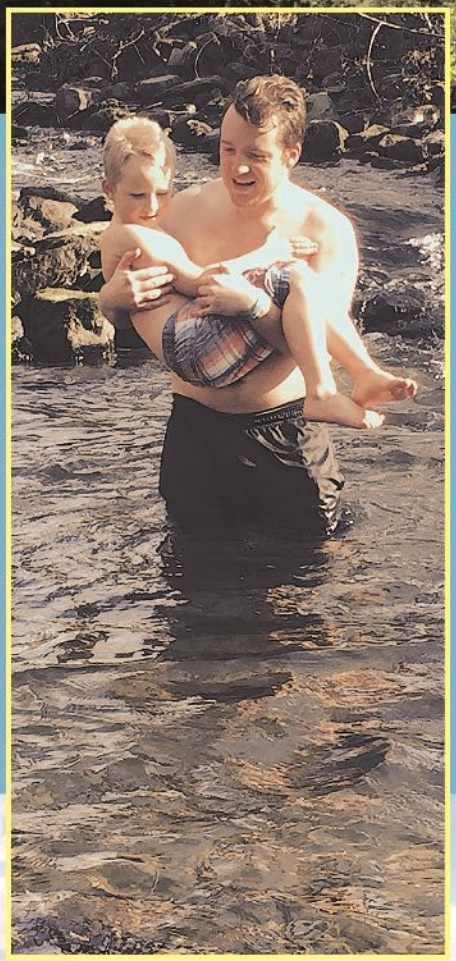
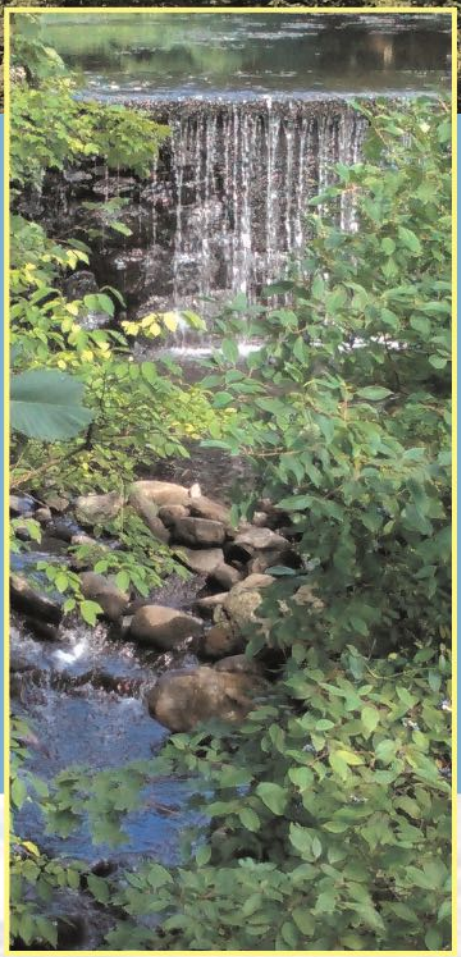
Town of Putnam Valley
Natural Resources Inventory





Prepared by the Putnam Valley Commission for the Conservation of the Environment, with assistance from the Hudson Highlands Land Trust and The New York State Department of Environmental Conservation

2018

Putnam Valley Committee for the Conservation of the Environment

Town of Putnam Valley
Natural Resources Inventory

2018

Table of Contents

Photo credits (cover page): hillside, lake, waterfall, turtle (Wendy Whetsel); hummingbird (Mario Mercado); father and son (Mia Aczue).

Contributors

This year-long project is the result of the diligent work of the Putnam Valley Commission for the Conservation of the Environment (CCE)'s Natural Resources Inventory (NRI) Working Group:

- Patricia Grove
- Eileen Reilly
- Julie Ruben
- Glenn Sapir
- Michael Usai
- Wendy Whetsel

Acknowledgements

The Putnam Valley Natural Resources Inventory was completed through a partnership among the Putnam Valley CCE, Hudson Highlands Land Trust (HHLT), and Cornell University Department of Natural Resources, with funding from the Environmental Protection Fund through the New York State Department of Environmental Conservation Hudson River Estuary Program (HREP). The Putnam Valley Scenic Resource Mapping project was funded through a partnership with the Hudson River Valley National Heritage Area and the Hudson River Valley Greenway.

Rick Lederer-Barnes of Upstate GIS, Ingrid Haeckel and Nate Nardi-Cyrus (HREP), and Karen Doyle (HHLT) are responsible for the updated mapping.

We deeply appreciate the invaluable contributions of our Project Coordinator, Karen Doyle, convener of dreams. We thank Laura Heady (HREP), and Michelle Smith, Katrina Shindledecker, and Nicole Wooten (HHLT) for their expertise and guidance. Gretchen Weiglein of the Putnam Valley Historical Society, and Sallie Sypher of the Putnam County Historical Society aided our historical research. The Putnam County Land Trust contributed information. Friedel Müller-Landau and Mia Azcue of the CCE provided valuable input. And we thank all the residents of Putnam Valley who contributed time, knowledge, observations, and photos to this project.

I. INTRODUCTION

Putnam Valley, "The Jewel of Putnam County," encompasses 43 square miles of geologically dynamic landscapes. Over a billion years of geological history and the receding of the glaciers some 12,000 years ago left us with the sculpted ridges, valleys, wetlands, lakes and ponds, and the rocky soils that characterize our area. Our Town is rich in diverse landscapes, habitats, and open spaces. An inventory of our natural resources will provide residents a roadmap for appreciating and protecting them.

This NRI, produced by the NRI Working Group of the Putnam Valley CCE, provides a foundation for valuing and preserving the past and the future of Putnam Valley. It is comprised of maps and related reports cataloguing significant natural resources, such as forests, rocky ridges, wetlands, and the cultural, historic, scenic and recreational assets enjoyed by our residents.

The NRI is intended as a reference document for anyone seeking information about the specific nature of Putnam Valley's resources and landscapes. It provides the Town Board, the Zoning Board of Appeals, the Planning Board, the CCE and others with information highly relevant to comprehensive planning, environmentally sound policy-making, and determining the effects that land-use decisions may have on important resources of the Town.

By examining current conditions, conservation values, threats to natural resources, and actions to protect the natural resources, Putnam Valley can balance development with conservation to ensure that the benefits of healthy ecosystems are available to our community and to future generations. By analyzing natural resources over a large area, the functioning of our watersheds, stream corridors, wetlands, extensive areas of forest and corridors connecting them can be protected better than if looked at individually.

Without such data it is difficult to fully assess the likely impacts of development on the health and quality of water resources, soils and biological communities, as well as on the welfare of residents and the safety of their homes. Many kinds of decisions can benefit from consulting these maps, such as where to place a septic system, where to minimize impervious surfaces, where is development appropriate, and what lands to protect and preserve. In addition, it can be used by landowners in making decisions about the most desirable use of their land or simply as a source of information that can help them better appreciate the land they own and its relationship to the Town as a whole. And it will be available to prospective residents in assessing the resources the Town has to offer.

The Putnam Valley NRI is an evolving document that will be updated periodically by the Commission for the Conservation of the Environment with the most current information available about the natural resources of our Town.

How to Use the NRI Maps[1]

The Putnam Valley NRI maps and accompanying reports are an ideal tool for understanding our Town's natural resources and for town-wide planning (e.g., comprehensive and open-space planning.) The maps spotlight important aspects of our Town and show the general distribution of natural resources. Residents, developers, town planning officials and consultants should consult these maps as an initial step in identifying site features and constraints. It is important to note, however, that the information displayed has not been uniformly verified by site visits nor does it reflect survey-level accuracy. As a result, the maps should *not* be used as the basis for site-specific land-use decisions or for jurisdictional determinations. Nevertheless, the NRI maps can serve as a starting point for gathering additional, more precise information about an area.

The natural resources highlighted through the NRI maps are interrelated. For instance, the susceptibility of groundwater to contamination can be affected by bedrock geology, soil drainage, and land slope. Thus, it is important to consult the maps together to develop a more holistic understanding of natural resource relationships and land use considerations in your area of interest. The NRI maps are available in PDF format with 2017 tax parcel boundaries, enabling users to zoom in and view features at a site or neighborhood scale. The online Hudson Valley Natural Resource Mapper (dec.ny.gov/lands/112137.html) is a companion tool that allows more interactive, customized viewing of many of the information layers presented in the NRI.

The **Base Map** is a geographic reference for the other maps in the NRI. The Base Map displays town, county, and state roads; tax parcel boundaries (which approximate property boundaries); and topographic features such as surface waters, land elevation, and contour lines.

The **Orthoimagery Maps** are also useful geographic references. They display images obtained from the NYS GIS Clearinghouse 2016 Orthoimagery Inventory. These aerial photos were taken in early spring before most deciduous plants leaf out and thus show the land's features unobscured by tree canopies. The infrared orthoimagery provides information about the vegetation in an area. Infrared reflectance varies with vegetation type (i.e., conifers vs. broadleaf species), and growth status. Therefore, actively growing vegetation appears bright red, and stressed vegetation appears a darker red on infrared orthoimagery[2].

For easy reference, the Natural Resources Inventory maps are grouped in this NRI by primary topic although many of the maps are relevant to more than one topic. Each map lists the data sources that were used to compile the map and provides a legend explaining the symbols used and features that are mapped. Each report's text, written by the NRI Work Group of the Putnam Valley CCE, provides additional context and insight for each of the maps.

Many of the maps are paired in the NRI, with the second of the pair including outlines of tax parcels.

References

[1] Modeled after "How to Use this Report" in the Town of Rosendale's Natural Resources Inventory (September 2010).

[2] Using Color Infrared (CIR) Imagery: A Guide for Understanding, Interpreting and Benefiting from CIR Imagery, North Carolina Geographic Information Coordinating Council, Statewide Mapping Advisory Committee, July 2011, nconemap.com/Portals/7/documents/Using_Color_Infrared_Imagery_20110810.pdf.

Town of Putnam Valley

Natural Resource Inventory

Base Map

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Town of Putnam Valley

Other Town Boundaries

Parks

Conserved Land with Public Access

Other Conserved Land

Appalachian Trail

Telecommunications Towers

Mapped Wetlands

Surface Water

Rivers & Streams

Data Sources: Parks and Conserved Land HHLT, WLT, NYCDEP, NCE Data Base 2018 and Putnam County Real Property Data 2017, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature

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Hudson River Estuary Program

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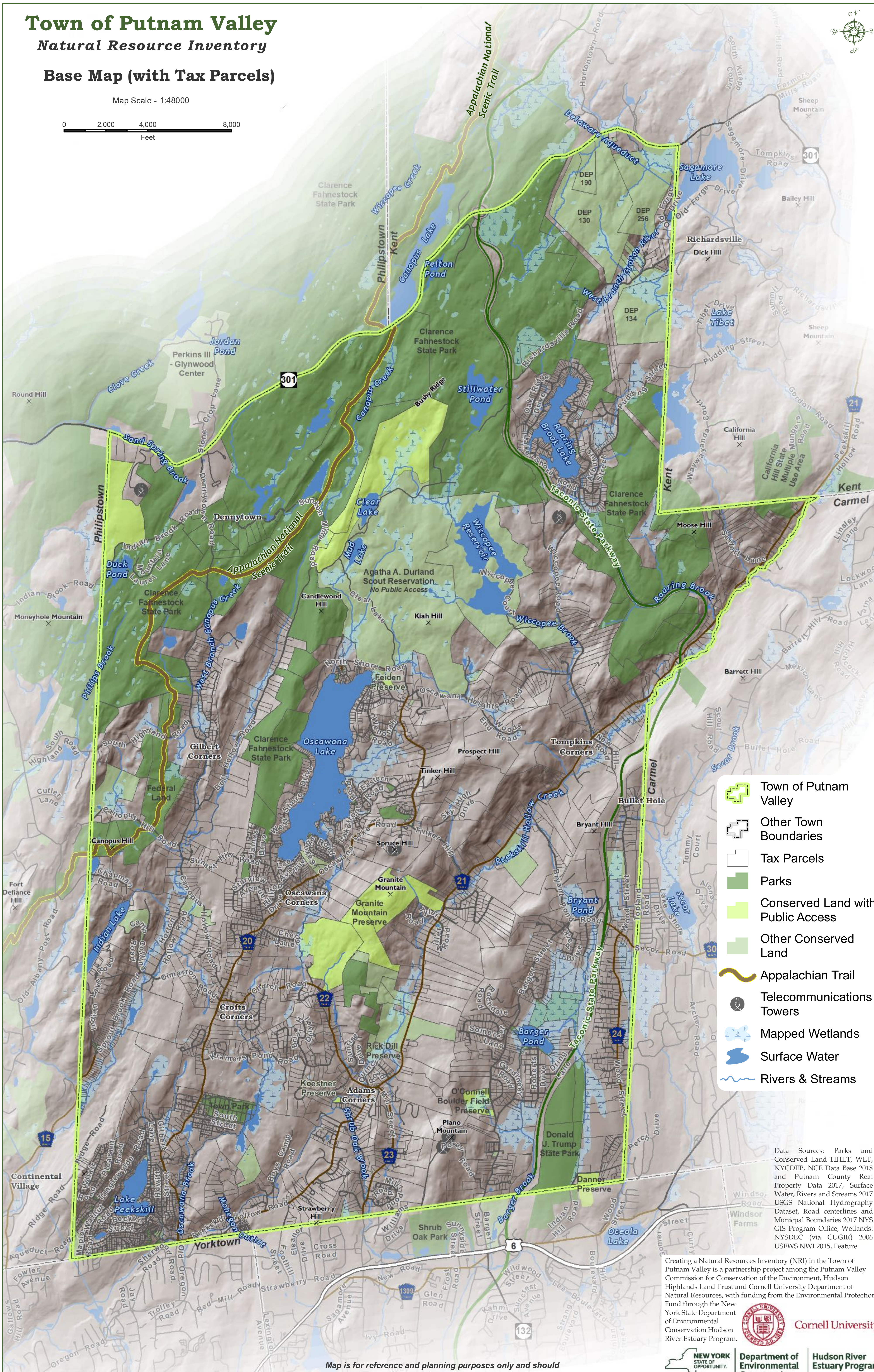
Map prepared by Upstate GIS - September 2018


Town of Putnam Valley
Natural Resource Inventory
Base Map (with Tax Parcels)
Map Scale - 1:48000
0 2,000 4,000 8,000
Feet
Town of Putnam Valley
Other Town Boundaries
Tax Parcels
Parks
Conserved Land with Public Access
Other Conserved Land
Appalachian Trail
Telecommunications Towers
Mapped Wetlands
Surface Water
Rivers & Streams
Data Sources: Parks and Conserved Land HHLT, WLT, NYCDEP, NCE Data Base 2018 and Putnam County Real Property Data 2017, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature
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Department of Environmental Conservation
Hudson River Estuary Program
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Town of Putnam Valley

Natural Resource Inventory

2016 Orthoimagery

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Town of Putnam Valley

Other Town Boundaries

Surface Water

Rivers & Streams

Data Sources: Orthoimagery NYSGIS Program 2016, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Feature location names 2018 USGS.

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Town of Putnam Valley

Natural Resource Inventory

2016 Orthoimagery (with Tax Parcels)

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Town of Putnam Valley

Other Town Boundaries

Tax Parcels

Surface Water

Rivers & Streams

Data Sources: Orthoimagery NYSGIS Program 2016, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Feature location names 2018 USGS.

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Map prepared by Upstate GIS - September 2018

Town of Putnam Valley

Natural Resource Inventory

2016 Infrared Orthoimagery

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Town of Putnam Valley

Other Town Boundaries

Surface Water

Rivers & Streams

Data Sources: Orthoimagery NYSGIS Program 2016, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Feature location names 2018 USGS.

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Map prepared by Upstate GIS - September 2018

Town of Putnam Valley

Natural Resource Inventory

2016 Infrared Orthoimagery (with Tax Parcels)

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Town of Putnam Valley

Other Town Boundaries

Tax Parcels

Surface Water

Rivers & Streams

Data Sources: Orthoimagery NYSGIS Program 2016, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Feature location names 2018 USGS.

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Map prepared by Upstate GIS - September 2018

II. GEOLOGY and TOPOGRAPHY

Bedrock Geology

The origin of Putnam Valley is written in its rocks, and it is a history that extends far back in time. An examination of the **Bedrock Geology** maps show that the geologic units generally run from southwest to northeast. This is typical of the larger area of the Hudson Highlands and beyond, and evidences some of the extraordinary events that have shaped the area. The nature of the bedrock plays a major role in soil formation in an area, as well as rendering the area calcareous or acidic, thus influencing the biotic community that can form[1].

The Earth is approximately 4.6 billion years old. The geologic time scale divides the time that the planet has existed into eras and epochs (Table 1).

Table 1. Ages of Bedrock in Putnam Valley[2]

	Era	Epoch	Years Ago
Oldest	Proterozoic (Precambrian)	Middle Proterozoic	1.6 to 1.0 billion
	Paleozoic	Cambrian	542 to 488.3 million
	Paleozoic	Middle Ordovician	471.8 to 460.9 million
	Paleozoic	Upper Ordovician	460.9 to 443.7 million
Youngest	Paleozoic	Upper Devonian	385.3 to 359.2 million

Over a billion years ago, ancient North America was located near the equator, and the east coast actually faced south. The warm tropical seas deposited sands, silts, muds, and limestone, and that became metamorphic rock. The plates on which the continents rest are in motion (known as plate tectonics), and ancient North America collided with another continent. That collision, known as the Grenville Orogeny, formed the Grenville Mountain range, which stretched from Canada to Mexico. The northeast-southwest trending narrow ridges and valleys evident on the **Bedrock Geology** maps are the result of the stresses caused by the intense compression of plates of crust. These erosion-resistant Precambrian rocks became the backbone of bedrock in Putnam Valley, and are estimated at 1.3 to 1.1 billion years old[3].

In Putnam Valley, bedrock is generally covered with a thin layer of recently-deposited (in geologic time) soil. The oldest layers of bedrock are under the younger layers. Some areas of the Town show exposed ancient Proterozoic or Precambrian rock. These rocks, once buried under miles of sediment, have been exposed over time through weathering and the scraping action of glaciers. Additionally, areas in the Hudson Highlands exhibit a curious phenomenon in which geological events have lifted some of the older erosion-resistant Cambrian rock layers above younger Ordovician layers[4].

Minerals are the building blocks of rock. Rocks can be classified according to the processes that form them. Igneous rocks cooled from molten rock. Metamorphic rocks formed through plate movements or very deep burial (pressure) or contact with molten rock (temperature). These energy sources cause pre-existing rock to “metamorphose” or change. For example, granite is the parent rock that forms gneiss, a metamorphic rock. Sedimentary rocks formed by the accretion of small particles that came from the breakup of igneous, sedimentary, and metamorphic rocks. Iron ore, once a product mined locally, is found in sedimentary rocks that formed over 1.8 billion years ago. Heat and pressure associated with

deep burial and tectonic deformation converted sedimentary and igneous rocks to metamorphic rocks (marble, quartzite, phyllite, schist, and gneiss).

Table 2 provides additional information about the geologic units found in Putnam Valley and displayed on the **Bedrock Geology** maps. It is notable that a large portion of the Town has bedrock that is calcareous or acidic. Calcareous bedrock is that which is partly or mostly composed of calcium carbonate. The areas with calcareous bedrock (labeled *Oma*, *OCi*, *bqpc*, and *mb* on the map) are found southwest of Adams Corners, and in a strip running southwest to northeast along Sprout Brook Road, Horton Hollow Road, and Candlewood Hill into the Mud Lake-Clear Lake and Bushy Ridge area. Plant communities that tolerate calcareous soils deriving from bedrock of this type are of biodiversity significance[1]. The higher elevations to the northeast likely include calcareous crest ledge and talus habitat. The lowland areas in the southwest likely include calcareous wet meadows. All of these areas should be explored further for the presence of rare plants. Similarly, acidic bedrock (labeled *Dpgr*, *Cpg*, *qtlg*, *bg*, or *qpg* on the map) would produce soils with a pH less than 5.5, and support acid-tolerant plant communities.

Clearly, many areas of the Town may house plant communities that have significance to biodiversity and should be investigated by a qualified expert with strong field identification skills.

Table 2. Bedrock Geologic Units[5]

Symbol	Name	Age Formed (million years ago)	Group	Notes[1,6]
Dpgr	Upper Devonian, granite	385.3 to 359.2	Diorite with hornblende and/or biotite	Diorite is the name used for a group of coarse-grained igneous rocks with a composition between that of granite and basalt. Acidic.
Od	Upper Ordovician, diorite	460.9 to 443.7		Alkaline but not calcareous.
Oma	Middle Ordovician, schist	471.8 to 460.9	Schist	Schist is a metamorphic rock made up of plate-shaped mineral grains that are large enough to see with an unaided eye. To become schist, shale must be metamorphosed in steps through slate and then through phyllite. If the schist is metamorphosed further, it might become a granular rock known as gneiss. Potentially calcareous.
Cpg	Cambrian, quartzite	542.0 to 488.3	Poughquag Quartzite	Quartzite forms when quartz-rich sandstone is altered by the heat, pressure, and chemical activity of metamorphism. Quartzite is one of the most physically durable and chemically resistant rocks found at Earth's surface. Acidic.
Oci	Early Cambrian-Lower Ordovician, marble	542.0 to 471.8	Inwood Marble	Metamorphosed limestone. This is one of three primary bedrocks that underlie Manhattan island. Calcareous.
bqpc	Middle Proterozoic, gneiss	1600 to 1000	Biotite-quartz-plagioclase paragneiss	Variable: Acidic and Calcareous
mb	Middle Proterozoic, marble	1600 to 1000	Calcitic and dolomitic marble, variably siliceous	Dolomitic marble, a metamorphic rock, is produced when dolostone is subjected to heat and pressure. Calcareous.
qtcs	Middle Proterozoic, gneiss	1600 to 1000	Garnet-biotite-quartz-feldspar gneiss	Gneiss is a metamorphic rock identified by its bands and lenses of varying composition.
qtlg	Middle Proterozoic, gneiss	1600 to 1000	Garnet-bearing paragneiss and interlayered quartzite	Acidic.
am	Middle Proterozoic, amphibolite	1600 to 1000	Amphibolite, pyroxenic amphibolite	Amphibolite is a coarse-grained metamorphic rock. It is harder than limestone and heavier than granite.
bg	Middle Proterozoic, granite gneiss	1600 to 1000	Biotite granite gneiss	Variable: Acidic and Calcareous
qpg	Middle Proterozoic, mafic gneiss	1600 to 1000	Pyroxene-hornblende-quartz-plagioclase gneiss	Acidic

References

[1] Kiviat, Erik, and Gretchen Stevens. Biodiversity Assessment Manual for the Hudson River Estuary Corridor. NYS Department of Environmental Conservation, 2001.

[2] Geologic Time Scale, University of California Museum of Paleontology, 6 May 2011, www.ucmp.berkeley.edu/help/timeform.php.

[3] Geology and Geography of the New York Bight. The Highlands Region, City University of New York, Earth and Environmental Science Program, www.geo.hunter.cuny.edu/bight/highland.html.

[4] Ansley, Jane E. The Teacher-Friendly Guide to the Geology of the Northeastern U.S. Paleontological Research Institute, 2000.

[5] Geology, New York State Museum, www.nysm.nysed.gov/research-collections/geology/gis

[6] Geoscience News and Information, geology.com/rocks

Town of Putnam Valley

Natural Resource Inventory

Bedrock Geology

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Bedrock Geologic Units

- Dpgr, Upper Devonian, granite
- Od, Upper Ordovician, diorite
- Oma, Middle Ordovician, schist
- Cpg, Cambrian, quartzite
- OCi, Early Cambrian - Lower Ordovician, marble
- bqpc, Middle Proterozoic, gneiss
- mb, Middle Proterozoic, marble
- qtcs, Middle Proterozoic, gneiss
- qtlg, Middle Proterozoic, gneiss
- am, Middle Proterozoic, amphibolite
- bg, Middle Proterozoic, granitic gneiss
- qpg, Middle Proterozoic, mafic gneiss

Town of Putnam Valley

Other Town Boundaries

Surface Water

Rivers & Streams

Historic Mines

Data Sources: Bedrock Geology NYSED 1970, Mines https://thediggings.com, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Feature location names 2018 USGS.

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Town of Putnam Valley

Natural Resource Inventory

Bedrock Geology (with Tax Parcels)

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Bedrock Geologic Units

- Dpgr, Upper Devonian, granite
- Od, Upper Ordovician, diorite
- Oma, Middle Ordovician, schist
- Cpg, Cambrian, quartzite
- OCi, Early Cambrian - Lower Ordovician, marble
- bqpc, Middle Proterozoic, gneiss
- mb, Middle Proterozoic, marble
- qtcs, Middle Proterozoic, gneiss
- qtlg, Middle Proterozoic, gneiss
- am, Middle Proterozoic, amphibolite
- bg, Middle Proterozoic, granitic gneiss
- qpg, Middle Proterozoic, mafic gneiss

Town of Putnam Valley

Other Town Boundaries

Tax Parcels

Surface Water

Rivers & Streams

Historic Mines

Data Sources: Bedrock Geology NYSED 1970, Mines https://thediggings.com, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Feature location names 2018 USGS.

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Surficial Geology

The **Surficial Geology** map illustrates the distribution of surface materials in Putnam Valley. These materials overlay the bedrock (see Bedrock Geology and contribute to the composition of the soils (see **Soil Drainage Classes)** in the Town. The overall topography of the Town is rugged upland; it is rocky with little or no soil covering the bedrock as seen in the ridgelines that run northeast to southwest[1].

The surface deposits are largely the product of the glaciers that repeatedly covered this area, most recently approximately 2.6 million years ago. This moving frozen sheet of water reached a maximum thickness of approximately 2 miles[2]. The glacier picked up materials in its path and then, as it melted and retreated 18,000 years ago with the changing climate, it left behind materials of varying sizes in the valleys of the Town. Large free-standing rocks such as the one found on Rock Hill Road in Putnam Valley are termed glacial *erratics*. Eroded substrate left behind by the glacier is termed *till* and contains a mixture of variously sized particles. *Outwash* is material and sediment deposited by the glacial meltwater. Some sediments were left behind in glacial ponds and lakes, others moved around by wind. The glacial till and water-sorted deposits, derived from the crystalline bedrock, are mostly stony and bouldery sands with some silt and little or no clay[2].

Table 1 explains the geological units that are displayed on the **Surficial Geology** map.

Sand and gravel deposits have been an important economic resource for construction and road maintenance. Sand and gravel deposits in Putnam Valley are located along Peekskill Hollow Creek, southeast and northeast of Roaring Brook Lake, and along Canopus Creek.

Areas where there are very thin surficial deposits (labeled as *Bedrock* on this map) are found around Lake Peekskill, southeast of Indian Lake, west of Peekskill Hollow Road north of Tinker Hill, and north of Piano Mountain. These areas would have limited drainage, and thus would not be ideal for supporting septic systems. This will be discussed further in the text accompanying **Soil Drainage Classes**.

Table 1. Geologic Units

Name	Description[3]
Recent alluvium	Oxidized fine sand to gravel, permeable, generally confined to flood plains within a valley, in larger valleys may be overlain by silt, subject to flooding, thickness 1-10 meters.
Swamp deposits	Peat-muck, organic silt and sand in poorly drained areas, unoxidized, commonly overlies marl and lake silt, potential land instability, thickness 2-20 meters.
Lacustrine silt and clay	Generally laminated silt and clay, deposited in proglacial lakes, generally calcareous, low permeability, potential land instability, thickness variable (up to 50 meters).
Outwash sand and gravel	Coarse to fine gravel with sand, proglacial fluvial deposition, well rounded and stratified, generally finer texture away from ice border, permeable, thickness variable (2-20 meters).
Kame deposits	Coarse to fine gravel and/or sand, includes kames, eskers, kame terraces, kame deltas, ice contact, or ice cored deposition, lateral variability in sorting, texture and permeability, may be firmly cemented with calcareous cement, thickness variable (10-30 meters).
Glacial Till	Variable texture (boulders to silt), usually poorly sorted sand-rich diamict, deposition beneath glacier ice, permeability varies with compaction, thickness variable (1-50 meters).
Bedrock	Exposed or generally within 1 meter of surface, in some areas saprolite is preserved

References

[1] "Geology of New York State." Geotechnical Design Manual, New York State Department of Transportation, 17 June 2013, dot.ny.gov/divisions/engineering/technical-services/geotechnical-engineering-bureau/geotech-eng-repository/GDM_Ch-3_Geology_of_NY.pdf.

[2] Broad, William J. "How the Ice Age Shaped New York." The New York Times, 6 June 2018, pp. D1–D1, nytimes.com/2018/06/05/science/how-the-ice-age-shaped-new-york.html. Originally appeared in print on June 5, 2018 on p. D1 of the New York edition with the headline "New York on Ice."

[3] Geology, New York State Museum, nysm.nysed.gov/research-collections/geology/gis

Town of Putnam Valley

Natural Resource Inventory

Surficial Geology

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Geologic Units

- Recent alluvium
- Swamp deposits
- Lacustrine silt and clay
- Outwash sand and gravel
- Kame deposits
- Glacial Till
- Bedrock

Town of Putnam Valley
Other Town Boundaries
Surface Water
Rivers & Streams
Sand and Gravel Mine

Data Sources: Surficial Geology NYSED 1989, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Feature location names 2018 USGS.

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Map prepared by Upstate GIS - September 2018

Town of Putnam Valley

Natural Resource Inventory

Surficial Geology (with Tax Parcels)

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Geologic Units

- Recent alluvium
- Swamp deposits
- Lacustrine silt and clay
- Outwash sand and gravel
- Kame deposits
- Glacial Till
- Bedrock

- Town of Putnam Valley
- Other Town Boundaries
- Tax Parcels
- Surface Water
- Rivers & Streams
- Sand and Gravel Mine

Data Sources: Surficial Geology NYSED 1989, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Feature location names 2018 USGS.

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Soil Drainage Classes

Soil is a natural body comprised of solids (minerals and organic matter), liquid, and gases, and it is the product of physical and biotic factors that degrade bedrock, surficial geological materials, and organic matter (waste products and dead organisms) in various stages of decomposition. To understand the natural processes of the land, and to plan land use accordingly, there is no more fundamental place to start than soil. Soil controls decomposition of organic matter and biogeochemical cycles; regulates water flow; influences the vegetation, habitat type, and agricultural potential of particular locations; and supports human habitation and structures[1]. Soil acts as a natural filter to help protect the quality of water and air, regulates rates of aquifer recharge versus runoff, supports food production, growth of forests, and biological communities that society depends on.

Soil information is critical for land-use planning as it helps to determine where it is appropriate or feasible to build. Each soil type has a certain set of characteristics defined by (but not limited to) properties such as permeability, drainage, available water capacity, pH, depth to bedrock, and risk of corrosion. Consideration of soil properties is important for planning and designing drainage systems; siting of structures; evaluating the potential for septic systems; assessing the need for specially-designed foundations, basements, and roads; determining the feasibility of excavation; and more.

Soil properties are important for identifying ecological resources as well. Drainage classes can help predict the occurrence of wetlands (see **Wetlands**). Poorly and very poorly drained soils are typically hydric soils and indicate wetland areas and somewhat poorly drained soils are indicators of possible wetland locations. Similarly, muck or peat soils indicate probable wetland presence. Soil chemistry is often influenced by underlying bedrock geology, and similarly influences the kinds of ecological communities that occur in a given place. Calcareous soils are often associated with uncommon habitats and biota.

Agriculture and forestry practices are also informed by soil data. Soils influence which crops are best to grow, whether irrigation or drainage is needed and how to design irrigation systems, and whether soil amendments are necessary. Soil properties can inform which farms are most valuable for preservation.

The Putnam and Westchester County Soil Survey[2], which maps and describes the soils of Putnam Valley, was completed by soil scientists based on a combination of field surveys and remote analyses. The surveys categorize soil data into series, types, and phases. Soil series delineate soils originating from the same parent materials and having relatively uniform structural engineering properties, except for texture. Soil series are the main unit of a county's detailed soil survey. Within a series, differing soils are broken down into soil phase categories according to slope and other properties. The USDA Natural Resources Conservation Service (NRCS) Web Soil Survey compiles nationwide soil data and information produced by the National Cooperative Soil Survey[3]. Users can use the Web Soil Survey for easy, interactive access to information from the Putnam and Westchester County Soil Survey. It is possible to zoom in to an area of interest and print a map of soil units or to classify the soils.

The soils mapped within Putnam Valley are classified according to natural drainage patterns on the **Soil Drainage Classes** maps. Notably, the Web Soil Survey indicates areas where the loamy soil is fertile and thus "prime farmland" (3,947 acres, 15%), and of those, 1913 acres (43% of the prime

farmland) are flagged as "of state-wide importance." This will be discussed further in **Agricultural Districts and Farmland Soils**.

In the Web Soil Survey most of the Town (20,728 acres, 78%) is classified as well drained. However, when the Town soil drainage is classified according to USDA criteria for septic tank absorption fields, the results are very different. The soils in Putnam Valley are somewhat or very limited in terms of septic tank absorption fields[5]. Septic tank absorption fields rely on the soil features between depths of 24 and 72 inches that affect the absorption of the effluent: permeability, depth to saturated zone, depth to dense material, and depth to bedrock. (Some areas of Town have a very shallow depth to bedrock [see **Bedrock Geology**]). These features were used to assign the ratings for each soil type in Putnam Valley.

Septic Tank Absorption Field Ratings are shown on Table 1 for each of the soil types found in Town.

- *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected.
- *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

The septic tank absorption field data are displayed on the third map in this section Septic Tank Absorption Fields.

Table 1. Soils in Putnam Valley[3]

Soil Symbol	Description	Acreage	Farmland Class	Parent Material[4]	Drainage Class	Septic Tank Absorption Fields Rating[5]
Ce	Carlisle muck, 0 to 2 % slopes	508.0	Prime	Organic	Very poorly drained	Very limited
ChB	Charlton fine sandy loam, 3 to 8 percent slopes	842.2	Prime	Till	Well drained	Somewhat limited
ChC	Charlton fine sandy loam, 8 to 15 percent slopes	632.0	Of Statewide Importance	Till	Well drained	Very limited
ChD	Charlton fine sandy loam, 15 to 25 percent slopes	345.8		Till	Well drained	Very limited
ChE	Charlton loam, 25 to 35 percent slopes	168.3		Till	Well drained	Very limited
CIB	Charlton fine sandy loam, 3 to 8 percent slopes, very stony	355.3		Till	Well drained	Somewhat limited
CIC	Charlton fine sandy loam, 8 to 15 percent slopes, very stony	584.3		Till	Well drained	Very limited
CID	Charlton loam, 15 to 25 percent slopes, very stony	528.1		Till	Well drained	Very limited
CIE	Charlton loam, 25 to 35 percent slopes, very stony	260.7		Till	Well drained	Very limited
CIC	Charlton fine sandy loam, 8 to 15 percent slopes, very stony	584.3		Till	Well drained	Very limited
CID	Charlton loam, 15 to 25 percent slopes, very stony	528.1		Till	Well drained	Very limited

Soil Symbol	Description	Acreage	Farmland Class	Parent Material[4]	Drainage Class	Septic Tank Absorption Fields Rating[5]
CIE	Charlton loam, 25 to 35 percent slopes, very stony	260.7		Till	Well drained	Very limited
CIF	Charlton loam, 35 to 45 percent slopes, very stony	134.0		Till	Well drained	Very limited
CrC	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	5079.9		Till	Well drained	Very limited
CsD	Chatfield-Charlton complex, 15 to 35 percent slopes, very rocky	3481.7		Till	Well drained	Very limited
CtC	Chatfield-Hollis-Rock outcrop complex, 0 to 15 percent slopes	2910.3		Till	Well drained	Very limited
CuD	Chatfield-Hollis-Rock outcrop complex, 15 to 35 percent slopes	2902.1		Till	Well drained	Very limited
Ff	Fluvaquents-Udifluvents complex, frequently flooded	412.7		Alluvium	Poorly drained	Very limited
Fr	Fredon silt loam	6.6	Prime	Outwash	Poorly drained	Very limited
HnB	Hinckley loamy sand, 3 to 8 percent slopes	26.0	Of Statewide Importance	Outwash	Excessively drained (dry)	Very limited
HnC	Hinckley loamy sand, 8 to 15 percent slopes	18.5		Outwash	Excessively drained (dry)	Very limited

Soil Symbol	Description	Acreage	Farmland Class	Parent Material[4]	Drainage Class	Septic Tank Absorption Fields Rating[5]
HnD	Hinckley loamy sand, 15 to 25 percent slopes	6.0		Outwash	Excessively drained (dry)	Very limited
HrF	Hollis-Rock outcrop complex, 35 to 60 percent slopes	2035.1		Till	Somewhat excessively drained	Very limited
KnB	Knickerbocker fine sandy loam, 2 to 8 percent slopes	13.2	Prime	Outwash	Somewhat excessively drained	Very limited
LcA	Leicester loam, 0 to 3 percent slopes, stony	79.0		Till	Poorly drained	Very limited
LcB	Leicester loam, 3 to 8 percent slopes, stony	129.4		Till	Poorly drained	Very limited
LeB	Leicester loam, 2 to 8 percent slopes, very stony	465.6		Till	Poorly drained	Very limited
Pa	Natchaug muck, 0 to 2 percent slopes	380.6		Organic	Very poorly drained	Very limited
Pc	Natchaug and Catden mucks, ponded, 0 to 2 percent slopes	75.2		Organic	Very poorly drained	Very limited
PnB	Paxton fine sandy loam, 3 to 8 percent slopes	639.0	Prime	Till	Well drained	Somewhat limited
PnC	Paxton fine sandy loam, 8 to 15 percent slopes	628.6	Of Statewide Importance	Till	Well drained	Very limited
PnD	Paxton fine sandy loam, 15 to 25 percent slopes	377.5		Till	Well drained	Very limited
PoB	Paxton fine sandy loam, 0 to 8 percent slopes, very stony	14.3		Till	Well drained	Somewhat limited

Soil Symbol	Description	Acreage	Farmland Class	Parent Material[4]	Drainage Class	Septic Tank Absorption Fields Rating[5]
PoC	Paxton fine sandy loam, 8 to 15 percent slopes, very stony	220.0		Till	Well drained	Very limited
PoD	Paxton fine sandy loam, 15 to 25 percent slopes, very stony	498.6		Till	Well drained	Very limited
Pt	Pits, gravel	2.7				Not rated
Pw	Pompton silt loam, loamy substratum	28.1	Prime	Outwash	Somewhat poorly drained	Very limited
Ra	Raynham silt loam	2.7	Prime	Laucustrine	Poorly drained	Very limited
RdA	Ridgebury loam, 0 to 3 percent slopes	171.6	Of Statewide Importance	Till	Poorly drained	Very limited
RdB	Ridgebury loam, 3 to 8 percent slopes	66.6	Of Statewide Importance	Till	Poorly drained	Very limited
RgB	Ridgebury loam, 2 to 8 percent slopes, very stony	143.1		Till	Poorly drained	Very limited
RhA	Riverhead loam, 0 to 3 percent slopes	7.7	Prime	Outwash	Well drained	Very limited
RhB	Riverhead loam, 3 to 8 percent slopes	90.6	Prime	Outwash	Well drained	Very limited
RhC	Riverhead loam, 8 to 15 percent slopes	19.5	Of Statewide Importance	Outwash	Well drained	Very limited
RhE	Riverhead loam, 25 to 50 percent slopes	5.1		Outwash	Well drained	Very limited
SbB	Stockbridge silt loam, 2 to 8 percent slopes	2.2	Prime	Till	Well drained	Somewhat limited
Sh	Sun loam	263.9	Of Statewide Importance	Till	Very poorly drained	Very limited
Sm	Sun loam, extremely stony	195.9		Till	Very poorly drained	Very limited

Soil Symbol	Description	Acreage	Farmland Class	Parent Material[4]	Drainage Class	Septic Tank Absorption Fields Rating[5]
SuA	Sutton loam, 0 to 3 percent slopes	16.9	Prime	Till	Moderately well drained	Very limited
SuB	Sutton loam, 3 to 8 percent slopes	120.5	Prime	Till	Moderately well drained	Very limited
Ub	Udorthents, smoothed	136.2		Disturbance (fill)	Moderately well drained	Very limited
Uc	Udorthents, wet substratum	26.5		Disturbance (fill)	Somewhat poorly drained	Very limited
UhB	Urban land-Charlton complex, 2 to 8 percent slopes	6.4		Urban (built)	Well drained	Not rated
W	Water	1019.5	--	--	--	--
WdA	Woodbridge loam, 0 to 3 percent slopes	72.2	Prime	Till	Moderately well drained	Very limited
WdB	Woodbridge loam, 3 to 8 percent slopes	201.8	Prime	Till	Moderately well drained	Very limited
WdC	Woodbridge loam, 8 to 15 percent	104.	Of Statewide Importance	Till	Moderately well drained	Very limited

References

[1] Randolph, John. Environmental Land Use Planning and Management. Island Press, 2003. as cited in Haeckel, Ingrid and Laura Heady, Creating a Natural Resources Inventory. 2014. New York State Department of Environmental Conservation's Hudson River Estuary Program. dec.ny.gov/docs/remediation_hudson_pdf/nriall.pdf

[2] Soil Survey of Putnam and Westchester Counties, New York. United State Department of Agriculture, Soil Conservation Service, 1994, pp. 1–205, Soil Survey of Putnam and Westchester Counties, New York, nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/new_york/putnam_westchesterNY1994/putnam_westchester.pdf

[3] Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at the following link: websoilsurvey.sc.egov.usda.gov/. Accessed 8 August 2018

[4] Heady, Laura, and Gretchen Stevens. Guidebook for Biodiversity Assessment. Hudsonia, 2017

[5] Web Soil Survey, United States Department of Agriculture Natural Resources Conservation Service, websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

Town of Putnam Valley

Natural Resource Inventory

Soil Drainage Classes

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Town of Putnam Valley
Other Town Boundaries
Surface Water
Rivers & Streams

Soil Drainage Class

Well drained
Moderately well drained
Somewhat excessively drained
Excessively drained
Somewhat poorly drained
Poorly drained
Very poorly drained
Other (Urban or water)

Data Sources: Soils USDA NRCS 2017, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature

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Town of Putnam Valley

Natural Resource Inventory

Soil Drainage Classes (with Tax Parcels)

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Soil Drainage Class

- Well drained
- Moderately well drained
- Somewhat excessively drained
- Excessively drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Other (Urban or water)

Town of Putnam Valley
Other Town Boundaries
Tax Parcels
Surface Water
Rivers & Streams

Data Sources: Soils USDA NRCS 2017, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature

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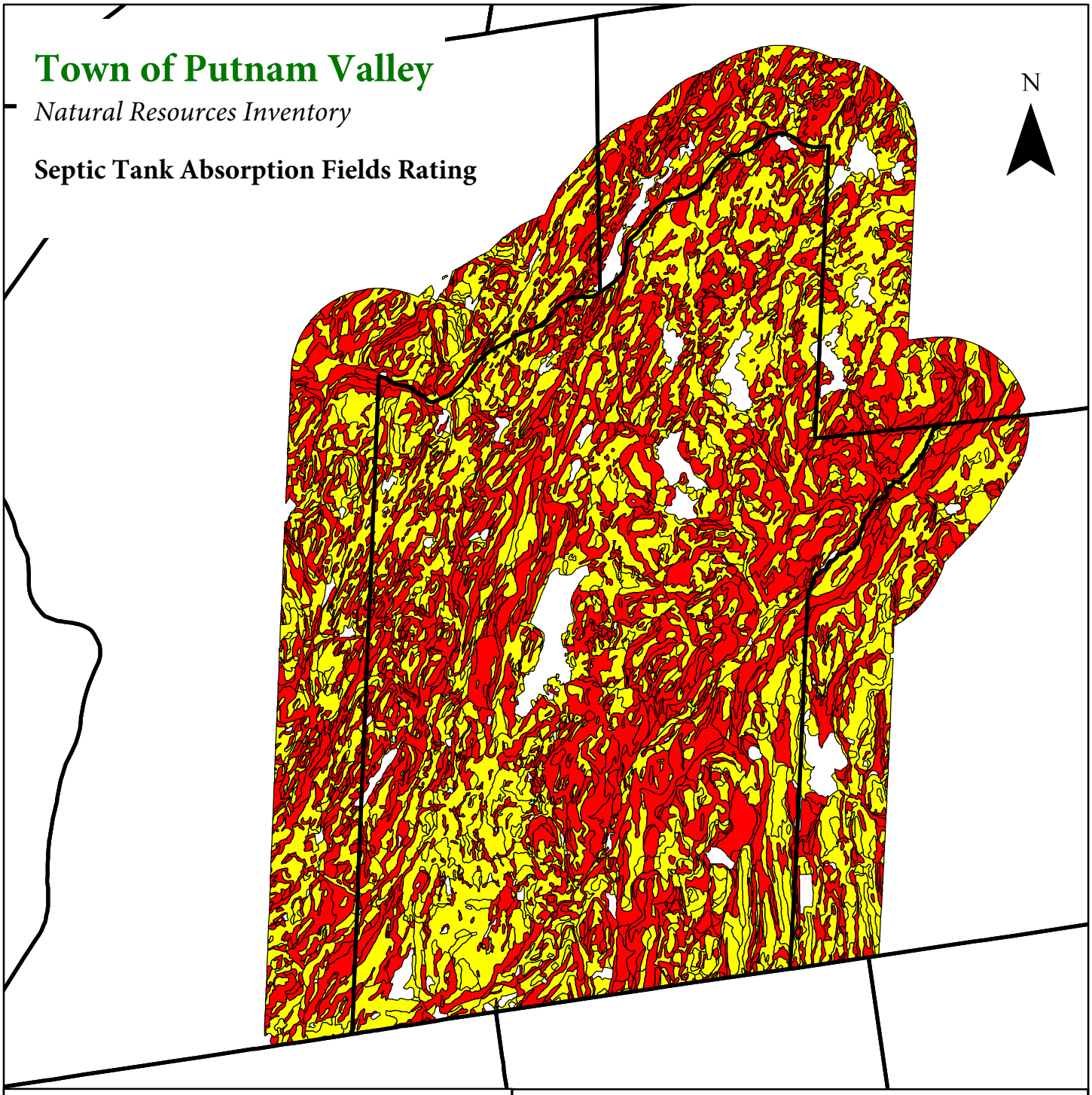
Town of Putnam Valley

Natural Resources Inventory

Septic Tank Absorption Fields Rating



Legend

Municipal Boundary

Septic Tank Absorption Fields - Rating

- Very limited
- Somewhat limited
- Not limited
- not rated or not available

Data Sources: Septic Tank Absorption Fields Rating - Web Soil Survey, United States Department of Agriculture, Natural Resources Conservation Service: websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx; Municipal Boundaries - NYS GIS Program Office

Map Created in 2018 by Ingrid Haeckel

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0 1 2 4 Miles

Steep Slopes

Many of the scenic vistas in Putnam Valley are associated with its varied topography and the ridgelines running predominantly NE-SW. As discussed in the reports accompanying the **Bedrock Geology** and **Surficial Geology** maps, these ridgelines are a product of the movement of the bedrock throughout geological history and the retreat of the glaciers that covered this area several times in geological history.

The **Steep Slopes** maps categorize the slope of the areas throughout the Town. 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. Because an on-site survey is necessary to determine the exact topographic conditions of a particular parcel, this map should only be considered an approximate depiction of steeply sloped areas in the Town.

Steep slopes are among the most sensitive environmental features in our landscapes. Steep slopes are highly susceptible to disturbance due to erosion, land slippage, and subsidence and thus pose significant constraints to land development and resource extraction. Such disturbance can harm water quality, damage built structures, and present public safety risks[1]. Steep slopes are vulnerable to soil erosion, excessive stormwater runoff, and slope instability. Disturbance of steep slopes can introduce sediment into waterbodies and thus affect the quality of water resources in a watershed[1]. In many settings, steep slopes provide scenic views for neighboring areas, and extensive removal of vegetation along with extensive earthwork can transform these intrinsic resources into visible eyesores. In consideration of these factors, Putnam Valley should pay close attention to steep slopes in its planning, conservation, and development permitting processes.

Table 1. Steep Slopes in Putnam Valley

Slope	Number of Acres	% of Total Land
0 to 10%	10939	39.8
10 to 15%	4721	17.2
15 to 20%	4180	15.2
20 to 25%	2908	10.6
> 25%	4728	17.2

Putnam Valley's varied topography results in moderate-to-steep slopes over a sizeable portion of the Town (see Table 1). The Town currently has a steep slope ordinance which places lands with a 20% or greater slope into the existing Hillside Management (HM) District[3]. (The criterion for a steep slope varies with local municipality. While nearby Philipstown uses a steep slope threshold of 20%, Fishkill uses 33% and Cortlandt Manor 15%.) Nearly 28% of Putnam Valley's acreage is, by definition, included in the HM District. These steeply-sloped areas can be found throughout the Town but are predominant along the major ridgelines. These ridgelines are delineated on the **Zoning** map.

While development is not prohibited on parcels in the HM District, the Planning Board is charged with reviewing proposals with the goal of "protecting designated ridgelines and steeply sloped areas from erosion and maintaining the natural character and amenity of hillsides and ridgelines as a scenic resource of the Town." The law regulating and controlling activity in a Hillside Management (HM) District is Chapter 155, Soil Erosion and Sediment Control, of the Code of the Town of Putnam

Valley. If a proposed development of a parcel in the HM District is approved, developers are required to minimize and mitigate the effects of disturbance in these ecologically sensitive steep slope and ridgeline areas.

The hillsides and ridgelines of Putnam Valley feature prominently in the **Scenic Resources** of the Town. Steep slopes with shallow soils (see **Surficial Geology**) are also potential crest ledge and talus habitats, some of which promise to be calcareous based on **Bedrock Geology** and may contain unique biotic communities.

References

[1] "Steep Slope Ordinance." Conservation_Tools.Org, Pennsylvania Land Trust Association, conservationtools.org/guides/59-steep-slope-ordinance.

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

[3] Code of the Town of Putnam Valley. §165-25. Hillside Management (HM) District

ecode360.com/9475802 - 9475802

Town of Putnam Valley

Natural Resource Inventory

Steep Slopes

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Percent Slope

- 0 - 10% Slope
- 10-15% Slope
- 15-20% Slope
- 20-25% Slope
- > 25% Slope

Town of Putnam Valley

Other Town Boundaries

Mapped Wetlands

Surface Water

Rivers & Streams

Data Sources: Slopes derived from USGS 10m DEM, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature location names 2018 USGS.

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Town of Putnam Valley

Natural Resource Inventory

Steep Slopes (with Tax Parcels)

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Town of Putnam Valley

Other Town Boundaries

Tax Parcels

Mapped Wetlands

Surface Water

Rivers & Streams

Percent Slope

0 - 10% Slope

10-15% Slope

15-20% Slope

20-25% Slope

> 25% Slope

Data Sources: Slopes derived from USGS 10m DEM, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature location names 2018 USGS.

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USGS Topography [1]

One of the most notable natural features of the Town is its topography, depicted on the **Topography** maps. Most of Putnam County is underlain by rocky landscapes characteristic of the Hudson Highlands physiographic province. Elevations in Putnam Valley generally range from less than 200 feet above sea level, in areas proximate to Oregon Corners, to greater than 1,200 feet above sea level at hilltops within Fahnestock State Park.

Hillside areas can offer a variety of amenities such as reduced densities, rural character, significant views, and privacy that are not commonly available in communities that are developed on flat land. The Town of Putnam Valley has a Steep Slope Ordinance, which is aimed at hillside management and protection, discussed further in the text accompanying the **Steep Slopes** maps. Town decision-makers have historically understood the need for preserving the Town's topography, a natural feature that has had a significant impact on how the Town has developed thus far.

There are a number of prominent ridgelines in Town that have and will continue to shape the growth of the Town. Perhaps the most notable ridgelines include lands to the west and east of the Peekskill Hollow Creek, which define the Peekskill Hollow river valley. Running south to north, this mountainous terrain includes Granite Mountain (elevation 964 feet), Tinker Hill (elevation 870 feet), and Prospect Hill (elevation 1,101 feet) to the west of the Peekskill Hollow Creek and Piano Mountain (elevation 1,018 feet) and Bryant Hill (elevation 840 feet) to the east. Significant ridgelines also exist on lands to the west and east of Canopus Creek, which define the Canopus Creek river valley. Running south to north, this mountainous terrain runs along Sprout Brook Road, Horton Hollow Road, Canopus Hollow Road, and Bell Hollow Road and includes Canopus Hill (elevation 840 feet) to the west of the Canopus Creek and Candlewood Hill (elevation 986 feet) to the east.

References

[1] Report text from Town of Putnam Valley, New York Comprehensive Plan and Generic Environmental Impact Statement (GEIS) Appendix, 2007, pp. 1–2.

Town of Putnam Valley

Natural Resource Inventory

USGS Topography

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Philipstown

Kent

Carmel

Cortlandt

Yorktown

Town of Putnam Valley

Other Town Boundaries

Data Sources: USGS Topography US National Map accessed 2018: Contour Interval = 20', Municpal Boundaries 2017 NYS GIS Program Office.

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Town of Putnam Valley

Natural Resource Inventory

USGS Topography (with Tax Parcels)

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Philipstown

Kent

Carmel

Yorktown

Town of Putnam Valley

Other Town Boundaries

Tax Parcels

Data Sources: USGS Topography US National Map accessed 2018: Contour Interval = 20', Municpal Boundaries 2017 NYS GIS Program Office.

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Map prepared by Upstate GIS - September 2018

III. WATER RESOURCES

Streams and Watersheds

A watershed is a geographic area whose rainfall, snowmelt, streams and rivers all flow or drain into a common body of water, such as a reservoir, lake, wetland or river, and includes not only the waterway itself but also the entire land area that drains to the water body[1]. Watershed boundaries are often defined by topography such as hills, ridges and slopes.

As shown on the **Streams and Watersheds** maps**,** portions of six major watersheds lie within Putnam Valley: Peekskill Hollow Creek Watershed, Annsville Creek Watershed, Clove Creek Watershed, Foundry Brook Watershed, West Branch Croton River Watershed, and Muscoot River Watershed. All these watersheds, and thus all of Putnam Valley, are part of the larger Hudson River Estuary Watershed.

Peekskill Hollow Creek Watershed

Most of the Town is within the Peekskill Hollow Creek Watershed, which drains a total of 47.4 square miles and flows to the Hudson River via Annsville Creek near the Town's border with the town of Cortlandt Manor. Peekskill Hollow Creek originates at the outflow of Lake Tibet in the Town of Kent and flows southwest for approximately 17 miles before joining Sprout Creek and then Annsville Creek. Approximately 20 tributaries including Roaring Brook, Wiccopee Brook, Shrub Oak Creek and Oscawana Brook feed it. Lake Peekskill drains to Peekskill Hollow Creek via an unnamed stream below its confluence with Oscawana Brook. The Town's three major lake communities—Roaring Brook Lake, Oscawana Lake and Lake Peekskill—as well as Stillwater Pond and Wiccopee Reservoir are located in the Peekskill Hollow Creek Watershed. These lakes were created as impoundments with water levels controlled by their dams.

The Peekskill Hollow Creek Watershed is an important secondary source of drinking water for communities in Westchester County and feeds groundwater wells for hundreds of Putnam Valley residents and businesses. The City of Peekskill owns the Wiccopee Reservoir, which supplies drinking water to about 21,000 residents in Peekskill, the Village of Buchanan, and Town of Cortlandt[2]. The Peekskill Hollow system supplies an additional 23,000 residents in Cortlandt and Yorktown via Northern Westchester Joint Water Works to supplement water from the New York City water supply.

Annsville Creek Watershed

A large portion of the Annsville Creek Watershed's headwaters is in Putnam Valley. The ridgeline that includes Candlewood Hill divides the Annsville Creek Watershed from the Peekskill Hollow Watershed to the east. The Annsville Creek Watershed originates at Canopus Lake in Fahnestock State Park in Kent and from there Canopus Creek flows south into the Town of Philipstown, Annsville Creek, and ultimately into the Hudson River. There are several tributaries to Canopus Creek including the West Branch Canopus Creek.

Clove Creek and Foundry Brook Watersheds

A small portion of northwestern Putnam Valley is in the Clove Creek Watershed and Foundry Brook Watershed. Each of these watersheds flows into the Hudson River. Sand Spring Brook flows to

Clove Creek in Philipstown and to the Hudson River[3]. Philipse Brook flows to Foundry Brook and out to the Hudson River in Cold Spring.

West Branch Croton River Watershed/Muscoot River Watershed

A small portion of the Town is in the Croton River Watershed serving the New York City Water Supply. Part of northern Putnam Valley is in the watershed of the West Branch of the Croton River feeding the Boyd Corners Reservoir in Kent. Boyd Corners is part of the New York City Water Supply's Delaware System, which supplies up to half of the City's water. Most of the water in this Watershed goes to the City through Kensico Reservoir in Valhalla, New York but some is released into the West Branch Croton River where it eventually either goes to the City through New Croton Reservoir or to the Hudson River via the Croton River.

The southeast corner of Putnam Valley is within Muscoot River Watershed and feeds the Amawalk Reservoir in Somers. Amawalk Reservoir is part of the City's Croton System and eventually flows to the New Croton Reservoir. New York City Department of Environmental Protection (DEP) enforces certain restrictions on development in these areas. For more information on the Croton Watershed, visit Croton Watershed Clean Water Coalition online or at 914-234-6470 and visit the DEP online at www.nyc.gov/dep for more information on the New York City Watershed.

In addition to watershed boundaries, the **Streams and Watersheds** maps show major streams, floodplains, waterbodies, and riparian buffer zones. Perennial streams, those that run continuously, are shown on the map. Intermittent streams or those that may not run for weeks and ephemeral streams, those that run only for a few hours after a rainfall, are not captured on this map. Visiting sites and creating more accurate maps are methods to pursue to ensure these important resources are identified and considered during planning processes[3]. Detailed stream locations were mapped by the 2014 Biodiversity Assessment Training team for the Canopus Valley study area (Annsville Creek Watershed) and are described in the group's report[4].

Riparian buffers are shown on the map surrounding portions of the streams and water bodies (see also the Stream Habitat and Aquatic Connectivity Map source information for the riparian buffer mapping). Riparian areas are transitional areas along streams and waterbodies that link land and water[2]. Riparian buffers are areas adjacent to a stream or water body and provide many ecosystem functions that reduce flooding and improve water quality and aquatic habitat. Buffers are often vegetated and include fringing wetlands. These riparian wetlands reduce flooding by holding on to and slowly releasing floodwater and reduce turbidity by allowing sediment to settle. Riparian buffers, especially those vegetated with native plants, stabilize stream banks preventing erosion, help keep the water clean by filtering out pollutants and nutrients running off the upland, and enhance aquatic habitat by cooling the stream with shade. Riparian vegetation also provides habitat for many species of wildlife and often functions as biotic corridors connecting larger areas of habitat.

The **Streams and Watersheds** maps also show the 100-year and 500-year flood zones. Flood zones are the lands adjacent to creeks, streams, rivers and other waterbodies that flood during periods of high flow. The 100-year flood zone has at least a 1% chance of being flooded each year and the 500-year flood zone has at least a 0.2% chance. Mapping these flood zones is important for town planners to help reduce the flood hazard to homes and businesses. Areas within the 100-year flood zones are

designated “areas of special flood hazard” in Putnam Valley and certain activities within these areas are regulated and require a floodplain development permit.

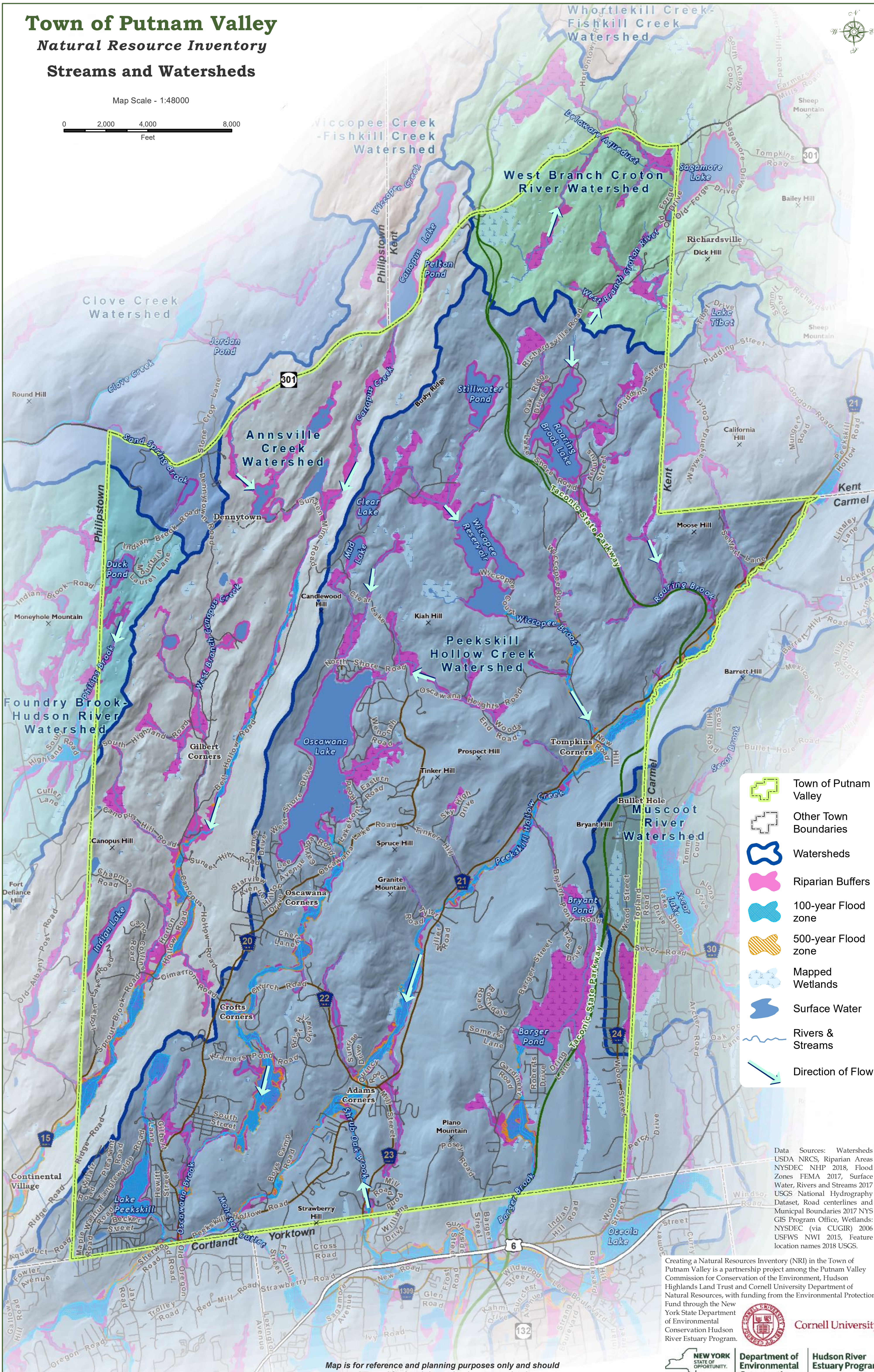
References

[1] New York City Department of Environmental Protection 2018. nyc.gov/html/dep/html/watershed_protection/about.shtml.

[2] Hollowbrook Water Watch. 2014. About the Hollowbrook. hollowbrookww.org/about-hollowbrook (Inaccessible 2018).

[3] Hudson River Estuary Program, New York State Department of Environmental Conservation. 2014. Natural Areas and Wildlife in Your Community: A Habitat Summary Prepared for the Town of Putnam Valley. 29 pp

[4] Corbett, J., M. Finger, A. Galler, K. Hamel, G. Kennedy, F. Muller Landau, E. Vincent, and W. Whetsel. 2014. Philipstown-Putnam Valley Biodiversity Assessment Training Project: Habitat Report and Recommendations. 26 pp plus appendices.



Town of Putnam Valley
Natural Resource Inventory
Streams and Watersheds
Map Scale - 1:48000
0
2,000
4,000
8,000
Feet
Whortlekill Creek-Fishkill Creek Watershed
Wiccopee Creek-Fishkill Creek Watershed
West Branch Croton River Watershed
Clove Creek Watershed
Annsville Creek Watershed
Peekskill Hollow Creek Watershed
Foundry Brook-Hudson River Watershed
Muscoot River Watershed
Philipstown
Kent
Carmel
Cortlandt
Yorktown
Delaware Aqueduct
Sagamore Lake
Richardsville
Dick Hill
Bailey Hill
Sheep Mountain
Lake Tibet
California Hill
Moose Hill
Canopus Lake
Pelton Pond
Wiccopee Creek
Jordan Pond
Clove Creek
Round Hill
Sand Spring Brook
Canopus Creek
Stillwater Pond
Roaring Brook Lake
Taconic State Parkway
Wiccopee Reservoir
Roaring Brook
Wiccopee Brook
Clear Lake
Mud Lake
Dennytown
Duck Pond
Moneyhole Mountain
Candlewood Hill
Kiah Hill
West Branch Canopus Creek
Philips Brook
Oscawana Lake
Gilbert Corners
Tompkins Corners
Prospect Hill
Tinker Hill
Barrett Hill
Secor Brook
Bullet Hole
Bryant Hill
Canopus Hill
Spruce Hill
Granite Mountain
Oscawana Corners
Peekskill Hollow Creek
Bryant Pond
Fort Defiance Hill
Indian Lake
Crofts Corners
Barger Pond
Secor Lake
Adams Corners
Piano Mountain
Shrub Oak Brook
Continental Village
Lake Peekskill
Oscawana Brook
Mohegan Outlet
Strawberry Hill
Barger Brook
Oceola Lake
Town of Putnam Valley
Other Town Boundaries
Watersheds
Riparian Buffers
100-year Flood zone
500-year Flood zone
Mapped Wetlands
Surface Water
Rivers & Streams
Direction of Flow
Data Sources: Watersheds USDA NRCS, Riparian Areas NYSDEC NHP 2018, Flood Zones FEMA 2017, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature location names 2018 USGS.
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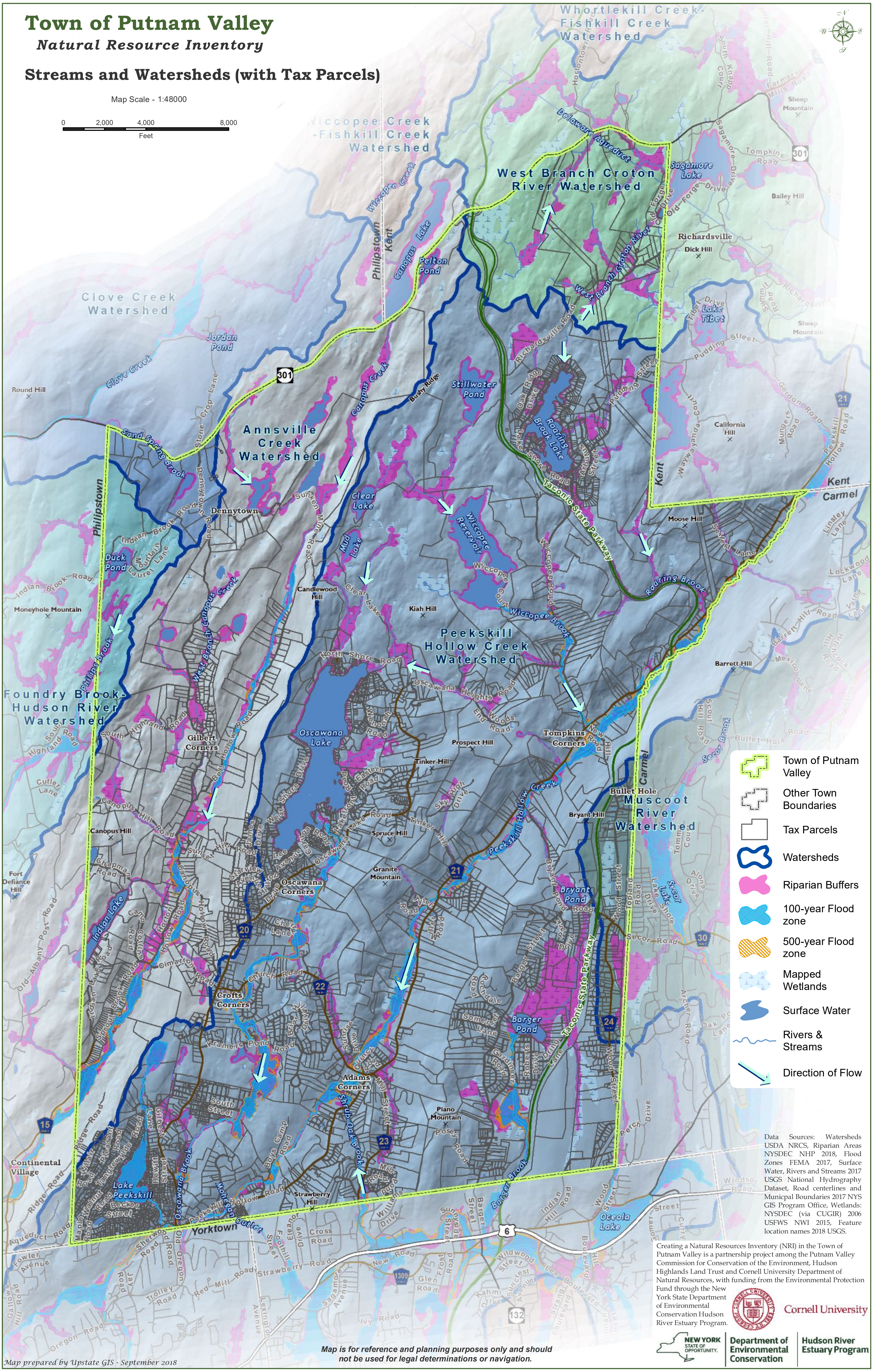
Town of Putnam Valley

Natural Resource Inventory

Streams and Watersheds (with Tax Parcels)



Data Sources: Watersheds USDA NRCS, Riparian Areas NYSDEC NHP 2018, Flood Zones FEMA 2017, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature location names 2018 USGS.

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Public Drinking Water Resources

The **Public Drinking Water Resources** map shows features in the Town that are important to the Town's water supply, and to that of other municipalities that depend on Putnam Valley's lakes, streams and wetlands for their water. The surface waters of Putnam Valley recharge the wells supplying drinking water to most of the Town's residents and businesses, and contribute to the systems that provide water to tens of thousands of people in Westchester County and to millions of people in New York City. The map shows surface water features, groundwater aquifers, and wells that are important for supplying a sufficient quantity of water for private and commercial use. The rural character of Putnam Valley—with its many lakes, wetlands and groundwater aquifers—helps provide natural filtration that improves water quality.

Most of the drinking water for the Town is provided by both public and individual private wells, with the majority of residents getting their water from private wells. Public-supply wells are scattered throughout Putnam Valley as seen on the map. The communities in the Town that draw their water from these wells include Floridan, Glenmar Gardens, Mill Ponds, and High Fields Condominiums. Many businesses, commercial buildings, and camps (e.g., Durland Scout Reservation) also draw water from public-supply wells.

The **Public Drinking Water Resources** map also shows the location of unconfined aquifers (also called water-table aquifers), that occur near the ground surface unbound by rock that have a water table as an upper boundary. These aquifers consist of unconsolidated sediments; loose material ranging in size from clay to sand, laid down by glacial meltwater during the Pleistocene epoch[1]. Groundwater is stored and moves through the spaces between the sediment grains. The mapped unconfined aquifers occur along Peekskill Hollow Creek and Canopus Creek. Confined aquifers (not shown) have layers of impermeable material above and below the aquifer and are under pressure so water will rise when punctured by a well[2].

The public-water-supply watersheds shown on the **Public Drinking Water Resources** map are part of the surface water supplies for the Cities of Peekskill and New York. The Peekskill Hollow Creek watershed is the Town's largest drainage, supplying Peekskill, parts of the Village of Buchanan, and the Town of Cortlandt; it is also a backup supply for the Town of Yorktown[3]. Smaller portions of Putnam Valley's northern and southeastern areas feed New York City's water supply through the Boyd Corners Reservoir in the Town of Kent and Amawalk Reservoir in the Town of Somers, respectively[4].

The wetlands, surface water, rivers, and lakes capture runoff and are the source of water for the surface water supplies. They each play a crucial role in providing a sufficient quantity of clean water, and are susceptible to degradation by bacteria and pollutants from sources in their drainage area. Surface water features help recharge groundwater wells, impacting groundwater quality. The protection of surface water and groundwater from contamination is essential to the proper maintenance of the quality and quantity of water in the Town and surrounding communities. The **Public Drinking Water Resources** map shows Groundwater Supply Protection Zones, delineated by the New York State Department of Health, to protect groundwater sources and wellhead areas. These Zones surround most public supply wells as well as larger areas where concentrations of individual private wells are located, such as Lake Peekskill, the Barger Pond area, and a portion of Lake Oscawana.

To further protect public and private wells, the Town developed Ground and Surface Water Protection Districts where greater protective standards for development and land use are enforced, helping to ensure land use is the least negatively impactful as possible[5]. These districts can be found on the Town's Ground and Surface Water Protection Overlay Map available at the Town's website[6].

References

[1] Perlmutter, Nathaniel M. 1960. Sources of Ground Water in Southeastern New York. Geological Survey Circular 417. pubs.usgs.gov/circ/1960/0417/report.pdf.

[2] United States Geological Survey. 2018. usgs.gov/faqs/what-difference-between-a-confined-and-unconfined-water-table-aquifer?qt-news_science_products=0 - qt-news_science_products.

[3] Hollowbrook Water Watch. 2014. About the Hollowbrook. hollowbrookww.org/about-hollowbrook (Inaccessible 2018).

[4] New York City Department of Environmental Protection. 2018. nyc.gov/dep.

[5] Code of the Town of Putnam Valley§165-26 Ground and Surface Water Protection (WP) District ecode360.com/9475826.

[6] Town of Putnam Valley 2018. putnamvalley.com/documents/10706_Grround&SurfaceWaterOverlayMap_24x36.pdf.

Town of Putnam Valley

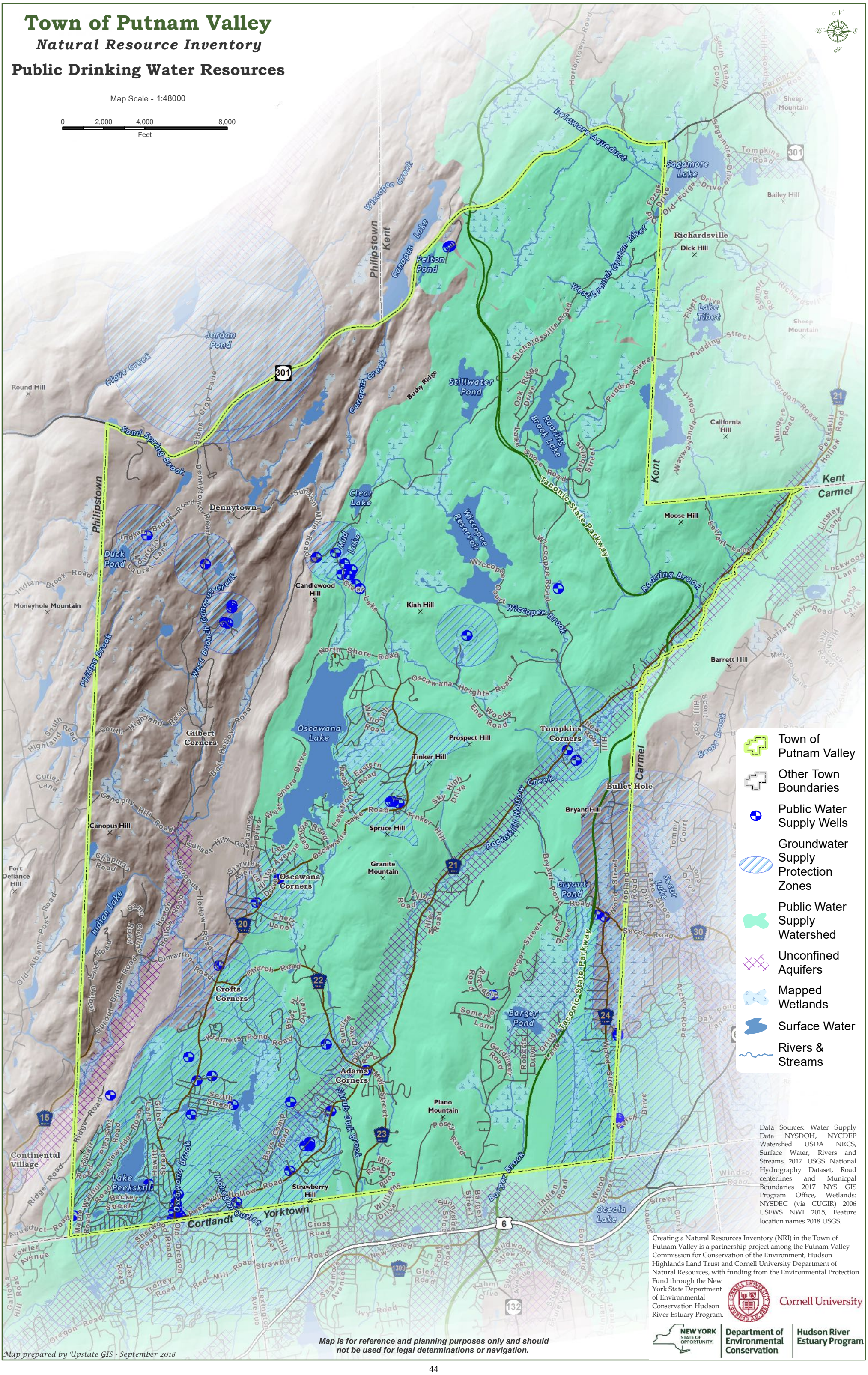
Natural Resource Inventory

Public Drinking Water Resources

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet



Town of Putnam Valley

Other Town Boundaries

Public Water Supply Wells

Groundwater Supply Protection Zones

Public Water Supply Watershed

Unconfined Aquifers

Mapped Wetlands

Surface Water

Rivers & Streams

Data Sources: Water Supply Data NYSDOH, NYCDEP Watershed USDA NRCS, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature location names 2018 USGS.

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Town of Putnam Valley

Natural Resource Inventory

Public Drinking Water Resources (with Tax Parcels)

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Town of Putnam Valley

Other Town Boundaries

Tax Parcels

Public Water Supply Wells

Groundwater Supply Protection Zones

Public Water Supply Watershed

Unconfined Aquifers

Mapped Wetlands

Surface Water

Rivers & Streams

Data Sources: Water Supply Data NYSDOH, NYCDEP Watershed USDA NRCS, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature location names 2018 USGS.

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Surface Water Resources

The **Surface Water Resources** maps show the abundance of surface water resources in Putnam Valley. It is easy to see why it is called the "Town of Lakes." The lakes, streams, and wetlands offer improved water quality and wildlife habitat, with benefits to the Town as well as recreational opportunities and scenic beauty. The map also shows potential sources of contamination and their proximity to water features. These facilities, such as Petroleum Bulk Storage and Chemical Bulk Storage sites, can leak or rupture and contaminate nearby streams or lakes.

New York State preserves and protects lakes, ponds, rivers, and streams through Article 15 (Title 5) of the Environmental Conservation Law (ECL)[1]. The New York State Department of Environmental Conservation created the Protection of Waters Regulatory Program to prevent undesirable activities on water bodies by establishing and enforcing regulations that are compatible with the preservation, protection, and enhancement of water resources. All waters of the State are provided a formal class and standard designation based on existing or expected "best use" of each water or waterway segment as follows:

- Classifications AA and A are assigned to waters used as a source of drinking water;
- Classification B indicates a best usage for swimming and other contact recreation, but not for drinking water;
- Classification C is for waters supporting fisheries and suitable for non-contact activities;
- Classification D is the lowest classification and reflects a best use for fishing.

Waters with the classifications A, B, and C may show "(T)", indicating the potential to support a trout population, and/or "(TS)", indicating the potential to support trout spawning. Special requirements apply to these waters and a Protection of Waters Permit is required for disturbing the bed or banks of a stream with a classification of AA, A, B, C(T) or C(TS). Disturbance may be temporary or permanent in nature. Examples of activities requiring this Permit include placement of structures in or across a stream, fill placement for bank stabilization or to isolate a work area, excavations for gravel removal or as part of a construction activity and lowering stream banks to establish a stream crossing.

The Surface Water Resources map shows that only Class A streams feed Wiccopee Reservoir, which supplies water to the City of Peekskill. These streams are likely designated Class A by virtue of feeding a water-supply reservoir. Most of the rest of the streams are either B or C. The large creeks—Peekskill Hollow Creek, Canopus Creek, and several of their larger tributaries—support trout and trout spawning, also indicating good water quality and excellent recreational opportunities. See the **Stream Habitat and Aquatic Connectivity** section of this NRI for additional information on stream habitat values.

Federal and State documented wetlands are shown on the **Surface Waters Resources** maps. Wetlands occupy a small portion of the landscape but provide enormous ecological functions when compared to most upland habitats[2]. These ecological and economic benefits include water quality improvement, stream flow maintenance, flood attenuation, erosion control, and habitat protection. Accurate mapping of the wetland resources is critical to protecting them from fill and degradation, and to maintain their important ecosystem services.

The **Surface Waters Resources** maps show wetlands mapped by the United States Fish and Wildlife Service under the National Wetlands Inventory (NWI) program. NWI wetlands maps are non-regulatory maps that provide information about the extent, distribution, and characteristics of wetlands as determined through remote-sensing and photo interpretation. Wetlands larger than 0.1 acre with a perennial hydrologic connection to navigable waters are federally protected under Section 404 of the Clean Water Act, which prohibits discharge of dredge or fill into waters of the United States without a permit from the US Army Corps of Engineers[3].

Wetlands regulated by the New York State Department of Environmental Conservation (NYSDEC) under the Freshwater Wetlands Act, Article 24, are also shown on the map. Under this Act, NYSDEC regulates activities in freshwater wetlands 12.4 acres or larger (and a few smaller wetlands of unusual local importance) and 100-foot adjacent buffer areas to prevent or minimize impairment of wetland functions. Almost any activity that may adversely impact the natural values of these wetlands or adjacent areas is regulated[4, 8].

Many NYSDEC-regulated wetlands in the Town occur in the valleys along the mainstems of the larger watercourses and in broad depressions adjacent to lakes and ponds. Many NWI-mapped wetlands occur in smaller basins, such as headwater wetlands higher in elevation, and in small fringe wetlands around lakes or in riparian areas of streams.

Putnam Valley also regulates wetlands, watercourses, and water bodies to prevent their degradation and loss, and to preserve the invaluable services these resources provide. The Town regulates wetlands of 0.5 acre or larger. Wetlands have a protective buffer of 100 feet, perennial streams have a 100-foot buffer, and intermittent watercourses and streams have a 50-foot buffer. Dredging, filling, erecting structures, and altering hydrology are among the activities that are prohibited under this regulation without a permit from the Town[3]. The Putnam County Freshwater Wetland and Watercourse Map shows the approximate locations of Town-regulated wetlands.

Point-source threats to the lakes, ponds, wetlands, and watercourses are shown on the **Surface Water Resources** maps. The location of Petroleum Bulk Storage (PBS) and Chemical Bulk Storage (CBS) facilities and the Town salt storage facilities are shown. The NYSDEC defines petroleum bulk storage as one or more tank systems designed to store 1,100 combined gallons or more of petroleum in aboveground and/or underground storage tanks; or one or more underground tank systems designed to store 110 or more gallons of petroleum[5]. The NYS Bulk Storage Database[6] shows 22 PBS facilities in Putnam Valley. The NYSDEC defines chemical bulk storage as 185 or more gallons of hazardous materials aboveground, and any amount below ground[7]. While the Bulk Storage Database has no CBS facilities registered in Putnam Valley, the map shows one CBS facility just outside the Town's southeast border, located on Lake Shore Drive near Lake Secor in the Town of Carmel.

Bulk storage facilities are a potential source of pollution to waterbodies if they leak or rupture. Many of the PBS facilities in Putnam Valley are located near streams, wetlands, vernal pools and lakes; a leak or spill into a waterbody can have severe ecological and water-quality consequences.

Likewise, salt storage facilities can contribute sodium and chloride to waterbodies, raising salinity to levels detrimental to aquatic plants, fish, insects, and other macroinvertebrates. Most salt runoff does not come from storage facilities but from runoff from road salt used to keep roads safe and passable in winter. The salt storage facilities in the Town are not located near watercourses.

Non-point sources such as fertilizer runoff and septic systems also threaten lakes, ponds, wetlands , vernal pools, and watercourses. These threats are discussed in the **Soil Drainage Classes** section of the NRI.

References

[1] NYSDEC 2018. Protection of Waters Program. dec.ny.gov/permits/6042.html.

[2] NYC DEP 2018. Wetlands Protection Strategy. 21 pp.

[3] US EPA 2018. Section 404 Permit Program. epa.gov/cwa-404/section-404-permit-program.

[4] NYSDEC 2018. Freshwater Wetlands Program. dec.ny.gov/lands/4937.html

[5] NYSDEC 2018. Bulk Storage of Chemicals, Petroleum and Liquefied Natural Gas. dec.ny.gov/chemical/287.html

[6] NYSDEC 2018. Bulk Storage Database Search. dec.ny.gov/cfmx/extapps/derexternal/index.cfm?pageid=4.

[7] Town of Putnam Valley 2018. Town Code. ecode360.com/9474401.

[8] Certain activities on lands within the New York City watershed are subjected to enhanced protection by the *Rules and Regulations for the Protection from Contamination, Degradation and Pollution of the New York City Watershed and its Sources* (Watershed Rules and Regulations) that are designed to protect the quality of New York City's drinking water. The Watershed Rules and Regulations applies to activities that include septic systems, construction near a stream or wetland, land clearing or grading within limiting distances of watercourses, wetlands and reservoirs, and the use of fertilizers. Activities that are subject to the Watershed Rules and Regulations require the New York City Department of Environmental Protection's review and approval. Further information can be found at https://www1.nyc.gov/html/dep/html/watershed_protection/watershed_regulations.shtml

Town of Putnam Valley

Natural Resource Inventory

Surface Water Resources

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Town of Putnam Valley

Other Town Boundaries

NYSDEC Wetlands

USFWS NWI Wetlands

Surface Water

NYSDEC Class C Waterbodies

Salt Storage Facilities

Petroleum Bulk Storage

Chemical Bulk Storage

NYSDEC Stream Classifications

A

B

C

Unclassified

Trout Class

(T) Trout

(TS) Trout Spawning

Data Sources: Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset with NYSDEC classes assigned 2017, Bulk Storage NYSDEC 2018, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature location names 2018 USGS.

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Town of Putnam Valley

Natural Resource Inventory

Surface Water Resources (with Tax Parcels)

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Town of Putnam Valley

Other Town Boundaries

Tax Parcels

NYSDEC Wetlands

USFWS NWI Wetlands

Surface Water

NYSDEC Class C Waterbodies

Salt Storage Facilities

Petroleum Bulk Storage

Chemical Bulk Storage

NYSDEC Stream Classifications

A

B

C

Unclassified

Trout Class

(T) Trout

(TS) Trout Spawning

Data Sources: Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset with NYSDEC classes assigned 2017, Bulk Storage NYSDEC 2018, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature location names 2018 USGS.

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Stream Habitat and Aquatic Connectivity

Healthy streams are generally associated with good water quality and productive wildlife habitats, such as wide, vegetated stream buffers and connected stream segments that are easily navigable by native fish and other animals. Putnam Valley's streams provide habitat to native migratory and nonmigratory fish that benefit from a healthy stream habitat. Threats to these species include shrinking vegetated buffers, and barriers to their movement within streams such as dams and poorly functioning bridges and culverts.

Riparian Buffers

Effective stream conservation and restoration occurs beyond stream channels and banks. The New York Natural Heritage Program (NYNHP)[1] uses the Riparian Buffer Delineation Model[2] to highlight important streamside areas that influence stream dynamics and health. Riparian buffers intercept stormwater runoff, filter sediment and nutrients, and help attenuate flooding. Forested buffers provide organic matter that supports the in-stream food web, and shade that helps maintain cool water temperatures. Forested buffers also support unique and diverse habitats and serve as wildlife travel corridors. The riparian buffer zones, mapped around streams on the **Stream Habitat and Aquatic Connectivity** maps, are based on digital elevation data, known wetlands, and modeling for the 50-year flood zone. Note that the riparian buffers were developed through modeling and have not been field verified. Nevertheless, they can provide a starting point to inform land-use strategies and stream- protection efforts. The NYSDEC Hudson River Estuary Program's "Trees for Tribs" initiative offers free consultation along with native trees and shrubs for qualifying streamside buffer planting projects.

Trout Waters

The **Stream Habitat and Aquatic Connectivity** maps show NYSDEC Trout Class streams. NYSDEC's Water Quality Standards and Classifications identify trout or trout-spawning presence along classified stream segments, suggesting there is cold-water habitat suitable for trout in many of Putnam Valley's streams, including Peekskill Hollow Creek, Canopus Creek, West Branch Canopus Creek, Shrub Oak Brook, Sand Spring Brook, and several smaller tributaries. Note that NYSDEC's water quality information does not reflect site-specific habitat quality. Trout are sensitive to warmer temperatures, requiring well-shaded, cool-to-cold flowing water. While all streams benefit from adequate streamside vegetation, it is especially important for maintaining clean, cold-water habitats that support native species like brook trout.

Brook trout (the only native trout species in our region) inhabit clear, cool, well-oxygenated streams and lakes with flowing water and gravel substrate, preferring water temperatures that range from 57-61°F; they rarely thrive in water over 68°F for extended periods of time[3]. Population declines in brook trout have led to its listing as a Species of Greatest Conservation Need (SGCN) in the New York State Wildlife Action Plan[4]. The presence of self-sustaining, wild brook trout populations in Sand Spring Brook and West Branch Canopus Creek in Putnam Valley is indicative of high-quality stream habitat. Upper reaches of Philipse Brook support a high-quality riverine community that includes the arrowhead spiketail, a rare dragonfly documented nearby in Philipstown.

Migratory Fish Runs

The **Stream Habitat and Aquatic Connectivity** map shows migratory fish runs. NYSDEC Bureau of Fisheries data, and an aquatic habitat connectivity study by NYNHP, indicate that sections of Peekskill Hollow Creek, Canopus Creek, and Shrub Oak Brook are migratory routes for American eel, a High Priority SGCN. This fish species begins life in the Atlantic Ocean and migrates to the headwaters of North American tributary streams as tiny "glass eels[5]." 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 streams to complete their life cycles and return to the sea to spawn.

Aquatic Barriers

The **Stream Habitat and Aquatic Connectivity** maps shows stream barriers. 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, or these structures can render the stream 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 similar barriers. Just as many forest-dwelling species are impacted negatively by forest fragmentation as a result of 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 fragmented the habitat of organisms such as brook trout and American eel.

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 roads during heavy precipitation or snowmelt. Bridges, open-bottom culverts, and similar structures that completely span waterways and associated floodplain/riparian areas generally have the smallest potential impacts on hydrology, floodplains, and habitat.

The **Stream Habitat and Aquatic Connectivity** maps displays information from the New York State Inventory of Dams (NYSID) as well as culvert information. While the NYSDEC tries to maintain an accurate inventory, these 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 done by the NYSDEC Hudson River Estuary Program in trial watersheds indicate that perhaps twice as many barriers exist than are recorded in the NYSID. Culvert data are provided from the North Atlantic Aquatic Connectivity Collaborative (NAACC), a network focused on improving aquatic habitat connectivity across the Northeast region.

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 SGCN species such as brook trout and American eel. To date, only two culverts have been assessed and documented as barriers in Putnam Valley, both located upstream of Wiccopee Reservoir. Other culverts on the map were identified through modeling of road-stream crossings and should be field verified. Technical

assistance is available from NYSDEC to conduct assessments and prioritize known aquatic barriers for removal or mitigation .

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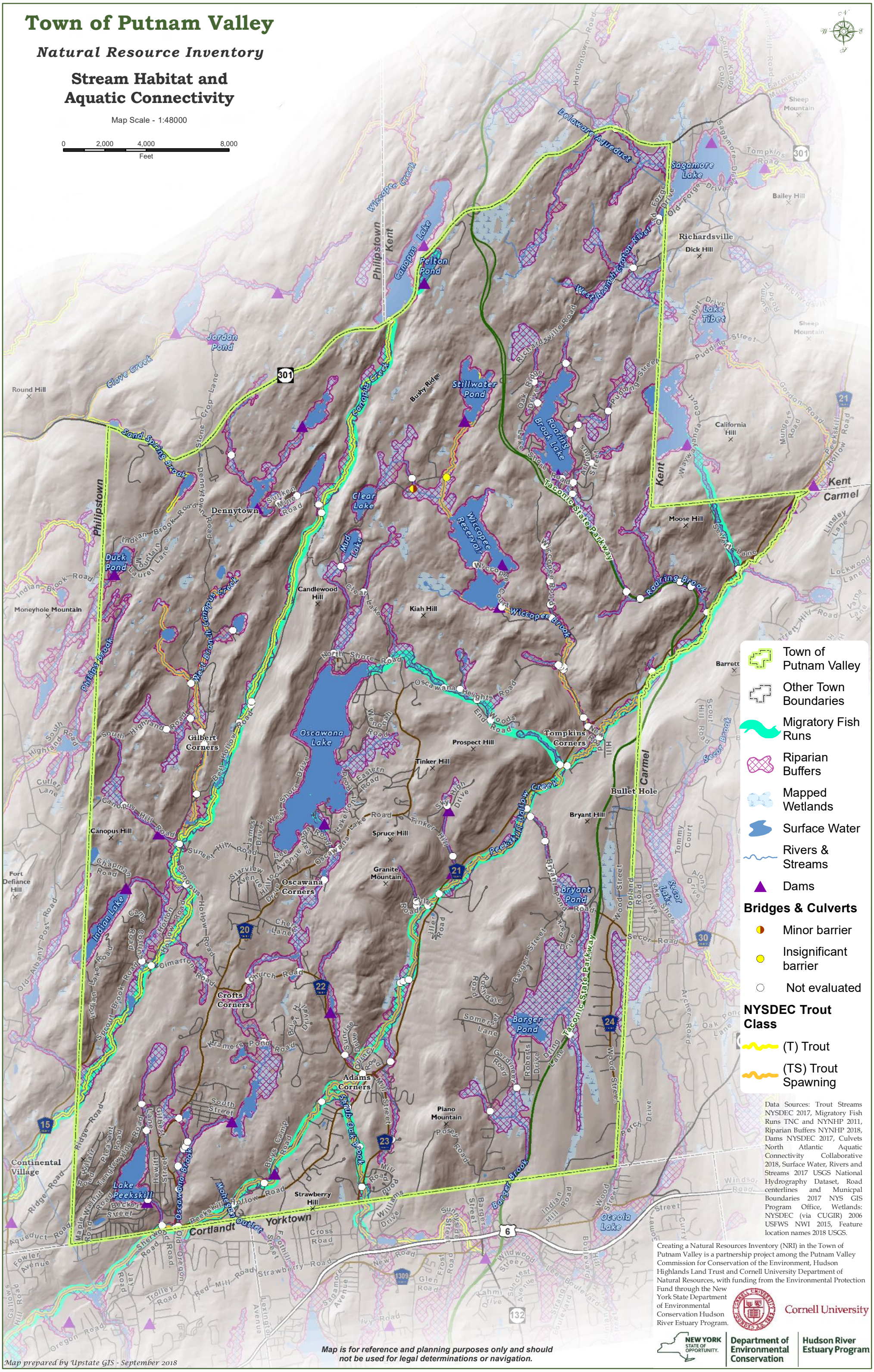
Town of Putnam Valley

Natural Resource Inventory

Stream Habitat and Aquatic Connectivity

Map Scale - 1:48000

0 2,000 4,000 8,000
Feet



Data Sources: Trout Streams NYSDEC 2017, Migratory Fish Runs TNC and NYNHP 2011, Riparian Buffers NYNHP 2018, Dams NYSDEC 2017, Culvets North Atlantic Aquatic Connectivity Collaborative 2018, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature location names 2018 USGS.

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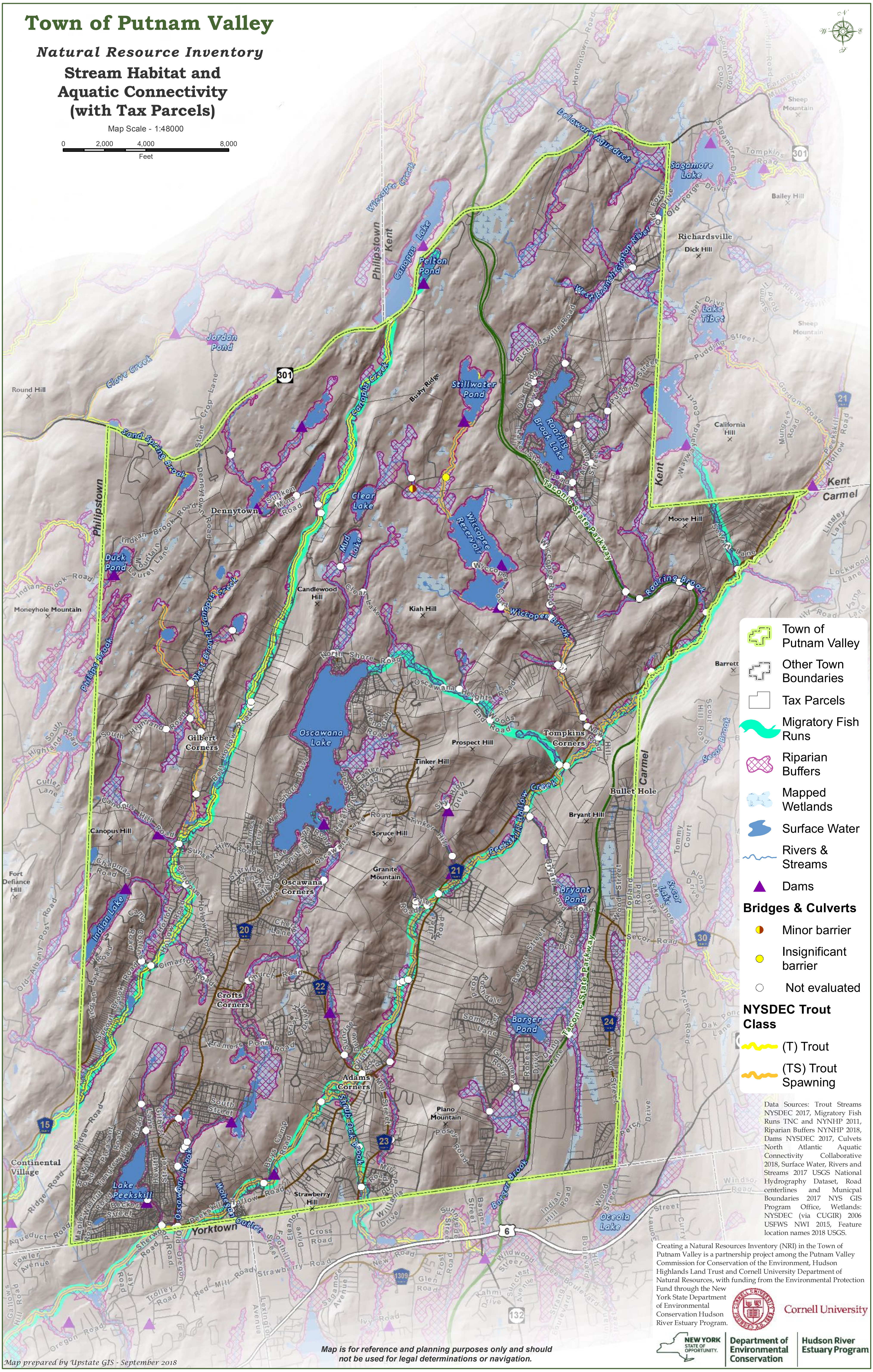
Town of Putnam Valley
Natural Resource Inventory
Stream Habitat and Aquatic Connectivity (with Tax Parcels)
Map Scale - 1:48000
0 2,000 4,000 8,000
Feet
Town of Putnam Valley
Other Town Boundaries
Tax Parcels
Migratory Fish Runs
Riparian Buffers
Mapped Wetlands
Surface Water
Rivers & Streams
Dams
Bridges & Culverts
Minor barrier
Insignificant barrier
Not evaluated
NYSDEC Trout Class
(T) Trout
(TS) Trout Spawning
Data Sources: Trout Streams NYSDEC 2017, Migratory Fish Runs TNC and NYNHP 2011, Riparian Buffers NYNHP 2018, Dams NYSDEC 2017, Culvets North Atlantic Aquatic Connectivity Collaborative 2018, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature location names 2018 USGS.
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Canopus Lake
Pelton Pond
Jordan Pond
Clove Creek
Sand Spring Brook
Canopus Creek
Stillwater Pond
Roaring Brook Lake
Delaware Aqueduct
Sagamore Lake
West Branch Croton River
Richardsville
Lake Tibet
Clear Lake
Mud Lake
Wiccopee Reservoir
Wiccopee Brook
Roaring Brook
Taconic State Parkway
Dennytown
Duck Pond
Philips Brook
West Branch Canopus Creek
Gilbert Corners
Oscawana Lake
Tompkins Corners
Peekskill Hollow Creek
Bullet Hole
Bryant Pond
Indian Lake
Oscawana Corners
Crofts Corners
Adams Corners
Barger Pond
Lake Peekskill
Oscawana Brook
Shrub Oak Brook
Mohegan Outlet
Barger Brook
Strawberry Hill
Yorktown
Continental Village
Oceola Lake
Secor Lake
Philipstown
Kent
Carmel

Wetlands

The **Wetlands** maps show the location of known wetlands in Putnam Valley. Wetlands are areas saturated by surface or groundwater sufficient to support distinctive vegetation adapted for life in saturated soil conditions[1]. There are many types of wetlands in Putnam Valley, including wet meadows, emergent marsh, forested and shrub swamps, vernal pools, and open water. In addition to providing critical habitat for many plants and animals, wetlands also: help 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 pavement, buildings, and pollution-generating or otherwise incompatible land uses encroach upan a wetland[2].

Knowledge about local wetlands can enable Putnam Valley to proactively plan to conserve this critical part of our life support system. Though the **Wetlands** maps show data compiled from several existing sources that provide the approximate locations and extent of wetlands, these data are inherently inaccurate and not a substitute for site visits and on-the-ground delineation. Nonetheless, the Town can use these maps as a starting point for inventorying local wetlands, and supplement them with more refined data as that becomes available. Some local wetland mapping has already been completed,including a town-wide vernal pool assessment by Teatown Lake Reservation (see **Verified and Potential Vernal Pools** section below). Biodiversity Assessment Training teams have also completed detailed habitat mapping, including the documentation of various wetland habitats, for a study area in the Canopus Valley[3].

National Wetlands Inventory and NYSDEC Wetlands

In the **Wetlands** map, forested/shrub, emergent, and riverine wetlands are shown from the US Fish and Wildlife Service's National Wetlands Inventory (NWI). NYSDEC's Freshwater Wetlands are also identified, but only include wetlands larger than 12.4 acres or those designated "of unusual local importance." While NWI maps include wetlands of all sizes down to 0.1 acre, they often underestimate wetland area and omit smaller and drier wetlands[4]. Vernal pools, wet meadows, and swamps are often under-represented on maps. Additionally, many of NYSDEC's regulatory maps are outdated and contain similar inaccuracies[5]. Thus, NWI maps offer some general information on wetland habitat (e.g., forested, emergent), but field visits are often necessary to comprehend true habitat values and their importance for maintaining biodiversity.

Possible and Probable Wetland Areas

The **Wetlands** map shows probable and possible wetland areas. County soil maps are also a good source for predicting the location of potential wetlands[6]. Soils classified in the Putnam County Soil Survey as very poorly drained or poorly drained are shown as probable wetland areas, and soils classified as somewhat poorly drained are shown as possible wetland areas. Note that these probable and possible wetland areas are greater in area than wetland areas designated by the NWI and NYSDEC. Likewise, note that soil units are only mapped to an approximate area of two acres, and 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.

Verified and Potential Vernal Pools

Vernal pools are small, isolated wetlands that are often dry in summer. They provide habitat for many animals, including many forest amphibians that use the pools for breeding. Vernal pools often go undetected in the forest due to their small size and seasonal drawdown. A study carried out by the Teatown Lake Reservation mapped potential vernal pools in Putnam Valley and neighboring towns, a subset of which have been confirmed through actual field visits[7]. Both verified and potential vernal pools are shown on the **Wetlands** map.

Vernal pools and other small, isolated wetlands are vulnerable due to limited regulatory protection. Specific management recommendations can be found in Best Development Practices: Conserving Pool-Breeding Amphibians in Residential and Commercial Development in the Northeastern United States[8], and the Maine Municipal Guide to Mapping and Conserving Vernal Pool Resources[9].

Wildlife Records

The NY Amphibian and Reptile Atlas (NYRA)[10] documented a number of wetland-dependent species in Putnam Valley. Spotted turtle (NY-Special Concern, High Priority SGCN) is a mobile wetland species that also uses upland forest and grassland habitats. The common musk turtle (High Priority SGCN) is dependent on wetlands and streams. Both spotted turtle and musk turtle are sensitive to water pollution and further threatened by wetland loss, invasive species, road mortality, and the pet trade. In addition, a bog turtle (NY-Endangered) was found on a public beach at Oscawana Lake in 1970, but no recent records of the species or its habitat exist in the Town. Vernal pool amphibians, including Jefferson salamander (NY-Special Concern) and marbled salamander (NY-Special Concern, SGCN), were also documented in Putnam Valley by the NYRA and the Metropolitan Conservation Alliance (MCA) Croton-to-Highlands Biodiversity Study (2004).

The New York Natural Heritage Program has recent breeding records from riparian wetlands in Putnam Valley for least bittern (NY-Threatened, SGCN), a marsh bird with a preference for large emergent wetlands with cattails, bulrushes, sedges, and large open water areas. See Table 1 in the **Regional Habitat Context** section of this NRI for a complete list of wetland-dependent species of conservation concern in Putnam Valley.

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Town of Putnam Valley

Natural Resource Inventory

Wetlands

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Town of Putnam Valley

Other Town Boundaries

Forested / Shrub Wetland

Emergent Wetland

Riverine Systems

NYSDEC Wetland

Probable wetland areas

Possible wetland areas

Verified Vernal Pools

Potential Vernal Pools

Surface Water

Rivers & Streams

Data Sources: Probable / Possible Wetlands based on USDA NRCS soils, Vernal Pools Teatown Lake Reservation 2013, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature location names 2018 USGS.

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Town of Putnam Valley

Natural Resource Inventory

Wetlands (with Tax Parcels)

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Town of Putnam Valley

Other Town Boundaries

Tax Parcels

Forested / Shrub Wetland

Emergent Wetland

Riverine Systems

NYSDEC Wetland

Probable wetland areas

Possible wetland areas

Verified Vernal Pools

Potential Vernal Pools

Surface Water

Rivers & Streams

Data Sources: Probable / Possible Wetlands based on USDA NRCS soils, Vernal Pools Teatown Lake Reservation 2013, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature location names 2018 USGS.

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IV. HABITATS

Regional Habitat Context

The first step to understanding habitats in Putnam Valley is to consider the Town's regional context. The **Regional Habitat Context** map helps illustrate the major ecological features in Putnam Valley extending beyond the Town's borders, including habitat areas that have been identified as significant at inter-municipal, regional, and statewide level.

Significant Biodiversity Areas

All of Putnam Valley is within the Hudson Highlands Significant Biodiversity Area (SBA), a regionally significant landscape recognized by NYSDEC's Hudson River Estuary Program for its extensive forest and high diversity of species and communities within close proximity of the New York City metropolitan area:

> [The Hudson Highlands] represents one of the largest unfragmented landscape blocks in New York State that creates an important landscape corridor that links the mid-Atlantic states (New Jersey and Pennsylvania) with New England. Along with the continuous and relatively unfragmented forests, the area contains higher elevation ridges and several networks of relatively undisturbed wetlands in the valleys. The ecological significance of this area relates to its large, contiguous forest and wetland habitats and the disturbance-sensitive species dependent on these habitats, as well as the diversity of plants, communities, and animals unique to this region[1].

More information about SBAs can be found at the Hudson River Estuary Wildlife and Habitat Conservation Framework[1].

Matrix Forest Blocks and Linkages

Most of Putnam Valley lies within the Hudson Highlands "matrix forest block," identified by the Nature Conservancy through a regional analysis of forests in the northeastern United States and shown on the **Regional Habitat Context** map. Matrix forests represent the largest intact forests, whose size and natural condition allow for the maintenance of ecological processes, natural forest communities, and populations of forest-interior species[2]. "Regional forest linkage zones" are sufficiently intact natural corridors that connect matrix forests across the landscape. A small portion of a regional forest linkage zone connects the Hudson Highlands matrix forest block with the Mid-Dutchess and Macedonia forest matrix blocks located northeast of the Town. The goal of the matrix forest analysis is to identify viable examples of forest types that, if protected and allowed to maintain or regain their natural condition, will serve as critical source areas for species associated with the forest types, or for species generally requiring forest-interior conditions. Conserving large, high-quality natural areas such as these, and the natural connections between them, will allow plants and animals to move northward and higher in elevation as temperatures increase with climate change.

Croton-to-Highlands Biodiversity Corridors

The Metropolitan Conservation Alliance (MCA) Croton-to-Highlands Biodiversity Plan[3] identified three large areas of Putnam Valley as biodiversity corridors, "broad swaths of habitat that link [biodiversity] hubs together." These expansive corridors often provide habitat in their own right, and the Putnam Valley corridors contain many such hubs, or source habitats, within them. The Canopus Hollow to Fahnestock corridor's extensive tracts of connected forest, interspersed with streams and vernal pools, is noted as one of the most biodiverse areas within the entire four-town region of the study (including towns of Cortlandt, New Castle, and Yorktown in Westchester County). The north-central to eastern Putnam Valley corridor connects two disjunct portions of Fahnestock State Park and hosts many development-sensitive species. Though slightly more developed, the east-central to southern Putnam Valley corridor paralleling Peekskill Hollow Brook continues to support a broad diversity of forest and shrubland species.

References

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Town of Putnam Valley

Natural Resource Inventory

Regional Habitat Context

Map Scale - 1:78000

0 3,250 6,500 13,000

Feet

Fishkill Creek
Wiccopee Creek
East Fishkill
Fishkill
Beacon
Dutchess County
Putnam County
Foundry Brook
Philipstown
Clove Creek
Canopus Creek
Putnam Valley
Peekskill Hollow Creek
Carmel
Kent
Highlands
Orange County
Putnam County
Annsville Creek
Oscawana Brook
Putnam County
Westchester County
Shrub Oak Brook
Peekskill Hollow Brook
Cortlandt
Somers
Yorktown
Stony Point
Peekskill
Catskill Aqueduct

82 52 84 980J 301 10 9 11 9D 403 20 22 23 24 30 6N 6 309 132 987H 202 92 9 9A 9W 42 32 21

Town of Putnam Valley

Other Town Boundaries

Croton-Highlands Biodiversity Corridors

Surface Water

Rivers & Streams

Significant Biodiversity Areas

Hudson Highlands East

Hudson Highlands West

Mid Hudson River

Matrix Forest Blocks and Linkages

Matrix Forest Blocks

Regional Forest Linkage Zone

Data Sources: Significant Biodiversity Areas NYSDEC HREP, Matrix Forest Blocks and Linkages TNC, Croton-Highland BC WCS Metro Cons Alliance, Surface Water, Rivers and Streams, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office.

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Town of Putnam Valley

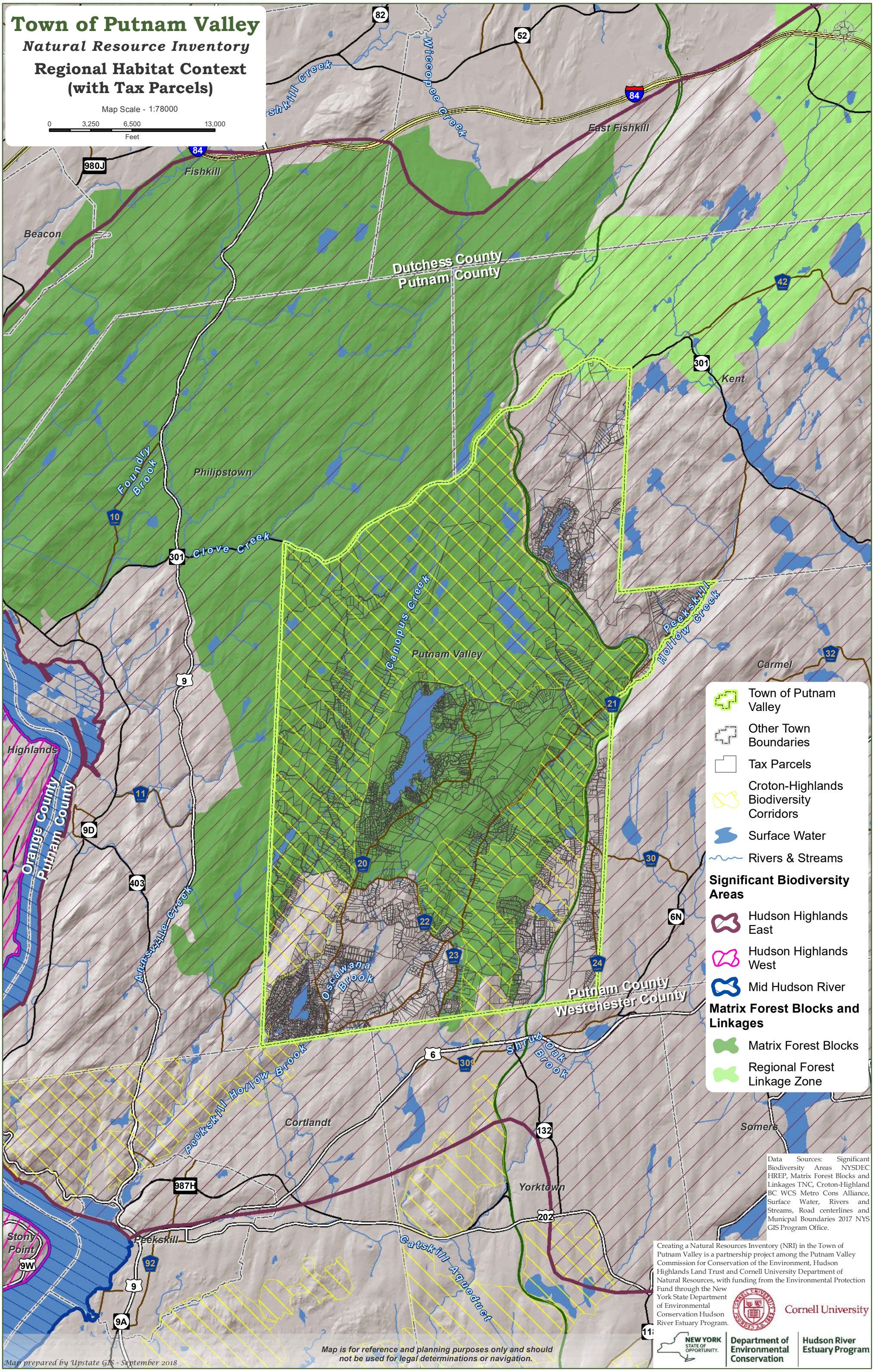
Natural Resource Inventory

Regional Habitat Context (with Tax Parcels)

Map Scale - 1:78000

0 3,250 6,500 13,000

Feet



Data Sources: Significant Biodiversity Areas NYSDEC HREP, Matrix Forest Blocks and Linkages TNC, Croton-Highland BC WCS Metro Cons Alliance, Surface Water, Rivers and Streams, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office.

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General Land Cover and Land Use

The **General 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 Putnam Valley 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 (NLCD). Each 30x30 meter 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[1]. 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[2]. Used in an appropriate manner, the land cover/land use data can be a helpful tool to understand general patterns of land cover and land use, to identify large connected habitat areas, and to identify potential areas of concern where land uses may impact habitats or water resources. Table 1 provides a summary of the acreage and percentage of land in Putnam Valley for each land cover or land use class. Definitions for land cover and land use classes shown on the map are as follows[3]:

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.

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.

Herbaceous/Grassland - 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.

Hay/Pasture - areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or for 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 1. Land Cover Percentage in the Town of Putnam Valley, NY

Category	Acres	Percent of Town
Open Water	909	3.3%
Developed, Open Space	2,855	10.4%
Developed, Low Intensity	455	1.7%
Developed, Medium Intensity	154	0.6%
Developed, High Intensity	14	0.0%
Deciduous Forest	19,610	71.4%
Evergreen Forest	946	3.4%
Mixed Forest	238	0.9%
Shrub/Scrub	181	0.7%
Herbaceous/Grassland	2	0.0%
Hay/Pasture	543	2.0%
Woody Wetlands	1,410	5.1%
Emergent Herbaceous Wetlands	160	0.6%
TOTAL:	26,568	100.0%

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Town of Putnam Valley

Natural Resource Inventory

General Land Cover and Land Use

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Land Cover (2011)

- Town of Putnam Valley
- Other Town Boundaries
- Rivers & Streams
- Open Water
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Shrub/Scrub
- Herbaceuous
- Hay/Pasture
- Cultivated Crops
- Woody Wetlands
- Emergent Herbaceuous Wetlands

Data Sources: Land Cover USGS 2011, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Feature location names 2018 USGS.

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Town of Putnam Valley

Natural Resource Inventory

General Land Cover and Land Use (with Tax Parcels)

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Land Cover (2011)

- Open Water
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Shrub/Scrub
- Herbaceuous
- Hay/Pasture
- Cultivated Crops
- Woody Wetlands
- Emergent Herbaceuous Wetlands

Town of Putnam Valley

Other Town Boundaries

Tax Parcels

Rivers & Streams

Data Sources: Land Cover USGS 2011, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Feature location names 2018 USGS.

Creating a Natural Resources Inventory (NRI) in the Town of Putnam Valley is a partnership project among the Putnam Valley Commission for Conservation of the Environment, Hudson Highlands Land Trust and Cornell University Department of Natural Resources, with funding from the Environmental Protection Fund through the New York State Department of Environmental Conservation Hudson River Estuary Program.

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Map prepared by Upstate GIS - September 2018

Large Forests

Large forest tracts are a defining feature of Putnam Valley, and are perhaps the Town's most ecologically significant resource. Forests provide wildlife habitat, clean the air, help maintain cool temperatures, infiltrate and purify water, and supply economic products—all of which depend in part upon maintaining large, intact forest areas. In general, larger forests: offer superior habitat for forest interior species; are better able to accommodate disturbances such as fire, flood, and wind damage; and are more likely to be resilient to climate change. Even small patches of forest can be extremely valuable, depending on landscape context. Factors such as deer browse, pest damage, management history, and invasive species, have a large impact on forest quality, but are difficult to assess remotely.

The **Large Forests** maps show forests 200 acres and larger in Putnam Valley from an analysis by Cornell University Department of Natural Resources and the NYSDEC Hudson River Estuary Program. Forested land cover classes were extracted from 2010 land cover data produced by the National Oceanic and Atmospheric Administration (NOAA) Coastal Change Analysis Program[1], including deciduous forest, evergreen forest, mixed forest, and palustrine forested wetland. County, State, US, and interstate roads and highways were buffered and erased from forest areas to show results of development-related fragmentation. Forests are classified according to size following the forest size thresholds used in the Orange County Open Space Plan[2].

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 therefore suffer greater impacts from development. Forest edge disturbances dominate small forests, such as invasive species, increased predation levels, domestic pet activity, and micro-climatic differences. Many of the large forest areas in Putnam Valley are divided to some extent by local roads, driveways, or small-scale development. Regardless of size or habitat values, all forests and trees in the Town help to manage stormwater, moderate temperature, and improve air quality, among myriad other ecosystem benefits.

As shown on the **Large Forests** map, more than half of Putnam Valley lies within a "globally significant" forest block, which extends over 21,000 acres, including portions of Philipstown. This forest largely corresponds with the eastern Hudson Highlands "matrix forest block," identified in a regional analysis by the Nature Conservancy (see the **Regional Habitat Context** map accompanying report). It also includes extensive examples of significant forest communities mapped by the New York Natural Heritage Program (see the **Important Biodiversity Areas** maps). Large, intact forest ecosystems such as this support wide-ranging and area-sensitive species, especially those that depend on interior forest. "Globally significant" forests are also large enough to contain a range of forest successional stages ranging from areas subjected to recent large-scale disturbance such as blowdowns and fire, to areas under recovery, and mature areas. These forests are also sufficiently large to maintain genetic diversity within species.

Three other large forests, shown on the Large Forests map, cover most of the remainder of Putnam Valley: regionally significant, locally significant and stepping stone. East of the Taconic Parkway, a large, contiguous forest surrounding Roaring Brook Lake exceeds 6,500 acres in size; such forests are considered "regionally significant" as they are large enough to provide habitat for more area-sensitive species. A somewhat smaller but "locally significant" forested area is located along Piano Mountain

between Peekskill Hollow Road and the Taconic State Parkway. Smaller forests such as these—more fragmented by development and roads—are at the lower limit of viable habitat patch size for forest-dependent birds. Nevertheless, this forested western slope of the ridge is largely undeveloped and is included within the matrix forest block and a Croton-Highlands Biodiversity Corridor (see the **Regional Habitat Context** map), which notes the high diversity of forest and shrubland species remaining in this area. The Piano Mountain biodiversity corridor presents an opportunity for inter-municipal collaboration on land use planning and management between Putnam Valley and Yorktown. Smaller "stepping stone" forest patches, such as the forest east of Barger Brook and the Taconic State Parkway, may provide valuable, relatively broad corridors connecting to larger forest blocks in the Town.

There are numerous wildlife records indicating the availability of high-quality forest habitat in Putnam Valley. The NYS Breeding Bird Atlas[3] documented many forest interior-nesting birds of conservation concern (e.g., black-throated blue warbler, scarlet tanager, wood thrush) as well as birds associated with high-quality riparian forest habitat (e.g., Louisiana waterthrush, yellow-throated vireo). Audubon New York designated the Fahnestock and Hudson Highlands State Parks Important Bird Area based on the remarkably intact forest communities and bird assemblages of the Highlands region (See the **Important Biodiversity Areas** maps.)

Putnam Valley's forests are also home to several reptile species of conservation concern, according to records from the NYS Reptile and Amphibian Atlas[4]. Eastern worm snake is a secretive species that burrows in damp forest soils or under logs and rocks. Black rat snake occurs in forests, shrublands, and often at the edges of open areas. Rocky, forested ridges provide habitat for northern black racer and timber rattlesnake, which forage quite widely from den sites. They are particularly susceptible to fragmentation of forest habitats by roads and development, which can isolate populations and lead to increased road mortality. Spotted turtle and eastern box turtle also spend significant periods of the year in forests while traveling, foraging, or in dormancy.

Conserving the Town's large, contiguous forested areas, particularly those that provide broad, connected corridors, is critical to the above species. Smaller forest patches act as stepping stones between larger forests, and forested floodplains and riparian zones help ensure adequate habitat to sustain these species as well as other forest plants and animals. This strategy will also help to preserve the ecosystem benefits that forests are providing Town residents.

References

[1] National Oceanic and Atmospheric Administration, Office for Coastal Management. New York 2010 Coastal Change Analysis Program (C-CAP) Regional Land Cover. Charleston, SC: NOAA Office for Coastal Management data for the Coastal Change Analysis Program. csc.noaa.gov/.

[2] Orange County (N.Y.) Planning Department. 2004. Orange County Open Space Plan. Goshen, N.Y.

[3] New York State Breeding Bird Atlas 2000 [Internet]. 2000 - 2005. Release 1.0. Albany (New York): New York State Department of Environmental Conservation. [updated 2007 Jun 11; data retrieved August 2018]. Available from: dec.ny.gov/animals/7312.html.

[4] New York Amphibian and Reptile Atlas. 1990-1999. New York State Department of Environmental Conservation, Albany, NY. Website: dec.ny.gov/animals/7140.html.

Town of Putnam Valley

Natural Resource Inventory

Large Forests

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Forest Patches (acres)

- Stepping Stone (200 - 1999)
- Locally Significant (2000 - 5999)
- Regionally Significant (6000 - 14999)
- Globally Significant (15000+)

Town of Putnam Valley

Other Town Boundaries

Mapped Wetlands

Surface Water

Rivers & Streams

Data Sources: Forest Patches Cornell/HREP, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature location names 2018 USGS.

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Map prepared by Upstate GIS - September 2018

Town of Putnam Valley

Natural Resource Inventory

Large Forests (with Tax Parcels)

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Town of Putnam Valley

Other Town Boundaries

Tax Parcels

Mapped Wetlands

Surface Water

Rivers & Streams

Forest Patches (acres)

Stepping Stone (200 - 1999)

Locally Significant (2000 - 5999)

Regionally Significant (6000 - 14999)

Globally Significant (15000+)

Data Sources: Forest Patches Cornell/HREP, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature location names 2018 USGS.

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Map prepared by Upstate GIS - September 2018

Important Biodiversity Areas

Putnam Valley is home to remarkable biological diversity. The **Important Biodiversity Areas** maps highlight important areas of the Town known for rare animal species and significant natural communities. Additional areas important for biodiversity may exist but have not been surveyed due to may limitations, including access. Local studies and attention to habitat values during the environmental review process can help to better document, understand, and conserve the Town's biological resources.

Fahnestock and Hudson Highlands State Parks Important Bird Area

Audubon New York has identified the large, unfragmented forest tract spanning these State parks as an area of statewide importance for birds, supporting a species assemblage representative of deciduous and mixed forests, including many regional conservation priorities. Forest birds documented in Putnam Valley during the 2000-2005 NYS Breeding Bird Atlas[1] are shown in Table 1 and include species such as red-shouldered hawk, scarlet tanager, and wood thrush.

Important Areas for Rare Animals

The New York Natural Heritage Program (NYNHP) has identified areas of importance for sustaining populations of rare animals based on existing records and the species' habitat requirements. Important Areas include the specific locations where species have been observed, as well as additional habitat areas which may be used at different times of the year, and areas critical to maintaining the habitats of these rare animal populations. Proactive planning that considers how species move across the landscape, with careful attention to maintaining connected habitat complexes, will contribute to the long-term survival of rare animals. NYNHP identified areas of importance in Putnam Valley for hibernating bats, New England cottontail, least bittern, timber rattlesnake, wood turtle, eastern box turtle, eastern worm snake, wild brook trout, American eel, rare forest butterflies, and stream dragonflies. A complete list of species of conservation concern known from Putnam Valley is shown in Table 1.

Bat hibernacula are sites where bats hibernate over the winter, most often caves. Indiana bat (US and NY – Endangered), northern long-eared bat (US and NY – Threatened) and other priority bat species have been found in a Putnam Valley cave and the surrounding forest. Bats will return year after year to the same hibernation site and are susceptible to human disturbance and disease. The recent spread of white-nose syndrome, a fungal disease, has devastated bat colonies throughout the northeast, resulting in large die-offs of bats across the region. Mapped important areas include the immediate areas surrounding known hibernaculum (wintering shelters) and summer roost sites. See the Bat Conservation Areas description below for additional information.

Wood Turtle (NY-Special Concern, High Priority SGCN) inhabits low-gradient perennial streams and also spends time in adjacent forests and grasslands. Habitat loss and fragmentation, stream degradation, nest predation, vehicle strikes, and the pet trade threaten wood turtle populations.

Least bittern (NY-Threatened, SGCN) is a marsh bird with a preference for large, emergent wetlands with cattails, bulrushes, sedges, and large open water areas. They have an average home range of almost 25 acres. NYNHP has documented least bittern breeding activity in a considerably smaller riparian

wetland habitat along the banks of Canopus Creek. Least bittern is threatened by continued wetland loss in the Hudson Valley and by habitat degradation due to fragmentation, exotic plant invasions, and nutrient enrichment of wetlands.

Eastern box turtle (NY-Special Concern, High Priority SGCN) primarily inhabits well-drained and open deciduous forests, but may also be found in field edges, shrublands, marshes, bogs, and along stream banks. Putnam Valley is near the northern limit of eastern box turtle's natural range, an area that is particularly important for stewardship as climate changes and suitable habitat shifts north. Habitat loss and fragmentation, vehicle strikes, and the pet trade threaten box turtles populations.

Timber rattlesnake (NY-Threatened, High Priority SGCN) inhabits mountainous or hilly forests, often with rock outcroppings, steep ledges, and rock slides. They migrate widely, abandoning their dens in summer to forage in the surrounding forest. Extensive forest and rocky barrens on Putnam Valley's ridges provide habitat for timber rattlesnake populations. Timber rattlesnakes are threatened due to habitat loss and fragmentation, illegal collecting, and malicious killing.

Edward's hairstreak butterfly (NY-Rare) lives in sandy pine barrens, rocky ridges, outcrops, and occasionally other habitats in close association with substantial patches of scrub oak. It is documented in woodlands north of Oscawana Lake. Habitat loss, spraying for gypsy moth, and habitat changes due to lack of fire threaten this and other forest butterfly and moth species.

New England cottontail (NY-Special Concern, High Priority SGCN) is the only native cottontail east of the Hudson River in New York; its range has been greatly reduced in the state due to aging forests, habitat loss, and competition with the more abundant Eastern cottontail. It prefers open woods, disturbed areas, shrubby areas, thickets, and marshes. It has been documented at several locations in Fahnestock State Park.

Eastern worm snake (NY-Special Concern, SCGN) is a secretive resident of the forest floor, often found under rocks and decaying wood. Threats to this species include pesticide application, habitat loss and forest fragmentation.

Tiger spiketail dragonfly (NY-Rare) and **arrowhead spiketail dragonfly** (NY-Rare) have been documented within small, spring-fed streams and seeps in forested areas adjacent to Putnam Valley. While there are no known records from within Putnam Valley, suitable habitat exists along Philipse Brook.

Bat Conservation Areas

At-risk bats, including Indiana bat, northern long-eared bat, and others, may travel long distances from their winter hibernacula during the summer months, using forested areas and stream corridors for shelter and foraging for insect prey. Female bats roost in trees and snags in maternity colonies to raise their young. Existing restrictions on tree cutting aim to protect threatened bat species, especially during the period when mothers are birthing and raising pups. Bat conservation areas depict bat summer habitat areas in Putnam Valley. NYSDEC recommends restricting any tree-cutting activities to the winter months (November 1-March 31) in areas occupied by protected bats to avoid direct impacts to the species.

NOTE: The NYSDEC Region 3 Office in New Paltz should be contacted at 845-256-3098 with any concerns or questions about the presence of protected species in Putnam Valley.

Significant Natural Communities

Three exemplary forest community types spanning 4,179 acres have been mapped in Putnam Valley by the NYNHP and are shown on the **Important Biodiversity Areas** maps: chestnut oak forest, hemlock- northern hardwood forest, , and oak-tulip tree forest. These forests have good habitat diversity and are surrounded by other forest types in a large, fairly intact landscape. The large extent of these significant forest communities underscores the high quality of forests in Putnam Valley. Hemlock woolly adelgid is a major threat to hemlocks in these high-quality forests and in other areas of Putnam Valley. In addition, NYNHP mapped a very large complex of highbush blueberry bog thickets (shown on the **Important Biodiversity Areas** map) comprising over 80 individual wetlands within the 14,000- acre forested landscape of Fahnestock State Park, extending into Philipstown and Kent.

Vernal Pools

The **Important Biodiversity Area** map also shows vernal pools. Vernal pools are small, isolated wetlands that are often dry in summer. They provide habitat to many animals, including forest amphibians like wood frog and spotted salamander, which use the pools for breeding. Vernal pools often go undetected in the forest due to their small size and seasonal drawdown and are vulnerable due to reduced regulatory protection of isolated wetlands. A 2013 study by Teatown Lake Reservation mapped 216 potential vernal pools in Putnam Valley, 11 of which were verified through field visits[2]. See the **Wetlands** section of this NRI for more information.

Species of Conservation Concern in the Town of Putnam Valley, NY

Table 1 below lists species of conservation concern that have been observed in the Town of Putnam Valley and some adjacent areas. Information comes from the (NYNHP) biodiversity databases, the NY Amphibian and Reptile Atlas (NYARA), the 2000-2005 New York State Breeding Bird Atlas (NYBBA), and the Metropolitan Conservation Alliance (MCA) Croton-to-Highlands Biodiversity Study[3]. Bird species from the NYBBA were obtained from those atlas blocks that occupy 50% of the Town or greater. The table only includes species listed in New York as endangered, threatened, special concern, Species of Greatest Conservation Need (SGCN), or a Hudson River Valley Priority Bird species recognized by Audubon New York. Historical records are provided from the NYNHP biodiversity databases. 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 guides.nynhp.org. This table was provided for the Town of Putnam Valley Natural Resources Inventory project in September 2018 by the NYSDEC Hudson River Estuary Program to inform conservation and land- use planning and decision-making.

Table 1. Species of Conservation Concern in the Town of Putnam Valley, NY

Common Name	Scientific Name	General Habitat	NYS Conservation Status					Data Source
			Hudson River Valley Priority Bird	Species of Greatest Conservation Need xx = high priority	Special Concern	Threatened	Endangered	
Mammals								
Eastern Small-footed Bat	*Myotis leibii*	cave, forest		x	x			NYNHP
Indiana Bat	*Myotis sodalis*	cave, forest		xx			US NY	NYNHP
New England Cottontail	*Sylvilagus transitionalis*	shrubland		xx	x			NYNHP
Northern Long-eared Bat	*Myotis septentrionalis*	cave, forest		xx		US NY		NYNHP
Tri-colored Bat	*Perimyotis subflavus*	cave, forest, stream		xx				NYNHP
Birds								
Acadian Flycatcher	*Empidonax virescens*	forest	x					NYBBA
American Goldfinch	*Spinus tristis*	young forest, shrubland	x					NYBBA
American Redstart	*Setophaga ruticilla*	forest	x					NYBBA
American Woodcock	*Scolopax minor*	young forest, shrubland	x	x				NYBBA
Bald Eagle	*Haliaeetus leucocephalus*	lake, stream, forest	x	x		NY		NYBBA
Baltimore Oriole	*Icterus galbula*	forest	x					NYBBA
Belted Kingfisher	*Megaceryle alcyon*	lake, stream	x					NYBBA
Black-and-white Warbler	*Mniotilta varia*	forest	x					NYBBA
Black-billed Cuckoo	*Coccyzus erythropthalmus*	young forest, shrubland	x	x				NYBBA
Blackburnian Warbler	*Dendroica fusca*	forest	x					NYBBA
Black-throated Blue Warbler	*Dendroica caerulescens*	forest	x	x				NYBBA
Black-throated Green Warbler	*Dendroica virens*	forest	x					NYBBA
Blue-Winged Warbler	*Vermivora pinus*	young forest, shrubland	x	x				NYBBA

Common Name	Scientific Name	General Habitat	NYS Conservation Status					Data Source
			Hudson River Valley Priority Bird	Species of Greatest Conservation Need xx = high priority	Special Concern	Threatened	Endangered	
Bobolink	*Dolichonyx oryzivorus*	grassland	x	xx				NYBBA
Broad-winged Hawk	*Buteo platypterus*	forest	x					NYBBA
Canada Warbler	*Wilsonia canadensis*	young forest, shrubland	x	xx				NYBBA
Chestnut-sided Warbler	*Setophaga pensylvanica*	young forest, shrubland	x					NYBBA
Chimney Swift	*Chaetura pelagica*	urban	x					NYBBA
Cooper's Hawk	*Accipiter cooperii*	forest	x		x			NYBBA
Downy Woodpecker	*Picoides pubescens*	forest	x					NYBBA
Eastern Kingbird	*Tyrannus tyrannus*	young forest, shrubland	x					NYBBA
Eastern Towhee	*Pipilo erythrophthalmus*	young forest, shrubland	x					NYBBA
Eastern Wood-Pewee	*Contopus virens*	forest	x					NYBBA
Field Sparrow	*Spizella pusilla*	young forest, shrubland	x					NYBBA
Hooded Warbler	*Wilsonia citrina*	forest	x					NYBBA
Least Bittern	*Ixobrychus exilis*	wetland	x	x		NY		NYNHP
Least Flycatcher	*Empidonax minimus*	forest	x					NYBBA
Louisiana Waterthrush	*Seiurus motacilla*	forest	x	x				NYBBA
Northern Flicker	*Colaptes auratus*	forest	x					NYBBA
Osprey	*Pandion haliaetus*	open water, wetland	x		x			NYBBA
Prairie Warbler	*Dendroica discolor*	young forest, shrubland	x	x				NYBBA
Red-shouldered Hawk	*Buteo lineatus*	forest	x	x	x			NYBBA
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	forest	x					NYBBA
Ruffed Grouse	*Bonasa umbellus*	young forest, shrubland	x	x				NYBBA
Scarlet Tanager	*Piranga olivacea*	forest	x	x				NYBBA

Common Name	Scientific Name	General Habitat	NYS Conservation Status					Data Source
			Hudson River Valley Priority Bird	Species of Greatest Conservation Need xx = high priority	Special Concern	Threatened	Endangered	
Sharp-shinned Hawk	*Accipter striatus*	forest	x		x			MCA
Short-eared Owl	*Asio flammeus*	grassland	x	xx			NY	NYBBA
Veery	*Catharus fuscescens*	forest	x					NYBBA
Willow Flycatcher	*Empidonax trailli*	young forest, shrubland	x					NYBBA
Wood Thrush	*Hylocichla mustelina*	forest	x	x				NYBBA
Worm-eating Warbler	*Helmitheros vermivorum*	forest	x	x				NYBBA
Yellow-billed Cuckoo	*Coccyzus americanus*	young forest, shrubland	x					NYBBA
Yellow-throated Vireo	*Vireo flavifrons*	forest	x					NYBBA
Reptiles								
Eastern Rat Snake	*Pantherophis alleghaniensis*	forest		x				NYSDEC
Common Musk Turtle	*Sternotherus odoratus*	wetland, stream		xx				NYARA
Common Snapping Turtle	*Chelydra s. serpentina*	wetland, coast, open water		x				NYARA
Eastern Box Turtle	*Terrapene c. carolina*	forest, young forest		xx	x			NYARA
Eastern Worm Snake	*Carphophis amoenus amoenus*	forest, rocky summit		x	x			NYNHP
Northern Black Racer	*Coluber c. constrictor*	forest, shrubland, meadow		x				NYARA
Spotted Turtle	*Clemmys guttata*	wetland		xx	x			NYARA
Timber Rattlesnake	*Crotalus horridus*	forest, rocky summit		xx		NY		NYNHP
Wood Turtle	*Clemmys insculpta*	stream		xx	x			NYARA
Amphibians								
Jefferson Salamander	*Ambystoma jeffersonianum*	vernal pool, forest			x			MCA
Marbled Salamander	*Ambystoma opacum*	vernal pool, forest		x	x			NYARA

Common Name	Scientific Name	General Habitat	NYS Conservation Status					Data Source
			Hudson River Valley Priority Bird	Species of Greatest Conservation Need xx = high priority	Special Concern	Threatened	Endangered	
Fish								
Alewife	*Alosa pseudoharengus*	coast, stream, lake		x				NYSDEC
American Eel	*Anguilla rostrata*	coast, stream		xx				NYSDEC
Brook Trout	*Salvelinus fontinalis*	stream		x				NYSDEC
Insects								
Edwards' Hairstreak*	*Satyrium edwardsii*	pine barren, rocky summit						NYNHP
Natural Communities								
Chestnut Oak Forest								NYNHP
Hemlock-Northern Hardwood Forest								NYNHP
Highbush Blueberry Bog Thicket								NYNHP
Historical Records								
Bog Turtle	*Glyptemys muhlenbergii*	wetland		xx		US	NY	NYNHP
Kentucky Warbler	*Oporornis formosus*	forest	x	xx				NYNHP
Wild Hydrangea	*Hydrangea arborescens*	forest, stream				NY		NYNHP

***Listed by NYNHP as a rare species in New York State**

References

[1] New York State Breeding Bird Atlas 2000 [Internet]. 2000 - 2005. Release 1.0. Albany (New York): New York State Department of Environmental Conservation. [updated 2007 Jun 11; data retrieved August 2018]. dec.ny.gov/animals/7312.html.

[2] Rubbo, M. 2013. Mapping Woodland Pools in the Hudson Hills and Highlands: Report to the Hudson River Estuary Program. Ossining, NY. 6 pp.

[3] Miller, N. and M. Klemens. 2004. Croton-to-Highlands Biodiversity Plan: Balancing development and the environment in the Hudson River Estuary Catchment. MCA Technical Paper No. 7, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, NY. 34 pp

Town of Putnam Valley

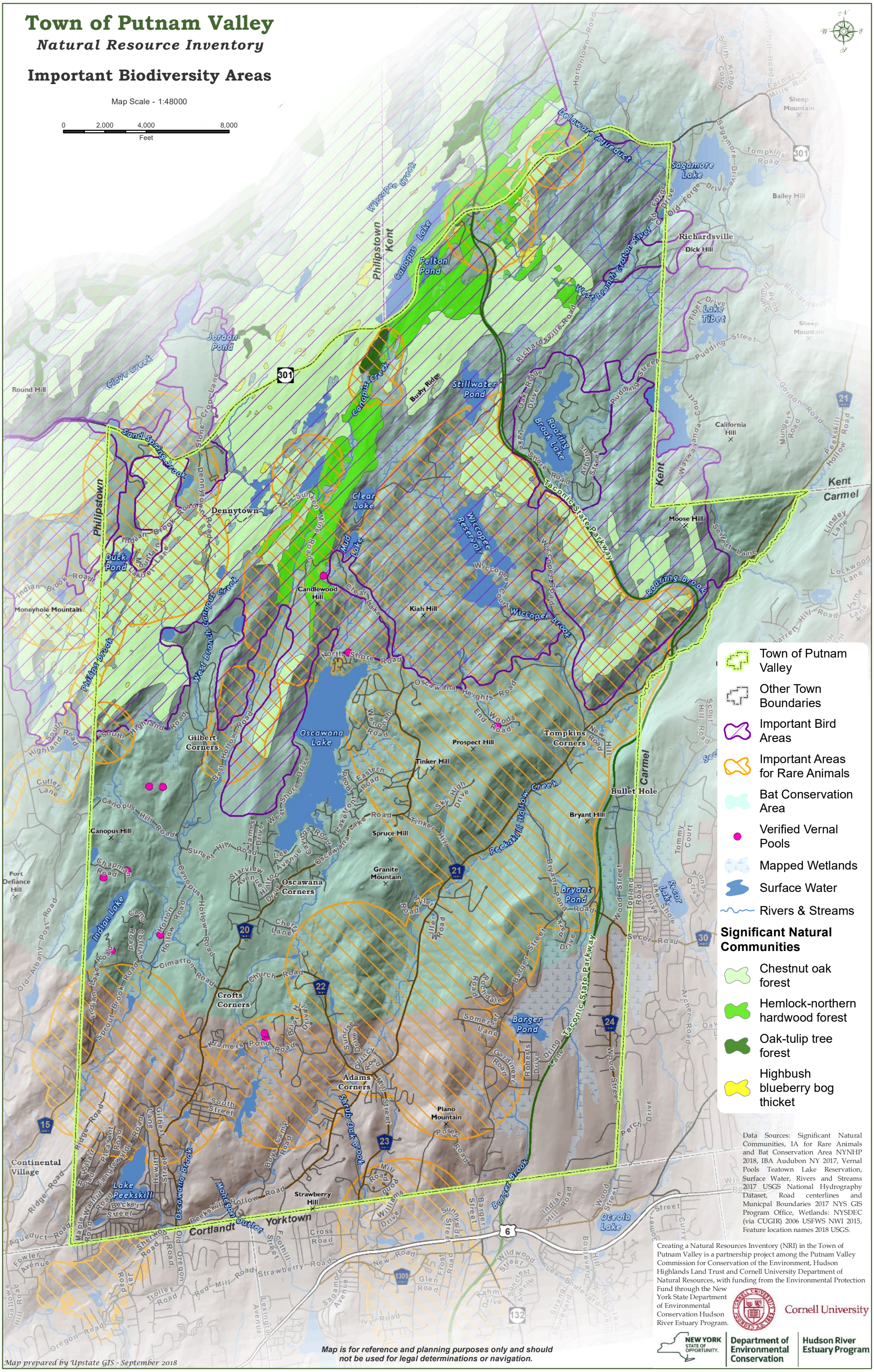
Natural Resource Inventory

Important Biodiversity Areas

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet



- Town of Putnam Valley
- Other Town Boundaries
- Important Bird Areas
- Important Areas for Rare Animals
- Bat Conservation Area
- Verified Vernal Pools
- Mapped Wetlands
- Surface Water
- Rivers & Streams

Significant Natural Communities

- Chestnut oak forest
- Hemlock-northern hardwood forest
- Oak-tulip tree forest
- Highbush blueberry bog thicket

Data Sources: Significant Natural Communities, IA for Rare Animals and Bat Conservation Area NYNHP 2018, IBA Audubon NY 2017, Vernal Pools Teatown Lake Reservation, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature location names 2018 USGS.

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Map prepared by Upstate GIS - September 2018

Town of Putnam Valley

Natural Resource Inventory

Important Biodiversity Areas (with Tax Parcels)

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

- Town of Putnam Valley
- Other Town Boundaries
- Tax Parcels
- Important Bird Areas
- Important Areas for Rare Animals
- Bat Conservation Area
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Significant Natural Communities

- Chestnut oak forest
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Data Sources: Significant Natural Communities, IA for Rare Animals and Bat Conservation Area NYNHP 2018, IBA Audubon NY 2017, Vernal Pools Teatown Lake Reservation, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature location names 2018 USGS.

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V. CLIMATE CONDITIONS

Climate in the lower Hudson Valley is temperate and variable, from warm summers bringing occasional heat waves and droughts to cold, snowy winters. Climate change has already affected the normal variability in weather patterns and is projected to continue to significantly alter climate conditions in the future. It is important for municipalities to understand the risks posed by changing climate conditions and how they relate to local natural resources and human health, as well as to the built environment.

The New York State Energy Research and Development Authority (NYSERDA) has been studying, documenting, and modeling the impacts of climate change in New York State for several years. Climate trends and projections for the East Hudson and Mohawk River Valleys come from NYSERDA's Responding to Climate Change in New York State (ClimAID)[1]. The New York Climate Smart Communities program[2] can suggest ways to put our Town's NRI in action for building climate resilience.

Two significant climate hazards are expected to affect Putnam Valley residents during the 21st century: increasing temperatures and changing precipitation patterns. These hazards may pose significant risks to natural resources and human communities, namely through heat waves, drought, flooding, and poor air quality. Recognizing the value of natural resources as "green infrastructure" in devising climate adaptation strategies is essential.

Temperature: Annual average temperatures have been steadily rising in New York State. Since 1970, they have been increasing at a rate of 0.6 degrees Fahrenheit (°F) per decade. In winter months, this warming effect is even greater, at 1.1°F per decade[1,2]

Models project that annual average temperature in the Hudson Valley region will rise by an additional 4 to 6°F by 2050; and 6 to 11°F by 2100 (see Table 1).

Table 1. Air Temperature Projections for the Lower Hudson Valley[3]

	Baseline 1971-2000	2020's	2050's	2080's	2100
Average air temperature (°F)	50	52.3 – 53.2	54.5 – 56.2	55.6 – 59.7	56.1 – 61.4
Increase in annual average (°F)	--	2.3 – 3.2	4.5 - 6.2	5.6 – 9.7	6.1 – 11.4

Changing Precipitation Patterns:

The Northeast has also experienced a 74% increase in the amount of precipitation occurring in heavy rainfall events between the periods of 1950-1979 and 1980-2009. Projections indicate that total annual precipitation could increase almost 15% by mid-century. In the future, Putnam Valley and other Hudson Valley communities can expect more dry periods intermixed with heavy rain events and decreased snow cover in winter (Table 2).

Table 2. Precipitation Projections for the Lower Hudson Valley[3]

	Baseline 1971–2000	2020's	2050's	2080's	2100
Total annual precipitation (inches)	51"	52 – 54.5"	53 – 57"	53.5 – 58.5"	53.5 – 61.5"
% Increase in annual precipitation	–	2 – 7%	4 – 12%	5 – 15%	5 – 21%
# Days with precipitation > 1 inch	10	14 – 15	14 – 16	15 – 17	–
# Days with precipitation > 2 inches	1	3 – 4	4	4 – 5	–

Climate Impacts in Putnam Valley:

These factors discussed previously will combine to create more frequent and severe heat waves (Table 3), short-term drought, and flooding (Table 4). These climate risks will affect human health in Putnam Valley directly as well as change habitats and associated biotic communities.

Table 3. Heat Wave Projections for the Lower Hudson Valley[3]

	Baseline 1971–2000	2020's	2050's	2080's	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	–

Table 4. Flood Projections for Coastal NY[3]

	Baseline 1971–2000	2020's	2050's	2080's	2100
Increase in probability of 100-year flood	–	20 – 50%	70 – 190%	140 – 610%	–
Flood height of 100-year flood (feet)	15	15.3 – 15.7	15.9 – 16.8	16.5 – 18.3	–

New York's changing climate presents new challenges and opportunities for communities. It is vital for our Town and county decision-makers to understand the community's vulnerability to changing climatic conditions and consider natural resources as an important asset in planning for resilience, managing climate risks, and recovering quickly from extreme weather events. Changing precipitation patterns will necessitate redrawing of flood zones around area waterways. (See the **Streams and Watersheds** maps.) The incentive to build in areas of higher elevation to house families displaced from flood zones in the Town and greater region may put pressure on current areas of open space.

Putnam Valley has ecological assets that will contribute to its resilience, including large forest areas (see **Large Forests**), Wetlands (see **Wetlands**), and healthy streams (see **Stream Habitat and Aquatic Connectivity**). The Town's forest habitats abut those in nearby areas providing corridors of connectivity (see **Regional Habitat Context**) that may help to preserve biodiversity in the face of a changing climate.

References

[1] Rosenzweig, C., W. Solecki, A. DeGaetano, M. O'Grady, S. Hassol, P. Grabhorn (editors). 2011. Responding to Climate Change in New York State: The ClimAID Integrated Assessment for Effective Climate Change Adaptation. Synthesis Report. New York State Energy Research and Development Authority (NYSERDA), Albany, NY. nyserda.ny.gov/climaid

[2] *Climate Smart Communities*, New York State, climatesmart.ny.gov.

[3] *Climate Projections In The Hudson River Estuary A Fact Sheet for the Public*, NYSDEC Hudson River Estuary Program, dec.ny.gov/docs/remediation_hudson_pdf/cphv.pdf.

VI. HISTORIC AND CULTURAL RESOURCES

Historic Resources

Historic resources are intrinsic to Putnam Valley's identity; they augment the natural beauty and character of the Town, and provide connections to the past. Along with natural, recreational, and scenic resources, the Town is fortunate to have many well-preserved historic structures. Many of these historic resources, discussed below and shown on the **Historic Resources** map, should be considered when making development and other land-use decisions.

Few relics remain of the Native Americans who once inhabited the entire region. The earliest known people were of the Canopus group of the Wappinger Confederacy, part of the Algonquin-speaking Mohican Nation. Native American land rights were challenged from the first arrival of Europeans, and eventually Dutch and English settlers completely displaced the Indians. Other than the occasional arrowhead, the only remnants of Native American history and culture are names of roads and other sites.

The steep slopes and rocky soils of Putnam Valley made farming difficult and limited the area's population; even now the Town remains less developed than nearby areas (see **Agricultural District and Farmland Soils**). The Town is latticed with historic stonewalls—some constructed up to 300 years ago— which contained livestock and served as repositories for the seemingly endless rocks removed from fields to improve farming.

Tenant farmers eked out a subsistence living cultivating berries and fruits, nuts, maple trees for syrup, bees for honey, flax for textiles, and the crops that could be successfully grown. Grazing animals provided meat, dairy products, and wool; trees were logged for railroad ties, ship timber, barrel hoops, and construction materials for the burgeoning cities[1]. Ice harvesting from local lakes provided a winter income; cut ice was packed in straw, driven by wagon to the Hudson, ferried to the City and then shipped around the globe (it is said Putnam Valley ice ended up in the gin and tonics of the ruling British in India). Historic stone chambers are scattered over the Town (see **Scenic Resources**). While their origins and ages are in dispute, they have certainly been used by area residents as root cellars for crop and ice storage well into the 20th century. Ten of the historic properties noted on the **Historic Resources** map still retain undeveloped open land originally used for farming. Many Town sites retain the names of early farming families, such as Adams, Barger, Tompkins, and Travis.

Revolutionary war relics remain in the Hempstead/Hampshire Huts, built to house a Revolutionary War detachment during the winter of 1779-1780. Graves of Revolutionary War veterans are found in five of the Town's thirteen historic cemeteries.

The Town features at least 100 structures built over a century ago, most with much of their original design and architecture preserved. Of these, 21 houses date back to the 18th century.

Among the four remaining historic churches in Putnam Valley is the Tompkins Methodist Church, built in 1770 on Peekskill Hollow Road and listed on the National Register of Historic Places; it is now a Cultural Center. Two of the historic churches are still used for regular religious services.

The first school districts were established in Putnam Valley during the 1830's. Three historic schoolhouses still stand; the 1846 Putnam Valley Museum/Schoolhouse, the 1820 Travis House (a tavern that became a schoolhouse), and one on Peekskill Hollow Road.

The **Historic Resources** map illustrates areas and assets that have been important to the history of Putnam Valley and can serve as historic corridors for appreciating our past as we move forward into the future.

References

[1] Life on a Rocky Farm: Rural Life Near New York City in the Late Nineteenth Century. Excelsior Editions/State University of New York, 2013.

Town of Putnam Valley

Natural Resource Inventory

Historic Resources

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Historic Sites and Cemeteries

Canada Mine
Pelton Pond
Baxter Cemetery
Old Mine Railbed Trail
Pratts Forge
Dennytown
EdisonHouse and Chimney
Barrett Burying Ground
Entrott Farm Plot
Hadden Farm Plot
Tompkins Corners Cultural Center (1770)
Tompkins Corners Store and Post Office
Amos Tompkins' Barn
Post Family Plot
Roy Scheider House
Balanced Rock (talked about in 1823)
Travis Burying Ground
Titus Travis House (1742)
Hampshire Huts/Hempstead Huts
Travis House (1820)
Monmouth Buckbee House (1830)
Barger Wixon Homestead(1790)
Likely Travis House (1820)
Horton Farm Plot
Selleck Family Grounds
Historic House (1815)
Baptist Church (1841)
Crofts Corners
Canopus Methodist Church Parsonage (1834)
Three Arrows Cooperative (est. 1937)
Barger House and Barn(1880)
Dusenbury House (1742)
S.F. Adams House (1750)
Adams Corners Cemetery
Putnam Valley Grange (1898)
Putnam Valley Museum and Schoolhouse (1846)
Adams Corners
King David and Rose Hills Cemetery
Rundle House (1895)
Lawson/Emmanuel Cemetery (1883-1961)
Requa House (1840)
Indian Church
JS Andrews Paper Mill (late 1800's)
Rundle Mill (1788)
Lawson Cemetery
George Kunz House
Paulding House (1763)
Lang & Lang Family Plots
Abraham and Saxton Smith House (1740)

Town of Putnam Valley

Other Town Boundaries

National Register of Historic Places (Taconic State Parkway)

Parks

Conserved Land with Public Access

Other Conserved Land

Mapped Wetlands

Surface Water

Rivers & Streams

Historic Homes

Year House Built

1742 - 1800

1801 - 1825

1826 - 1850

1851 - 1875

1876 - 1920

Data Sources: Historic Sites and House Town of Putnam Valley 2018, NR Historic Places OPRHP 2016, Parks and Conserved Land HHLT, WLT, NYCDEP, NCE Data Base 2018 and Putnam County Real Property Data 2017, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature location names 2018 USGS.

Creating a Natural Resources Inventory (NRI) in the Town of Putnam Valley is a partnership project among the Putnam Valley Commission for Conservation of the Environment, Hudson Highlands Land Trust and Cornell University Department of Natural Resources, with funding from the Environmental Protection Fund through the New York State Department of Environmental Conservation Hudson River Estuary Program. The Putnam Valley Scenic Resource Mapping project is funded through a partnership with the Hudson River Valley National Heritage Area and the Hudson River Valley Greenway.

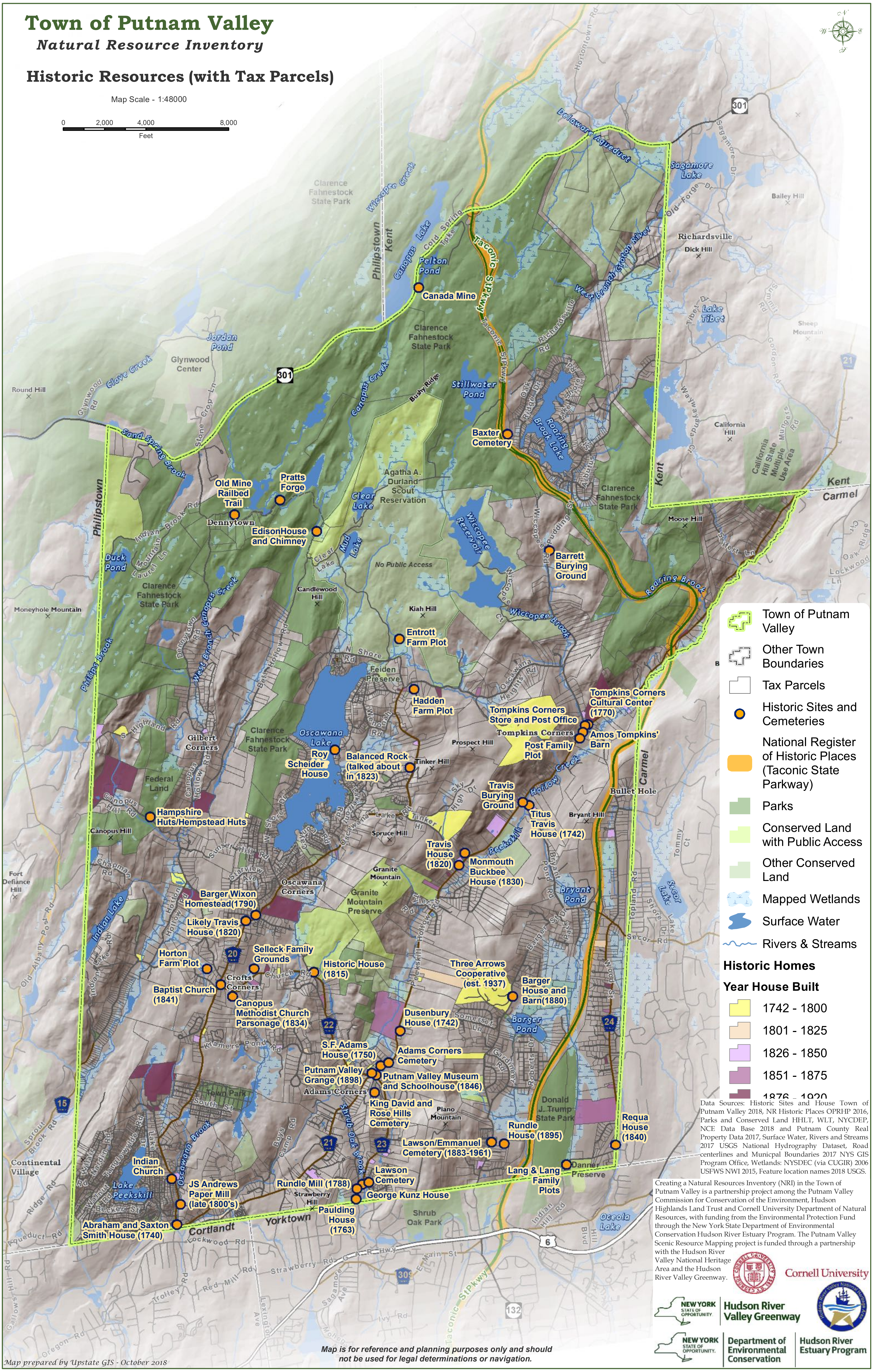
Cornell University

NEW YORK STATE OF OPPORTUNITY. Hudson River Valley Greenway

NEW YORK STATE OF OPPORTUNITY. Department of Environmental Conservation | Hudson River Estuary Program

Map is for reference and planning purposes only and should not be used for legal determinations or navigation.

Map prepared by Upstate GIS - October 2018



Town of Putnam Valley
Natural Resource Inventory
Historic Resources (with Tax Parcels)
Map Scale - 1:48000
0 2,000 4,000 8,000
Feet
Town of Putnam Valley
Other Town Boundaries
Tax Parcels
Historic Sites and Cemeteries
National Register of Historic Places (Taconic State Parkway)
Parks
Conserved Land with Public Access
Other Conserved Land
Mapped Wetlands
Surface Water
Rivers & Streams
Historic Homes
Year House Built
1742 - 1800
1801 - 1825
1826 - 1850
1851 - 1875
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Canada Mine
Baxter Cemetery
Old Mine Railbed Trail
Pratts Forge
EdisonHouse and Chimney
Barrett Burying Ground
Entrott Farm Plot
Hadden Farm Plot
Tompkins Corners Cultural Center (1770)
Tompkins Corners Store and Post Office
Amos Tompkins' Barn
Post Family Plot
Roy Scheider House
Balanced Rock (talked about in 1823)
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Titus Travis House (1742)
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Lang & Lang Family Plots
Lawson Cemetery
Rundle Mill (1788)
George Kunz House
Paulding House (1763)
Indian Church
JS Andrews Paper Mill (late 1800's)
Abraham and Saxton Smith House (1740)
Philipstown
Kent
Carmel
Cortlandt
Yorktown
Oscawana Lake
Roaring Brook Lake
Wiccopee Reservoir
Canopus Lake
Clarence Fahnestock State Park
Tompkins Corners
Adams Corners
Oscawana Corners
Crofts Corners
Gilbert Corners
Dennytown
Richardsville
Taconic StPkwy
Data Sources: Historic Sites and House Town of Putnam Valley 2018, NR Historic Places OPRHP 2016, Parks and Conserved Land HHLT, WLT, NYCDEP, NCE Data Base 2018 and Putnam County Real Property Data 2017, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature location names 2018 USGS.
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Cornell University
Hudson River Valley Greenway
Department of Environmental Conservation
Hudson River Estuary Program
Map is for reference and planning purposes only and should not be used for legal determinations or navigation.
Map prepared by Upstate GIS - October 2018

Scenic Resources

Anyone who spends time in Putnam Valley can see that the landscape is lovely. The 2007 Town Comprehensive Plan affirms "Wetlands, heavily forested areas, numerous creeks, streams, and lakes, and varying topography with prominent ridgelines and rural roads all contribute to the Town's scenic beauty." These visual resources create an important backdrop for tourism and home ownership that is critical to the economy of the Town. Haeckel and Heady[1] explain "preserving the integrity of scenic vistas requires consideration of both scenic views and the areas visible from them, which together comprise 'the viewshed.' Identifying the full suite of scenic resources is the first step toward assessing potential impacts from development and determining strategies for protection."[1] This **Scenic Resources** map and the narrative are Putnam Valley's first step in ensuring that this valuable resource endures.

Scenic Outdoor Destinations in Putnam Valley

The retreating glaciers of the last ice age and other geological forces (see **Bedrock Geology**) have shaped the landscape of Putnam Valley, including the shearing of hills to expose springs such as Bryant Pond, and leaving behind glacial deposits of stone and magnificent large boulders.

The scenic resources that are revered by residents as well as visitors to Putnam Valley are numerous. See the **Conservation and Public Lands and Recreational Resources** section of the NRI for more information about use of and access to some of these scenic areas.

Significant scenic resources identified through public input are described below, tabulated (Table 1) and displayed on the **Scenic Resources** map. Note that some of the identified resources are marked as "private" and there is either no access allowed or landowner permission may be needed to access those areas. (See **Methodology: Creating the Scenic Resources Map** below for a detailed description of how the **Scenic Resources** map was created.)

Fahnestock State Park is a 14,000-acre park located in Putnam and Dutchess Counties. The park offers hiking trails with magnificent scenic views of surrounding mountain ridges. In June, the mountain laurel in bloom enhances the area. Canopus Beach offers rowboat rentals, fishing, and swimming at Canopus Lake in the summer. There are campsites available, and numerous trails for hiking enthusiasts. Hikers northbound on the scenic Appalachian Trail enter Putnam Valley in the Indian Lake and Canopus Hill areas, traverse the State Park, and then cross into Dutchess County. Pelton Pond features picnic facilities and a 1.5-mile nature trail around the pond. Fahnestock Winter Park, open when there is sufficient snow, has slopes for sledding along with groomed trails for cross-country skiing and snowshoeing. The Taconic Outdoor Education Center, offers school, scout, and community groups a comfortable, yet rustic setting for environmental education programs and outdoor science field trips.

Sunken Mine Road and area is located within Fahnestock State Park. Iron was mined for Civil War cannons, steamship boilers, and the first locomotive built in the United States. A few mines were located nearby, like the Hamilton Mine. Five massive mine shafts comprise the 1,000-foot long and 300-foot deep mine. The hikes to the mines can be dangerous and may disturb vulnerable species of conservation concern; please heed all "No Trespassing" signs.

Sunken Mine Road, an unpaved road that traverses the area, is a four-mile hike that runs north from Oscawana Lake to Dennytown Road. This scenic area includes western views of Putnam Valley mountains and ridgelines from the top of Candlewood Hill. A few foundations and chimneys remain of

once-occupied homes. Remnants of a home belonging to Thomas Edison can be found along the east side of Sunk Mine Road.

Putnam Valley Town Park includes hiking trails, lighted tennis courts, lighted multi-purpose fields for baseball and softball, a roller hockey rink, horseshoe pits, and a pavilion with picnic tables.

Oscawana Lake is a private lake of 386 acres, fed by a stream from the north end and draining through a stream at the middle of its eastern shore. It is located between two prominent ridgelines. Local residents with access can enjoy boating, swimming and fishing.

Lake Peekskill is a reservoir originally called Lower Cranberry Pond before being dammed and developed in the 1920s with summer cottages sold to New York City residents. Most residents are now year-round inhabitants. Swimming, fishing, and small boating are enjoyed here. There are three private beaches on the lake: North Beach, Singers Beach, and Carraras Beach.

Roaring Brook Lake is a private, human-constructed lake created in the 1940s when woodlands were flooded, and a dam was built. A second, larger dam was built behind the first dam in 1960.

Stone Chambers are scattered throughout Putnam Valley, and some estimate there are more than 200 in existence. The origin of these chambers is an unsolved mystery although theories abound. Regardless of their origins, they have been used by local farmers to store of crops and ice since the 19th century. Many are of similar construction, with a stone corbel placed over the open doorway, although sizes vary. Many of these chambers are aligned with equinox and solstice sunrises, promoting speculation that chambers had spiritual significance. Although similar stone structures exist in Connecticut, Vermont and New Hampshire, the highest concentration of stone chambers lies in Putnam County.

Methodology: Creating the Scenic Resources Map

The **Scenic Resources** map is a product of the Putnam Valley Scenic Resources Mapping project, coordinated by Hudson Highlands Land Trust (HHLT) working with the NYSDEC Hudson River Estuary Program and contracted services provided by Upstate GIS. The project was funded through a partnership with the Hudson River Valley National Heritage Area and the Hudson River Valley Greenway. Participation from the residents of Putnam Valley was critical in determining the relative value of the Town's scenery, identifying significant scenic resources and providing the basis for the methods and analysis used to develop the **Scenic Resources** map. The steps taken to develop the map are described below:

First, "significant scenic resources" in Putnam Valley were identified using public input gathered by HHLT and the Putnam Valley CCE in two public workshops using facilitated, hands-on scenic mapping activities. In addition, an online web map allowing for point identification, comments and photo upload from online users was made available. Community outreach in support of this effort included posts on the HHLT and CCE webpages, announcements at Town Board meetings and public workshops, distribution of flyers and social media posts.

Next, from the information gathered from the public workshops, the online web map, and other existing available information, 10 "high value scenic areas"(defined as public and private lands that include features recognized, visited or viewed and enjoyed by the community for their inherent visual qualities) were identified:

- Appalachian Trail

- Bryant Pond Road/views of Tinker Hill and Prospect Hill
- Candlewood Hill/Oscawana Lake
- Granite Mountain Preserve
- Horton Hollow Road
- Lake Peekskill
- Peekskill Hollow Road
- Rose Hill Memorial Park
- Sunken Mine Road
- Town Park

Next, viewshed analyses were conducted for the above identified 10 "high value scenic areas" to determine the predicted visibility for each and to help determine publicly accessible places or view spots from which these high value scenic resources can be viewed. For "high value scenic areas" to be mapped as scenic resources they must be visible from the public domain (i.e., roads, public parks and preserves). Given the number of "significant scenic resources" identified along Sunken Mine Road and Peekskill Hollow Road, these two resources were included in the **Scenic Resources** map as "Scenic Roads" and appropriately illustrated as such.

Finally, using all collected information described above, the **Scenic Resources** map was created. The following items describe the symbols in the **Scenic Resources** map legend and how they should be interpreted.

a. High Scenic Area Viewing Spot (Star): All of these locations are publicly accessible viewing spots from which at least one of the "high value scenic areas" identified through the process outlined above can be seen.
b. Scenic Locations (Purple Circle): View Spots at Map Location #'s 14, 22, 24, 25, 28, 29 (also a scenic area), 31 and 32; Scenic Areas at Map Location #'s 13, 14 and 33; Scenic Road View Spots at Map Location #'s 38 and 40; Scenic Road Scenic Areas at Map Location #'s 34, 35, 37, 39, 41 and 42; Notable Scenic Locations View Spots at Map Location #'s 50, 51, 53, 54, 55 and 56; Notable Scenic Locations Scenic Areas at Map Location #'s 4, 44, 45, 46, 47 and 52.
c. Viewable Scenic Area-Private-No Public Access ("No" Symbol or Circle-Backslash): Scenic Areas at Map Location #'s 11, 12, 16 - 21, 23, 26, 27 and 30; Scenic Road View Spot at Map Location # 36; Notable Scenic Location Scenic Areas at Map Location #'s 48 and 49; Oscawana Lake Road Scenic Area at Map Location # 57.
d. Scenic View/Area - Partial Public Access (Red Circle): Scenic Areas at Map Location #'s 43 and 44. Map users are referred to the map narrative report (see Map Key) for more information about these locations.
e. Scenic Road (Pink Line): Two roads were identified as scenic (Sunken Mine Road and Peekskill Hollow Road).
f. Composite Visibility Results: The **Scenic Resources** map also includes the Composite Visibility Results from the viewshed analyses done on the 10 "high value scenic areas", thus showing visibility of scenic areas from multiple locations.

NOTE: As stated above, points identifying publicly accessible viewing spots and private or public scenic view areas for 8 of the 10 "high value scenic areas" are shown on the **Scenic Resources** map. The other two identified "high value scenic areas", Peekskill Hollow Road

and Sunk Mine Road, were given the "Scenic Road" designation on the map because of the number of significant scenic resources reported along both these roads. View spots and scenic areas that did not fall into one of the 10 "high value scenic areas" were given the Scenic Resource Area category of "Notable Scenic Location".

Map Key

The Map Key was created to accompany the **Scenic Resources** map showing:

a. Map Location # for finding each publicly identified location[2] on the Scenic Resources map
b. which Scenic Resource Area the publicly identified location falls within (unless the location was identified as a stand-alone spot or area in which case it went into the "Notable Scenic Location" Scenic Resource Area category (see NOTE above))
c. the Location Name for the location given by the public
d. whether the location was publicly identified as a view spot (VS) or a scenic area (SA)
e. whether the location was identified as public or private, and
f. any public input or comment given about the location.

Key to Putnam Valley NRI Scenic Resources Map with Public Input (Map Key)

Map Location #	Scenic Resource Area (SR= Scenic Road)	Location Name	Scenic Area (SA) or Viewing Spot (VS)	Location Public or Private	Input of Putnam Valley Residents
1	Candlewood Hill/Oscawana Lake	Candlewood Hill	VS	Public	- trail leads to gazebo on Candlewood Hill along/beyond red trail - view of Oscawana Lake (private) - view of Kiah Hill (private)
2	Candlewood Hill/Oscawana Lake	Candlewood Hill	VS	Public	- gazebo - trail off Sunken Mine Road - scenic views
3	Bryant Pond Road	Bryant Pond Road	VS	Public	- views of mountainside - historic barn - views of Prospect Hill (private) and Tinker Hill (private)
4	Granite Mountain Preserve	Granite Mountain Preserve (*not-for-profit org, open to public*)	VS	Public	- southeastern views of trees, rolling hills and mountain
5	Granite Mountain Preserve	Granite Mountain Preserve, rocky ledge for viewing areas	VS	Public	-viewed from #4
6	Horton Hollow Road	Horton Hollow Road	VS	Public	- beaver dam - waterfall - stream
7	Lake Peekskill	Bridge at Lake Peekskill	VS	Public	- sunsets - views of entire lake (private)
8	Town Park	PV Town Park trail spot on hill View of wetland and stream	VS	Public	- view of wetlands (private) - nesting owls, herons
9	Rose Hill Memorial Park	View from Rose Hill Cemetery (*not-for-profit org.)*	VS	Public	- view of #29 (PV Elementary School) - trees, forest
10	Appalachian Trail	Appalachian Trail	VS	Public	- northeastern view
11	Candlewood Hill/Oscawana Lake	Oscawana Lake	SA	Private	- Oscawana Lake viewed from Candlewood Hill
12	Candlewood Hill/Oscawana Lake	Kiah Hill	SA	Private	- Kiah Hill (private) - as viewed from Candlewood Hill - Kiah Hill ((private)is within Boy Scout Camp (private)
13	Candlewood Hill/Oscawana Lake	Candlewood Hill View; ridge to the west	SA	Public	- Fahnestock
14	Candlewood Hill/Oscawana Lake	Trail in Fahnestock Park	VS	Public	- views of Hudson and western and northern hills
15	Candlewood Hill/Oscawana Lake	Trail in the woods	SA	Public	Trail with scenic interest
16	Candlewood Hill/Oscawana Lake	Highest Point in Lake Oscawana viewshed	SA	Private	- views of hills around Lake Oscawana (private)
17	Candlewood Hill/Oscawana Lake	Piano Mountain	SA	Private	- views beyond Oscawana Lake (private) (in Candlewood viewshed)
18	Bryant Pond Road	Views from Bryant Pond Road	SA	Private	- view from Bryant Pond Road viewpoint (#3)
19	Bryant Pond	Tinker Hill	SA	Private	- view from the Bryant Pont Road viewpoint (#3)
20	Bryant Pond Road	Historic red barn/Bryant Pond Road	SA	Private	- historic barn (private), viewable from road (#3)
21	Horton Hollow Road	Horton Hollow Brook	SA	Public	- beaver dam - scenic stream
22	Lake Peekskill	Tanglewyede Road & Travers Road Lake Peekskill	VS	Public	- view to Lake Peekskill (private) - public road
23	Lake Peekskill	Scenic area/private lake	SA	Private	-view of Lake Peekskill (private) from #22
24	Lake Peekskill	Viewspot from Lake Drive	VS	Public	-view of #23 from #24
25	Lake Peekskill	North Beach	VS	Public	-see view Lake Peekskill (private)

Map Location #	Scenic Resource Area (SR= Scenic Road)	Location Name	Scenic Area (SA) or Viewing Spot (VS)	Location Public or Private	Input of Putnam Valley Residents
26	Town Park	Wetland behind Town Park	SA	Private	- large wetlands (private) behind Town Park
27	Town Park	View from #8	SA	Private	- view above wetland (private) with nesting owls, herons
28	Rose Hill Memorial Park	View from King David Cemetery	VS	Public	- view of #30 (private) -Sunrise Drive, mountain ridge
29	Rose Hill Memorial Park	PV Elementary Public School (historic)	SA & VS	Public	- viewed from #9 (Rose Hill Memorial Park) - top of school provides view of #9 and # 8 mountains, trees in bloom & foliage
30	Rose Hill Memorial Park	Sunrise Drive	SA	Private	- viewed from #28 (Rose Hill Memorial Park/King David Cemetery)
31	Rose Hill Memorial Park	Adams Corners Cemetery	VS	Public	- view of ridgelines - forest - cemeteries - Rose Hills Cemetery
32	Appalachian Trail (AT)	Appalachian Trail	VS	Public	- Dennytown Road access to Appalachian Trail, all scenic
33	Appalachian Trail	Canopus Hill Road access to AT/Federal Land	SA	Public	- historic area - Hempstead Huts - Continental Army camped there
34	Peekskill Hollow Road (SR)	Travis Cemetery	SA	Public	- Travis Cemetery-Peekskill Hollow & Bryant Pond Road
35	Peekskill Hollow Road (SR)	Adams Corners Cemetery	SA	Public	- Adams Corners Cemetery - north of Mill Street on Peekskill Hollow Road
36	Peekskill Hollow Road (SR)	Peekskill Hollow Creek	VS	Private	- fir trees - flats and rapids - scenic view
37	Sunken Mine Road (SR)	Sunken Mine Road	SA	Public	- Sunken Mine Road - hemlock stands - wetlands
38	Sunken Mine Road (SR)	Sunken Mine Road viewpoint Fahnestock Park	VS	Public	- views of Mud Lake and Clear Lake
39	Sunken Mine Road (SR)	Sunken Mine	SA	Public	- Sunken Mine and other mines (iron mines) - parking area on Dennytown Road - along Sunken Mine Road or Three Lakes Trailhead
40	Sunken Mine Road (SR)	Sunken Mine Road Fahnestock Park	VS	Public	- scenic views (identified multiple times) of pond - wildlife: Beaver dams, John Adams pond
41	Sunken Mine Road (SR)	Entrance to Sunken Mine Road (western)	SA	Public	- Sunken Mine scenic hiking road, map whole road as scenic - Fahnestock southern end
42	Sunken Mine Road (SR)	Entrance to Sunken Mine Road (eastern)	SA	Public	- Sunken Mine scenic hiking road - Fahnestock southeast
43	Notable Scenic Location	Oscawana Creek watershed	SA	Public & Private	- Oscawana Creek watershed - public and (private) Land - important viewshed - Oscawana Lake to Oregon Corners
44	Notable Scenic Location	Bridle Trail	SA	Public & Private	- Bridle Trail - historic areas - lean-to - scenic areas - stone walls - in Fahnestock Park and private road
45	Notable Scenic Location	Fahnestock State Park campground	SA	Public	- Fahnestock State Park Campground and Pelton Pond - along Route 301 - hike, ski to Stillwater Lake; mines
46	Notable Scenic Location	Richardsville Road	SA	Public	- Richardsville Road - scenic hike along road - Fahnestock, *aka* Dicktown Road
47	Notable Scenic Location	Baxter Cemetery	SA	Public	-Baxter Cemetery - along Roaring Brook and Taconic - Baxter family - Oak Ridge Street
48	Notable Scenic Location	Lawsonville Cemetery	SA	Private	- Lawsonville Cemetery (private) - east of Barger Street
49	Notable Scenic Location	Barger Farm	SA	Private	-Three Arrows historic barn -- Barger Farm - along Barger Pond - private - visible from road

Map Location #	Scenic Resource Area (SR= Scenic Road)	Location Name	Scenic Area (SA) or Viewing Spot (VS)	Location Public or Private	Input of Putnam Valley Residents
50	Notable Scenic Location	Tompkins Corners	VS	Public	- store - stables - church
51	Notable Scenic Location	Chapman Road	VS	Public	- wetlands - hollow - northeast and southwest views
52	Notable Scenic Location	Pelton Pond -- part of Fahnestock	SA	Public	- picnic areas -small lake - beavers!!
53	Notable Scenic Location	Viewing spot from Ridge Crest Road	VS	Public	- western views, sunsets
54	Notable Scenic Location	Indian Brook Road	VS	Public	- great spot with dirt road and hilltop open field views
55	Notable Scenic Location	Duck Pond Taconic Outdoor Center	VS	Public	- beautiful in all seasons
56	Notable Scenic Location	Sunset Hill Road	VS	Public	- western views
57	Oscawana Lake Road	S.E. side of Oscawana Lake Road below T	SA	Private	

Town of Putnam Valley

Natural Resource Inventory

Scenic Resources

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Town of Putnam Valley

Other Town Boundaries

Parks

Conserved Land with Public Access

Other Conserved Land*

Appalachian Trail

Mapped Wetlands

Surface Water

Rivers & Streams

Publicly Identified Scenic Resources

High Scenic Area Viewing Spot

Scenic Locations

Viewable Scenic Area – Private - No Public Access

Scenic View/Area Partial Public Access - see accompanying report

Scenic Road

Composite Visibility Results

Visible from multiple locations

Visible from at least one location

*Preserves and Other Conserved Land may have zero, limited or pending public access. See report accompanying this map.

Data Sources: Scenic Locations Public Workshops and Online Map 2018, Visibility Analysis Upstate GIS 2018, Parks and Conserved Land HHLT, WLT, NYCDEP, NCE Data Base 2018 and Putnam County Real Property Data 2017, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature location names 2018 USGS.

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Town of Putnam Valley

Natural Resource Inventory

Scenic Resources (with Tax Parcels)

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Legend

- Town of Putnam Valley
- Other Town Boundaries
- Tax Parcels
- Parks
- Conserved Land with Public Access
- Other Conserved Land*
- Appalachian Trail
- Mapped Wetlands
- Surface Water
- Rivers & Streams

Publicly Identified Scenic Resources

- High Scenic Area Viewing Spot
- Scenic Locations
- Viewable Scenic Area – Private - No Public Access
- Scenic View/Area Partial Public Access - see accompanying report
- Scenic Road

Composite Visibility Results

- Visible from multiple locations
- Visible from at least one location

*Preserved and other Conserved Land may have zero, limited or pending public access. See report accompanying this map.

Data Sources: Scenic Locations Public Workshops and Online Map 2018, Visibility Analysis Upstate GIS 2018, Parks and Conserved Land HHLT, WLT, NYCDEP, NCE Data Base 2018 and Putnam County Real Property Data 2017, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature location names 2018 USGS.

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Conservation and Public Lands and Recreation Resources

Putnam Valley features expansive forests and numerous lakes and streams. Town residents and visitors have access to many of these natural treasures through a large network of parks, public lands, and other conserved properties in Town, ranging from the Town Park to federal lands along the Appalachian Trail. Popular outdoor recreational activities include hiking, camping, fishing, and hunting, and the **Conservation and Public Lands and Recreation Resources** map indicates where outdoor enthusiasts can enjoy those various pastimes.

Conserved lands provide numerous benefits to communities. They lead to improved water and air quality and an enhanced quality of life for residents by providing places to recreate and observe nature. Conserved lands protect important habitats while helping manage stormwater runoff and providing protection to lessen the impacts of severe flood events (see the **Streams and Watersheds** maps. Land may be conserved in Putnam Valley through voluntary conservation easements in which land remains privately owned but is protected through easements held by local land trusts, or through direct land acquisition by government or conservation organizations.

Some public land managers require permits, in most cases free, for recreation activities. Some permits are available online, others by mail, and yet others in person only. On all properties where fishing and hunting are permitted, a person must have, in addition to that particular property's required documents, any licenses and permits required by New York State or the federal government (i.e., Federal Duck Stamps for waterfowl hunting). Table 1 below summarizes the properties depicted on the **Conservation and Public Lands and Recreation Resources** maps that allow hiking, fishing, camping and/or hunting. The asterisks denote that a permit must be acquired from the managing agency. Table 2 offers the contact information for the managing agencies of lands allowing public access for recreational purposes.

Examples of required permits and how they can best be acquired are:

Deer hunting and spring turkey hunting at Fahnestock Park is permissible with a free permit acquired in person while showing valid state hunting licenses and permits at the park headquarters at 1498 Rt. 301, Carmel, NY 10512; a required weekly or seasonal paid permit for non-motorized boats on Stillwater and John Allen ponds are available at the same headquarters.

- Reservations for campsites at Fahnestock Park must be made online at https://newyorkstateparks.reserveamerica.com;
- Hunting and hiking where permitted on New York City Department of Environmental Protection lands require a free NYC Water Supply Lands Access Permit, obtainable online at https://a826-web01.nyc.gov/recpermitapp/;
- Primitive camping at the California Hill State Multiple Use Area for more than three nights requires a permit from the New York State Department of Environmental Conservation's Region 3 Division of Lands & Forests, telephone 845-256-3076.

Although the map and this accompanying report attempt to clarify the properties available for public recreation and the requirements the public must meet, anyone interested in those opportunities is responsible for contacting the managing agency to become familiar with all governing rules and

regulations, including how to acquire necessary permits. Any property not designated in Table 1 and on the **Conservation and Public Lands and Recreation Resources** map as a park or conserved land with public access should be assumed to be privately owned, requiring the permission of the landowner for access.

Recreationists interested in enjoying the publicly accessible natural areas in Putnam Valley can find benefit from the Hudson Valley Natural Resource Mapper, a user-friendly, interactive mapping tool.

Table 1: Properties Open to Public Access

Parcel	Access Locations	Ownership/ Management	Permissible Activities
Agatha A. Durland Scout Reservation (northern portion only, as shown on map)	Sunken Mine Rd.	Westchester-Putnam Council of the Boy Scouts of America	Hiking
Appalachian National Scenic Trail	S. Highland Rd., Rte 301, Dennytown Rd., Sunken Mine Rd.	Appalachian Trail Conservancy	Hiking
Clarence Fahnestock State Park	Sunken Mine Rd., Dennytown Rd, Indian Brook Rd, Pudding St, Taconic State Pkwy (Stillwater Pond)	New York State Office of Parks, Recreation and Historic Preservation (NYS OPRHP)	Hiking, Fishing*, Hunting*, Camping*, Boating*
California Hill State Multiple Use Area	Peekskill Hollow Rd., Gordon Rd, Waywayanda Ct.	New York State Dept. of Environmental Conservation (NYSDEC)	Hiking, Fishing, Hunting, Camping*
Danner Family Preserve	Indian Hill Rd.	Putnam County Land Trust (PCLT)	Hiking
DEP Unit 130	Rte 301	New York City Dept. of Environmental Protection (NYC DEP)	Hiking*
DEP Unit 134	Richardsville Rd.	NYC DEP	Hiking*, Hunting*
DEP Unit 190	Rte 301	NYC DEP	Hiking*, Hunting*
DEP Unit 256	Rte 301	NYC DEP	Hiking*, Hunting*
Donald J. Trump State Park	Indian Hill Rd	NYS OPRHP	Hiking
Feiden Oscawanna Preserve	Silleck Blvd	PCLT	Hiking
Granite Mountain Preserve	Peekskill Hollow Rd	Hudson Highlands Land Trust (HHLT)	Hiking
Koestner Preserve	White Rd (end)	PCLT	Fishing access to Peekskill Hollow Creek
Putnam Valley Town Park	156 Oscawana Lake Rd	Putnam Valley Dept. of Parks & Recreation	Hiking
Pudding Street Pond	Pudding St	NYSDEC	Fishing

* Requires permit from the ownership/management agency

Table 2. Contacts for More Information and Required Permits

Appalachian Trail Conservancy 799 Washington Street Harpers Ferry, WV 25425-0807	Telephone: 304-535-6331 Email: info@appalachiantrail.org, Website: appalachiantrail.org/home/
Hudson Highlands Land Trust P.O. Box 226 Garrison, NY 10524	Telephone: 845-424-3358 Email: info@hhlt.org, Website: hhlt.org/
New York City Department of Environmental Protection 71 Smith Avenue, Kingston, NY 12401	Telephone: 800-575-5263 Email: Recreation@dep.nyc.gov Website: nyc.gov/html/dep/html/recreation/index.shtml
New York State Department of Environmental Conservation Region 3, Division of Lands & Forests 21 South Putt Corners Road New Paltz, NY 12561	Telephone: 845-256-3076 Email: R3admin@dec.ny.gov Website: dec.ny.gov/about/607.html
New York State Office of Parks, Recreation and Historic Preservation Taconic Region PO Box 308, Staatsburg, NY 12580 **For Clarence Fahnestock State Park**, contact Park Headquarters, 1498 Route 301, Carmel, NY 10512 **For Donald J. Trump State Park**, contact FDR State Park, 2957 Crompond Road, Yorktown Heights, NY 10598,	Telephone: 845-889-4100 Website: (For general information): parks.ny.gov/regions/taconic/default.aspx Telephone: 845-225-7207 Telephone: 914-245-4434
Putnam County Land Trust P.O. Box 36, Brewster, NY 10509	Telephone: 845-278-2808 Email: info@pclt.net, Website: pclt.net/
Putnam Valley Department of Parks & Recreation 265 Oscawana Lake Road Putnam Valley, NY 10579	Telephone: 845-526-3292 Email: fdimarco@putnamvalley.com Website: pvpr.com
Westchester-Putnam Council of the Boy Scouts of America 41 Saw Mill River Road Hawthorne, NY 10532	Telephone: 914-773-1135 Email: richard.stockton@scouting.org Website: wpcbsa.org/

Town of Putnam Valley

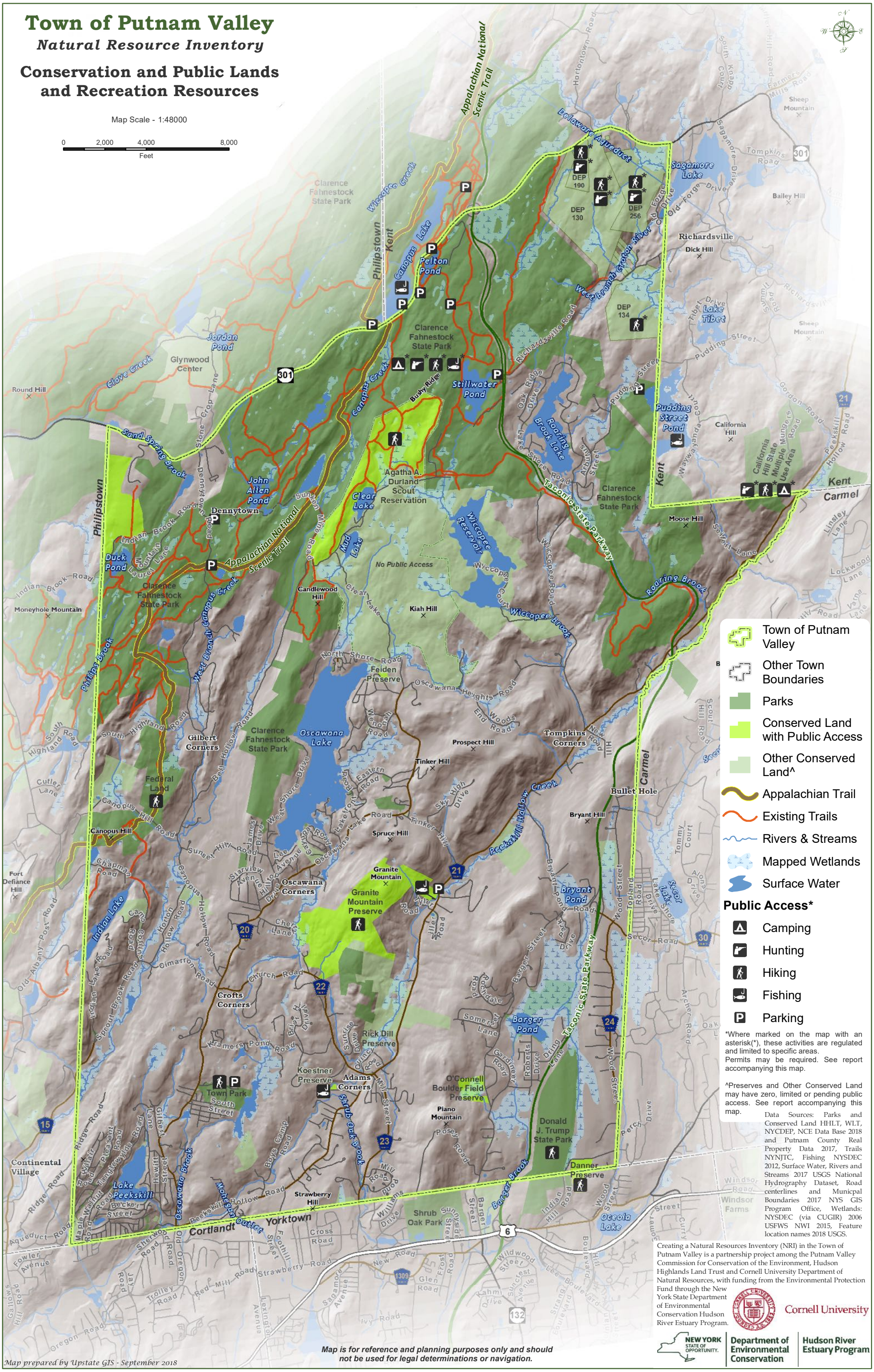
Natural Resource Inventory

Conservation and Public Lands and Recreation Resources

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet



- Town of Putnam Valley
- Other Town Boundaries
- Parks
- Conserved Land with Public Access
- Other Conserved Land^
- Appalachian Trail
- Existing Trails
- Rivers & Streams
- Mapped Wetlands
- Surface Water

Public Access*

- Camping
- Hunting
- Hiking
- Fishing
- Parking

*Where marked on the map with an asterisk(*), these activities are regulated and limited to specific areas.
Permits may be required. See report accompanying this map.

^Preserves and Other Conserved Land may have zero, limited or pending public access. See report accompanying this map.

Data Sources: Parks and Conserved Land HHLT, WLT, NYCDEP, NCE Data Base 2018 and Putnam County Real Property Data 2017, Trails NYNJTC, Fishing NYSDEC 2012, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature location names 2018 USGS.

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Town of Putnam Valley

Natural Resource Inventory

Conservation and Public Lands and Recreation Resources (with Tax Parcels)

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Town of Putnam Valley

Other Town Boundaries

Tax Parcels

Parks

Conserved Land with Public Access

Other Conserved Land^

Appalachian Trail

Existing Trails

Rivers & Streams

Mapped Wetlands

Surface Water

Public Access*

Camping

Hunting

Hiking

Fishing

Parking

*Where marked on the map with an asterisk(*), these activities are regulated and limited to specific areas.
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VII. CURRENT LAND USE

Zoning

Putnam Valley is divided into several zoning districts as illustrated in the **Zoning** map. The following brief descriptions of each zoning district are summarized from Chapter 165, Zoning, of the Town Code that was adopted in 1995[1,2].

Preservation District (PD) (Town Code Sec. 165-11)

The Preservation (PD) Zoning District encompasses lands that are publicly owned, owned by a quasi-public entity, or are tax exempt. The PD zone is primarily used for permanent open space purposes or low-intensity recreational purposes. The PD zones are generally located in the northern half of Town and encompass all of Fahnestock State Park.

Conservation District (CD) (Town Code Sec. 165-12.A.)

The purpose of the Conservation (CD) Zoning District is to provide for single-family residences while maintaining substantial areas of open space and protecting environmental resources and various ecological features. In addition to single-family development, a variety of community-based facilities, recreational uses, and low impact commercial uses are permitted. The CD zones generally buffer the PD zoned areas from the residential zones.

Rural Residential Districts (R-1, R-2, R-3) (Town Code Section 165-12.B-D).

The Rural Residential Zoning districts allow for the creation of three-acre, two-acre, and one-acre lots. While the three-acre Zoning District is intended to encompass lands that are environmentally constrained, the one-acre zones tend to overlay existing densely populated areas. Although the intent of these districts is to provide for residential development, a variety of commercial and business-oriented uses are permitted by special use permit.

Lake Peekskill Residence District (LP) (Town Code Sec. 165-12.E.)

The Lake Peekskill (LP) Zoning District has the highest density and covers the areas surrounding Lake Peekskill. Although the creation of a lot in Lake Peekskill now requires at least two acres, the vast majority of the existing lots in this zone are closer to 0.5-acre in size.

Neighborhood Commercial (CN) (Town Code Sec. 165-13.A.)

The purpose of the Neighborhood Commercial (CN) Zoning District is to encourage the integration of small-scale shopping areas that provide limited services in small business districts. These areas are designed to serve the adjacent residential community, without competing with general commercial uses and services found in the CC-1 and CC-2 zones. There are a limited number of parcels currently zoned CN, which are located primarily at Adams Corners, Crofts Corners, Oscawana Corners, and Tompkins Corners.

Community Commercial-One (CC-1) (Town Code Sec. 165-13.B.)

The Community Commercial-One (CC-1) Zoning District provides a variety of highly regulated and intense commercial activities at Oregon Corners. CC-1 is designed to accommodate most retail and

service needs of the residents. The CC-1 District is intended to establish the commercial character of the Town through its balanced mixture of land uses, architecture, streets, environmental, and pedestrian orientation.

Community Commercial-Two (CC-2) (Town Code Sec. 165-13.C.)

The Community Commercial-Two (CC-2) Zoning District provides for a variety of commercial activities that are of moderate intensity in scale and traffic generation and are similar to, but more restricted than, uses allowed in the CC-1 zone. The uses permitted in this zone are to serve the convenience and needs of the greater Putnam Valley community and must be compatible with the residential character and environment of adjacent neighborhoods. The two areas currently zoned CC-2 are located along Morrissey Drive, leading up to Lake Peekskill, and the area around the intersection of Wood Street and Bryant Pond Road.

In addition, the Town of Putnam Valley has designated an Environmental Management District that is further subdivided into an overlay and two districts. These are not shown on the **Zoning** map but are described further in the cited sections of the Putnam Valley Town Code[3].

Wetlands and Watercourse Overlay (Town Code Sec. 165-24)

The purpose and intent of the Wetlands and Watercourses (W) Overlay District is to implement programs and policies of the Master Plan and Chapter 144, Freshwater Wetlands, of the Code of the Town of Putnam Valley, as they relate to preserving resources for flood protection, erosion control, wildlife habitat, pollution treatment, open space, groundwater and surface water quality, recreation and other benefits associated therewith.

Hillside Management District (Town Code Sec. 165-25)

The purpose and intent of the Hillside Management (HM) District is to implement the programs and policies of the Master Plan, as they relate to protecting designated ridgelines and steeply sloped areas from erosion and maintaining the natural character and amenity of hillsides and ridgelines as a scenic resource of the Town.

Ground and Surface Water Protection District (Sec. 165-26)

The protection of the Town's lakes, ponds, reservoirs, wetlands, streams, drinking water, and watershed areas from surface water and groundwater contamination is essential to the proper maintenance of the quality and quantity of water in the Town and surrounding communities. It is, therefore, necessary to protect these areas from development encroachment, erosion, and water pollution from surface or subsurface runoff.

References

[1] Code of the Town of Putnam Valley. § 165-6 Establishment of Zoning Districts. ecode360.com/9474829 .

[2] *Town of Putnam Valley, New York Comprehensive Plan and Generic Environmental Impact Statement (GEIS)*, 2007, pp. 1–111.

[3] Code of the Town of Putnam Valley. ecode360.com/.

Town of Putnam Valley

Natural Resource Inventory

Zoning (with Tax Parcels)

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Zoning Districts

- CC-1, Community Commercial 1
- CC-2, Community Commercial 2
- CC-3, Community Commercial 3
- HC, Highway Commercial
- NC, Neighborho... Commercial
- LP, Lake Peekskill Residential
- RR, Rural Residential
- CD, Conservation District
- PD, Preservation District
- Town of Putnam Valley
- Other Town Boundaries
- Tax Parcels
- Surface Water
- Rivers & Streams
- Designated Ridgelines

Ground and Surface Water Protection District

- Aquifer Protection Zone
- NYCDEP Watershed
- City Of Peekskill Watershed

Data Sources: Zoning Districts and Overlays The Chazen Companies 2007, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Feature location names 2018 USGS.

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Existing Land Use

The **Existing Land Use** map illustrates the existing land use of each parcel within the Town[1]. This map was generated using tax parcel information provided by Putnam County, based on county assessor classifications that may or may not have been verified through field observations. Second to undeveloped land, the dominant land use in the Town is residential, consisting of mainly single-family, detached residences. The majority of the protected lands in Putnam Valley, including Fahnestock State Park, are located in the northern half of the Town. Development has historically been focused in the southern sections of the Town and around Roaring Brook Lake, with higher residential densities occurring around Lake Peekskill and Lake Oscawana. Other high-density areas include Brookdale Gardens and Floradan Estates off Oscawana Lake Road, areas to the south of Barger Pond, and the Highfields development near the High School. With the exception of these higher density residential areas, the majority of the dwellings in Putnam Valley are located on relatively large lots, with significant amounts of open space, forested lands, and wetlands between them.

Oregon Corners, located at the southwestern corner of Town and extending into the Town of Cortlandt in Westchester County, is currently considered the Town's principal business area and provides a variety of small retail and service businesses.

Commercial uses are also found along Morrissey Drive at the entrance to Lake Peekskill, at the intersection of Bryant Pond Road and Wood Street off Lake Secor Road, and at several of the historic corners, including Adams Corners, Tompkins Corners, Oscawana Corners, and Crofts Corners.

References

[1] Town of Putnam Valley, New York Comprehensive Plan and Generic Environmental Impact Statement (GEIS), 2007, pp. 1–111.

Town of Putnam Valley

Natural Resource Inventory

Existing Land Use (with Tax Parcels)

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet

Town of Putnam Valley

Other Town Boundaries

Mapped Wetlands

Surface Water

Rivers & Streams

Land Use Class

Residential

Apartments

Commercial

Industrial

Recreation & Entertainment

Community Services

Public Services

Private Forest

State Forest and Conservation Land

Vacant*

Unclassified

Map does not reflect extent of all protected lands, including conservation easements.

Data Sources: Land Use Putnam County Parcels with NYS RPS data 2017, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature location names 2018 USGS.

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Agricultural District and Farmland Soils

As described in the text accompanying the **Soil Drainage Classes** maps, much of Putnam Valley's land is unsuitable for agriculture. *Prime farmland*, as defined by the US Department of Agriculture, is that which has the best combination of physical and chemical characteristics for producing food, feed, or forage: the nature of the soil (quality, texture, aeration, and pH); minimal slope of the land; available moisture and drainage; quantity and nature of rocks; and salt and sodium content all interact to produce land that holds promise as farmland[1].

The **Agricultural Districts and Farmland Soils** map illustrates three categories of farmland according to soil characteristics: *Prime Farmland Soil*, *Farmland Soil of Statewide Importance* and *Prime Farmland Soil if Drained*. The acreages for each category in Putnam Valley are shown in Table 1 below.

Table 1. Farmland Soils in Putnam Valley

Category	Acres	% of Total Acreage in PV
Prime Farmland	2,034	7.7
Prime Farmland of Statewide Importance	1,913	7.2
Prime Farmland Soil if Drained	9	< 1
Total Acreage	26,457	--

Thus 15% of the total acreage in Putnam Valley supports soils suitable for farmland, though much of that area is forested today. *Prime Farmland* represents the most suitable farmland soils, described previously. *Prime Farmland of Statewide Importance* is that which nearly meets the requirements for prime farmland and may produce as high a yield as prime farmland when conditions are favorable[1].

It should be noted that the majority of the parcels containing prime farmland soils are located in the southern portion of Town, the area of Town that is most densely populated. Given the limited availability of suitable farmland soils in the Town, future farmland potential should be considered for any parcel with prime farmland soils. Protecting existing or future farmable parcels could contribute to the Town's open space goals[2].

The largest present-day agricultural activity within the Town of Putnam Valley is horse boarding; however, other farm activities in Town include horticulture, Christmas tree farms, maple syrup farms, and a composting facility.

Putnam County Agricultural Districts are also displayed on the **Agricultural Districts and Farmland Soils** map. Enacted in 1971, New York's Agricultural Districts Law (ADL) is a very effective tool for maintaining lands in agriculture and ensuring New York's position as an outstanding agricultural state[3]. These Agricultural Districts have been designated on the basis of proposals from landowners. The land designated by Putnam County's Agricultural and Farmland Protection Board and the County Planning Board as an Agricultural District must be at least 250 acres in size and show viable farming activity[4]. Land owners of such properties "receive partial real property tax relief (agricultural assessment and special benefit assessments), and protections against overly restrictive local laws, government funded acquisition or construction projects, and private nuisance suits involving agricultural practices."[4]

Another form of tax relief available to landowners is the Agricultural Assessment Program.[2] Any owner of at least seven acres of land that produces a minimum of $10,000 annually, or any owner of fewer than seven acres of land that produces a minimum of $50,000 annually, on average, in the preceding two years from the sale of crops, livestock, or livestock products, is eligible to receive an agricultural assessment. This program allows land to be taxed on its agricultural assessment rather than fair market value.

Tax relief is an important issue for New York farmers. Farms need land to operate and property taxes on farmland are often a significant expense. At the same time, farmland tends to pay more in property tax than it requires in public services. "Cows and corn don't go to school." This saying reflects the fact that while farmland pays less in property taxes than residences do, it requires significantly less in public services. Cost of Community Services studies from around the country have demonstrated that farm and forest land generate a net property tax "profit" while houses generally cause a property tax "loss" (due to the high cost of their associated public services)[4]. Thus, having farmland in a community can help maintain a lower demand for public services and keep property taxes lower. By maintaining a balance of land uses and by focusing growth in areas with access to underutilized infrastructure, communities can promote fiscal efficiency, preserve farmland and open space, and avoid other costs of sprawl. Increasingly, state and local governments are recognizing that keeping farmland in production may help control the cost of providing community services[5].

Farms can provide both economic and ecological benefits to the communities in which they occur. Active farms contribute to the local economy through sales of agricultural products and job creation. The Putnam Valley Residents' Coalition sponsors a thriving Farmers Market each summer at the Tompkins Corners Cultural Center. Agricultural land provides wildlife with food, water, shelter, and space, promoting biodiversity. The floodplain management and carbon sequestration of these areas are important in light of changing **Climate Conditions**. As mentioned above, use of land for agricultural purposes limits sprawl and the impact sprawl has on property and school taxes and the demand on public services. Agricultural lands are considered open space, and a number of agricultural lands have been identified as some of Putnam Valley's **Scenic Resources**.

References

[1] *Soil Data Access (SDA) Prime and Other Important Farmlands*, NRCS USDA, nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcseprd1338623.html.

[2] *Town of Putnam Valley, New York Comprehensive Plan And Generic Environmental Impact Statement (GEIS)*, 2007, pp. 1–111.

[3] "Frequently Asked Questions Regarding Agricultural Districts." *New York's Agricultural Districts*, New York State Department of Agriculture and Markets, Nov. 2016, agriculture.ny.gov/ap/agservices/Agricultural_Districts_FAQ.pdf.

[4] "Farmer Benefits & Protections — Agricultural District Program." *Agriculture and Markets*, New York State, agriculture.ny.gov/ap/agservices/agdistricts.html.

[5] "Planning for Agriculture in New York: A Toolkit for Towns and Counties." *Protecting Farms in New York*, American Farmland Trust, 2011, farmlandinfo.org/sites/default/files/P4A_FINAL_lo_res_1-21-11_1.pdf.

Town of Putnam Valley

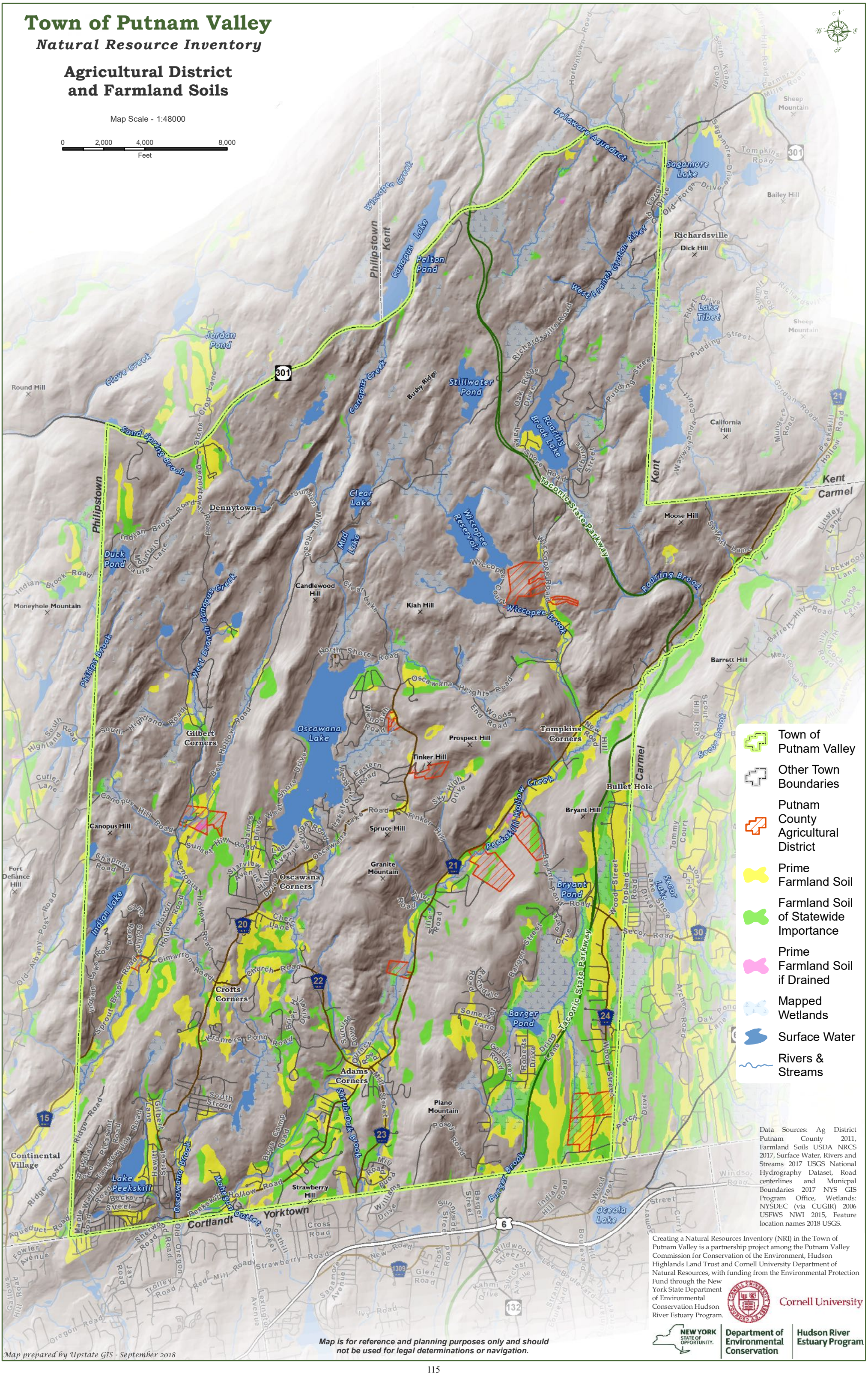
Natural Resource Inventory

Agricultural District and Farmland Soils

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet



Town of Putnam Valley

Other Town Boundaries

Putnam County Agricultural District

Prime Farmland Soil

Farmland Soil of Statewide Importance

Prime Farmland Soil if Drained

Mapped Wetlands

Surface Water

Rivers & Streams

Data Sources: Ag District Putnam County 2011, Farmland Soils USDA NRCS 2017, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature location names 2018 USGS.

Creating a Natural Resources Inventory (NRI) in the Town of Putnam Valley is a partnership project among the Putnam Valley Commission for Conservation of the Environment, Hudson Highlands Land Trust and Cornell University Department of Natural Resources, with funding from the Environmental Protection Fund through the New York State Department of Environmental Conservation Hudson River Estuary Program.

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Town of Putnam Valley

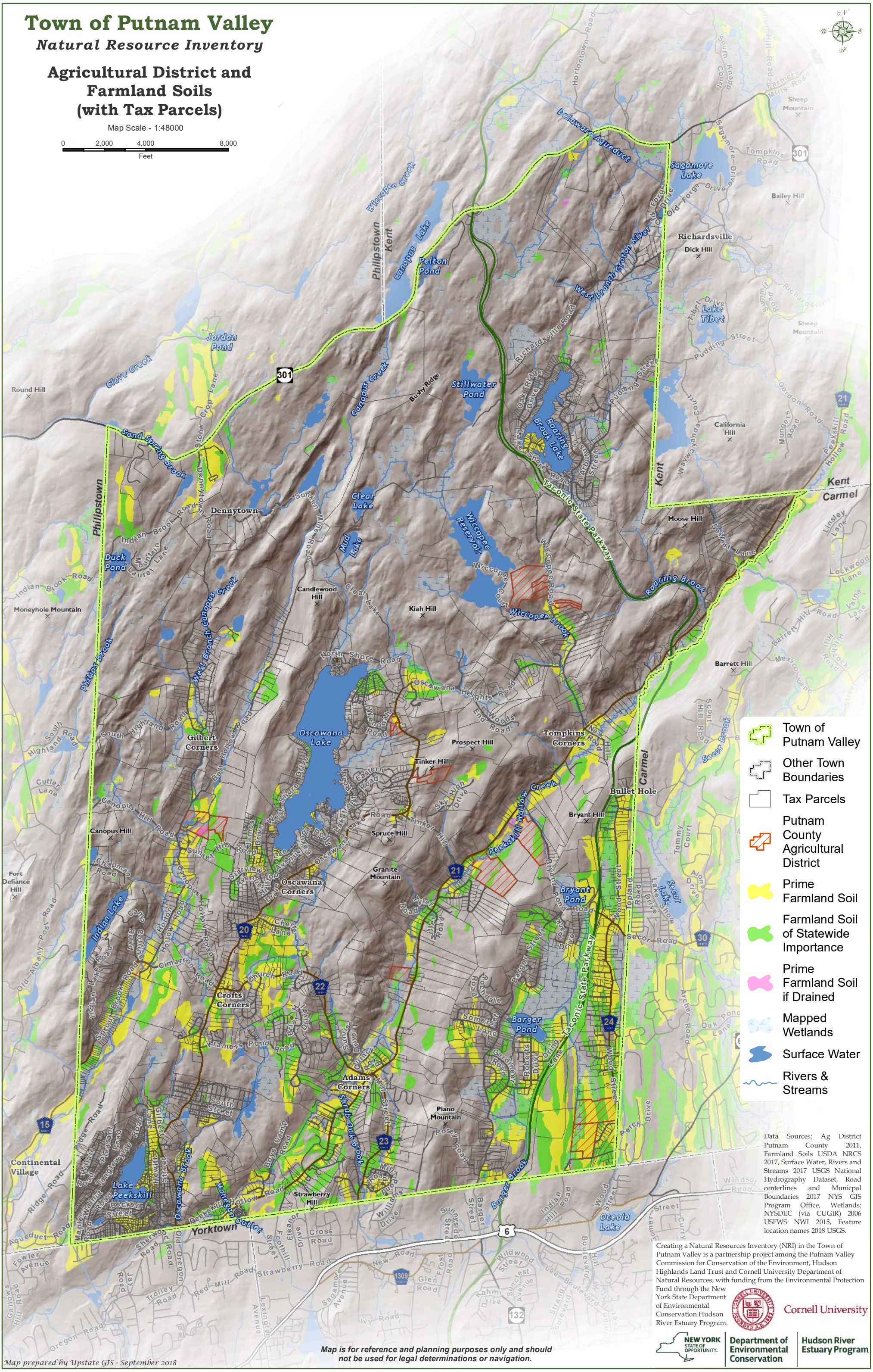
Natural Resource Inventory

Agricultural District and Farmland Soils (with Tax Parcels)

Map Scale - 1:48000

0 2,000 4,000 8,000

Feet



- Town of Putnam Valley
- Other Town Boundaries
- Tax Parcels
- Putnam County Agricultural District
- Prime Farmland Soil
- Farmland Soil of Statewide Importance
- Prime Farmland Soil if Drained
- Mapped Wetlands
- Surface Water
- Rivers & Streams

Data Sources: Ag District Putnam County 2011, Farmland Soils USDA NRCS 2017, Surface Water, Rivers and Streams 2017 USGS National Hydrography Dataset, Road centerlines and Municpal Boundaries 2017 NYS GIS Program Office, Wetlands: NYSDEC (via CUGIR) 2006 USFWS NWI 2015, Feature location names 2018 USGS.

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