



Conservation Analysis Tool

With Conservation Criteria List

(Detailed Version)

DRAFT

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Town of Bethlehem

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Conservation Analysis Tool: *Identifying Bethlehem's Conservation Priority Areas*

Why did we develop a Geographic Information System (GIS)-based Conservation Analysis Tool?:

Bethlehem town staff studied nine other NYS towns who have completed similar open space conservation priority analyses to develop the most appropriate conservation criteria and method of analysis applicable to Bethlehem. The intent is for the analysis to be objective, data-driven and scientifically based. Additionally, the Geographic Information System (GIS) tool developed 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. The **GIS Conservation Analysis Tool**, developed in partnership with M.J. Engineering and Land Surveying, P.C. (MJ) will serve these purposes, allowing the town to use science and analysis to prioritize conservation areas in Bethlehem, for now and into the future. The Conservation Easement Review Board and Town staff provided methodology for the Conservation Analysis Tool while design and execution were provided by MJ. As conservation opportunities present themselves, the town can use this GIS tool and the output it produces, to respond quickly and appropriately to best balance growth and conservation in real time.

Development of Conservation Criteria – “the input”: The GIS tool utilizes “input” data in the form of 25 Conservation Criteria (listed below) 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 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 Draft Conservation Priority Areas Map.

The Resulting Draft Conservation Priority Areas Map – the “output”: Based on the three categories of conservation priority, the resulting “output”, or the Draft Conservation Priority Areas Map, 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. 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 on a case by case basis.

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, to name a few.

Incorporating important “subjective” conservation criteria: In addition to the objective conservation criteria, there are important subjective conservation criteria that should also be considered when evaluating land for conservation opportunities. An example of a subjective, or opinion-based criteria, is the concept of “scenic views”. See a description of how scenic views are incorporated outside of the GIS analysis at the end of the Conservation Criteria List document.

DRAFT 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 the Draft Conservation Priority Areas Map. However, when a conservation opportunity arises, consideration of potential conservation properties should be field verified 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 patches¹.

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 wetland² (mapped by federal or state agencies, including tidal wetlands), including a natural, vegetated wetland buffer to filter pollutants and reduce downstream flooding^{3, 4}. 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^{5, 6}.

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

¹ 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.

² "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").

³ 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.

⁴ Kennedy, et al. 2003. Conservation Thresholds for Land Use Planners, Environmental Law Institute Report, Washington, D.C. www.elistore.org.

⁵ Planner's Guide to Wetland Buffers for Local Governments. 2008. Environmental Law Institute.

⁶ 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 wetland⁷. 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 reptiles⁸.

Open Space Value Map: NWS, FFWE, RG

11. Contains land within floodplains adjacent to local streams, their tributaries, or the Hudson River⁹.

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 predictions¹⁰.

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 2100¹¹. 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. ^{12,13}:

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

⁷ 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.

⁸ Semlitsch, R.D. and J.R. Bodie. 1998. Are small, isolated wetlands expendable? *Conservation Biology*, 12(5):1129-1133.

⁹ 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).

¹⁰ 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>

¹¹ 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.

¹² Kennedy, et al. 2003. Conservation Thresholds for Land Use Planners, Environmental Law Institute Report, Washington, D.C. www.elistore.org.

¹³ 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 area¹⁴ to filter pollutants, reduce downstream flooding and provide wildlife habitat for biologically diverse plant and animal species.¹⁵:

Conservation benefits include: This wider (300 foot) vegetated buffer area along a stream or river, and the associated active river area ¹⁶, 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)¹⁷.

Conservation benefits include: Highlighting the connection of the town's creeks to the Hudson River Estuary, the Normanskill, Vlomankill and Onequethaw 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 area¹⁸.

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 more¹⁹.

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 gasses²⁰. 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 incidence²¹. 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

¹⁴ 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.

¹⁵ 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.

¹⁶ "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.

¹⁷ NYS Department of Environmental Conservation Bureau of Fisheries and the New York Natural Heritage Program.

¹⁸ 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.

¹⁹ NOAA Coastal Change Analysis Program: 2010 land cover data; Cornell University Department of Natural Resources: Forest Fragmentation Analysis.

²⁰ 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>

²¹ Allen, et al. 2003. Effects of Habitat Fragmentation on Lyme Disease Risk. *Conservation Biology* 17: 267-272.

18. Contains or is connected to a “Stepping Stone” forest patch of 200-1,999 acres²².

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 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 acres²³.

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) ²⁴.

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 Animals²⁵.

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

²² Kennedy, et al. 2003. Conservation Thresholds for Land Use Planners, Environmental Law Institute Report, Washington, D.C. www.elistore.org.

²³ 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.

²⁴ 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>

²⁵ 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 town²⁶.

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 uses²⁷.

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 agriculture²⁸.

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 conflicts²⁹.

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 slopes³⁰.

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 River³¹. 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

²⁶ 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.

²⁷ Shaffer, et al. 2015. *A New Comparison of Greenhouse Gas Emissions from California Agricultural and Urban Land Uses*, American Farmland Trust.

²⁸ U.S. Department of Agriculture, *National Soil Survey Handbook*: definition of Prime Farmland and Soils of Statewide Importance.

²⁹ 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>

³⁰ Town of Bethlehem data based on Albany County data for “soils with high erosion potential”.

³¹ Kiviat, E. and G. Stevens. 2001. *Biodiversity Assessment Manual for the Hudson River Estuary Corridor*. NYS Department of Environmental Conservation, Albany, N.Y.

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

Contains a scenic view area as identified by public photo survey and input. During the summer of 2017, the town conducted a “Scenic Bethlehem Photo Survey” 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 serve as important information, but are not included in the above objective data analysis tool. The scenic views photo location data will be utilized by the land use professionals 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, and the scenic views data shows several residents have sent photos of land in this area and consider it to have high scenic value, this information would add to the conservation value of that land.

Conservation benefits include: Protecting land with scenic value to people who live, work and play in the town provides aesthetic, recreational, and property value benefits. Scenic lands, although this is a subjective criteria that may differ by the viewer, add to community character and the quality of life in town.

Open Space Value Map: CC

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, 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.

Conservation benefits include: All benefits associated with the specific land being considered.

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