional logging practices typically store 45 percent less carbon above ground than no-treatment forests, and SCE is the forestry practice Professor Keaton recommends for carbon sequestration projects ("Bill Keaton" 2018). But it is likely the case, as reflected in the opinions of many community members and the official position of the MA Department of Conservation and

Recreation, that forests managed without logging, i.e. no-treatment forests, sequester the most carbon over time. Most carbon registries provide methodologies for projects that convert forests that are unmanaged or managed for logging to forest that are managed without any logging practice.

D. MASSACHUSETTS FOREST REGULATIONS

I. CHAPTER 61: THE FOREST TAX LAW

Private landowners with 10 or more acres of forest land (contiguous) who maintain their property as “open space” are eligible for tax abatement under the Massachusetts Current Use Tax Programs (M.G.L. Chapter 61). The current use programs are comprised of: Chapter 61 for forestlands, Chapter 61A for agricultural properties, and Chapter 61B for recreational or open space properties. Properties enrolled in Ch. 61 and Ch. 61A are taxed at the same rate, determined by the current use of the property (i.e., the productive potential of land for growing trees) rather than fair market or development value of the land. Current use values for forestland are determined annually by the MA Farmland Advisory Commission. Apart from having 10 or more contiguous acres of forestland, the landowners must have a long-term commitment to improving the quantity and quality of timber on their land in order to enroll.

In Williamstown, privately owned lands are classified under Ch. 61 upon submission of a registered forest land management plan and approval for participation from the Conservation Commission. A management plan must describe and map the property resources and include management objectives and recommendations, and is reviewed every ten years.

There is a substantial tax penalty for early withdrawal from the Ch. 61/61A program (DCR 2019).

II. CHAPTER 132: THE FOREST CUTTING PRACTICES ACT

The Massachusetts Forest Cutting Practices Act (M.G.L. Chapter 132, Sections 40-46) protects forests by requiring landowners to file a Forest Cutting Plan with the DCR before timber harvesting on public and private properties. This law regulates timber harvesting of wood products with a total volume exceeding 25,000 board feet or 50 cords on any forest stand or parcel of land. The forest cutting plan (FCP) must be filed with the DCR and the local conservation commission at least ten business days before the proposed start date. The landowner or agent must also notify all abutters within 200 ft. of the proposed cutting area.

FCPs on private land are reviewed by licensed DCR service foresters. Service foresters review the FCP for compliance with wetland mapping, Best Management Practices (BMPs) to protect water resources, and forest regeneration requirements.

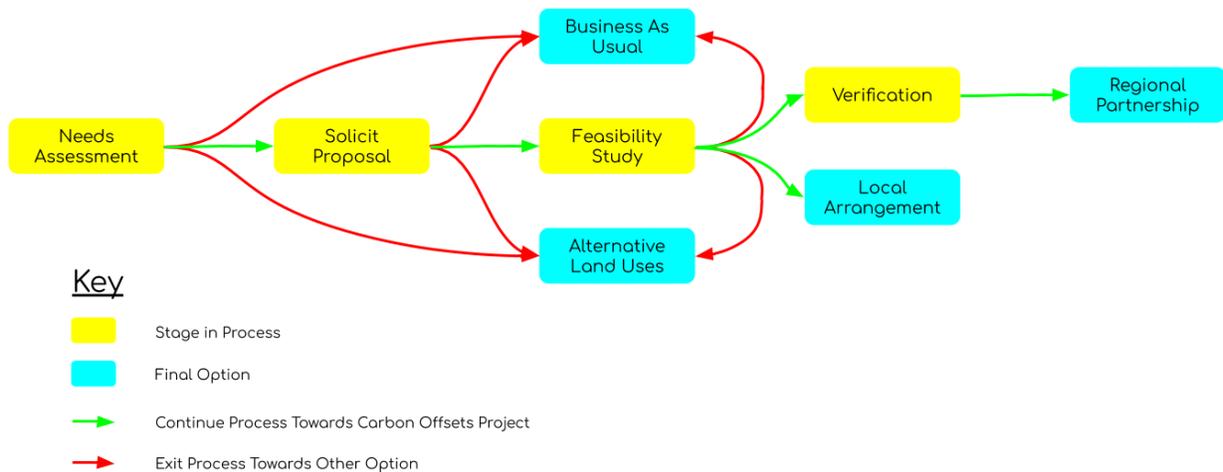
Loggers must hold a Timber Harvesting License in the state of Massachusetts. To obtain a harvesting license, loggers must demonstrate familiarity with Massachusetts timber harvesting laws, complete basic forest ecology and workplace safety training, and provide information about their harvesting from the previous year. Furthermore, Ch. 132 establishes a Forester Licensing Board to recommend Timber Harvesting License qualifications and supervise the processes of licensing, renewal, and complaint adjudication (DCR2019).

3. PROCESS MAP FOR CARBON SEQUESTRATION

A. INTRODUCTION

Figure 4 below maps out the process through which Williamstown might enter the carbon market as an offset producer. Each yellow rectangle represents a stage in this process, some necessary step that must occur before reaching other stages or some final option. Each of the four stages will be described in detail in this section, along with predicted costs and recommended firms to hire.

FIGURE 4-- PROCESS MAP



The blue rectangles refer to final options, or the destinations of any possible path through this diagram. There are four of these as well, two of which (“Regional Partnership” and “Local Arrangement”) involve Williamstown entering the carbon market, and two of which (“Business as Usual” and “Alternative Land Uses”) do not. Each of these options will be described in detail in Section IV, where the benefits and costs of each option will also be considered.

The arrows in the diagram represent choices the town might take at any stage to continue along a certain path through further process stages or towards a final option. Green arrows represent the choices necessary to keep to a path towards a final option that involves entering the carbon market. The red arrows represent decisions to exit the process towards a final option that does not involve entering the carbon market. The town may choose one path over another for various reasons, be it presence or lack of interest or resources, or feasibility or infeasibility of a carbon sequestration project. With each step in the process the town chooses to take, it will gain more information and insight that will guide it towards the best final option.

B. DESCRIPTION OF STAGES

I. NEEDS ASSESSMENT

A needs assessment study takes biomass calculations, inventory documentation and stock projections, and statistical analysis of inventory costs. This provides the landowner with adequate information on how much the land is harvestable and how much carbon can be stored within the confines of their forest. Currently, Blair Lot and Rattlesnake Reservoir lands are the only two parcels of Town-owned land with inventory documentations.

The needs assessment is conducted by plot on a piece of land. Plots are laid out on a grid in the property, the density of which depends on the density and stocking of trees in the forest. Plots are often circular, spanning a certain number of trees, which then stand in for trees outside the plot in the biomass calculations. Since the number of plots depends on the stocking levels of the forest, it is hard to say exactly how many plots a project might have

before the needs assessment is conducted. We have it on good authority that in this region one can expect to have one plot for every 10 to 15 acres of forest.

To begin this process, a landowner hires a forester specializing in carbon projects. One example is Green Timber Consulting Foresters, a Michigan foresting consulting firm that provides needs assessments.

Typically, a need assessment can cost around \$200-225 per plot. However, it is prudent to overestimate costs and given variability of land can cost as much as \$400 per plot. In total, we expect the needs assessment to cost the town \$30-35k for its approximately 1,500 acres of forested land.

II. SOLICIT PROPOSALS

Upon completion of the needs assessment, the next step is to solicit proposals from carbon companies, seeking competitive bids to qualify and register carbon credits for the properties Williamstown is interested in managing for carbon sequestration. Examples of environmental advisory companies that help buy, sell and market verified carbon offsets are 3Degrees, BlueSource and Spatial Informatics Group. In preparation to issue an official Request for Proposal (RFP), it is important to assemble maps, forest stewardship and/ or land management plans as well as prepare to answer any questions from interested bidders.

Important items to include in the RFP are: a specific due date for proposal submissions, specification of the contract period (i.e. beginning September 1 for one year), background

information, a point of contact for questions that bidders may have, and a detailed summary of the scope of work. Developing an effective Request for Proposals document is key to effective gathering of information from potential vendors. An excerpt from an RFP for a Carbon Pricing Study from the State of Rhode Island is found in Appendix A.

III. FEASIBILITY STUDY

The purpose of the feasibility study is straightforward: to establish the viability of a project, and to recommend how the project should be executed. The feasibility study is conducted by an outside body on the lands available and project proposed for them. The team conducting the study will consult the data collected in the means assessment, periodically processing the data and conducting a re-inventory as necessary. In the case of Williamstown, as a registered project with its lands alone will likely not be feasible, it will be the responsibility of the study to explore how best to expand the acreage within the scope of the project. This might include consulting and negotiating with other small municipalities in the region and other larger land owners such as land trusts and/or institutions. The report should also explore the various carbon registries that are available and their various methodologies, and the costs and benefits to choosing any specific protocol from a certain registry. The report should give alternatives as to how to manage the land, which lands to include, partners for aggregation, which carbon registry and methodology is best suited for the lands at hand, and whether to pursue a registered project (see “Regional Partnership” option, Section 4.A.III) or an unregistered project (see “Local Arrangement” option, Section 4.A.IV).

The outside body conducting this report would likely be the environmental consultancy agency brought on during the “Solicit Proposals” stage. If no such body has been employed, a consulting firm should be hired to conduct the feasibility study. Some firms will conduct a complimentary feasibility study without charge, with the understanding that they will be the organization involved in administering the project. Upfront, the costs for a feasibility study can range anywhere from \$5,000 to \$25,000. Such a study takes at least six months, though those involving negotiations with other towns and landowners can extend to a period of multiple years, as was the case with the Tri-City project.

IV. VERIFICATION

Verification is the formal process through which a project is registered with a carbon registry, who then issue carbon offsets for the project which can be listed on the voluntary or compliance markets. For the “Regional Partnership” option, this is a required part of the process. The “Local Arrangement” option, registration with a carbon registry is not the end goal, and therefore this process may not be entirely required. However, the town may very well wish to follow the standard of verification established by these registries, and therefore undergo something akin to verification. More in-depth descriptions of the regional partnership and local arrangement options can be found in Section IV.

Certain decisions will have to be made at the beginning of this process. Many registries, such as Verra, require a third-party verification body to be involved with the verification and registration process. Even when not required, such a body with expertise in such projects is invaluable to have present. These bodies often take the form of accredited environmental consultancy firms, such as Bluesource, 3Degrees, and Spatial Informatics Group. Likely, the

Town will use or have an agreement to use the services of the same firm hired to conduct the feasibility study. The Town will also have to choose which carbon registry it wishes to register with, and which methodology to follow under that registry. Different registries and methodologies will have different costs and benefits for different that vary from project to project. Guidance for these decisions should be provided in the feasibility study.

Each registry has its own set of protocols to follow for each of their methodologies, but generally, the process will involve the following: the project will have to be proposed to the registry. A baseline scenario will have to be established. Standards of monitoring additionality over the years will have to be established and carried out. Monitoring reports will have to be verified and submitted to the registry, which will then issue the offsets for the project.

There are various costs associated with the verification process. There is the cost of hiring a third-party verification body, the labor and administrative costs of monitoring the project over the years, which will involve the retaking of stocks at regular intervals, as well as the fees charged by the registry per offset issued. These costs vary wildly and are difficult to predict at this early stage. A rough estimate would give a range of \$50,000-\$150,000 for the verification process, though this range can be narrowed as more information is gathered on the property and the exact nature of the project becomes more fleshed-out. The initial process of starting up verification (submitting the proposal to the registry, establishing a baseline, etc.) will take a minimum of six months, with the project itself lasting decades, around 25 years for forest management projects under many of the protocols.

	Name of Item	Anticipated Amount (\$)
Costs	Needs Assessment	30k-35k
	Feasibility Study	5k-25k
	Verification	50k-150k
Benefits¹	Funding- MWTP Implementation Grant	20k
	Tri-City Plan credit generation	2m
	Voluntary market offsets	\$7-\$13/credit
Total Net Benefit:		20k-115k/year

Table 2-- Summary of Costs and Benefits

4. EVALUATING OPTIONS FOR A CARBON SEQUESTRATION PROGRAM

A. PLANNING BALANCE SHEET

As illustrated in our Process Diagram (Figure 4), there are several options for engagement in a carbon sequestration program in Williamstown. In order to evaluate each option’s benefits and costs, we utilize the Planning Balance Sheet (PBS). This framework offers a basis for decision-making designed for evaluation in town/urban planning (Lichfield 1968). It is an adaptation of a cost-benefit analysis (CBA), with the addition of non-monetized impacts. Each line denotes an impact that is created by producers and borne by consumers. In the following section, we present four potential directions the Town can take in their land management strategy.

¹ The Department of Conservation of Recreation offers a Stewardship Grant which covers a portion of the cost for a needs assessments and feasibility studies for different management practices. Melissa Patterson, Program Administrator of the DCR, mentioned she was optimistic that within the coming year the State grant would also cover the costs of a carbon sequestration management plan.

I. OPTION ONE: ***BUSINESS AS USUAL***

A business as usual approach maintains the current land management practices for Williamstown owned lands. As of today, Blair Lot (224 acres) and Rattlesnake Reservoir (373 acres) are limited logging sites. The other properties lack management plans. If a needs assessment is not conducted, this is the only option available to the town, though this option remains available to the town at any stage of the process if it does not move to implement new management plans on any of its lands.

Table 3 below presents a PBS evaluation matrix for this option. In summary, this option is cheap and easy, forgoing the administrative processes of conceiving and implementing a carbon sequestration project. But most of the town-owned land remains underutilized, and the town misses the opportunity to do pioneering work in a burgeoning market, and a climate that demands more active involvement in protecting the environment.

<u>Sector</u>	<u>Benefits</u>	<u>Costs</u>
Town of Williamstown	<ul style="list-style-type: none"> • Save money/time on research, additional development, meetings • Continue same revenue stream of current management practices (Blair & Rattlesnake) 	<ul style="list-style-type: none"> • Town residents of Williamstown have expressed interests of more carbon sequestration management practices, this plan would not align with their requests • Miss out on an anticipated growing carbon market -- both regulatory compliance & voluntary
Williamstown Residents	<ul style="list-style-type: none"> • Keep Recreational Uses 	<ul style="list-style-type: none"> • Less forests and wildlife due to continued logging • Loss of potential benefits from carbon markets • Less reduction of CO2 emissions

Table 3-- Illustrative transactions for Business As Usual

II. OPTION TWO: *ALTERNATIVE LAND USES*

As has been discussed before, two of the large town-owned properties, Rattlesnake Reservoir and the Blair Lot, have some sort of management plan in place, both for limited logging operations. If the “needs assessment” stage of the process diagram is completed for all of the properties, data becomes available that makes the creation of management plans possible for these sites.

At any stage in the process map after the needs assessment the Town may decide not to pursue a carbon sequestration project with these lands, due to lack of interest, infeasibility of the project, or other reasons. However, the option remains open to manage these town-owned lands towards ends other than carbon sequestration. This is what we call the “alternative land uses” option.

The possible ends for which a town-owned property can be managed can be boiled down to three main possibilities: harvesting, recreation, and conservation. Harvesting refers to the logging of trees on site in some regular, managed fashion. There are obvious benefits to logging operations, namely profits, but care must also be taken not to disturb the ecological soundness of the forests in the process. This is especially pertinent when one (i.e. an exemplary logging program) considers the viability of logging/harvesting in the short-term.

Williamstown has a wealth of natural resources, and outdoor recreation is a quite popular activity. Increasing public access to these sites, be it through trails or campsites or other outdoor amenities, would likely have public support. Conservation of land is also a well-documented practice in Williamstown. There has long been a desire to preserve the

natural and agricultural aesthetic of the town, and land trusts such as the Williamstown Rural Lands Foundation are generally eager to put more land under conservation easement. There are multiple other options should a carbon sequestration process be deemed unsuitable.

It is important to note that these three purposes, harvesting, conservation, and recreation, are not mutually exclusive land management goals. Indeed, it is conceivable that a parcel be managed in such a way that allows for all three. However, not all land parcels allow for this action. Figure 5 provides an easy flowchart to evaluate the alternative land use options for any individual property. Having conducted a needs assessment, and perhaps a public survey or town hall, answering these questions should be more straightforward.

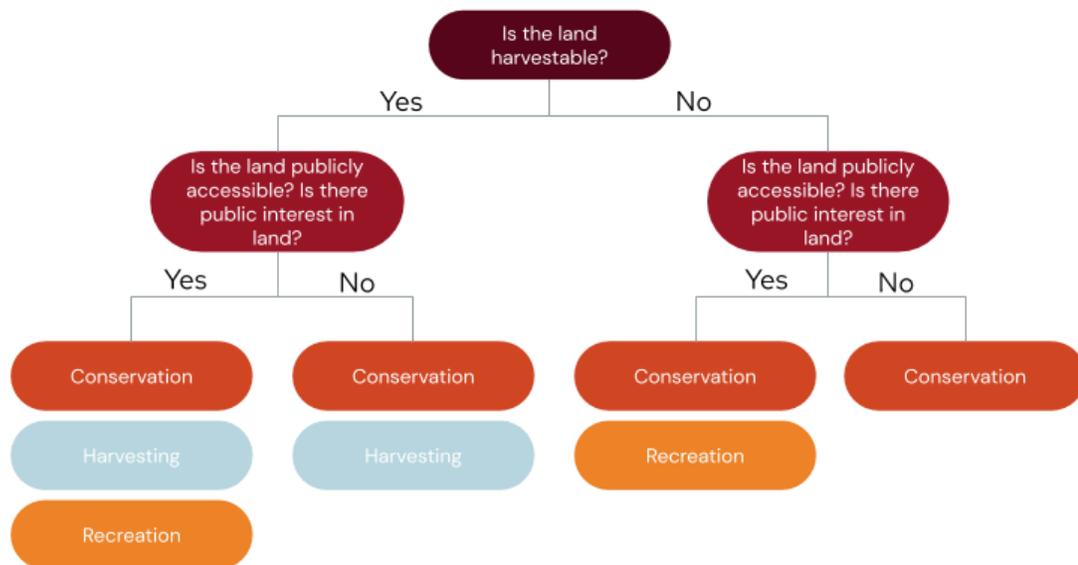


FIGURE 5-- Alternative Land Use Evaluation Flowchart

The first question to ask is whether the property is suitable for harvest. If a site is too steep, or if it cannot be accessed by logging equipment, then harvesting is out of the question.

Inventory is also important to know when answering these questions, as it may be possible that a site has few trees of value, or that certain harvests might become detrimental to the health of the forest. All of these questions should be answered by a needs assessment.

The second set of questions to ask is whether there is public interest in the land, and whether the land is accessible or can be made accessible to the public (the landlocked Blair property, for instance, cannot). Only if the answer is positive to both can recreation uses for the site be considered.

Using this flow chart to evaluate each property, the town can determine what options are available for the management of each site. It is the town’s responsibility to further determine which uses are in its best interest to prioritize.

○ Harvest ○ Rec. ○ Con.	<u>Benefits</u>	<u>Costs</u>
Producer: Town of Williamstown	<ul style="list-style-type: none"> Logging revenue ○ Less of an undertaking than carbon project ○ ● Less restrictive, more flexible ○ ● ● Can still positively impact environment ○ ● 	<ul style="list-style-type: none"> No carbon revenue ○ ● ● Cost of necessary reports, planning, and access ○ ● ● Cost of improving infrastructure, access ●
Consumers: Residents of Williamstown	<ul style="list-style-type: none"> Indirect financial benefit from logging ○ Direct benefit from conservation and recreation ● ● More understanding ○ ● ● Better access to nature ● 	<ul style="list-style-type: none"> No indirect financial benefits from carbon sequestration ○ ● ● Potentially no additionality, not offsetting more emissions ○ ● No learning opportunity ○ ● ●

Table 4-- Illustrative transactions for Alternative Management Practices (Logging, Rec, Conservation)

Table 4 provides a PBS evaluation matrix for the “Alternative Land Uses” option. Which benefits and costs apply to a specific management plan depend on which uses the plan

manages for. When a cost or benefit applies is indicated by a colored circle underneath (blue for harvesting, orange for recreation, red for conservation).

In summary, there is the potential for financial, recreational, and ecological benefits from such plans, which are also far more flexible, involve fewer upfront costs, and are better understood by the public. However, there are still costs to such plans, and any financial gain to be made from entering the carbon market becomes a missed opportunity. It is also quite important to note that certain plans, especially those that at the outset establish infrequent harvesting rotations or prohibit any harvesting, may preclude Williamstown from subsequently using these lands towards a carbon sequestration process in the future. This is because such plans essentially change the status quo to one that encourages the maximum amount of carbon sequestration in these forests. As such, there is no possible additionality to be had in any project that would be proposed in the future. Additional sequestration may occur, but the town cannot profit from it, as is the case with the Stone Hill Woodlot.

III. OPTION THREE: ***REGIONAL PARTNERSHIP***

The regional partnership plan is an aggregation of multiple municipalities (i.e. local neighboring cities/towns) in order to establish mass acreage for an expansive carbon offsets management program. In summary, this plan would be greatly beneficial financially, environmentally, and socially for multiple municipalities combined. This plan considers forming an aggregate partnership with Williamstown and several other municipalities to provide a large acreage of available forest land that would be owned by each municipal body. Environmental management companies like Bluesource, which would be tasked with assisting the municipalities with a project of this type, require a minimum acreage of 3000

acres as criteria (Strauss 2019). An aggregate partnership would certainly meet this criterion, especially since an aggregate plan considers pertinent financial elements related to the purchasing of these offsets to be the most salient element.

<u>Producers and Consumers</u>	<u>Benefits</u>	<u>Costs</u>
Town of Williamstown	<ul style="list-style-type: none"> • Potential revenue • Williamstown acts as a functional interface for the launching of an offset program 	<ul style="list-style-type: none"> • Opportunity costs associated with loss of timber harvesting revenue + risk • High upfront expenditures for regulatory activities
Town of X (depends on town interest, amount of available acreage, and other variable factors)	<ul style="list-style-type: none"> • Would accrue financial gains from local offset generation • Revenue could be used to benefit city infrastructure and underfunded city projects • Ecosystem impact 	<ul style="list-style-type: none"> • Administrative and labor costs in partnership with Williamstown • Some project uncertainty that must be factored into consideration • Projected Stakeholder commitment could change

Table 5-- Illustrative transactions for Aggregation Efforts

Williamstown would act as a functional interface for this plan, as project administration and bureaucratic initiatives would mostly be directed towards it. The plan includes such benefits like positive ecosystem impact through water quality protection, habitat protection, and soil erosion prevention. Another benefit would be that revenue could be used for underfunded projects to benefit the cities/towns. Costs would include opportunity costs associated with timber harvesting revenue, the high upfront expenditures for regulatory

activities, and some project uncertainty related to stakeholder commitments, risks, and baseline CO₂.

There are also potential costs associated with this project that are generally centered around issues related to the very system of an aggregate partnership with a diversity of entities that are not homogenous. Municipal interest and commitment to the project may lessen or even fully wane over time. There are also administrative and labor costs associated with this project, though these costs could be abated somewhat with state-sponsored grants. To be clear, there are also aggregate properties for various non-municipal entities, which would include cooperation with institutions, private non-profits, and privately-owned forest lands located outside of Williamstown as well.

IV. OPTION FOUR: *LOCAL ARRANGEMENT*

The final option for Williamstown to participate in a carbon sequestration project is through an internal arrangement between the Town and another partner, for example Williams College, another interested private institution, or a large metropolitan city such as New York or Boston. The partners would internally negotiate the pricing of carbon offsets. Once reaching consensus, they utilize national carbon registry standards for verification of offsets, yet they do not officially participate in these registries. The Planning Balance Sheet matrix below outlines the expected benefits and costs to the four key agents potentially implicated by this project option.

<u>Producers/Consumers</u>	<u>Benefits</u>	<u>Costs</u>
Town of Williamstown	<ul style="list-style-type: none"> • Fewer issues of scale • Eliminate payments to registry 	<ul style="list-style-type: none"> • Less economic efficiency • Regulatory activities cost
Williams College	<ul style="list-style-type: none"> • Additionality from unused college lands • Academic value (collab w/ CES) 	<ul style="list-style-type: none"> • Admin/labor costs: partnering with Williamstown
Neighboring Large Cities	<ul style="list-style-type: none"> • Extra revenue generated from larger metropolitan areas • Social responsibility/image 	<ul style="list-style-type: none"> • Admin/labor costs: partnering w/ Williamstown • Opportunity cost of participating in a larger-scale registry
Williamstown Residents	<ul style="list-style-type: none"> • Fewer regulatory guidelines • Greater community involvement 	<ul style="list-style-type: none"> • Tax dollars spent on administration of project

Table 6-- Illustrative transactions for Local Carbon Sequestration

The benefits to Williamstown of entering into such an arrangement accrue from bypassing a national carbon marketplace/registry while still using a marketplace verification system. This is advantageous for several reasons. First, bypassing enrollment into a national registry protects the Town from outlays of commissions associated with participation in a registry. Next, given Williamstown's limited acreage, minimum land requirements are likely to hinder the town's participation in a national registry. Internally negotiated acreage requirements would eliminate these issues of scale. A lower acreage, however, entails less economic efficiency from offset credit generation. Furthermore, new expenditures for regulatory activities (third-party verification of quality of sequestered carbon) come with the implementation of an unprecedented model.

5. CONCLUSION

A. NEXT STEPS

Having conducted this report, we believe that the natural next step, as per the process diagram, is to proceed with a needs assessment on the large town-owned lands (Hunter, Mills Hollow, etc.). There are many reasons why we believe this is a preferable option to preceding simply with business as usual:

First, a needs assessment is the necessary first step in any carbon sequestration project that involves forest management. Without it, no such project can even be conceived let alone undertaken. If the town has any intention at all to proceed along the process towards even potentially using its lands for a carbon sequestration project, it must conduct a needs assessment. With the current state of documentation on the properties, there simply is not enough data to properly advise on the formation of a specific project.

Second, some inventory and surveying has already been conducted on the Blair and Rattlesnake Reservoir properties by Ed Denham and his forestry team to develop management plans on the properties for infrequent harvesting. The town is thus already part-way through a needs assessment process. It now needs to fill in this data for the rest of the properties, verify the quality of the data already collected on Blair and Rattlesnake, and use the data to calculate stocks on the property and number of plots per property.

Third, the data collected from a needs assessment-type study can be used towards other ends beyond carbon sequestration projects. It is entirely possible that after conducting the

needs assessment, the town will decide that it is no longer interested in pursuing a path towards carbon trading, or that indeed such a project is simply unfeasible on its lands. However, if this becomes the case, the cost put into conducting the needs assessment will not have been wasted, as the data can be used to develop management plans for the land under the “Alternative Land Uses” option in the process diagram. And thus the town can still benefit, economically, ecologically, and recreationally, if the lands are then managed accordingly for some combination of harvesting, conservation, and recreation uses.

Finally, there is a funding opportunity available from the Mohawk Trail Woodland Partnership that would cover the costs of a needs assessment. This grant, titled the MTWP Implementation grant, gives grantees up to \$20,000 in funding for woodlands related projects. According to the grant application document, a task suitable for funding is the following:

Completion of studies or inventories required to prepare a forest carbon credit market project or forest stewardship planning activities needed to supplement funding provided by the DCR Working Forest Initiative.

This is to say that a needs assessment-type study is specifically outlined as eligible for this grant. Applications must be submitted by January 9th 2020, with the indented contract period over by June 30th, 2020, and deliverables for the project received by July 31st, 2020. A bidder’s conference for the grant was held on November 21st, 2019, with Professor Hank Art, in attendance. Professor Art, reporting on the meeting, believes that the Town would be essentially guaranteed the money it requested if it applied for funds for a needs

assessment under this grant. Further questions about this meeting can be directed towards Professor Art, whose contact information can be found in the appendices. Full documentation for the grant, including a grant description and application instructions, can be found in the appendices.

To reiterate, a needs assessment would cost the town \$30,000-\$35,000. As the application for the grant is due January 9th, 2020, and thus within a very short window after the publishing of this report, the town must act quickly to apply for this funding. And since the contract period for the funded ends June 30th, 2020, a needs assessment is the only step in the process diagram that can realistically be undertaken within that time frame. Should the town wish to proceed on the path towards carbon trading, it is advisable that it apply for the funding and use it for a needs assessment study. The town may also work with other towns in the MTWP who can apply for funding, to combine funding from grants awarded to other towns.

I. PRIVATE AGGREGATOR OPTION

We would like to elaborate briefly on a concept that came to our attention during our research period, which we call the “private aggregator option.” This option addresses the many small, privately held parcels of open land that make up much of Williamstown (see Figure 2). These landowners do not have anywhere near enough land to undertake their own carbon sequestration project, and they alone cannot foot the upfront costs of such an undertaking, but together, these parcels of lands constitute significant tracts of forest that can be optimized to store more carbon.

The private aggregator option proposes the creation of some aggregating body, be it the town, or more likely some private entity. This body would pool together these small lands into one large carbon sequestration project. The aggregating body might contribute larger amounts of land of its own to the pool to help reach a critical mass of land and encourage private landowners to contribute their lands. These private landowners might pay a small fee to put their land into the pool, but then the aggregating body would do the work of taking stock of the lands and roping them into the larger project. The private landowner would then reap a small share of the profits from the project as it progresses.

The possibility of such an option first came to our attention through discussions with David McGowan, Executive Director of the Williamstown Rural Lands Foundation, in the context of discussing the role land trusts might play in town carbon sequestration projects. We did not believe it to be within the purview of this report to investigate the feasibility of such an option, but we believe it to be an intriguing idea, and though highly ambitious, if implemented effectively, it could be hugely beneficial to the town and town residents and landowners. We would encourage future investigations into such an option, possibly with help from Williams College CES.

II. FURTHER QUESTIONS

We hope this report gives comprehensive insight into the best practices for carbon sequestration in forests, the inner workings of the carbon market, and how Williamstown

might use its own properties for carbon offsets. However, there are some larger questions that remain unanswered, questions that simple research will not resolve. For instance, protocols for carbon sequestration projects in forests only take into account the carbon stored above ground. But much carbon is sequestered by trees underground and in the soil of forests as well. Should we be including the biomass of carbon stored underground in our calculations? How much should we be considering active management of forests, potentially with logging practice, when the best approach may very well be a hands-off one, letting nature take its course? How much should we care who our offsets are sold too? Are we supporting certain environmentally harmful industries with our offsets project? That last question proved particularly contentious in the negotiation process between the three cities involved in the Tri-City project.

These questions amount to new ethical dilemmas that come with the brand new territory, and there are a variety of positions, each with their own merits. These are not clear cut issues, and we do not think it healthy for a report of this kind simply to take a stance one way or another. We encourage the town to grapple with these concerns, engage the community in lively debate on these issues of the environment, because the more active the community engages with protecting the environment, the greater the prospects are for a sustainable future.

6. APPENDICES

A. COVER PAGE OF RHODE ISLAND REQUEST FOR PROPOSALS EXAMPLE²



Solicitation Information July 8, 2019

RFP# 7598882

TITLE: Carbon Pricing Study

Submission Deadline: August 5, 2019 10:00 AM (Eastern Time)

PRE-BID/ PROPOSAL CONFERENCE: No

MANDATORY:

If YES, any Vendor who intends to submit a bid proposal in response to this solicitation must have its designated representative attend the mandatory Pre-Bid/ Proposal Conference. The representative must register at the Pre-Bid/ Proposal Conference and disclose the identity of the vendor whom he/she represents. A vendor's failure to attend and register at the mandatory Pre-Bid/ Proposal Conference shall result in disqualification of the vendor's bid proposals as non-responsive to the solicitation.

DATE: N/A

LOCATION:N/A

Questions concerning this solicitation must be received by the Division of Purchases at Max.Rightler@purchasing.ri.gov no later than **July 19th 5:00 PM EST**. Questions should be submitted in a *Microsoft Word attachment*. Please reference the RFP# on all correspondence. Questions received, if any, will be posted on the Division of Purchases' website as an addendum to this solicitation. It is the responsibility of all interested parties to download this information.

BID SURETY BOND REQUIRED: No

PAYMENT AND PERFORMANCE BOND REQUIRED: No

Max Rightler, Senior Buyer

Note to Applicants:

- Applicants must register on-line at the State Purchasing Website at www.purchasing.ri.gov
- Proposals received without a completed RIVIP Bidder Certification Cover Form attached may result in disqualification.

THIS PAGE IS NOT A BIDDER CERTIFICATION COVER FORM

² Note: The full Request for Proposals document can be found online at:
<https://www.bidnet.com/bneattachments/?/581235720.pdf>

B. MOHAWK FOREST WOODLAND PARTNERSHIP GRANT



**EXECUTIVE OFFICE OF ENERGY &
ENVIRONMENTAL AFFAIRS
KATHLEEN THEOHARIDES, SECRETARY
GRANT ANNOUNCEMENT**

**MOHAWK TRAIL WOODLANDS PARTNERSHIP -
IMPLEMENTATION GRANTS**

ENV 20 DCS 15

DATED: NOVEMBER 6, 2019

RESPONSES DUE: JANUARY 9, 2020

COMMBUYS BID # BD-20-1042-ENV-ENV01-45719

OVERVIEW AND GOALS: In support of Section 91 of Chapter 209 of the Acts of 2018, which established the Mohawk Trail Woodlands Partnership (MTWP) and called for partnership and collaboration among state, regional, and local governments to advance the goals of the Partnership, the Executive Office of Energy & Environmental Affairs (EEA) hereby offers grants to communities that have voted to participate in the MTWP, and the regional planning agencies specified as MTWP Board Members in Section 91 of Chapter 209 of the Acts of 2018, to engage in activities and program to advance the goals of the Partnership.

PROPOSALS SOUGHT FOR: Activities and programs that advance the goals of the Mohawk Trail Woodlands Partnership

TYPE OF PROCUREMENT: Grant

CONTACT PERSON: Bob O'Connor
Executive Office of Energy and
Environmental Affairs
100 Cambridge Street, 9th Floor
Boston, MA 02114
Robert.OConnor@mass.gov

RESPONSE DUE DATE: January 9, 2020 at 5:00 PM

SUBMIT RESPONSES TO: Bob O'Connor (*see above*)

MULTIPLE CONTRACTS: Each community or Regional Planning Agency (RPA) may submit or participate in only one application with the exception that an RPA may apply more than once if it is applying on behalf of a municipality. Multiple applicants will be selected for funding.

BIDDERS CONFERENCE: A bidder's conference will be held at 2:30 pm on November 21, 2019 at the Berkshire East Ski Lodge at 66 Thunder Road, Charlemont, MA

In addition, questions will be accepted through December 19, 2019 at 5pm and should be directed to Robert O'Connor at robert.oconnor@mass.gov. Answers will be posted on COMM-BUYS.

SINGLE OR MULTIPLE DEPARTMENTS MAY CONTRACT UNDER THIS RFR:

ALL contracts awarded under this RFR will be utilized solely by EEA.

TOTAL ANTICIPATED DURATION OF CONTRACT (S): The contract period will end by June 30, 2020, and deliverables for these contracts must be received, along with final billing, by July 31, 2020 (exceptions and contract extensions are unlikely, will be handled on a case by case basis, and addressed in individual contracts).

ANTICIPATED BUDGET: Up to \$20,000 per municipal proposal, or \$60,000 per proposal from a regional planning agency, will be available, though exceptions may be made at the Secretary's discretion. Proposals are expected to vary in the amount of funding requested based on the anticipated activity.

REGULATIONS, STATUTES, OR AUTHORIZION GOVERNING THIS GRANT

PROGRAM: This RFR is issued in support of Chapter 209 of the Acts of 2018, Section 91, which created the Mohawk Trail Woodlands Partnership, established a process for communities in the Mohawk Trail region to opt into the MTWP, called for partnership and collaboration among state, regional, and local governments to advance the Partnership, and specified purposes for the Partnership. Such purposes are compatible with those of EEA and with funding authorized in line item 2000-7072 of Section 2 for activities to be funded via this procurement that include providing funding and establishing programs for natural resource conservation, recreation, landscape-scale land conservation, climate resilience, and local and regional land use planning and management.

MATCH REQUIREMENT: A match in the form of volunteer or town staff time or additional municipal or regional planning agency funds is encouraged, but not required.

PREVAILING WAGE APPLICABLE: No

IDENTIFICATION OF CONTRACTS WITH COMMONWEALTH AGENCIES OR SUBDIVISIONS: Yes

IDENTIFICATION OF FINANCIALLY INTERESTED PARTIES: No

RFR DISTRIBUTION (Comm-Buys): This RFR has been distributed electronically using the COMM-BUYS system, and is also posted on the website of the Executive Office of Energy and Environmental Affairs. Proposal are to be submitted directly to EEA to the attention of Bob O'Connor at the address provided on the first page of this procurement. It is the responsibility of every Respondent to check for any addenda or modifications to an RFR to which they intend to respond. The Commonwealth of Massachusetts and its subdivisions accept no liability and will provide no accommodations to Respondents who fail to check for amended RFRs and submit inadequate or incorrect responses. Potential Respondents are advised to check the "last change" field on the summary page of RFRs for which they intend to submit a response to ensure they have the most recent RFR files.

Respondents may not alter RFR language or any RFR component files. Those submitting a proposal must respond in accordance to the RFR directions and complete only those sections that prompt a Respondent for a response. Modifications to the body of this RFR, specifications, terms and conditions, or which change the intent of this RFR are prohibited. Any unauthorized alterations will disqualify response.

RESPONDENT ELIGIBILITY: This RFR is open to -

- Municipalities that have officially voted (by Select Board, Town Meeting, City Council or Signature of the Mayor) to join the Mohawk Trail Woodlands Partnership on or before a contract is signed with EEA (individually or as a group for a multi-jurisdictional project with an identified lead community or regional planning agency with whom the state will contract). Municipalities are expected, subject to EEA approval and following public procurement laws, to sub-contract with a non-profit, planning consultant, regional planning agency, a construction firm, or other appropriate vendor to complete approved proposals.
- Regional Planning Agencies (RPAs) named as MTWP Partnership Board members. RPAs may, with EEA approval, sub-contract with a vendor appropriate to the proposed activity.

PROJECT DEFINITION: EEA seeks to further two of the goals of the Mohawk Trail Woodlands Partnership as created in Massachusetts General Law Chapter 209, Section 91 of the Acts of 2018 for municipalities that have officially voted to join the Partnership. These goals are to: 1) increase economic development related to sustainable forestry and natural resource-based tourism in the municipalities and 2) increase forest conservation and sustainable forestry on private and municipal lands.

Responses can be for a project within a single municipality or for a planning or implementation activity across municipal boundaries or for the entire Partnership region. For example, five communities interested in forest stewardship for municipal lands may submit a regional application. Regional responses will require the endorsement, via a letter of support, from any community that is to be the subject of a proposal.

Tasks suitable for funding under this RFR include but are not limited to:

- Completion of studies or inventories required to prepare a forest carbon credit market project or forest stewardship planning activities needed to supplement funding provided by the DCR Working Forest Initiative;
- Completion of studies or implementation projects such as signage, tourism facilities or woods roads or trail repairs to support natural resource-based tourism related to hiking, bicycling, rafting, hunting, fishing or other outdoor recreational activities;
- Completion of studies or implementation projects such as educational exhibits about sustainable forestry to support local sustainable forestry projects or natural resource-based tourism ;
- Technical assistance or education projects to assist businesses or landowners and support sustainable forestry or natural resource-based tourism;
- Design, planning or other activities to prepare the community to apply for other grants or funding to further the above two goals;
- Acquisition of trail easements, river protection easements or town forest or conservation

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- land especially when needed to supplement other funding sources;
- Other projects to support local sustainable forestry or natural resource-based tourism that are outlined in the Mohawk Trail Woodland Partnership 2014-2015 Plan.

Ineligible activities:

- Funding of maintenance activities or activities already funded by municipalities and their staff;
- Funding of projects that do not directly support the sustainable forestry and natural resource-based tourism goals listed above.

GRANT REQUIREMENTS: As a condition of funding assistance contracts executed under this RFR will include a clause noting that grant recipients agree to share the end product of the funded activities with EEA and with other communities in the Commonwealth through reports, meetings, workshops, and to highlight these activities in print, on the web or other media outlets. EEA is to be credited for project funding.

All contracts resulting from this RFR will require a brief project update every quarter. These updates will include a summary of tasks achieved and include all public outreach materials created during this period. A final report is also required. This final report must include a copy of the completed tasks as contracted. An electronic & paper copy of all deliverables must be sent to EEA.

INVOICING: Granted funds will be disbursed on a reimbursement basis. Reimbursement requests should be submitted at least quarterly. Grantees must prepare a final report and invoice upon project completion that details all costs incurred and matching funds provided. Only work completed during the period of the executed contract will be eligible for reimbursement. Upon receipt of all required deliverables the community will be reimbursed for the balance of any grant funds outstanding.

SUBMISSION REQUIREMENTS: Submit an electronic copy of the proposal on appropriate media (CD or memory stick) along with ONE printed original (clearly marked as such) and THREE printed copies directly to EEA to the attention of Bob O'Connor at the address provided on the first page of this procurement. Each Proposal must clearly indicate that it is an application to the Mohawk Trail Woodland Partnership Grant Program on the title page of the Proposal and on the shipping container used in delivering the Proposal. Failure to provide any of the materials listed below may result in the disqualification of the Proposal. Proposals must be submitted on or before January 9, 2020 at 5:00 PM. A postmark will NOT be accepted for verification of date of submission, though Proposals will be accepted by regular mail & courier in advance of the submission date & time. Proposals will NOT be accepted by fax machine or email.

Project proposals must include the following:

- Projects must be focused on furthering one or both of the two goals listed above in the Project Definition Section;
- A task-by-task description of each major element of the proposed project including means of accomplishment, projected budget, a timeline indicating anticipated initiation and completion; any product to be delivered or outcome to be realized, and proposed measures of success;

- Explanation as to how proposed activities meet the evaluation criteria;
- A letter(s) committing to participate, if a multi-jurisdictional application;
- If a proposed task is implementing a recommendation from the MTWP Plan, a Master Plan or other plan, Climate Vulnerability Assessment, or other document include a copy of relevant pages;

If selected, the Respondent will be required to submit the following forms to complete a contract:

- Commonwealth Standard Contract Form
- W-9 Form
- Commonwealth Terms and Conditions filled out and signed by the Applicant
- Authorized Signatory Listing Form

Electronic Funds Transfer (EFT) set-up form

Respondents are encouraged to review these forms prior to submission of a Response. They are available at: <http://www.mass.gov/anf/budget-taxes-and-procurement/oversight-agencies/osd/osd-forms.html>

EVALUATION CRITERIA: Each Response will be scored using the following measures:

- Advances one or both of the goals outlined in the Project Definition Section; (20 Points)
- Utilizes funding efficiently & provides it where it is most needed; (20 Points)
- Provides a product that is readily usable (whether a plan, design or physical structure) to further the above goals; (15 Points)
- Contains a component to gather input from the community or an educational or technical assistant component, if applicable; (15 Points)
- Involves more than one municipality collaborating regionally on similar and related tasks or the product can be used by other communities in the MTWP; (10 Points)
- Provides a match in the form of volunteer time or staff time or donated services or materials (although this is not required, it is encouraged); (10 Points)
- Considers and incorporates resilience to climate change into the project; (10 Points)
- Projects will be rated on a scale of 100 points.

NOTE: EEA reserves the option to interview some or all of those submitting a proposal for the purpose of clarifying a proposal prior to making a final award.

PROJECT TERMS: A final contract is subject to successful negotiation of a Final Scope of Services. Please note that EEA does not guarantee that any contract may result from this RFR or that any particular funding level will be awarded. It is anticipated that projects could commence immediately upon contract execution. The awarded contract will be reviewed during its course and, upon request by the Contractor, may be extended at the sole discretion of EEA for up to one additional year. Any extension granted will not necessarily change, or increase, the monetary value of the contract.

C. INTERVIEWS

Hank Art--Professor, Williams College

Andrew Groff--Community Development Director, Town of Williamstown

Jason Hoch--Town Manager, Town of Williamstown

Bill Van Doren--Senior Scientist and Lead Biometrician, Spatial Informatics Group

David McGowan--Executive Director, Williamstown Rural Lands Foundation

Keith Ross--Senior Advisor, LandVest

Josh Strauss--Vice President, Bluesource

Ed Denham--Professional Forester, New England Woodland Management

Melissa Patterson--Program Administrator, Department Of Conservation and Recreation

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