



Natural Areas and Wildlife in Your Community

A Habitat Summary Prepared for the Town of Copake March 2014

This summary was completed to provide information for land-use planning and decision-making as requested by the Town of Copake. It identifies significant ecosystems in the town, including streams, forests, wetlands, and other natural areas with important biological values. This summary is based only on existing information available to the New York State Department of Environmental Conservation (DEC) and its partners, and, therefore should not be considered a complete inventory. Additional information about habitats in our region can be found in the *Wildlife and Habitat Conservation Framework* developed by the Hudson River Estuary Program (Penhollow et al. 2006) and in the *Biodiversity Assessment Manual for the Hudson River Estuary Corridor* developed by Hudsonia and published by NYSDEC (Kiviat and Stevens 2001).

Ecosystems of the estuary watershed—wetlands, forests, stream corridors, grasslands, and shrublands—are not only habitat for abundant fish and wildlife, but also support the estuary and provide many vital benefits to human communities. These ecosystems help to keep drinking water and air clean, moderate temperature, filter pollutants, and absorb floodwaters. They also provide opportunity for outdoor recreation and education, and create the scenery and sense of place that is unique to the Hudson Valley. Local land-use planning efforts are instrumental in balancing future development with protection of these resources. By conserving sufficient habitat to support the region’s astonishing diversity of plants and animals, communities can ensure that healthy, resilient ecosystems—and the benefits they provide—are available to future generations. For more information on local conservation approaches, see *Conserving Natural Areas and Wildlife in Your Community: Smart Growth Strategies for Protecting the Biological Diversity of New York’s Hudson River Valley* (Strong 2008).

To further support land-use and conservation planning efforts in the Town of Copake, this Natural Areas and Habitat Summary is supplemented by complementary Water Resource and Climate Resilience Summaries.



Cornell University

This document was created by the New York State Department of Environmental Conservation's Hudson River Estuary Program and Cornell University's Department of Natural Resources. The Estuary Program (<http://www.dec.ny.gov/lands/4920.html>) protects and improves the natural and scenic Hudson River watershed for all its residents. The program was created in 1987 and extends from the Troy dam to upper New York Harbor.

The Estuary Program is funded by the NYS Environmental Protection Fund. The Biodiversity Outreach Program was created in partnership with Cornell University to help Hudson Valley communities learn what plants, animals, and habitats are found locally; understand the value of these resources; and increase their capacity to identify, prioritize, and conserve important natural areas through informed decision-making.

Additional information about habitats and the state of habitats in the Hudson Valley can be found on DEC's webpages, starting with <http://www.dec.ny.gov/lands/5094.html>.

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The core mission of the Hudson River Estuary Program is to:

- *Ensure clean water*
- *Protect and restore fish, wildlife and their habitats*
- *Provide water recreation and river access*
- *Adapt to climate change*
- *Conserve world-famous scenery*

Introduction

The Hudson River estuary and its watershed is a region of remarkable beauty, historical and economic significance, and high biological diversity. The region, comprising only 13.5% of the land area in New York, contains nearly 85% of the bird, mammal, reptile, and amphibian species found in the state (Penhollow et al. 2006). Local municipalities can play a key role in conserving this natural heritage and the ecological processes that sustain it. By identifying important areas for habitat and wildlife, municipalities are better equipped to pursue conservation opportunities and make informed land-use decisions. This proactive approach to planning can help municipalities avoid the costs of urban and suburban sprawl, maintain community character and quality of life, and preserve the many benefits, or *ecosystem services*, that healthy, natural systems provide to present and future generations.

*An **ecosystem** is a community of animals and plants interacting with one another and with their physical environment. **Ecosystem services** are life-sustaining benefits we receive from nature, such as food, medicine, water purification, flood control, and pollination. Many of these services are provided for “free,” yet are worth many trillions of dollars.*

- Ecological Society of America

Summary Content

This summary includes complementary text, maps, and tables. The [Habitat Summary text](#) describes what is known about the town’s important natural areas and habitats and has the same headings as the maps. It details the information in the maps, including the ecological importance of the data and its sources. There are five habitat maps for the Town of Copake, which follow the text:

[Figure 1: Regional Context](#) of Copake, NY

[Figure 2: Major Ecological Features](#) in Copake, NY

[Figure 3: Streams and Watersheds](#) in Copake, NY

[Figure 4: Wetlands](#) in Copake, NY

[Figure 5: Large Forests \(≥ 200 acres\)](#) in Copake, NY

Descriptions of grassland, shrubland, and young forest habitats are included in the text but not mapped. Following the maps, Tables 1 -4 list known species and habitats of conservation concern that have been recorded for Copake.

[Table 1: State Rare Plants, Animals, and Ecosystems](#) in Copake

[Table 2: Significant Birds](#) in Copake

[Table 3: Plants of Regional or Local Conservation Concern](#) in Copake

[Table 4: County-rare Ants](#) in Copake

At the end of the summary, [references](#) identify the sources of information in this document and places to find more information. [General conservation measures](#) for protecting natural areas and wildlife are also provided.

The summary presents available information about species and habitats of regional conservation

concern in Copake, including many records obtained from the [Farmscape Ecology Program at Hawthorne Valley Farm](#). The program has been working in Columbia County to understand the relationships among agriculture, natural areas, and socio-economics. Extensive county-wide fieldwork by these researchers makes them an especially useful source.

Links in the summary will direct you to websites, publications, and fact sheets for supplemental information. In addition, Adobe Reader will enable you to zoom in and turn off data layers to customize your view of the maps.

Please note that some habitats and species identified in this document may be protected by state or federal programs. The [Environmental Resource Mapper](#) on DEC's website can help identify those resources. Please work with DEC's Region 4 Office in Schenectady and other appropriate entities as necessary.

Limitations of Maps in this Summary

Maps included here were created in a geographic information system or GIS. Information on the maps comes from different sources, produced at different times, at different scales, and for different purposes. It is often collected or developed from remote sensing data (i.e., aerial photographs, satellite imagery) or derived from paper maps. For these reasons, GIS data often contain inaccuracies from the original data, plus any errors from converting it. *Therefore, maps created in GIS are approximate and best used for planning purposes. They should not be substituted for site surveys. Any resource shown on a map should be verified for legal purposes, including environmental review.*

How to Use this Summary

This summary provides a starting point for recognizing important natural areas in the town and surrounding areas, but is limited to existing information and is not a substitute for on-site survey and assessment. Effective conservation occurs across property and political boundaries and, therefore, necessitates a broader view of natural landscapes. By identifying areas with high-quality resources, this summary will be especially useful for setting priorities to inform town planning. Habitat summaries like this have been used by communities for open space plans, comprehensive plans, natural resource inventories, and other conservation and planning actions. One Hudson Valley town used the species lists in its comprehensive plan's generic environmental impact statement, another to designate critical environmental areas. Some communities have incorporated their summaries directly into plans, while others refer to the information when writing their own documents. This summary goes hand in hand with the Water Resource Summary and Climate Resiliency Summary for Copake, also provided by the Estuary Program. Together they provide critical information for local land-use decisions, including economic development and conservation.

Though this summary does not contain adequate detail for site planning purposes, it can be useful for environmental review. First, by identifying high quality habitats on a town-wide scale, it helps land-use decision-makers and applicants understand how a proposed site plan might relate to important natural

areas on- and off-site. Second, the summary highlights areas that may require more detailed assessment to evaluate potential impacts. Third, the tables identify species of conservation concern that may warrant special attention during reviews. If it's not already a routine step, the planning board should consider requiring applicants to produce a current letter from the [New York Natural Heritage Program](#) that identifies rare plants, rare animals, and significant ecosystems that are known to be on or near a proposed development site. The planning board and applicants should also work closely with DEC Region 4 Permits staff to ensure regulatory requirements are met.

How to Find More Information

Information in this summary can be enhanced by local knowledge. Local studies, maps, plans, and knowledgeable residents can provide details and may reveal previously unknown, high-quality ecosystems. Biological information in environmental impact statements may also be useful, especially when a town has habitat standards for environmental review. Additional information may be available from the [Farmscape Ecology Program](#) or from [Hudsonia Ltd.](#); their biologists have conducted biological assessments in many parts of Columbia County. For help with incorporating additional information into the summary, please contact Ingrid Haeckel, Hudson River Estuary Conservation and Land Use Specialist.

Conservation

Once important habitats and natural areas are identified, municipalities have numerous options to strengthen their protection, such as incorporating maps and data into comprehensive plans and zoning, developing critical environmental areas or conservation overlay districts, adopting resource protection regulations, and acquiring conservation easements for sensitive habitats, such as floodplains or wetlands and their buffers.

Included with this summary are [General Conservation Measures for Protecting Natural Areas and Wildlife](#) that can help guide Copake's plans and land-use decisions. More detailed information on the how and why of local habitat conservation is available in [Conserving Natural Areas in Your Community: Smart Growth Strategies for Protecting the Biological Diversity of New York's Hudson River Valley](#) (Strong, 2008). This handbook was published by DEC and details why towns should conserve their biological resources, as well as the tools and techniques local governments can use to conserve natural areas and wildlife. Chapter 5 covers habitat conservation. The document is available on a CD or in hard copy upon request.

Technical assistance is available through the Estuary Program, including help with incorporating natural resource conservation principles and information into municipal land-use planning procedures, plans, and policies. The Estuary Program and its partners also provide training to local leaders to recognize and map ecologically significant habitats and communicate their importance to the community. The [Hudson River Estuary Grants](#) program supports projects that continue to raise the capacity of municipalities, land trusts, and non-profits to identify and assess watershed biodiversity, promote stewardship and conservation of vital habitats, and create local conservation programs. For more information on technical assistance opportunities, please contact Ingrid Haeckel.

Important Habitats in the Town of Copake

Regional Context (Figure 1)

The first step to understanding the natural areas and habitats of Copake is to consider how the town relates to the ecological features that extend beyond its borders. Most of Copake is in the Roeliff Jansen Kill (Roe Jan) watershed, which drains approximately 150 square miles of land within Columbia and Dutchess Counties and a small area of Massachusetts and flows into the Hudson River at Linlithgo on the border between Germantown and Livingston. The northwest portion of Copake drains into Taghkanic Creek, a subwatershed of the Greater Stockport Creek watershed, also a tributary of the Hudson River estuary. Copake contains parts of the Taconic Ridge and the Harlem Valley Calcareous Wetlands significant biodiversity areas (SBAs) described in Penhollow et al. (2006). The area of the Taconic Ridge in Copake is part of a globally significant forest block spanning the Mt. Riga Plateau, which includes portions of New York, Massachusetts, and Connecticut. Smaller forest blocks in northwest Copake comprise a linkage zone important for regional forest connectivity. These regionally significant features are further discussed in the following sections.

*A **watershed** is the area of land where all of the water that is under it, or drains off of it, goes into the same stream, river, lake, or other waterbody.*

– U.S. Environmental Protection Agency

Major Ecological Features (Figure 2)

[Figure 2](#) shows the major ecological and natural features known to occur in Copake, including the Taconic Ridge and the Harlem Valley Calcareous Wetlands SBAs; a calcium-rich bedrock area; a regional forest linkage zone; important areas for rare plants, rare animals, and significant natural communities; and stream habitat for migratory fishes. The Roeliff Jansen Kill bisects the town from north to south and is described below in the [Streams and Watersheds](#) section. [Figure 2](#) and the corresponding descriptions below are based on limited information and more study of the town is needed to better describe Copake’s natural assets.

Taconic Ridge SBA. The Taconic Ridge runs along New York’s border with Massachusetts in Rensselaer and Columbia Counties. This regionally significant landscape is identified as an SBA by DEC’s Hudson River Estuary Program for its large forests and associated wildlife, and is one of the best occurrences of northern hardwood forest communities in the Hudson Valley region (Penhollow et al., 2006):

“The Taconic Ridge encompasses large areas of contiguous, high quality, northern hardwood forest underlain by complex metamorphic bedrock. It serves as a principle watershed and recharge area for numerous rich fens and associated rare plant and animal species. The Taconic Ridge extends nearly 60 miles along the eastern edge of New York State, [along Rensselaer, Columbia, and Dutchess Counties] and is about 12 miles wide at its widest point.” ... The “high topographic variability enhances diversity of community types and associated species.”

***Significant Biodiversity Areas (SBA)** are locations of high concentration of biological diversity or value for regional biodiversity, described in [The Hudson River Estuary Wildlife and Habitat Conservation Framework](#) (Penhollow et al. 2006).*

The value of the Taconic Region's natural assets extends beyond New York. It is considered a multi-state "priority landscape area" in the Forest Action Plans of New York, Massachusetts, Vermont, and Connecticut for its high ecological integrity, low fragmentation, and important connectivity between extensive forests of the Northern and Central Appalachians (NYSDEC, 2010). This designation raises the eligibility of forest conservation-related projects in the area for federal funding sources, including land conservation initiatives, trails and recreation projects, and landowner stewardship outreach.

The Taconic Ridge runs along the eastern portion of the Town of Copake, reaching a maximum elevation in the town of 2,100 feet above sea-level along the New York-Massachusetts border on the slopes of Alander Mountain. Most of the portion of the Taconic Ridge in Copake is within Taconic State Park. Five exemplary forest community types have been documented by the New York Natural Heritage Program in the area, shown as areas of known importance for significant natural communities: [hemlock-northern hardwood forest](#), [maple-basswood rich mesic forest](#), [Appalachian oak hickory forest](#), [pitch pine-oak heath rocky summit](#), and [acidic talus slope woodland](#). Significant natural communities account for 67 percent of forest on the Taconic Ridge in the town, underlining the extraordinarily high quality of this natural area. Numerous state rare plants are known from the ridge, including blunt-lobe grape-fern, Pennsylvania catchfly, violet wood-sorrel, wild pink, and wood reed grass. In addition, an impressive number of locally and regionally rare plants have been documented in the Copake Taconic Ridge area by the Farmscape Ecology Program, including many species adapted to the ridge's rocky barrens such as three-toothed cinquefoil, bearberry, winged sumac, and running serviceberry. Extensive forest and rocky barrens in this significant biodiversity area provide habitat for the NYS-threatened [timber rattlesnake](#), which occurs in Copake (see [Areas of Known Importance for Rare Animals](#), below). A probable record of NYS-special concern [small-footed bat](#) from the Taconic Ridge forest will be confirmed by the New York Natural Heritage Program in 2014. The complete list of known rare species and significant ecosystems known from this area in Copake is shown in [Tables 1](#) and [3](#).

Harlem Valley Calcareous Wetlands SBA. The Harlem Valley wetlands run along the eastern-most New York State in Columbia, Dutchess, and Putnam Counties, and cover a large portion of southern Copake. The chemistry of these wetlands is influenced by the calcium-rich or *calcareous* limestone and dolostone bedrock underlying the valley. This regionally significant landscape hosts many uncommon plants, animals, and habitats associated with its calcium-rich bedrock and dynamic geologic history (Penhollow et al., 2006):

"The Harlem Valley Calcareous Wetlands are composed of the valleys and adjacent ridges... The majority of the Harlem Valley Calcareous Wetlands biodiversity area consists of Stockbridge Marble, a metamorphic rock composed of the minerals calcite or dolomite. It is formed when limestone is treated to very high temperature and pressure, such as the [formation of the Taconic Mountains]... The result is a preponderance of communities dependent on freshwater upwellings of high pH [calcium-rich] water, namely fens.... Wetland matrix communities consist of red maple-hardwood swamp and floodplain forest. The upland matrix community tends to be Appalachian oak-hickory forest."

Calcium-rich bedrock is somewhat unusual in the Hudson Valley and often supports more unique or rare plants and ecological communities than other areas (Anderson and Ferree, 2010; Kiviat and Stevens, 2001). Several high-quality ecological communities and species of conservation concern are reported from the Harlem Valley portion of Copake, including a high diversity [rich graminoid fen](#) and wetland and a large [rich sloping fen](#). Several state, regional, and locally rare plants of calcareous wetlands are known from Copake, including Ohio goldenrod, brown-bog sedge, fen orchid, grass-pink, mock-pennyroyal, New England northern reedgrass, smallflower false foxglove, and others. In addition to contributing to clean water and flood moderation, the wetlands in this significant biodiversity area provide habitat for the NYS-endangered [bog turtle](#), which occurs in Copake and has specialized habitat requirements (see [Areas of Known Importance for Rare Animals](#), below). Calcium-rich bedrock extends beyond the SBA boundary, and calcareous wetland and upland communities may occur in other areas of Copake.

Calcium-rich Bedrock. The NYS Geological Survey has mapped bedrock geology for the entire state, and while the maps are highly generalized (at a scale of 1:250,000), they can help describe the geological character of an area and infer its influence on habitats (Heady and Stevens, 2007). Calcium-rich bedrock in Copake extends along the Roeliff Jansen Kill valley, widening from Hillsdale toward Ancram (see [Figure 2](#)). In addition to the calcareous wetland communities described previously, other potential habitats that are associated with calcareous bedrock are [calcareous crests and ledges](#) and [limestone woodland](#). The *Biodiversity Assessment Manual for the Hudson River Valley* (Kiviat and Stevens, 2001) describes some of these habitats and provides a list of calcium-loving plants in Appendix 5. Rare plants documented by the Farmscape Ecology Program such as walking-fern spleenwort, wall-rue spleenwort, black cohosh, and hackberry suggest the presence of both of these habitats in Copake.

Geology strongly influences features like soil and groundwater chemistry, and thereby helps shape where different kinds of habitats occur.

The 2009 [Groundwater Resources Study and Protection Plan](#) for the Town of Copake identified areas of the town with calcium-rich bedrock to have the highest well yields; where overlain with coarse-grained soils, these permeable areas are also the most susceptible to groundwater contamination. Much of the Roeliff Jansen Valley area is noted in the study to have high to very high sensitivity to groundwater contamination. For additional discussion of groundwater resources in Copake, see the accompanying Water Resource Summary or refer to the town's Groundwater Resources Study.

Regional Forest Linkage. [Figure 2](#) highlights a large swath of forest area in northwest Copake comprising several forest patches. This linkage provides important connectivity between the Taconic Ridge's globally significant forest and other major forest blocks of the United States' northeast region. Forest connectivity facilitates wildlife movement and will play a critical role in species migration as climate changes. See the [Forests](#) section below for greater detail on forests of all sizes in the town.

Areas of Known Importance for Rare Animals and Rare Plants. The New York Natural Heritage Program (NYNHP) has identified areas of importance for sustaining populations of rare animals and plants 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 and plant populations. Proactive planning that considers how species moves across the landscape, with careful attention to maintaining connected habitat complexes, will contribute to the long-term survival of rare animals and to the persistence and dispersal of rare plants. NYNHP identified areas of importance in Copake for the NYS-endangered bog turtle, NYS-threatened timber rattlesnake, NYS-threatened bald eagle, and NYS-threatened least bittern. A complete list of state rare plants and animals known from Copake is shown in [Table 1](#).

In New York, [bog turtles](#) occur in wet meadows and calcareous wetlands known as fens. [Fens](#) are shallow, often fed by groundwater, and the vegetation always includes various species of sedges. Bog turtles are present in Copake. Populations of this species are often small and isolated, increasing their vulnerability. Bog turtles are threatened by habitat loss, degradation, and fragmentation, as well as road mortality, woody vegetation encroachment into fen habitat, the expansion of invasive exotic vegetation, and illegal collecting for the pet trade.

[Timber rattlesnake](#) inhabits mountainous or hilly forests, often with rocky outcroppings, steep ledges, and rock slides. They migrate widely from their dens in summer to forage in the forest surrounding den sites (Brown, 1993). Timber rattlesnakes are known from the Taconic Ridge but may forage seasonally in the Roeliff Jansen Kill Valley for rodents. Timber rattlesnakes are threatened due to habitat loss or fragmentation, illegal collecting, and malicious killing.

[Bald eagle](#) nesting occurs in Copake in the vicinity of Robinson Pond. Bald eagles are typically found in relatively undisturbed wood areas near large bodies of water, such as bays, rivers, and lakes that support a healthy population of fish and waterfowl, their primary food source (Nye, et al., 1994). While bald eagle breeding and non-breeding populations are increasing in New York, development pressure and its impacts on habitat remain significant threats.

NYNHP also documented a nesting site at Chrysler Pond in Copake for [least bittern](#), a marsh bird that prefers large emergent wetlands with cattails, bulrushes, and sedges, and large open water areas. 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.

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

Areas of Known Importance for Significant Natural Communities. NYNHP mapped seven types of rare or high-quality ecological communities in Copake and areas of importance critical to maintaining them. Five of these communities occur in the Taconic Mountains SBA and two in and near the Harlem Valley Calcareous Wetlands SBA. [Table 1](#) lists the significant natural communities documented in Copake and provides links to NYNHP guides with detailed descriptions of the habitats and conservation recommendations.

Stream Habitat for Migratory Fishes. DEC Bureau of Fisheries data and an aquatic habitat connectivity study by NYNHP indicate that sections of the Roeliff Jansen Kill, Bash Bish Brook, and Noster Kill highlighted in [Figure 2](#) comprise migratory routes for American eel, a fish species that begins life in the Atlantic Ocean and migrates to the headwaters of North American tributary streams as tiny "glass eels" (White, et al., 2011). 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 cycle and return to the sea to spawn. For more information on dams and other aquatic barriers, see the accompanying Water Resource Summary.

Streams and Watersheds (Figure 3)

[Streams](#), their floodplains, adjacent wetlands, and other "riparian" or streamside habitats that occur along their channel provide important ecosystem services to communities, including clean water, flood management, and recreational opportunities like fishing and kayaking. In addition, Hudson River tributary streams and their associated shoreline and floodplain areas provide some of the most productive wildlife habitat in the region. The health of the Hudson River estuary is closely linked to the health of its tributaries and their watersheds (Penhollow et al., 2006).

Riparian zones are transitional areas along waterbodies that link land and water. They include streambanks, lakeshores, wetlands, and floodplains and are closely tied to stream health. They often have very high biological diversity.

Most of the land in Copake drains to the Hudson River, though a small area on the Taconic Ridge drains to Long Island Sound via the Housatonic River ([Figures 1](#) and [3](#)). Most of the town is contained in the Roeliff Jansen Kill watershed which drains to the Hudson River at Linlithgo. The northwest portion of Copake drains to Taghkanic Creek, within the Greater Stockport Creek watershed. For more information on the Stockport Creek watershed, visit the Greater Stockport Creek Watershed Alliance online or contact Watershed Coordinator Fran Martino at riverhaggie@peoplepc.com or 518-828-1330.

In addition to watershed boundaries, [Figure 3](#) shows streams, floodplains, waterbodies, and general stream habitat information. Streams shown on maps in this summary are from the 1:24,000 USGS Quadrangle Maps and were digitized from air photos. Note the resulting maps have inherent inaccuracies and will not capture many of the intermittent streams in Copake. Visiting sites and creating more accurate maps are methods to pursue to ensure these important resources are identified and considered during planning processes.

Intermittent streams only flow seasonally or after rain. They can easily be overlooked when dry, but have great impact on larger downstream waters and warrant attention. Many flow directly into the Hudson and its tributaries, wetlands, and other water bodies, influencing water quantity and quality.

Stream habitat information on [Figure 3](#) is based on DEC's water quality classifications. Streams deemed to have conditions suitable for trout (T) or trout spawning (TS) are identified as coldwater habitat; streams without that designation are identified as warmwater habitat. These are generalized stream habitat

types based on limited information and do not reflect site-specific habitat quality. The data suggest there is coldwater habitat in many streams in Copake, including the Roeliff Jansen Kill, Taghkanic Creek, Bash Bish Brook, Noster Kill, and several smaller tributaries. Trout require well-shaded, cool to cold, flowing water and are sensitive to warmer temperatures. While all streams benefit from adequate streamside vegetation, it is especially important for maintaining clean, coldwater habitats that support native species like brook trout. See [Figure 2](#) for the location of [streams supporting migratory fish runs](#). The [NY Amphibian and Reptile Atlas](#) documented the presence of wood turtle in Copake, a NY species of Special Concern occurring along low gradient perennial streams that also spends time in adjacent forests and grasslands. Wood turtle is threatened by habitat loss, stream degradation, nest predation, and the pet trade. For additional discussion of stream water quality, state water classification and impairment information, and watershed characteristics in Copake, see the accompanying Water Resource Summary.

Floodplain information included in [Figure 3](#) comes from the [Federal Emergency Management Agency](#) (FEMA) Digital Q3 Flood Data, which were developed by scanning existing hardcopy Flood Insurance Rate Maps with an effective date of 1985. FEMA has recently updated many flood hazard maps across the country to reflect physical changes in floodplains, new data, and modeling capabilities. However, at the time of this writing, no update has been scheduled for Columbia County. Floodplain information was included in the Habitat Summary to highlight the riparian corridors where stream and floodplain habitats occur, and where land-use change will likely influence stream quality. In addition to their high ecological value, floodplains provide many important functions including preventing erosion and recharging groundwater. They also act as a safety zone between human settlement and the damaging impacts of flood events. When left in their natural state, they provide space for the fluctuations in flow that cause streams to expand, contract, and sometimes change course. [Figure 3](#) shows the areas estimated by FEMA to have a 1% chance or greater probability of being inundated in any given year (often referred to as the “100-year flood”), including areas along the Roeliff Jansen Kill, Bash Bish Brook, Noster Kill, Taghkanic Creek, and the banks of Robinson Pond.

*Floodplains are low-lying areas adjacent to streams and rivers that can become inundated during heavy precipitation or snow melt. The **floodway** is the channel of a stream or river that carries the deepest, fastest water downstream.*

It is important to note that these floodplains, and their statistical flooding intervals are estimations based on the data and technology available at the time of mapping. Due to many variables, such as the unpredictable nature of some kinds of floods, local drainage problems, and the variable intensity of land development in watersheds, some flood-prone areas may not appear on the maps. Nonetheless, the mapped floodplains provide a starting point for proactive conservation planning and may contain a variety of habitats, including but not limited to upland meadows, wet meadows, swamps, marshes, and forests (Kiviat and Stevens, 2001). The Farmscape Ecology Program at Hawthorne Valley Farm has shown that floodplain forests are home to a unique suite of plants and animals that tolerate occasional flooding (Knab-Vispo and Vispo, 2010). These stream-side forests are included in [Figure 3](#) and discussed in greater detail in the [Forests](#) section, below. For additional information on the functions of floodplains and riparian buffers, see the accompanying Water Resource Summary. Information about flooding risk due to climate change is provided in the accompanying Climate Resiliency Summary.

Wetlands (Figure 4)

In addition to providing critical habitat for many plants and animals, wetlands provide important services for human communities. They help to control flooding and reduce damage from storm surge, recharge groundwater, act as filters to cleanse water of impurities, and provide recreation opportunities. The upland area surrounding a wetland is essential to its survival and function; both may diminish when a wetland is surrounded by pavement, buildings, and pollution-generating or other incompatible land uses ([Environmental Law Institute, 2008](#)).

Wetlands are areas saturated by surface or groundwater sufficient to support distinctive vegetation adapted for life in saturated soil conditions.

Knowing about local wetlands enables municipalities to proactively plan to conserve this critical part of our life support system. Although several existing maps provide approximate locations and extent of wetlands, they are inherently inaccurate and not a substitute for site visits and on-the-ground delineation. Nonetheless, towns can use these maps as a starting point for inventorying local wetlands and supplement them with more refined data as they become available.

In [Figure 4](#), “known wetlands” are shown from the U.S. Fish and Wildlife Service’s (USFWS) [National Wetlands Inventory \(NWI\)](#) and DEC’s [Freshwater Wetlands Program](#) maps (which only include wetlands larger than 12.4 acres, unless designated “of unusual local importance”). NWI data are available for viewing on the NWI [Wetlands Mapper](#) or as a [download](#) for use in geographic information systems (GIS). NYS freshwater wetland maps are available for viewing using the [Environmental Resource Mapper](#) or to download as GIS files at the [NYS GIS Clearinghouse](#). In [Figure 4](#), information also comes from county soil maps, which are a good source for predicting the location of potential wetlands. “Probable wetlands” are those areas classified in the soil survey as very poorly drained or poorly drained soils, and “possible wetlands” are those classified as somewhat poorly drained (after Kiviat and Stevens, 2001). Note that in [Figure 4](#), probable and possible wetlands cover a greater area than NWI and DEC wetland layers. NWI maps often underestimate wetland area and omit smaller and drier wetlands (Zucker and Lau, unpublished report). In particular, vernal pools, wet meadows, and swamps are often under-represented on maps. Many of DEC’s regulatory maps are outdated and have similar inaccuracies (Huffman and Associates, 2000).

While NWI maps offer some limited, general information on wetland habitat (e.g., forested, emergent), most existing map resources focus on wetland locations and do not yield information about habitat or importance for biodiversity. Towns can learn more about habitat values from other sources and by conducting local surveys and studies. In addition to small wetlands distributed throughout the town, several large wetland complexes in Copake contribute to the high habitat quality of the [Harlem Valley Calcareous Wetlands SBA](#) and the [Area of Known Importance for Rare Animals](#), which include bog turtle and least bittern (see [Figure 2](#)). Significant wetland communities mapped by NYNHP in Copake include [rich graminoid fen](#) and [rich sloping fen](#). Other [fens](#) may occur in Copake’s calcium-rich bedrock areas. In addition to calcareous wetlands, the Farmscape Ecology Program confirmed the presence of a small

acidic bog in Copake with regionally rare and uncommon plant species such as mountain holly, large cranberry, roundleaf sundw, pitcher plant, grass-pink, and fen orchid. Wetlands are particularly abundant all along the Roeliff Jansen Kill and Taghkanic Creek and in the Harlem Valley SBA along the lower reaches of Bash Bish Brook and the Noster Kill. There are numerous forested and shrub [swamps](#) in this area. There are notably large emergent marshes to the west of Farm Road north of Robinson Pond, as well as along the Taghkanic Creek near Craryville. The [NY Amphibian and Reptile Atlas](#) documented the presence of NY Special Concern [spotted turtle](#) in Copake, a mobile wetland species that also uses upland forest and grassland habitats. Spotted turtle is very sensitive to water pollution and further threatened by wetland loss and the pet trade.

Although no [vernal pools](#) have been mapped in Copake, records of blue-spotted salamander, Jefferson salamander, spotted salamander, four-toed salamander, and wood frog in the *NY Amphibian and Reptile Atlas* attest to the presence of vernal pools in the town. [Vernal pools](#) are small, isolated wetlands that are often dry in summer. They provide habitat for many animals, including forest amphibians like wood frog and several salamander species, 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 (see [Conserving Small Wetlands in the Hudson Valley](#) for more information.) Biodiversity assessment in the town may reveal additional wetland habitat types and provide detail on quality and habitat use. Knowing there are unmapped vernal pools in Copake, outreach to landowners and planners may help promote stewardship and land-use decisions that protect the pools, surrounding forest habitat, and associated wildlife. Specific management recommendations can be found in [Best Development Practices: Conserving Pool-Breeding Amphibians in Residential and Commercial Development in the Northeastern United States](#) (Calhoun and Klemens, 2002) and [Maine Municipal Guide to Mapping and Conserving Vernal Pool Resources](#) (Morgan and Calhoun, 2012).

Forests (Figure 5)

The ability of forests to provide wildlife habitat, clean water, climate moderation, and economically viable forest products depends in part on our ability to maintain sizeable tracts of forest. In general, larger forests provide more ecosystem services and higher quality forest habitat than smaller ones. However, the value of each forest is relative to the values of other forests in the community, watershed, or natural landscape. Even small patches of forest can be extremely valuable depending on different factors, such as their relationship to the surrounding landscape. For example, a network of forest patches along a stream can create a riparian corridor that helps maintain water quality and wildlife habitat, and that serves as a travel route for forest animals. Similarly, wooded hedgerows in an agricultural landscape

Forest fragmentation is the process of breaking large patches of forest into smaller pieces, often by clearing it for new roads or development. Fragmentation decreases forest habitat quality and health, disrupts wildlife movement, and facilitates the spread of invasive species. These impacts are greatest at forest edges but can extend for hundreds of feet into forest patches, often displacing sensitive species that depend on interior forest.

often provide a refuge for animals that do not typically use agricultural fields.

[Figure 5](#) shows forest patches 200 acres and larger in Copake. The map was created from land cover data developed for the Coastal Change Analysis Program (National Oceanic and Atmospheric Administration, 2006). Land cover categories considered ‘forest for this analysis included deciduous forest, evergreen forest, mixed forest, and palustrine forested wetland. Roads were buffered and removed from forest patches to show results of development-related fragmentation. Interstate roads were buffered by a total of 300 feet and state and county roads by 66 feet (Dunn, 2008). Forest patch size classifications follow the Orange County Open Space Plan (Orange County Planning Department, 2004) as cited in Strong (2008).

We know little about the on-the-ground habitat quality of forests in Copake (e.g., presence of invasive species, lack of understory vegetation, etc.). However, the “birds-eye view” shows that outside of the Roeliff Jansen valley and Taghkanic Creek valley, most of Copake is covered in forests of varying sizes, most notably a “globally significant” forest occurring on the Taconic Ridge. Copake’s Taconic Ridge forest is contiguous with a larger forest block spanning the Mt. Riga Plateau, which includes portions of New York, Massachusetts, and Connecticut and contains 13 mountains that are over 2,000 feet in elevation above sea-level, reaching a maximum of 2,602 ft on Mt. Everett. Measuring over 47,000 acres, the Mt. Riga Plateau forest was identified as a “matrix forest block” in a regional analysis by the Nature Conservancy of matrix forests and forest linkage zones in the northeastern United States. Matrix forests represent the largest, most intact forests, whose size and natural condition allow for the maintenance of ecological processes, natural forest communities, and populations of forest-interior species (Anderson and Bernstein, 2003). These characteristics will likely contribute to resiliency in a changing climate. The goal of the matrix forest analysis was to identify viable examples of forest types that, if protected and allowed to 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 natural connections between them will also allow plants and animals to move northward and up in elevation as temperatures increase with climate change. The Copake portion of this forest is largely comprised of high quality natural communities with low disturbance, including five significant forest types mapped by the NY Natural Heritage Program and many rare plant and animal species, which are outlined in the [Taconic Ridge SBA section](#). [Taconic State Park](#) protects over 2,700 acres of forest land on the Taconic Ridge in Copake (see [Figure 2](#)).

Several other large forest patches are present in Copake, and together, the northwest portion of the town comprises an important regional forest linkage zone providing connectivity between the Taconic Ridge and other matrix forest blocks in the northeast region. Forest linkages are wide swaths of natural land between a pair of forest blocks, which facilitate wildlife movement and species migration. They will play a critical role for maintaining biodiversity as climate changes. The forest linkage encompasses a 2517-acre forest patch on Rheinstrom Hill and a 2206-acre forest patch around Lake Copake. Such forests are considered “locally significant” as they represent the lower limit of intact, viable forest size for forest-dependent birds (Orange County Planning Department, 2004). The forest linkage also spans an 1860-acre forest east of County Route 7 that can be considered a “stepping stone.” Such examples of

smaller forest ecosystems provide valuable, relatively broad corridors connecting to larger patches of habitat, such as the locally and globally significant forests in the town.

[Rheinstrom Hill Audubon Center and Sanctuary](#) protects 1,039-acres of primarily forest land in northwest Copake (see [Figure 2](#)). The Farmscape Ecology Program notes that the predominantly oak-hickory forest at the sanctuary is very high quality and includes examples of mature American chestnut trees, a rarity in the county, and swamp agrimony, a state rare plant species. Numerous rare bird species have been documented at the sanctuary, included in [Table 2](#). Two rare ant species were also identified by the Farmscape Ecology Program at the Rheinstrom preserve: *Protomognathus americanus*, listed as vulnerable by the International Union for Conservation of Nature; and *Formica obscuriventris*, a county-rare species that was also found at Sunset Rock on the Taconic Ridge (see [Table 4](#)).

The Streams and Watersheds map ([Figure 3](#)) also includes floodplain forest detail from a study conducted by the Farmscape Ecology Program (FEP) (Knab-Vispo and Vispo, 2010). The [FEP study](#) concluded that few natural riparian habitats remain in Columbia County and “legacy” floodplain forests (those that were not cleared during the last 85 years or more) are especially rare and ecologically unique. Even legacy forests that were used as woodlots for selective timber harvest have significantly less invasive shrubs and more native forest plants than recently reforested floodplains. [Figure 3](#) shows the distribution of legacy floodplain forests in Copake, as well as floodplains that have been reforested more recently and also may harbor unique biodiversity.

Regardless of age and species composition, forested floodplains support the in-stream food web and serve as a travel corridor for some wildlife (Knab-Vispo and Vispo, 2010). In addition to their biological values, floodplain forests play a vital role in minimizing soil erosion and surface runoff, control water temperatures, and help reduce downstream flood intensity. Small areas of legacy floodplain forest are located along Taghkanic Creek, the Roeliff Jansen Kill, and Bash Bish Brook in Copake and reforested floodplains occur in several additional areas. The Farmscape Ecology Program has documented several rare plants of floodplain and other riparian habitats in Copake such as American golden-saxifrage, closed gentian, Culver’s root, cutleaf coneflower, and Virginia water horehound. Where appropriate, there may be potential for reforestation of floodplains in Copake. The Hudson River Estuary Program’s “[Trees for Tribes](#)” initiative offers free consultation and native trees and shrubs for qualifying streamside buffer planting projects in the estuary watershed.

The [NYS Breeding Bird Atlas](#) has numerous records of birds that indicate the availability of high-quality forest habitat (e.g., [black-throated blue warbler](#), [scarlet tanager](#), [wood thrush](#)) and high-quality riparian forest habitat ([Louisiana waterthrush](#), [yellow-throated vireo](#)) in Copake (see [Table 2](#)). Conserving the town’s large, contiguous forested areas, particularly those that provide broad, connected corridors; smaller forest patches that act as stepping stones between larger forests; and forested floodplains will help ensure there is adequate habitat to sustain these species, as well as other forest plants and animals. This strategy will also help to preserve the ecosystem services that the town’s forests are providing to its residents. Audubon New York’s website has specific information on [managing habitat for forest birds](#).

Grasslands, Shrublands, and Young Forests (not mapped)

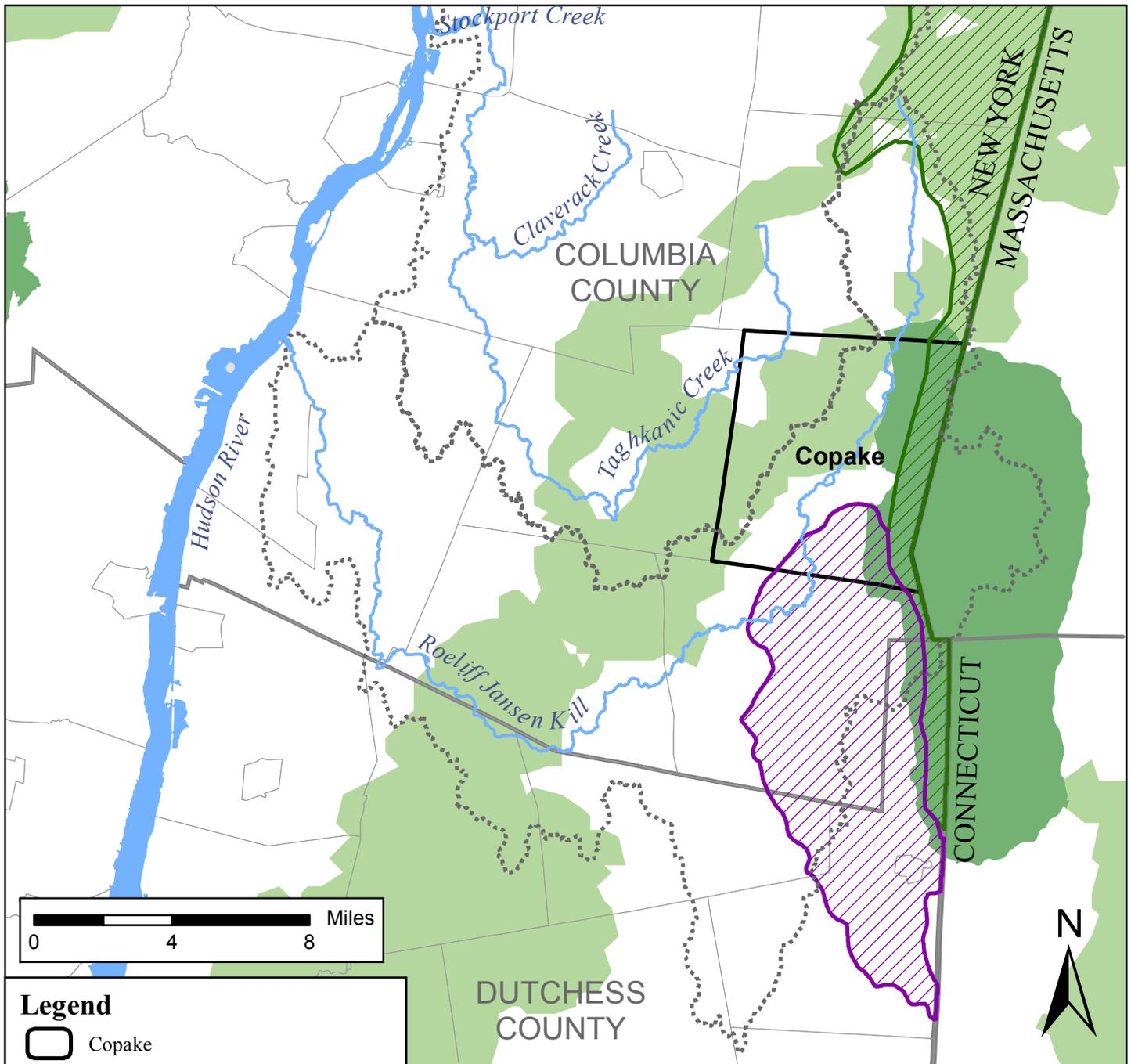
Recently disturbed sites, such as abandoned farm fields or forest clearings, can provide important habitat for species that require grasslands, shrublands, and young forests. These successional habitat types are transitional and relatively short-lived, and typically require periodic maintenance to avoid becoming more densely vegetated, eventually developing a canopy and becoming forest. In the accompanying Water Resource Summary, Figure 4 (Land Use and Land Cover) identifies approximate locations of agriculture, pasture, hayfield, and other grassland habitat in Copake obtained from the USGS National Landcover Database (2006). We can infer from wildlife records that valuable grasslands, shrublands, and young forests occur in the town. For example, northern black racer, a species of conservation concern that prefers open fields and transitional habitat between forests and fields, was documented in Copake during the [NY Amphibian and Reptile Atlas](#) (see [Table 1](#)).

Upland grassland or [meadow](#) habitat can support a variety of life, including rare plants, butterflies, reptiles, and birds, in addition to providing agricultural uses and scenic values. The quantity and quality of grasslands for wildlife have rapidly decreased in the Northeast during the last century due to increased human population, changes in agricultural technology, and abandonment of family farms. This continuing trend threatens populations of grassland birds that have adapted to the agricultural landscape. Breeding bird records from Copake indicate that grassland habitat is present in the town. [Table 2](#) shows four grassland bird species of state conservation concern known to breed in Copake (*NYS Breeding Bird Atlas*): [American kestrel](#), [bobolink](#), [eastern meadowlark](#), and [savannah sparrow](#). Grassland breeding birds respond to habitat structure rather than species composition, so even hayfields dominated by non-native grasses can provide suitable habitat for species of conservation concern if they are managed appropriately. Audubon New York offers guidance on [managing habitat for grassland birds](#).

Young forests and shrublands are transitional habitats characterized by few or no mature trees, with a diverse mix of shrubs and/or tree saplings, along with openings where grasses and wildflowers grow. They can occur in recently cleared areas and abandoned farmland and are sometimes maintained along utility corridors by cutting or herbicides. These habitats are important for many wildlife species declining throughout the region because former agricultural areas have grown into forests, and natural forest disturbances that trigger young forest growth, such as fires, have been suppressed. In Copake, NYNHP documented the presence of [New England cottontail](#), a NY species of Special Concern and Candidate for federal listing under the Endangered Species Act. New England cottontail is the only native cottontail east of the Hudson River in New York and its range has been greatly reduced in the state due to forest maturation, habitat loss, and competition with the more abundant Eastern cottontail. It prefers open woods, disturbed areas, shrubby areas, thickets, and marshes. The *NYS Breeding Bird Atlas* documented twelve species of conservation concern in Copake that prefer young forest and shrubland habitat, including [blue-winged warbler](#), [brown thrasher](#), [prairie warbler](#), and [whip-poor-will](#). Extensive young forests and those that form large complexes with meadow habitats may be particularly important for nesting by these species, as well as for grassland nesting birds; for more information, see Audubon's guidance on [managing habitat for shrubland birds](#).

Even when limited to small habitat patches, grasslands and young forests in Copake may host a number of rare plants of conservation concern. Small forest openings and dry grassy crests and slopes on the Taconic Ridge have rare species including American harebell, stiff-leaf goldenrod, and wild pink. In addition, a number of rare grassland plant species were historically documented in the vicinity of Robinson Pond, including Ohio goldenrod, showy goldenrod, stiff-leaf goldenrod, Pennsylvania catchfly, and fringe-top bottle gentian; historical records of false pennyroyal, fringed orchid, and hairy bush clover from Copake Falls also suggest the presence of high quality grassland and successional communities. It is unknown which are still present; additional field work will probably reveal more records.

Figure 1: Regional Context of Copake, NY



Legend

- Copake
- Municipal Boundary
- County Boundary
- Watershed Boundary

Major Forest Blocks and Linkages

- Globally significant forest block
- Regional forest linkage zone

Significant Biodiversity Areas

- Harlem Valley Calcareous Wetlands
- Taconic Mountains

This map shows the location of the Town of Copake, Columbia County in relation to its watersheds, important forest blocks, and significant biodiversity areas. This map was produced as part of a Habitat Summary for the Town. For more information, please contact NYSDEC's Hudson River Estuary Program Conservation and Land Use Specialist Ingrid Haeckel at ibhaecke@gw.dec.state.ny.us or (518) 402-8954. <http://www.dec.ny.gov/lands/5094.html>

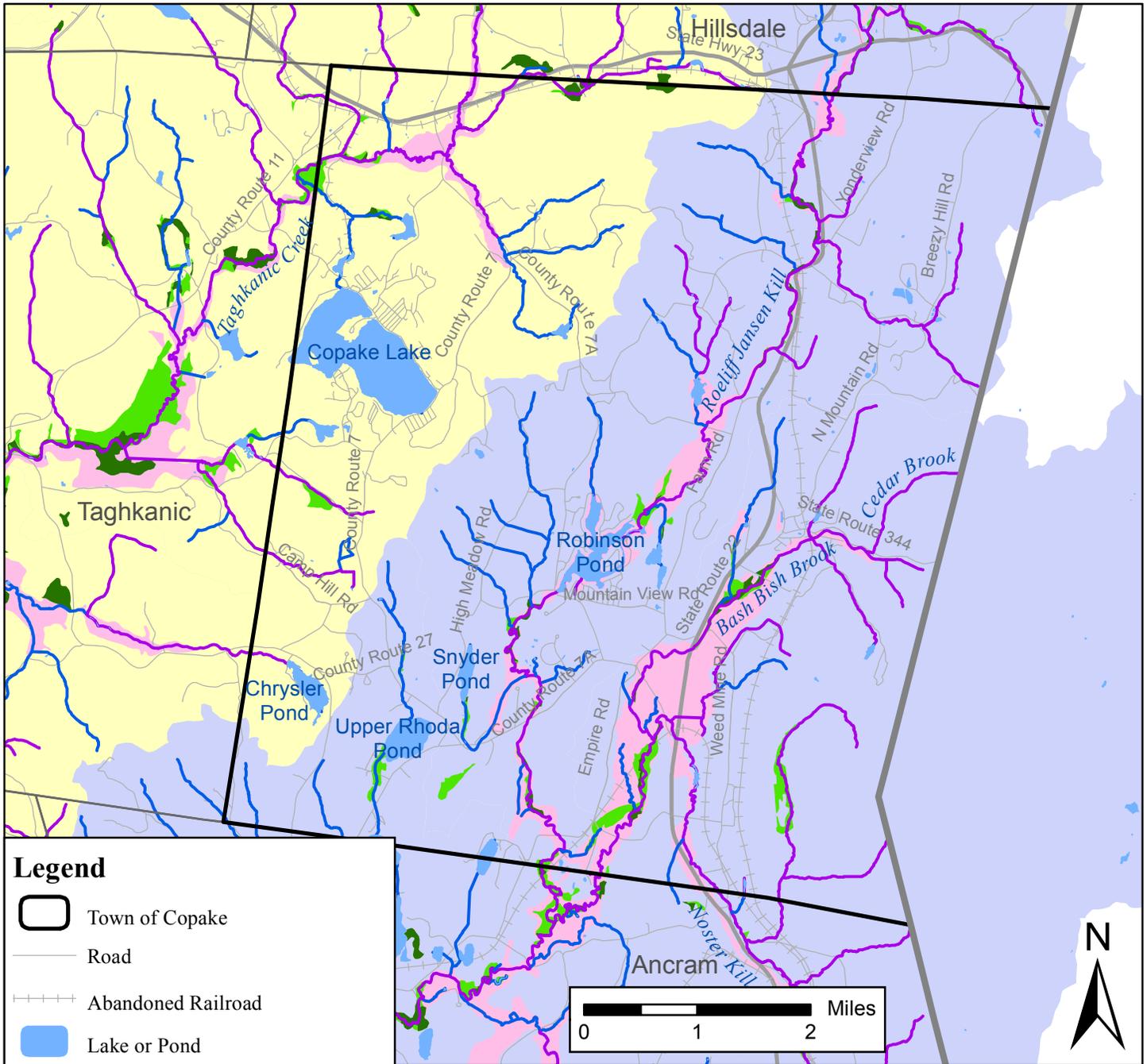
Data Sources:

- New York State Department of Environmental Conservation
- New York Natural Heritage Program
- New York State Office of Cyber Security and Critical Infrastructure Coordination
- US Geological Survey
- The Nature Conservancy



Map Created March 2014

Figure 3: Streams and Watersheds in Copake, NY



Legend

- Town of Copake
- Road
- Abandoned Railroad
- Lake or Pond
- Roeliff Jansen Kill Watershed
- Greater Stockport Creek Watershed

Stream Habitat

- Coldwater
- Warmwater

Floodplain Features

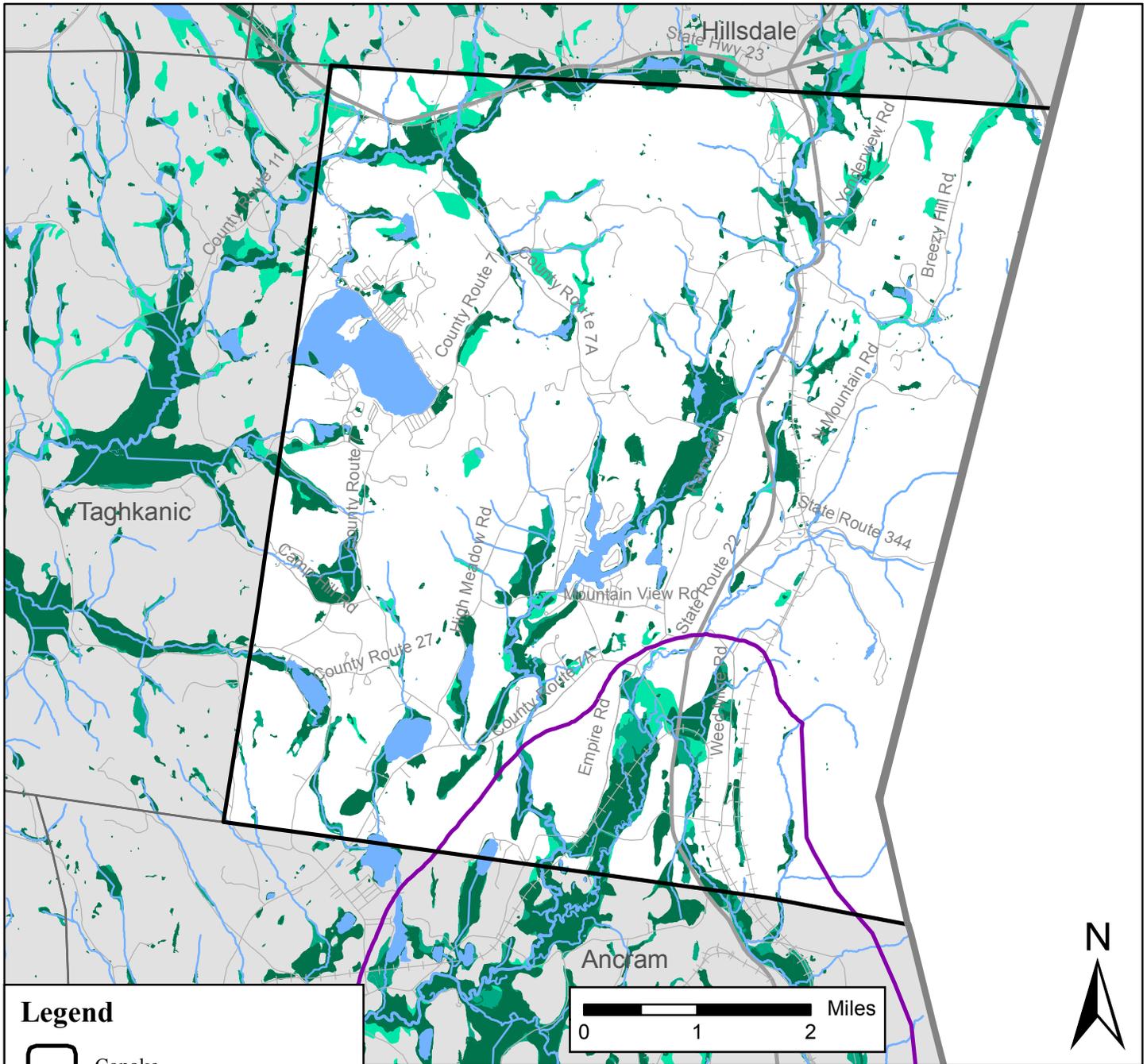
- 100 Year Floodplain
- Legacy Floodplain Forest
- Reforested Floodplain

This map shows streams, floodplains, waterbodies, watersheds, and aquatic habitat data for the Town of Copake, Columbia County. The map also shows floodplain forests identified by the Farmscape Ecology Program. This map was produced as part of a Habitat Summary for the Town. For more information, please contact NYSDEC's Hudson River Estuary Program Conservation and Land Use Specialist Ingrid Haeckel at ibhaecke@gw.dec.state.ny.us or (518)402-8954. <http://www.dec.ny.gov/lands/5094.html>

Data Sources: US Geological Survey
 Federal Emergency Management Agency
 New York State Department of Environmental Conservation
 Natural Resources Conservation Service
 New York State Office of Cyber Security and Critical Infrastructure Coordination
 Hawthorne Valley Association
 Farmscape Ecology Program



Figure 4: Wetlands in Copake, NY



Legend

- Copake
- Road
- Abandoned Railroad
- Stream
- Lake or Pond
- Harlem Valley Calcareous Wetlands Significant Biodiversity Area
- Known wetland
- Probable wetland
- Possible wetland

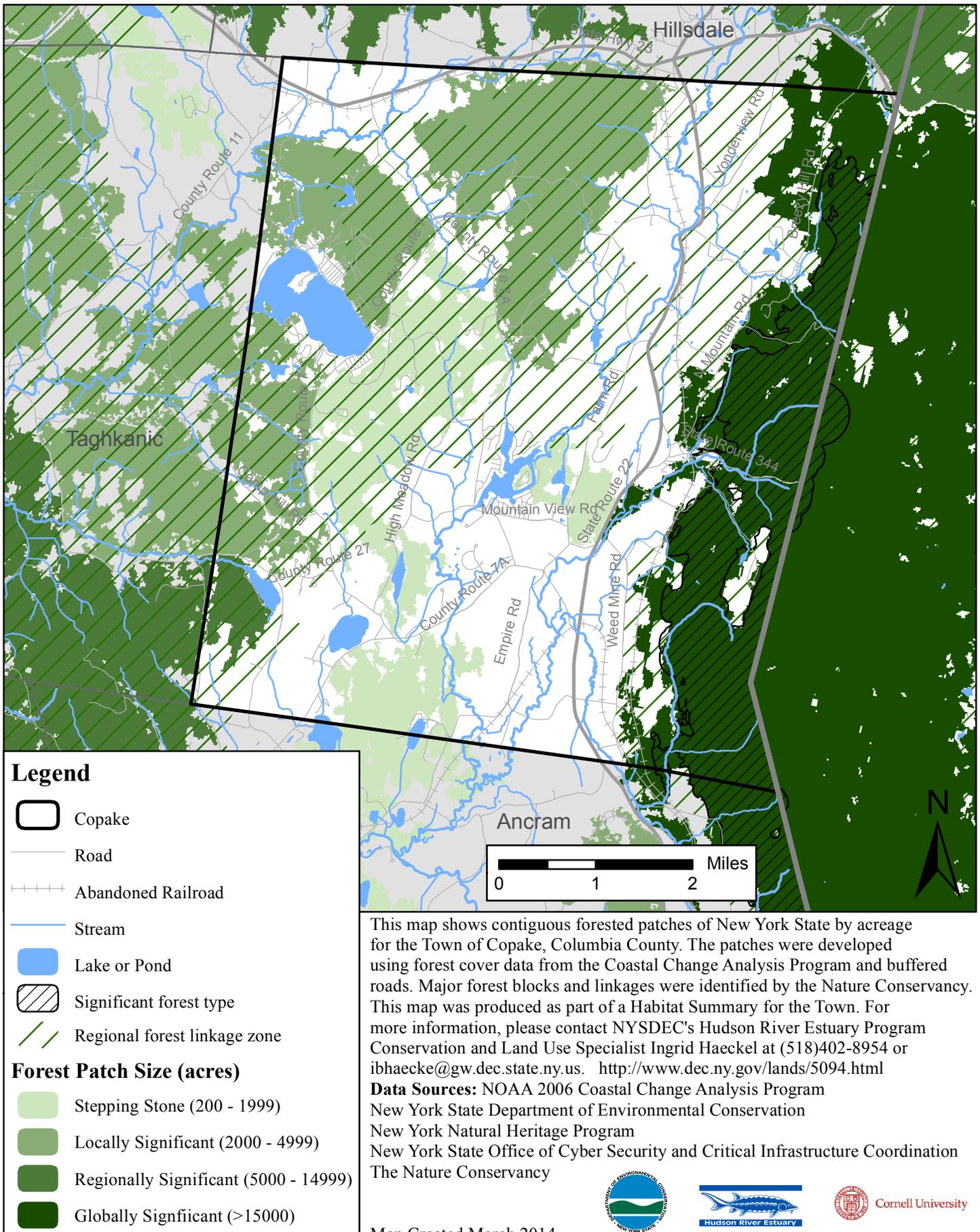
This map shows *known* wetlands from the National Wetlands Inventory and NYS Freshwater Wetland Map and potential wetlands in the Town of Copake, Columbia County, NY. Probable and possible wetlands were identified based on soil drainage class in the Columbia County Soil Survey; see habitat summary text for more details. This map was produced as part of a Habitat Summary for the town and is not intended for regulatory purposes. For more information, please contact NYSDEC's Hudson River Estuary Program Conservation and Land Use Specialist Ingrid Haeckel at (518)402-8954 or ibhaecke@gw.dec.state.ny.us. <http://www.dec.ny.gov/lands/5094.html>

Data Sources: US Fish and Wildlife Service, National Wetlands Inventory
 New York State Department of Environmental Conservation, New York State Museum
 Natural Resources Conservation Service
 New York Natural Heritage Program
 US Geological Survey

Map Created March 2014



Figure 5: Large Forests (200 acres and larger) in Copake, NY



This map shows contiguous forested patches of New York State by acreage for the Town of Copake, Columbia County. The patches were developed using forest cover data from the Coastal Change Analysis Program and buffered roads. Major forest blocks and linkages were identified by the Nature Conservancy. This map was produced as part of a Habitat Summary for the Town. For more information, please contact NYSDEC's Hudson River Estuary Program Conservation and Land Use Specialist Ingrid Haeckel at (518)402-8954 or ibhaecke@gw.dec.state.ny.us. <http://www.dec.ny.gov/lands/5094.html>

Data Sources: NOAA 2006 Coastal Change Analysis Program
 New York State Department of Environmental Conservation
 New York Natural Heritage Program
 New York State Office of Cyber Security and Critical Infrastructure Coordination
 The Nature Conservancy



Species and Ecosystems of Conservation Concern in Copake

The species and ecosystems of conservation concern that have been recorded in Copake are listed in Tables 1-4. [Table 1](#) lists state rare species and ecosystems and [Table 2](#) lists bird species of conservation concern; both are referenced throughout the [Habitat Summary text](#). In Tables 1 and 2, species are included if they are: on state or federal endangered and threatened species lists; listed as a Species of Greatest Conservation Need in [New York’s Comprehensive Wildlife Conservation Strategy Plan](#); recognized as a [Hudson River Valley Priority Bird](#) by Audubon New York; or are other indicators of high quality habitat. [Table 3](#) and [Table 4](#) list species of regional and local conservation concern, compiled from information provided by the Farmscape Ecology Program. All species and ecosystems on the lists are linked to a habitat described in the summary.

Note: There may be additional rare species and habitats in Copake not yet documented.

Table 1. State Rare Animals, Plants, and Ecosystems in Copake

The following information comes from the [New York Natural Heritage Program](#) (NYNHP) biodiversity databases, the [NY Amphibian and Reptile Atlas](#) (NYARA), the [2000-2005 New York State Breeding Bird Atlas](#), Rheinstrom Hill Audubon Sanctuary, and the Farmscape Ecology Program. Data from NYNHP are available online from the [New York Nature Explorer](#) and information on rare animals, plants, and ecological communities can be found at <http://guides.nynhp.org>. The NYARA documented more reptile and amphibian species in Copake than listed below; the table only includes those that are of conservation concern or are indicators of high quality habitat. For wildlife species, the “Description” column is largely based on the species groups in the [NYS Comprehensive Wildlife Conservation Strategy](#) (2005).

Common Name	Description	Scientific Name	Source
hemlock-northern hardwood forest	high quality forest community	n/a	NYNHP
maple-basswood rich mesic forest	high quality forest community	n/a	NYNHP
Appalachian oak-hickory forest	high quality forest community	n/a	NYNHP
acidic talus slope woodland	high quality forest community	n/a	NYNHP
pitch pine-oak-heath rocky summit	high quality forest community	n/a	NYNHP
rich shrub fen	high quality wetland community	n/a	NYNHP
rich graminoid fen	high quality wetland community	n/a	NYNHP
New England cottontail ²	forest mammal	<i>Sylvilagus transitionalis</i>	NYNHP
eastern small-footed bat ^{2***}	forest mammal	<i>Myotis leibii</i>	NYNHP
bald eagle ³	open water/ forest bird	<i>Haliaeetus leucocephalus</i>	NYNHP
Cooper’s hawk ²	forest bird	<i>Accipiter cooperii</i>	Audubon
red-shouldered hawk ²	forest bird	<i>Buteo lineatus</i>	Audubon
sharp-shinned hawk ²	forest bird	<i>Accipter striatus</i>	Audubon
least bittern ³	wetland bird	<i>Ixobrychus exilis</i>	NYNHP

whip-poor-will ²	young forest/shrubland bird	<i>Caprimulgus vociferus</i>	NYBBA
blue-spotted salamander ²	vernal pool/forest amphibian	<i>Ambystoma laterale</i>	NYARA
Jefferson salamander ²	vernal pool/forest amphibian	<i>Ambystoma jeffersonianum</i> <i>x laterale</i>	NYARA
spotted salamander	vernal pool/forest amphibian	<i>Ambystoma maculatum</i>	NYARA
four-toed salamander ¹	vernal pool/forest amphibian	<i>Hemidactylium scutatum</i>	NYNHP
wood frog	vernal pool/forest amphibian	<i>Rana sylvatica</i>	NYARA
bog turtle ⁴	wetland turtle	<i>Glyptemys muhlenbergii</i>	NYNHP
northern black racer ¹	woodland/ grassland snake	<i>Coluber c. constrictor</i>	NYARA
spotted turtle ²	wetland/forest/grassland turtle	<i>Clemmys guttata</i>	NYARA
timber rattlesnake ³	forest snake	<i>Crotalus horridus</i>	NYNHP
wood turtle ²	stream/forest/grassland turtle	<i>Clemmys insculpta</i>	NYARA
blunt-lobed grape-fern ³	forest plant	<i>Botrychium oneidense</i>	FEP
hairy angelica**	forest plant	<i>Angelica venenosa</i>	FEP
small-flowered crowfoot ^{3*}	forest plant	<i>Ranunculus micranthus</i>	NYNHP
violet wood-sorrel ³	forest plant	<i>Oxalis violacea</i>	NYNHP
wood reedgrass ^{4**}	forest plant	<i>Calamagrostis perplexa</i>	FEP
brown bog sedge ³	wetland plant	<i>Carex buxbaumii</i>	NYNHP
cat-tail sedge ⁴	wetland plant	<i>Carex typhina</i>	NYNHP
Ohio goldenrod ^{3*}	wetland plant	<i>Oligoneuron ohioense</i>	NYNHP
New England northern reedgrass ³	wetland/grassland plant	<i>Calamagrostis stricta</i> ssp. <i>Inexpansa</i>	NYNHP
Culver's root ^{3**}	grassland/woodland plant	<i>Veronicastrum virginicum</i>	FEP
false pennyroyal**	grassland/woodland plant	<i>Trichostema brachiatum</i>	FEP
golden corydalis ³	grassland/woodland plant	<i>Corydalis aurea</i>	NYNHP
mock-pennyroyal ³	wetland/grassland plant	<i>Hedeoma hispida</i>	NYNHP
stiff-leaf goldenrod ³	grassland/woodland plant	<i>Oligoneuron rigidum</i> var. <i>rigidum</i>	NYNHP
swamp agrimony	grassland/woodland plant	<i>Agrimonia parviflora</i>	FEP
wild pink ³	grassland/woodland plant	<i>Silene caroliniana</i> ssp. <i>pennsylvanica</i>	NYNHP

¹NYS Species of Greatest Conservation Need (SGCN)

²NYS Special Concern

³NYS Threatened Species

⁴NYS Endangered Species

*historical record

**historical record documented in the "Flora of Columbia County" (McVaugh 1958)

***probable record, not yet confirmed

Table 2. Significant Birds in Copake

The following table lists bird species of conservation concern that were observed in Copake during the [2000-2005 New York State Breeding Bird Atlas](#) or were documented by the New York Natural Heritage Program (NYNHP) or the Rheinstrom Hill Audubon Sanctuary. Species are included in the table if: 1) they were documented in atlas blocks of more than 50% in Copake or were documented by NYNHP or Audubon; and 2) they have been identified as [Hudson River Valley Priority Birds](#) by Audubon NY (2009). Associated habitat information and links to species profiles, when available, are also from Audubon NY (2009); young forest and shrubland habitat designations are from DEC Biologist Paul Novak.

Common Name	Scientific Name	NYS Conservation Status			
		Species of Greatest Conservation Need	Special Concern	Threatened	Endangered
Forest Birds					
American Redstart	<i>Setophaga ruticilla</i>				
Baltimore Oriole	<i>Icterus galbula</i>				
Black-and-white Warbler	<i>Mniotilta varia</i>				
Blackburnian Warbler	<i>Dendroica fusca</i>				
Black-throated Green Warbler	<i>Dendroica virens</i>				
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>	X			
Blue-headed Vireo	<i>Vireo solitarius</i>				
Broad-winged Hawk	<i>Buteo platypterus</i>				
Cooper's Hawk	<i>Accipiter cooperii</i>	X	X		
Downy Woodpecker	<i>Picoides pubescens</i>				
Eastern Wood-Pewee	<i>Contopus virens</i>				
Louisiana Waterthrush	<i>Seiurus motacilla</i>	X			
Northern Flicker	<i>Colaptes auratus</i>				
Purple Finch	<i>Carpodacus purpureus</i>				
Red-shouldered Hawk	<i>Buteo lineatus</i>	X	X		
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>				
Scarlet Tanager	<i>Piranga olivacea</i>	X			
Sharp-shinned Hawk	<i>Accipter striatus</i>	X	X		
Veery	<i>Catharus fuscescens</i>				
Wood Thrush	<i>Hylocichla mustelina</i>	X			
Yellow-throated Vireo	<i>Vireo flavifrons</i>				
Grassland Birds					
American Kestrel	<i>Falco sparverius</i>				
Bobolink	<i>Dolichonyx oryzivorus</i>	X			
Eastern Meadowlark	<i>Sturnella magna</i>	X			

Common Name	Scientific Name	NYS Conservation Status			
		<u>Species of Greatest Conservation Need</u>	<u>Special Concern</u>	<u>Threatened</u>	<u>Endangered</u>
Savannah Sparrow	<i>Passerculus sandwichensis</i>				
Young Forest and Shrubland Birds					
American Woodcock	<i>Scolopax minor</i>				
Blue-Winged Warbler	<i>Vermivora pinus</i>	x			
Brown Thrasher	<i>Toxostoma rufum</i>	x			
Canada Warbler	<i>Wilsonia canadensis</i>	x			
Eastern Kingbird	<i>Tyrannus tyrannus</i>				
Eastern Towhee	<i>Pipilo erythrophthalmus</i>				
Field Sparrow	<i>Spizella pusilla</i>				
Indigo Bunting	<i>Passerina cyanea</i>				
Prairie Warbler	<i>Dendroica discolor</i>	x			
Ruffed Grouse	<i>Bonasa umbellus</i>	x			
Whip-poor-will	<i>Caprimulgus vociferus</i>	x	x		
Willow Flycatcher	<i>Empidonax trailli</i>	x			
Wetland Birds					
Least Bittern	<i>Ixobrychus exilis</i>	x		x	
Marsh Wren	<i>Cistothorus palustris</i>				
Birds of Other Habitats					
Bald Eagle (open water/forest)	<i>Haliaeetus leucocephalus</i>	x		x	
Belted Kingfisher (open water)	<i>Megaceryle alcyon</i>				
Chimney Swift (urban)	<i>Chaetura pelagica</i>				

Table 3. Plants of Regional or Local Conservation Concern in Copake

Regional conservation concern means the species or habitat is rare or uncommon on the Hudson Valley, county, or town scale; detailed definitions are provided in the footnotes. The Farmscape Ecology Program has documented 54 plant species of regional or local conservation concern in the Town of Copake since 2003 and provided an additional 55 rare plant records dating to the 1930s from McVaugh (1958). It is unknown which are still present; additional field work will probably reveal more records. The table shows examples of these plants from a variety of habitats. A complete list can be requested from the Farmscape Ecology Program, which continues to search for these rare plants (fep@hawthornevalleyfarm.org).

Common Name	Scientific Name	State rank	County rank	Regional rank	Habitat in Summary
three-toothed cinquefoil	<i>Sibbaldiopsis tridentata</i>	S4	CCg	R	barrens/ rocky summit
bearberry	<i>Arctostaphylos uva-ursi</i>	S5	CCu	R?	barrens/ rocky summit
running serviceberry	<i>Amelanchier spicata</i>	S5	CCu	R	barrens/ rocky summit
alternate-leaf dogwood	<i>Cornus alternifolia</i>	S5	CCu	S?	forest
American fly-honeysuckle	<i>Lonicera canadensis</i>	S5	CCu	R	forest
American pinesap*	<i>Monotropa hypopithys</i>	S4	CCr		forest
American yew*	<i>Taxus canadensis</i>	S5	CCr	S	forest
blunt-lobe grape-fern	<i>Botrychium oneidense</i>	S2S3	CCr		forest
American chestnut	<i>Castanea dentata</i>	S4	CCr		forest
Hervey's aster*	<i>Eurybia x herveyi</i>	S2?	CCr		forest
hobblebush	<i>Viburnum lantanoides</i>	S5	CCu	R?	forest
climbing fumitory*	<i>Adlumia fungosa</i>	S4	CCr	R	forest (acidic)
large whorled pogonia*	<i>Isotria verticillata</i>	S3S4	CCr		forest (acidic)
walking-fern spleenwort	<i>Asplenium rhizophyllum</i>	S4S5	CCu	S	forest (calcareous rocks)
wall-rue spleenwort*	<i>Asplenium ruta-muraria</i>	S4	CCr		forest (calcareous rocks)
black cohosh*	<i>Cimicifuga racemosa</i>	S4	CCr		forest (calcareous)
broad beech fern	<i>Phegopteris hexagonoptera</i>	S4S5	CCu	S	forest (clay soils)
northern beech fern	<i>Phegopteris connectilis</i>	S5	CCu	R	forest (cool), stream (rocky)
northern oak fern*	<i>Gymnocarpium dryopteris</i>	S4S5	CCr	R?	forest (cool, moist)
poke milkweed	<i>Asclepias exaltata</i>	S4	CCu	R?	forest (dry or moist)
whorled milkweed*	<i>Asclepias quadrifolia</i>	S5	CCu	R?	forest (dry)
hairy angelica*	<i>Angelica venenosa</i>	S3	CCr		forest (dry)
toothed tick-trefoil*	<i>Desmodium cuspidatum</i>	S5	CCr		forest (dry)
Virginia flax*	<i>Linum virginianum</i>	S5	CCu	R?	forest (dry)
wild-indigo	<i>Baptisia tinctoria</i>	S4	CCr		forest (dry), grassland
pink lady's-slipper	<i>Cypripedium acaule</i>	S4	CCu		forest (dry, acidic)
spotted wintergreen*	<i>Chimaphila maculata</i>	S4	CCr		forest (dry, acidic)
trailing arbutus	<i>Epigaea repens</i>	S4	CCu	S	forest (dry, acidic)
downy arrow-wood	<i>Viburnum rafinesquianum</i>	S5	CCu	S	forest (dry, calcareous)
hairy bedstraw*	<i>Galium pilosum</i>	S4	CCr		forest (dry, rocky)
northern bedstraw	<i>Galium boreale</i>	S5	CCr	R?	forest (dry, rocky)
wild pink	<i>Silene caroliniana ssp. pennsylvanica</i>	S2	CCr		forest (dry, rocky)
racemed milkwort*	<i>Polygala polygama</i>	S5	CCr		forest (dry, rocky)

Common Name	Scientific Name	State rank	County rank	Regional rank	Habitat in Summary
upland boneset	<i>Eupatorium sessilifolium</i> var. <i>brittonianum</i>	SNR	CCr	R	forest (dry, rocky)
velvetleaf huckleberry	<i>Vaccinium myrtilloides</i>	S5	CCr		forest (dry, rocky)
Virginia dwarf-dandelion*	<i>Krigia virginica</i>	S4	CCu	S	forest (dry, rocky)
wood reed grass*	<i>Calamagrostis perplexa</i>	S1	CCr		forest (dry, rocky)
winged sumac*	<i>Rhus copallinum</i>	S5	CCr	S2	forest (dry, rocky)
wood lily*	<i>Lilium philadelphicum</i>	S4	CCr		forest (dry, rocky)
fernleaf yellow false-foxglove*	<i>Aureolaria pedicularia</i>	S4	CCr		forest (dry, rocky, acidic)
hairy rock-cress*	<i>Arabis hirsuta</i> var. <i>pycnocarpa</i>	S5?	CCu	S	forest (dry, rocky, calcareous)
roundleaf dogwood	<i>Cornus rugosa</i>	S5	CCu	R?	forest (dry, rocky, calcareous)
flaxleaf whitetop aster*	<i>Ionactis linariifolius</i>	S4	CCr	R?	forest (dry, rocky, sandy)
smooth yellow false foxglove	<i>Aureolaria flava</i> var. <i>flava</i>	S5	CCr		forest (dry, sandy, rocky)
rusty woodsia	<i>Woodsia ilvensis</i>	S5	CCr	R?	forest (acidic rocks)
bloodroot	<i>Sanguinaria canadensis</i>	S4	CCu		forest (moist)
blue cohosh	<i>Caulophyllum thalictroides</i>	S5	CCu	S	forest (moist)
Boott's wood fern*	<i>Dryopteris x boottii</i>	S3S5	CCu		forest (moist)
large-flowered bellwort	<i>Uvularia grandiflora</i>	S5	CCu	S?	forest (moist)
one-flowered broomrape	<i>Orobanche uniflora</i>	S4	CCr	R	forest (moist)
silvery glade fern	<i>Deparia acrostichoides</i>	S5	CCr	R	forest (moist)
spotted coralroot	<i>Corallorhiza maculata</i> var. <i>maculata</i>	S4	CCu	S?	forest (moist)
violet wood-sorrel	<i>Oxalis violacea</i>	S2S3	CCr		forest (moist)
white wood-sorrel*	<i>Oxalis montana</i>	S5	CCr		forest (moist)
creeping spikemoss*	<i>Selaginella apoda</i>	S2?	CCr		forest (moist), wetlands, grassland (moist)
closed gentian*	<i>Gentiana clausa</i>	S4	CCr	R	forest (moist, floodplain), wetlands, grasslands (moist)
lupine, sundial lupine*	<i>Lupinus perennis</i> ssp. <i>perennis</i>	S3	CCr	R	forest (open, dry, rocky)
mountain maple	<i>Acer spicatum</i>	S4S5	CCg	S	forest (rocky)
northern green orchid	<i>Platanthera aquilonis</i>	S4	CCr		forest (rocky)
purple clematis*	<i>Clematis occidentalis</i> var. <i>occidentalis</i>	S4	CCr	R?	forest (rocky)
rosy twisted-stalk	<i>Streptopus lanceolatus</i>	S5	CCr		forest (rocky)
small-flower bitter-cress	<i>Cardamine parviflora</i> var. <i>arenicola</i>	S4	CCg	S	forest (rocky)
stiff gentian*	<i>Gentianella quinquefolia</i> ssp. <i>quinquefolia</i>	S4	CCr	R	forest (rocky)
hackberry*	<i>Celtis occidentalis</i>	S4	CCu	S	forest (rocky, calcareous)
eastern yellow stargrass*	<i>Hypoxis hirsuta</i>	S5	CCu	S	forest (sandy, rocky)
Virginia water horehound	<i>Lycopus virginicus</i>	S4	CCu		stream (riparian)
white water-crowfoot*	<i>Ranunculus longirostris</i>	S5	CCr		lakes and ponds
marsh St. John's-wort*	<i>Triadenum fraseri</i>	S5	CCr		wetlands
silky willow	<i>Salix sericea</i>	S5		S	wetlands

Common Name	Scientific Name	State rank	County rank	Regional rank	Habitat in Summary
yellow spikerush	<i>Eleocharis flavescens</i> var. <i>olivacea</i>	S5	CCr	R	wetlands
bog willow*	<i>Salix pedicellaris</i>	S5	CCr		wetlands (acidic bog)
large cranberry	<i>Vaccinium macrocarpon</i>	S5	CCu	S	wetlands (acidic bog)
leatherleaf	<i>Chamaedaphne calyculata</i>	S5	CCr		wetlands (acidic bog)
roundleaf sundew	<i>Drosera rotundifolia</i> var. <i>rotundifolia</i>	S4	CCu	S	wetlands (acidic bog)
white fringed orchis*	<i>Platanthera blephariglottis</i> var. <i>blephariglottis</i>	S4	CCr		wetlands (acidic bog)
pitcher-plant	<i>Sarracenia purpurea</i>	S3S4	CCu	S?	wetlands (acidic to calcareous)
autumn willow*	<i>Salix serissima</i>	S5	CCg	S	wetlands (calcareous)
bog bedstraw	<i>Galium labradoricum</i>	S4	CCu		wetlands (calcareous)
bog goldenrod*	<i>Solidago uliginosa</i> var. <i>linoides</i>	SNR	CCr		wetlands (calcareous)
dioecious sedge	<i>Carex sterilis</i>	S4	CCu	S?	wetlands (calcareous)
grass-of-parnassus*	<i>Parnassia glauca</i>	S4	CCr	S	wetlands (calcareous)
grass-pink*	<i>Calopogon tuberosus</i> var. <i>tuberosus</i>	S4	CCr	R	wetlands (calcareous)
Kalm's lobelia*	<i>Lobelia kalmii</i>	S5	CCu	S	wetlands (calcareous)
fen orchid*	<i>Liparis loeselii</i>	S4	CCr		wetlands (calcareous)
oblong-leaf serviceberry*	<i>Amelanchier canadensis</i>	S5	CCr		wetlands (calcareous)
prairie sedge*	<i>Carex prairea</i>	S5	CCr	R	wetlands (calcareous)
sage willow	<i>Salix candida</i>	S5	CCu	S	wetlands (calcareous)
smallflower false foxglove*	<i>Agalinis paupercula</i> var. <i>paupercula</i>	S3?	CCr		wetlands (calcareous)
tamarack, American larch	<i>Larix laricina</i>	S5	CCu	S	wetlands (calcareous)
shrubby cinquefoil	<i>Dasiphora fruticosa</i> ssp. <i>floribunda</i>	S4	CCu		wetlands (calcareous), calcareous rocky habitats
poison sumac	<i>Toxicodendron vernix</i>	S4	CCu		wetlands (swamp)
mountain holly	<i>Nemopanthus mucronatus</i>	S5	CCu	S	wetlands (swamp, bog)
small water-wort*	<i>Elatine minima</i>	S4	CCr		wetlands, open water
cutleaf coneflower	<i>Rudbeckia laciniata</i> var. <i>laciniata</i>	S5	CCu	S	wetlands, stream (floodplain)
American golden-saxifrage	<i>Chrysosplenium americanum</i>	S4	CCg		wetlands, streams (rocky)
Greene's rush*	<i>Juncus greenei</i>	S5	CCr		grassland (dry to moist, rocky summit)
cutleaf grape-fern	<i>Botrychium dissectum</i>	S5		R?	grassland (dry), forests
Indiangrass*	<i>Sorghastrum nutans</i>	S5	CCr	S?	grassland (dry, rocky)
showy goldenrod*	<i>Solidago speciosa</i> var. <i>speciosa</i>	S4	CCr	R?	grassland (dry, rocky)
stiff-leaf goldenrod*	<i>Oligoneuron rigidum</i> var. <i>rigidum</i>	S2	CCr		grassland (dry, rocky)
American harebell	<i>Campanula rotundifolia</i>	S4S5	CCr		grassland (rocky)
western poison ivy	<i>Toxicodendron rydbergii</i>	S3?			grassland (rocky, open)
fringed orchid*	<i>Platanthera lacera</i>	S4	CCu	R?	grassland, forest

Common Name	Scientific Name	State rank	County rank	Regional rank	Habitat in Summary
fleshy hawthorn*	<i>Crataegus succulenta</i>	S4	CCr		grassland, forest (dry, rocky)
hairy bush-clover*	<i>Lespedeza hirta</i>	S5	CCr		grassland, forest (dry, rocky)
false pennyroyal*	<i>Trichostema brachiatum</i>	S3	CCr		grassland, forest (dry, rocky, calcareous)
fringe-top bottle gentian*	<i>Gentiana andrewsii</i>	S4	CCr	S	grassland, forest (moist, floodplain)
swamp agrimony	<i>Agrimonia parviflora</i>	S3	CCu		grassland, shrubland/young forest
Culver's-root*	<i>Veronicastrum virginicum</i>	S2	CCr		grasslands (moist, floodplain, calcareous)

*documented in the "Flora of Columbia County" (McVaugh 1958)

¹ S1=extremely rare in NYS, S2=very rare in NYS, S3=rare to uncommon in NYS, S4=common in NYS, S5=very common in NYS, as determined by the NY Natural Heritage Program www.nynhp.org

² R=rare in Hudson Valley, S=scarce in Hudson Valley, as determined in Kiviat and Stevens (2001)

³ CCr=rare in Columbia County, CCu=uncommon in Columbia County, CCG=geographically limited in Columbia County; determined by FEP as of January 2014, subject to change as fieldwork continues

Table 4. County-rare Ants in Copake

Documented by FEP from Copake since 2003, these observations are not the result of an exhaustive town-wide survey. More fieldwork will certainly document additional rare species. Status as of January 2014.

Scientific Name	Habitat in Summary	County Status ¹
<i>Protomognathus americanus</i> *	forest	rare
<i>Camponotus americanus</i>	forest	rare
<i>Formica obscuriventris</i>	forest	uncommon

¹Assessment as of January 2014 based on field work and historic and current regional literature

*Listed as vulnerable by the International Union for Conservation of Nature (IUCN)

General Conservation Measures for Protecting Natural Areas and Wildlife



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- **Protect large, contiguous, unaltered tracts** wherever possible.
- **Preserve links** between natural habitats on adjacent properties.
- **Preserve natural disturbance processes**, such as fires, floods, tidal flushing, seasonal drawdowns, landslides, and wind exposures wherever possible. Discourage development that would interfere with these processes.
- **Restore and maintain broad buffer zones** of natural vegetation along streams, along shores of other water bodies and wetlands, and at the perimeter of other sensitive habitats.
- In general, **encourage development of altered land** instead of unaltered land wherever possible.
- **Promote redevelopment of brownfields**, other post-industrial sites, and other previously-altered sites (such as mined lands), “infill” development, and “adaptive re-use” of existing structures wherever possible, instead of breaking new ground in unaltered areas.
- **Encourage pedestrian-centered developments** that enhance existing neighborhoods, instead of isolated developments requiring new roads or expanded vehicle use.
- **Concentrate development along existing roads**; discourage construction of new roads in undeveloped areas. Promote clustered development wherever appropriate, to maximize extent of unaltered land.
- **Direct human uses toward the least sensitive areas**, and minimize alteration of natural features, including vegetation, soils, bedrock, and waterways.
- **Preserve farmland potential** wherever possible.
- **Minimize area of impervious surfaces** (roads, parking lots, sidewalks, driveways, roof surfaces) and maximize onsite runoff retention and infiltration to help protect groundwater recharge, and surface water quality and flows.
- **Restore degraded habitats wherever possible**, but do not use restoration projects as a “license” to destroy existing habitats.

Source: Kiviat, E. & G. Stevens. 2001. Biodiversity Assessment Manual for the Hudson River Estuary Corridor. NYS Department of Environmental Conservation, Albany, NY.

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