

Town of Bethlehem

Open Space Plan:

Conservation Criteria Implementation

December 2017

FINAL

Prepared by:

**Bethlehem Department of Economic Development and Planning, and
M.J. Engineering and Land Surveying, P.C.,
with support from the
Conservation Easement Review Board**



**Engineering and
Land Surveying, P.C.**

Executive Summary



Open space conservation planning has been a topic of discussion in Bethlehem for over a decade, and has been a focus of numerous committees, meetings, focus groups and written reports. A consistent recommendation found in these efforts, from the 2005 Comprehensive Plan to the 2014 Open Space Program Resolution, has been the development of conservation criteria to evaluate conservation opportunities when they arise. As a result, in February 2017 the town hired M.J. Engineering and Land Surveying, P.C. (MJ) to assist the town planning department in the development of conservation criteria and ultimately, this open space plan. This open space plan document describes how the town first developed four open space conservation values

maps; then a list of 25 conservation criteria; and finally, a GIS-based conservation analysis tool to inform ongoing current and future open space conservation tools in town. With the assistance of the Conservation Easement Review Board the following was prepared:

- 1. An updated, town-wide open space inventory and database, as illustrated in four Open Space Conservation Values Maps:**
 - a. Community Character
 - b. Recreation and Greenways
 - c. Forests, Fields and Wildlife Ecosystems
 - d. Natural Water systems: Streams, Wetlands and the Hudson River
- 2. A list of data-driven Conservation Criteria (25) with which to evaluate open space land for its conservation values.**
- 3. An effective, flexible, data-based method - the GIS Conservation Analysis Tool - to evaluate, numerically score, and prioritize the conservation of open space land.**

Implementation of the conservation values maps, conservation criteria, and conservation analysis tool will occur through ongoing use by the Town Board, Planning Board, Planning Department staff, and the Conservation Easement Review Board. The conservation criteria and analysis tool will prepare and guide the town in responding to landowner-initiated inquiries about conservation opportunities, as well as inform the town's development review and design process. Further, it will inform the use of limited financial resources and direct future funds to the conservation of open space land that will have the most beneficial impact town-wide. Having this open space plan in place will also support town applications for state, regional and federal grant funding for conservation implementation.

Implementation can be achieved through current conservation tools as follows:

- 1. Conservation Easement Exemption program:** If a landowner applies to the town's Conservation Easement Exemption program, the Conservation Criteria and the Conservation Analysis Tool will inform the Conservation Easement Review Board about the conservation benefits of the land. The CEE program invites interested/willing landowners with 5 acres or more of open space to apply for tax exemptions in exchange for placing a conservation easement on their land for a certain period of time (from 15 years to perpetuity).

2. **Conservation within the development process:** The Conservation Criteria and the Conservation Analysis Tool can inform, where appropriate, the support of Conservation Subdivision or Planned Development District projects within the town's development review process administered by the Planning Board. These design options that include density incentives can help to conserve priority open space areas, while clustering development in less sensitive areas on the development site.
3. **Partnerships with local land trusts (MHLC, Scenic Hudson, or other):** If a landowner is interested in conservation, but the situation is more suitably handled through a land trust, or a partnership with a land trust, the town can foster that collaboration. Additionally, if a Conservation Easement, Conservation Subdivision or Planned Development District results in the conservation of land that is most effectively owned and/or managed by a land trust, the town can work with the land trust to facilitate that result.



Potential future implementation tools that would need funding, and could include the development of a dedicated open space fund:

1. **Conservation through purchase development rights (PDR):** If a private landowner expresses interest in selling their development rights to the town, the Conservation Criteria and Conservation Analysis Tool will inform the conservation benefits of the land. In this case, the land remains under private ownership and thus, ongoing stewardship and maintenance costs are incurred by the landowner.
2. **Conservation through purchase of land:** If a private landowner expresses an interest in selling their land to the town for conservation, the Conservation Criteria and the Conservation Analysis Tool will inform the open space benefits of the land. If the town purchases land, there may need to be a land management and stewardship plan in place, and potentially funding to support that ongoing stewardship, whether the land is maintained directly by the town, or if there is an agreement with a land trust for ongoing stewardship.

This current open space planning process included public engagement and the gathering of public comments at several stages, including a public workshop in October at Five Rivers Environmental Education Center, a “Scenic Bethlehem Photo Survey” that invited residents to send the town photos of “scenic open and natural spaces” in town; opportunities for discussions with town staff on three summer Saturdays at the Delmar Farmers Market; maps, displays and opportunity for comment at the public library during the months of July and November 2017; several public presentations to the Town Board and ongoing updates to the town's Open Space Planning webpage; a Town Board member and ecologist-led kayak eco-tour on the Hudson River; and a dedicated email for comments at OpenSpace@townofbethlehem.org. The public engagement efforts highlighted the understanding that voluntary participation by interested landowners is key if the Town is to have success in open space conservation. The conservation criteria and analysis tool has been developed to be flexible and revisited as time goes on. By regularly using the conservation planning tools in the appropriate situations, the town can maximize conservation at several levels that ultimately will aim to strike a sustainable balance of both developed and open space land, maintaining the ecological integrity and community character enjoyed by all of us. During implementation of this open space plan, ongoing public engagement efforts are recommended to inform the public about conservation achievements and the various conservation tools and options that are available through the town. Going forward, if the town desires to purchase land or development rights it will need to raise funding. In order to do this, residents will need to decide how to effectively and fairly collect these funds to be used solely for the purchase of open space. These monies will need to be kept in a fund in advance of conservation opportunities so that when priority conservation land becomes available for sale, the town is ready to act in a timely manner.

I. The Purpose of Open Space Planning – finding the balance between development and conservation open space land



Bethlehem is a unique place where people want to live and where businesses continue to thrive. Bethlehem's [Comprehensive Plan](#) vision for the town in the year 2020 reflects on Bethlehem as a community of attractive residential neighborhoods, vibrant hamlets, successful mixed-use commercial centers, modern industrial facilities, and productive rural lands. A balance between development and open space conservation is critical for the continued achievement of this vision. Over the years, the town has lost a good deal of its open space to the development of housing, industry, commerce and other land uses, many of which support and add value to the community. Developed areas in town are important because they provide places for people to live and work, they provide nearby businesses and restaurants offering opportunities for local shopping and socializing. Developed land can also help to balance the tax base for town residents.

At the same time, important open spaces that are kept in a natural, undeveloped state are also essential to conserve in town, not only because they serve as valuable recreational and scenic resources, and link us to our culture

and history, but open spaces also provide “natural systems services” that protect water and air quality, as well as wildlife habitat, biodiversity and public health. The full composite of these town features, both developed and undeveloped, make up our town's unique community character and enhance both its intrinsic and economic value. The risks of NOT conserving open spaces provides a picture of what Bethlehem could look like if we made no effort to conserve land. Losing key open spaces could potentially lead to increased traffic congestion, loss of our natural systems and habitat, increased cost of community services and infrastructure maintenance, the increase of potential human-wildlife conflicts as animals will have less space to live, and a loss of farmland, community character and scenic beauty. Open space planning does not aim to stop or curtail development activity, or to limit or curtail the rights of private landowners. The town must find creative economic and other incentives to make it financially desirable to conserve open space in its undeveloped state.

Benefits of Conserving Open Spaces

- Natural Systems Services: clean water, clean air, temperature cooling, farming, forestry, flood reduction, cost savings (less need for engineered “fixes”).
- Climate change resilience.
- Wildlife habitat, biodiversity, and decreased wildlife/human conflict.
- Community cost savings: open land costs town less than development, helps to balance the tax base.
- Quality of life and public health: water quality, air quality, local food, recreation, greenways, trails.
- Community character: forests, farmland, diversity in landscape, connection to history, recreation opportunities, scenic beauty.

Risks of Not Conserving Open Spaces

- Loss of community character and scenic beauty provided by forests, fields, wetlands.
- Further reduction of local agricultural lands and working landscapes.
- Climate change vulnerability.
- Less places for wildlife to live and travel; increase in human-wildlife conflicts.
- Residential development, particularly single family homes, is a net loss to town taxpayers because more is spent on services than collected in taxes.
- Missed opportunities for mitigating traffic increases, potential traffic congestion, and infrastructure construction and maintenance needs (water, sewer, stormwater, etc.).

So how does the town both manage growth while also conserving valuable open spaces that are important to the town when these seem like opposing goals?

The key to maintaining Bethlehem's mix of appropriate development and important open spaces is being prepared with a plan and an implementation program that include: an open space inventory, a list of data-driven conservation criteria, and a method to evaluate and prioritize conservation opportunities that arise within the town. To be successful the Town needs a set of flexible conservation implementation tools that include financial incentives for landowners and developers, so that when conservation opportunities arise, the town can be ready to respond efficiently and effectively. By regularly using these thoughtful conservation planning tools in the appropriate situations, the town can maximize conservation at several levels that ultimately will aim to strike a sustainable balance of both developed and open space land, maintaining the ecological integrity and community character enjoyed by all of us.

"The purpose of open space planning is to ensure that future consumption of land for development is balanced with the conservation of land for its open space value."

*Citizens Advisory Committee on Conservation, 2009,
Recommendations on Open Space Needs and
Opportunities.*

Several past focus groups and surveys, as well as recent public comments, show that as a community, residents appreciate and want to conserve Bethlehem's open space and natural resources. While many residents agree that the existence of our open spaces makes Bethlehem a special place now, they are also mindful of the development pressures that inevitably face a desirable community like Bethlehem. Growth trends in the past several decades show consistent and ongoing development, and that is predicted to continue as more people want to live and work in Bethlehem ([see CPAC presentation on Demographic and Development Trends Overview](#) showing trends from 1990-2011).

This document sets forth a plan for the implementation of open space conservation utilizing conservation criteria. This tool is a key component of Bethlehem's open space program. Additionally, the document outlines a variety of incentive-based conservation tools (current and future), that can be used either town-wide or on a case-by-case basis, to help balance the town's future growth with thoughtful, data-driven and well-planned conservation going forward.

Overcoming challenges of conserving open space in Bethlehem: Private landowners with large acreage of open space are often burdened with maintenance costs (fencing, brush hogging, etc.), and issues with illegal trespassing and dumping, sometimes making it difficult to keep land in open space. Farmers face challenges with an aging population, few young people interested in farming, and the lack of a local agricultural economy and farm services. The current competitive regional and local real estate market can present a challenge to these landowners who often feel pressure to sell to developers (it is their right to do so, but it is a challenge if that is not their desire). Running parallel to



maintaining land in an open space state, the town is a desirable place to live and is faced with the challenges of attracting the right blend of commercial development to locate in town to balance a heavily residential tax base. All of these factors combined create obstacles for open space conservation. This open space plan does not solve all of these challenges, but provides the next steps and tools to continue to address them.



- **Working with interested and willing private open space landowners:** The town and its residents appreciate and respect the landowners in Bethlehem who currently maintain large - anywhere from five to hundreds of acres - tracts of open space land. These families have often been living here and stewarding this valued open space in the community for decades, and often for generations. If open space landowners wish to keep their land in open space, but due to financial difficulties are having trouble doing so, the town would like to work with them to conserve their land. The whole community benefits from this partnership. Keeping in mind that most of the open space land in Bethlehem is in private ownership, and that private landowner rights are paramount, potential opportunities for conservation will need to be initiated by interested landowners. Conservation opportunities will occur only when landowners desire for the town to help them conserve their land, and where there is mutual benefit for the landowner and the town (currently through a Conservation Easement Exemption, and potentially in the future through Purchase of Development Rights or land purchase).

- **Working with the agricultural community:** Combined with the open space stewardship and management challenges mentioned above, farmers in our community face additional issues based on the fact that their land, and its production, is part or all of their livelihood. Large tracts of land in Bethlehem historically were used for farming. The farming economy has changed over the decades, making it difficult for farmers to keep land open and in the agricultural business. Interviews of 11 Bethlehem farmers summarized in the 2009 Agriculture and Farmland Protection Plan help us to understand the perspective of the town's current aging farm population's opinion about future of farming potential in town. These interviews indicate a generally pessimistic outlook on local future farming potential and soils data in the report show a local lack of good soils for farming (food crop). However, interested landowners with financial incentives could find innovative ways to keep Bethlehem land in production (food, fiber, livestock, flowers, forestry, agro-tourism, etc.). If town residents continue to express an interest in supporting local farmers and local production of food and other farm products, the town could establish resources to facilitate the connection of landowners and farmers/producers when these opportunities exist, and bolster the necessary nearby farm support services, to keep local land in farming. See Attachment 11 for some regional projects and ideas illustrating how the town could assist in the rejuvenation of agricultural economy and help to keep agricultural open space conserved and viable.

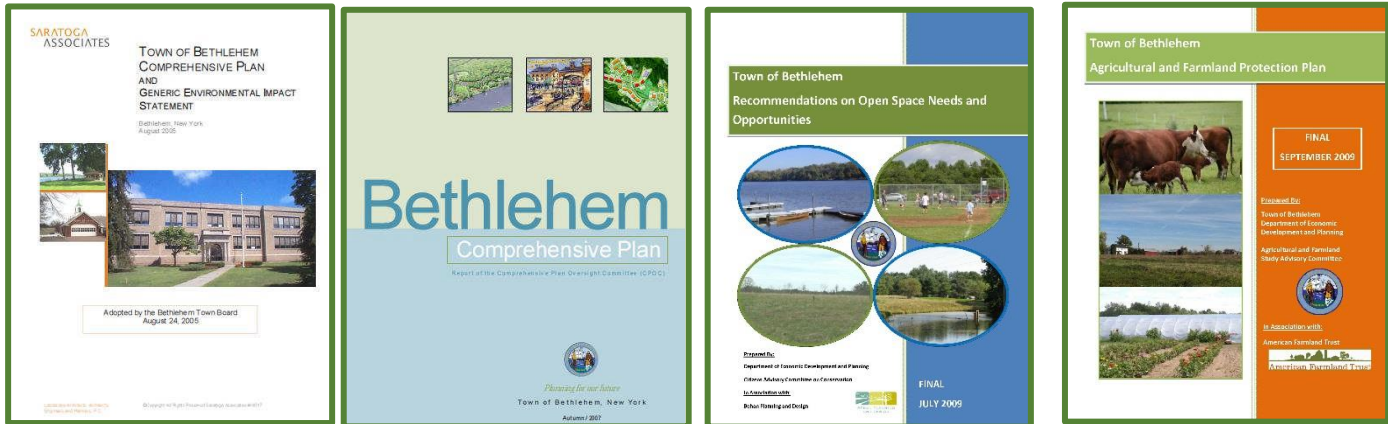


- **Working with developers:** When land is sold or slated for development, in many cases there is still opportunity for open space conservation. The town can incentivize conservation subdivision (CS) site designs or planned development districts (PDD) that will provide mutual benefit for conservation and for the developer (as key natural areas are conserved and development is concentrated, sometimes with increased density, on less sensitive areas).



II. Background of Open Space Planning – past efforts and recommendations

Open space conservation planning has been a topic of discussion in Bethlehem for over a decade, and has been a focus of numerous committees, meetings, surveys, focus groups and written reports. This Open Space Conservation Implementation Plan draws directly from the recommendations of these past efforts, and provides the logical next step in the town's open space planning and program implementation efforts. A brief history of these open space planning efforts in town is summarized below.



In August 2005, the Town of Bethlehem adopted its first-ever **Comprehensive Plan**. The adoption culminated an eighteen month public process and conversation about the future of the community. One recommendation of the 2005 Comprehensive Plan was for the Town Board to consider the creation of a Farmland and Open Space Protection Program. Another recommendation of the Comprehensive Plan was to establish a Citizens Advisory Committee on Conservation (CACC), which was established by the Town Board in 2006 to explore conservation projects, and opportunities with willing landowners. One of the Committee's products was the **"Open Space Protection Programs – Funding and Tools Report"**, which presents an overview of open space funding methods, programs, and sources applicable to the Town, and will continue to provide useful information to the town in the near future as it considers future land purchase or purchase of development rights funding. **The CACC's report also recommended the town create (and gave an example of) a conservation criteria list to help evaluate and prioritize conservation lands, which is a direct product of this Open Space Conservation Implementation Plan.**

Shortly thereafter, in 2007, the **Comprehensive Plan Oversight Committee (CPOC)** was formed to help guide the Town Board in the implementation of the Comprehensive Plan. That same year, the CPOC recommended the Town Board initiate the farmland and open space planning process. In early 2008, the Town Board authorized the development of a Farmland and Open Space Protection Program. The effort resulted in two products in the summer of 2009: a **"Recommendations on Open Space Needs and Opportunities Report"**, and an **"Agricultural and Farmland Protection Plan"**. The Open Space Report and the Agricultural and Farmland Protection Plan were conducted in tandem and there was

An Open Space Plan should include:

- Maps that depict open space types and categories,
- A method of prioritization and resource valuation criteria and data,
- A delineation of conservation priorities.

From CACC's (2009) Recommendations on Open Space Needs and Opportunities Report.

opportunity for concurrent public dialogue on both efforts during several public meetings. The Open Space Report contained several goals and recommendations that are served by this Open Space Plan.

The Report states that a future open space plan should include maps that include depictions of open space types and categories, a method of prioritization and resource valuation criteria and data, and a delineation of conservation priorities. The Report also provided an example of a conservation criteria list for prioritization of open space lands, which was reviewed for the development of the Conservation Criteria List in this Plan. The Agricultural and Farmland Protection Plan set forth several goals and recommendations that should be included in ongoing conservation planning and implementation, including: “support economic opportunities for farms and businesses that complement agriculture, and provide voluntary incentives (term conservation easement exemptions and purchase of development rights (PDR) programs) for agricultural landowners to continue agricultural activities”.

In 2012, the **Comprehensive Plan Assessment Committee** (CPAC) was created to evaluate the town’s progress on implementing the Comprehensive Plan’s goals and objectives. **The CPAC final report to the Town Board recommended that the town develop criteria for land protection and acquisition to be used by the Town Board for purchasing or accepting land for open space preservation, establish funding sources to purchase land, and establish an outreach program to facilitate discussions with landowners.** Following the recommendation to increase public education about the planning process and open space conservation options, like Conservation Subdivision design, the town created the **Citizen’s Guide to Land Use, Planning and Development**.

To Further Open Space Conservation, the Town should:

- Develop criteria for land protection and acquisition to be used by the Town Board for purchasing or accepting land for open space preservation,
- Establish funding sources to purchase land, and
- Establish an outreach program to facilitate discussions with landowners.

From CPAC’s (2013) Report to the Town Board.

Additionally, following the CPAC recommendation to explore a term and permanent conservation easement program to incentivize voluntary landowner open space conservation, in 2014, the Town Board established a **Conservation Easement Exemption (CEE) program** through local law. This program is one of only five of its kind in the state. The CEE provides a financial incentive, through percentage tax exemptions, to landowners with open space of five acres or more who wish to conserve their land through a conservation easement held with the town. The five citizen member Conservation Easement Review Board (CERB) was then established to administer and provide guidance for the CEE program. The town’s CEE program, although relatively new, is one tool that can provide interested landowners the incentive they may need to forego development on their land. The CERB has also been providing guidance throughout the current town-wide open space planning process and has been instrumental in preparing the components of this

Open Space Conservation Implementation Plan. **Also in 2014, the Town Board passed an Open Space Program resolution that called for the following elements:** develop objective criteria for evaluating lands, incorporate new conservation tools into planning, set up a Capital Reserve Fund as a designated fund for open space purchasing opportunities (e.g. land acquisition or development rights), select mechanisms for preserving (and maintaining) open space – which could include municipal ownership and maintenance, conservation easements, purchase and transfer of development rights. The resolution also called for an increase in public education and outreach.



III. The Process of Open Space Planning – open space inventory, conservation criteria, and conservation analysis tool

After over a decade of collaborations, discussions, reports, and presentations regarding how to move forward on open space conservation, and after taking some significant steps toward implementing certain recommendations (such as creating the Conservation Easement Exemption program for voluntary landowner conservation), the town, along with public input, is taking the next important step in the implementation process. Taking direction from the above recommendations, and in consultation with the town's Conservation Easement Review Board **this open space plan establishes a method of evaluating and prioritizing open space land by developing conservation evaluation criteria.** As result, the town now has:



1. **An updated, town-wide open space inventory and database, as illustrated in four Open Space Conservation Values Maps.**
2. **A list of data-driven Conservation Criteria with which to evaluate open space land for its conservation values.**
3. **An effective, flexible, data-based method - the GIS Conservation Analysis Tool - to evaluate, numerically score, and prioritize the conservation of open space land.**

This current open space planning process included public engagement and the gathering of public comment at several stages, including a public workshop in October at Five Rivers Environmental Education Center, which drew approximately 70 people; a “Scenic Bethlehem Photo Survey” that invited residents to send the town photos of scenic open and natural spaces in town; opportunities for discussions with town staff on three summer Saturdays at the



Delmar Farmers Market; maps, displays and opportunity for comment at the public library during the months of July and November 2017; several public presentations to the Town Board and ongoing updates to the town's Open Space Planning webpage; a Town Board member and ecologist-led kayak eco-tour on the Hudson River; and a

dedicated email for comments at OpenSpace@townofbethlehem.org. For the full public participation activities list, see Attachment 9. (Because ongoing public engagement, education and involvement will be a cornerstone of the open space conservation program, more on this topic can be found in the section below: *Ongoing public engagement.*)

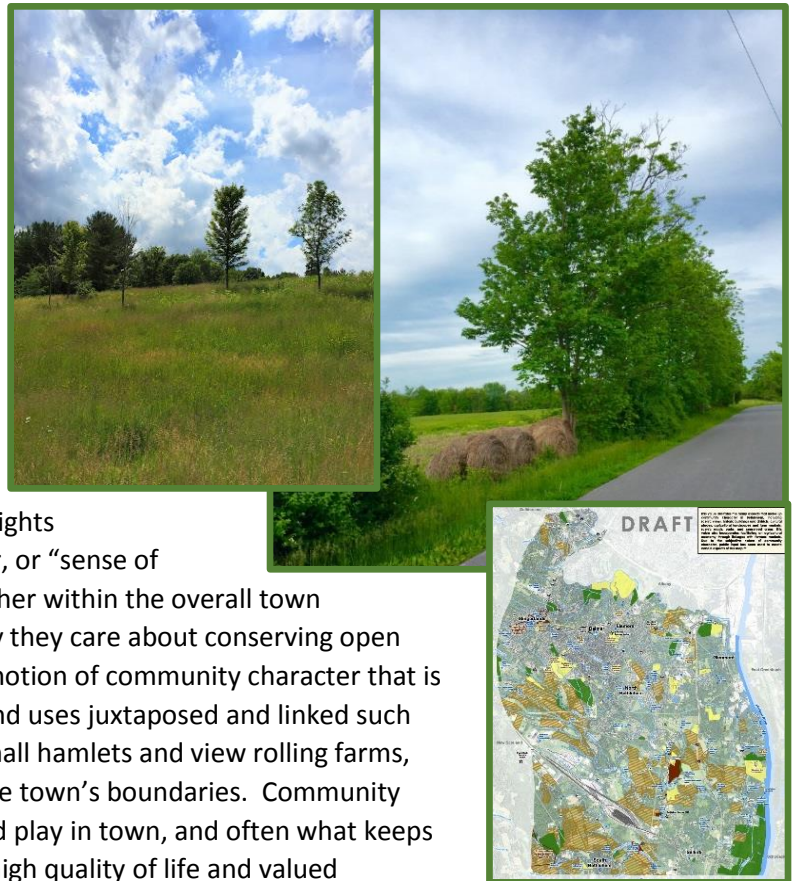


Step #1: Open Space Conservation Values Maps – an inventory of town-wide natural and cultural resources

The first step in identifying and prioritizing open space lands in town was to conduct an open space inventory that included natural and cultural resources in Bethlehem. This was done to a large extent for the 2009 Recommendations on Open Space Needs and Opportunities Report and the Agriculture and Farmland Protection Plan, but the data and maps in these reports needed to be updated, and also categorized, so that the many overlapping pieces of information could be geographically overlaid and displayed in a meaningful way. See the aforementioned reports for additional background on areas (acreage) related to natural and cultural resources (wetlands, forests, public/private recreation areas, etc.). Based on past reports, surveys and focus group summaries, categories for several open space values (or benefits to the community) were identified. Using data collected from over 20 public data sources (including town, state and federal), and inputting more than 70 data sets into a GIS mapping system, the town input data representative of these values to create four Open Space Conservation Values maps: **Community Character**; **Recreation and Greenways**; **Forests, Fields and Wildlife Ecosystems**; and **Natural Water systems: Streams, Wetlands and the Hudson River**. It should be noted that most of the data utilized was developed based on remote assessment, and field verification may be conducted as needed. These maps will be used on an ongoing basis, in conjunction with the Conservation Criteria and the Conservation Analysis Tool, to help inform conservation decisions. Reviewing these maps, and the relationships they show, is a useful step in considering any land in town for conservation purposes. The many open space values and benefits illustrated within these four maps are summarized below.

Community Character Open Space Conservation Values Map (click on heading for online map):

This map illustrates the interrelationship of the many aspects that make up “community character” as it relates to open space in Bethlehem. The map includes historic buildings and the Slingerlands and the Onesquethaw historic districts; cultural places, or “points of interest” (older homes with architectural interest, barns, scenic views, etc.) as designated by the town’s Bicycle and Pedestrian Committee and the town’s historical records; active agricultural landscapes found throughout the town; as well as local farm markets, schools, scenic roads, parks, preserves and conserved areas. This map highlights known places that contribute to community character, or “sense of place”, and how these special places relate to each other within the overall town landscape. Often when residents are asked about why they care about conserving open space in town, it relates back to this more subjective notion of community character that is uniquely Bethlehem and is the composite of mixed land uses juxtaposed and linked such that one can shop, work, hike, bike, fish, boat, visit small hamlets and view rolling farms, enjoy local food and relaxing restaurants, all within the town’s boundaries. Community character is often what draws people to live, work and play in town, and often what keeps people here; in turn, community character creates a high quality of life and valued community interconnectedness. Scenic views, as perceived by community members, are also an important component of community character. See Attachment 5 to learn about the 2017 “Scenic Bethlehem Photo Survey” and how it can be used to inform certain open space conservation opportunities.



Recreation and Greenways Open Space Conservation

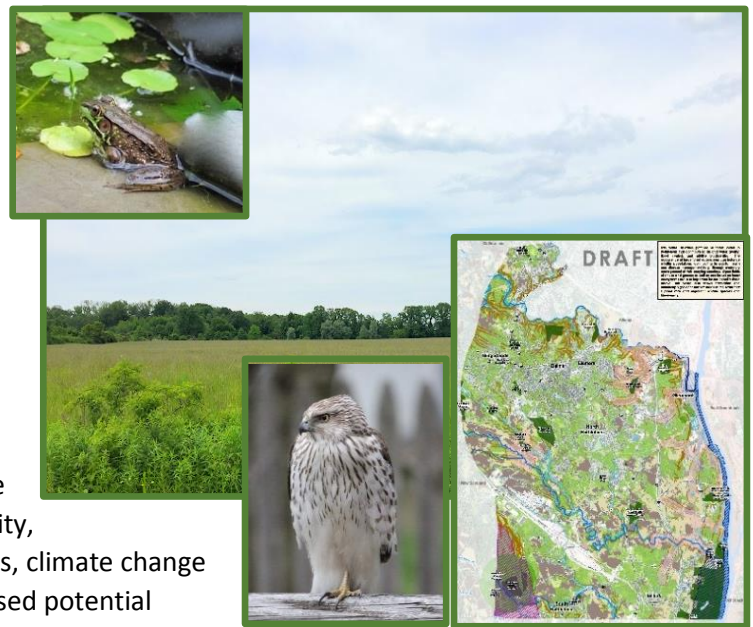
Values Map (click on heading for online map):

This map illustrates the interrelationship between recreation areas (preserves with trails, bike paths, the YMCA, soccer fields, etc.) and how people and wildlife move across the landscape of the town. Furthermore, the map shows how open spaces and connected pathways and greenways can facilitate that movement. For humans, these pathways include roads, trails, bike paths and walkable areas, including the Albany County Rail Trail and the roads included in the town's Bicycle and Pedestrian Priority Network (which includes both designated and planned future routes). These linear pathways can enhance opportunities for recreation and healthy lifestyles. For wildlife, the map shows larger forest patches of five acres or more, as well as streams and waterbodies that serve as natural greenways for animals to move between habitat patches and to find water, shelter, nesting and other habitat needs. This map also includes several utility corridors that run through town, as they are observed as incidental wildlife corridors that help animals travel between habitats. Showing open space areas in relation to their connectivity for people to travel between community "hubs" (farmers markets, schools, parks, hamlets and business centers); and for wildlife to travel through and between habitat patches (woodlands, wetlands, streams, etc.), this map helps us see how the values of recreation and greenways can be connected to enhance the town's value.



Forests, Fields and Wildlife Ecosystems Open Space Conservation Values Map (click on heading for online map):

This map illustrates the interrelationships between terrestrial, or land-based, ecosystems, including forests, fields and their associated wildlife habitats (aquatic systems are also on the map to show the key connections between land and water ecosystems and habitats). Large areas of forest cover (five acres or more in size) in Bethlehem contribute to air and water quality, flood control, and wildlife biodiversity, as well as scenic beauty. The occurrence of large forest ecosystems can allow for greater diversity and balance in wildlife populations, and provide travel corridors between wildlife patches. Forests also contribute to public health (air quality, temperature cooling, reduction of human/wildlife conflicts, climate change resilience, etc.) and disease management (through increased potential natural predation of tick-carrying species, mosquitos, etc.). This map also shows open fields, pastures, and shrublands, which may provide habitat for numerous declining grassland and shrubland bird species and other wildlife depending on agricultural practices. Additionally, this map shows where state and nationally significant habitat areas may exist that support rare and declining wildlife species important to local biodiversity. Rare, or declining in number, animals found in town include the NY-Threatened bald eagle, migratory fish that complete their life cycles between the sea and Bethlehem's fresh water (NY-Endangered shortnose sturgeon,



blueback herring, alewives, and American eel), a state-rare mussel called the Alewife floater and other rare mussels, and the NY-Special Concern Wood turtle that lives along streams and in forests. Rare and threatened plants are also found in town and include the coastal Davis' sedge and Golden-seal.

Notably, certain areas have a concentration of biodiversity and overlapping habitat values, such as the Upper Hudson River Significant Biodiversity Area (SBA) that supports rare tidal wetland areas and important spawning and nursery habitat for Hudson River fisheries. Areas around local streams are also highlighted, as these riparian areas provide habitat for diverse aquatic and terrestrial wildlife, as well as providing water quality and flood protection. Additionally, the southwestern corner of Bethlehem lies within the Hudson Valley Limestone and Shale SBA and contains limestone bedrock, calcareous cliffs, and areas of karst terrain that provide winter bat hibernacula, supports the cold water trout fishery found in the Onesquethaw Creek, as well as provides habitat for rare amphibians, reptiles, and plants. Finally, the map shows steep slopes or ravines adjacent to streams, where loss of existing forest cover might increase erosion potential and could lead to mudslides, property damage and siltation of downstream waters. More detailed information about wildlife habitats in Bethlehem can be found in the 2017 NYDEC Hudson River Estuary report, "[Natural Areas and Wildlife in Your Community: A Habitat Summary for the Town of Bethlehem](#)".

Natural Water Systems: Streams, Wetlands and the Hudson River Open Space Conservation Value Map (click on heading for online map): This map

illustrates Bethlehem's natural water systems, including streams, wetlands, groundwater recharge areas, and the Hudson River flowing along the eastern edge of town, the management of which benefits water quality, aquatic habitat, fisheries, public health, drinking water and local flood control. Potential wetlands on this map are areas with wetland-supporting hydric soils, but that are not yet officially mapped by federal or state agencies; these wetlands are important to field verify. The

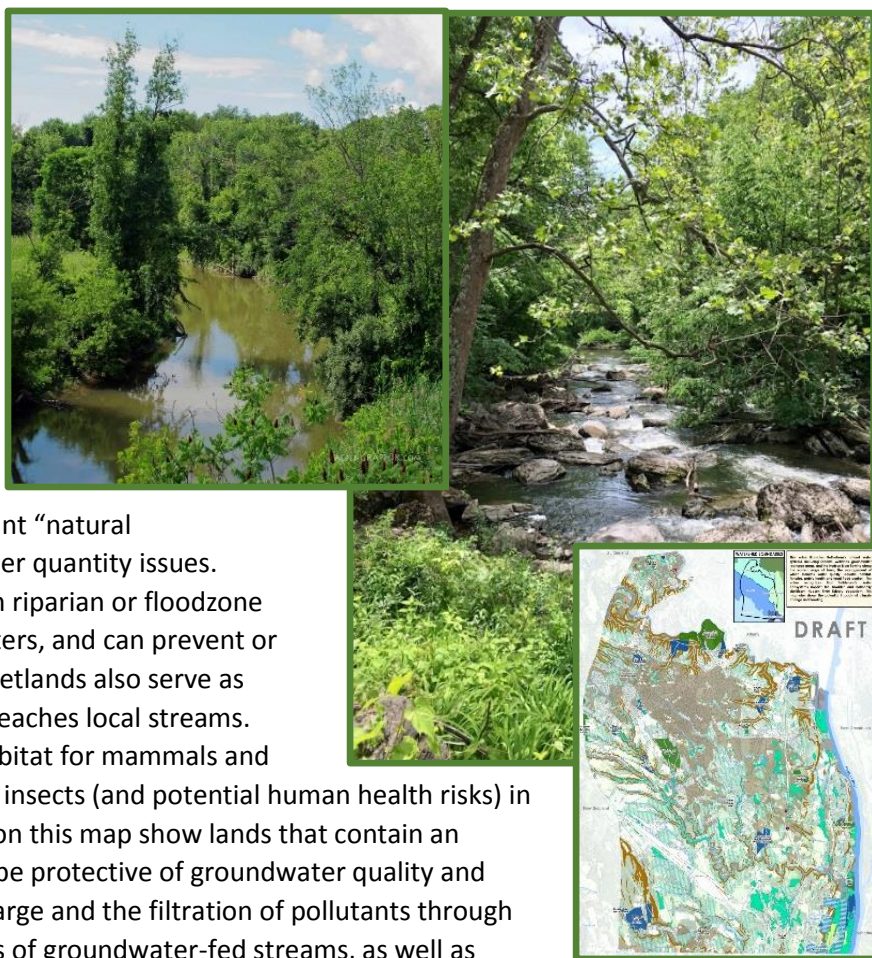
town's many water resources provide important "natural services" with regard to water quality and water quantity issues.

Wetlands, for example, especially those within riparian or floodzone areas, help to slow down and absorb floodwaters, and can prevent or reduce downstream impacts from flooding. Wetlands also serve as natural filters, cleaning stormwater before it reaches local streams.

Natural, intact wetlands provide important habitat for mammals and birds that naturally keep mosquitos and other insects (and potential human health risks) in check.

Potential groundwater recharge areas on this map show lands that contain an aquifer and highly permeable soils that could be protective of groundwater quality and quantity by contributing to groundwater recharge and the filtration of pollutants through soils; this value is important to the ecosystems of groundwater-fed streams, as well as

continuing to provide clean drinking water for residents who rely on wells. A small inset map at top right shows the major watersheds in the town, all eventually flowing into the nationally significant Hudson River Estuary and influencing its aquatic and tidal wetland ecosystems. Fisheries in and along the Hudson River, as well as along the Onesquethaw, provide unique recreational opportunities and are dependent on the overall health of their watersheds.



Step #2: Conservation Criteria – objective rating system for open space lands



As highlighted above, several past open space planning recommendations cited the need for the town to develop objective conservation criteria in order to rate and then prioritize open space lands for their open space values. Quoting the CACC's 2006 Open Space Protection Programs – Funding and Tools Report, criteria for prioritizing open space lands **“are a valuable tool for decision makers to help them decide how to spend available funds; they are useful guidance to landowners willing to consider selling or otherwise protecting lands that meet the criteria, and; for the developers, such criteria help identify areas of conservation interest which is useful information when designing a project or preparing an impact statement.”** After the natural and cultural resources inventory produced the four Open Space Conservation Values Maps, the second step was to look into the scientific literature, as well as locally significant reports (examples include the 2017 NYSDEC Hudson River Estuary Program's [Natural Areas and Wildlife in Bethlehem](#) report and the 2007 [Normanskill Riparian Corridor Study](#), see Attachment 12 for a full list of resources cited) , as well as evaluate the conservation criteria of other NYS towns, to develop, review and complete a list of scientifically derived, and locally relevant, conservation criteria with

which to objectively rate and prioritize open space lands in Bethlehem. Town staff and the CERB worked together to create a robust, but simple list of 25 equally weighted criteria that best represented the conservation values for the town. This list would be used to evaluate open space land with a binary classification system. Simply, during the evaluation if the land contained the criteria, then it was given a “1”. If the land did not contain the criteria, it was given a “0”. The final cumulative conservation “score” for the land being analyzed would then fall between 0-25.

The Conservation Criteria List can be used in a few ways. First, it has been formatted into a table so that it may be taken out into the field to help evaluate a proposed conservation land while at the site (see Attachment 6). For example, when a landowner is applying for a town CEE and town staff and the landowner are walking the site together, they can use this written list as a guide to answer questions about the land and its conservation value, as well as spark discussion about any subjective or additional information – beyond the 25 objective criteria. Second, the list can be used as a simple and consistent reference if an interested landowner calls about the potential for conservation with the town and can quickly indicate whether or not the land might qualify for town (or other entity, such as a land conservancy) conservation support. Finally, the Conservation Criteria is used as input information for the GIS Conservation Analysis Tool, as described in the following section, so that the conservation scores can be viewed geographically on a map, either on a single piece of property for an interested individual landowner, or in the broader context of adjacent properties, as well as in the context of the entire town. Finally, in recognition of the need to keep these analysis tools flexible and meaningful, this criteria can be adapted and modified as new data are created or if priorities change over time.

The full list of the 25 Conservation Criteria are below. See Attachment 7 for a detailed version of this list that includes the conservation benefits of each, resource and literature citations, and the criteria's relationship to each of the four Open Space Conservation Values Maps.

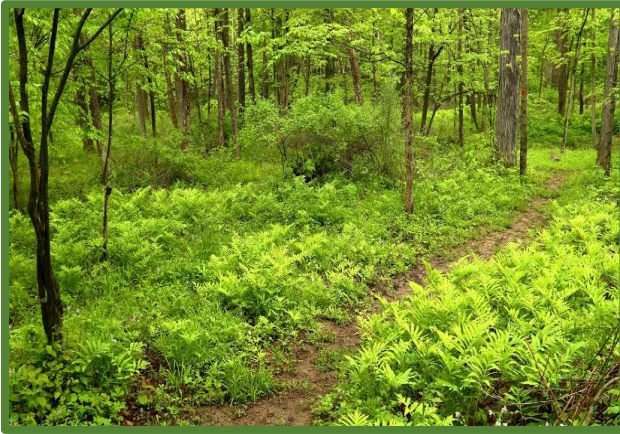
Bethlehem Open Space Conservation Criteria

1. Adjacent to or containing town or privately owned parklands, or existing commercial outdoor recreation (including golf courses, private athletic fields, the YMCA, Rail Trail, etc.).
2. Adjacent to conserved land and preserves, including land owned by MHLC, Scenic Hudson, Audubon and other private/non-profit entities.
3. Adjacent to town conservation easements, including lands participating in town's Conservation Easement Exemption program.
4. Adjacent to Bicycle and Pedestrian Priority Network roads.
5. Contains an officially registered historic structure (12 such structures in town) or district (the Slingerlands Historic District and a portion of the Onesquethaw Historic District).
6. Adjacent to community educational facilities or services, including public schools and libraries.
7. Adjacent to wildlife corridors or greenways, which serve as wildlife travel pathways between habitat patches.
8. Contains a known wetland (mapped by federal or state agencies, including tidal wetlands), including a natural, vegetated wetland buffer (100 ft) to filter pollutants and reduce downstream flooding.
9. Contains a known wetland (mapped by federal or state agencies, including tidal wetlands), including a wider (300 ft) natural, vegetated wetland buffer to filter pollutants, reduce downstream flooding and provide wildlife habitat for biologically diverse plant and animal species.
10. Contains a potential wetland.
11. Contains land within floodplains adjacent to local streams, their tributaries, or the Hudson River.
12. Contains land affected by projected sea level rise due to climate change predictions.
13. Contains, or is adjacent to, a stream or river, and/or a moderately wide (100 ft) vegetated streamside buffer area to filter pollutants and reduce downstream flooding.
14. Contains, or is adjacent to, a stream or river, and/or a wide (300 ft) vegetated streamside buffer area, and/or an active river area to filter pollutants, reduce downstream flooding and provide wildlife habitat for biologically diverse plant and animal species.
15. Contains a stream that has been designated as a migratory fish run or a trout stream (includes the Normanskill, Vlomankill and Onesquethaw Creek).
16. Contains a potential groundwater recharge area.

17. Contains or is connected to a large forest patch of 5 – 199 acres or more.
18. Contains or is connected to a “Stepping Stone” forest patch of 200-1,999 acres.
19. Contains or is connected to a “Locally Significant” forest patch size of 2,000-5,999 acres.
20. Contains or is adjacent to a Significant Biodiversity Area (SBA).
21. Contains or is adjacent to an Areas Important for Rare Plants or Rare Animals.
22. Contains land currently in active agricultural use, is within an agricultural district, or has a current agricultural assessment from the town.
23. Contains land with “prime farmland soils” or soils designated as “Farmland of Statewide Importance”, as these soils are best suited for supporting current and future active agriculture.
24. Adjacent to active farmland, providing a buffer between farmland and other land uses, thereby reducing potential conflicts.
25. Contains land with soils and geology designated as having “high erosion potential” or steep slopes.
Total Initial Conservation Score: (0-25)

Other additional considerations beyond of the 25 Conservation Criteria: Each conservation opportunity will inherently have its own unique set of circumstances. The above 25 criteria can produce useful information about a proposed conservation action, but ultimately, only provide a piece of the puzzle. Each conservation opportunity will be assessed by town staff and the Town Board, and in partnership with the interested individual who owns the land being considered, so that the landowner and the community both benefit from any resulting conservation action. A good example of additional criteria to be considered would be any subjective, or opinion-based, criteria that is important to the evaluation of conservation benefit, such as the concept of “scenic views”. During the summer of 2017, the town conducted a “Scenic Bethlehem Photo Survey” inviting residents to submit digital photos of scenic open and natural spaces that are important to them. More than 200 photos were submitted to the town, illustrating publicly noted “scenic” areas. [A map](#), found in Attachment 5, shows the general locations of a sample of the submitted photos. The locations of the photos can be considered by town staff reviewing specific conservation opportunities as they arise on a case by case basis. For example, if land is being reviewed for a Conservation Easement Exemption or a Conservation Subdivision design, and the photo survey shows that residents consider the area to have high scenic value, this subjective information could add to the conservation value of that land.

Step #3: Conservation Analysis Tool – a GIS-based method for identifying Bethlehem’s Conservation Priority Areas



After inventory data were illustrated on maps, and the above conservation criteria developed, the third piece in identifying Bethlehem’s Conservation Priority Areas was built – the Geographic Information System (GIS) - based Conservation Analysis Tool. The GIS Conservation Analysis Tool, developed in partnership with M.J. Engineering and Land Surveying, P.C. (MJ) will allow the town to use science and analysis to prioritize conservation areas in Bethlehem, for now and into the future, as it is to remain a “working tool” that is flexible, so that both the tool and the input can be modified as the landscape and circumstances change over time.

After first studying the open space prioritization methods of nine other NYS towns (Towns of Phillipstown, Aurora, Red Hook, Warwick, Pittsford, Pleasant Valley, Halfmoon, Shawangunk, and New Paltz – see Attachment 8 for links to these plans, where available), Bethlehem planning staff, the CERB and MJ staff developed the most appropriate method applicable to Bethlehem. **Going forward, as conservation opportunities present themselves, the town can now use this GIS tool and the output it produces, to respond quickly and appropriately to best balance growth and conservation in real time.** Provided below is a description of how the GIS tool works.

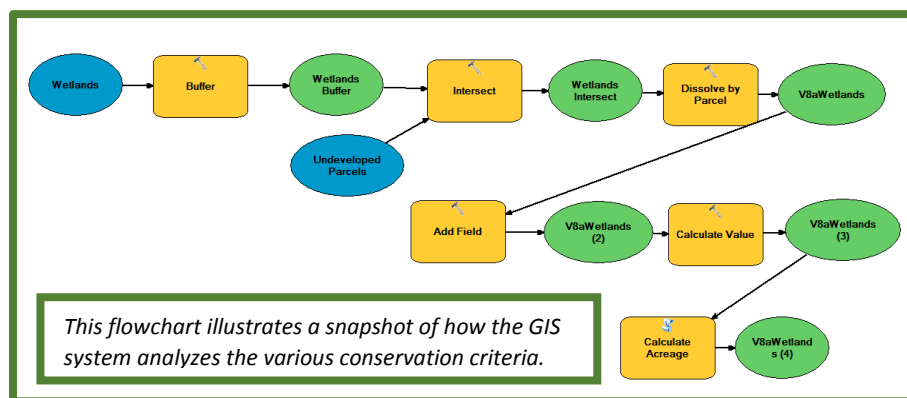
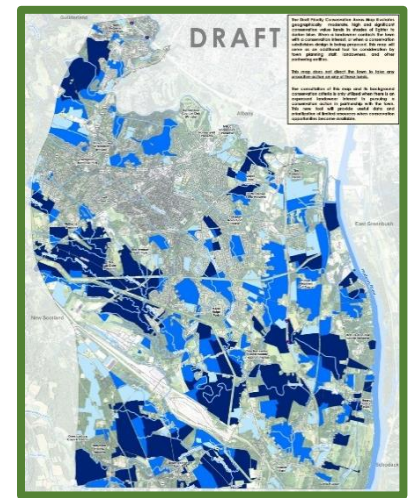
Conservation Criteria as “the input”: The GIS tool utilizes “input” data in the form of the 25 Conservation Criteria (described above and listed below and in Attachment 7) to analyze areas of conservation value across the town. To be as objective as possible in this analysis, the Conservation Analysis Tool utilizes existing scientific data, locally generated data layers and best practices for interpreting that data, as cited. A base criteria for the GIS tool was established so that only open space lands of five acres or more were analyzed. This base criteria included vacant land, residential land with large acreage, agricultural land, etc. This allowed the analysis to apply the conservation criteria only to larger open spaces (a total of about 11,749 acres, or approximately 37% of the town’s total acreage) that would presumably have the most significant impact on conservation. The five acre size requirement was established based on the town’s existing five acre threshold for eligible Conservation Easement Exemption lands.

Using the Conservation Analysis Tool – finding lands where Conservation Criteria overlap: Undeveloped open space land in town was tested against the 25 Conservation Criteria input listed below. Lands that met the criteria were assigned "1" for that value. If the land did not meet the criteria, "0" was assigned to the land. The sum of all overlapping criteria was calculated resulting in a conservation “score” of 0 – 25. This numerical score places the land into three broader prioritization categories of moderate, high, or significant conservation value and are illustrated as such on the resulting Conservation Priority Areas Map.

OBJECTID *	Area_Acres	V1a	V1b	V1c	V2a	V3a	V3b	V3c	V3d	V4a	V4b	V5a	V5b	V6a	V7
1	41.574115	1	0	0	1	0	1	0	0	0	1	1	1	0	<Nu
2	60.743647	1	1	0	1	0	0	0	0	0	1	1	0	0	<Nu
3	18.223148	1	0	0	1	0	1	0	0	0	1	0	1	0	<Nu
4	16.027633	1	0	0	1	0	1	0	0	0	1	1	1	0	<Nu
5	68.36418	1	1	0	1	0	1	0	0	0	1	1	1	0	<Nu
6	58.996913	1	1	0	1	0	1	0	0	0	0	1	1	0	<Nu
7	180.306769	1	1	1	0	0	1	1	0	0	1	0	0	0	<Nu
8	113.361941	1	1	1	1	0	1	1	0	0	1	1	0	0	<Nu
9	36.909124	1	0	0	0	0	1	0	0	0	1	0	0	0	<Nu
10	76.579023	1	1	0	1	0	1	0	0	0	1	0	0	0	<Nu
11	55.518228	1	1	0	0	0	1	0	0	1	1	0	0	0	<Nu
12	34.885905	1	0	0	0	0	1	0	0	0	1	0	0	0	<Nu
13	52.723216	1	1	0	1	0	1	0	0	0	1	0	0	1	<Nu
14	19.910296	1	0	0	1	0	1	0	0	0	1	0	0	1	<Nu
15	101.896686	1	1	1	0	0	1	0	0	1	1	0	0	0	<Nu
16	191.831526	1	1	1	1	1	1	0	0	1	1	0	0	0	<Nu
17	60.254849	1	1	0	0	1	1	0	0	0	1	1	0	0	<Nu
18	7.048169	0	0	0	0	0	0	0	0	0	1	1	0	0	<Nu
19	38.981556	1	0	0	1	0	1	0	0	0	1	1	0	0	<Nu
20	8.138814	0	0	0	1	0	1	0	0	0	1	0	0	0	<Nu
21	37.455367	1	0	0	0	0	1	0	0	0	0	0	0	0	<Nu
22	74.378959	1	1	0	0	0	1	0	0	0	1	0	0	0	<Nu
23	67.98279	1	1	0	1	0	0	0	0	0	0	0	0	0	<Nu
24	142.21043	1	1	1	1	0	1	1	0	0	0	0	1	0	<Nu
25	21.865991	1	0	0	1	1	1	0	0	0	1	0	1	0	<Nu

The data above is a small sample of the binary output in table format of the GIS Conservation Analysis Tool results in “0”s and “1”s.

The Resulting Conservation Priority Areas Map as the “output”: Based on the three categories of conservation priority, the resulting “output”, or the Conservation Priority Areas Map (see larger in Attachment 10 and [click here to see this example map online](#)), illustrates geographically moderate, high and significant conservation value lands in shades of lighter to darker blue. When a landowner contacts the town with a conservation interest, or when a conservation subdivision design is proposed, this map will serve as an additional tool for consideration by town planning staff, landowners, and other partnering entities. **This map does not direct the town to take any proactive action on any of these lands;** alternatively, the consultation of this map and its background conservation criteria is only utilized when there is an expressed landowner interest in pursuing a conservation action in partnership with the town, or when a development is being designed and the town can use the conservation subdivision tool to direct conservation to sensitive areas of land and concentrate development in less sensitive areas. This new tool will provide useful data and prioritization of limited resources when conservation opportunities become available. Consideration of potential conservation properties should be field verified by a professional on a case by case basis. This map, due to the ongoing changing of the landscape and



the updating of input data, is not a static or permanent feature and should not be considered as such. The December, 2017 map in this report may be a good representation of the conservation priorities for that snapshot in time, but the map should be updated as the landscape or priorities change, and should always simply provide a starting reference point for land use professionals when a conservation opportunity is proposed.

Note on the inherent limitations of a computer analysis tool; e.g. the value of human interpretation: The town recognizes that any GIS analysis has its limitations and the results will always merit review by land use professionals, so that analysis results will be viewed in the context of real time and real circumstances on the landscape, as well as the most updated data available. **Ultimately, any conservation action taken by the town would use the Conservation Analysis Tool and resulting Conservation Priority Areas map as a starting point and guide for discussions with interested landowners, the Conservation Easement Review Board, developers and other partners involved in a particular conservation effort, taking into consideration relevant factors, such as current conservation needs, any costs associated, or any new data available.**



IV. Implementing the Conservation Criteria and Analysis Tool

An Open Space Plan is an important document that includes data, maps, resources, analysis - all on paper. In this case, the open space plan includes a description of all of the working components above that help to evaluate and prioritize open space lands in town for their conservation values and benefits. If the Open Space Plan is “conservation on paper”, then we can think of the implementation as the people, tools, partnerships, and often funding, that create “conservation on the land”. The people that will be needed to ensure effective implementation of the conservation criteria will include town staff, town boards (like the CERB, Planning Board and Town Board), willing and interested landowners, partnerships with conservation entities such as land trusts and agricultural agencies, as well as the support of the general public.



The conservation criteria and analysis tool will prepare and guide the town staff and the town’s various boards in responding to landowner-initiated inquiries about conservation opportunities, as well as inform the town’s development review and design process. Further, it will inform the use of limited financial resources and direct future funds to the conservation lands that will have the most beneficial impact town-wide. Having this open space plan in place will also support town applications for state, regional and federal grant funding for conservation implementation.

Implementation can be achieved through current conservation tools and potential future tools as follows:

Currently available conservation tools through the town:

1. **Conservation Easement Exemption program:** If a landowner applies to the [town’s Conservation Easement Exemption](#) program, the Conservation Criteria and the Conservation Analysis Tool will inform the Conservation Easement Review Board about the conservation benefits of the land. The CEE program invites interested/willing landowners with 5 acres or more of open space to apply for tax exemptions in exchange for placing a conservation easement on their land for a certain period of time (from 15 years to perpetuity).
2. **Conservation within the development process:** The Conservation Criteria and the Conservation Analysis Tool can inform, where appropriate, the support of Conservation Subdivision or Planned Development District projects ([see Citizen’s Guide to Land Use, Planning and Development](#)) within the Town’s development review process administered by the Planning Board. These design options that include density incentives can help to conserve priority open space areas, while clustering development in less sensitive areas on the development site.
3. **Partnerships with local land trusts (MHLC, Scenic Hudson, or other):** If a landowner is interested in conservation, but the situation is more suitably handled through a land trust, or a partnership with a land trust, the town can foster that collaboration. Additionally, if a Conservation Easement, Conservation Subdivision or Planned Development District results in the conservation of land that is most effectively owned and/or managed by a land trust, the town can work with the land trust to facilitate that result.

Future potential conservation tools through the town – generally would need funding: In the future, the town could take the next step and consider being a potential purchaser of development rights (PDR) or purchaser of land, in partnership with interested and willing landowners. In these scenarios, the town would need to have enough funds available so that landowners would always be fairly compensated for the market value of their open space land. Over the longer term, the town will seek a consensus on how to fund such conservation investments in our town (see section called “The need to consider dedicated open space funding” below). Potential future implementation tools that would need funding, and could include the development of a dedicated open space fund:

1. **Conservation through purchase development rights (PDR):** If a private landowner expresses interest in selling their development rights for conservation to the town, the Conservation Criteria and Conservation Analysis Tool will inform the conservation benefits of the land. In this case, the land remains under private ownership and thus, ongoing stewardship and maintenance costs are incurred by the landowner.
2. **Conservation through purchase of land:** If a private landowner expresses an interest in selling their land for conservation to the town, the Conservation Criteria and the Conservation Analysis Tool will inform the conservation benefits of the land. If the town purchases land for conservation, there will need to be a land management and stewardship plan in place, as well as funding to support that ongoing stewardship, whether the land is maintained directly by the town, or if there is an agreement with a land trust for ongoing stewardship.

Voluntary Participation

It is important to reiterate here that the implementation of the open space plan is based on the understanding that it is a landowner’s right to decide what is best for their family, their finances and their future with regard to their land – in its current use and for any future sale or transfer. **The initiation of a conservation opportunity will take place either through an interested landowner; or, through the development review process for conservation subdivision design or planned development districts that may include density incentives.** In this way, a landowner who is NOT interested in engaging in conservation measures will not become involved. However, if a landowner reaches out to the town for conservation assistance, or when the town is actively engaged with a developer, the town can effectively work with the landowner or developer in offering conservation assistance.



V. Ongoing public engagement



Several of the past town committees and their reports recommended ongoing education and outreach as part of a successful open space conservation program. For example, the 2014 Open Space Program Town Board resolution included an education and outreach component, stating that **“Bethlehem residents are interested in open space. However, contention often stems from miscommunication and misinformation, and community engagement is important to educate residents on the benefits of open space planning, and promote existing conservation and stewardship options to interested landowners. Education and outreach is also essential to explain options available to those interested in pursuing a more formal mechanism of open space conservation”**. The CPAC, in 2013, reiterated this statement by recommending the town establish an **“outreach program to facilitate discussions with landowners”**. The CACC also recommended, in its 2006 Funding and Tools report, that an open space plan include **“a public education and outreach program to identify landowners willing or interested in**

conservation of their property.” With these visions in mind, the current planning process to date has included an active public participation and engagement plan (Attachment 9) that included a variety of participation, education and public comment opportunities through various venues and outlets. These opportunities included a public involvement “Scenic Bethlehem” photo survey, several staffed displays at the local farmers market, an expert-led kayak eco-tour on the Hudson, displays and information at the town’s library, and regular updates on the town’s website with a dedicated open space email address for ongoing comments.

These types of outreach and participation efforts will continue as a key component of the town’s conservation implementation program, and will include reaching out to the general public as well as promoting available conservation tools to landowners through events, landowner forum, general mailings, town communications (like the monthly e-news), etc. Additionally, town staff and the CERB will continue to strive to connect interested open space landowners to the town’s various landowner support programs (existing CEE, future PDR, etc.) as they evolve, as well as to strengthen partnerships with local conservation organizations, like Scenic Hudson and MHLC, to ensure that interested landowners are connected with the most effective conservation programs for their situation. The town will continue to build partnerships with these land trusts and other conservation entities to find opportunities where conservation priorities overlap and can be implemented jointly (such as in the case of the town and MHLC’s collaboration to create the Van Dyke Preserve).

Ongoing public engagement efforts may include:

- Landowner forum or “roundtables” to generate understanding of available conservation programs and incentives,
- Conservation speakers series,
- Forum to discuss open space funding mechanism options,
- Educational materials regarding trespassing and encroachment on open space lands,
- Public survey or focus groups,
- Displays at library, farmers markets, etc.
- Hikes and kayak outings to build awareness,
- Collaboration with local land trusts and conservation organizations to create joint events and raise awareness.

The town will also endeavor to continue to collect input from the public about conservation priorities at every possible opportunity, and may consider a town-wide open space survey or focus groups to best identify issues and opportunities. Additionally, when a conservation action is completed, either through a successful CEE agreement or through a land donation, etc., the town will continue to celebrate these successes through various media outlets so that the public is aware of ongoing efforts and accomplishments on the landscape (so that conservation areas are as “visible” and celebrated as new developments and the effort toward balance can be noted). Finally, in tandem to communicating

with the public, the town will continue to work with developers during the site design process to ensure that new developments incorporate the conservation of key open space land and important natural resources through the established conservation subdivision design process.

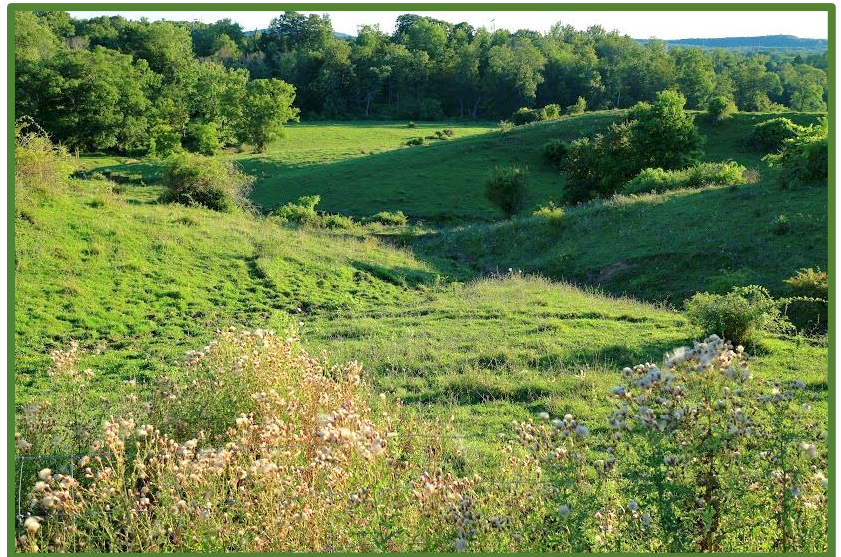
Furthermore, if the town decides to pursue a conservation tool that will need funding (like PDR or land purchase program), then town staff will need to work with the public to research, discuss and ultimately establish the most appropriate funding mechanism(s) to maintain a dedicated open space fund that would be used only for the purchase of open space land or land rights (PDR).



VI. Considering dedicated funding for open space conservation

Currently, the town offers two major tools for conservation: through the voluntary landowner tax incentive-based Conservation Easement Exemption program, and through the density incentives to encourage conservation land through the Conservation Subdivision or Planned Development District process during site design with a developer. If the town desires to offer interested landowners additional financial incentives and conservation support in the form of purchase of development rights (PDR) or purchase of land for conservation of open space, **a dedicated funding mechanism would generally be needed – both for the purchase of land or development rights, and, in some cases,**

for the ongoing maintenance and stewardship of any acquired land. To purchase land it is usually necessary to raise a significant sum of money. In order to do this, residents will need to decide how to effectively and fairly collect these funds (likely upwards of \$1 million dollars), to be used solely for the purchase of open space. These monies will need to be kept in a fund in advance of conservation opportunities so that when priority conservation land becomes available on





the market, the town is ready to act in a timely manner. As summarized in the background of open space efforts above, in 2006, the Citizen’s Advisory Committee on Conservation (CACC) was charged by the Town Board to develop an overview of programs and sources of funding for open space protection. This process resulted in the report entitled [“Open Space Protection Programs – Funding and Tools”](#). The report describes various potential funding mechanisms and sources, some of which utilize Bethlehem tax dollars and others which utilize outside sources (state and federal tax dollars and private/not-for-profit organization funds). It should be noted that state and federal funds often come with a local fund match requirement. The report states, that in most situations

where a landowner desires to participate in conservation of his/her property, funding will be required to provide consideration to the seller, and sets forth a description of funding mechanisms that could be established to provide competitive and fair market value of open space property should there be an opportunity for the town to consider a purchase.

These funding mechanisms include the appropriation of town funds or municipal general obligation bonds, which would incur debt that would be paid back, with interest, over time. Another potential option is a real estate transfer tax, which is a percentage tax levy on property sales paid by the buyer. This tax could only be enacted if the town were granted state enabling legislation (the Community Preservation Fund) and a subsequent town-wide referendum approved the transfer tax. Other funding mechanisms include sales and hospitality taxes; local, private donations; and parkland set aside fees. All of these funding mechanisms have advantages and disadvantages, as described in the report, and would need to be broadly considered, with community discussions, before taking action. See the report online for more detailed information about potential town conservation funding as well as state and federal grants, which often require some percentage of local match funds. The report recommends that the town consider a combination of funding mechanisms and also notes that “with any property acquisition or in the situation of trails/hike paths, there will be maintenance costs and other costs for patrolling, insuring and structural costs related to signage and fences where necessary”. These additional ongoing maintenance costs should be added to the consideration of funding mechanisms and how to potentially fund open space on an ongoing basis.



VII. Conclusion

This open space plan, containing a description of the development and the implementation of the open space conservation values maps, the conservation criteria, and the conservation analysis tool, will serve the town as documentation of the next steps toward thoughtful open space conservation. With these data-driven open space rating and prioritization methods, the town will be able to more effectively make decisions regarding open space values when conservation opportunities arise.

Although this document is complete, the tools it describes are iterative, flexible and modifiable as data is updated or priorities change over time. They are to be utilized on a regular basis by Town Planning

Department Staff, the Town Board, the Conservation Easement Review Board, the Planning Board and others as a first point of evaluating an open space conservation opportunity. These tools will prepare and guide the town in responding to landowner inquiries about conservation opportunities, as well as inform the town's development review and design process. Additionally, it will inform the use of limited financial resources and direct future funds to the conservation of open space land that will have the most beneficial impact town-wide. Having this open space plan in place will also support town applications for state, regional and federal grant funding for conservation implementation.

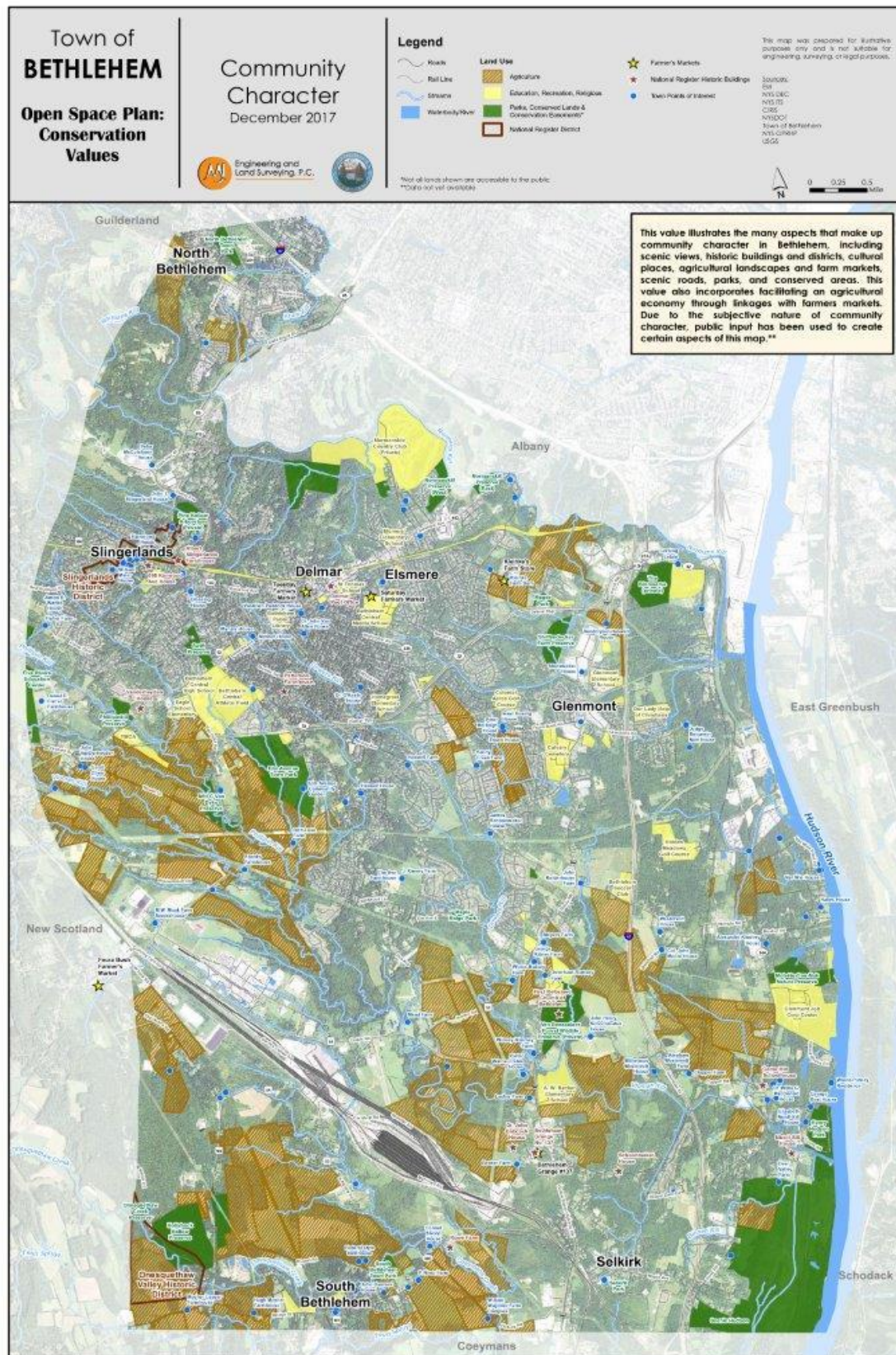
Key to the success of the conservation tools described in this plan is ongoing public engagement and involvement, as well as continued discussions about potential funding mechanisms to support future potential purchases of land or development rights in partnership with interested landowners. Town staff and town boards are dedicated to working with the public, with interested individuals, and with land trusts and other entities to strengthen partnerships that support land conservation efforts that benefit both the landowner and the community. As undeveloped land in its natural state provides a myriad of benefits to us all, the town will employ the tools within this document, and others as they are developed in the future, to continue to work to balance appropriate development with open space conservation with the goal of protecting Bethlehem's community character, scenic qualities, and ecological and economic values.



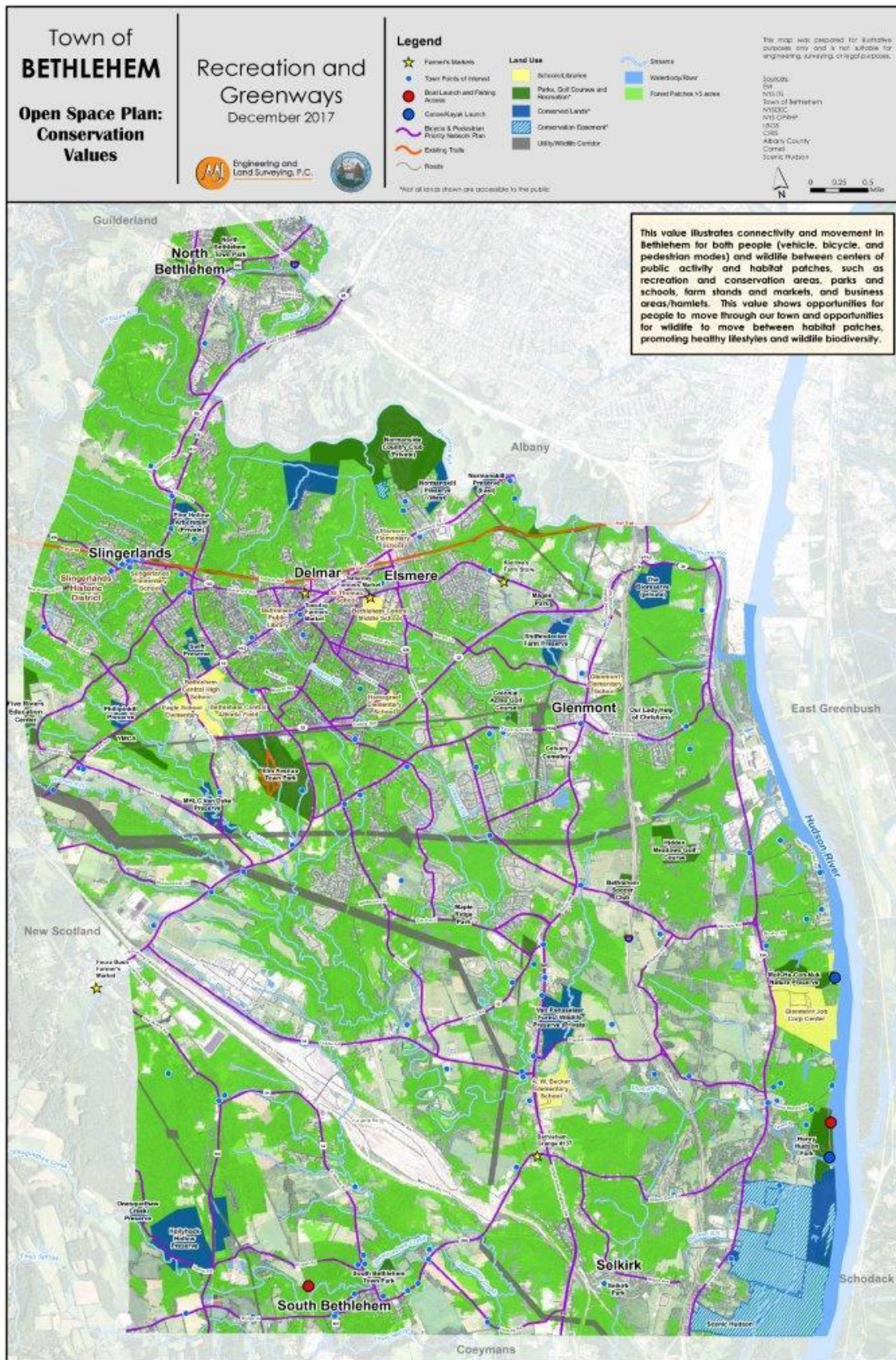
Attachments:

1. Community Character Open Space Conservation Values Map
2. Recreation and Greenways Open Space Conservation Values Map
3. Forests, Fields and Wildlife Ecosystems Open Space Conservation Values Map
4. Natural Water Systems: Streams, Wetlands and the Hudson River Open Space Conservation Value Map
5. “Scenic Bethlehem Photo Survey”: Examples of publicly identified open space scenic views locations
6. Bethlehem Open Space Conservation Criteria List - Initial analysis of Conservation Easement Exemption Program applications.
7. Bethlehem Open Space Conservation Criteria List (detailed version)
8. Example Open Space Plans Reviewed
9. Public Participation and Engagement Process for Open Space Planning (2017)
10. Conservation Priority Areas Map – Example (October, 2017)
11. Conservation of Farmland: making connections to facilitate sustainable agricultural open space
12. Resources cited

Attachment 1: Community Character Open Space Conservation Values Map



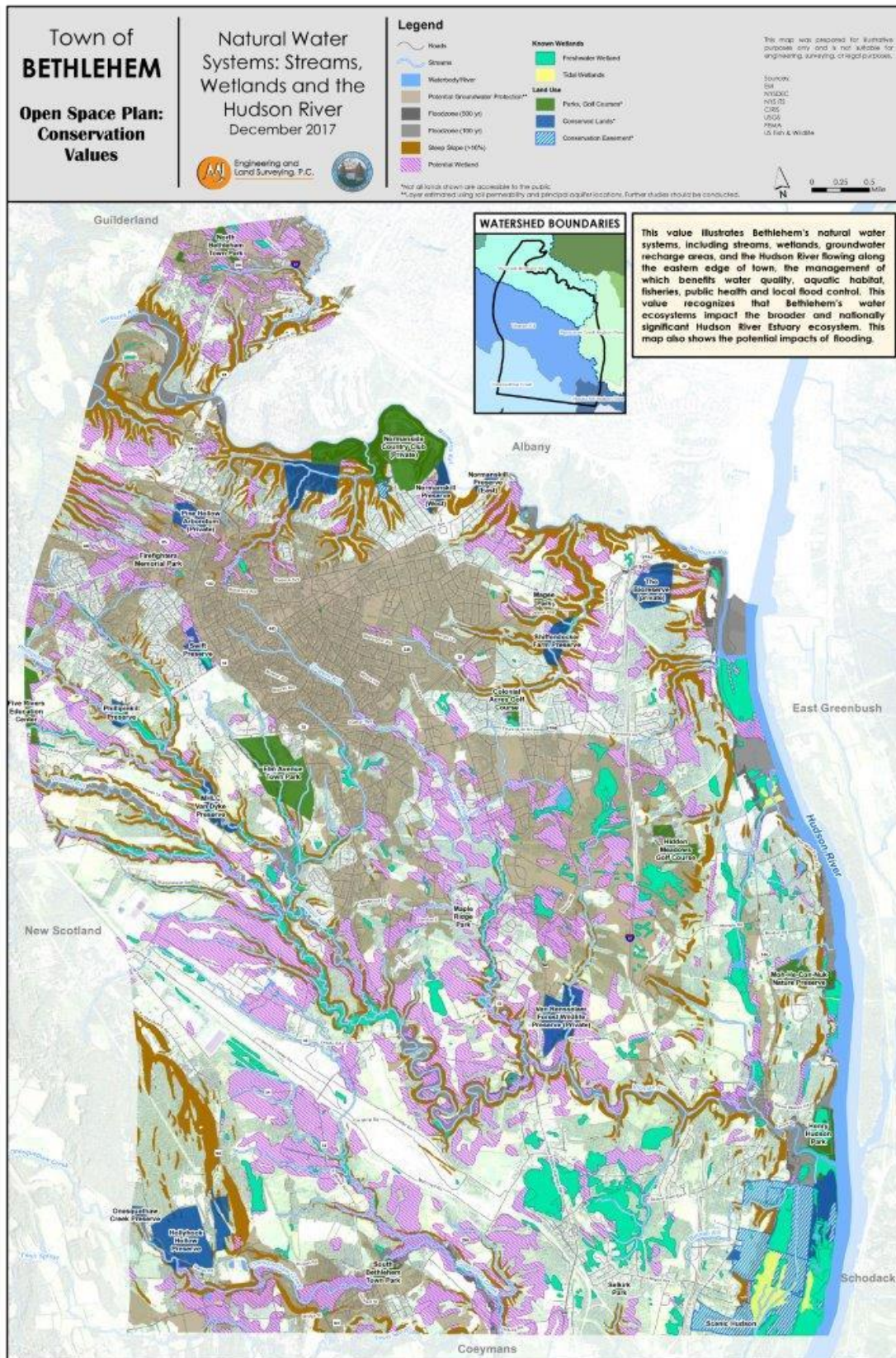
Attachment 2: Recreation and Greenways Open Space Conservation Values Map



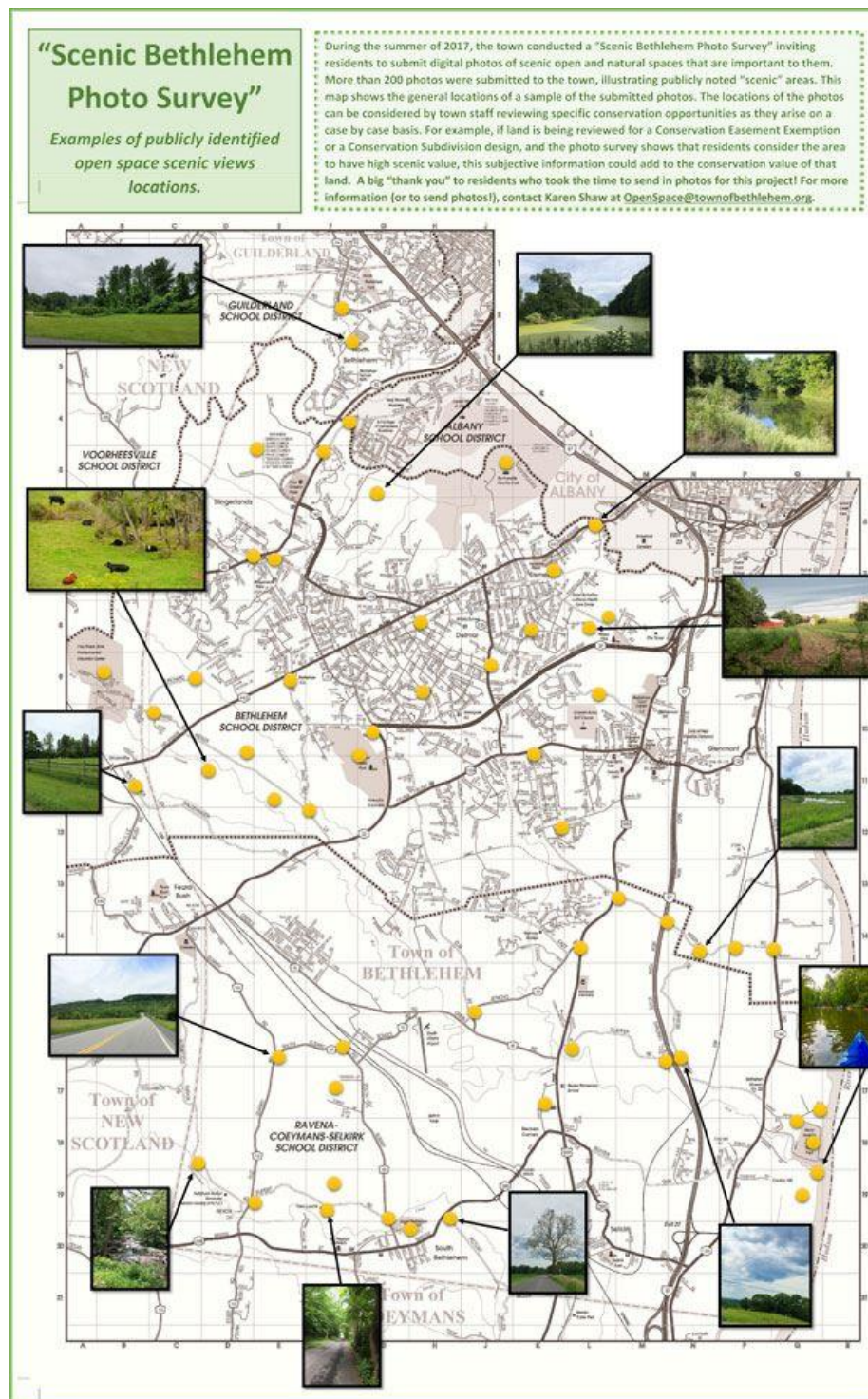
Attachment 3: Forests, Fields and Wildlife Ecosystems Open Space Conservation Values Map



Attachment 4: Natural Water Systems: Streams, Wetlands and the Hudson River Open Space Conservation Value Map



Attachment 5: “Scenic Bethlehem Photo Survey”: Examples of publicly identified open space scenic views locations.



Attachment 6:

Bethlehem Open Space Conservation Criteria List

Initial analysis of Conservation Easement Exemption Program applications.

Applicant name(s):

Property address:

Parcel Tax ID #:

Acres included in proposed Conservation Easement:

Conservation Criteria	Yes = 1 No = 0	Notes
1. Adjacent to or containing town or privately owned parklands, or existing commercial outdoor recreation (including golf courses, private athletic fields, the YMCA, Rail Trail, etc.).		
2. Adjacent to conserved land and preserves, including land owned by MHL, Scenic Hudson, Audubon and other private/non-profit entities.		
3. Adjacent to town conservation easements, including lands participating in town's Conservation Easement Exemption program.		
4. Adjacent to Bicycle and Pedestrian Priority Network roads.		
5. Contains an officially registered historic structure (12 such structures in town) or district (the Slingerlands Historic District and a portion of the Onesquethaw Historic District).		
6. Adjacent to community educational facilities or services, including public schools and libraries.		
7. Adjacent to wildlife corridors or greenways, which serve as wildlife travel pathways between habitat patches.		
8. Contains a known wetland (mapped by federal or state agencies, including tidal wetlands), including a natural, vegetated wetland buffer to filter pollutants and reduce downstream flooding.		
9. Contains a known wetland (mapped by federal or state agencies, including tidal wetlands), including a wider natural, vegetated wetland buffer to filter pollutants, reduce downstream flooding and provide wildlife habitat for biologically diverse plant and animal species.		
10. Contains a potential wetland.		
11. Contains land within floodplains adjacent to local streams, their tributaries, or the Hudson River.		
12. Contains land affected by projected sea level rise due to climate change predictions.		
13. Contains, or is adjacent to, a stream or river, and/or a moderately wide (100 ft) vegetated streamside buffer area to filter pollutants and reduce downstream flooding.		
14. Contains, or is adjacent to, a stream or river, and/or a wide (300 ft) vegetated streamside buffer area, and/or an active river area to filter pollutants, reduce downstream flooding and provide wildlife habitat for biologically diverse plant and animal species.		
15. Contains a stream that has been designated as a migratory fish run or a trout stream (includes the Normanskill, Vlomankill and Onesquethaw Creek).		
16. Contains a potential groundwater recharge area.		

17. Contains or is connected to a large forest patch of 5 – 199 acres or more.		
18. Contains or is connected to a “Stepping Stone” forest patch of 200-1,999 acres.		
19. Contains or is connected to a “Locally Significant” forest patch size of 2,000-5,999 acres.		
20. Contains or is adjacent to a Significant Biodiversity Area (SBA).		
21. Contains or is adjacent to an Areas Important for Rare Plants or Rare Animals.		
22. Contains land currently in active agricultural use, is within an agricultural district, or has a current agricultural assessment from the town.		
23. Contains land with “prime farmland soils” or soils designated as “Farmland of Statewide Importance”, as these soils are best suited for supporting current and future active agriculture.		
24. Adjacent to active farmland, providing a buffer between farmland and other land uses, thereby reducing potential conflicts.		
25. Contains land with soils and geology designated as having “high erosion potential” or steep slopes.		
Total Initial Conservation Score:		

Additional subjective criteria to be considered by town staff, Town Board, and CERB ¹	yes/no	Notes
Contains a publicly noted “scenic view/area” (SBPS) ²		
Historic value.		
Other factors		

Additional notes:

¹ Other additional considerations outside of the 25 Conservation Criteria: Each conservation opportunity will inherently have its own unique set of circumstances. The above 25 criteria can produce useful information about a proposed conservation action through a “score”, but ultimately, can only provide a piece of the puzzle. Each conservation opportunity will be assessed by town staff, the CERB, and the Town Board, and in partnership with the interested individual who owns the land being considered, so that the landowner and the community both benefit from any resulting conservation action.

² During the summer of 2017, the town conducted a “Scenic Bethlehem Photo Survey” (SBPS) and invited residents to submit digital photos of scenic open and natural spaces that are important to them in town. More than 200 photos were submitted to the town from the public, illustrating publicly noted “scenic” areas. Due to the inherent subjectivity of scenic views, these locations will be utilized by the land use professionals reviewing specific conservation opportunities as they arise on a case by case basis.

Attachment 7:

Bethlehem Open Space Conservation Criteria List (Detailed Version)

The 25 conservation criteria below are applied only to lands of five acres or greater including vacant land, residential land with large acreage and agricultural land. A property receives a “1” for each of the criteria it meets. If it does not meet a conservation criteria, the land receives a “0” for that criteria. The more conservation criteria the land meets, the higher its numerical “score”. The GIS application of the below conservation criteria results in lands receiving a conservation prioritization number of 0 – 25, placing the land into the broader prioritization categories of moderate, high, or significant conservation value and is illustrated in three shades of lighter to darker blue on a Conservation Priority Areas Map. However, when a conservation opportunity arises, consideration of potential conservation properties should be field verified, and assessed by land use professionals, on a case by case basis. Open Space Value map association to each conservation criteria is annotated by the following abbreviations: Community Character (CC); Recreation and Greenways (RG); Forests, Fields and Wildlife Ecosystems (FFWE); and Natural Water Systems: Streams, Wetlands and the Hudson River (NWS).

1. Adjacent to or containing town or privately owned parklands, or existing commercial outdoor recreation (including golf courses, private athletic fields, the YMCA, Rail Trail, etc.).

Conservation benefits include: Providing scenic views, community character and possible recreation opportunities (if publicly accessible) that expand the benefits of the public’s usability and value of adjacent recreation areas.

Open Space Value map: CC, RG

2. Adjacent to conserved land and preserves, including land owned by MHLC, Scenic Hudson, Audubon and other private/non-profit entities (as of 2009, approximately 800 acres or about 3% of the town’s total acreage falls under this category).

Conservation benefits include: Expansion of contiguous open space for increased wildlife habitat patches and travel corridors between habitats; increasing water quality and flood protection; enhancing community character and potential recreation area.

Open Space Value map: NWS, FFWE, RG, CC

3. Adjacent to town conservation easements, including lands participating in town’s Conservation Easement Exemption program.

Conservation benefits include: Expansion of contiguous open space for increased wildlife habitat patches and travel corridors between habitats; increasing water quality and flood protection; enhancing community character.

Open Space Value map: NWS, FFWE, RG, CC

4. Adjacent to Bicycle and Pedestrian Priority Network roads.

Conservation benefits include: The bicycle and pedestrian priority network is a system of existing and planned paths that can serve as alternative transportation modes to access, and benefit from, the preservation of open space lands and their scenic and recreation qualities.

Open Space Value map: CC, RG

5. Contains an officially registered historic structure (12 such structures in town) or district (the Slingerlands Historic District and a portion of the Onesquethaw Historic District).

Conservation benefits include: While conservation measures will apply only to open space land, it is recognized that a historic structure on the land, or the land’s containment inside of or adjacent to a historic district, adds to the scenic and community character value of that open space land.

Open Space Value Map: CC, RG

6. Adjacent to community educational facilities or services, including public schools and libraries.

Conservation benefits include: Open space lands neighboring the town's centers of learning, and community gathering nodes, can provide added scenic value, community character, educational and recreation opportunities to these centers and the activities they support.

Open Space Value Map: CC, RG

7. Adjacent to wildlife corridors or greenways, which serve as wildlife travel pathways between habitat patches³.

Conservation benefits include: Streams and associated streambank areas in natural vegetation, provide pathways and travel corridors for a diversity of wildlife species, especially with a wider (100-300 foot) streamside buffer. Additionally, where a linear greenway or path is maintained by humans, as is the case with utility corridors (electric, water), this path can provide incidental wildlife linkages to travel between habitat patches across the larger landscape.

Open Space Value Map: MWS, FFWE, RG

8. Contains a known wetland⁴ (mapped by federal or state agencies, including tidal wetlands), including a natural, vegetated wetland buffer to filter pollutants and reduce downstream flooding^{5, 6}. Wetlands are transitional lands between terrestrial and aquatic systems where the water table is at or near the surface or the land is periodically saturated or covered by water; characterized by plants present, hydric soils and frequency of flooding.

Conservation benefits include: In addition to providing critical life cycle habitat for many plants and animals, wetlands help to control flooding by providing "natural engineering services" - acting as natural sponges on the landscape, reducing damage from storm water surges; recharging groundwater, filtering and cleaning surface water pollutants, and providing recreation opportunities. The upland area, or buffer, surrounding a wetland is essential to the wetland's survival and function. A wetland with at least 100 feet of natural vegetation surrounding it (buffer width) is best at filtering non-point source pollution, like phosphorus, nitrogen and other pollutants, like sediment, from stormwater runoff, and providing critical edge habitat for wildlife that use the wetland for breeding, nesting and foraging.

Open Space Value Map: NWS, FFWE, RG

9. Contains a known wetland (mapped by federal or state agencies, including tidal wetlands), including a wider natural, vegetated wetland buffer to filter pollutants, reduce downstream flooding and provide wildlife habitat for biologically diverse plant and animal species^{7, 8}.

Conservation benefits include: See above for list of the many benefits of wetlands. A wetland with a wider 300 foot vegetated upland area, or buffer, better protects wetland biodiversity and species habitat for foraging, nesting and breeding. A wider buffer also provides higher water quality filtering and flood attenuation benefits, as the increased area of natural vegetation surrounding the wetland helps it do its job of acting as a stormwater sponge, capturing and slowly releasing stormwater, reducing flood impacts downstream.

Open Space Value Map: NWS, FFWE, RG

³ Planning for Resilient, Connected Natural Areas and Habitats: A Conservation Framework. 2014. A Pilot Project conducted by the Town of Red Hook, Village of Red Hook, and Village of Tivoli with financial support from the Hudson River Estuary Program and Cornell University. Prepared by AKRF, Inc. and GREENPLAN, Inc.

⁴ "Known wetlands" include federally mapped and state mapped wetlands, as shown on the U.S. Fish and Wildlife Service's National Wetlands Inventory (NWI) and NY DEC's Freshwater Wetlands Program maps (which only include wetlands larger than 12.4 acres, unless designated "of unusual local importance").

⁵ Strong, K. 2008. Conserving Natural Areas and Wildlife in Your Community: Smart Growth Strategies for Protecting the Biological Diversity of New York's Hudson River Valley. New York Cooperative Fish and Wildlife Research Unit, Cornell University, and New York State Department of Environmental Conservation, Hudson River Estuary Program. Ithaca, N.Y.

⁶ Kennedy, et al. 2003. Conservation Thresholds for Land Use Planners, Environmental Law Institute Report, Washington, D.C. www.elistore.org.

⁷ [Planner's Guide to Wetland Buffers for Local Governments](#). 2008. Environmental Law Institute.

⁸ Crawford, et al. 2007. Estimation of Core Habitat for Stream-Breeding Salamanders and Delineation of Riparian Buffers for the Conservation of Biodiversity. Conservation Biology 21(1):152-158.

10. Contains a potential wetland⁹. State and federal wetland mapping does not include all local wetlands; often smaller wetlands that are not connected to a stream are not included on federal or state maps. These yet-to-be-mapped wetlands are called “potential wetlands”, and are identified initially with soil classification data. Potential wetlands need to be field verified on a case by case basis.

Conservation benefits include: Potential wetlands provide the same benefits as mapped wetlands, but are often overlooked and under-mapped. These potential wetlands provide water quality, flood protection and wildlife habitat benefits, particularly for vernal pool (seasonal wetland), wet meadows and wooded swamp species, like amphibians and reptiles¹⁰.

Open Space Value Map: NWS, FFWE, RG

11. Contains land within floodplains adjacent to local streams, their tributaries, or the Hudson River¹¹.

Conservation benefits include: Floodplains are low-lying areas adjacent to streams and rivers that can become inundated and submerged during heavy precipitation or snowmelt, causing the flooding of these areas. Floodplain areas left in their natural, undeveloped state protect against erosion and downstream flooding, and also help to recharge groundwater. Floodplain areas also provide high ecological value as they serve as important streamside habitat for wildlife and often include streamside, or riparian, wetlands. Floodplains also act as a safety zone between development and the damaging impacts of flood events. The tidal floodplain areas adjacent to the Hudson River are of particular ecological significance, as they are globally rare and key to the survival of many aquatic fisheries species.

Open Space Value Map: NWS, FFWE, RG

12. Contains land affected by projected sea level rise due to climate change predictions¹².

Conservation benefits include: The Hudson River estuary is connected to the Atlantic Ocean and is affected by sea level rise due to climate change. The Hudson has already risen one foot since 1900 and is likely to rise an additional 3-6 feet by 2100¹³. A 2016 study, conducted by Scenic Hudson, shows areas along the Hudson in Bethlehem that are most likely to support tidal wetlands in the future as sea level rises. These important future tidal wetlands expand adjacent to the Binnen Kill, and Shad and Schermerhorn Island, and north to the Vlomankill. Protecting and managing the lands where future tidal wetlands will likely expand will reduce flood risks to landowners and reduce the negative sea level rise impacts.

Open Space Value Map: NWS, FFWE, RG

13. Contains, or is adjacent to, a stream or river, and/or a moderately wide vegetated streamside buffer area to filter pollutants and reduce downstream flooding.^{14, 15}

Conservation benefits include: The protection of the major streams in Bethlehem (Normanskill, Vlomankill and Onesquethaw Creek) and their tributaries (the Dowerskill, Phillipinkill, and smaller streams) contribute to the overall health of aquatic ecosystems and can reduce potential flooding and pollution downstream. A moderate (100 foot) vegetated buffer areas along streams and the river protects water quality and limits downstream flooding; streamside vegetation helps to protect aquatic and riparian wildlife habitat, and can serve as a narrow, but important greenway, or wildlife travel corridor between habitat patches, particularly for bird and small mammal species.

Open Space Value Map: NWS, FFWE, RG, CC

⁹ Hydric soil classification data area used to identify potential wetlands: Albany County Soil Survey. Includes hydric soils with a drainage classification of somewhat poorly drained, poorly drained, or very poorly drained, indicating the ability to hold water for a sufficient amount of time to support wetland vegetation.

¹⁰ Semlitsch, R.D. and J.R. Bodie. 1998. Are small, isolated wetlands expendable? *Conservation Biology*, 12(5):1129-1133.

¹¹ Floodplain information comes from the Federal Emergency Management Agency (FEMA), showing areas estimated to have a 1% chance or greater probability of being inundated in any given year (100 year floodplain area) and areas with a 0.2% chance or greater probability of being inundated in any given year (500 year floodplain).

¹² Tabak, N. and S. Spector. 2016. Protecting the Pathways: A Climate Change Adaptation Framework for Hudson River Estuary Tidal Wetlands. Scenic Hudson, Poughkeepsie, NY. <http://www.scenichudson.org/sites/default/files/protecting-the-pathways.pdf>

¹³ Horton, et al. 2014. Climate change in New York State: Updating the 2011 ClimAID Climate Risk Information. New York State Energy Research and Development Authority (NYSERDA), Albany, N.Y. www.nyserda.ny.gov/climaid.

¹⁴ Kennedy, et al. 2003. Conservation Thresholds for Land Use Planners, Environmental Law Institute Report, Washington, D.C. www.elistore.org.

¹⁵ Normanskill Riparian Corridor Study. 2007. Prepared for Audubon New York by Albany County Department of Economic Development, Conservation and Planning, Albany, N.Y. <http://www.hudsonwatershed.org/images/WaterShedManagementPlans/Normans-Kill-report.pdf>.

14. Contains, or is adjacent to, a stream or river, and/or a wide vegetated streamside buffer area, and/or an active river area¹⁶ to filter pollutants, reduce downstream flooding and provide wildlife habitat for biologically diverse plant and animal species.¹⁷:

Conservation benefits include: This wider (300 foot) vegetated buffer area along a stream or river, and the associated active river area ¹⁸, protects water quality, limits downstream flooding, and provides greater variety of habitats and thus the biodiversity of aquatic and riparian wildlife. Wider streamside buffers also provide a more robust linear greenway/wildlife travel corridor between habitat patches that accommodates a more diverse set of species, including mammals, birds, amphibians, etc.

Open Space Value Map: NWS, FFWE, RG, CC

15. Contains a stream that has been designated as a migratory fish run or a trout stream (includes the Normanskill, Vlomankill and Onesquethaw Creek)¹⁹.

Conservation benefits include: Highlighting the connection of the town's creeks to the Hudson River Estuary, the Normanskill, Vlomankill and Onesquethaw Creek provide migratory routes for the American eel, a fish species that begins life in the Atlantic Ocean and migrates upstream as tiny "glass eels". The Onesquethaw is a cold water stream that provides habitat for brown trout, offering fishing and recreational opportunities.

Open Space Value Map: NWS, FFWE, RG

16. Contains a potential groundwater recharge area²⁰.

Conservation benefits include: Indicates land that includes an aquifer and highly permeable soils that could be protective of groundwater quality and quantity by contributing to groundwater recharge (the percolation of rainwater through highly permeable soils) and the filtration of pollutants through soils. This layer includes USDA soil drainage and principal aquifers from NYDEC.

Open Space Value Map: NWS

17. Contains or is connected to a large forest patch of 5 – 199 acres or more²¹.

Conservation benefits include: Large forests provide wildlife habitat and biodiversity; water quality protection through the filtration of non-point source pollution; absorbs stormwater and reduces downstream flooding; provides streamside buffer and protects highly erodible clay slopes; improves air quality and provides temperature cooling, especially important near developed areas or "heat islands", and provides carbon sequestration to reduce greenhouse gasses²². Also, forests patches of five or more acres have been shown to protect public health by supporting natural predator/prey biodiversity that can reduce human tick-borne disease incidence²³. Forests also enhance scenic qualities and community character, and can provide recreation opportunities, if public access is available.

Open Space Value Map: FFWE, NWS, CC, RG

18. Contains or is connected to a "Stepping Stone" forest patch of 200-1,999 acres²⁴.

Conservation benefits include: This forest size provides all of the above benefits of a 5-199 acre forest. In addition, larger Stepping Stone forests still found in Bethlehem, primarily in the ravines formed by the Normanskill, the Vlomankill and their

¹⁶ Smith, M.P., Schiff, R., Olivero, A. and MacBroom, J.C., 2008. The Active River Area: A Conservation Framework for Protecting Rivers and Streams. The Nature Conservancy, Boston, MA.

¹⁷ Spackman, Et al. 1995. Assessment of Minimum Corridor Width for Biological Conservation: Species Richness and Distribution along Mid-Order Streams in Vermont, U.S.A. *Biological Conservation* 71:325-332.

¹⁸ "The active river area framework is a spatially explicit, holistic view of rivers that includes both the channels and the riparian lands necessary to accommodate the physical and ecological processes associated with the river system. The five components of active river areas include material contribution areas, meander belts, floodplains, terraces, and riparian wetlands." Smith, et al. 2008.

¹⁹ NYS Department of Environmental Conservation Bureau of Fisheries and the New York Natural Heritage Program.

²⁰ Personal communication (August, 2017) with Steven Winkley, Hydrogeologist and Source Water Protection Specialist, New York Rural Water Association, Ghent, N.Y.; personal communication with Elisa Chae-Banaja, Source Water Protection Specialist, Hudson River Estuary Program, NYDEC, New Paltz, N.Y.

²¹ NOAA Coastal Change Analysis Program: 2010 land cover data; Cornell University Department of Natural Resources: Forest Fragmentation Analysis.

²² Trees: The Carbon Storage Experts. New York State Department of Environmental Conservation, Lands and Forests, Albany, N.Y.

<http://www.dec.ny.gov/lands/47481.html>

²³ Allen, et al. 2003. Effects of Habitat Fragmentation on Lyme Disease Risk. *Conservation Biology* 17: 267-272.

²⁴ Kennedy, et al. 2003. Conservation Thresholds for Land Use Planners, Environmental Law Institute Report, Washington, D.C. www.elistore.org.

tributary areas, provide habitat for forest interior species of birds and mammals, as well as relatively broad corridors for wildlife movement and plant dispersal, enabling a diverse array of species to move from one habitat to another across a landscape otherwise fragmented by roads and developed areas. Forested stream corridors found within these forests are particularly important travel routes for wildlife. Forests also enhance scenic qualities and community character, and can provide recreation opportunities, if public access is available.

Open Space Value Map: FFWE, NWS, CC, RG

19. Contains or is connected to a “Locally Significant” forest patch size of 2,000-5,999 acres²⁵.

Conservation benefits include: The largest intact forest patch in Bethlehem occurs in South Bethlehem along the Onesquethaw Creek corridor and continues into New Scotland. This forest size provides all of the above benefits of a 5-1,999 acre forest, and also provides broader habitat diversity for more abundant interior and edge species of mammals, birds and other forest species, including forested wetland species, like reptiles and amphibians. This forest size provides the minimum area needed for sensitive forest-dependent birds. Forests also enhance scenic qualities and community character, and can provide recreation opportunities, if public access is available.

Open Space Value Map: FFWE, NWS, CC, RG

20. Contains or is adjacent to a Significant Biodiversity Area (SBA) ²⁶.

Conservation benefits include: SBA’s are locations of high concentrations of biological diversity or value for regional biodiversity as designated by the NY DEC Hudson River Estuary Program. Two Significant Biodiversity Areas are designated in Bethlehem. **The Upper Hudson River Estuary SBA** includes biologically important tidal wetlands and shallow water habitats along the Hudson River on the eastern border of town, including submerged aquatic vegetation (SAV) beds in the Hudson in the Shad and Shermerhorn Islands habitat area. This area also includes a downstream portion of the Normanskill (approximately 2 miles of stream) that provides favorable habitat for a variety of coastal migratory and resident freshwater fish species and mussels. The Upper Hudson River Estuary SBA supports a globally rare ecosystem and a regionally important fishery, including nursery, breeding and migration habitat for migratory blueback herring, American shad, and striped bass. **The Hudson Valley Limestone and Shale Ridge SBA** lies in the southwest corner of town, its limestone bedrock supporting diverse and rare communities, including calcareous cliffs and areas of karst terrain that provide winter hibernacula for bats; rare species of amphibians and reptiles are also found in this unique SBA.

Open Space Value Map: NWS, FFWE, CC

21. Contains or is adjacent to an Areas Important for Rare Plants or Rare Animals²⁷.

Conservation benefits include: The New York Natural Heritage Program (NYNHP) identifies areas that contain habitat to support certain rare plants and animals in the state. Protection of these important area habitats for plants and animals, and their potential migration patterns across the landscape, will help protect these rare species and local biodiversity. Rare animals found in the town include the NY-Threatened bald eagle, migratory fish that migrate between the sea and Bethlehem’s fresh water (NY-Endangered shortnose sturgeon, blueback herring, alewives, and American eel), a state-rare mussel called the Alewife floater and other rare mussels, and the NY-Special Concern Wood turtle that lives along streams and in forests. Rare and threatened plants are also found in town, including the coastal Davis’ sedge and Golden-seal.

Open Space Value Map: FFWE, NWS, CC, RG

²⁵ Haeckel, I. 2018. [Natural Areas and Wildlife in your Community: A Habitat Summary Prepared for the Town of Bethlehem](#). NYS DEC Hudson River Estuary Program, Cornell University.

²⁶ Penhollow, et al. 2006. Wildlife and Habitat Conservation Framework: An Approach for Conserving Biodiversity in the Hudson River Estuary Corridor. New York Cooperative Fish and Wildlife Research Unit, Cornell University and New York State Department of Environmental Conservation, Hudson River Estuary Program, Ithaca, N.Y. <http://dec.ny.gov/lands/5096html>

²⁷ New York Natural Heritage Program data.

22. Contains land currently in active agricultural use, is within an agricultural district, or has a current agricultural assessment from the town²⁸.

Conservation benefits include: Protecting active agricultural land in town is important to maintaining land currently and historically in productive use, contributing to community character, scenic views, and the local agricultural economy and local foodshed. Lands in active agriculture can also benefit water quality, quantity (preventing flooding and recharging groundwater) and provide wildlife habitat. Additionally, recent research has shown that agricultural lands have dramatically less impact on climate change versus urban development, as farmland produces fewer greenhouse gases per acre than developed land uses²⁹.

Open Space Value Map: CC, FFWE, NWS

23. Contains land with “prime farmland soils” or soils designated as “Farmland of Statewide Importance”, as these soils are best suited for supporting current and future active agriculture³⁰.

Conservation benefits include: Protecting lands with the most potentially productive local farming soils, taking into consideration a variety of physical and chemical soil characteristics that are suitable for producing food, feed, forage, fiber, and oilseed crops, could help to support a productive agricultural economy and support future farming in town. Farmland contributes to our local foodshed, community character, scenic views and can benefit wildlife and water quality.

Open Space Value Map: CC, FFWE, NWS

24. Adjacent to active farmland, providing a buffer between farmland and other land uses, thereby reducing potential conflicts³¹.

Conservation benefits include: Protecting open space adjacent to active farms can serve as a buffer between rural and suburban activities, reducing the potential conflicts that may arise with these land uses. Open space adjacent to active farmland also can increase the wildlife habitat and scenic value of both.

Open Space Values Map: CC, FFWE, NWS

25. Contains land with soils and geology designated as having “high erosion potential” or steep slopes³².

Conservation benefits include: Significantly steep slopes and highly erodible clay soils are found in the ravines and bluffs along the three main streams in Bethlehem (Normanskill, Vlomankill and Onesquethaw), as well as along stretches of the Hudson River³³. This combination of slopes and soils creates high erosion and landslide potential in these areas. Maintaining natural vegetation, particularly forests, along these areas prone to erosion helps to stabilize these vulnerable areas, prevent future erosion and protect stream habitats.

Open Space Value Map: CC, FFWE, NWS

Additional subjective criteria to be considered after GIS analysis on a case by case basis:

Each conservation opportunity will inherently have its own unique set of circumstances. The above 25 criteria can produce useful information about a proposed conservation action, but ultimately, only provide a piece of the puzzle. Each conservation opportunity will be assessed by town staff and the Town Board, and in partnership with the interested individual who owns the land being considered, so that the landowner and the community both benefit from any resulting conservation action.

²⁸ Town of Bethlehem Agricultural and Farmland Protection Plan. 2009. Prepared by Town of Bethlehem Department of Economic Development and Planning, Agricultural and Farmland Study Advisory Committee, in Association with American Farmland Trust.

²⁹ Shaffer, et al. 2015. *A New Comparison of Greenhouse Gas Emissions from California Agricultural and Urban Land Uses*, American Farmland Trust.

³⁰ U.S. Department of Agriculture, [National Soil Survey Handbook](#): definition of Prime Farmland and Soils of Statewide Importance.

³¹ Sullivan, et al. 2004. Agricultural buffers at the rural-urban fringe: an examination of approval by farmers, residents, and academics in the Midwestern United States. *Landscape and Urban Planning*. 69: 299-313. <http://willsull.net/resources/Sullivan-papers/SullivanAndersonLovell.pdf>

³² Town of Bethlehem data based on Albany County data for “soils with high erosion potential”.

³³ Kiviat, E. and G. Stevens. 2001. *Biodiversity Assessment Manual for the Hudson River Estuary Corridor*. NYS Department of Environmental Conservation, Albany, N.Y.

Attachment 8:

Example Open Space Plans Reviewed:

Town of Red Hook, New York Community Preservation Plan (Update 2016).

<http://redhook.org/PDFs/Supervisor/2016/Red-Hook-CPP-Update-06-09-2016.pdf>

Town of Warwick, New York, 2006, Community Preservation Plan.

Town of Phillipstown, Putnam Co., New York. Natural Resource and Open Space Protection Plan, and an Open Space Index (2009).

Town of Aurora, NY (Erie Co): Open Space Plan

Town of Pittsford, NY (Monroe Co) "Greenprint"

Pleasant Valley, NY (Dutchess Co) 2013 Open Space and Farmland Protection Plan

Town of Halfmoon, NY (Saratoga Co): Natural Resource and Open Space Conservation Plan

The Town of Shawangunk (Ulster Co): <http://www.shawangunk.org/pdf/enviro/Shawangunk-Open-Space-Analysis.pdf>

Town of New Paltz, NY (Ulster Co): <http://www.townofnewpaltz.org/building/pages/open-space-plan-2006>

Attachment 9:

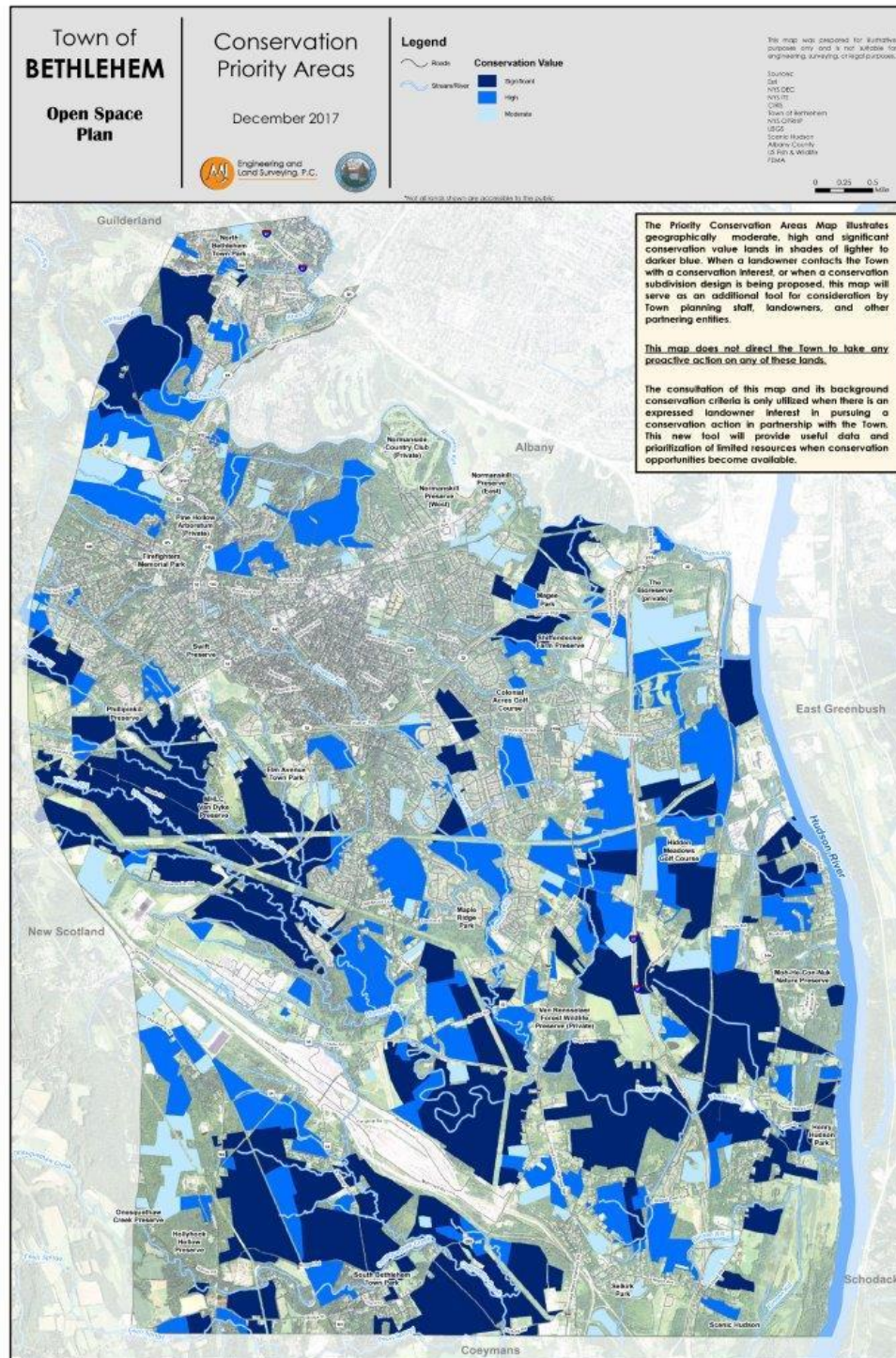
Public Participation and Engagement Process for Open Space Planning (2017)

- **May – July: Get out your cameras, Bethlehem!** Participate in the town’s “Scenic Bethlehem Photo Survey”. Assist the town in identifying the open and natural spaces in town that are important to you. Take a digital photo and email to OpenSpace@townofbethlehem with the photo location and why this place is important to you.
- **June 14th Town Board meeting (6:00 PM at Town Hall):** [Presentation](#) of a series of Draft Open Space Values maps to initiate a public comment period over the summer and fall. (Click on the links above to see these maps.)
- **June 17th at the Delmar Farmers Market:** Learn about and participate in the town’s “Scenic Bethlehem Photo Survey” to help identify scenic natural areas in our community. Review the Draft Open Space Values maps presented to the Town Board on June 14th.
- **July 1st – 31st at the Bethlehem Public Library:** The Draft Open Space Values maps (along with information about the town’s Conservation Easement Exemption program and the Scenic Bethlehem Photo Survey) were displayed for comment all month in the library’s lobby area.
- **August 10th – Hudson Kayak Eco-Tour:** A group of Bethlehem residents, lead my Town Board member David VanLuven, utilized the new kayak launch at Henry Hudson Park and paddled up the Vlomankill and down the Hudson River and saw much wildlife, including a bald eagle, while learning about the positive impact of land conservation on the health of these vital local waterways.
- **August 23 Town Board meeting:** Join us for a presentation of “Bethlehem’s Natural Areas and Wildlife” given by staff at the [Hudson River Estuary Program](#). See a copy of the presentation here (insert link to attached PPT presentation). See the supporting document [here](#).
- **August 5th at the [Delmar Farmers Market](#):** Town staff will answer questions about the Draft Open Space Values Maps and the town’s Conservation Easement Exemption Program for landowners of 5 acres or more.
- **September – Review the town’s Draft Open Space Values maps at Town Hall** – displayed on the wall in front of the Town Clerk’s window.
- **October 7th at the [Delmar Farmers Market](#):** Town staff will answer questions about the Draft Open Space Values Maps and the town’s Conservation Easement Exemption Program for landowners of 5 acres or more.
- **October 12th Open Space Conservation Planning Public Workshop (6:00-8:00 at Five Rivers Environmental Education Center):** About 70 people, representing businesses, land conservancies, landowners, developers, and other interest groups, attended the open house style workshop. Town staff and staff from MJ Engineering and Land Surveying, P.C. presented the open space planning process and maps, and took questions from participants. [Click here for the presentation](#).
- **November 8th Town Board meeting (6:00 PM at Town Hall):** Planning staff will present an update of the Open Space Conservation Planning process to the Town Board.
- **November 1st – 30th at the Bethlehem Public Library:** The Draft Open Space Values maps and the Draft Conservation Priority Areas map (along with information about the town’s Conservation Easement Exemption program) will be displayed for comment all month in the library’s lobby area.
- **November 20th – “[Bethlehem’s Open Space Plan: Conservation Criteria Implementation](#)”**, draft document online, available for public comment.
- **December 13th –** Town Board presentation of Open Space Plan and resolution.
- **Comments always welcome** via email at OpenSpace@townofbethlehem.org.

Attachment 10:

Conservation Priority Areas Map – Example, December 2017

This example Conservation Priority Areas map is a result of applying the 25 conservation criteria to vacant land, residential land with large acreage, and agricultural land that contain a minimum of 5 acres. The map does not direct the town to take any proactive action on any of these lands; it provides information, based on data and objective criteria that can help guide the town, landowner, or other agencies about a conservation opportunity when that opportunity arises.



Attachment 11:

Conservation of Farmland: making connections to facilitate sustainable agricultural open space

- Consider a “Farmer Landowner Match Program” that connects landowners seeking to have their land farmed with farmers seeking land. The Columbia Land Conservancy Farm Landowner Match Program provides a successful example of this activity and currently has 200 active participants. CLC also developed a Conserve a Local Farm (CALF) program connecting sellers of active farmland with conservation-minded buyers and helping to ensure that the remaining farmland in Columbia County is accessible to farmers.
- Work with Hudson-Mohawk Resource Conservation and Development (RC&D), Cornell University Cooperative Extension of Albany County (CCE) to assess opportunities for specialty crops, niche markets, and use of value-added programs, as suggested in the 2004 Albany County Agricultural and Farmland Protection Plan (currently under revision).
- Partner with Scenic Hudson utilizing their “Securing Fresh, Local Food for New York City and the Hudson Valley: A Foodshed Conservation Plan for the region” document to help identify and support conservation of important farmland in Bethlehem. This plan illustrates that farms in Bethlehem have high priority for conservation in the context of the regional foodshed.
- Encourage CSAs in town (free-choice and in-town pick up locations – example of Plowbreak Farm in Hector, NY).
- Work with the Hudson Valley (and National) Young Farmers Coalition <http://www.hvyoungfarmers.org/> to bring together a new generation of farmers and ideas for shoring up the local farming economy through creative business models and cooperation.
- New Farmers Grant Fund Program: New York State grants for young/new farmers and veterans to assist with starting in farming (Oct. 2017).
- Participate in Capital Roots Food Hub Buyer program, which purchases food from more than 75 family farms that make up their 11-county regional food shed, so that urban families can access healthy, affordable food in their neighborhoods through the Veggie Mobile.
- Create a publication for farmers with a complete list of tax relief opportunities and other agricultural programs.
- Foster relationships between local restaurants and local producers to encourage the use of locally grown products.
- Encourage relationships between producers and local farmers markets, so that Bethlehem farms are represented.

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(Additional sources cited within the Conservation Criteria List – detailed version – Attachment 7).