

Town of East  
Greenbush

# Natural Resources Inventory



# **Town of East Greenbush Natural Resources Inventory**

**Prepared by the East Greenbush Natural Resources Work Group**

Final Report

May 2019

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This project was carried out through a partnership with Cornell University and the New York State Department of Environmental Conservation Hudson River Estuary Program with funding from the New York State Environmental Protection Fund.



**Department of  
Environmental  
Conservation**

**Hudson River  
Estuary Program**



**Cornell University**





## **Section 1: Introduction**

East Greenbush is the most populous township in Rensselaer County and maintains a high quality of life that continues to attract residents and businesses. Preservation of the Town's fresh water, parks, and scenic spaces is essential to ensure continued prosperity and responsible growth. Recognizing this need, the Town Board convened a Town of East Greenbush Natural Resources Work Group (NRWG) in spring 2018 to create a Natural Resources Inventory (NRI) to document a wide range of natural and cultural resource assets in the community. The NRWG consists of volunteers who reside in East Greenbush and have experience in land use, conservation, open space planning, civil engineering and historic preservation. As part of this initiative, East Greenbush was awarded free technical assistance and mapping support services from Cornell University through the New York State Department of Environmental Conservation (NYSDEC) Hudson River Estuary Program, with funding from the NYS Environmental Protection Fund.

The purpose of the NRI is to identify and document naturally occurring resources located within the Town including geology and soils; water resources; habitats and wildlife; sites of cultural, historic, recreational, and scenic importance; existing land use; and climate conditions. The NRI is comprised of a series of 25 maps as well as an accompanying report with narrative descriptions, supporting data tables, and recommendations. By proactively considering the community's land and water resources, the NRI provides a foundation for comprehensive and open space planning, zoning updates, potential conservation overlay districts, identifying critical environmental areas, climate adaptation strategies, and other municipal plans and policies for the Town of East Greenbush. The NRI can also inform land stewardship and conservation in the Town.

Due to the changing nature of resources documented in the NRI, and because sources of data are regularly developed and improved, the report should be considered a living document and be updated every 5-10 years as new data is available. As the NRWG's work concludes, the committee recommends that the Town Board establish a Conservation Advisory Council (CAC), pursuant to Section 239-x of NYS General Municipal Law, to maintain and update the NRI over time, and to create a formal body devoted to natural resource-based planning and to advising on environmental matters in the Town.

## Data and Methods

Mapping for the East Greenbush NRI was completed in 2018 through technical assistance from Cornell University through the NYSDEC Hudson River Estuary Program. The maps were created by a Cornell University graduate student intern, Andrew Varuzzo, under the supervision of Hudson River Estuary Conservation and Land Use Specialist Ingrid Haeckel and with input from the NRWG. They display data from federal, state, and county agencies; non-profit organizations including the Rensselaer Land Trust, Scenic Hudson, and The Nature Conservancy; and prior planning efforts by the Town of East Greenbush. Some data from earlier plans were digitized, including proposed amenities from the *Town of East Greenbush Amenities Plan: 2016-2017* and the location of historic sites mapped in the Town's 1993 *Comprehensive Development Plan*, which were verified in person by NRWG members. Scenic roadways described in the 1993 plan were also digitized and confirmed by NRWG members. Several maps include data from Rensselaer Land Trust's *Land Conservation Plan: 2018-2030*.<sup>1</sup> They draw on extensive studies in the county by local ecologist Dr. David Hunt, who helped interpret information from the *Conservation Plan* for the NRI. The original source and publication year of data sets are included on each map, and are described in the report.

All maps were produced using ESRI ArcGIS 10.6 Geographic Information Systems (GIS) software and data in the NAD 1983 State Plane New York East FIPS 3101 Feet coordinate system. Information on the maps comes from different sources, produced at different times, at different scales, and for different purposes. Most of the GIS data were collected or developed from remote sensing data (i.e., aerial photographs, satellite imagery) or derived from paper maps. For these reasons, GIS data often contain inaccuracies present in the original data, plus any errors from converting it. Therefore, maps created in GIS are approximate and best used for planning purposes. They should not be substituted for onsite surveys. Any resource shown on a map should be verified for legal purposes, including environmental review. Information provided by the maps can be enhanced by local knowledge, and the NRI should be updated over time as new data become available.

The NRI report was largely written by NRWG members, with assistance from Ingrid Haeckel and Adam Yagelski, Town Director of Planning and Zoning. It incorporates *Natural Areas and Wildlife in Your Community: A Habitat Summary Prepared for the Town of East Greenbush* by Ingrid Haeckel (delivered in September 2018), as well as relevant descriptions of certain resources from inventories within the Town's 1970 and 1993 comprehensive plans. Additional background information was drawn from *Creating a Natural Resources Inventory: A Guide for Communities in the Hudson River Estuary Watershed*.<sup>2</sup> The NRWG followed the *Town of Rosendale Natural Resources Inventory*<sup>3</sup> as a general

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1 Winter, John, Jim Tolisano, Rick Lederer-Barnes, Michael Batcher, and Nick Conrad. *Rensselaer Land Trust Land Conservation Plan: 2018 to 2030*. Rensselaer Land Trust, Troy, NY, 2018, <https://www.renstrust.org/protect/county-conservation-plan>.

2 Haeckel, Ingrid, and Laura Heady. *Creating a Natural Resources Inventory: A Guide for Communities in the Hudson River Estuary Watershed*. New York State Department of Environmental Conservation and Cornell University, 2014, <http://www.dec.ny.gov/lands/100925.html>.

3 The Town of Rosendale Environmental Commission. *Rosendale Natural Resources Inventory*. Town of Rosendale, 2018,



guide for style and format.

The draft NRI maps were made available via the Town website and in hard copy at Town Hall and the East Greenbush Community Library for public comment throughout fall 2018. They were formally presented to the Town Board at its meeting on October 17, 2018. A public presentation and community meeting were held in the East Greenbush Town Library on November 1, 2018. There were seventeen attendees representing Town residents and various organizations. After a presentation and question and answer period, the draft maps were made available at individual stations. One written comment was received during this time. The final draft report was posted to the Town website for public comment in May 2019.



*Public Meeting 11/1/2018*

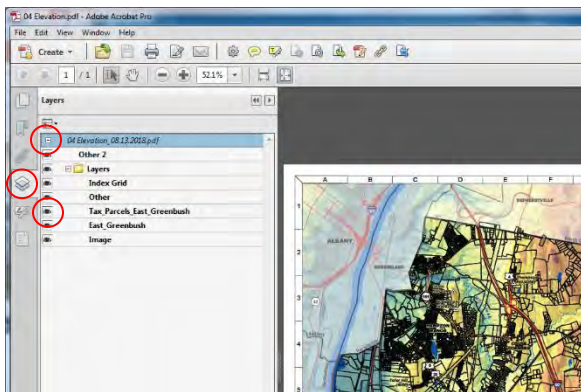
## How to Use this Report

The NRI is a valuable land use planning tool as well as educational resource that documents aspects of the Town's diverse natural and cultural resources. The NRI is being completed as the Town embarks on a Comprehensive Plan and Integrated Land Use Planning Update. Information from the NRI will be integrated into the Comprehensive Plan and the NRWG is compiling a series of recommendations to present to the Comprehensive Plan Committee. The inventory provides an essential tool for East Greenbush's Planning and Zoning, Building and Codes, and Public Works Departments by officially identifying sensitive land, water and cultural/historical resources.

The NRI maps and report discuss development considerations for the Town's Planning and Zoning Boards, laying a foundation for land-use planning and decision-making, zoning considerations and municipal policy guidance, as well as environmental conservation. In addition, the NRI provides property owners, developers, and their consultants with information they may need in considering the impact a proposed project may have on East Greenbush's natural resources. It can be used to address natural resources during project planning and design and to help expedite review and approval of their endeavors. It can also be used as a general reference for landowners to understand resources that may occur on their property and to inform stewardship.

It is important to keep in mind that the NRI is best suited for municipal scale planning but may be used as a screening tool at the site scale to raise questions or identify the need for additional site assessment. The maps are not intended to provide site-specific accuracy and should not be used as a primary source for land use decision-making but may identify where further site assessments are needed.

The NRI maps are available as PDFs on the Town website ([www.eastgreenbush.org](http://www.eastgreenbush.org)) and physical copies are available in the Planning Department at Town Hall. The PDF maps allow for ease of navigation with the ability to zoom in to an area of interest. In addition, tax parcel boundaries are embedded in the PDF maps. To view parcel boundaries, you must download the maps and open them using Adobe software (download free Adobe Reader software at <https://get.adobe.com/reader/>). Expand the layers by clicking the overlapping diamond symbol on the left-hand side of the window. Click the + sign next to the "Layers" folder to expand visible layers and select the box to the left of the tax parcel layer to turn it on.



## **Base Map (Map 1)**

The Base Map is the foundation for the East Greenbush Natural Resources Inventory map series. It shows municipal boundaries and transportation infrastructure including roads and railways, as well as general environmental features such as surface water and topography. East Greenbush is bordered by the Hudson River estuary and Town of Bethlehem to the west, the City of Rensselaer, and the towns of North Greenbush, Sand Lake and Schodack. The Base Map also identifies the hamlets and recognized neighborhoods of Hampton Manor, Sherwood Park, Couse Corners, Best and Luther.

Multiple highways pass through East Greenbush. US Routes 9 & 20 cross the Town from Rensselaer to Schodack via Columbia Turnpike. US Route 4 runs north from an intersection at Columbia Turnpike, passing the Town line at North Greenbush. Interstate 90 is the largest highway in the Capital Region with one exit in East Greenbush connecting to US Route 4. There are also two New York State Routes crossing the Town: NY 151 from Rensselaer to Sand Lake and NY 9J from Rensselaer to Schodack.

Two rail lines run parallel to NY 9J and the Hudson River. Both tracks are operated by Amtrak. CSX Transportation, Inc and Canadian Pacific Railway both have trackage rights on the western line.<sup>4</sup> The Hudson River itself is a major transportation corridor and has been designated Marine Highway M87 by the US Department of Transportation.

The Base Map also illustrates general natural features such as open bodies of water, streams, rivers and wetlands. Of note, the Hudson River, Mill Creek, Papscaene Creek and Moordener Kill are labeled. General topographic relief is shown using a shaded digital elevation model. These features are shown in more detail on other maps in the inventory.

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4 *Rail Roads in New York - 2016*. New York State Department of Transportation, January 2016, [www.dot.ny.gov/divisions/operating/opdm/passenger-rail/passenger-rail-repository/2016 NYS Rail Map.pdf](http://www.dot.ny.gov/divisions/operating/opdm/passenger-rail/passenger-rail-repository/2016%20NYS%20Rail%20Map.pdf)

## Aerial View (Map 2)

The Aerial View Map gives a bird's-eye view of the Town, showing 1-ft resolution 4-band digital orthoimagery taken in natural color in 2017 by the NYS Digital Orthoimagery Program. Orthoimagery is aerial imagery that has been georeferenced and digitally corrected to remove geometric distortion due to ground relief and camera position.<sup>5</sup> The resulting imagery is proportionally accurate and can be overlaid onto maps. The aerial imagery was taken in early spring prior to the leaf out of deciduous trees, resulting in a detailed view of vegetation types, land uses, and development. It can serve as a reference for comparison with features shown on other maps in the Natural Resources Inventory.

For more detailed, interactive viewing of orthoimagery dating back to 1994, users can visit the Discover GIS Data NY website at <https://orthos.dhSES.ny.gov/>.

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5 *Frequently Asked Questions – Digital Orthoimagery Information*. NYS GIS Program Office, <http://gis.ny.gov/gateway/mg/faq.htm>

### Color Infrared Aerial View (Map 3)

The Infrared Aerial View map shows a different aspect of the 2017 orthoimagery described in the Aerial View Map: light captured from the near-infrared spectrum is displayed in red, increasing color contrast and helping to highlight details in the landscape. Color infrared aerial imagery detects and records energy reflected by the ground and the sun's spectral energy, displaying it at visible wavelengths.<sup>6</sup> This type of imagery is particularly useful for remotely identifying habitats and waterbodies, including small streams, vernal pools, and other wetlands that are flooded or saturated in the early spring when the photos are taken.

A variety of colors in the color infrared imagery show the differences between vegetation, bare soils, water and development.<sup>7</sup> Red tones are associated with growing vegetation. More intense red areas indicate places where vegetation is growing vigorously such as conifer trees or shrubs and fertilized lawns, crops, or pastures. Dormant or less vigorously growing vegetation typically appears in lighter shades of pink or various shades of green, brown, or tan. Bare soils and gravel appear in shades of white, blue, or green. Water typically appears black or dark blue. Wetland vegetation will appear darker than surrounding upland habitats. In some cases, emergent marshes and wet meadows may appear whitish because of dead standing vegetation from the previous growing season.

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6 *Understanding Color-Infrared Photographs*. US Geological Survey, 2001, <https://pubs.usgs.gov/fs/2001/0129/report.pdf>. USGS Fact Sheet 129-01.

7 *What Do the Different Colors Represent?* US Geological Survey, <https://www.usgs.gov/faqs/what-do-different-colors-a-cir-aerial-photograph-represent>

## **Section 2: Physical Setting**

### **Elevation and Topography (Map 4)**

Land in East Greenbush rises from sea level along the Hudson River to an elevation of 672 feet in the northeast corner of Town. The variation in the Town's topography reflects differences in the underlying geology and has been an important factor influencing the location of development.

Land in East Greenbush rises from sea level along the Hudson River to an elevation of 672 feet in the northeast corner of Town.

The Town's highest point is located on a hill near Providence Drive. Other high points in the eastern hills include Hallenbeck Hill (635 feet), near the Town Park; and Thompson Hill (426 feet), just east of U.S. Route 4. The western part of Town has some high hills, too, rising above the Hudson River lowlands: Olcott Hill (413 feet) and Rysedorph Hill (400 feet) north of Hampton Manor; and Teller Hill (405 feet) and Grandview Hill (418 feet) on the aptly named Ridge Road.

Cutting through these landscapes, creating both gorges and flat meander belts, are the North Branch Moordener Kill and Mill Creek. The Hudson River into which they flow is a tidal estuary, an arm of the sea influenced by daily tides.<sup>8</sup>

*Topography change from marshlands of Papscanee Island east of 9J towards hills of East Greenbush.*



<sup>8</sup> “The Hudson Estuary: A River That Flows Two Ways.” NYS Dept. of Environmental Conservation, [www.dec.ny.gov/lands/4923.html](http://www.dec.ny.gov/lands/4923.html).



The following summary of the Town's topography provided in the Town of East Greenbush 1970 Comprehensive Development Plan<sup>9</sup> is still useful today to understand general patterns as well as to explain existing development patterns:

"From the Hudson River to Route 9J the land is extremely flat and marshy. Elevations in this area are approximately 10 feet above mean sea level. Directly east of Route 9J are a chain of hills elongated in a north-south direction [including Teller Hill and Grandview Hill]. The land form rises very abruptly directly east of Route 9J exceeding in many areas grades of 20%. As a result, only Hays Road intersects the east side of Route 9J in East Greenbush...

Directly east of Teller Hill and Grandview Hill, along the Columbia Turnpike (Route 9 & 20) corridor the land form becomes more level forming a plateau with elevations ranging generally between 200 to 300 feet. Topographically this area of the Town is most suitable for development and presently contains the major populated areas of the Town. The plateau extends north to Olcott Hill and Rysedorph Hill and south to include the ...land along both sides of Phillips Road, Hays Road and Gilligan Road. Land along both sides of Third Avenue is relatively level and suitable for development from a topographic point of view.

In the eastern portion of the Town land form again becomes hilly and reaches elevations of over 600 feet in the extreme northeast portion of the Town at Hallenbeck Hill, southeast of Elliot Road. Within this section of the Town there are very few sizable areas suitable for intensive development."

## **Discussion**

Topography is an important factor for planning and design of land development projects. Overall elevation affects the layout of site improvements, stormwater drainage, and the land that can be developed on a particular site (i.e., unconstrained lands). Low-lying areas can be prone to flooding, and understanding the absolute elevation as well as elevation change across a site can provide insight into the potential for the existence of floodplains, wetlands, and other sensitive environmental features. Disturbance of areas with steep slopes is regulated under the Town's Comprehensive Zoning Law and Subdivision Regulations.

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<sup>9</sup> Murphy & Kren Planning Associates, Inc. *Development Plan – Town of East Greenbush*. Town of East Greenbush, July 1970.

## Steep Slopes (Map 5)

Slope is defined as the vertical change in elevation over a given horizontal distance. For example, a 10% slope is one that rises 10 feet over a horizontal distance of 100 feet. The Steep Slope map is derived from 10-meter resolution digital elevation models from the U.S. Geological Survey and should only be considered an approximate depiction of steeply sloped areas in the Town. Steeper slopes are primarily found along stream corridors, such as the gorges of the North Branch Moordener Kill between Best and Luther, and along the approaches and ridges of higher hills, such as Olcott, Teller, and Grandview. These slopes are indicated on the map by shades of yellow and orange, with darker shades indicating steeper slopes.

Areas with slopes greater than 15% and covering at least  $\frac{1}{4}$  acre are defined as Steep Slopes by the Town's zoning ordinance. Under the ordinance, development is not permitted in areas where slopes exceed 25%.

The Steep Slopes Map includes the following slope classes, based on the national Soil Survey Manual:<sup>10</sup>

- <10% (nearly level to gently sloping)
- 10 – 15% (strongly sloping)
- 15 – 25% (steep)
- Over 25 % (very steep)

The Town of East Greenbush Comprehensive Zoning Law of 2008 defines steep slopes as areas with a slope greater than 15% covering a minimum horizontal area of  $\frac{1}{4}$  acre and a minimum horizontal dimension of 10 feet. Severe slopes are defined as areas with a slope greater than 25%, following the same dimensional requirements. The Town-wide design and performance standards (Section 3.13.11) call for avoiding disturbance of steep slopes and prohibit land-disturbing activities on severe slopes. Steep slopes are included in the definition of constrained land used for the calculation of residential density.

### Discussion

In general, slopes greater than 15% pose significant limitations to development and are among the most sensitive environmental features in the landscape. Development of steeply sloped landscapes can increase the danger of erosion, landslides, and excessive polluted runoff.<sup>11</sup> Steep slope disturbance can introduce sediment to streams and waterbodies, affecting downstream water quality. Grading and construction on steep slopes can also be prohibitively expensive, and such sites may not be able to support a properly functioning public or private sewer system.<sup>12</sup> Steep slopes may also be important scenic resources visible from surrounding areas; for example, the view of Olcott Hill from Thompson

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10 Ditzler, C., K. Scheffe, and H.C. Monger (eds.). *Soil Survey Manual*. USDA Handbook 18. Government Printing Office, Washington, D.C., 2017.

11 *Steep Slopes and Land Use Decisions*. Prepared by Southern Tier Central Regional Planning and Development Board, February 2012, [www.stcplanning.org/usr/Program\\_Areas/Flood\\_Mitigation/SCAP\\_steepslopes\\_2010\\_02\\_21\\_CR.pdf](http://www.stcplanning.org/usr/Program_Areas/Flood_Mitigation/SCAP_steepslopes_2010_02_21_CR.pdf).

12 Chemung County Environmental Management Council. *Chemung County Natural Resources Inventory*. Chemung County, 2008. [https://www.chemungcountyny.gov/document\\_center/Slope.pdf](https://www.chemungcountyny.gov/document_center/Slope.pdf)

Hill and the Route 4 corridor and the view of Rysedorph Hill from across the river. Development on steep slopes can mar scenic values.

Several significant habitats are associated with steep slopes, as well. Thinly soiled steep slopes may support rocky ledges and talus, which are used for denning, shelter, foraging, and basking by various wildlife species.<sup>13</sup> Steep slopes along the Hudson River may support unique clay bluff and ravine habitat characterized by narrow ridges, steep-sided ravines cut by small streams, and steep bluffs fronting on the river. Steep slopes located on glacial clay deposits may be prone to landslides (see Surficial Geology section).

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13 Kiviat, E. and G. Stevens. *Biodiversity Assessment Manual for the Hudson River Estuary Corridor*. New York State Department of Environmental Conservation, 2001.

## Bedrock Geology (Map 6)

Bedrock is the solid rock that lies beneath the soil and subsoil. The New York State Museum has mapped general bedrock geology for New York State at a 1:250,000 scale.<sup>15</sup>

East Greenbush lies within two general bedrock geologic groups. The eastern part of Town rests on the remnants of ancient mountains, eroded over millions of years and

encrusted with surficial detritus left behind following the last ice age. The western part of Town has a foundation of sedimentary rock formed in ancient tropical seas and much later covered by the silt of glacial lakes. **Table 1** describes the geology units shown on the **Bedrock Geology Map**.

East Greenbush lies on the sediments of seas and the remnants of mountains 450 million years old.

**Table 1.** Bedrock Geology Units in the Town of East Greenbush, NY.

| Code | Bedrock Unit                          | Primary Materials   | Geologic Age                 |
|------|---------------------------------------|---|------------------------------|
| h2o  | Water                                 | water   |                              |
| On   | Mount Merino & Austin Glen Formations | black shales  | Middle Ordovician            |
| Oag  | Austin Glen Formation                 | graywacke, shale  | Middle Ordovician            |
| Otm  | Taconic Melange                       | chaotic mixture of pebble--to block-size clasts in a pelitic material   | Middle Ordovician            |
| Oc   | Canajoharie Shale                     | black shales  | Middle Ordovician            |
| Osf  | Stuyvesant Falls Formation            | shale, dolostone, quartzite   | Early Ordovician             |
| Cg   | Germantown Formation                  | shale, conglomerate, limestone  | Cambrian to Early Ordovician |
| Cn   | Nassau Formation                      | dark red and green soft shale, interbedded with quartzite and sandstone | Cambrian                     |

Under the eastern two-thirds of Town (east of Route 4 and Phillips Road) lie various formations of the Taconic Overthrust, a mixture of sedimentary and metamorphic rock pushed far from its place of origin by the pressure of tectonic plates converging to form the Taconic Mountains. The largest of these is the Nassau Formation, comprised of dark red and green soft shale, interbedded with quartzite and sandstone. The slightly younger Germantown and Stuyvesant Falls formations include limestone and dolostone components, respectively. The western third of the Town (west of Route 4 and Phillips Road) is mostly underlain by Canajoharie shales, a member of the Lorraine, Trenton, and Black River Groups of

<sup>15</sup> Fisher, Donald W., Yngvar W. Isachsen, and V. Lawrence Rickard. *Geologic Map of New York: Hudson-Mohawk Sheet*. New York State Museum and Science Service, Map and Chart Series No. 15, 1970. Available online at <http://www.nysm.nysed.gov/research-collections/geology/gis>.

sedimentary rock, largely undeformed since their original deposition.<sup>17</sup> The remarkable hills rising above these ancient marine sediments are thought to be the remnants of submarine gravity slides of Taconic Overthrust.<sup>18</sup> This Taconic “melange” of limestone conglomerate and greywacke-shale rock is exposed in the Troy Frontal Melange Zone, a unique geologic feature mapped where Route 151 passes Rysedorph Hill.<sup>19</sup>



*Exposed shale at East Greenbush Town Park*

## Discussion

Geology influences many environmental factors, including topography, groundwater resources, migration of pollutants, and mineral resources.<sup>20</sup> Geologic properties also strongly influence soil properties, as well as groundwater and surface water chemistry, which in turn influence the establishment of ecological communities. Calcium-rich bedrock including limestone and certain shales often support rare plants and uncommon habitats. Most of the bedrock in East Greenbush is of acidic reaction or pH, but alkaline limestone (basic pH) appears as a component in the Germantown and Stuyvesant formations as well as Taconic Melange.

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17 "List of fossiliferous stratigraphic units in New York." Wikipedia, The Free Encyclopedia, 23 Sep. 2018. Web. 2 Oct. 2018.

18 Fisher, Donald W., Yngvar W. Isachsen, and V. Lawrence Rickard. *Geologic Map of New York: Hudson-Mohawk Sheet*. New York State Museum and Science Service, Map and Chart Series No. 15, 1970.

19 *Troy Frontal Melange Zone*. NYSDEC, <https://www.dec.ny.gov/permits/53859.html>

20 Haeckel, Ingrid, and Laura Heady. *Creating a Natural Resources Inventory: A Guide for Communities in the Hudson River Estuary Watershed*. New York State Department of Environmental Conservation and Cornell University, 2014.

## Surficial Geology (Map 7)

Surficial geology refers to unconsolidated sediments lying above the bedrock. The weathering of both bedrock and surficial geology deposits along with organic matter, water, and air is responsible for the slow process of soil formation and the properties of these “parent materials” strongly influence resulting soil chemistry, nutrients, and texture. The surficial geology of East Greenbush largely reflects the retreat of glaciers following the last ice age. A giant ice sheet blanketed the area during the Wisconsin Stage of the Pleistocene Epoch, about 21,000 years ago. Glacial ice, as much as 5,000 feet thick, scoured the landscape and deposited boulders, sand, and gravel in its path. Glacial meltwater turned the Hudson Valley into vast Lake Albany, and left behind beaches, deltas, and deposits of silt and clay.<sup>21</sup>

The mile-thick ice of melting glaciers deposited boulders, gravel, sand, and silt throughout East Greenbush.

The Surficial Geology Map displays information from statewide maps produced by the New York State Geological Survey.<sup>22</sup> This map, like the one for bedrock geology, was developed at a scale of 1:250,000 and is best used as a general reference. There are nine types of surficial materials mapped in East Greenbush:

- Recent Alluvium (modern stream deposits)
- Lacustrine Silt and Clay (fine-grained deposits deposited in glacial lakes)
- Lacustrine Delta (sand and gravel deposits often underlain by finer-grained sand and silt/clay)
- Lacustrine Sand (fine to medium sand often underlain by silt or clay deposits)
- Outwash Sand and Gravel (sand and gravel deposits from glacial meltwater streams)
- Kame Deposit (mound-like hill of poorly sorted drift, mostly sand and gravel, deposited at or near the terminus of a glacier)
- Till (dense, unsorted clay, silt, sand, gravel, boulders)
- Till Moraine (an accumulation of till deposited by direct glacial action)
- Bedrock (exposed bedrock, typically within 1 meter of the soil surface)

The eastern part of Town is dominated by glacial till, a jumble of sand, gravel, and bedrock fragments ranging in size from immense boulders to fine-grained rock flour. Till (shown in gray on the map) is picked up, transported, and deposited by the glacier without being sorted. Outwash sand and gravel deposits (shown in orange) become sorted as meltwater carries them away from the glacier. Kame deposits (shown in black) show different degrees of sorting depending on the degree to which they have been washed by meltwater.

Evidence of glacial Lake Albany is preserved in the lacustrine (lake) deposits in the western part of

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21 Fisher, Donald W., and Stephen L. Nightingale. *The Rise and Fall of the Taconic Mountains: A Geological History of Eastern New York*. Black Dome Press, 2006

22 Caldwell, Donald H., and Robert J. Dineen. *Surficial Geologic Map of New York, Hudson-Mohawk Sheet*. New York State Geological Survey, 1987.



Town. A lacustrine beach (yellow on the map) slopes down just west of U.S. Route 4. Flat-topped lacustrine delta deposits and smooth sand, silt and clay underlie Sherwood Park and Hampton Manor. The surficial geology under Ridge Road is glacial rather than lacustrine because its elevation is higher than was the water level of Lake Albany.

The shores of Mill Creek and the Hudson River are lined with alluvium (recent deposits of clay, silt, sand, and gravel), shown in blue on the map.

The map includes locations of active and reclaimed mines in the Town, identified using the DECinfo Locator tool.<sup>24</sup> There are four active sand and gravel mines permitted by DEC including the East Greenbush Sand Pit, Onderdonk Ridge Pit, Witbeck Bank, and Dunn Bank.

## Discussion

Outwash sand and gravel and kame deposits hold East Greenbush's major aquifers (see the **Major Aquifers and Water Supply map**) and may be an important source of sand, gravel, and crushed stone for building and road construction. However, the potential effect of any proposed mining operations on scenic beauty, wildlife habitat, and the level, turbidity, flow, and temperature of ground water must be considered.<sup>25</sup>

The upper Hudson River estuary corridor is one of the areas with the highest potential for landslides in New York, where steep slopes occur atop ancient glacial lake clay deposits.<sup>26</sup> Landslide susceptibility on glacial lake deposits becomes significant on slopes of 10 degrees or higher. Steep slopes with similar surficial geology along the Normans Kill in the neighboring Town of Bethlehem have experienced a series of landslides in recent decades, most recently in 2015.<sup>27</sup> Causes or triggers of landslides on marginally stable slopes can be both naturally occurring or human induced and include three (3) primary factors: water saturation of the ground; loading, or increased weight at the top or high end of the slope; and taking away soil or removing mass from the bottom.<sup>28</sup> The major 2015 landslide on the Normans Kill is attributed to dumping of fill at the top of an unstable slope.<sup>29</sup> Within East Greenbush, the steep bluffs east of Route 9J and ravines located in the northwest corner of the Town bordering the City of Rensselaer may be vulnerable to landslides. Land disturbance to steep slopes with lacustrine glacial deposits should be avoided when planning and permitting new development in the Town.

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24 DECinfo Locator. <https://www.dec.ny.gov/pubs/109457.html>.

25 Green, J.A. and J.A. Pavlish, R.G. Merritt, and J.L. Leete. *Hydraulic Impacts of Quarries and Gravel Pits*. Minnesota Department of Natural Resources, Division of Waters, for the Legislative Commission on Minnesota Resources funded by the Minnesota Environment and Natural Resources Trust Fund, 2005.

26 3.14.1 Landslide Profile. *New York State Hazard Mitigation Plan*. New York State Department of Homeland Security and Emergency Services, 2014. <http://www.dhsec.ny.gov/recovery/mitigation/plan.cfm>

27 *Normans Kill Riparian Corridor Study*. Prepared for Audubon New York by Albany County Department of Economic Development, Conservation and Planning, Albany, NY, 2007.

<http://www.hudsonwatershed.org/images/WaterShedManagementPlans/Normans-Kill-report.pdf>

28 *New York State Hazard Mitigation Plan*. NYS Department of Homeland Security and Emergency Services, 2014.

29 Crowley, Cathleen. *Dumping before Bethlehem landslide under scrutiny: Albany accuses Bethlehem of negligence*. Albany Times Union, 22 June 2015. <https://www.timesunion.com/tuplus-local/article/Dumping-before-Bethlehem-landslide-under-scrutiny-6340815.php>

## Soils (Map 8)

Soils are the foundation for the establishment of natural communities of plants and animals as well as for critical ecological processes from decomposition and nutrient cycling to the water cycle. Soil characteristics including reaction (acidity or alkalinity), drainage, soil texture, depth to bedrock, and slope inform the natural habitats that become established in a particular area.<sup>30</sup> Soils also play a fundamental role in determining suitability for land uses. Soil characteristics determine potential for agricultural production as well as vulnerability to flooding, soil erosion or instability, and efficiency at filtering pollutants and wastes.<sup>31</sup> (Farmland soils are further discussed in relation to **Map 23, Agricultural Resources**.) Consideration of soil properties is important for planning and designing drainage systems; siting of structures; evaluating the potential for septic systems; assessing requirements for constructing foundations, basements, and roads; and determining the feasibility of excavation; among other uses.<sup>32</sup>

The *Soil Survey of Rensselaer County*<sup>33</sup> includes detailed soil maps for the entire county along with descriptions of soil types and tables of chemical, hydrologic, and structural characteristics of the soils for various human uses. It's important to note that county soil maps are only approximate; any soil unit may contain "inclusions" of up to 2 acres of soil types different from the mapped unit. The soil data may also be viewed online using the USDA Natural Resources Conservation Service (NRCS) Web Soil Survey. The soil survey report is available for download in PDF format on the NRCS website. **Table 2** lists soil types found in East Greenbush along with selected soil characteristics, such as soil code, soil unit name, drainage class, depth to bedrock, and soil reaction, based on tabular information provided in the county soil survey.

The **Soils Map** shows the soil units from the county *Soil Survey* symbolized by natural drainage class. Refer to **Table 2** for additional characteristics associated with each soil unit.

**Soil drainage class** indicates the possible presence of wetlands, and is a particularly important factor to consider in the evaluation of proposed development. Somewhat poorly drained soils are good indicators of possible wetland areas and poorly drained and very poorly drained soils are indicators of probable wetland areas.<sup>34</sup> They are also shown on **Map 11 (Wetlands)**.

Well drained soils can be more suitable for green infrastructure stormwater management practices, which have environmental as well as financial benefits.

30 Heady, Laura, and Gretchen Stevens. *Biodiversity Assessment Guidebook*, Hudsonia Ltd, 2018.

31 Rosendale Environmental Commission. *Rosendale Natural Resources Inventory*, 2018.

32 Haeckel, Ingrid, and Laura Heady. *Creating a Natural Resources Inventory: A Guide for Communities in the Hudson River Estuary Watershed*. New York State Department of Environmental Conservation and Cornell University, 2014.

33 Work, Ralph. *Soil Survey of Rensselaer County, New York*, USDA Soil Conservation Service, 1988.  
[https://www.nrcs.usda.gov/Internet/FSE\\_MANUSCRIPTS/new\\_york/NY083/0/rensselaer.pdf](https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/new_york/NY083/0/rensselaer.pdf)

34 Kiviat, E. and G. Stevens. *Biodiversity Assessment Manual for the Hudson River Estuary Corridor*. New York State

Soil drainage class also relates to the suitability of soils for infiltration-based stormwater practices like green infrastructure and septic system suitability. Soil properties like saturated hydraulic conductivity (Ksat), depth to a seasonal high-water table, depth to bedrock, depth to dense material, and susceptibility to flooding affect septic system suitability and performance. Stones and boulders and a shallow depth to bedrock or dense material interfere with installation. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas in addition to increased susceptibility to erosion and sedimentation. Where a shallow depth to bedrock exists, especially where loose sand and gravel or fractured bedrock at a depth of less than 2 feet are found, the absorption field may not adequately filter the effluent, particularly when the system is new, risking ground water contamination. Wet soils and slow percolation rates present the most severe limitations for septic system construction. Very high percolation rates may require additional stormwater pretreatment where infiltration practices are used.

**Depth to bedrock** is another important soil characteristic to consider in land use planning. Soil depth influences suitability for septic and other wastewater treatment systems, as well as the siting of buildings and roads. Shallow soils (<20 inches to bedrock) are often associated with steep slopes, increasing susceptibility to erosion. Shallow soils are also less capable of filtering pollutants draining to surface and groundwater supplies. With the exception of Nassau soils, soils in East Greenbush are generally deep.

**Soil reaction** refers to the acidity or alkalinity of the soil, expressed in pH values.<sup>35</sup> Soil chemistry exerts a strong influence on plant and animal communities, and can be a useful predictor for certain habitats, from acidic bogs to calcareous wet meadows. Soils developing over calcium-rich bedrock such as limestone often support disproportionately high numbers of rare plants, animals, and natural communities. Many soils in East Greenbush are at least somewhat calcareous.

**Table 2.** Soils of East Greenbush, NY

| Code*                       | Soil Unit Name                 | Drainage            | Depth (inches) | Reaction** |
|-----------------------------|--------------------------------|---------------------|----------------|------------|
| AnA                         | Alden silt loam                | Very poorly drained | >60            | C          |
| BeB,<br>BeC,<br>BeD,<br>BeE | Bernardston gravelly silt loam | Well drained        | >60            | NC         |
|                             |                                |                     |                |            |
|                             |                                |                     |                |            |
|                             |                                |                     |                |            |
| BnB,<br>BnC,                | Bernardston-Nassau complex     | Well drained        | >60            | NC         |

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Department of Environmental Conservation, 2001.

35 Heady, Laura, and Gretchen Stevens. *Biodiversity Assessment Guidebook*, Hudsonia Ltd, 2018.

| <b>Code*</b>                        | <b>Soil Unit Name</b>           | <b>Drainage</b>              | <b>Depth (inches)</b> | <b>Reaction**</b> |
|-------------------------------------|---------------------------------|------------------------------|-----------------------|-------------------|
| BnD                                 |                                 |                              |                       |                   |
|                                     |                                 |                              |                       |                   |
|                                     |                                 |                              |                       |                   |
| CaA                                 | Catden muck                     | Very poorly drained          | >60                   | C                 |
| CbA                                 | Castile gravelly silt loam      | Moderately well drained      | >60                   | SC, NC            |
| ChA,<br>ChB                         | Chenango very gravelly loam     | Excessively drained          | >60                   | SC, NC            |
|                                     |                                 |                              |                       |                   |
| Du                                  | Dumps                           | Somewhat poorly drained      |                       |                   |
| ElB                                 | Elmridge very fine sandy loam   | Moderately well drained      | >60                   | SC, NC            |
| FlA                                 | Fluvaquents-Udifluvents complex | Poorly drained               | >60                   | (variable)        |
| FrA                                 | Fredon silt loam                | Poorly drained               | >60                   | C                 |
| HaA                                 | Hamlin silt loam                | Well drained                 | >60                   | C                 |
| HbA,<br>HbB                         | Haven silt loam                 | Well drained                 | >60                   | NC                |
|                                     |                                 |                              |                       |                   |
| HoA,<br>HoB,<br>HoC,<br>HoD,<br>HoE | Hoosic gravelly sandy loam      | Somewhat excessively drained | >60                   | NC                |
|                                     |                                 |                              |                       |                   |
|                                     |                                 |                              |                       |                   |
|                                     |                                 |                              |                       |                   |
|                                     |                                 |                              |                       |                   |
| HuB,<br>HuC,<br>HuD,<br>HuE         | Hudson silt loam                | Moderately well drained      | >60                   | C                 |
|                                     |                                 |                              |                       |                   |
|                                     |                                 |                              |                       |                   |
|                                     |                                 |                              |                       |                   |
| LmA                                 | Limerick silt loam              | Poorly drained               | >60                   | C                 |
| MbA                                 | Madalin silt loam               | Poorly drained               | >60                   | C                 |
| NaB,<br>NaC                         | Nassau-Manlius complex          | Somewhat excessively drained | <40                   | NC                |
|                                     |                                 |                              |                       |                   |
| NrC,                                | Nassau-Rock outcrop             | Somewhat excessively         | <20                   | NC                |

| <b>Code*</b> | <b>Soil Unit Name</b>        | <b>Drainage</b>         | <b>Depth (inches)</b> | <b>Reaction**</b> |
|--------------|------------------------------|-------------------------|-----------------------|-------------------|
| NrD          |                              | drained                 |                       |                   |
|              |                              |                         |                       |                   |
| PaA          | Natchaug muck                | Very poorly drained     | >60                   | C                 |
| Pg           | Pits                         |                         |                       |                   |
| PtB,<br>PtC  | PittsTown gravelly silt loam | Moderately well drained | >60                   | NC                |
|              |                              |                         |                       |                   |
| RaA          | Raynham silt loam            | Poorly drained          | >60                   | C                 |
| RhA,<br>RhB  | Rhinebeck silt loam          | Somewhat poorly drained | >60                   | C                 |
|              |                              |                         |                       |                   |
| RkB,<br>RkC  | Riverhead fine sandy loam    | Well drained            | >60                   | SC                |
|              |                              |                         |                       |                   |
| Sa           | Saprists and Aqueuts         | Very poorly drained     | >60                   | (variable)        |
| ScA,<br>ScB  | Scio very fine sandy loam    | Moderately well drained | >60                   | SC, NC            |
|              |                              |                         |                       |                   |
| SrA,<br>SrB  | Scriba silt loam             | Somewhat poorly drained | >60                   | C                 |
|              |                              |                         |                       |                   |
| SwA          | Shaker very fine sandy loam  | Poorly drained          | >60                   | C, SC             |
| TeA          | Teel silt loam               | Moderately well drained | >60                   | C                 |
| Ud,<br>Ue    | Udorthents                   | Well drained            | (variable)            | (variable)        |
|              |                              |                         |                       |                   |
| UnB,<br>UnC  | Unadilla silt loam           | Well drained            | >60                   | (variable)        |
|              |                              |                         |                       |                   |
| Ur           | Urban land                   |                         |                       |                   |
| W            | Water                        |                         |                       |                   |
| WnC,<br>WnE  | Windsor loamy sand           | Excessively drained     | >60                   | NC                |
|              |                              |                         |                       |                   |

\* The final letter in each soil unit code (i.e., the “A” in “CaA”) refers to slope. Slopes are given letter codes A-F, with “A” signifying the gentlest slopes and “F” the steepest. The absence of a final uppercase letter indicates more-or-less flat terrain.

|   |        |                                     |
|---|--------|-------------------------------------|
| A | 0-3%   | level to gently sloping             |
| B | 3-8%   | gently sloping                      |
| C | 3-15%  | gently to strongly sloping          |
| D | 15-35% | strongly sloping to steep, or hilly |
| E | 25-45% | moderately steep to very steep      |

\*\*Reaction: C=calcareous (one or more soil layer with pH > 6.5), SC = somewhat calcareous (only deepest soil layer with pH > 6.5), NC = non-calcareous.

## Discussion

Soils are a sensitive resource that require centuries to develop, and play a foundational role in determining the occurrence of natural communities. Soils are also a key element of land development planning, design, and engineering. The NRI maps provide a larger-scale understanding of where soil types occur across wider areas. Table 2, above, can help interpret characteristics of those soil types.

Similarly, another tool that can provide additional soil information is the Natural Resource Conservation Service's (NRCS) Web Soil Survey (WSS), which can be accessed from this webpage: <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>. Like the NRI maps, the WSS allows wide-area planning and analysis. Users can select an area of interest (AOI) on a map-based interface and receive a report with detailed descriptions of the soils in the AOI. Users can also access suitability of the soils for a variety of particular uses.

Contemporary approaches to stormwater management involve use of "green infrastructure," which includes a wide array of practices at multiple geographic scales to manage and treat stormwater and maintain and restore natural hydrology and ecological function by infiltration, evapotranspiration, capture and reuse of stormwater, and establishment of natural vegetative features. From a land development perspective, use of green infrastructure can mean smaller stormwater management areas, yielding more developable area and reducing site development costs.

Infiltration practices capture and temporarily store stormwater before allowing it to infiltrate into the soil. Suitability for stormwater management practices involving infiltration, such as stormwater planters, vegetated swales, and certain stormwater management ponds, is determined, in large part, by soil characteristics. According to NYSDEC, typical site limitations include: seasonal high groundwater, shallow depth to bedrock, and soils with an infiltration rate less than 0.5 inches/hour.<sup>36</sup> The NRI maps can help determine locations suitable for green infrastructure practices and facilitate additional site-level analysis.

It is important to note that the NRI maps and WSS data provide support for wide-area planning and design. However, site-level analysis is typically required. Depending upon the type of land development and soils present, site analysis can also include various types of subsurface investigation and data

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36 NYSDEC, *New York State Stormwater Management Design Manual* (January 2015), [https://www.dec.ny.gov/docs/water\\_pdf/swdm2015entire.pdf](https://www.dec.ny.gov/docs/water_pdf/swdm2015entire.pdf) (last accessed March 11, 2019).



collection efforts, such as percolation tests, soil borings, and test pits.

## **Section 3: Water Resources**

### **Major Aquifers and Water Supply (Map 9)**

**Major aquifers** are unconsolidated deposits of sand and gravel that are capable of storing large quantities of water. For this reason, they are often sources of public water supply. Aquifers also provide important base flow to streams during dry periods of the year. The **Major Aquifers and Water Supply Map** displays unconsolidated aquifers in the Town of East Greenbush that were mapped at a scale of 1:250,000 by the US Geological Survey in partnership with the NYSDEC. The mapping is based on the New York State Museum maps of surficial and bedrock geology referred to in previous sections of this report.

**Major Aquifers** are unconsolidated deposits of sand and gravel that are capable of storing large quantities of water.

The Town shares a major aquifer with the Town of Schodack known as the Schodack Terrace. This is shown on the map in blue as two distinct areas, running along the Moordener Kill near the Town's eastern border and along both sides of Routes 9 & 20, south of Route 4. Much of the developed portion of this aquifer is classified as low-yield (<10 gallons/minute) or unknown yield; however, the southern section along the Moordener Kill where it crosses I-90 is classified as high yield (>100 gallons/minute). Another major high yield aquifer is located between Route 9J and the Hudson River. This area runs from the City of Rensselaer south to the Town of Schodack.

Most residents in East Greenbush receive public water from the City of Troy through the General Water District, located principally west of Route 4 and south of I-90. The City of Troy also supplies water via the City of Rensselaer to an area in the northwest corner of Town, along American Oil Road, which is not part of the Town's General Water District. Troy's water source is the Tomhannock Reservoir in the Town of Pittstown, 6.5 miles to the northeast. The Town recently transitioned the roughly 2,240 residents and 650 homes in the former Hampton Manor Water District to the General Water District supplied by the City of Troy system. The Hampton Manor Water District will be consolidated with the General Water District and the two groundwater wells and associated infrastructure are to be decommissioned.

All properties outside of the General Water District rely on individual private wells drawing on water from aquifers as well as other groundwater stored in the cracks and fractures of bedrock. There is a single active public water supply well in East Greenbush serving facilities at the Town Park. A general recharge area around the well mapped by NYS Department of Health is shown on the map.

#### **Discussion**

Major aquifers are valuable resources for the Town and should be part of any planning or review process. Care must be taken in approving any land use for industrial purposes in which there is a potential for pollution of the aquifer. Conversely, the Town may want to encourage the siting of large water users by changing the zoning or creating an industrial park. With the consolidation of the

Hampton Manor Water District into the General Water District in fall 2018, all residents with public water supply now receive water purchased from the City of Troy via the General Water District.

At present, the Town does not utilize any of the major aquifers for public water supply. However, if, in the future, there is enough growth in the eastern part of the Town, the Schodack aquifer could be a potential source. Engineering analyses and tests would have to be conducted to determine the quantity of water available and its quality. There are also land use planning tools available to protect these resources, such as a critical aquifer recharge area (CARA), which is a zoning overlay district.

## Streams and Watersheds (Map 10)

A **watershed** is the area of land from which water drains into a river, lake or other waterbody. Watersheds are divided by high points on the land such as ridges, mountains and hills. There is a very strong relationship between land use in a watershed and water quality in streams, wetlands, and other waterbodies. Land and water are connected through the interactions of water, soil, organisms, and chemical components. Healthy watersheds can recharge groundwater, reduce erosion and flooding impacts, minimize the need for public infrastructure, and be more resilient to climate change—all ecosystem services that directly benefit the Town and cost less than the alternatives.<sup>37</sup>

**A watershed is the area of land that drains into a stream, river, lake, or other waterbody.**



Source: Center for Watershed Protection

All the land in East Greenbush ultimately drains to the Hudson River Estuary via tributary streams. These major drainage areas are shown on the **Streams and Watersheds Map**. Streams and waterbodies on this and other maps in the inventory are from the USGS National Hydrography Dataset (NHD) and were digitized from air photos.

### Healthy watersheds can:

- recharge groundwater
- provide clean water
- reduce erosion and flooding impacts
- minimize public infrastructure
- be more resilient to climate change

Note the resulting maps have inherent inaccuracies and do not capture most intermittent streams, which only flow seasonally or after rain. Intermittent streams are in fact widespread, accounting for an estimated 59% of total stream length in the United States. The US Environmental Protection Agency has compiled extensive scientific reviews highlighting their essential role in maintaining water quantity, quality, and overall watershed function or health.<sup>38</sup> Intermittent streams also play a vital role in

37 U.S. EPA. *The Economic Benefits of Protecting Healthy Watersheds*. U.S. Environmental Protection Agency, Washington, DC, 2015, [https://www.epa.gov/sites/production/files/2015-10/documents/economic\\_benefits\\_factsheet3.pdf](https://www.epa.gov/sites/production/files/2015-10/documents/economic_benefits_factsheet3.pdf)

38 U.S. EPA. *Connectivity of Streams and Wetlands to Downstream Waters: A Review and Synthesis of the Scientific Evidence (Final Report)*. U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-14/475F, 2015, <https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=296414>

dissipating stream energy during storms and reducing erosion and downstream flood impacts. By visiting sites and creating more accurate maps the Town can ensure that intermittent streams are identified and considered during planning and project review.

Mill Creek enters East Greenbush from the Town of North Greenbush and flows in a southwesterly direction to near U.S. Routes 9 & 20 and then turns in a northerly direction before draining through the City of Rensselaer to the Hudson River. The Mill Creek watershed in East Greenbush drains 11.7 square miles (16.1 sq. mi. total) in the center of the Town. As it passes through Town, the majority of the stream is classified as C(TS), capable of supporting trout spawning (see the **Water Quality Classifications** section).

The North Branch Moordener Kill enters East Greenbush along its eastern border at the Hamlet of Best and flows across the southeast corner of the Town before entering the Town of Schodack, where it enters the Hudson River near the Village of Castleton-On-Hudson. The North Branch Moordener Kill is classified as a C(T) stream, capable of supporting a trout population, and its watershed drains five square miles of land in East Greenbush (32 sq. mi. total).



*Moordener Kill running through East Greenbush Town Park*

The Papscanee Creek-Hudson River watershed drains 6.9 square miles of East Greenbush from U.S. Routes 9 & 20 westward to the Hudson River. The Hudson River, which flows south to the Atlantic Ocean via New York Harbor, is the largest water feature here, forming the western border of the Town from the Town of Schodack on the south to the City of Rensselaer on the north. Papscanee Creek is a tidal water that meanders along the eastern shore of the Hudson River and forms a unique marsh habitat and island that provide important breeding and migratory habitat for birds and other wildlife. It is also an important nursery for the young of migratory fish and other aquatic life that come into the Hudson River from the ocean and reproduce. Sections of the Hudson River and Papscanee Creek within the Town are classified as C streams.

A small area of the Town of East Greenbush in the northwest corner along the border with the City of Rensselaer is included in the Quackenderry Creek-Hudson River watershed, although the creek never enters the Town. The Quackenderry Creek and tributaries are class C streams. Most of the developed area along Third Avenue Extension is located within the Quackenderry Creek-Hudson River watershed.

Another water feature of importance in the Town is Hampton Manor Lake. This man-made impoundment is 11.7 acres in size and is an important recreational source for Town residents, accepts runoff from the surrounding areas, and provides wildlife habitat. The lake is primarily spring-fed and is a class C waterbody.

## Discussion

Development in watersheds can lead to increased impervious cover and stormwater runoff. This runoff can cause flooding downstream. For example, the Quackenderry Creek-Hudson River has experienced recent flood events; Quackenderry Creek has also experienced recent land development. Proper stormwater management techniques are important to reducing potential for downstream flooding impacts. In addition to water quality and quantity benefits, healthy watersheds can reduce the cost and extent of public infrastructure. For example, rivers and streams which have retained undeveloped floodplain areas can reduce “gray” flood control infrastructure, such as retaining walls and berms. A 2010 report by the Office of the NY State Comptroller summed up these benefits by stating: “In many instances, it is less expensive for a community to maintain open space that naturally maintains water quality, reduces runoff, or controls flooding than to use tax dollars for costly engineered infrastructure projects such as water filtration plants and storm sewers.”<sup>39</sup>

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39 Office of the State Comptroller Thomas DiNapoli. *The Economic Benefits of Open Space Preservation*. NYS OSC, 2010. [https://www.dec.ny.gov/docs/lands\\_forests\\_pdf/openspacepres.pdf](https://www.dec.ny.gov/docs/lands_forests_pdf/openspacepres.pdf)



## Floodplains and Riparian Areas (Map 11)

Floodplains and riparian buffers provide many critical functions for a healthy stream and its watershed. Successful stream management depends in large part on the natural condition and connection of the floodplain and adjacent riparian areas to the stream channel.

**Floodplains** are low-lying areas, often next to streams and rivers, which are inundated during heavy precipitation or snowmelt events. They are naturally connected to streams but can extend far from a stream or river and aren't necessarily found alongside them. Flooding is a natural process and is one way a stream reacts to an increase in water coming into it. Streams of all sizes can have floodplains at various locations along their length. The total size of a floodplain and its distance from and connection to a stream can vary greatly with topography and other local conditions.

When left in a natural state, floodplains act as a natural infrastructure, providing a safety zone between people and the damaging waters of a flood. They provide the space streams need to expand, contract, and sometimes change course. Building in floodplains increases the risk of property damage and loss of life. The location of floodplain boundaries can change over time and in response to changing weather patterns, changes in land use in and around the floodplain and in the surrounding watershed, obstructions in the floodway, stream projects (including dams and levees), and natural stream processes.

### Floodplains perform many functions:

- prevention of erosion
- habitat for plants and wildlife
- temporary storage of flood waters
- moderation of peak flows
- maintenance of water quality
- recharge of groundwater
- recreational opportunities
- aesthetic benefits

**The Floodplains and Riparian Areas Map** shows flood hazard areas mapped by the Federal Emergency Management Agency (FEMA) for the [National Flood Insurance Program](https://www.fema.gov/national-flood-insurance-program) (NFIP).<sup>40</sup> Flood insurance rate maps (FIRM) show areas estimated to have a 1% chance or greater probability of being inundated in any given year, areas commonly referred to as the “100-year” floodplain. Map 11 shows NFIP digital Q3 Flood Data, which were developed by scanning existing hard copy Flood Insurance Rate Maps developed in the 1980s. FEMA has recently updated many flood hazard maps across the country to reflect physical changes in floodplains, new data, and improved modeling capabilities. However, as of 2018, FEMA has not yet completed digital remapping for Rensselaer County.

The floodplain map is a valuable tool, but it is important to note that FIRMs are only estimates based on the data and modeling technology available at the time of mapping. Due to the unpredictable nature of some kinds of floods, they often omit many areas subject to flooding from localized drainage problems, including undersized culverts, ice jams or sheet flooding down a slope. In addition, floodplains for

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40 National Flood Insurance Program. <https://www.fema.gov/national-flood-insurance-program>

smaller streams and intermittent streams are usually not depicted on FIRMs. Climate change is furthermore changing precipitation patterns and increasing flood frequency in the Hudson Valley – annual rainfall occurring in heavy downpour events across the Northeast increased 74% between the periods of 1950-1979 and 1980-2009.<sup>41</sup> See the **Climate** section for more information.

In East Greenbush, streams east of Route 4 and north of U.S. Routes 9 & 20 are mostly in rural areas where there has been little development pressure in the floodplains. In other areas of the Town, the streams are in narrow valleys and the floodplains are mostly narrow and close to the stream bed. The exception to this is the Hudson River-Papscanee Creek floodplain, which is covered by the “100-year” floodplain from Route 9J to the river. The Town's floodplain management law meets the NFIP requirements and gives the Town's code enforcement office the authority to regulate floodplain development.

**Riparian areas** are the sensitive transition zones between land and water and are vital to stream physical processes, habitat, and water quality. The mapped riparian areas include the floodplains as well as other areas adjacent to streams, ponds, wetlands, and other waterbodies. Riparian areas help clean water by intercepting runoff and filtering sediment and nutrients. They can attenuate flooding by slowing down and absorbing floodwaters. Forested riparian buffers provide organic matter that supports the in-stream food web and shade that keeps water cool. They also support unique and diverse habitats, and serve as wildlife travel corridors.

The riparian areas on **Map 11** were mapped by the New York Natural Heritage Program for the Statewide Riparian Opportunity Assessment.<sup>42</sup> They are delineated around streams based on digital elevation data, known wetlands, and modeling for the 50-year flood zone, for the primary purpose of guiding streamside tree planting projects. The riparian areas overlap partially with FEMA floodplain data in the map and may indicate additional flood-prone areas. However, they are not a substitute for the regulatory flood insurance rate maps. Note that the riparian areas were developed through modeling and have not been field verified, and that wider stream buffers are in many cases recommended to adequately conserve wildlife habitat corridors and other functions of the riparian zone. Nevertheless, the mapped riparian areas can provide a starting point to inform land use and stream protection efforts. The Hudson River Estuary Program's “Trees for Tribs” initiative offers free consultation and native trees and shrubs for qualifying streamside buffer planting projects in the estuary watershed.<sup>43</sup>

## Discussion

Protecting and restoring free-flowing streams, vegetated streamside riparian buffers, and floodplains, are the most effective actions to conserve and restore stream habitat. The Town should explore technical

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41 Horton, R., D. Bader, C. Rosenzweig, A. DeGaetano, and W. Solecki. *Climate Change in New York State: Updating the 2011 ClimAID Climate Risk Information*. New York State Energy Research and Development Authority (NYSERDA), Albany, NY, 2014, [www.nyseda.ny.gov/climaid](http://www.nyseda.ny.gov/climaid)

42 Conley, A., T. Howard, and E. White. *New York State Riparian Opportunity Assessment*. New York Natural Heritage Program, State University of New York College of Environmental Science and Forestry, Albany, NY, 2018. [http://nynhp.org/files/TreesForTribes2017/Statewide\\_riparian\\_assessment\\_final\\_jan2018.pdf](http://nynhp.org/files/TreesForTribes2017/Statewide_riparian_assessment_final_jan2018.pdf)

43 Hudson River Estuary Trees for Tribs Program. <http://www.dec.ny.gov/lands/43668.html>

assistance and grants available from the NYSDEC Hudson River Estuary Program to assess and prioritize streams, floodplains and riparian areas for protection and restoration. See the **Water Quality Classification** section for discussion of the Town's Watercourse Management Overlay District.

## Water Quality Classifications (Map 12)

NYSDEC designates the “best uses” that a waterbody should be supporting. Waterbodies are classified by the letters A, B, C, or D for freshwater. The letter classifications and their best uses are described in regulation NYS regulation 6 NYCRR Part 701. For more information about classifications, see the NYSDEC's webpage on [Water Quality Standards and Classifications](#).<sup>44</sup> For each class, the designated best uses are defined as follows:

Activities allowed in and around waterbodies are regulated by NYSDEC based on their classification and standard.

- Class A, AA-water supply, primary and secondary contact recreation and fishing
- Class B-primary and secondary contact recreation and fishing
- Class C-fishing, suitable for fish propagation and survival
- Class D-fishing

Waterbodies classified as A, B, or C may also have a standard of (T), indicating they are trout waters, or (TS), indicating they are trout spawning waters. The **Water Quality Classifications Map** shows the water quality classifications of surface waters in the Town. Note that waterbodies may be divided into multiple segments with differing classifications and standards.

NYSDEC also establishes water quality standards, specific for particular parameters and pollutants, to protect the uses associated with these classifications. These standards are found in NYS regulation 6 NYCRR Part 703. Standards can be numerical or narrative. For example, dissolved oxygen has a numerical standard of no less than 7.0 mg/l in trout spawning waters. Turbidity has a narrative water quality standard which states there should be “no increase that will cause a substantial visible contrast to natural conditions.” Information on surface water and groundwater quality standards can be found at [Surface Water and Groundwater Quality Standards](#).<sup>45</sup> If waterbodies are not supporting the standards for their best uses, they may be listed on the Priority Waterbody List as impaired (see the **Waterbody Impairment** section).

Activities allowed in and around waterbodies are regulated based on their classification and standard. C(T), C(TS) and all types of B and A streams (as well as waterbodies under 10 acres located in the course of these streams) are collectively referred to as “protected streams.” They are subject to the stream protective provisions of the [Protection of Waters](#) regulations in Article 15 of the Environmental Conservation Law.<sup>46</sup>

### Discussion

On protected streams, NYSDEC regulates the beds and banks, defined as the areas immediately adjacent to and sloping toward the stream, extending 50 feet or more. Activities that excavate, fill or disturb these

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44 *Water Quality Standards and Classifications*. NYS DEC, <https://www.dec.ny.gov/chemical/23853.html>

45 *Surface Water and Groundwater Quality Standards*. NYS DEC, <http://www.dec.ny.gov/regs/4590.html>

46 *Protection of Waters*. NYS DEC, <https://www.dec.ny.gov/permits/6042.html>

beds or banks require a NYSDEC permit. See [Protection of Waters: Disturbance of the Bed or Banks of a Protected Stream or Other Watercourse](#) for more information.<sup>47</sup> In situations where streams are unmapped in NYSDEC databases, perennial streams share the classification of the receiving stream, while intermittent streams become Class D.

The Town of East Greenbush Zoning Law of 2008 Section 2.8 establishes a Watercourse Management Overlay (WMO) District relating to NYSDEC's classified streams in order to protect natural and cultural resources in the stream corridor, enhance surface water quality, control non-point source pollution sources such as erosion and sedimentation, and protect people and structures from flood hazards. Protected areas are established "for a horizontal distance 50 feet from the high-water mark of ponds and lakes and from the nearest bank of streams and rivers... The water bodies covered by the Watercourse Management District have been classified by [NYSDEC] as designated water classes 'AA' through 'D'" (Section 2.8.3). Planning Board approval is required before any improvements are made on public or private property within the WMO district. Applicants are responsible for indicating any water bodies and their 50-foot overlay boundary on proposed site plans.

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<sup>47</sup> *Protection of Waters*. NYS DEC, <https://www.dec.ny.gov/permits/6554.html>

## Waterbody Impairment (not mapped)

The Waterbody Inventory/Priority Waterbodies List (WI/PWL) is a statewide inventory of waters that NYSDEC uses to track support (or impairment) of water uses, overall assessment of water quality, causes and sources of water quality impact/impairment, and the status of restoration, protection and other water quality activities and efforts.<sup>48</sup> WI/PWL information is used to identify those water quality issues and specific waterbodies where efforts will have the greatest impact and benefit, objectively evaluate needs for project funding, monitor water quality improvement, and record and report changes over time. The WI/PWL includes waterbody fact sheets outlining the most recent assessment of use support, identification of water quality problems and sources, and a summary of activities to restore and protect each individual waterbody.

The reach of the Hudson River that borders East Greenbush is listed as impaired in the WI/PWL. Fish consumption is impaired by the presence of PCBs, dioxins and heavy metals. Aquatic life, recreation, habitat and aesthetics are stressed by urban/stormwater runoff and combined sewer overflows, principally from Albany, Troy and Rensselaer, during heavy rainstorms. Mill Creek is listed as having no known impacts; however, NYSDEC biomonitoring data from 2001 identified slight impacts at two points in the Town downstream from Route 4. The North Branch Moordener Kill in East Greenbush is listed as unassessed.

Hampton Manor Lake is listed as having minor impacts in the WI/PWL. The fact sheet was most recently updated in 2008. At the time, suspected types of pollutants were algal weed growth, nutrients and silt/sediment. The suspected source of pollutants was urban/stormwater runoff. It was also reported that the lake suffered from a significant infestation of Eurasian milfoil. The condition of Hampton Manor Lake is regularly assessed by NYSDEC as part of the Lake Classification and Inventory Survey.<sup>49</sup> DEC conducts water quality sampling and evaluates these waterbodies primarily through two monitoring programs: Lake Classification and Inventory (LCI) and Citizens Statewide Lake Assessment Program (CSLAP). Monitoring data collected through these programs is used to plan, develop and manage lake resources. The LCI monitoring program is a component of the Statewide Waters Monitoring Program of the NYSDEC Division of Water, and uses a rotating strategy in which waterbodies in all major drainage basins in the state are monitored over a five-year cycle. Hampton Manor Lake was most recently sampled in 2013, and the most recent LCI report identifies the presence of several aquatic invasive species in the lake, including: Eurasian watermilfoil, curly leafed pondweed, water chestnut.<sup>50</sup>

## Discussion

NYSDEC's waterbody impairment data provide a starting point for understanding known and potential threats to water quality. More detailed assessment is needed to identify areas for targeted mitigation,

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48 *Waterbody Inventory/Priority Waterbodies List*. NYS DEC, <https://www.dec.ny.gov/chemical/36730.html>

49 <https://www.dec.ny.gov/chemical/31411.html>

50 <http://nysfola.mylaketown.com/uploads/tinymce/nysfola/MidHudson2016.pdf>

such as nutrient management, additional stormwater controls or retrofits, or where streambed/bank or stream buffer restoration is needed to stabilize sources of sediment or increase shading. NYSDEC citizen science programs including Citizens Statewide Lake Assessment Program (CSLAP) and Water Assessment by Volunteer Evaluators (WAVE) can help to collect additional data to fill in gaps and narrow down potential sources of impairment. The Town should consider participating in these programs to augment the existing record, raise awareness among residents, and track changes in water quality over time. Citizen monitors can also help identify specific water quality threats, such as observed illicit outfalls or evidence of failing septic systems resulting in overland wastewater flows into streams. Grant funding for watershed planning is also available through the NYSDEC Hudson River Estuary Program and NYS Department of State.

Hampton Manor Lake is a shallow lake and lies at the lowest point of an urban/residential area. Stormwater from most surrounding streets drains directly into the lake, some of which is treated in stormwater management practices found at Hampton Lake Park and along Route 9 & 20. This runoff can contain pollutants such as fertilizers from lawns, oils and heavy metals. Sedimentation basins are located where the street culverts empty into the lake and have been effective in collecting silt at some locations. The Town is responsible, under its regulated municipal separate storm sewer system (MS4) program, for maintaining the stormwater management system. See the **Regulated Facilities** section for additional information about the MS4 program. The aquatic weed growth appears to have significantly increased since the NYSDEC's 2008 assessment. NYSDEC staff undertook routine water quality monitoring in the Lower Hudson basin in 2018. The Town should inquire with NYSDEC into the status of an updated assessment for Hampton Manor Lake and use the latest information to work with interested stakeholders toward a remediation strategy. NYSDEC LCI-related monitoring activities and data collection efforts can help the Town identify and address water quality needs.

## Wetlands (Map 13)

Wetlands are areas saturated by surface or groundwater sufficient to support distinctive vegetation adapted for life in saturated soil conditions.<sup>51</sup> There are many types of freshwater wetlands in East Greenbush, including wet meadows, emergent marsh, forested and shrub swamps, vernal pools, floating and submerged vegetation, and open water. Wetlands at Papscanee Island and Creek are both freshwater and tidal, and are considered to be globally rare. They are described under the **Coastal Habitats** section. In addition to providing critical habitat for many plants and animals, wetlands help to control flooding and reduce damage from storm surge, recharge groundwater, filter and purify surface water, and provide recreation opportunities. The upland area surrounding a wetland is essential to its survival and function; both may diminish when a wetland is surrounded by pavement, buildings, and pollution-generating or other incompatible land uses.<sup>52</sup>

### Wetlands:

- provide critical habitat
- control flooding
- reduce damage from storm surge
- recharge ground water
- filter and purify surface water
- provide recreational opportunities

The **Wetlands Map** shows information from several existing sources that provide approximate locations and extent of wetlands. Open water habitats including the Hudson River are symbolized in blue as “waterbodies.” **New York State Freshwater Wetlands** only include wetlands larger than 12.4 acres, unless designated “of unusual local importance.” The U.S. Fish and Wildlife Service’s **National Wetlands Inventory** (NWI) includes wetlands of all sizes. NWI maps offer general information on wetland habitat, distinguishing forested wetlands (e.g., shrub or forest swamp) from emergent wetlands (e.g. marsh or wet meadow). Note that NWI maps often underestimate wetland area and omit smaller and drier wetlands. In particular, vernal pools, wet meadows, and swamps are often under-represented on maps. Many of NYSDEC’s wetland maps are outdated and have similar inaccuracies.<sup>53</sup> When it comes to identifying wetlands, there is no substitute for site visits and on-the-ground delineation.

County soil maps are also a good source for predicting the location of potential wetlands and can help inform site visits to verify wetland presence. Soils classified in the *Soil Survey for Rensselaer County* as very poorly drained or poorly drained are good indicators of **probable wetland areas**, and soils classified as somewhat poorly drained may indicate **possible wetland areas** (see Soils section for further discussion of soil properties).<sup>54</sup> Note that the probable and possible wetland areas cover a greater area than NWI and NYSDEC wetland layers. Likewise, note that soil units are only mapped to an

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51 NYSDEC definition of wetlands. <https://www.dec.ny.gov/lands/305.html>

52 Environmental Law Institute. *Planner’s Guide to Wetland Buffers for Local Governments*. Washington, DC, 2008. [www.eli.org/sites/default/files/eli-pubs/d18\\_01.pdf](http://www.eli.org/sites/default/files/eli-pubs/d18_01.pdf)

53 Huffman & Associates, Inc. *Wetlands Status and Trend Analysis of New York State - Mid-1980’s to Mid-1990’s*. Prepared for New York State Department of Environmental Conservation. Larkspur, CA, 2000. [http://www.dec.ny.gov/docs/wildlife\\_pdf/wetstattrend2.pdf](http://www.dec.ny.gov/docs/wildlife_pdf/wetstattrend2.pdf)

54 Kiviat, E. and G. Stevens. *Biodiversity Assessment Manual for the Hudson River Estuary Corridor*. NYS DEC, 2001.



approximate area of about two acres, and that soils within the unit may not be homogeneous. Areas shown as supporting probable or possible wetlands should always be verified in the field for the purposes of environmental review.

Rensselaer Land Trust's *Land Conservation Plan*<sup>55</sup> identifies several **Important Wetland Complexes** in East Greenbush, described in the **Significant Ecological Features** section. They include Papscanee Island and Creek, Hampton Manor Lake, the Best Road Wetlands complex, and the Moordener Kill Riparian Wetlands.

Wildlife records from the *NY Amphibian and Reptile Atlas* indicate that four-toed salamander, a NY High Priority Species of Greatest Conservation Need (SGCN), inhabits wetlands in East Greenbush. Four-toed salamander breeds in forested wetlands (swamps) with a preference for those with abundant sphagnum mosses. It uses the surrounding forest habitat for foraging during the year. Additional records for wood frog and spotted salamander suggest the presence of vernal pools in the Town, although none have been formally mapped. Vernal pools are small, isolated wetlands that are often dry in summer. They provide habitat for many animals, including a group of forest amphibians which use the pools for breeding. Vernal pools often go undetected in the forest due to their small size and seasonal drawdown. Specific development and management recommendations are available to minimize impacts to vernal pools and associated wildlife.<sup>56</sup> Additional local studies or surveys could improve understanding of wetland habitat values in the Town, and help to identify vernal pools and other currently unmapped wetlands.

## Discussion

The Wetlands Map is a starting point for inventorying local wetlands; more refined data can be added as they become available. Existing state and federal wetland maps are inherently inaccurate and omit many smaller, drier wetlands. The mapped possible and probable wetland areas are helpful for identifying additional wetland areas, which must be verified through site visits. Prior to any development, a wetland biologist should walk a property to determine whether federal jurisdictional wetlands are present. It is also important to recognize that upland buffer areas around wetlands play an essential role in protecting wetland habitat and water quality, although in many cases they have no formal protection.

State and federal laws protect some but not all wetlands. The New York State Freshwater Wetlands Act generally regulates activities in and around large wetlands, including a 100-foot adjacent area.<sup>57</sup> To be

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55 Winter, John, Jim Tolisano, Rick Lederer-Barnes, Michael Batcher, and Nick Conrad. *Rensselaer Land Trust Land Conservation Plan: 2018 to 2030*. Rensselaer Land Trust, Troy, NY, 2018.

56 Calhoun, A. and M. Klemens. *Best development practices: Conserving pool-breeding amphibians in residential and commercial developments in the northeastern United States*. MCA Technical Paper No. 5, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, New York, 2002, <http://maineaudubon.org/wp-content/uploads/2012/08/Best-Development-Practices-Conserving-Pool-breeding-Amph.pdf> and Morgan, D. and A. Calhoun. *The Maine Municipal Guide to Mapping and Conserving Vernal Pools*. University of Maine, Sustainability Solutions Initiative, Orono, ME, 2012, <http://maineaudubon.org/wp-content/uploads/2012/08/MeAud-ME-Municipal-Guide-to-Mapping-and-Conserving-Vernal-Pool.pdf>

57 New York State Freshwater Wetlands Program. <http://www.dec.ny.gov/lands/4937.html>

protected, a wetland must be at least 12.4 acres or considered of unusual local importance, and appear on the NYS Freshwater Wetlands Map. The U.S. Army Corps of Engineers regulates wetlands of all sizes in New York under section 404 of the Clean Water Act.<sup>58</sup> However, to be protected, wetlands must be connected to a navigable waterway. Vernal pools and other isolated wetlands less than 12.4 acres are generally unprotected by state or federal wetland regulations.<sup>59</sup> At the time of writing, changes to the Clean Water Act have been proposed that would further limit federal wetland protection. Local governments can protect wetlands and wetland buffers through home rule authority. The Environmental Law Institute's *Planner's Guide to Wetland Buffers for Local Governments* provides scientific guidance on the conservation values of different buffer widths.<sup>60</sup> The Town of East Greenbush does not currently have a local wetlands protection law; however, the Comprehensive Zoning Law of 2008 seeks to limit filling, grading, or alteration of wetlands and requires that a 25' vegetative buffer be maintained between disturbed areas and protected federal wetlands.

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58 Section 404 of the Clean Water Act. <https://www.epa.gov/cwa-404>

59 *Conserving Small Wetlands in the Hudson Valley*. NYS DEC, <http://www.dec.ny.gov/lands/47486.html>

60 Environmental Law Institute. *Planner's Guide to Wetland Buffers for Local Governments*. Washington, DC, 2008.

## **Section 4: Habitats and Wildlife**

### **Land Cover and Land Use (Map 14)**

The **Land Cover and Land Use Map** provides a bird's-eye view of general habitat types, development, and land use patterns in the Town of East Greenbush based on remote sensing analysis of Landsat satellite imagery. It displays information at a 30-meter spatial resolution from the 2011 National Land Cover Dataset. Each 30x30m square displays a land cover or land use class. Overall accuracy for the 2011 assessments was 88%, with variations by geography and by identified class<sup>61</sup>. **Note that NLCD data are most reliable at regional scales and have important limitations at the municipal scale. The data are not necessarily accurate for all locations and do not distinguish many important habitat types.** Read more about the applications and limitations on the NLCD factsheet <sup>62</sup> One benefit of using NLCD is that the dataset is available for all municipalities nationally and facilitates comparison. **Table 3** provides a summary of the acreage and percentage of land in East Greenbush for each land cover or land use class. Definitions for land cover and land use classes shown on the map are as follows<sup>63</sup>:

Nearly a third (31.6%) of East Greenbush is classified as developed, but the Town retains substantial undeveloped areas east of I-90 and on Papsweeney Island.

**Open Water** - areas of open water, generally with less than 25% cover of vegetation or soil.

**Developed, Open Space** - areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20% of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.

**Developed, Low Intensity** - areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20% to 49% percent of total cover. These areas most commonly include single-family housing units.

**Developed, Medium Intensity** - areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50% to 79% of the total cover. These areas most commonly include single-family housing units.

**Developed High Intensity** - highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80% to 100% of the total cover.

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61 Wickham, J., S. Stehman, L. Gass, J. Dewitz, D. Sorenson, B.J. Granneman, R.V. Poss, L.A. Baer. 2017. Thematic accuracy assessment of the 2011 National Land Cover Database (NLCD). Remote Sensing of Environment. 191. 328-341. 10.1016/j.rse.2016.12.026.

62 National Land Cover Database Fact Sheet. United States Geological Survey. 2012. <https://pubs.usgs.gov/fs/2012/3020/>

63 National Land Cover Database (NLCD). United States Geological Survey. <https://www.mrlc.gov/data/legends/national-land-cover-database-2011-nlcd2011-legend>

**Deciduous Forest** - areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species shed foliage simultaneously in response to seasonal change.

**Evergreen Forest** - areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species maintain their leaves all year. Canopy is never without green foliage.

**Mixed Forest** - areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. Neither deciduous nor evergreen species are greater than 75% of total tree cover.

**Shrub/Scrub** - areas dominated by shrubs; less than 5 meters tall with shrub canopy typically greater than 20% of total vegetation. This class includes true shrubs, young trees in an early successional stage or trees stunted from environmental conditions.

**Grassland/Herbaceous** - areas dominated by graminoid or herbaceous vegetation, generally greater than 80% of total vegetation. These areas are not subject to intensive management such as tilling, but can be utilized for grazing.

**Pasture/Hay** - areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20% of total vegetation.

**Woody Wetlands** - areas where forest or shrubland vegetation accounts for greater than 20% of vegetative cover and the soil or substrate is periodically saturated with or covered with water.

**Emergent Herbaceous Wetlands** - Areas where perennial herbaceous vegetation accounts for greater than 80% of vegetative cover and the soil or substrate is periodically saturated with or covered with water.

**Table 3.** Area and percent of East Greenbush represented by land cover and land use classes.

| Land Cover/Use Class        | Acres | Percent of Town |
|-----------------------------|-------|-----------------|
| Open Water                  | 143   | 0.9%            |
| Developed, Open Space       | 1693  | 10.8%           |
| Developed, Low Intensity    | 1414  | 9.0%            |
| Developed, Medium Intensity | 1494  | 9.5%            |
| Developed, High Intensity   | 358   | 2.3%            |
| Barren Land                 | 19    | 0.1%            |
| Deciduous Forest            | 4952  | 31.6%           |
| Evergreen Forest            | 823   | 5.2%            |

|                                     |        |        |
|-------------------------------------|--------|--------|
| <b>Mixed Forest</b>                 | 210    | 1.3%   |
| <b>Shrub/Scrub</b>                  | 1074   | 6.8%   |
| <b>Herbaceous</b>                   | 41     | 0.3%   |
| <b>Hay/Pasture</b>                  | 2141   | 13.7%  |
| <b>Cultivated Crops</b>             | 228    | 1.5%   |
| <b>Woody Wetlands</b>               | 853    | 5.4%   |
| <b>Emergent Herbaceous Wetlands</b> | 238    | 1.5%   |
| <b>Total</b>                        | 15,681 | 100.0% |

Nearly a third of East Greenbush is developed: 10.8% open space (e.g., lawns), 9% low intensity, 9.5% moderate intensity and 2.3% high intensity development for a total of 4,959 acres or 31.6% of the Town. The most intensely developed areas follow the Route 9 & 20 and Route 4 corridors. The Town still retains substantial forest and shrubland areas, hayfields, and meadows, especially east of I-90. In addition, large wetlands occur along riparian corridors and on Papscaanee Island. Coastal habitats, floodplains, wetlands, large forests, and grassland and shrubland habitats are further described in subsequent sections of this report.

### **Discussion**

Used in an appropriate manner, the land cover and land use data can be a helpful tool to understand general patterns of land cover and land use in the Town. This map can help to identify large connected habitat areas and to identify potential areas of concern where land uses may impact habitats or water resources.

## Significant Ecological Features (Map 15)

The **Significant Ecological Features Map** highlights the most significant *known* ecological features in East Greenbush based on state, regional, and county-level assessments. The map and descriptions are based on limited existing information; more study is needed to better document the Town's natural features. Some of the overlapping layers in the map may be viewed in greater detail using the [Hudson Valley Natural Resource Mapper](#).<sup>64</sup>

The Town of East Greenbush spans approximately 24.5 square miles including underwater lands in the Hudson River. All land in the Town ultimately drains to the Hudson River Estuary, a globally rare ecosystem that supports many rare species as well as regionally important fisheries. Tidal wetlands and shallow water habitats in the estuary and Papscanee Creek encompass some of the Town's most biologically significant habitats. The Upper Hudson River Estuary is identified as a Significant Biodiversity Area (SBA) by NYSDEC, including the Town's Hudson River shoreline and Papscanee Marsh and Creek. SBAs are locations of high concentration of biological diversity or value for regional biodiversity, and are described in the *Hudson River Estuary Wildlife and Habitat Conservation Framework*.<sup>65</sup>

Freshwater tidal wetlands in the Hudson River Estuary are **globally rare** and provide critical nursery habitat for fish.

The Hudson River Estuary contains significant freshwater and brackish tidal wetlands, as well as other riverine and estuarine habitats, islands, riparian zones, and important tributaries. These habitats support a high diversity of fish, birds, and mammals.... The open water, tidal wetlands, and tributaries in the upper reach of the Hudson are regionally important fish spawning habitats for anadromous fish, especially American shad, striped bass, Atlantic sturgeon and shortnose sturgeon, and provide habitat for all life stages of resident freshwater species. The numerous creeks and tidal freshwater marshes in this stretch serve as breeding, nursery, and migration corridors supporting waterfowl, shorebirds, herons, raptors, and passerine birds. Regionally and globally rare tidal communities include freshwater tidal swamp, freshwater tidal marsh, freshwater intertidal mudflats, and freshwater intertidal shore.

From a county-wide perspective, Rensselaer Land Trust's *Land Conservation Plan*<sup>66</sup> also highlights the Town's coastal resources and a few other resource targets and conservation priority areas. It states:

The tidal wetlands and floodplains along the Hudson River and Papscanee Creek are a high priority for water resources, agricultural areas, ecological resources (uncommon habitats, plants, and animals), and climate resiliency (this area will allow the migration of tidal wetlands as river

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64 Hudson Valley Natural Resource Mapper. [www.dec.ny.gov/lands/112137.html](http://www.dec.ny.gov/lands/112137.html)

65 Penhollow, M., P. Jensen, and L. Zucker. *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, NY, 2006. <http://www.dec.ny.gov/lands/5096.html>

66 Winter, John, Jim Tolisano, Rick Lederer-Barnes, Michael Batcher, and Nick Conrad. *Rensselaer Land Trust Land Conservation Plan: 2018 to 2030*. Rensselaer Land Trust, Troy, NY, 2018.

level rises). The corridor of the Moordener Kill North Branch has high priority water resources, and flows through East Greenbush Town Park, the largest public land and the center of high priority scenic areas. Other high priority water resources are along Mill Creek and west of Miller Road, and other high priority agricultural resources are in the eastern part of the Town. Of lower priority on a county-wide scale but significant for East Greenbush are the large areas of forested lands in the area of Best Road and Best-Luther Road (particularly north of Best Road) and the wetlands near Best Road which help protect water quality of streams and provide wildlife habitat. Areas of uncommon plants are found near Mannix Road and along Mill Creek.

Several map layers from the *Land Conservation Plan* are described further below.

**Significant Coastal Fish and Wildlife Habitats.** The DEC has identified and evaluated coastal habitats throughout the state’s coastal regions, providing recommendations to the NYS Department of State so that the most important or “significant” habitats may be designated for protection in accordance with the Waterfront Revitalization and Coastal Resources Act. Papscanee Marsh and Creek is a designated significant coastal fish and wildlife habitat in East Greenbush and is described under **Coastal Habitat**.



*Variety of bird sightings captured by East Greenbush resident Jodie Krulikowski*

**Known Important Areas for Rare Animals.** The New York Natural Heritage Program (NYNHP) has identified areas of importance for sustaining populations of rare plants and rare animals based on existing records and the species’ habitat requirements.<sup>67</sup> Known important areas include the specific locations where species have been observed, as well as areas critical to maintaining the species’ habitat. Proactive planning that considers how species move or disperse across the landscape, with careful attention to maintaining connected habitat complexes, will contribute to the long-term survival and persistence of rare species. NYNHP has identified known important areas in East Greenbush for freshwater mussels, Bald Eagle, and migratory fish, as well as important areas for the tidal river natural community. A complete list of state rare species documented in East Greenbush is shown in **Table 4**.<sup>68</sup> Rare animals with modeled important areas in East Greenbush are briefly described along with general threats/sensitivities as follows:

**Known Important Areas** include the specific locations where species have been observed, as well as areas critical to maintaining the species’ habitat.

67 New York Natural Heritage Program, New York State Department of Environmental Conservation. Biodiversity Databases, Important Areas Digital Data Set [updated 25 April 2013]. Albany, New York. [www.nynhp.org](http://www.nynhp.org)

68 New York Natural Heritage Program, New York State Department of Environmental Conservation. [data retrieved July 2018]. Biodiversity Databases, Element Occurrence Record Digital Data Set. Albany, New York. [www.nynhp.org](http://www.nynhp.org)



**Alewife Floater** is a state-rare mussel documented near East Greenbush in the Hudson River and mouth of the Normans Kill. Populations of these mussels have declined dramatically since exotic zebra mussels were introduced to the Hudson River Estuary in the 1990s. These and other freshwater mussels are furthermore threatened by habitat loss and fragmentation, especially from dams, siltation and sedimentation from dams, altered river flows, and surface run-off.

**Bald Eagle** (NY-Threatened, SGCN) nesting is known in East Greenbush along the Hudson River. While Bald Eagle breeding and non-breeding populations are increasing in New York, development pressure and its impacts on habitat remain significant threats. Nesting sites are sensitive to human disturbance.

**Migratory fish** species including NY-Endangered Atlantic sturgeon and Shortnose Sturgeon and SGCN such as Blueback Herring, Alewives, and American Eel utilize the Town's Hudson River coastal habitats. **Diadromous fish** refer to species that migrate between the sea and freshwater. Those that return to freshwater habitats to spawn are also referred to as **anadromous** and include sturgeon and herring species. Stream reaches used by American eel are shown in **Stream Habitat for Migratory Fishes**.

The **Ostrich Fern Borer Moth** is a rare species associated with riparian (streamside) habitats supporting its larval food plant, Ostrich Fern. One of only three known locations of this species in New York State was documented along Mill Creek in the early 1980s. Although the moth has not been recently verified in East Greenbush, its habitat persists. Conserving and managing riparian areas with Ostrich Fern is a conservation priority for this species.

The Hudson is an important **tidal river community** in a relatively intact landscape that benefits from natural shorelines and vegetated riparian buffers. Protecting diverse and high-quality examples of habitats and avoiding habitat alterations are conservation priorities.

**Note:** Rare animals may occur in more locations than are currently known by NYNHP or DEC. The DEC Region 4 Office in Schenectady should be contacted at (518) 357-2355 with any concerns or questions about the presence of protected species in the Town of East Greenbush.

**Streams with Migratory Fish.** East Greenbush's Hudson River tributaries provide important stream habitat for migratory fish species according to DEC Bureau of Fisheries data and an aquatic habitat connectivity study by NYNHP.<sup>69</sup> American Eel occur along the full length of Mill Creek, the North Branch Moordener Kill, and the main tributary to Papscanee Creek in the Town. River Herring (Alewife and Blueback Herring) spawn in Papscanee Creek and the lower reaches of the Moordener Kill in neighboring Schodack. American Eel is in decline throughout much of its range, and though eels are able to bypass certain dams, culverts, and other aquatic barriers, they rely on aquatic connectivity along

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69 White, E.L., J.J. Schmid, T.G. Howard, M.D. Schlesinger, and A.L. Feldmann. *New York State freshwater conservation blueprint project, phases I and II: Freshwater systems, species, and viability metrics*. New York Natural Heritage Program and The Nature Conservancy, Albany, NY, 2011, [http://nynhp.org/files/FreshwaterBlueprint2011/NYS\\_Freshwater\\_Blueprint\\_30Dec2011.pdf](http://nynhp.org/files/FreshwaterBlueprint2011/NYS_Freshwater_Blueprint_30Dec2011.pdf)

streams to complete their life cycle and return to the sea to spawn. River Herring spend most of their time in coastal waters and return to the fresh water of the Hudson River each spring to spawn before returning back to ocean waters. See the **Streams and Watersheds** and **Stream Habitats** section for additional information on stream habitat in East Greenbush.

**Trout and Trout Spawning Waters.** DEC's Water Quality Classifications and Standards identify trout or trout-spawning presence along classified stream segments and suggest there is coldwater habitat suitable for trout in the North Branch Moordener Kill and for trout-spawning in Mill Creek starting just downstream of Route 151. DEC Bureau of Fisheries records in the *Atlas of Inland Fishes of New York*<sup>70</sup> confirm recent records of native Brook Trout in Mill Creek. Trout require well-shaded, cool to cold, flowing water and are sensitive to warmer temperatures. While all streams benefit from adequate streamside vegetation, it is especially important for maintaining clean, coldwater habitats that support native species like Brook Trout.

**Important Ecosystem Complexes.** The Rensselaer Land Trust's *Land Conservation Plan* identifies several important ecosystem complexes in East Greenbush, representing uncommon or restricted habitat types likely to support rare or uncommon native species. Ecosystem complexes are groupings of habitat types that often co-occur across a landscape in relation to underlying physical features. **Papscanee Island and Creek** includes tidal and wetland aquatic habitat complexes that rank highest in the Town in terms of county-level importance. **Rensselaer Bay** is mapped at a lower level of significance. Despite disturbed conditions, **Hampton Manor Lake** is noted as one of only two known examples of natural calcareous (calcium-rich) lakes in the county. The **Best Road Wetlands** complex is ranked among the top 5 of such examples in the county. The **Moordener Kill Riparian Wetlands** complex is also identified as important.

**Important Aquatic Networks.** The *Land Conservation Plan* also identifies broader important aquatic networks encompassing the freshwater tidal Hudson River and the riparian and headwater areas of the North Branch Moordener Kill. These areas highlight the relatively intact natural condition of these riparian corridors and their adjacent uplands, as well as the relatively clean, connected status of the estuary or in-stream habitats. Maintaining aquatic network areas will benefit the long-term conservation of native aquatic plants and animals (and especially native fish) that rely on intact, connected river landscapes. Note that while Mill Creek supports a wild Brook Trout population, its riparian corridor and watershed forest cover are in poorer condition than that of the Moordener Kill.

**Important Interior Forest Habitat.** The *Land Conservation Plan* identifies mostly or relatively undisturbed interior forest habitat areas, representing the largest areas in the county of contiguous, primarily forest habitats. Interior forest habitats support a broad range of native species including many that are sensitive to human disturbance. These values are discussed further in the Large Forest section.

**County Rare Plant Concentration Areas.** The *Land Conservation Plan* identifies three county-rare plant concentration areas in East Greenbush: Papscanee Island and vicinity, Mannix Road woods, and Mill Creek woods and swamp. A list of rare plants identified in these areas is provided in **Table 5**.

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<sup>70</sup> Carlson, D.M., R.A. Daniels, and J.J. Wright. *Atlas of Inland Fishes of New York*. New York State Education Department, Albany, NY, 2016, <http://www.nysm.nysed.gov/common/nysm/files/atlasofinlandfishes.pdf>

**Table 4.** Species and Ecosystems of New York State Conservation Concern in East Greenbush, NY

The following table lists species of conservation concern that have been recorded in East Greenbush, NY. The information comes from the New York Natural Heritage Program (NYNHP) biodiversity databases, the *Atlas of Inland Fishes of New York*<sup>71</sup>, the *1990-1999 New York Amphibian and Reptile Atlas* (NYARA)<sup>72</sup>, and the *2000-2005 New York State Breeding Bird Atlas* (NYBBA)<sup>73</sup>. Species from the NYBBA are included in the table if they were documented in Atlas blocks that are more than 50% in the Town. The table only includes species listed in New York<sup>74</sup> (NY) or federally (US) as endangered, threatened, special concern, rare, a Species of Greatest Conservation Need (SGCN)<sup>75</sup>, or a Hudson River Valley Priority Bird species recognized by Audubon New York.<sup>76</sup> Generalized primary habitat types are provided for each species, but for conservation and planning purposes, it's important to recognize that many species utilize more than one kind of habitat. More information on rare animals, plants, and ecological communities can be found at <http://guides.nynhp.org>. **Note:** Additional rare species and habitats may occur in the Town of East Greenbush.

|                            |                                 |                 | NYS Conservation Status                               |  |                                 |                            |                            |             |
|----------------------------|---------------------------------|-----------------|---|--|---------------------------------|----------------------------|----------------------------|-------------|
| Common Name                | Scientific Name                 | General Habitat | <a href="#">Hudson River Valley<br/>Priority Bird</a> | <a href="#">Species of Greatest<br/>Conservation Need<br/>xx = high priority</a> | <a href="#">Special Concern</a> | <a href="#">Threatened</a> | <a href="#">Endangered</a> | Data Source |
| Birds                      |                                 |                 |   |  |                                 |                            |                            |             |
| <a href="#">Bald Eagle</a> | <i>Haliaeetus leucocephalus</i> | coastal         | x   | x  |                                 | NY                         |                            | NYNHP       |
| American Redstart          | <i>Setophaga ruticilla</i>      | forest          | x   |  |                                 |                            |                            | NYBBA       |
| Baltimore Oriole           | <i>Icterus galbula</i>          | forest          | x   |  |                                 |                            |                            | NYBBA       |
| Black-and-white Warbler    | <i>Mniotilta varia</i>          | forest          | x   |  |                                 |                            |                            | NYBBA       |
| Downy Woodpecker           | <i>Picoides pubescens</i>       | forest          | x   |  |                                 |                            |                            | NYBBA       |
| Eastern Wood-Pewee         | <i>Contopus virens</i>          | forest          | x   |  |                                 |                            |                            | NYBBA       |

71 *Atlas of Inland Fishes of New York*. <http://www.nysm.nysed.gov/staff-publications/atlas-inland-fishes-new-york>

72 *New York Amphibian and Reptile Atlas*. 1990-1999. Albany (New York): New York State Department of Environmental Conservation. Available at: <http://www.dec.ny.gov/animals/7140.html>

73 *New York State Breeding Bird Atlas 2000*. 2000 – 2005 [2007 update]. New York State Department of Environmental Conservation, Albany, NY. Available at: <http://www.dec.ny.gov/animals/7312.html>

74 List of Endangered, Threatened and Special Concern Fish & Wildlife Species of New York State. <https://www.dec.ny.gov/animals/7494.html>

75 New York State Department of Environmental Conservation and New York Cooperative Fish and Wildlife Research Unit at Cornell University. 2015. Species of Greatest Conservation Need List. Available at [http://www.dec.ny.gov/docs/wildlife\\_pdf/sgnc2015list.pdf](http://www.dec.ny.gov/docs/wildlife_pdf/sgnc2015list.pdf)

76 Hudson River Valley Conservation. Audubon NY. <http://ny.audubon.org/conservation/hudson-river-valley-conservation>

| Common Name            | Scientific Name                | General Habitat         | NYS Conservation Status                      |  |                        |                   |                   | Data Source |
|------------------------|--------------------------------|-------------------------|--|--|------------------------|-------------------|-------------------|-------------|
|                        |                                |                         | <u>Hudson River Valley<br/>Priority Bird</u> | <u>Species of Greatest<br/>Conservation Need</u><br>xx = high priority | <u>Special Concern</u> | <u>Threatened</u> | <u>Endangered</u> |             |
| Least Flycatcher       | <i>Empidonax minimus</i>       | forest                  | x  |  |                        |                   |                   | NYBBA       |
| Northern Flicker       | <i>Colaptes auratus</i>        | forest                  | x  |  |                        |                   |                   | NYBBA       |
| Rose-breasted Grosbeak | <i>Pheucticus ludovicianus</i> | forest                  | x  |  |                        |                   |                   | NYBBA       |
| Scarlet Tanager        | <i>Piranga olivacea</i>        | forest                  | x  | x  |                        |                   |                   | NYBBA       |
| Sharp-shinned Hawk     | <i>Accipiter striatus</i>      | forest                  | x  | x  | x                      |                   |                   | NYBBA       |
| Veery                  | <i>Catharus fuscescens</i>     | forest                  | x  |  |                        |                   |                   | NYBBA       |
| Wood Thrush            | <i>Hylocichla mustelina</i>    | forest                  | x  | x  |                        |                   |                   | NYBBA       |
| Yellow-throated Vireo  | <i>Vireo flavifrons</i>        | forest                  | x  |  |                        |                   |                   | NYBBA       |
| American Kestrel       | <i>Falco sparverius</i>        | grassland               | x  | x  |                        |                   |                   | NYBBA       |
| Bobolink               | <i>Dolichonyx oryzivorus</i>   | grassland               | x  | xx   |                        |                   |                   | NYBBA       |
| Eastern Meadowlark     | <i>Sturnella magna</i>         | grassland               | x  | xx   |                        |                   |                   | NYBBA       |
| Belted Kingfisher      | <i>Megaceryle alcyon</i>       | stream                  | x  |  |                        |                   |                   | NYBBA       |
| Chimney Swift          | <i>Chaetura pelagica</i>       | urban                   | x  |  |                        |                   |                   | NYBBA       |
| American Goldfinch     | <i>Spinus tristis</i>          | young forest, shrubland | x  |  |                        |                   |                   | NYBBA       |
| American Woodcock      | <i>Scolopax minor</i>          | young forest, shrubland | x  | x  |                        |                   |                   | NYBBA       |
| Blue-winged Warbler    | <i>Vermivora pinus</i>         | young forest, shrubland | x  | x  |                        |                   |                   | NYBBA       |
| Chestnut-sided Warbler | <i>Setophaga pensylvanica</i>  | young forest, shrubland | x  |  |                        |                   |                   | NYBBA       |
| Eastern Kingbird       | <i>Tyrannus tyrannus</i>       | young forest, shrubland | x  |  |                        |                   |                   | NYBBA       |
| Eastern Towhee         | <i>Pipilo erythrophthalmus</i> | young forest, shrubland | x  |  |                        |                   |                   | NYBBA       |
| Field Sparrow          | <i>Spizella pusilla</i>        | young forest, shrubland | x  |  |                        |                   |                   | NYBBA       |



| Common Name       | Scientific Name           | General Habitat         | NYS Conservation Status                           |   |                                 |                            |                            | Data Source |
|-------------------|---------------------------|-------------------------|---|---|---------------------------------|----------------------------|----------------------------|-------------|
|                   |                           |                         | <a href="#">Hudson River Valley Priority Bird</a> | <a href="#">Species of Greatest Conservation Need</a><br>xx = high priority | <a href="#">Special Concern</a> | <a href="#">Threatened</a> | <a href="#">Endangered</a> |             |
| Prairie Warbler   | <i>Dendroica discolor</i> | young forest, shrubland | x   | x   |                                 |                            |                            | NYBBA       |
| Ruffed Grouse     | <i>Bonasa umbellus</i>    | young forest, shrubland | x   | x   |                                 |                            |                            | NYBBA       |
| Willow Flycatcher | <i>Empidonax traillii</i> | young forest, shrubland | x   |   |                                 |                            |                            | NYBBA       |

| Reptiles               |                               |                   |  |   |  |  |  |       |
|------------------------|-------------------------------|-------------------|--|---|--|--|--|-------|
| Common Snapping Turtle | <i>Chelydra s. serpentina</i> | wetlands, coastal |  | x |  |  |  | NYARA |

| Amphibians           |                               |          |  |    |  |  |  |       |
|----------------------|-------------------------------|----------|--|----|--|--|--|-------|
| Four-toed Salamander | <i>Hemidactylium scutatum</i> | wetlands |  | xx |  |  |  | NYARA |

| Fish                               |                               |         |  |    |  |  |       |        |
|------------------------------------|-------------------------------|---------|--|----|--|--|-------|--------|
| Alewife                            | <i>Alosa pseudoharengus</i>   | coastal |  | x  |  |  |       | NYSDEC |
| American Eel                       | <i>Anguilla rostrata</i>      | stream  |  | xx |  |  |       | NYSDEC |
| American Shad                      | <i>Alosa sapidissima</i>      | coastal |  | xx |  |  |       | NYSDEC |
| Blueback Herring                   | <i>Alosa aestivalis</i>       | coastal |  | x  |  |  |       | NYSDEC |
| Brook Trout                        | <i>Salvelinus fontinalis</i>  | stream  |  | x  |  |  |       | NYSDEC |
| <a href="#">Shortnose Sturgeon</a> | <i>Acipenser brevirostrum</i> | coastal |  | x  |  |  | US NY | NYNHP  |

| Historical Records                      |                                     |          |   |    |  |    |       |       |
|---|-------------------------------------|----------|---|----|--|----|-------|-------|
| <a href="#">Alewife Floater</a>         | <i>Anodonta implicata</i>           | coastal  |   | xx |  |    | US NY | NYNHP |
| <a href="#">Bog Turtle</a>              | <i>Glyptemys muhlenbergii</i>       | wetlands |   | xx |  | US | NY    | NYNHP |
| <a href="#">Least Bittern</a>           | <i>Ixobrychus exilis</i>            | wetlands | x | x  |  | NY |       | NYNHP |
| <a href="#">Ostrich Fern Borer Moth</a> | <i>Papaipema sp. 2 nr. pterisii</i> | stream   |   |    |  |    |       | NYNHP |
| <a href="#">Yellow</a>                  | <i>Lampsilis cariosa</i>            | coastal  |   | x  |  |    |       | NYNHP |

| Common Name       | Scientific Name | General Habitat | NYS Conservation Status                      |  |                        |                   |                   | Data Source |
|-------------------|-----------------|-----------------|--|--|------------------------|-------------------|-------------------|-------------|
|                   |                 |                 | <u>Hudson River Valley<br/>Priority Bird</u> | <u>Species of Greatest<br/>Conservation Need</u><br>xx = high priority | <u>Special Concern</u> | <u>Threatened</u> | <u>Endangered</u> |             |
| <u>Lampmussel</u> |                 |                 |  |  |                        |                   |                   |             |

**Table 5.** County-Rare Plants in East Greenbush, NY

The following table is comprised of rare plant species observed within the Town of East Greenbush. The observations were made by various surveyors between 2003 and 2016 and were compiled into a report by Dr. David Hunt for the Rensselaer County Biodiversity Greenprint Project. Dr. Hunt prepared this list in a 3 July 2018 memo for the Town of East Greenbush Natural Resources Inventory. “General Habitats” are based on the habitat where each species was observed, as noted in Dr. Hunt’s memo. “Rarity Ranking” categorizes each species by its observed abundance at county, state and global scales. State and global ranking terminology is defined by the New York Natural Heritage Program and county terminology follows the same format. “Survey Location(s)” identify sites where each species was observed.

| Common Name          | Scientific Name                                   | General Habitat  | Rarity Ranking |              |               | Survey Location(s)                      |
|----------------------|---|------------------|----------------|--------------|---------------|---|
|                      |   |                  | <u>County</u>  | <u>State</u> | <u>Global</u> |   |
| Bergamot             | <i>Monarda sp.</i>                                | Island           | C1C2-          | -            | -             | Papscanee Island & Vicinity             |
| Narrowleaf Willow    | <i>Salix exigua</i>                               | Island           | C1C2-          | S4           | G4            | Papscanee Island & Vicinity             |
| Red Mulberry         | <i>Morus rubra</i>                                | Island           | C1C2N?         | S5           | G5            | Papscanee Island & Vicinity             |
| Erect Knotweed       | <i>Polygonum erectum</i>                          | Island           | C1C2           | S2S3         | G5            | Papscanee Island & Vicinity             |
| Sleepy Catchfly      | <i>Silene antirrhina</i>                          | Island           | C2C3           | S5           | G5            | Papscanee Island & Vicinity             |
| Switch Grass         | <i>Panicum virgatum</i>                           | Island           | C2C3-          | S5           | G5T5          | Papscanee Island & Vicinity             |
| Three-square bulrush | <i>Schoenoplectus pungens</i> var. <i>pungens</i> | Island, Wetlands | C2             | S5           | G5            | Papscanee Island & Vicinity; Mill Creek |
| Ambiguous Sedge      | <i>Carex amphibola</i>                            | Island           | C2C3-          | S3           | G5T4Q         | Papscanee Island & Vicinity             |
| Naiad                | <i>Najas sp.</i>                                  | Island           | C2C3           | -            | -             | Papscanee Island &                      |

|                        |                                 |                 | Rarity Ranking |       |        |                             |
|------------------------|---------------------------------|-----------------|----------------|-------|--------|-----------------------------|
| Common Name            | Scientific Name                 | General Habitat | County         | State | Global | Survey Location(s)          |
|                        |                                 |                 |                |       |        | Vicinity                    |
| Water Celery           | <i>Vallisneria americana</i>    | Island          | C2C#           | S5    | G5     | Papscanee Island & Vicinity |
| Large Solomon's Seal   | <i>Polygonatum commutatum</i>   | Island          | C2C3           | -     | -      | Papscanee Island & Vicinity |
| Wild Black Currant     | <i>Ribes americanum</i>         | Island          | C2C3           | S5    | S5     | Papscanee Island & Vicinity |
| Virginia Stickseed     | <i>Hackelia virginiana</i>      | Island          | C2C3/C3        | S5    | -      | Papscanee Island & Vicinity |
| Giant Ragweed          | <i>Ambrosia trifida</i>         | Island          | C3d            | S4    | -      | Papscanee Island & Vicinity |
| Estuary Beggar Ticks   | <i>Bidens bidentoides</i>       | Creek           | C1C2           | S3    | G3G4   | Papscanee Island & Vicinity |
| Southern Wild Rice     | <i>Zizania aquatica</i>         | Creek           | C2             | S5    | G5     | Papscanee Island & Vicinity |
| Spreading-beaked sedge | <i>Carex squarrosa</i>          | Forest          | C1C2           | S5    | G4G5   | Mannix Road Woods           |
| Wild Bergamot          | <i>Monarda fistulosa</i>        | Forest          | C1C2           | S5    | G5     | Mannix Road Woods           |
| Black Walnut           | <i>Juglans nigra</i>            | Forest          | C2NC3E         | S5    | G5     | Mannix Road Woods           |
| Flowering Dogwood      | <i>Cornus florida</i>           | Forest          | C2C3           | S3S5  | -      | Mannix Road Woods           |
| Pitch Pine             | <i>Pinus rigida</i>             | Forest          | C2C3           | S5    | -      | Mannix Road Woods           |
| Horse Nettle           | <i>Solanum carolinense</i>      | Forest          | C2C3           | S5    | -      | Mannix Road Woods           |
| New Jersey Tea         | <i>Ceanothus americanus</i>     | Forest          | C1C2           | S5    | G5     | Mannix Road Woods           |
| White Trillium         | <i>Trillium grandiflorum</i>    | Forest          | C1C2>C2        | S5    | G5     | Mannix Road Woods           |
| Yellow Star Grass      | <i>Hypoxis hirsuta</i>          | Forest          | C2C3/C2        | S5    | G5     | Mannix Road Woods           |
| Mountain Laurel        | <i>Kalmia latifolia</i>         | Forest          | C2C3/C2        | S5    | -      | Mannix Road Woods           |
| Canada Lily            | <i>Lilium canadense</i>         | Forest          | C2C3-          | S5    | G5T4?  | Mannix Road Woods           |
| Dutchman's Breeches    | <i>Dicentra cucullaria</i>      | Forest          | C2C3           | S5    | G5     | Mannix Road Woods           |
| Scarlet Oak            | <i>Quercus coccinea</i>         | Forest          | C2C3           | S5    | G5     | Mannix Road Woods           |
| Rue Anemone            | <i>Thalictrum thalictroides</i> | Forest          | C2C3           | S5    | G5     | Mannix Road Woods           |
| -                      | <i>Heteranthera sp.</i>         | Forest          | C2-            | -     | -      | Mannix Road Woods           |



|                         |                              |                 | Rarity Ranking |       |        | Survey Location(s) |
|-------------------------|------------------------------|-----------------|----------------|-------|--------|--------------------|
| Common Name             | Scientific Name              | General Habitat | County         | State | Global |                    |
| Deerberry               | <i>Vaccinium stamineum</i>   | Forest          | C3d            | S5    | -      | Mannix Road Woods  |
| Great Water Dock        | <i>Rumex orbiculatus</i>     | Uplands         | C1C2           | S5    | G5     | Mill Creek         |
| Great Blue Lobelia      | <i>Lobelia siphilitica</i>   | Uplands         | C2C3           | S5    | G5     | Mill Creek         |
| Bitternut Hickory       | <i>Carya cordiformis</i>     | Uplands         | C3d            | S5    | G5     | Mill Creek         |
| Agrimony                | <i>Agrimonia parviflora</i>  | Wetlands        | C1             | S3    | G5     | Mill Creek         |
| Red-rooted Flat Sedge   | <i>Cyperus erythrorhizos</i> | Wetlands        | C1             | S3    | G5     | Mill Creek         |
| Ditch Stonecrop         | <i>Penthorum sedoides</i>    | Wetlands        | 2/C2C3         | S5    | G5     | Mill Creek         |
| Green-headed Coneflower | <i>Rudbeckia laciniata</i>   | Wetlands        | C2C3           | S5    | G5     | Mill Creek         |

## Discussion

East Greenbush retains a rich natural heritage including high quality habitats and populations of rare or declining species of plants and animals. Identifying potential habitat concerns early in the planning process will help to more proactively avoid or minimize impacts to sensitive resources and maintain connected habitats. Developing local checklists for site plan and subdivision reviews that incorporate mapped significant ecological features can help to standardize reviews and ensure consideration of this information. Critical Environmental Area designation or the establishment of conservation overlay districts are possible tools to formally recognize significant habitat areas in the Town. Habitat assessment by a qualified biologist can provide local agencies with information about potential habitat for species of conservation concern in the context of SEQR reviews. The New York Natural Heritage Program can provide any existing records of rare animals or significant natural communities for proposed development sites.

## Large Forests (Map 16)

The **Large Forests Map** shows forests greater than 200 acres in size, which provide numerous benefits including wildlife habitat, clean water, climate moderation, and forest products. In general, larger forests provide higher quality habitat and greater benefits than smaller ones. Across the region, however, many large forests have been divided into smaller forest patches through the process of fragmentation. Forest fragmentation often occurs through clearing for new roads or development and is linked to decreased habitat quality and health, disruptions in wildlife movement, and the spread of invasive species. These impacts are greatest at forest edges but can extend for hundreds of feet into forest patches, often displacing sensitive species that avoid human disturbance. Conserving East Greenbush's large forest areas and connections between them will help sustain the Town's rich diversity of forest plants and animals and the numerous other benefits that forests provide residents.

**Forest fragmentation** is the process of dividing a large forest into smaller areas, and causes:

- decline in habitat quality
- loss of forest interior species
- disrupted wildlife movement
- spread of invasive species

The **Large Forests Map** provides a bird's-eye view of large, contiguous forests in East Greenbush. The forest patches were identified by the NYSDEC Hudson River Estuary Program and Cornell University based on 2010 land cover data.<sup>77</sup> Land cover categories considered "forest" for this analysis included deciduous forest, evergreen forest, mixed forest, and palustrine forested wetland. Roads were buffered and removed from forest patches to show results of development-related fragmentation. Interstate roads were buffered by a total of 300 feet and state and county roads by 66 feet. Forest patch size classifications follow the Orange County Open Space Plan.<sup>78</sup>

East Greenbush's forests are small compared to rural parts of Rensselaer County; however, sizeable patches of forest habitat persist in the more undeveloped parts of the Town, as well as small patches and street trees that contribute to a better quality of life in suburban areas. Intact forest patches ranging from 200-1,000 acres remain throughout East Greenbush, primarily along Route 9J and east of the I-90 corridor. "Stepping stone" forest patches such as these may provide habitat for some forest interior species as well as relatively broad corridors for wildlife movement and plant dispersal. They enable a large array of species to move from one habitat to another across a landscape fragmented by roads and developed areas. Forested stream corridors are particularly favored travel routes for many species of wildlife and help protect water quality and habitat. The North Branch Moordener Kill retains a relatively intact forest corridor highlighted as an **Important Aquatic Network** in the Stream Habitat Map. The East Greenbush Town Park is a protected portion of a stepping stone forest along this corridor, and supports many woodland plant species and mixed-age forest stands which include large, older trees.<sup>79</sup>

<sup>77</sup> National Oceanic and Atmospheric Administration. *Land Cover data for the Coastal Change Analysis Program*. NOAA Coastal Service Center, Charleston, SC, 2010, <https://coast.noaa.gov/dataregistry/search/collection/info/ccapregional>

<sup>78</sup> Orange County, NY Open Space Plan, 2004. Available at <https://www.orangecountygov.com/301/Open-Space-Plan>

<sup>79</sup> Schmitt, C. and N. Miller. *Natural Areas of Rensselaer County, New York*. Rensselaer-Taconic Land Conservancy, Troy, NY, 1994.

Although rare species and significant habitats have not been documented in the park, it was identified as having biodiversity value through the Rensselaer Land Trust's community values meetings for the *Land Conservation Plan*.

The 200-acre threshold is often considered a minimum size for intact forest ecosystems. Smaller forests have limited habitat value for forest interior bird species and suffer greater impacts from development. Forest edge disturbances dominate small forests, such as invasive species, increased predation levels, and micro-climatic differences. Many of the larger forest patches mapped in East Greenbush appear to have considerable edge habitat, and are in fact divided by local roads, driveways, or small-scale development. These forests nevertheless serve a critical ecological function as buffers to the Town's streams and help to protect steep slopes, promote groundwater infiltration, and reduce flood damage. Regardless of size or habitat values, all forests and trees in the Town help to manage stormwater, moderate temperature, and improve air quality, among other ecosystem benefits. The General Land Cover and Land Use Map shows approximate location of forests of all sizes in the Town.

Wildlife records confirm the availability of high-quality forest habitat in East Greenbush. The *2000-2005 NYS Breeding Bird Atlas*<sup>80</sup> documented several forest-interior bird species of conservation concern in the Town, including NY-Species of Greatest Conservation Need such as Scarlet Tanager, Sharp-shinned Hawk, and Wood Thrush (Table 4). Audubon New York's website has specific guidance on managing habitat for forest birds.<sup>81</sup>

**Important Interior Forest Habitat.** Rensselaer Land Trust's *Land Conservation Plan*<sup>82</sup> identifies a few mostly or relatively undisturbed interior forest habitat areas in East Greenbush, which occur east of Route 9J, along the Mill Creek corridor, and north of Best Road. These large forest areas far from roads and development are the most likely places in the Town to support populations of forest-interior nesting birds and other sensitive wildlife species.

One of the greatest threats to forests in East Greenbush today is the introduction of tree diseases, forest pests, and other invasive species inadvertently brought in by people through landscaping and international commerce. Hemlock Woollyadelgid and Emerald Ash Borer have already done much damage in nearby towns, and are expected to eventually kill most large trees of these common species in the region. Also, oak wilt, a fungal disease which can quickly kill oak trees, is in nearby Schenectady County. The DEC Division of Lands and Forests has further information about Forest Health Issues and preventative measures to reduce the spread of pests, such as using locally-sourced firewood.<sup>83</sup> The Capital/Mohawk Partnership for Regional Invasive Species Management<sup>84</sup> (PRISM) works to promote education, prevention, early detection and control of invasive species and is helping communities to prepare for and respond to this threat. Guiding future development to minimize forest fragmentation and loss will help minimize the spread of invasive species into interior forests and conserve important habitats in the Town.

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80 *New York State Breeding Bird Atlas*. <http://www.dec.ny.gov/animals/7312.html>

81 Managing Habitat for Forest Birds. <http://ny.audubon.org/managing-habitat-forest-birds>

82 Winter, John, Jim Tolisano, Rick Lederer-Barnes, Michael Batcher, and Nick Conrad. *Rensselaer Land Trust Land Conservation Plan: 2018 to 2030*. Rensselaer Land Trust, Troy, NY, 2018.

83 Forest Health. <https://www.dec.ny.gov/lands/4969.html>

84 Capital/Mohawk Partnership for Regional Invasive Species Management. <http://www.capitalmohawkprism.org/>

**Discussion**

The Town should seek ways to alert project sponsors to the significance of large forests and forest interior habitat areas. Critical Environmental Area designation or the establishment of conservation overlay districts are possible tools to formally recognize specific areas. Site plan and subdivision reviews provide an opportunity to evaluate potential impact of proposed development to forest cover and fragmentation. Habitat assessment by a qualified biologist can provide local agencies with information about forest habitat quality in the context of SEQR reviews. A forestry local law should be considered in order to give clear guidance to forest land owners, encourage sustainable forest management practices, and protect water quality.

## Grasslands, Shrublands, and Young Forests (not mapped)

Recently disturbed sites, such as hayfields, abandoned farm fields, or forest clearings, can provide important habitat for species that require grasslands, shrublands, and young forests. These successional habitat types are transitional and relatively short-lived, and typically require periodic maintenance to avoid becoming more densely vegetated, eventually developing a canopy and becoming forest. We can infer from the **Aerial View** maps and **Land Cover and Land Use Map** as well as from breeding bird records that valuable grasslands, shrublands, and young forests occur in East Greenbush (see Table 4).

Many wildlife species depend on grasslands, shrublands, and young forests – common habitats that have declined region-wide due to urbanization and farm abandonment.

Grassland or meadow habitat can support a variety of life, including rare plants, butterflies, reptiles, and birds, in addition to providing agricultural uses and scenic values. The quantity and quality of grasslands for wildlife have rapidly decreased in the Northeast during the last century due to increased human population, changes in agricultural technology, and abandonment of family farms. This continuing trend threatens populations of grassland birds that have adapted to the agricultural landscape. East Greenbush is largely forested or developed today, but the General Land Cover and Land Use map indicates that approximately 15% of the Town is in herbaceous land cover (hay, pasture, or cropland). The *2000-2005 NYS Breeding Bird Atlas* documented breeding by three grassland bird Species of Greatest Conservation Need in the East Greenbush area, including Eastern Meadowlark, Bobolink, and American Kestrel.

Shrublands and young forests are characterized by few or no mature trees, with a diverse mix of shrubs and/or tree saplings, along with openings where grasses and wildflowers grow. They can occur in recently cleared areas and abandoned farmland and are sometimes maintained along utility corridors by cutting or herbicides. These habitats are important for many wildlife species declining throughout the region because former agricultural areas have grown into forests, and natural forest disturbances that trigger young forest growth, such as fires, have been suppressed. Records from the *NYS Breeding Bird Atlas* support the presence of 10 species of conservation concern in East Greenbush that prefer young forest and shrubland habitat, including American Woodcock, Ruffed Grouse, and Blue-winged Warbler.

### Discussion

These types of open habitats are often overlooked during environmental reviews but support many species of plants and animals as well as pollinators. Even small patches of early successional habitat may be important, but patches greater than ten acres in size are more likely to support grassland- and shrubland-breeding birds. Audubon New York offers guidance on managing habitat for grassland birds<sup>85</sup> and for shrubland and young forest birds.<sup>86</sup>

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85 Managing Habitat for Grassland Birds. <http://ny.audubon.org/managing-habitat-grassland-birds>

86 Managing Habitat for Shrubland and Young Forest Birds. <http://ny.audubon.org/managing-habitat-shrub-birds>

## Stream Habitats (Map 17)

From cold, medium gradient, headwater streams like Mill Creek to the large, warm Hudson River Estuary, East Greenbush supports a variety of streams and rivers illustrated in the **Stream Habitats Map**. The Town's streams store freshwater and support diverse aquatic life, as well as recreational activities like fishing and boating.

**Mill Creek** supports wild Brook Trout, New York's native trout species. Brook Trout require cold, clear streams and are very sensitive to pollution.

### Stream Habitats

The Nature Conservancy has mapped and classified stream habitats across the Northeast region based on four attributes: size (the area drained by the stream; the primary classification variable), gradient (the steepness of the stream channel), geology (influence on water pH), and temperature (the mean summer water temperature).<sup>87</sup> The following stream habitat descriptions are based on TNC's accompanying aquatic habitat guides.<sup>88</sup> **Note:** the stream habitat classification system was developed based on remote assessment at a regional scale, and has not been field verified. Nevertheless, the general habitat information can provide a starting point for understanding the diversity of stream conditions and associated aquatic communities the Town.

#### **Medium gradient, cold, headwaters and creeks (Examples: Mill Creek)**

Cold, moderately fast-moving, headwaters and creeks of hills and gentle slopes. These small streams of northern regions or high elevations occur on hills and slopes at moderate to high elevations in small watersheds (< 39 sq mi). They have cold moderately fast-moving waters with good oxygenation. Instream habitats are dominated by riffle-pool development. Permanent cold-water temperatures in these streams means coldwater fish species, such as Brook Trout and Slimy Sculpin likely represent over half of the fish community.

#### **Medium gradient, cool, headwaters and creeks (Example: Papscanee Creek tributary)**

Similar to medium gradient, cold, headwaters and creeks, but with a higher proportion of cool and warm water species such as Smallmouth Bass and White Sucker relative to coldwater species.

#### **Low gradient, cool, headwaters and creeks (Example: Moordener Kill)**

Cool, slow-moving, headwaters and creeks of low-moderate elevation flat, marshy settings. These small streams of moderate to low elevations occur on flats or very gentle slopes in small watersheds. The cool slow-moving waters may have high turbidity and be somewhat poorly oxygenated. Instream habitats are dominated by glide-pool and ripple-dune systems with runs

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87 Olivero, A.P., and M.G. Anderson. *Northeast aquatic habitat classification*. The Nature Conservancy Eastern Regional Office, Boston, MA, 2008.  
<http://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/edc/reportsdata/freshwater/habitat/Pages/Northeast-Stream-Classification.aspx>

88 Anderson, M.G. M. Clark, C.E. Ferree, A. Jospe, A. Olivero Sheldon and K.J. Weaver. *Northeast Habitat Guides: A companion to the terrestrial and aquatic habitat maps*. The Nature Conservancy, Eastern Conservation Science, Eastern Regional Office. Boston, MA, 2013. <http://nature.ly/HabitatGuide>.

interspersed by pools and a few short or no distinct riffles. Bed materials are predominantly sands, silt, and only isolated amounts of gravel. Cool and warm water species predominate.

**Tidal, low gradient, cool, headwaters and creeks (Example: Papscanee Creek)**

Slow-moving, shallow, tidally influenced creeks and headwater streams. These tidal creeks and streams connect directly to the ocean or to large tidal rivers estuaries and have small watersheds. The water flow and level in these streams is tidally influenced. Most tidal streams have moderately firm, sandy channel bottoms and vertical banks that are regularly eroded and slump into the creek bottom. These streams and their associated estuaries support a rich diversity of plants and animals and serve as the primary nursery area for many marine fishes. The ecological importance of small tidal streams has historically been undervalued, but recent research is showing their collective influence on estuarine ecosystem function may equal or exceed that of larger tidal rivers.

**Tidal, low gradient, warm, large river (Example: Hudson River).**

Slow moving, large, deep, tidally influenced rivers. These very large rivers connect directly to the ocean or to large estuaries and their water flow and level fluctuates with the tides. They have large upstream watersheds (>1000 sq mi) and are often over 300 feet wide. In the river there is a vertical salinity gradient (but note that the Upper Hudson River Estuary is entirely freshwater). Plant and wildlife communities found in and along the river are determined by both depth and salinity. These rivers and their associated estuaries support a rich diversity of plant and animals and serve as the primary nursery area for many marine, estuarine, and anadromous fishes.

**Important Aquatic Networks.** The Hudson River shoreline and the largely intact forested riparian corridor and headwaters of the North Branch Moordener Kill are highlighted as Important Aquatic Networks and described under Significant Ecological Features.

**Riparian Areas.** Riparian areas including streamside buffers, adjacent wetlands, and the 50-year flood zone are described under the **Floodplains and Riparian Areas map**.

**Trout and Trout Spawning Waters.** DEC's Water Quality Standards and Classifications identify trout or trout-spawning presence along classified stream segments and suggest there is coldwater habitat suitable for trout in the North Branch Moordener Kill and for trout-spawning in Mill Creek starting just downstream of Route 151.

**Dams and Culverts.** Infrastructure in streams, such as dams and culverts, can isolate and severely limit the range of fish and other aquatic organisms that use stream corridors. Dams and culverts can present physical barriers to passage, and these structures can also become impassable by changing water quality (e.g. temperature) and quantity (e.g. high velocity). Dams can also lead to flow barriers, when the water in the impoundment behind the dam is used, consumed, or diverted for other purposes (e.g., drinking water supply), leading to lack of water downstream. In some cases, pollution and channel modifications can create the same kinds of barriers. Just as many forest-dwelling species are negatively impacted by forest fragmentation from roads and structures, stream barriers disconnect streams and decrease available habitat. Historically, as mills and road crossings were added to the streams of the Hudson



Valley, dams and culverts blocked off and cut up the habitat for organisms like Brook Trout and American Eel. In addition to impacts on fish and other aquatic life, stream barriers can also have serious effects on local flooding and water quality. Streams flowing into undersized culverts can flood upstream and, in some cases, overtake and wash out a road during heavy precipitation or snowmelt.

The Stream Habitats map displays the **New York State Inventory of Dams**. While the DEC tries to maintain an accurate inventory, this data should not be relied upon for emergency response decision-making. NYSDEC recommends that critical data, including dam location and hazard classification, be verified in the field. The presence or absence of a dam in this inventory does not indicate its regulatory status. Note that assessments by the NYSDEC Hudson River Estuary Program in trial watersheds indicate that perhaps twice as many barriers exist than are recorded in the NYS Inventory of Dams.

**Culvert** data are provided from the [North Atlantic Aquatic Connectivity Collaborative](#) (NAACC), a network focused on improving aquatic habitat connectivity across the Northeast region. Only one culvert in East Greenbush has been formally assessed using this protocol (on Phillips Rd). It was identified as a significant aquatic barrier. The NYSDEC Hudson River Estuary Program is leading efforts in the Hudson Valley to assess road-stream crossings for aquatic passability and to mitigate significant barriers to increase aquatic habitat available for SGCN species such as Brook Trout and American Eel.

## **Discussion**

Protecting and restoring vegetated streamside riparian buffers and restoring free-flowing streams where possible in the Town are the most effective actions to conserve and restore stream habitat. Bridges, open-bottom culverts and similar structures that completely span the waterway and associated floodplain/riparian area generally have the least potential impacts on stream hydrology, floodplains, and habitat. The Town should explore technical assistance and grants available from the NYSDEC Hudson River Estuary Program to assess and prioritize known aquatic barriers for removal or mitigation. Once aquatic barriers are identified, funding opportunities to replace these barriers are available through the NYSDEC Hudson River Estuary Program as well as the Green Innovation grant program through Environmental Facilities Corporation and NYSDEC Water Quality Improvement Program, both of which are available through the Consolidated Funding Application (CFA) process.

## Coastal Habitats (Map 18)

Connections to upper watersheds, the Atlantic Ocean, and the changing tides make the coastal and shoreline zones of the Hudson River Estuary a dynamic area. The northern Hudson River estuary is entirely freshwater, supporting globally rare natural communities such as freshwater tidal marsh and swamp. **Coastal Habitats** along the tidal Hudson in the Town of East Greenbush are shown in **Map 18**. Potential tidal wetland migration pathways are shown in the **Sea Level Rise Map** (Map 19).

**Significant Coastal Fish and Wildlife Habitats.** Diverse coastal habitats occur in New York that provide critical habitat and feeding areas for animals as well as economic values. The NYSDEC has identified and evaluated coastal habitats throughout the state's coastal regions, providing recommendations to the NYS Department of State (DOS) so that the most important or "significant" habitats may be designated for protection in accordance with the Waterfront Revitalization and Coastal Resources Act. The Significant Coastal Fish and Wildlife Habitats describe the highest quality habitats on the Hudson, outlining fish and wildlife values and activities that may have large impacts on the habitats. State and federal law requires that some projects may be reviewed for consistency with coastal policies on significant fish and wildlife habitat.

**Papscanee Marsh and Creek** is a designated significant coastal fish and wildlife habitat spanning approximately 700 acres along the west side of Route 9J in the towns of East Greenbush and Schodack. According to the DOS habitat rating form,<sup>89</sup>

Papscanee Marsh ... is primarily a floodplain wetland area, encompassing a large tidal creek, emergent marshes, freshwater tributaries, old fields, submerged aquatic vegetation, mainly water celery, and young woodlands. The habitat also includes a one-mile segment of the Moordener Kill, which is a medium gradient, warm water stream, with a gravelly substrate and a drainage area of approximately 33 square miles.

Papscanee Marsh and Creek have been subject to considerable human disturbance as a result of navigation channel construction, agricultural use, nearby commercial and industrial developments, stream channel alterations, and the intrusion of invasive species including common reed, purple loosestrife and water chestnut.

Papscanee Creek and its tributaries, especially the Moordener Kill, are important spawning and nursery areas for a variety of coastal migratory fish species such as blueback herring, alewife, American eel, and American shad. In addition, the habitat is an important producer of forage fish (killifish, shiners) that are consumed by larger predatory fish species. Many resident estuarine and freshwater fish species are also found here, including white perch,

**Papscanee Creek** is an important spawning and nursery area for migratory fish species such as Blueback Herring, Alewife, American Eel, and American Shad.

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89 New York State Department of State. 2012. *Papscanee Marsh and Creek. Coastal Fish and Wildlife Habitat Rating Form*.

[https://www.dos.ny.gov/opd/programs/consistency/Habitats/HudsonRiver/Papscanee\\_Marsh\\_and\\_Creek\\_FINAL.pdf](https://www.dos.ny.gov/opd/programs/consistency/Habitats/HudsonRiver/Papscanee_Marsh_and_Creek_FINAL.pdf)



white catfish, largemouth bass, and smallmouth bass. The submerged aquatic vegetation located within the habitat provides food for fish, invertebrates and waterfowl as well as refuge for fish and invertebrates.

Papscanee Marsh is also an important resting and feeding area for migratory waterfowl such as American Black Duck and a confirmed or probable breeding site for numerous bird species. See Table 4 for more information on the documented rare species associated with East Greenbush's coastal habitats.

**Underwater (Subtidal) Habitats.** Beds of submerged aquatic vegetation (SAV), primarily Water Celery, occur in shallow areas of the Hudson River along Papscanee Island. SAV improves water quality by trapping fine sediment and organic matter and adding oxygen to the water. It also provides essential habitat for organisms like insects, worms, and snails that feed fish and birds in the estuary, and serves as nursery habitat for young fish. Native species of SAV in the Hudson such as water celery currently compete for habitat with invasive, non-native Water Chestnut. Water Chestnut does not provide the same water quality benefit as native SAV because its floating leaves release oxygen into the air rather than into the water.

The map shows areas where SAV has been found since 1997. NYSDEC's most recent survey in 2014 found less than 0.1 acre of SAV along the Hudson River in East Greenbush, about 0.3% of the area documented with SAV in 2007. Extensive water chestnut has been documented in Papscanee Creek. A dramatic decline in SAV (90% loss) was seen throughout the Hudson River Estuary following Hurricanes Irene and Lee in 2011. The habitat loss was believed to be due to the large amount of sediment entering the estuary from the storms, which blocked light and prevented plant growth. Since 2016, signs of SAV recovery have been seen throughout the estuary. Even if SAV is not present today, the areas shown on the Coastal Habitat Map could support it in the future.

**Tidal Hudson River Estuary Wetlands.** The wetlands in Papscanee Creek are both freshwater and tidal, a globally rare ecosystem type. Tidal wetlands serve a very important purpose in the river, providing habitat for rare plants and young fish and other benefits for people like wastewater dilution/purification and protecting shorelines from waves and strong storms. The **Coastal Habitat Map** shows tidal wetlands mapping from a 2007 inventory by NYSDEC, which identified about 28 acres of tidal wetlands in East Greenbush in Papscanee Marsh and Creek. Dominant wetland vegetation types were Water Chestnut (8.5 acres), Cattail marsh (6.9 acres), and Common Reed (4 acres).



*Hudson River Shoreline at  
Papscanee Nature Preserve*

**Tidal Shoreline Status.** Natural shorelines are an important transition zone between water and land and provide habitat for diverse plants, fish and wildlife. Tidal shorelines comprise lands directly on the Hudson River as well as the shorelines of tidal wetlands, tidal tributaries, and coves, including both naturally vegetated and hard engineered shoreline. East Greenbush has approximately 3.2 miles of tidal shoreline directly along the Hudson River, in addition to unmapped shoreline along Papscanee Creek. The Coastal Habitat Map shows general shoreline type according to a 2005 inventory of Hudson River shoreline status by NYSDEC and the Hudson River National Estuarine Research Reserve. The study identified 0.6 miles of hard

engineered shoreline in East Greenbush, primarily consisting of a bulkhead along the shoreline of Papscanee Island Park. The remaining 2.7 miles of natural shoreline support primarily woody vegetation or unvegetated rock, sand, and gravel.

## Discussion

There are opportunities to conserve, restore, and manage coastal and shoreline habitats throughout the East Greenbush waterfront area. Parks, preserves, and regulated wetlands may offer a starting point to conserve or restore natural shorelines that will allow tidal wetlands to move with sea level rise. See the **Sea Level Rise Map** to view areas where tidal wetlands are predicted to move inland in the coming decades. Even along working waterfronts there are ways to improve the habitat value of bulkheads and rip-rap revetments. The Hudson River Sustainable Shorelines Project provides information and tools on enhancing the ecology of built shorelines as well as how to conserve natural shorelines.<sup>90</sup> The handbook *Managing Shore Zones for Ecological Benefits*<sup>91</sup> offers practical suggestions for protecting shore zones and increasing the benefits they provide people.

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90 Hudson River Sustainable Shorelines Project. <https://www.hrnerr.org/udson-river-sustainable-shorelines/>

91 Strayer, D. and L. Tumbelty. *Managing Shore Zones for Ecological Benefits*. Hudson River Sustainable Shorelines Project, 2016. <https://www.hrnerr.org/doc?doc=273743856>

## **Section 5: Climate**

### **Climate and Sea Level Rise (Maps 19a and 19b)**

As in most areas of the Northeast, East Greenbush experiences cold winters with snow and warm summers. According to data collected in the Albany by the National Weather Service, for the period of 1981-2010 the average temperature was 48 degrees and the average precipitation received was 39.35 inches. However, local data show steady and rapid changes in our climate that reflect global trends. It is vital for local decision-makers to understand these trends and the related climate hazards facing the region and to plan for future conditions. This section presents general climate information prepared for Hudson Valley communities by the NYSDEC Hudson River Estuary Climate Program.<sup>92</sup>

#### **Climate Projections**

*Responding to Climate Change in New York State* (the ClimAID Report), written in 2011 and updated in 2014, is the current authoritative source for climate projections for New York State.<sup>93</sup> ClimAID translated Intergovernmental Panel on Climate Change (IPCC) scenarios into more robust regional-scale predictions incorporating local data inputs and expert knowledge. The ClimAID report divides the state into seven regions to link climate information with potential impacts, and East Greenbush is located within the ClimAID climate region 5. ***Note that models are inherently uncertain and simply present a range of possible scenarios to assist people and communities plan for the future.*** Future climate changes in East Greenbush could exceed or fall short of these projections.

Looking towards the future there are three prominent climate trends that will affect East Greenbush and the region: increasing temperatures, shifting precipitation patterns, and sea level rise (SLR).

**Temperature.** New York has experienced particularly rapid changes to the regional climate in the last century and this trend is projected to continue through the 21<sup>st</sup> century. Global average temperature has been rising in unison with increasing input of insulating greenhouse gases, driving changes to regional and local climate. Warming atmospheric temperature alters the water cycle, leading to more extreme precipitation, short-term drought and severe storms. Since 1970 East Greenbush has seen a 2°F increase in average annual temperature and a 5°F winter temperature increase. These increases are above both the national and global increase in annual temperature during the same period. Current projections see an additional increase of about 4-6°F in the coming decades and up to 11°F by 2100.

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92 Zemaitis, Libby. *Working Toward Climate Resilience: General Climate Information Prepared for Hudson Valley Communities*. NYSDEC Hudson River Estuary Program, 2018.

93 Horton, R., D. Bader, C. Rosenzweig, A. DeGaetano, and W. Solecki. *Climate Change in New York State: Updating the 2011 ClimAID Climate Risk Information*. New York State Energy Research and Development Authority (NYSERDA), Albany, NY, 2014.



Increasing annual temperatures will lead to more frequent, intense, and long-lasting heat waves during the summer, posing a serious threat to human health and increased electricity demand from air conditioning. Heat waves are a particular concern in more urbanized areas of East Greenbush, where the urban heat-island effect can further exacerbate high temperatures. By mid-century, East Greenbush could annually experience three to 10 days above 95 degrees, and five to seven heat waves that last one to two days longer than average. Increasing temperature not only affects human health and ecosystems but can impact the electrical needs of a community putting strain on both budgets and the grid while creating more challenges in agriculture and other industries. Higher temperatures could stress coldwater stream habitats in Mill Creek and the North Branch Moordener Kill and could exacerbate weed growth in Hampton Manor Lake.

#### HEAT WAVE PROJECTIONS FOR REGION 5

|                                  | Baseline<br>1971-2000 | 2020s     | 2050s     | 2080s    | 2100 |
|----------------------------------|-----------------------|-----------|-----------|----------|------|
| # Days per year above 90°F       | 10                    | 26 - 31   | 39 - 52   | 44 - 76  | *    |
| # Days per year above 95°F       | 1                     | 2 - 4     | 3 - 10    | 6 - 25   | *    |
| # Heat waves per year            | 1                     | 3 - 4     | 5 - 7     | 6 - 9    | *    |
| Average # days of each heat wave | 4                     | 5         | 5 - 6     | 5 - 7    | *    |
| # Days per year ≤ 32°F           | 155                   | 127 - 136 | 104 - 119 | 84 - 109 | *    |

\*Projections not available at this time

**Precipitation.** Precipitation has become more variable and extreme, whereas total rainfall has changed only marginally. The amount of rain falling in heavy downpour events increased 71% from 1958 to 2012 in the Northeast.<sup>94</sup> Projections indicate total annual precipitation could increase as much as 12% by mid-century and 21% by 2100. Overall, New York State models project more dry periods intermixed with heavy rain and decreased snow cover in winter. However, climate projections for precipitation are considered more uncertain since it they are difficult to model. In addition to elevating flood risk, infrastructure such as roads and the Town's wastewater system could become strained during heavy rains.

#### PRECIPITATION PROJECTIONS FOR REGION 5

|                                    | Baseline<br>1971-2000 | 2020s       | 2050s     | 2080s         | 2100           |
|------------------------------------|-----------------------|-------------|-----------|---------------|----------------|
| Total annual precipitation         | 51"                   | 52" - 54.5" | 53" - 57" | 53.5" - 58.5" | 53.5" to 61.5" |
| % Increase in annual precipitation | -                     | 2 - 7%      | 4 - 12%   | 5 - 15%       | 5 - 21%        |
| # Days with precipitation > 1"     | 10                    | 14 - 15     | 14 - 16   | 15 - 17       | *              |
| # Days with precipitation > 2"     | 1                     | 3 - 4       | 4         | 4 - 5         | *              |

\*Projections not available at this time

**Sea Level Rise.** Global sea level is rising due to various factors, including thermal expansion from

94 Melillo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe, Eds. *Climate Change Impacts in the United States: The Third National Climate Assessment*. U.S. Global Change Research Program, doi:10.7930/J0Z31WJ2, 2014.  
<https://nca2014.globalchange.gov/>

warmer water temperatures and melting of land-based ice. The Hudson River is connected to and influenced by the sea; therefore, it experiences tides and is rising with global sea level. Since 1900, sea level in New York Harbor has risen 13 inches. More concerning, the water is rising faster and faster (from 2000 to 2014 the average rate was 6.8 millimeters per year compared to 4.6 millimeters per year from 1990 to 2014). East Greenbush is in the Mid-Hudson region, which is defined in regulation as north of Kingston to the Troy dam.<sup>95</sup> Projections for additional sea level rise along this portion of the Hudson River range from one to 9 inches by year 2020 and five to 27 inches by mid-century. It is possible that East Greenbush could experience as much as 71 inches of sea-level rise by the end of the 21st century if rapid ice melt from the Greenland Ice Sheet continues. Although this “high projection” scenario is considered very unlikely by NYSDEC, there is relative certainty that global sea level will ultimately rise at least six feet over current levels due to warming that is already locked in to the atmosphere.

#### SEA LEVEL RISE PROJECTIONS FOR THE HUDSON

|                         | Baseline<br>1971-2000 | 2020s   | 2050s   | 2080s    | 2100     |
|-------------------------|-----------------------|---------|---------|----------|----------|
| Mid-Hudson region       | —                     | 1 - 9"  | 5 - 27" | 10 - 54" | 11 - 71" |
| NYC/Lower Hudson region | —                     | 2 - 10" | 8 - 30" | 13 - 58" | 15 - 75" |

The Community Risk and Resiliency Act (CRRA) was signed into law in New York in 2014 to advance planning for climate resilience. NYSDEC officially adopted sea-level rise projections (see Table 6) in 2017 and is developing guidance for natural and nature-based solutions. CRRA requires the NYS Department of State to develop model local laws to enhance community resiliency.

**Table 6.** New York State Sea-level Rise Projections for the Mid-Hudson region (6 NYCRR Part 490). “Low” signifies the lower end of model forecasts, while “high” signifies the upper end over the range of different model formulations and initialization scenarios.

**Table 6.**

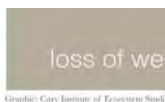
| Mid-Hudson region (from Troy south to Kingston) |                |                       |                   |                        |                 |
|---|----------------|-----------------------|-------------------|------------------------|-----------------|
| Time Interval                                   | Low Projection | Low-Medium Projection | Medium Projection | High-Medium Projection | High Projection |
| 2020s   | 1 inch         | 3 inches              | 5 inches          | 7 inches               | 9 inches        |
| 2050s   | 5 inches       | 9 inches              | 14 inches         | 19 inches              | 27 inches       |
| 2080s   | 10 inches      | 14 inches             | 25 inches         | 36 inches              | 54 inches       |
| 2100  | 11 inches      | 18 inches             | 32 inches         | 46 inches              | 71 inches       |

95 NYS 6 NYCRR Part 490. <https://www.dec.ny.gov/energy/102559.html>



The **Sea Level Rise Map** shows the current water level and “100-year” flood zone with projections of potential Sea Level Rise (SLR) at 12, 30, 54 and 72 inches over current levels, as well as modeling for **tidal wetland pathways**. The **Sea Level Rise Detail Map** (Map 19b) shows the affected coastal area in greater detail. The sea level rise modeling comes from the non-profit group Scenic Hudson, which utilized high resolution LiDAR topography and local tidal datum research in a modified-bathtub approach to estimate current and future inundation zones.<sup>96</sup> It’s important to note that the modeling does not account for storm surge and wave action, and that estimates for future flood zones do not account for projected changes in precipitation patterns.

Projections for rapid sea level rise on the Hudson threaten waterfront development and infrastructure as well as the future of tidal wetlands. Along the Hudson River Estuary there are about 7,000 acres of tidal wetland, most of which occur north of the City of Kingston. With a projection of 36-72” (3-6 ft) of SLR by the end of the century, up to 4,000 acres of tidal wetland may be completely inundated in the estuary. Tidal wetlands along the Hudson River will disappear as water rises unless they can build up sediment in place (through the process of accretion; see Figure on left) or move horizontally to higher ground. However, wetlands bordered by steep shorelines, walls, or existing development may have no place to go. Potential tidal wetland loss threatens the health of the entire estuary. Wetlands are also one of the most important tools in flood control as they are able to absorb and slow movement of rising waters. A recent study by Scenic Hudson shows areas along the Hudson most likely to support tidal wetlands in the future as sea level rises.<sup>97</sup> The study predicts a significant expansion of tidal wetland acreage in East Greenbush by 2100.



The **tidal wetland pathways** show where tidal wetlands are likely to move by 2100 as sea level rises under the full range of sea level rise and accretion rates examined in the study. Tidal wetlands are projected to expand throughout the Papsweeney Island floodplain west of Route 9J. **The undeveloped floodplain lands of Papsweeney Island may be one of the most important opportunity areas in the estuary for new tidal wetlands to be established in the 21<sup>st</sup> century.**<sup>98</sup> Elsewhere in the estuary, steep

96 Scenic Hudson Sea Level Rise Mapper. <https://www.scenichudson.org/about-slr-mapper>

97 Tabak, Nava, and Sacha Spector. *Protecting the Pathways: A Climate Change Adaptation Framework for Hudson River Estuary Tidal Wetlands*. Scenic Hudson, May 2016, <https://www.scenichudson.org/sites/default/files/protecting-the-pathways.pdf>

98 See Figure 7 in Tabak, N.M., M. Laba, and S. Spector. *Simulating the Effects of Sea Level Rise on the Resilience and Migration of Tidal Wetlands along the Hudson River*. PLoS ONE 11(4): e0152437. doi:10.1371/journal.pone.0152437. 2016. <http://www.scenichudson.org/sites/default/files/tabak-et-al-2016.pdf>

shorelines, existing roads, railroads, and development pose a physical barrier to tidal wetland migration. The wetland pathways do not account for all the barriers that may be present; for example, bulkheads, revetment, and other hard engineered shorelines may be a barrier to inland wetland migration along sections of East Greenbush's Hudson River shoreline.



*Flooding at Papscanee Island Nature Preserve*

The **Sea Level Rise Detail Map** shows the Town's coastal flood zone in greater detail with a projected 72" (6 ft) sea level rise. This is the high range projection, which will be achieved if rapid ice melt from the Greenland ice sheet continues at current rates. Even if it does not occur by 2100, there is relative certainty that it will occur in the 22<sup>nd</sup> century due to warming that is already locked in to the atmosphere. The map illustrates the vital need to plan for the potential of our changing

landscape and river system in the near future. The map shows the possibility of near complete inundation of the Papscanee Island floodplain and the possibility of future flooding past County Route 9J. Currently a portion (approximately shy of one quarter) of this area is designated as the Papscanee Island Nature Preserve. The remaining majority of the projected wetland pathways and inundation area are a mix of agricultural crop land, industrial and commercial properties, crossed by the Amtrak and CSX freight railroad lines. Sea level rise projections for the Town's waterfront can be viewed using Scenic Hudson's [Sea Level Rise Mapper](http://www.scenichudson.org/slr/mapper).<sup>99</sup>

## Discussion

Under the 2008 Comprehensive Zoning Law, approximately half of the Papscanee Island floodplain is located within the Coastal Industrial zoning district (see **Zoning and Tax Parcels Map**). According to the zoning, "The CI District is intended to permit and encourage the development of light manufacturing and warehousing uses appropriate along the waterfront which require access to the river, rail line or require large quantities of water." Much of this area remains vacant or in agricultural use (see **Tax Parcel Land Use Map**), with the potential for significant new development. Under the current zoning,

<sup>99</sup> <http://www.scenichudson.org/slr/mapper>

development plans are required to minimize conflict with adjacent agricultural operations by providing a 100' buffer. In light of the risks posed by sea level rise and coastal flooding, and in view of the current land use vision, under which a balance between resource conservation and development is desired, the Town should consider using the comprehensive plan update or a Generic Environmental Impact Statement to evaluate the potential cumulative impact of buildout in the Papscanee Island floodplain and identify mitigation options.

The Town should also consider strategies to conserve tidal wetland habitats in the face of projected changes. The most effective way to do this is to protect and manage the areas where wetlands may move. Minimizing future development in the pathways and designing public waterfronts to allow for these changes will ensure that tidal wetlands have room to adapt to rising sea levels. This strategy will also reduce risks to communities and property owners in the changing Hudson River flood zone. For more information, see [Protecting the Pathways: A Climate Change Adaptation Framework for Hudson River Estuary Tidal Wetlands](#).

While adapting to flood risks along the Hudson River, East Greenbush can also take steps to reduce potential for inland flood damage due to increased stormwater runoff by implementing green infrastructure strategies and limiting impervious surfaces where applicable. East Greenbush should also plan for increasing temperatures by expanding shaded areas in public spaces to offer relief. This could include tree planting and construction of shade structures. Riparian buffer restoration could also be beneficial to shade streams. The NYSDEC recommends developing or updating a heat emergency plan to provide a course of action during intense heat events. More information and resources on adapting to changing climate is provided in *Working Toward Climate Resilience*.<sup>100</sup>

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100 Zemaitis, Libby. *Working Toward Climate Resilience: General Climate Information Prepared for Hudson Valley Communities*. NYSDEC Hudson River Estuary Program, 2018.

## **Section 6: Land Use**

### **Zoning and Tax Parcels (Map 20)**

The **Zoning and Tax Parcels Map** illustrates land use regulations which apply to real property in the Town.

#### **Zoning**

Cities, towns and villages in New York State are authorized by state statutes (called “zoning enabling laws”) to regulate the use of land by enacting what is commonly referred to as “zoning.” Zoning governs the way land in a municipality is used and developed. Its goal is to carry out the municipality’s long-range land use objectives. Zoning regulates the uses to which property may be devoted, the siting of development on land, and the density of development on property. Typically, zoning laws divide the community into land use districts and establish building restrictions regarding building height, lot area coverage, the dimension of structures, and other aspects of building and land use.

**Zoning** regulates the uses to which property may be devoted, the siting of development on land, and the density of development on property

New York is a “home rule” state and municipalities have the choice of whether to implement zoning. The Town of East Greenbush has implemented the Comprehensive Zoning Law (CZL), Local Law # 1 of 2008 to implement zoning.<sup>101</sup> The stated purpose is to divide the Town of East Greenbush “into zoning districts, and all land and building are regulated as to use, occupancy, location, construction and alteration for the purpose of protecting and promoting public health, safety, morals, comfort, convenience, economy, urban aesthetics, and the general welfare.”

The CZL designates permitted uses of land based on the fourteen (14) zoning districts. In addition, a Watercourse Management Overlay District overlay zone and a Planned Development District floating zone are also specified in the CZL. These zoning districts are shown on the Town’s Official Zoning Map and are reproduced on the **Town Zoning and Tax Parcels Map**. A detailed schedule of permitted uses, area and bulk standards, and other requirements for each zone, as well as the intent of each zone, can be found in Section 2 of the CZL.

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<sup>101</sup> A copy of the local law can be viewed by visiting the Town’s website:  
[https://www.eastgreenbush.org/application/files/4114/9081/6524/EGB\\_Zoning\\_Law\\_061108.pdf](https://www.eastgreenbush.org/application/files/4114/9081/6524/EGB_Zoning_Law_061108.pdf)

Table X. Zoning Districts and Abbreviations

| <b>Zoning District</b>                        | <b>Abbreviation</b> |
|---|---------------------|
| <i>Residential Districts</i>                  |                     |
| Agriculture-Residential District              | A-R                 |
| Residential-Open Space District               | R-OS                |
| Residential-Buffer District                   | R-B                 |
| Residence District                            | R-1                 |
| Residence District                            | R-1A                |
| Residence District                            | R-2                 |
| Residence District                            | R-3                 |
| <i>Commercial and Industrial Districts</i>    |                     |
| Personal/Professional District                | PPB                 |
| General Business Mixed Use District           | B-1                 |
| General Business District                     | B-2                 |
| Corporate Office Only District                | O                   |
| Corporate Office/Regional Commercial District | OC                  |
| Corporate Office/Light Industrial District    | OI                  |
| Coastal Industrial District                   | CI                  |
| <i>Overlay Districts and Floating Zones</i>   |                     |
| Watercourse Management Overlay District       | WMO                 |
| Planned Development District (floating zone)  | PDD                 |

The Town is roughly divided into Residential Districts and Commercial and Industrial Districts. The Hudson River shoreline to Route 9J is a combination of light industrial and agricultural zones. The area along the length of Routes 9 & 20 and along Route 4 north to Couse Corners is a combination of medium density residential (5 dwelling units per acre to a maximum of 12 units per acre in the R-3), commercial, and mixed-use districts. The area along Route 4 to the north and west of Couse Corners is easily accessible to the interstate and is designated for office and commercial uses. The area between Route 9J and Interstate 90 not along the major roadways is zoned low-density residential (1 unit per 1.5 acres) but higher densities (up to 2 units per acre) are permitted where access to public water and sewer is available. Most of the area east of Interstate 90 is a combination of low-density residential (with densities ranging from 1 dwelling unit per 5 acres to 1 dwelling unit per 1.5 acres), agriculture, and open space.

There are several Planned Development Districts (PDDs) which apply to specific areas in the Town and are a type of incentive zoning intended to encourage creative, compact development while fostering community amenities such as a usable open space system for residents and nearby neighborhoods throughout the Town. Performance, use, and other criteria specific to the PDD area become the basis for detailed design, review and control of subsequent development in those areas. The Watercourse Management Overlay District applies to a horizontal distance 50 feet from the high-water mark of ponds and lakes and from the nearest bank of streams and rivers. The waterbodies covered by the Watercourse



Management District have been classified by the New York State Department of Environmental Conservation (NYSDEC) as designated water classes "AA" through "D."

### **Tax Parcels**

This map also includes property boundaries as reflected by tax parcel lines, which are used for tax collection purposes. State law requires local governments to prepare and maintain tax maps in accordance with standards established by New York State. The Town's tax map reflects the size, shape and geographical characteristics of each parcel of land in the assessing unit. The tax map is a graphic display of the Town's land inventory, and as such is the major source to the real property assessment roll. The working copy of the tax map is used by the Town Assessor to record and analyze property transfers and record other features pertinent to the valuation of land.<sup>102</sup> Tax parcel data shown in the Natural Resources Inventory map series were published in March 2018 by the Rensselaer County Tax Services Department.

### **Discussion**

Examining the zoning map and tax parcels in relation to other maps of the Natural Resources Inventory can provide insight into potential development scenarios which could affect the existing natural resource base, ecology, and other significant features. This map is also useful when placed in relation to the other NRI maps when making decisions about how to update the comprehensive plan and zoning districts.

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<sup>102</sup> Adapted from *Tax Mapping in New York State*. New York State Department of Taxation and Finance, [www.tax.ny.gov/research/property/assess/gis/taxmap/](http://www.tax.ny.gov/research/property/assess/gis/taxmap/). Accessed 3 Oct. 2018.

## Existing Land Use (Map 21)

The **Existing Land Use Map** shows current land use patterns in Town as reflected by tax assessment property use data. This report includes an alternative map of current land use information, the National Land Cover Dataset (NLCD), which is gathered from remote sensing. For more information, see the **Land Cover and Land Use** section.

### Existing Land Use Patterns

As shown on the map, the predominant uses in Town by land area are vacant land, residential, and agricultural. There are a mix of large and small residential uses, with the larger residential uses found

**The predominant land uses in Town by land area according to tax assessment data are vacant land, residential, and agricultural.**

primarily east of Interstate 90. There are agricultural uses found in nearly all portions of the Town except the area bounded by Route 4, Routes 9 & 20, and the Town boundaries with the City of Rensselaer and North Greenbush. Vacant land, which includes several utility rights-of-way, coincides with Mill Creek and areas situated away from major roadway corridors.

Commercial uses are found primarily along Routes 9 & 20, along Route 4 north of Couse Corners, and along Route 9J and the Hudson River. Industrial properties are also found across the portion of the Town west of Interstate 90 and include manufacturing and processing, product research, mining and quarrying, wells, and industrial product pipelines.

Community Services uses are found throughout the Town. This is a broad category that includes education, religious, healthcare, government, and cultural and recreational uses. In East Greenbush, the Town parks, cemeteries, library, and several assisted living facilities are shown. Public services include Town facilities, certain Town parks, and the Amtrak and CSX railroad lines.

### A Note About Property Type Classification Codes

Property Type Classification Codes were originally developed for use by assessors to describe the primary use of each parcel of real property on a taxing entity's assessment roll. A single code intended to be the best description for the overall use of the property is assigned to each parcel. These codes form a uniform classification system which is in use by all New York State municipalities, including the Town. The system of classification consists of numeric codes in nine categories. Each category is composed of divisions, indicated by the second digit, and subdivisions (where required), indicated by a third digit.<sup>103</sup>

This classification system is designed for a specific purpose and should be distinguished from other land use classification systems in the NRI, such as the zoning map and NLCD. Certain characteristics of these data may affect the accuracy of the resulting depiction of land use, depending upon the

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<sup>103</sup> Adapted from *Property type classification codes - Assessors' Manual*. New York State Department of Taxation and Finance, <https://www.tax.ny.gov/research/property/assess/manuals/prclas.htm>. Accessed 3 October 2018.



community. For example, it is not updated for non-taxed parcels (i.e., not-for-profit), and it is often incorrect in the type of agriculture. Parcels having more than one use (e.g., residential with agriculture) are often shown to be the highest taxable use.

### **Discussion**

Examining the Existing Land Use map in relation to other maps of the Natural Resources Inventory can provide insight into the types of activities occurring on land in the Town and their locations. It can help suggest areas where certain types of resources, such as agriculture and open space, can be found. Examining land uses over time can provide insight into changes in the use of land and development patterns.

## Regulated Facilities and Industrial Land Use (Map 22)

The **Regulated Facilities and Industrial Land Use Map** shows the distribution in the Town of industrial land uses, waste management facilities, hydrocarbon storage facilities, mines, Superfund sites, and locations of point source discharges to groundwaters as well as surface waters regulated under the Clean Water Act. Information about individual permitted facilities identified on the map is available through the DECinfo Locator interactive online map at <https://www.dec.ny.gov/pubs/109457.html>. A complete list of the locations shown on this map is available in Appendix A.

The mapped locations include the following:

- SPDES Permit Sites – New York's State Pollutant Discharge Elimination System (SPDES) program is intended to control of surface wastewater and stormwater discharges in accordance with the Clean Water Act. Permits are required for constructing or using an outlet or discharge pipe (i.e. a "point source") discharging wastewater to surface waters or ground waters of the state and disposal systems such as a sewage treatment plant.<sup>104</sup> Several commercial and industrial uses along the Hudson River have SPDES permits, as does the Town-operated wastewater treatment plant.
- Regulated MS4 Area - Polluted stormwater runoff is commonly transported through municipal separate storm sewer systems (MS4s), and then often discharged, untreated, into local water bodies. An MS4 is a conveyance or system of conveyances that is: owned by a state, city, town, village, or other public entity that discharges to waters of the U.S., designed or used to collect or convey stormwater (e.g., storm drains, pipes, ditches), not a combined sewer, and not part of a sewage treatment plant, or publicly owned treatment works (POTW).<sup>105</sup> Small MS4s that are located within the boundaries of a Census Bureau defined "urbanized area"<sup>106</sup> are regulated under EPA's Phase II Stormwater Rule and must obtain a SPDES permit from NYSDEC. The MS4 boundary is shown on the map.

The location of certain regulated facilities in Town can be valuable to those looking to undertake land development projects in East Greenbush.

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104 *State Pollutant Discharge Elimination System (SPDES) Permit Program*. NYSDEC, <https://www.dec.ny.gov/permits/6054.html>. Accessed 3 October 2018.

105 USEPA, *National Pollutant Discharge Elimination System (NPDES) - Stormwater Discharges from Municipal Sources*, <https://www.epa.gov/npdes/stormwater-discharges-municipal-sources>, Accessed 19 January 2019.

106 As the USEPA explains, "An urbanized area (UA) is a densely settled core of census tracts and/or census blocks that have population of at least 50,000, along with adjacent territory containing non-residential urban land uses as well as territory with low population density included to link outlying densely settled territory with the densely settled core." USEPA *Stormwater Phase II Final Rule Urbanized Areas: Definition and Description*, <https://www3.epa.gov/npdes/pubs/fact2-2.pdf>, Accessed 19 January 2019.

As a regulated MS4, the Town is required to develop a stormwater management program (SWMP) that describes the stormwater control practices that will reduce the amount of pollutants carried by stormwater during storm events to waterbodies to the "maximum extent practicable."<sup>107</sup> The goal of the program is to improve water quality and recreational use of waterways.<sup>108</sup> The Town does not contain any combined sewer overflows, any 303(d) listed waterbodies as identified in the General Permit, and is not located in a Watershed Improvement Strategy Area. As part of the SWMP, the Town has mapped 149 outfalls, or points of discharge from the MS4 to surface waters. Receiving waters within the MS4 boundary include: Papscanee Creek, Mill Creek, Moordener Kill, and Hampton Manor Lake.

- Petroleum Bulk Storage Facility – These locations are regulated under the NYS Petroleum Bulk Storage (PBS) program, which applies to facilities that store more than 1,100 gallons of petroleum in aboveground and underground storage tanks.<sup>109</sup> The majority of these facilities in the Town are gas stations.
- Chemical Bulk Storage Facility – These locations are regulated under the NYS Chemical Bulk Storage (CBS) program which applies to facilities that store a "hazardous substance" listed in 6 NYCRR Part 597 in an aboveground storage tank larger than 185 gallons, any size underground storage tank, with some exceptions, or in a non-stationary tank used to store 1,000 kg or more for a period of 90 consecutive days or more.<sup>110</sup> CBS regulated facilities are located at sites in the Town used for manufacturing, research, and petroleum industrial land uses.
- Major Oil Storage Facility – These locations are regulated under the NYS Oil Spill Prevention, Control and Compensation Act, which requires regulation of all oil terminals and transport vessels operating in the waters of the State which have a storage capacity of 400,000 gallons or more.<sup>111</sup> These facilities are located along the Hudson River and are involved in the storage and distribution of various refined petroleum products.
- Salt Bulk Storage Facility – These facilities are locations where road salt and other materials used for snow and ice operations by public works and roadway agencies are stockpiled. Salt storage facilities are located at the DPW garage and NYSDOT Rensselaer County Residency.

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107 <https://www.eastgreenbush.org/departments/planning-zoning/stormwater>

108 NYSDEC, *Stormwater MS4 Permit and Forms*, <https://www.dec.ny.gov/chemical/43150.html>, Accessed 19 January 2019.

109 *Bulk Storage of Chemicals, Petroleum, and Liquefied Natural Gas*. NYSDEC, <https://www.dec.ny.gov/chemical/287.html>. Accessed 3 October 2018.

110 *Bulk Storage of Chemicals, Petroleum, and Liquefied Natural Gas*.

111 *Regulation of Major Oil Storage Facilities*. NYSDEC, <https://www.dec.ny.gov/chemical/2644.html>. Accessed 3 October 2018.

- Active or Reclaimed Mine – These are regulated sites in the mining and oil and gas industries. There are five (5) such sites in the Town, which are primarily privately owned sand and gravel mines.<sup>112</sup>
- State Superfund Site - The NYS Superfund Program is an enforcement program whose goal is to identify and characterize suspected inactive hazardous waste disposal sites and to ensure that those sites which pose a significant threat to public health or the environment are properly addressed. These are locations where the presence of a consequential amount of hazardous waste has been confirmed and to which various tracking, remediation, environmental management and reporting requirements apply. There are six (6) such sites in Town.<sup>113</sup>
- Transfer Station and Former Landfill – The Town formerly operated a landfill for municipal solid waste disposal along Ridge Road which is now the site of the Town-operated Transfer Station.
- Industrial Land Uses – Industrial land uses, which are defined by property class data (see Map 21), are also found across the portion of the Town west of Interstate 90 and include manufacturing and processing, product research, mining and quarrying, wells, and industrial product pipelines.

## Discussion

Examining the Regulated Facilities and Industrial Land Use map in relation to other maps of the Natural Resources Inventory can provide insight into the types of regulated and industrial activities occurring in Town and their locations relative to natural resources and other significant features. This map shows sites undergoing cleanup of contaminated sites, which can be valuable to those looking to undertake projects in Town. More information about facilities regulated under DEC permits is available online through the [DECinfo Locator](https://www.dec.ny.gov/pubs/109457.html) tool.<sup>114</sup>

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112 *Mining and Reclamation*. NYSDEC, <https://www.dec.ny.gov/lands/5020.html>. Accessed 3 October 2018.

113 *State Superfund Sites*. NYSDEC, <https://www.dec.ny.gov/chemical/8439.html>. Accessed 3 October 2018.

114 DECinfo Locator. NYSDEC, <https://www.dec.ny.gov/pubs/109457.html>. Accessed 12 February 2019.

## Agricultural Resources (Map 23)

The **Agricultural Resources Map** shows the distribution of soils, farm parcels, and state and local agriculture promotion programs in the Town.

### Soils

Successful agriculture requires quality soils. High quality soils require small fertilizer and nutrients inputs, leading to lower costs and higher production rates. Prime Farmland Soils are defined by the USDA and New York State and considered the most productive soils for farming.<sup>115</sup> Farmland Soils of Statewide Importance are soils that do not meet all criteria for Prime Farmland. Though not as productive as Prime Farmland, if managed properly, these soils can produce fair to good yields. There are soils conducive to agriculture found across the Town. The most productive soils are located west of Interstate 90 and have seen extensive development (see the **Existing Land Use Map**).

High quality soils contribute to successful agriculture because they require smaller fertilizer and nutrients inputs, leading to lower costs and higher production rates.

### Tax Exemptions and Agricultural Districts

County agricultural district designation entitles landowners to a mix of incentives aimed at preventing the conversion of farmland to non-agricultural uses. Agricultural tax exemptions limit local property tax liability to a prescribed agricultural assessment value. According to the map, a significant proportion of the lands east of Interstate 90 either receive agricultural tax exemptions, are enrolled in an ag district, or both. There is a cluster of properties enrolled in these programs along the Hudson River, and several similar properties along Route 9 & 20 and along the southern border with the Town of Schodack.

### Discussion

Large areas of farmland can promote a critical mass of farming which is important to the long-term viability of agriculture in Town and in the county. Understanding the distribution of these agricultural resources should be an important consideration in Town planning and development management processes. Growing food locally can benefit the local economy, the environment, and the health and welfare of the community if sustainable agricultural practices are used. In addition to providing the community with a local source of crops, livestock, and economic benefits, farmlands can also serve as an important source of food and cover for wildlife, and provided certain practices are used, can help control flooding and protect wetlands and watersheds. Farmland also contributes to scenic beauty and open space.

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<sup>115</sup> *Rensselaer County, NY: Agricultural and Farmland Protection Plan.*  
[https://www.farmlandinfo.org/sites/default/files/Keep\\_It\\_Growing-Rensselaer\\_Cty\\_NY\\_1.pdf](https://www.farmlandinfo.org/sites/default/files/Keep_It_Growing-Rensselaer_Cty_NY_1.pdf). Accessed 3 October 2018.

## **Section 7: Cultural Resources**

### **Conservation, Recreation & Scenic Areas (Map 24)**

Access to parks and open space within a community brings substantial social, environmental, economic, and health benefits.<sup>116</sup> These places help define our Town by giving residents opportunities to enjoy the natural beauty of the region and provide areas to promote relaxation and exercise. From nature preserves, to pocket parks, to biking and walking paths, the Town of East Greenbush has much to offer.

#### **Parks and Protected Lands**

A variety of parks, preserves, and other protected lands in the East Greenbush were identified from the NY Protected Areas Database (NYPAD), a spatial database of lands protected, designated, or functioning as open space, natural areas, conservation lands, or recreational areas. NYPAD uses the term “protected” broadly, including lands that may be public or private, open or closed to public use, permanently protected from development or subject to future changes in management. NYPAD was created by the NY Natural Heritage Program, and can be accessed through NYPAD.org, or through the Hudson River Valley Natural Resource Mapper.<sup>117</sup>



Six public recreation areas (Woodland's Eckman Park, Hampton Lake Park, Onderdonk Memorial Park, Ontario Park, Prospect Heights Park, and the Town Park) are maintained by the Town and described fully in *The Town of East Greenbush Amenities Plan, 2016-2017*.<sup>118</sup> Each of these parks provides at least one, and often multiple, forms of recreation equipment, such as swing sets, basketball

courts, or bocce courts. The Town Park, located off Elliot Road, is the largest recreation park in the Town and provides hiking trails, pavilions, ball fields, a dog park, views of the North Branch Moordener Kill, and more.

Papscaene Island County Nature Preserve is the only formal preserve in the Town dedicated to conservation. Situated along the Hudson River, the preserve contains tidal and wetland aquatic habitats for rare species of plants and animals. This hotspot of biodiversity is described in further detail in the **Habitats and Wildlife** section of this report.

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116 Sherer, Paul M. *Benefits of Parks: Why America Needs More City Parks and Open Space*. Trust for Public Land, 2006.

117 <http://www.dec.ny.gov/gis/hre/>

118 *The Town of East Greenbush Amenities Plan: 2016-2017*. Prepared by Behan Planning and Design. [www.eastgreenbush.org/application/files/3714/9201/9187/Amenities\\_Plan\\_2016\\_Final\\_Draft.pdf](http://www.eastgreenbush.org/application/files/3714/9201/9187/Amenities_Plan_2016_Final_Draft.pdf)

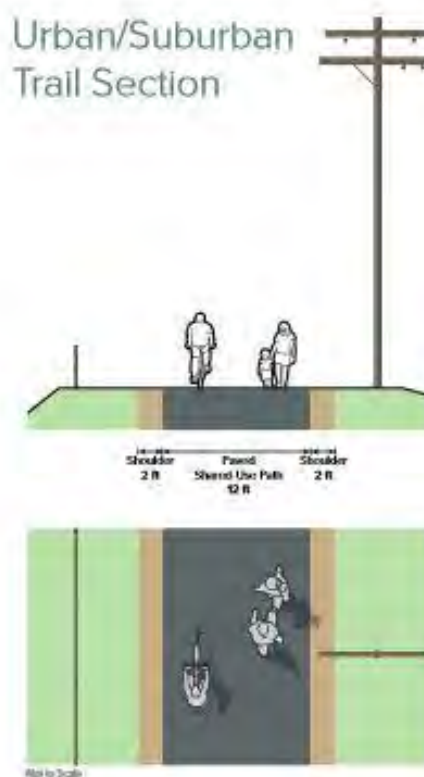
In addition to the Town's publicly accessible parks and preserve, there are at least two privately-owned properties in Town that are protected under conservation easements held by the USDA Natural Resources Conservation Service (NRCS). These properties are not open to the public. A conservation easement is a voluntary legal agreement between a landowner and a land trust or government agency that permanently limits uses of the land in order to protect its conservation values. Landowners retain many of their rights, including the right to own and use the land, sell it and pass it on to their heirs.<sup>119</sup> NRCS offers voluntary easement programs to landowners who want to maintain or enhance their land in a way beneficial to agriculture and/or the environment.<sup>120</sup> Local lands trusts, such as the Rensselaer Land Trust, also offer conservation easement programs that can help residents preserve their land for future generations.<sup>121</sup>

### **Pedestrian and Bicycle Access**

Safe access for pedestrians and bicycles allows residents to use alternate forms of transportation, which helps reduce car congestion, increases overall health of the community, and provides economic benefits.<sup>122</sup> In recent decades, shared-use bicycle and pedestrian paths have become a trademark of "livable" communities, making them more attractive to potential home buyers and businesses.

In 2020, The Town of East Greenbush will host a central piece of the Empire State Trail, a state-funded initiative to create a shared-use path from New York City to the Canadian border, and from Albany to

**The Albany-Hudson Electric Trail** will be a shared-use bicycling and pedestrian trail along the historic 35-mile Albany-Hudson Electric Trolley corridor from the cities of Hudson to Rensselaer. The route runs through East Greenbush parallel to Route 20, connecting neighborhoods, schools, shopping areas, and parks, providing recreation and linkage opportunities for many residents.



119 <https://www.landtrustalliance.org/what-you-can-do/conserve-your-land/questions>

120 <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements>

121 <https://www.renstrust.org/protect/landowner-information>

122 <https://www.railstotrails.org/experience-trails/benefits-of-trails/>



Buffalo.<sup>123</sup> The Albany-Hudson Electric Trail is a 35-mile segment of this trail that will traverse Rensselaer and Columbia Counties, following the historic tracks of the Albany-Hudson Electric Trolley that operated from 1899 to 1929. Construction is expected to begin in 2019, with completion the following year. The detailed and most current route plans can be found at [www.ahettrail.org](http://www.ahettrail.org).

Through East Greenbush, this path will be a mix of marked, on-road sections and separated off-road paths. The section from the City of Rensselaer to Southern Avenue of Hampton Manor will be on-road for cyclists, and on improved sidewalks along Route 9/20 for pedestrians. From the south end of Southern Avenue, a newly constructed shared-use path will continue until Point View Drive, at which point, an on-road route will be used until Greenwood Drive, and then the shared-use off-road path will resume until Old Miller Road.

### **Other Corridor Visions**

The East Greenbush Amenities Plan also included a vision of other multi-use trails using National Grid utility corridors that crisscross the Town, possibly connecting key features such as Papscanee Island County Park with the center of Town. Approval from National Grid would be a necessary first step towards making official paths along the corridors. State Routes 9J and 151 are State Designated Bike Routes; however, neither appear to have any bicycle amenities. Route 9J has significantly wide shoulders. Some segments of Route 151 offer wide shoulders, while others are narrow and less suited to bicycling and walking. Many of the Town's major thoroughfares and more densely settled areas, such as the Route 9 & 20 corridor, portions of Route 4 and Route 151, do have sidewalks, although overall the network displays a number of gaps and needs.

### **Scenic Roadways and Views**

The hilly terrain of East Greenbush and general westward aspect towards the Hudson River Valley, coupled with many forest and open field habitats, create opportunities for scenic vistas along many of the Town roads. The Town's 1993 Comprehensive Plan documented and described relatively intact aesthetic resources worthy of protection.<sup>124</sup> The Natural Resources Work Group determined that the 1993 inventory remains valid and worked with the project GIS intern to map the identified scenic roadways. Stretches along Ridge Road, I-90, Route 4 (between Mannix Road and the FedEx center), Hays Rd, Best Road, and Best-Luther Road are some examples of scenic roads within East Greenbush. In addition, the Natural Resources Work Group identified Old Best Road, Craver Road, and Werking Road as scenic. The following descriptions are provided from the 1993 Comprehensive Plan:

Route 4: The view westward from Route 4, between the Interstate Exit 9 ramp and the Albany International building [currently the FedEx distribution center, south of the Rensselaer County Plaza] is important to both tourists and commuters. This view is a panorama which includes Olcott and Rysedorph Hills, and the downtown Albany Government complex which includes the Nelson A. Rockefeller Plaza. Landcover types which are seen from the Route 4 at close and

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123 [www.ny.gov/programs/empire-state-trail](http://www.ny.gov/programs/empire-state-trail)

124 1993 Comprehensive Development Plan Update: Town of East Greenbush, NY.

medium range include small structures, wooded areas and open brushland. The distant view from Route 4 is of the Downtown Albany Government complex, a grouping of modern and historic buildings which form an interesting visual unit because of scale, texture, and color.



*View towards Downtown Albany from Route 4*

Town Park: The Town Park picnic and swimming area provides a greenspace setting for Town residents. The views from within Town Park are important to the overall quality of the recreational resource. Any new development in the area should respect the views both on the road leading into Town Park and views from the picnic and swimming area [Note: the swimming area is no longer open due to high bacterial counts].<sup>125</sup>

Hudson River: Views associated with East Greenbush's Hudson River waterfront should be protected and enhanced. These views are predominated by the natural settings and include:

- Views looking west along Route 9J are wetlands adjacent to woods in close to medium range, with the woods forming the distant view. Both wetlands and woods provide seasonal color and textural changes and settings for wildlife.
- The view along the Hudson River, south of the King Fuel's Terminal is of the generally undeveloped river bank and residential structures along the west shore.
- The view from Hayes Road, from the descent of the hill west to 9J is a view of wetlands, wooded shore and the hills of the west side of the river.

Ridge Road provides short range views to the winding rural roads with deciduous trees and shrubs close to the road and long-range views of ravines and forest.

I-90: The view from I-90 is an important view for the Town. Many residents travel this route

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<sup>125</sup> The pond historically has been used for public swimming and includes a beach area. However, due to high concentrations of fecal coliform, the beach has been closed to public swimming for several years by order of the Rensselaer County Health Department.

daily. For non-residents this is the only corridor which forms their impressions of East Greenbush. The existing right of way (ROW) along I-90 is relatively unobstructed with manmade landforms in the closer view. Additionally, there are open views of natural vegetation from many areas on I-90. This view is important for the quality of life for residents and for the positive impressions of the Town which it portrays to the passing motorist. View protection would preserve the rural suburban character of the Town and provide an attractive atmosphere for tourism and other economic development opportunities.

Best Luther Road: Views from Best Luther Road (Route 53) and portions of Best Road (Route 55) are generally of mixed deciduous forest on elevated topography in the medium to distant range, and brushland, and/or farms in the closer range. These views are significant because they portray the rural character which distinguishes the eastern portion of the Town.

The 1993 description of Best Luther Road and Best Road remains true in 2019. Despite additional residential development, the eastern part of Town is still dominated by views of field and forest. Best Luther Road, Best Road, Werking Road, and Luther Road delineate a rectangle of largely open space, framed by and enclosing wetlands, pasture, and the forested banks of the Moordener Kill. A number of 19<sup>th</sup> century barns and farmhouses dot this rural landscape, to which Old Best Road and Craver Road also belong. These roadways should be considered scenic resources in addition to the previously identified areas of the Town.

## **Discussion**

The Conservation, Recreation & Scenic Areas map can help the Town consider how projects adjacent to parks, open space, and trails may impact the value residents gain from these areas, as well as ways to maintain habitat connectivity with preserves and other protected lands. This map can also help identify opportunities to grow and connect parks, preserves, paths, and trails as new projects arise. For example, the incoming multi-use path will provide a backbone of pedestrian and bicycle access to which other paths and sidewalks can connect and eventually provide a valuable network of safe linkages to many parts of Town. During site plan and subdivision review, the Town should consider creating and maintaining habitat connections for the movement of plants and animals. It should also consider creating new connections among parks and trails, and the potential to create connections among future trails, for pedestrian mobility and accessibility. (Creating connections for pedestrians can also advance habitat connectivity objectives.) In order to accomplish these objectives, land can be set aside and deed restricted, put under a conservation easement, or conveyed to the Town on site and subdivision plans for these purposes.

Locations of scenic roadways can inform planning and design of new development projects. The Town may consider adoption of design guidelines to maintain community character and minimize impacts to scenic resources

## Historic Preservation Assets (Map 25)

### A Thriving Past Civilization

The earliest known inhabitants of East Greenbush were members of a complex and thriving confederacy of Mohicans who inhabited the Hudson River Valley for thousands of years before the arrival of Europeans. Known to be advanced agriculturalists and successful hunters, these Native Americans became heavily involved in the Dutch fur trade in the mid-1600's. Mohican villages were fairly large, consisting of 20 to 30 mid-sized longhouses, located on hills and heavily fortified. Schodack and the Papscanee Islands were major settlement sites. Mohican villages were governed by hereditary sachems advised by a council of elders, with a general council that met regularly at Schodack to decide matters affecting the entire confederacy.<sup>126</sup> Although the cumulative population has been estimated at over 10,000 in the Hudson Valley area at the time of European contact, by the early 1700's their numbers dwindled to four or five hundred. The spread of highly contagious European borne diseases to which natives had no immunity was catastrophic. In addition, after 1680 many Mohicans were driven southeastward to Berkshire County around Stockbridge Massachusetts due to conflicts with the Mohawk during the Beaver Wars, and westward toward Central and Western New York following the disruption of the American Revolutionary War.<sup>127</sup>

On August 12, 2015 the Stockbridge-Munsee Community, Band of Mohican Indians, opened its New York Tribal Historic Preservation Office in the City of Troy. Hosted by the Sage Colleges, the Tribal Historic Preservation Officer works directly out of this office to facilitate reviews and consultations in archeology and historic preservation that the Mohican Tribe undertakes as part of the National Historic Preservation Act Section 106 process. This is a tremendous development in the presence of the Mohicans in their historic Hudson Valley homeland.<sup>128</sup>

### Architectural Heritage

The Town of East Greenbush has a very rich Post-European settlement history rooted in the prominence of people and families and the structures they inhabited. Although there are a number of very old notable buildings that still exist as referenced in the **Historic Preservation Assets Map**, many have been significantly altered to the detriment of their original integrity. Colonists from the Netherlands built a handful of "urban-style" Dutch Colonial houses from the mid-1600's to early 1700's that only exist today in rural Albany region settings, one of the finest examples being the Bries House constructed in East Greenbush in 1723. Although recognized as one of less than six remaining examples of the Dutch urban-style, and among the rarest of American domestic buildings, it is barely recognizable today. A "Historic American Buildings Survey" in the Library of Congress includes photographs of the "Jan Breese House" taken sometime after 1933 documenting this short-lived architectural style that gave way

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126 "Mahican." Wikipedia. Wikipedia.org, n.d. <https://en.wikipedia.org/wiki/Mahican>. Accessed 7 January 2019

127 Coffey, Richard. "This Land Was Theirs (Part Two)." *History Tidbits*, [www.vizettes.com/kt/upstateny-history/ny-na/upstate-local-sites.htm](http://www.vizettes.com/kt/upstateny-history/ny-na/upstate-local-sites.htm).

128 Curtin, Edward V. *The Mohican Tribe Opens Its Historic Preservation Office in Troy, NY*. Curtin Archeological Consulting, Inc, 21 Aug. 2015, [www.curtinarch.com/blog/2015/8/20/the-mohican-tribe-opens-its-historic-preservation-office-in-troy-new-york](http://www.curtinarch.com/blog/2015/8/20/the-mohican-tribe-opens-its-historic-preservation-office-in-troy-new-york).

to Dutch “rural-style” construction. Hundreds of buildings remain of the latter style, predominantly found in regions of former Dutch influence.<sup>129</sup> In contrast, two later structures, the John Carner, Jr. House built sometime before 1776 and the Craver Farmhouse (also known as Van Rensselaer House) from 1790, are both well-preserved examples of Federal style architecture and the only Town structures currently listed on the National Register of Historic Places.

### **Sensitive Historic Areas**

Although not formally recognized by Federal, State or local government, East Greenbush has several geographic areas of historical, archaeological and architectural significance as highlighted on Map 25. These areas include neighborhoods exhibiting unique architectural styles; travel, trade and commerce corridors; native American settlements; military facilities; and clustered 18<sup>th</sup> and 19<sup>th</sup> century farmsteads.

**Hampton Manor (former Greenbush Cantonment grounds)** is a census-designated neighborhood within East Greenbush. Historically, this area was tenant farmland sold to the US Government in 1812 when construction began for a military Greenbush Cantonment. The huge Army post housed over 4,000 soldiers with several buildings and parade grounds. By 1831 the US Government sold the Cantonment property and it returned to farmland. Today one building of the original Cantonment remains as a private residence while the other structures have long been demolished.<sup>130</sup>

Early 20<sup>th</sup> century Albany area growth included a trolley line through surrounding towns that would bring about the next evolution of the area dubbed “Hampton Manor.” This was a planned development that included a spring-fed lake, sponsored by Veeder Realty whereby farmland was purchased in the 1920's and marketed as vacation spots for those wanting a quick getaway just outside of Albany. Hampton Manor is significant due to an intact concentration of Sears Kit Homes. This neighborhood of just 0.6 square miles<sup>131</sup> boasts at least 60 kit homes as well as a metal manufactured “Lustron” house.



*Entrance to original Hampton Manor development*

**The Best Road Corridor** is a winding rural road dotted with well-preserved private homes and farmsteads, two of which are individually listed on the National Register of Historic Places. The John Carner House (pre-1776) and Craver Farmhouse (1790) sites are meticulously maintained examples of the numerous mid-18<sup>th</sup> to early 19<sup>th</sup> century farmstead buildings found along this corridor. These homes

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129 McAlester, Virginia, and Lee McAlester. “Dutch Colonial.” *A Field Guide to American Houses*, Knopf Doubleday Publishing Group, 1992.

130 “Greenbush Cantonment.” *New York State Military Museum and Veterans Research Center*, New York State Division of Military and Naval Affairs: Military History, Feb. 2006, [dmna.ny.gov/forts/fortsE\\_L/greenbushCantonment.htm](http://dmna.ny.gov/forts/fortsE_L/greenbushCantonment.htm).

131 Mutch, Andrew, and Wendy Mutch. “Kit House Hunters: Hampton Manor, NY.” *Kit House Hunters*, 2015, [kithousehunters.blogspot.com/p/hampton-manor-new-york.html](http://kithousehunters.blogspot.com/p/hampton-manor-new-york.html)

and estates are indicative of the prominence and wealth early Dutch families amassed primarily through land and property acquisitions.

**Columbia Turnpike (US Route 20)** today is recognized by the US Department of Transportation's Federal Highway Administration as the longest road in the United States, stretching from Boston, Massachusetts to Newport, Oregon at 3,365 miles long, coast-to-coast.<sup>132</sup> The non-profit Historic US Route 20 Association was founded in 2012 dedicated to preserving the cultural importance of, and promoting economic development in communities along this vast stretch of highway.<sup>133</sup> Known as the Boston and Albany Turnpike constructed in 1800 complete with tollhouses, this roadway provided a means of bringing goods to markets. Earlier in history, this roadway offered a route for General Knox to haul cannons to General Washington awaiting their arrival in Boston during the 1776 American Revolution.



*Signage available  
through Historic  
Route 20 Association*

The Hamlet of East Greenbush is situated at the eastern most portion of the Turnpike within Town lines. A concentration of historical buildings is located in this neighborhood including the first Post Office, a pharmacy, hotel, and houses of prominent Town members from the 19<sup>th</sup> century. A number of schools, including Lyman's Boarding School, School House #2 and the Greenbush and Schodack Academy were originally located in this area. Additionally, one of many tollhouses that were common along Columbia Turnpike once stood in this location.<sup>134</sup>

**Papscanee Island and Route 9J corridor** is an area located within the Town of East Greenbush that runs along the eastern shore of the Hudson River from Hayes Road to the northern Town border. Route 9J, once known as the Farmer's Turnpike, was built as a farm-to-market toll road around the same time Columbia Turnpike was established in 1800. Several prominent homes were built in this area, the earliest being the Hendrick Bries House highlighted above.

The New York State Office of Parks, Recreation and Historic Preservation (OPRHP) has determined that Papscanee Island meets eligibility criteria for inclusion in the National Register of Historic Places based on its archaeological significance. The Statement of Significance from the 2009 Determination of Eligibility provides a more detailed summary overview of the area and is included in **Appendix C**. Undeveloped lands of Papscanee Island Nature Preserve owned and protected by OPRHP are situated in an area of high sensitivity for the presence of early Dutch and Mohican archaeological sites. Over 30 acres of the 156-acre preserve are still farmed today, giving this stretch of property the distinction of

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132 "Highway History - Ask the Rambler." *U.S. Dept. of Transportation*, Federal Highway Administration, [www.fhwa.dot.gov/infrastructure/history.cfm](http://www.fhwa.dot.gov/infrastructure/history.cfm).

133 "Discover Historic Route 20." *Historic Route 20*, The Historic Route 20 Association, [www.historicus20.com](http://www.historicus20.com).

134 *East Greenbush Historic Sites*. *East Greenbush Historic Sites*, Town of East Greenbush, n.d. Map and legend prepared by Office of Town Historian



being under active agriculture (corn) longer than any other lands in the United States.<sup>135</sup>

### **Notable Scattered Building Sites**

With the exception of two previously mentioned National Register properties, individual properties referenced on Map 25 are informally recognized local resources, familiar to many for the role they played in the Town's early roots and settlement. They include homes and farmsteads, municipal and civic structures, religious buildings and commercial establishments. Although in varying physical condition today, many of these buildings are considered significant by Town residents due to the prominence of the primarily Dutch families that lived and worked in this region as New World inhabitants. Numerous descendants of these families continue to reside in East Greenbush, still living in historic family homes or simply recalling the history of these properties.

### **Map 25. Historic Preservation Assets Legend**

Building locations and construction dates are approximations based on: a survey conducted by Town of East Greenbush planning consultants as part of the 1993 Comprehensive Plan; an informal mapped "Historic Tour" with photographs prepared by Town historians in 1987; a quadricentennial commemorative booklet sponsored by the Greenbush Historical Society, "Yesterday & Today, A Historical Journey" published 2009; and an 1876 map print displayed in the East Greenbush Town Historian's office.

1. Vandenburg House – 1834 (Reported as early as 1780 in a 1987 Town Historian photographic survey.)
2. John Carner Jr. House (Chenot) – pre-1776  
Early federal style building listed on the National Register of Historic Places. Now a private residence.
3. Charles Earing House (Earing-Green, Nittenger) – 1838  
Original homestead was settled in 1708 by Earing. In 1857 David H. Green bought the property where the home remained in the Green family for 103 years.
4. Reynolds House (Prins) – 1840
5. Craver Farmhouse (Van Rensselaer House) – 1790  
Listed on the National Register of Historic Places. John W. Craver was one of the first "Overseers of the Poor" in East Greenbush. Now a private residence.
6. J. N. Loesch Sawmill – 1860
7. Timothy Phillips Farm – 1709
8. School House #6 – 1890. Now the Best-Luther Firehouse.

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<sup>135</sup> . "Papsanee Island Nature Preserve Walk." *Hudson River Valley Ramble*, Cornell Cooperative Ext., [www.hudsonrivervalley.com/ramble/events](http://www.hudsonrivervalley.com/ramble/events). Accessed 12 Dec. 2018



9. Greenbush Methodist Church – 1874. Now a commercial retail building.
10. W. R. DeFreest Hotel (Knowlton Tavern) – 1802  
Location of the first Town (then Clinton) meeting in 1855 and subsequent (new) Town of East Greenbush meetings. Currently a commercial retail building.
11. East Greenbush Dutch Reformed Church – 1861  
Congregation was founded in 1787 and this is the third structure to stand on the site. The adjacent Church cemetery is the resting place of the Genet Family.
12. Bates Building – 1914. Originally built as a four-room schoolhouse, now a commercial building.
13. Lyman’s Boarding School – 1854
14. Holy Spirit Church – 1924
15. Hulsapple House (Witbeck House, Pockman Farm) – 1830
16. Quigley House – 1861 Currently Becker’s Farm and a private residence.
17. Onderdonk House/ Maple Hill Farm – 1820
18. Irwin House – 1859. One of two mansions built by the Irwin Brothers on Red Mill Road.
19. The Olcott Mansion – 1876
20. Cantonment Building – 1812  
The Cantonment Building is the only remaining structure from a vast U.S. Army Post that housed 4,000 soldiers during the War of 1812. Now a private residence.
21. Wm. A. McCulloch House – 1843. This early Victorian House was built from building components salvaged from the East Greenbush Cantonment. Once part of a 200-acre farm, the building is now a private residence.
22. Newkirk Blacksmith Shop – 1854
23. Herrington House – Pre-1854. Remaining one of several Herrington family houses along the Troy Road corridor.
24. Michel’s Farm House – Pre-1850, perhaps as early as 1790.
25. Witbeck Farm House – 1790. Georgian Colonial red brick house. Home of the William Witbeck family, leaders in Rensselaer County’s organized resistance during the Anti-Rent War.
26. Jan Breese (Hendrick Bries) House – 1723  
Although significantly altered, this is believed to be the oldest structure in East Greenbush. Documented in a “Historic America Building Survey” for the Library of Congress.
27. Ailein-Kellogg Farm House – 1840. This was a 238-acre estate known as “Mt. Eden.”
28. Genet House (Charmontot) – 1806  
Home built as a wedding gift from “Citizen” Genet to his son Major General Henry J. Genet. Now a private residence.

## **Discussion**

The history of East Greenbush lives on through homes, farmsteads, churches, schools and government buildings that have survived throughout the years. They are physical reminders of the very significant role area residents, families and events played in the development of this Town, region and country. Dating back to the American Revolution and before, significant structures remain today in various states of repair as part of the identity of the land and its residents. Vulnerable to development pressures, many historic buildings have been lost or significantly altered throughout time but opportunities exist to

protect, preserve and restore these resources. Many regional municipalities have successfully integrated historic preservation with neighborhood and economic revitalization initiatives. These communities have managed to maintain a welcome comfort and quaintness, while encouraging new commercial investment and residential development.

There is potential in East Greenbush for historic preservation to coexist with growth and vitality. Creation of cultural overlay districts that inform developers and offer historic preservation design guidelines would be a good first step. Another consideration might involve expansion of the Town's "special use permit" provisions to allow thoughtful non-conforming new uses for individual historic structures. This is a compelling approach in areas where individual historically significant scattered structures survive while the character of surrounding neighborhoods continues to change and develop. As stewards of East Greenbush resources, it is incumbent on the Town to streamline re-development procedures for historically significant properties and encourage adaptive re-use of buildings that no longer conform to regularly up-dated zoning regulations.

Historic preservation efforts should not be limited to individual structures situated in East Greenbush. The Town has evolved as a part of greater cultural, societal and economic influences and events. Opportunities remain to preserve legacies of the past by highlighting culturally sensitive historic areas including cemeteries, settlements and historic routes of commerce that linked the Hudson River to expansive, bustling turnpikes. Of particular significance is the Route 9J River Road and Papsweeney Island corridor, native home of the continent's earliest Mohican inhabitants as well as Route 20, Columbia Turnpike a very historic part of this Nation's longest continual continental roadway. Historic Route 20 Association is one resource that works with communities along this highway to promote small business development, historic sites and tourism.

**Appendix A: Town of East Greenbush List of Regulated Facilities**

## SPDES Permits

| Facility Name                      | Street Address      | SPDES #   | NYS DEC ID |
|------------------------------------|---------------------|-----------|------------|
| C H SPRAGUE-RENSSELAER<br>TERMINAL | 540 RIVERSIDE AVE   | NY0007722 | 4382400003 |
| NATIONAL GYPSUM COMPANY            | 301 AMERICAN OIL RD | NY0122980 | 4382400010 |
| EAST GREENBUSH STP                 | 80 COLUMBIA TPKE    | NY0026034 | 4382400002 |
| SPRAGUE ENERGY CORP                | 58 RIVERSIDE AVE    | NY0028843 | 4381400005 |
| HESS RENSSELAER TERMINAL           | 367 AMERICAN OIL RD | NY0005690 | 4382400019 |

## Major Oil Storage Facilities

| Facility Name                                   | NYS DEC ID |
|---|------------|
| I.P.T. LLC                                      | 4-1480     |
| SPRAGUE RENSSELAER TERMINAL                     | 4-1600     |
| BUCKEYE TERMINALS, LLC -<br>RENSSELAER TERMINAL | 4-1880     |

## Petroleum Bulk Storage Permits

| Facility Name                                  | NYS DEC ID |
|--|------------|
| EAST GREENBUSH SEWAGE TRT<br>PLT               | 4-009423   |
| GARELICK FARMS NEW YORK                        | 4-036684   |
| GAS AMERICA INC.                               | 4-037052   |
| MILLBROOK DOLLY MADISON                        | 4-051691   |
| GREENBUSH ON THE RUN                           | 4-059498   |
| YANKEE TRAILS INC                              | 4-066206   |
| HIGHWAY OIL #139                               | 4-072400   |
| DISTRICT GROUNDS SHOP                          | 4-075906   |
| 577 AUTO CARE                                  | 4-086045   |
| UNIVERSITY AT ALBANY                           | 4-088269   |
| BIOSCIENCE DEVELOPMENT CORP                    |            |
| R L SMITH SALES INC                            | 4-121673   |
| EAST GREENBUSH MOBIL #0060 -<br>0528 / #23021  | 4-121754   |
| NYS DOT  | 4-133930   |
| STEWART'S SHOPS #214                           | 4-142212   |
| SPEEDWAY # 7582                                | 4-163902   |
| EAST GREENBUSH SUNOCO                          | 4-429651   |
| WARREN W. FANE INC. (PERRY<br>PIT)             | 4-431109   |
| FIRST UNITED METHODIST<br>CHURCH               | 4-443638   |
| FUCCILLO FORD OF EAST<br>GREENBUSH             | 4-462004   |
| NORMAN STAHLMAN                                | 4-484679   |
| TOWN OF E GREENBUSH TOWN<br>GARAGE DPW         | 4-485241   |
| NEW NGC, INC. D/B/A NATIONAL<br>GYPSUM COMPANY | 4-485829   |
| SIDOTI'S SERVICE CENTER                        | 4-600272   |
| JEFFY LUBE STORE NO. 453                       | 4-600281   |
| SMITH'S TIRE SERVICE                           | 4-600337   |
| MICHAELS AUTO PLAZA 920 CORP.                  | 4-600365   |
| VALVOLINE INSTANT OIL CHANGE                   | 4-600388   |

|  |          |
|--|----------|
| BEST VALUE INN                         | 4-600415 |
| MONRO MUFFLER/BRAKE #107               | 4-600434 |
| MABEY'S MOVING AND STORAGE, INC.       | 4-600604 |
| WM. H. CLARK MUNICIPAL EQUIPMENT, INC. | 4-600723 |
| NEW YORK PLASTICS                      | 4-600761 |
| REGENERON PHARMACEUTICALS, INC.        | 4-600915 |
| WALMART SUPERCENTER #1940              | 4-600969 |
| GREENBUSH REFORMED CHURCH              | 4-600978 |
| S.A. DUNN and COMPANY                  | 4-601005 |
| CRAWFORD DOORS and WINDOWS             | 4-601008 |
| 5 COUSE PLACE PROPERTY                 | 4-601138 |
| NEW YORK INDEPENDENT SYSTEM OPERATOR   | 4-601142 |
| WARREN TIRE                            | 4-601344 |
| FEDEX GROUND PACKAGE SYSTEM, INC.      | 4-601430 |

## Chemical Bulk Storage Permits

| Facility Name                                | NYS DEC ID |
|--|------------|
| ASHLAND DISTRIBUTION COMPANY                 | 4-000049   |
| BUCKEYE TERMINALS, LLC - RENSSELAER TERMINAL | 4-000064   |
| GARELICK FARMS NEW YORK                      | 4-000134   |
| SPRAGUE ENERGY CORP.                         | 4-000202   |
| I.P.T., LLC TERMINAL                         | 4-000214   |
| REGENERON PHARMACEUTICALS, INC.              | 4-000275   |

## Mines

| Facility Name           | NYS DEC ID | Commodity       | Status    |
|-------------------------|------------|-----------------|-----------|
| Cipperly Farm Pit       | 40556      | Sand and Gravel | Reclaimed |
| Dunn Bank               | 40346      | Sand and Gravel | Active    |
| East Greenbush Sand Pit | 40239      | Sand and Gravel | Active    |
| Hayes Road Clay Pit     | 40413      | Clay            | Reclaimed |
| Onderdonk Ridge Pit     | 40322      | Sand and Gravel | Active    |
| Witbeck Bank            | 40329      | Sand and Gravel | Active    |

## Superfund Sites

| Facility Name                        |
|--------------------------------------|
| East Greenbush Landfill              |
| Sterling Drug Site 3                 |
| Fashion Care Cleaning East Greenbush |
| Sterling Drug Site 2                 |
| Former United One-Hour Dry Cleaners  |
| Former City of Rensselaer Landfill   |

## **Appendix B: Historic Sites**





## Columbia Turnpike

Today the hamlet of East Greenbush on Columbia Turnpike still features structures from the mid 19th through the early 20th century. The turnpike once boasted many homes, businesses, school and toll houses. Surviving historic structures show changing architectural detail and changes in the lifestyle of East Greenbush residents over the last 200 years.

*Bates Building - Former School House 1914*



*Former Greenbush Methodist Church  
1874*



*Former Boarding School 1854*



## Columbia Turnpike



*Holy Spirit Church 1924*



*Historical marker for the resting place of French diplomat "Citizen" Genet - prominent East Greenbush resident*



*Greenbush Dutch Reformed Church 1861 - Site of original church founded in 1787*



## Greenbush Cantonment



Today one building remains from the 1812 Cantonment where the grounds house more than a dozen structures including barracks, a hospital and officer quarters.



The cantonment area became home to the new Hampton Manor development in the 1920's. The neighborhood features a high concentration of kit houses from Sears and Montgomery Ward.





18th Century  
Homesteads







Circa Late 18th & Early  
19th Century Homesteads





## Early 19th Century Homes

Many remaining homes from the 18th & 19th centuries in East Greenbush were once part of large estates and farmsteads. Today many surviving homes from these times feature similar characteristics such as wooden white clapboard and column detail or pediments of the federal and greek revival style. Porches, window shutters and fencing would be common but have not always survived with changes over time.





## **Appendix C: Papscanee Island Statement of Significance**

# RESOURCE EVALUATION

DATE: November 25, 2009

STAFF: Blakemore/Herter

PROPERTY: Papscanee Island

MCD: East Greenbush (08303)  
Schodack (08313)

ADDRESS: N/A

COUNTY: Rensselaer

PROJECT REF: [REDACTED]

USN: 08303.000010/08313.000018

- I. ☐ Property is individually listed on SR/NR:  
name of listing:
- ☐ Property is a contributing component of a SR/NR district:  
name of district:
- II. ☒ Property meets eligibility criteria.
- ☐ Property contributes to a district which appears to meet eligibility criteria.
- Pre SRB: ☒ Post SRB: ☐ SRB date

## Criteria for Inclusion in the National Register:

- A. ☒ **Associated** with events that have made a significant contribution to the broad patterns of our history;
- B. ☒ **Associated** with the lives of persons significant in our past;
- C. ☐ Embodies the distinctive characteristics of a type, period or method of construction; or represents the work of a master; or possess high artistic values; or represents a significant and distinguishable entity whose components may lack individual distinction;
- D. ☒ **Have** yielded, or may be likely to yield information important in prehistory or history.

## STATEMENT OF SIGNIFICANCE:

**Papscanee Island** is historically and archeologically significant for its association with upper Hudson Valley's predominant native people, the Mohican, who are currently recognized as the Stockbridge-Munsee Community Band of Mohicans. The pre 20<sup>th</sup> century island is historically significant as a center of life for this cultural group in New York where it served as a primary gathering spot and place of ceremony. The island is also archeologically significant for the potential it possesses to provide significant information about the life ways of its inhabitants and also for the information that has already been acquired through the archeological record.

The island is located in the floodplain of the Hudson River, in the Town of East Greenbush, Rensselaer County. It is about 4 miles long and about a half mile across, with the Papscanee Kill separating it from the mainland. A strip of additional fertile land lay east of the kill that was another half mile at it widest. (Huey 2004). In the 19<sup>th</sup> and 20<sup>th</sup> century, filling of the channel behind the dike resulted in an expansion of the island's western shore and silting between the island and the mainland has resulted in wetlands that have obscured the original island configuration. The tidal estuary Cuyper Kill originally separated the small Cuyper Island from the western shore of Papscanee Island until alluvium began to fill the channel in the late 1750's creating a single landform (Huey 1996: 137).<sup>1</sup>

<sup>1</sup> The boundary for the Determination of Eligibility includes an area, which based on historic maps best represents the historic limits of Papscanee Island prior to its connection to the eastern shore of the Hudson River.

The Mohican Indian Nation was the most populace Indian Nation in the Upper Hudson upon the arrival of the Dutch. Historic documentation provides evidence that when Hudson arrived in 1609, he was well within the Mohican territory which extended throughout the Upper Hudson (Dunn: 1994, 54). Hudson was greeted by the Mohicans who provided land for Dutch use and maintained a peaceful coexistence with the Dutch (Dunn 1994:63). At the time of Dutch arrival they had claim to “16,000 morgens of mountain and valley and 1200 morgens of cleared land” (Van Laer, 1908). The 2400 acres of cleared land included Papscanee Island. When the Dutch farmers came upriver in 1637, they were able to immediately plant on the previously cleared land. (Dunn 1994:226).

Papscanee Island was the home of the Mohican Sachem, Papsickene, who also controlled other smaller nearby islands and some of the adjacent mainland. A territory associated with a particular sachem was often mentioned in the Dutch deeds. One example of a fertile territory bearing the name of the chief, Papsickene’s Island and “Paep-sykenekaes kill” is shown on the 1632 map. Numerous Dutch documents, letters and land references refer to Papsickene’s land. (Dunn: 1994, 54) Papsickene’s importance during the 17<sup>th</sup> century is reflected in how the Mohicans interacted with the Dutch, as the sachem’s decisions meant the difference between war and peace. Prosperity for the newcomers depended on the relationship of the native population with the Dutch but also to other native groups. The status of the sachem seems evident in that Papsickene’s son in the historic record is referred to as “the son of Papsickene”. After Papsickene’s death in 1634, three years lapsed before the island was acquired from his heirs by Kiliaen Van Renseelaer, who had repeatedly sought to obtain the land.

The Mohican people consider Papscanee Island to be a historic property of religious and cultural significance based on its direct association to the sachem Papsickene, for its importance as a place of traditional ceremonies and for its direct connection to their ancestors. The following presents the view of the Stockbridge Munsee Community Band of Mohicans:

“The homes of the Mohican Chiefs, or Sachems were places of spiritual and ceremonial rituals. The Sachem was looked upon as a great tree in whose shade the whole nation sat. His business was to contemplate the welfare of his people, promote peace and happiness with all of their allies. The sachem kept the bag of ceremonial wampum and the pipe of peace.

The wampum was used to track treaties, stories and important events in the tribe’s history. In the years before contact and for 150 years afterwards, all collective knowledge had been memorized. To assure that traditions and treaty obligations were not forgotten, at regular intervals, conferences were held to recite and memorize the Nation’s past. Both young and old were expected to participate in this tradition. This could take as long as two months. Tribal members gathered together at certain seasons, and the historian taking a piece of wampum from the bag, repeated aloud its meaning, and passed it to the person who sat next to him, who then repeated the story. Each piece of wampum and story was passed to each tribal member.

It was not just pieces or strings of wampum, but also elaborate belts were made to mark a treaty with government officials, and other tribes. The belt told the story of the event. The belt was also used to invite a tribe to join in a war, or mark death. It is the native way of documenting its history, and held in great importance. The sachem had a bag which was made special to hold wampum and wampum belts. It was his responsibility to keep these in his home. When a sachem dies his responsibility to care for the wampum was passed to the next sachem. (Jones: 1854, 21)

Turtles have a great value to the Mohican people. Many Lenape Tribes, of which Mohican belong, have a creation story. It is believed the earth is resting on the back of a giant turtle lying in the water. From the soil on the turtle’s back there grew a tree that sent forth a sprout that produced the first man. Then bending over, the top of the tree touched the earth and another sprout grew and this became the woman. These two people were the original parents for all Lenape Indians.

The turtle did not just give us life but helped to sustain life. The shell of the turtle was used as cups and dishes. The shell was also used as rattles in spiritual and ceremonial rituals. The animal world is believed to be one with us and we must treat them with dignity and respect. In the spirit world, the destiny of the Indian is linked with the animal.

The importance of the turtle is not just spoken about, but displayed daily in our tribal affairs. The turtle is on our tribal flag, letterheads, and part of our daily lives. In our clan system, one of the clans is a turtle. The painted turtle which is symbolic with Mohican people still exists on this island today. Protecting the water ways to ensure this turtle does not become extinct is vital to the Mohican people.

This island also holds known graves of our Mohican ancestors. Mohican people hold burials in extreme spiritual significance. Traditional Native beliefs are if graves are disturbed the spirit of this person can not continue their journey. Because of the tribe's strong beliefs in protecting its ancestors' graves, the tribe has an officer whose job is to protect their ancestors. With the knowledge that Papscanee Island was the home of our sachem, used as fishing and camping sites, and burials are known to be in situ we believe this island must be listed as a historic district to protect our tribe's rich history on this island. (White: 2009).

The rich soil along the flats and on Papscanee Island was flooded annually and generations of Mohicans cleared and cultivated these areas. The Van Rensselaer manuscripts reveal "that 1200 morgens of lands were enriched by the overflow of high water when the ice breaks" (Van Laer, 1908). Kiliaen van Rensselaer, when establishing his agricultural colony in New Netherlands, had his agent select desirable lands on the west side of the Hudson near Albany and a small tract on the east side. Papscanee Island attracted sufficient notice to be described in Johannes de Laet's book published in 1625: "...on the east side of the river live the *Mahikans*. On the same East side lies a long, broken Island (many kills run through it so that there multiple Islands) extending nearby...and the ships can come up this far" (Huey 2004: 64). Not being initially successful in acquiring Papsickene's lands in 1632, Kiliaen van Rensselaer wrote in 1636 to his agent in the New Netherlands who was responsible for getting farmers located, that "in case they (the farmers) should want to settle on PaepZickens land, which I think has not yet been bought, make every effort to purchase the same or at best to cause the farmers to be established there with the consent of the owners" (Waite 1913: 26).

After the Hudson's seasonal spring flooding, Papscanee Island would have been an ideal resource procurement site. New plant growth and abundant fish (perhaps collecting in the receding back water) provided a ready food source. With the introduction of maize agriculture into the Northeast during the Woodland Period, the Mohican people had an ideal location for the growing of crops, including beans and squash. While intensive cultivation normally depletes the soil, Papscanee Island was annually enriched with new soils.

The archeological data that exists for Papscanee Island have already provided significant information about precontact Native peoples, the Mohican people of the Woodland and Contact Periods, and later Dutch inhabitants. The hunter-gatherer model suggests that Native populations would disperse into smaller task based or family groups, depending on the season and available resources, and then come back together when it was logistically favorable for larger groups to function together-generally fall and winter. Various hypotheses have been presented on the model of Mohican Pre-Contact settlement. While some of the early maps show fortified villages, there have been no palisaded Mohican villages found to date. Another hypothesis is that small camps were used in addition to stockaded villages, or that unfortified household groupings were dispersed throughout the Mohican territory. (Sopko 2009: 7). The archeological sites that have been identified on Papscanee Island provide evidence that the Mohican's use of the island was extensive throughout the precontact and contact periods.

The earliest identified precontact occupation on Papscanee dates to the Late Archaic (2500 B.C. to 1500 B.C.) The Goldcrest Site (A08303.000050) was identified on the former Cuyper Island (now part of Papscanee) which was held by the Mohicans until 1661. The site dates to the Middle Woodland (A.D. 290 and A.D. 430) and to the Late Woodland/Contact Period (A.D. 1435 and A.D. 1660). Earlier burned deposits found below these occupations may reflect the initial Mohican land clearing process (Sopko 2009). A burial was encountered at this site,

suggesting that Papscanee Island was considered an appropriate location for burials and that other Woodland and Contact Period burials may be present elsewhere on Papscanee Island.

In addition to the recently identified East Greenbush Marina site (A08303.000093), there are 10 other recently identified Late Woodland Period and Contact Period Mohican sites on the island representing temporary agricultural camps, fishing camps and long term isolated farmsteads. Late Woodland pottery has been encountered on seven archaeological sites, with two sites representing different Late Woodland Period occupations. Three sites date to both the Contact and the Late Woodland Period and three sites are single component Lake Woodland occupations. Recovered materials include chert tools and flakes, hearth features, mussels, deer bones, fish bones, nut, structural remains and pottery. While these sites have many similarities, they also have many differences (Sopko 2009: 9).

The fact that new sites are being identified as a result of systematic archeological investigations, suggests that there are many more unidentified sites on the island that will yield significant information about the precontact period, the Mohican utilization and habitation of the island and the Mohican interaction with the Dutch during the Contact Period. Many Dutch farm sites are located on earlier Mohican sites, some of them below alluvial soils and fill. The Dutch farm sites have archaeological importance because they contain information on the earliest Dutch house types, individual living standards, trade contacts, and other significant research topics (Huey 2004:69). The Mohican's cultivated farmland on Papscanee Island may actually be the first European farms in New York State (Huey: undated). Some of this original farm land continues to be actively farmed.

## References

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2009 Significance Statement for Papscanee Island.



## Boundary for Papscanee Island Determination of Eligibility

