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To: Town of Hillsdale Conservation Advisory Council
From: Karen Strong, Hudson River Estuary Biodiversity Outreach Coordinator, 518-402-8878, klstrong@gw.dec.state.ny.us
Re: Town of Hillsdale Habitat Summary
Date: November 2010

Background

This summary was completed upon request to provide information for the Town of Hillsdale for use in land use planning and decision-making. It identifies major natural features, as well as important stream, forest, wetland, and other habitats with important biological resources based on information available to the NYSDEC. Because it is based only on existing information, it should not be considered a complete biological resource inventory. In the case of Hillsdale, few biological surveys have been completed, therefore little is known about the occurrence of plants and animals of conservation concern. Additional general information can be found in the *Wildlife and Habitat Conservation Framework* developed by the Hudson River Estuary Program (Penhollow et al. 2006). If you have any questions about this summary, or want to know if it needs to be updated, please contact Karen Strong, Biodiversity Outreach Coordinator.

NYSDEC's Hudson River Estuary Program protects and improves the historic and scenic Hudson River watershed for all its residents. The program was created in 1987 and extends from the Troy dam to the Verrazano Narrows. Its core mission is to:

- Ensure clean water;
- Protect and restore fish and wildlife habitats;
- Provide recreation in and on the water;
- Adapt to climate change; and
- Conserve the scenic landscape.

Upland watershed ecosystems—wetlands, forests, stream corridors, grasslands and shrublands—are not only habitats for abundant fish and wildlife, but also support the estuary and provide many vital benefits to human communities. These ecosystems help clean drinking water, clean air, moderate temperature, clean up pollution, and absorb floodwaters. Conserving a diversity of plants and animals maintains these healthy and resilient ecosystems. The Biodiversity Outreach Program was created in partnership with Cornell University to help communities understand what plants, animals, and habitat are found locally; appreciate the value of these resources; and identify local tools to conserve them.

How to use this summary

Maps and written descriptions are provided for the major natural features and each habitat type: streams, forests, wetlands, and calcium-rich areas. Each habitat type is briefly described (including how the map was made) and any significant resources are noted. Major natural features are the most significant resources in your town based on the information available. The species lists that follow the habitat descriptions list the species known to occur in your town that are of conservation concern, there are likely others that are not known. You will find links throughout this document that will direct you to the internet for more information, including websites, publications, and fact sheets. There are references listed at the end that identify the sources of the information in this document.

While this summary is limited to existing information and is therefore not a substitute for on-the-ground survey and assessment, it provides a starting point for recognizing important natural areas in your town and in the surrounding areas.

Effective conservation occurs across property and political boundaries and therefore necessitates a broader view of natural landscapes. By identifying areas of high-quality resources, this summary will be especially useful for setting priorities that support town planning. Habitat summaries like this one have been used by other communities for open space plans, comprehensive plans, natural resource inventories, and developing critical environmental areas. One Hudson Valley town used the species lists in its comprehensive plan's generic environmental impact statement. Some communities have incorporated their summaries directly into plans, while others use the information to write their own documents.

Though this summary does not contain the detail needed for site planning, it is useful for environmental review. First, a good inventory makes it easier to review projects. By identifying high quality habitats at the town-wide scale, it helps land use decision-makers and applicants understand how a proposed site plan might relate to important areas off-site. Second, the summary informs environmental review by highlighting areas that might need a more detailed assessment. Third, the species lists identify species of conservation concern you may want to address during your reviews.

Please note that some of the habitats and species identified in this document may be protected by state or federal programs. Continue to work with the DEC Region 4 office in Schenectady and other appropriate agencies on those issues.

Conservation

Once you understand the kinds of habitats in your town, you may want to identify conservation actions that protect the resources in order to protect the benefits they provide to the community. Included with this summary are General Conservation Measures for Protecting Natural Areas and Wildlife that can help guide Hillsdale'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). The handbook was published by NYSDEC to support the Hudson River Estuary Biodiversity Outreach Program. It describes in more detail why towns should conserve their biological resources, as well as the tools and techniques that local governments can use to conserve natural areas and wildlife. Chapter 5 covers habitat conservation. The document is also available in CD or hard copy upon request.

Species and Habitat Lists

Following the general descriptions of habitat, you will find lists of species of conservation concern that have been recorded for the town, though it is almost certainly not a complete list. Species on lists come from the NY Natural Heritage Program, the New York Amphibian and Reptile Atlas, and the NYS Breeding Bird Atlas. Species are included if they are on the state or federal endangered and threatened species list, listed as a Species of Greatest Conservation Need in New York's Wildlife Action Plan, recognized as a "responsibility species" for the Hudson Valley by Audubon New York, or are other indicators of high quality habitat. Lists of significant ecosystems come from the NY Natural Heritage Program (there are none reported from Hillsdale).

How to find more information

The information in this summary can be enhanced by local knowledge. Local studies, maps, plans, and knowledgeable local people can add to detail to these areas, and may reveal unknown, high- quality ecosystems. Biological information in environmental impact statements may be useful, especially when a town has standards for environmental review. If you want help with incorporating additional information into the summary, please contact Karen Strong, Biodiversity Outreach Coordinator.

Important habitats of the Town of Hillsdale

Major Natural Features

Major natural features were the most significant resources in your town based on the information available. Remember that little existing biological information was available for Hillsdale, so areas that are potentially significant were included. More biological assessment and survey needs to be done to determine what additional plants, animals, and habitats of conservation concern are found here

Figure 1 draws from all the information collected for this summary. The map shows the Taconic Ridge, as well as coldwater (trout) streams, and calcium-rich areas. Coldwater streams were included for their potential trout populations, and calcium-rich areas in nearby communities provide habitat for many plants and animals of conservation concern. Both are explained in the following sections. More information can be found in the *Wildlife and Habitat Conservation Framework* developed by the Hudson River Estuary Program (Penhollow et al. 2006).

Taconic Ridge

The Taconic Ridge is in the far eastern edge of town on the border with Massachusetts (Figure 1). It is the most significant known resource in Hillsdale. This regionally significant resource is identified as a significant biodiversity area by the NYSDEC Hudson River Estuary Program (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 forests in the Taconic Ridge area are the largest in Hillsdale. They are described in more detail under the forests section. The most significant threat to the Hudson Valley's forest ecosystems is fragmentation into smaller patches.

Other Habitats

Streams

Stream corridors, including the stream channel itself, wetlands, floodplains, and shoreline vegetation bordering the channel provide important ecosystem services to people of the town, including clean water, fishing opportunities, and flood management. Hudson River tributary streams and their associated shoreline and floodplain areas provide some of the most productive wildlife habitat in the region.

Most of the land in the Town of Hillsdale drains to the Hudson River, though the far eastern part drains to the Housatonic via the Green River (Figure 2). Hillsdale drains to two Hudson River Estuary tributaries: the Claverack Creek, part of the Greater Stockport Creek watershed, and the Roeliff-Jansen Kill. The Greater Stockport Creek Watershed Alliance meets regularly to share information and provide training. If it doesn't already, the Town could participate in the alliance to learn how to be more proactive in protecting water quality and quantity. For more information, visit the Greater Stockport Creek Watershed Alliance online or contact Watershed Coordinator Fran Martino at riverhaggie@peoplepc.com or 518-828-1330.

The Streams map (Figure 2) shows digitized USGS topographic maps, general stream habitat information, and floodplain forest information from the Farmscape Ecology Program at Hawthorne Valley Farm. The USGS stream data may be inaccurate or incomplete and will not show many of the intermittent streams in the town. The stream habitat information was determined based on the NYS Department of Environmental Conservation water quality classifications. Streams known to have trout (T) or trout spawning (TS) were identified as coldwater habitats. Streams without that designation are identified as warmwater habitats. Some small headwater streams that show as warmwater on the map, may in fact be coldwater, but because they were not known to support trout, were not identified as coldwater. Keep in mind these are generalized stream habitat types, and they do not reflect habitat quality. These data show that all the primary streams in

Hillsdale, the Awagamuck Creek, Taghkanic Creek, Roeliff-Jansen Kill, and Green River (and tributaries), provide coldwater habitat for trout. Trout are sensitive to warmer waters and therefore need trees to shade their streams. While all stream habitats benefit from adequate streamside vegetation, it is especially important for coldwater habitat. A review paper recommends that at least 80% of the stream banks retain woody vegetation at least 33 feet from the edge of the stream to protect this important fishery (Wenger et al. 1999).

The Farmscape Ecology Program at Hawthorne Valley Farm has conducted floodplain forest surveys throughout Columbia County. Their work has shown that floodplains that have been continually forested for at least 60 years are home to a unique suite of plants and animals that tolerate occasional flooding, such as Sycamore (*Platanus occidentalis*), Bitternut (*Carya cordiformis*), and Cottonwood (*Populus deltoides*) trees as well as Ostrich Fern (*Matteuccia struthiopteris*) and False Mermaid Weed (*Floerkea proserpinacoides*) (Knab-Vispo and Vispo 2009). These "ancient" forests, as the folks at Hawthorne Valley call them, may have been farm woodlots, but were not completely cleared since the late 1940s.

Forests

The Large Forests map (Figure 3) was made using a forest layer created from the Multi-Resolution Land Characteristics National Land Cover Database produced by the Environmental Protection Agency in 2001. Roads with a buffer were removed from the map to identify unfragmented forest patches. Interstate roads were buffered by a total of 300 feet, state and county roads by 66 feet. Forest patch size classifications follow the Orange County Open Space Plan (Orange County Planning Department 2004) and cited in Strong (2008).

The town has a lot of forest cover, however, two areas of large forest stand out. There are 10 large blocks that make up the Taconic Ridge significant biodiversity area, from 211 acres to 5722 acres (the largest is shared with Austerlitz). The forest blocks that lie on the state border are larger than indicated as they continue into Massachusetts. The Breeding Bird Atlas from this areas indicates birds of conservation concern that are typical of northern forest areas, including confirmed Black-throated Blue Warbler, Blackburnian Warbler, and Worm-eating warbler. Another indication of the habitat quality of the forest is that 18 of 20 bird species representative of high quality forests for the Atlantic Northern Forest were found in this Breeding Bird Atlas block (Burger and Liner 2005). The other area that stands out is a 2228 acre block in the western part of town. The Breeding Bird Atlas block here also included probable breeding record for a Worm-eating Warbler, and has 15 of 20 bird species representative of high quality forests for the region (Burger and Liner 2005).

Wetlands

Wetlands not only provide quality habitat for unique plants and animals, but provide important services for human communities, including pollutant removal, flood storage, and carbon sequestration. The Wetlands map (Figure 4) shows wetlands as mapped by the US Fish and Wildlife Service for the National Wetlands Inventory (NWI) as well as some information on potential wetlands based on county soil maps. "Probable wetlands" are those classified in the soil survey as very poorly drained or poorly drained, and "possible wetlands" are those classified as somewhat poorly drained soils (after Kiviat and Stevens 2001). The National Wetland Inventory data are available for you to view at the US Fish and Wildlife Service website. You will note that the probable and potential wetlands cover a greater area than the NWI wetland layer. NWI maps are known to be inaccurate, generally underestimating wetland area both because on-the-ground wetlands are larger than those shown on the map and because smaller and drier wetlands tend to be missed (Zucker and Lau, unpublished report). Nothing can replace the on-the- ground delineation for understanding wetlands. NYSDEC Freshwater wetlands (12.4 acres and larger) were purposefully not identified on the map. If you want more information on these wetlands, please contact the DEC Region 4 office.

Though we have a good sense of where wetlands might be, we do not know which of these are most important for wildlife. The most recent NYS Breeding Bird Atlas has a possible breeding record for the NYS threatened species, Least Bittern, which depends on large wetlands with dense vegetation. The bird was found somewhere within the block shown on Figure 4. Reports of spotted salamander, wood frog, and a Jefferson's and a Jefferson's hybrid salamander in the NY Amphibian and Reptile Atlas reveal there are probably vernal pools located in town. Vernal pools are small wetlands in forests (forested vernal pools are often called woodland pools) that hold water for only part of the year, when they serve as important breeding habitat for a group of forest salamanders. They are usually isolated from surface water flows and unprotected by state or federal programs, however, local governments can fill the gap. Consider identifying these features

in a town natural resource inventory or during environmental review. To learn more about vernal pool conservation, visit the woodland pool conservation page on the NYSDEC website.

Calcium-rich areas

Calcium-rich areas, also called calcareous areas, are identified in Figure 5 from the NYS Geological Survey bedrock maps (and Kiviat and Stevens 2001). The Town of Hillsdale has a wide swath of calcareous bedrock, which is somewhat unusual in the Hudson Valley. These areas have the potential to support unique plants and plant communities. The Farmscape Ecology Program has recently documented found a small calcareous fen at the base of the Taconic Range east of Mitchell Street in the southeastern corner of the Town of Hillsdale (Vispo, pers. com.). Amongst the characteristic and rare fen vegetation, it also had a population of the uncommon orchid Shining Ladies'-tresses (*Spiranthes lucida*) and Fringed Gentian (*Gentianella crinita)*. More calcareous fens might well be located along the base of that eastern mountain range. Other habitats that may be present in this area include calcareous wet meadow, fens, carbonate crest ledge and talus habitats, calcareous swamps (red-maple tamarack swamp, for example), limestone woodland, and calcareous talus slope woodland, among others. Further investigation may turn up more unique habitats. The Biodiversity Assessment Manual for the Hudson River Estuary Corridor (Kiviat and Stevens 2001) describes some of these habitats and provide a list of calcium-loving plants in Appendix 5.

More information from the Farmscape Ecology Program at Hawthorne Valley Farm

The Farmscape Ecology Program at Hawthorne Valley Farm has been working in Columbia County to understand the relationship between agriculture, natural areas, and socio-economics. Their extensive fieldwork throughout the county makes them an especially useful source for this summary. Some of their work was included in the stream and calcium-rich area sections. What follows is more information from the program that is not easily integrated into the other sections nd is not mapped.

Yankee Hill Country

The Farmscape Ecology Program has identified Hillsdale as part of Yankee Hill Country, which is the part of the county dominated by the Taconics and has the most northern species, as evidenced by the Breeding Bird Atlas records of Black Throated Blue warbler and Blackburnian warbler.

Farms

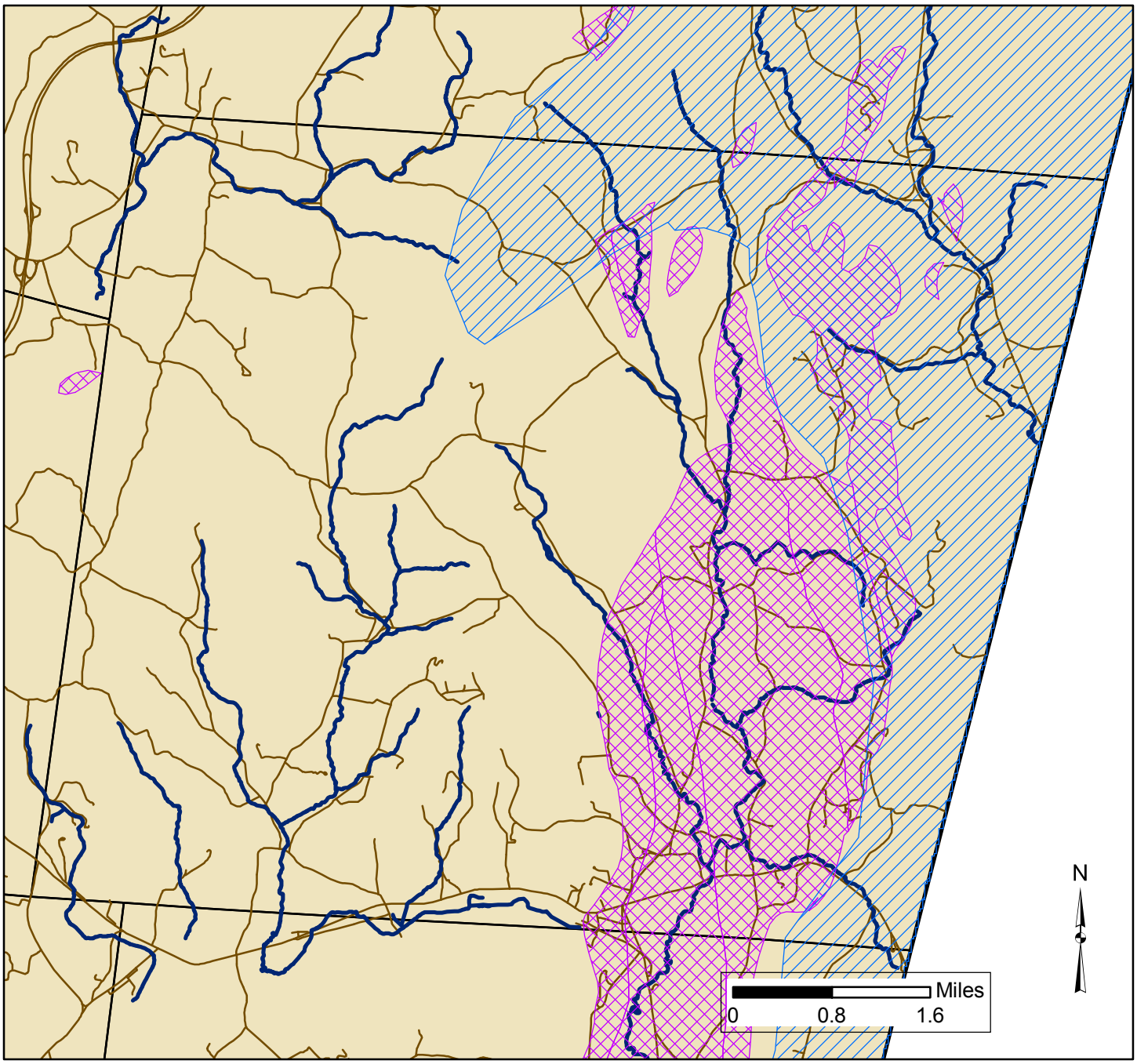
The well-studied fields of Hawthorne Valley Farm in the north-western corner of the Town of Hillsdale, harbor the regionally rare plants Clammy Cuphea (*Cuphea viscosissima*), Field and Whorled Milkwort (*Polygala sanguinea* and P. *verticillata*), Ragged-fringed Orchid (*Platanthera lacera),* Squarrose Sedge (*Carex squarrosa*), Seedbox (*Ludwigia alternifolia*), Yellow Stargrass (*Hypoxis hirsuta*), and New Jersey Tea (*Ceanothus americanus*) (Knab-Vispo, pers.com.). Several animal species of conservation interest, including Spotted Turtle (*Clemmys guttata*), Wood Frog (*Rana sylvatica*), Spotted Salamander (*Ambystoma maculatum*), Jefferson Salamander (*Ambystoma jeffersonianum*), Eastern Ribbon Snake (*Thamnophis sauritus*), Smooth Greensnake (*Opheodrya vernalis*), Clay-colored Sparrow (*Spizella pallida*), Meadowlark (*Sturnella magna*), Bobolink (*Dolichonyx oryzivorus)*, Longnose Sucker (*Catostomus catostomus*), Leonard's Skipper (*Hesperia leonardus*), and Bronze Copper (*Lycaena hyllus*) also occur on this farm (Vispo, pers. com.). Bobcat and Fisher are regularly seen on this farm and probably occur throughout many of the forests in the Town.

Spotted Salamanders and Wood Frogs were also recorded at ponds on the Bridlewood Farm (where Jefferson Salamander eggs were also seen) and Sills Farm in the Eastern half of the Town. Furthermore, a pond on the Sills Farm is the only recorded location for Eastern Red Damselfly (*Amphiagrion saucium*) in Columbia County. Other farms in the town might well harbor a high diversity of native plants and animals. Another high concentration of regionally rare plants occurs in the well-studied floodplain forest and on the western slope of Phudd Hill in Harlemville. The close proximity of floodplain and steep hill-side with (partly calcareous) rocky outcrops provides an exceptionally rich habitat for at least fifteen regional rarities, including False Mermaid Weed (*Floerkea proserpinacoides*), Blue Cohosh (*Caulophylum thalictroides*), Dutchman's Breeches (*Dicentra cucullaria*), and Leatherwood (*Dirca palustris*).
Along the upper Roeliff-Jansen Kill on Skarship Farm, just south of Route 22, there is an interesting swamp forest with the uncommon Wood-Betony (*Pedicularis canadensis*) and Swamp Saxifrage (*Saxifraga pensilvanica*). South of this swamp, the Roeliff-Jansen Kill flows through a bedrock restricted stretch similar to a Hemlock Ravine.

Historic Plant Records

The Hawthorne Valley Farmscape Ecology Program has located at least two historically special places in the Town of Hillsdale, as well as a few recently documented occurrences of regionally rare plants and animals (Knab-Vispo and Vispo, pers. com.). The only historically known population of the regionally rare Wild Lupine (*Lupinus perennis*) in Columbia County was in the extreme southwestern corner of the town, known then as "lupine hill" (McVaugh 1958). A bog 3 miles south-east of Harlemville was the only location in Columbia County where McVaugh found in the 1930s the orchids Dragon's Mouth (*Arethusa bulbosa*) and Green Adder's-mouth (*Malaxis unifolia*). This bog historically also harbored the regionally rare Snakemouth Orchid or Rose Pogonia (*Pogonia ophioglossoides*), Spatulate-leaved Sundew (*Drosera intermedia*), and Large Cranberry (*Vaccinium macrocarpon*). These two locations have not yet been re-visited to determine the current status of these rare plant populations.

Figure 1: Major Natural Features in the Town of Hillsdale, Columbia County, NY



Legend

- Taconic Mountains significant biodiversity area
- Coldwater Streams
- Calcium-rich Bedrock
- Municipal Boundaries
- County Boundaries
- Roads

This map shows the most significant *known* natural features in the Town of Hillsdale, Columbia County based on currently available information. Please note, there are limited data available for this town. This map was produced as part of a Habitat Summary for Hillsdale.

For more information, please contact NYSDEC's Hudson River Estuary Biodiversity Outreach Coordinator Karen Strong at (518) 402-8878.

Data Sources:

New York State Department of Environmental Conservation

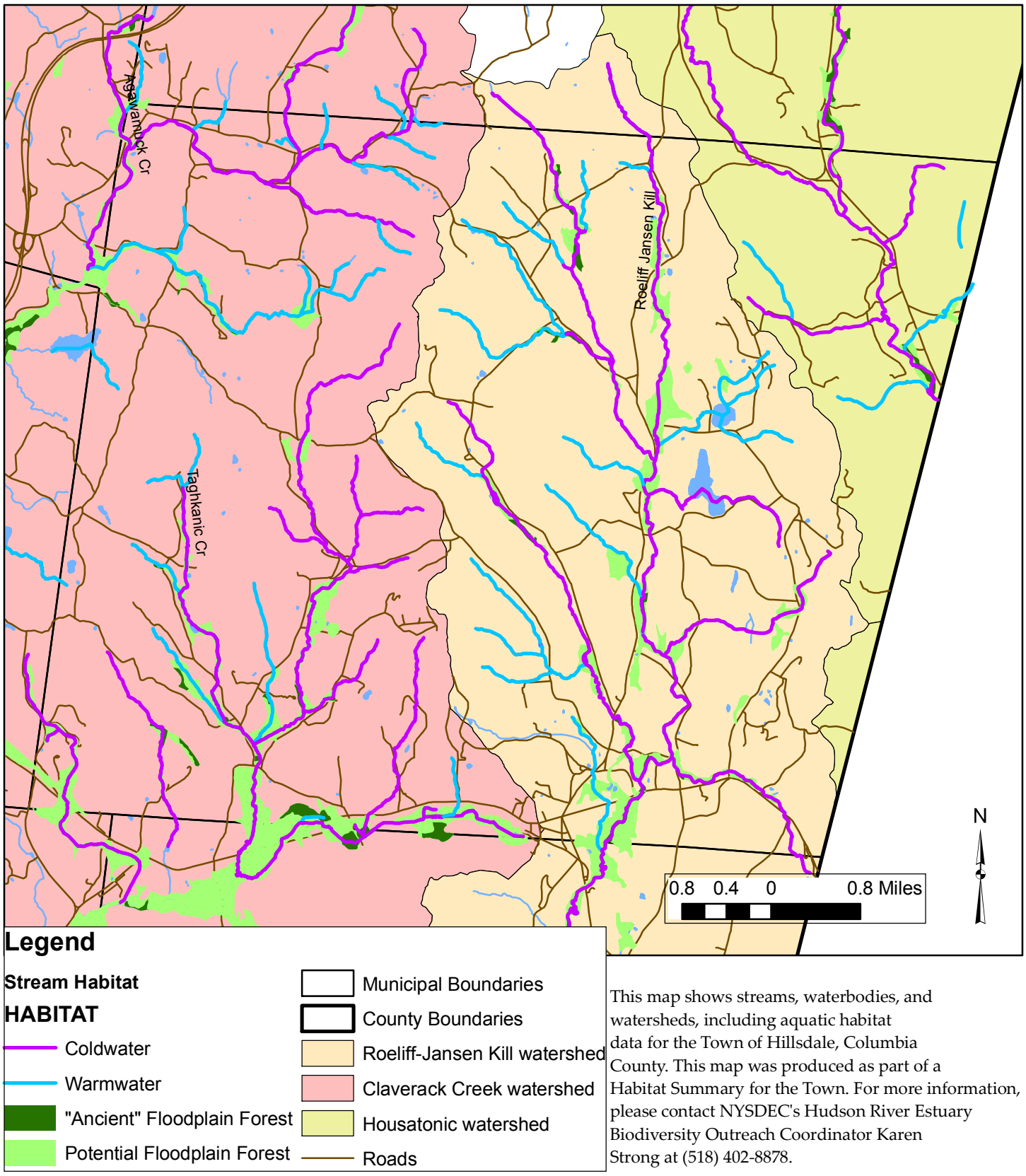
New York State Geological Survey

Map Created 29 November 2010

Hudson River Estuary

Cornell University

Figure 2: Streams and Watersheds in the Town of Hillsdale, Columbia County, NY



This map shows streams, waterbodies, and watersheds, including aquatic habitat data for the Town of Hillsdale, Columbia County. This map was produced as part of a Habitat Summary for the Town. For more information, please contact NYSDEC's Hudson River Estuary Biodiversity Outreach Coordinator Karen Strong at (518) 402-8878.

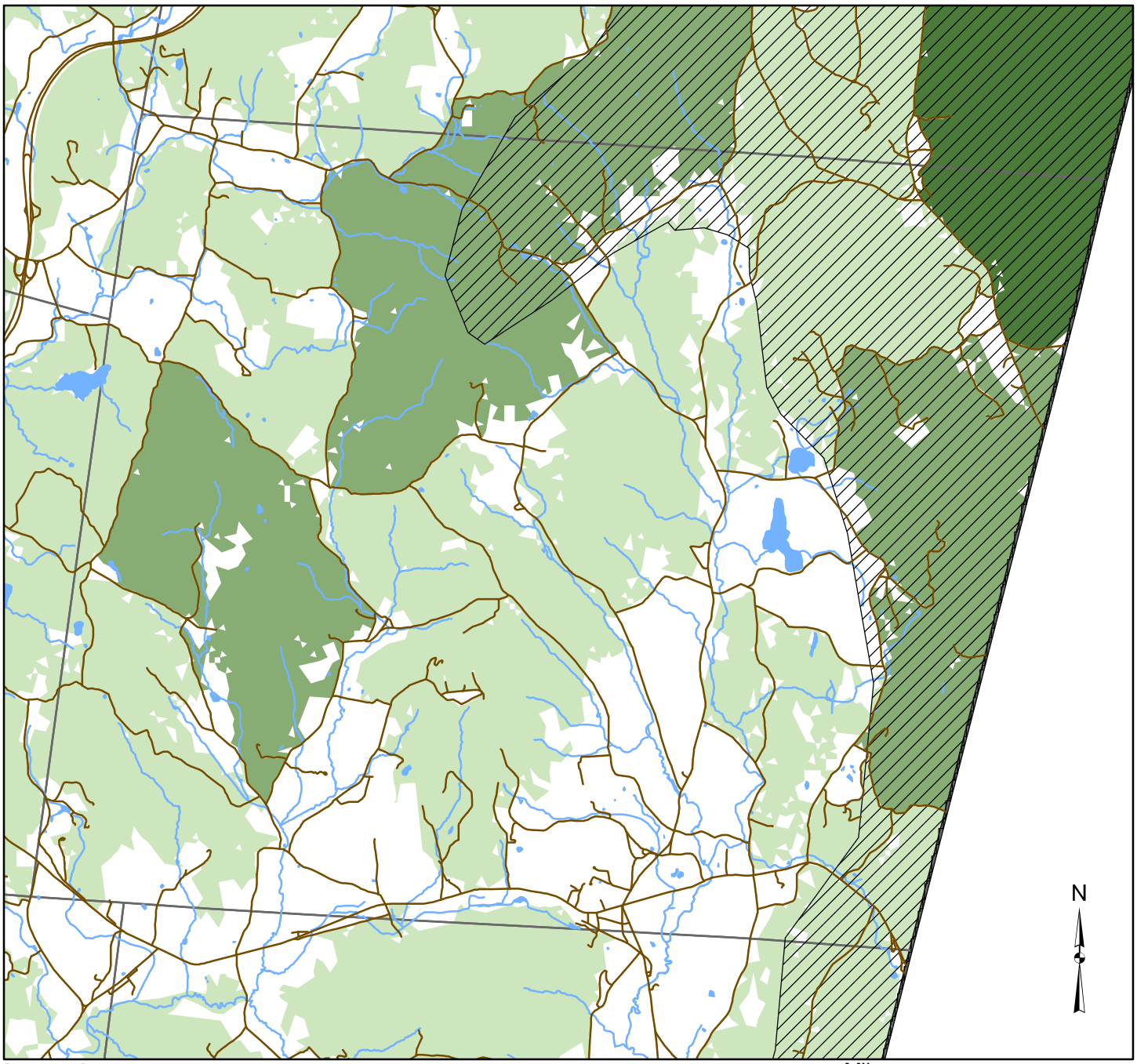
Data Sources:
US Geological Survey
New York State Department of Environmental Conservation
National Resources Conservation Service
New York State Office of Cyber Security and Critical Infrastructure Coordination

Map Created 27 October 2010

Hudson River Estuary

Cornell University

Figure 3: Large Forests (200 acres and larger) in the Town of Hillsdale, Columbia County.



Legend

- Roads
- Taconic Ridge signfiicant biodiversity area
- Streams
- Waterbodies
- Municipal Boundaries
- County Boundaries

Forest Patch Size (Acres)

- 200 - 1999: Stepping Stone
- 2000 - 4999: Locally Significant
- 5000 - 14999: Regionally Significant
- 15000+: Globally Signfiicant

This map shows continuous forested patches of New York State by acreage for the Town of Hillsdale, Columbia County. It was created using the National Land Cover Database to identify forest cover and buffered roads were used to identify forest patches. This map was produced as part of a habitat summary for the town. For more information, please contact NYSDEC's Hudson River Estuary Biodiversity Outreach Coordinator Karen Strong at (518) 402-8878.

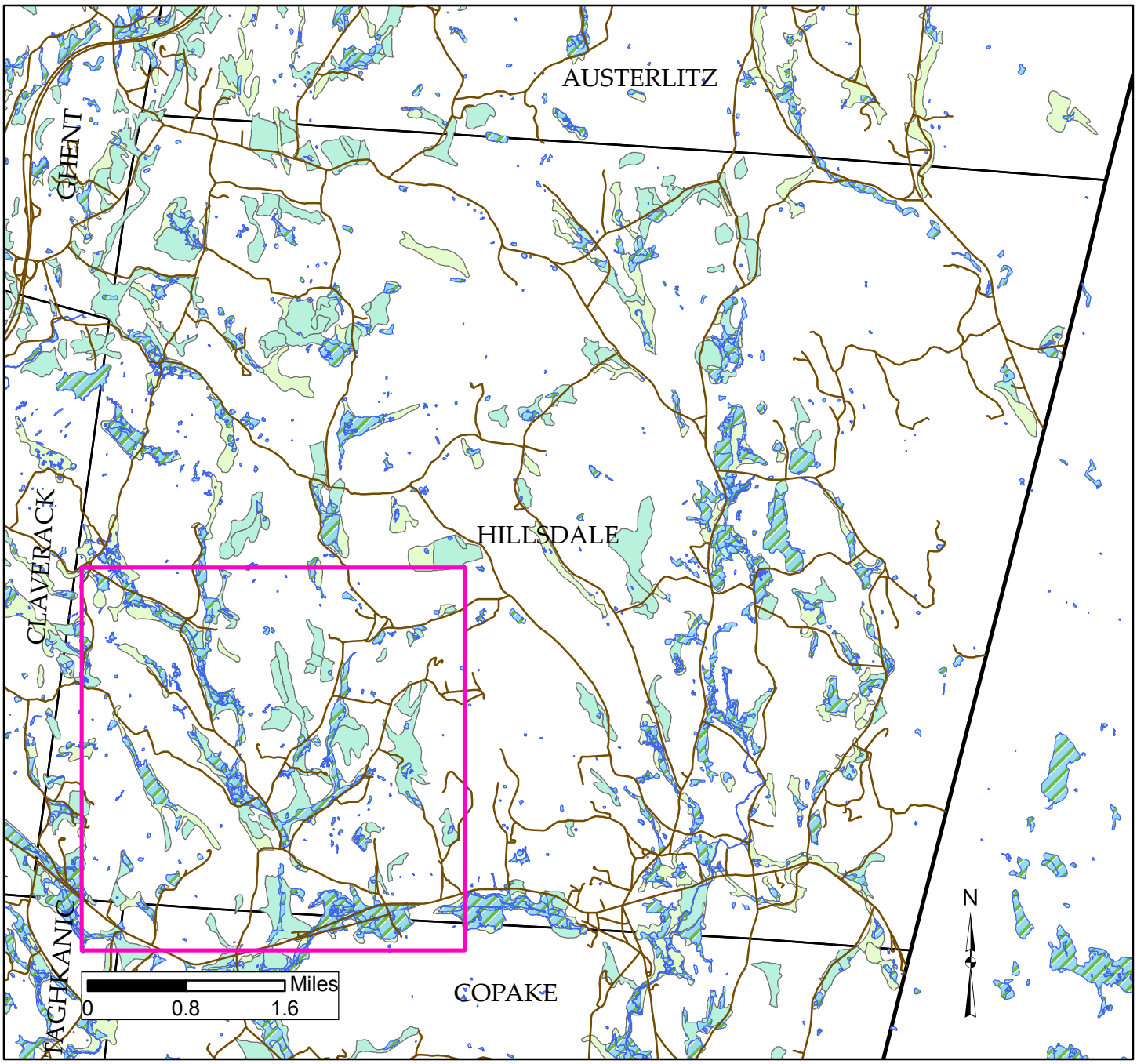
Data Sources: EPA 2001 Multi-Resolution Land Characteristics dataset
New York State Department of Environmental Conservation
New York State Office of Cyber Security and Critical Infrastructure Coordination

Map Created 26 October 2010

Hudson River Estuary

Cornell University

Figure 4: Wetlands in the Town of Hillsdale, Columbia County, NY



Legend

- Least Bittern
- Wetlands (National Wetland Inventory)
- Columbia County Probable wetland
- Columbia County Possible wetland
- Municipal Boundaries
- County Boundaries
- Roads

This map shows wetlands for the Town of Hillsdale, Columbia County, NY. Probable and possible wetlands were identified by drainage class on the Columbia County Soil Survey. See the habitat summary text for details. This map was produced as part of a Habitat Summary for the Town.
For more information, please contact NYSDEC's Hudson River Estuary Biodiversity Outreach Coordinator Karen Strong at (518) 402-8878.

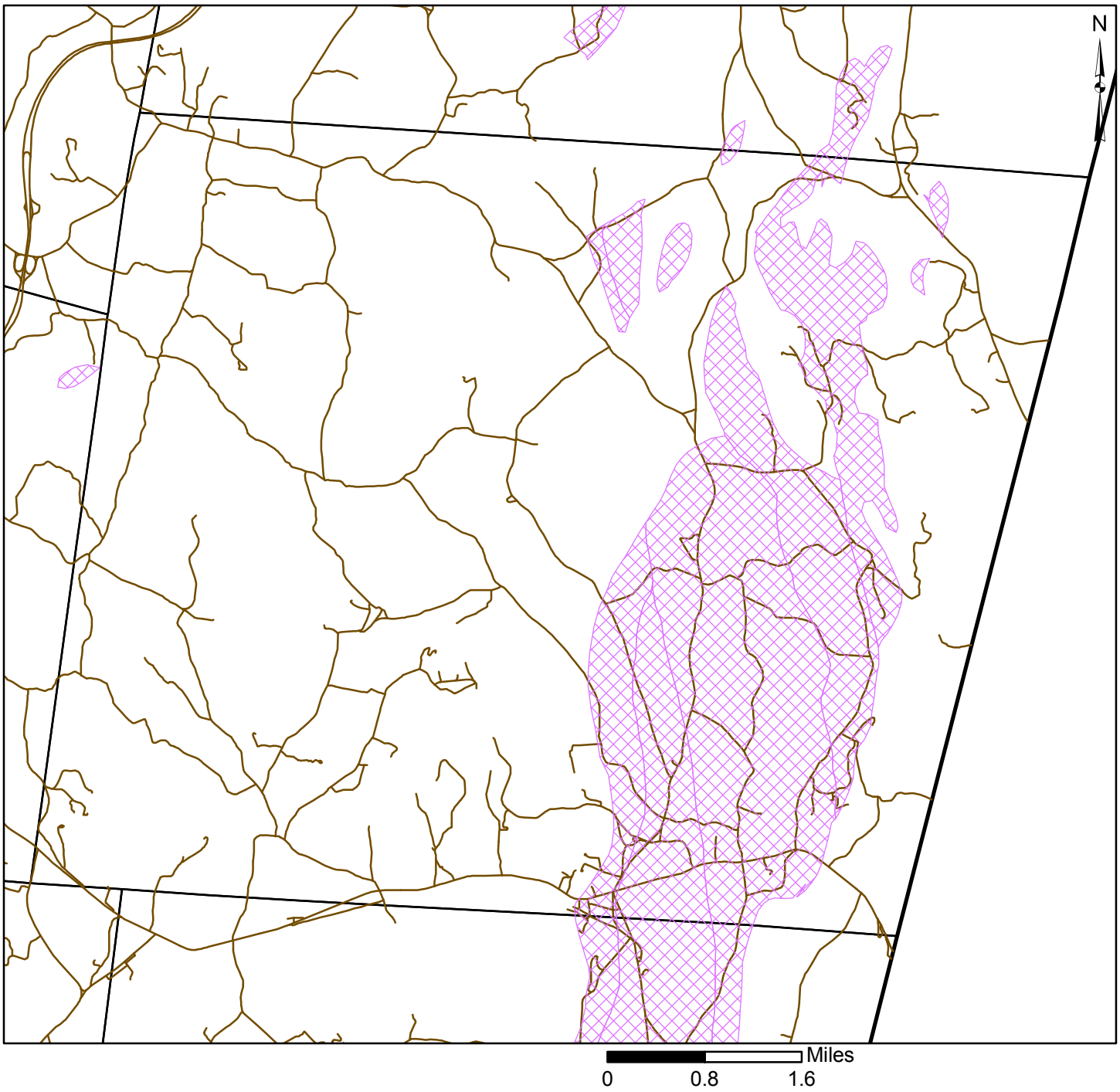
Data Sources: NYS Geological Survey
Columbia County Soil and Water Conservation District
New York State Department of Environmental Conservation
NYS Department of Transportation

Map Created 29 November 2010

Hudson River Estuary

Cornell University

Figure 5: Calcium-rich Bedrock in The Town of Hillsdale, Columbia County, NY



This map shows calcium-rich soils and bedrock for the Town of Hillsdale, Columbia County, NY. Areas underlain with calcium-rich (calcareous) soil or bedrock have the potential to provide unique habitats that might be home to rare and uncommon plants and animals. Known uncommon calcareous habitats are also shown. This map was produced as part of a Habitat Summary for the Town. For more information, please contact NYSDEC's Hudson River Estuary Biodiversity Outreach Coordinator Karen Strong at (518) 402-8878.

Data Sources: NYS Geological Survey
Columbia County Soil and Water Conservation District
New York State Department of Environmental Conservation
NYS Department of Transportation

Legend

- Calcium-rich Bedrock
- Roads
- Municipal Boundaries
- County Boundaries

Map Created 27 October 2010

Hudson River Estuary

Cornell University

Species and Habitat lists

Table 1. Known Significant Reptiles and Amphibians of the Town of Hillsdale. Data are from the NY Amphibian and Reptile Atlas. Other species have been reported from town, but only those that indicate high quality habitat are included here.

Common name	Scientific Name	Significance	Stream-Associated Species
Black Rat Snake*	*Elaphe o. obsoleta*		
Eastern Ribbon Snake*	*Thamnophis sauritus sauritus*		Y
Jefferson's salamander*	*Ambystoma jeffersonianum*	NYS Species of Special Concern	
Jefferson's salamander complex	*Ambystoma jeffersonianum x laterale*	NYS Species of Special Concern	
Spotted Salamander	*Ambystoma maculatum*	Vernal pool indicator	
Spotted Turtle*	*Clemmys guttata*	NYS Species of Special Concern	Y
Wood Frog	*Rana sylvatica*	Vernal pool indicator	

* denotes NYS Species of Greatest Conservation Need (SGCN)

Table 2. Known Significant Birds of the Town of Hillsdale. Data from New York Breeding Bird Atlas 2000 [Internet]. 2000 - 2005. Release 1.0. Albany (New York): New York State Department of Environmental Conservation. [updated 2007 Jun 11; cited 2009 Aug 18]. Conservation Priority, habitat type, and links from Audubon NY (2009)[UH] Data are from blocks that are more than 50% in Hillsdale, Shown here is a subset of that list, we selected birds identified as a "special conservation responsibility" for the Hudson Valley by Audubon NY and those especially sensitive to fragmentation (Dewan 2008).

Common Name	Scientific Name	General Habitat Type	Stream-Associated Species	More information from...
Forest Birds				
American Redstart	*Setophaga ruticilla*	Forest		
Baltimore Oriole	*Icterus galbula*	Forest		
Black-and-white Warbler	*Mniotilta varia*	Forest		Audubon
Black-billed Cuckoo*	*Coccyzus erythropthalmus*	Forest		Audubon
Black-throated Blue Warbler*	*Dendroica caerulecsens*	Forest		Audubon
Blackburnian Warbler	*Dendroica fusca*	Forest		Audubon
Broad-winged Hawk	*Buteo platypterus*	Forest		Audubon
Downy Woodpecker	*Picoides pubescens*	Forest		Audubon
Eastern Wood-Pewee	*Contopus virens*	Forest		Audubon
Louisiana Waterthrush*	***Seiurus motacilla***	**Forest**	**Y**	**Audubon**
Northern Flicker	*Colaptes auratus*	Forest		Audubon
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	Forest		Audubon
Ruffed Grouse*	*Bonasa umbellus*	Forest		Audubon
Scarlet Tanager*	***Piranga olivacea***	**Forest**		**Audubon**
Sharp-shinned Hawk**	*Accipter striatus*	Forest		Audubon
Veery	*Catharus fuscescens*	Forest		Audubon
White-throated Sparrow	*Zonotrichia albicollis*	Forest		
Wood Thrush*	*Hylocichla mustelina*	Forest		Audubon
Worm-eating warbler*	***Helmitheros vermivorum***	**Forest**		**Audubon**

Common Name	Scientific Name	General Habitat Type	Stream-Associated Species	More information from…
Yellow-throated Vireo	*Vireo flavifrons*	Forest	Y	Audubon
Grassland Birds				
American Kestrel	*Falco sparverius*	Grassland		Audubon
Bobolink*	*Dolichonyx oryzivorus*	Grassland		Audubon
Eastern Kingbird	*Tyrannus tyrannus*	Grassland		Audubon
Eastern Meadowlark	*Sturnella magna*			Audubon
Savannah Sparrow	*Passerculus sandwichensis*	Grassland		Audubon
Shrubland Birds				
Blue-Winged Warbler*	***Vermivora pinus***	**Shrubland**		**Audubon**
Brown Thrasher*	***Toxostoma rufum***	**Shrubland**		**Audubon**
Chestnut-sided Warbler	***Dendroica pensylvanica***	**Shrubland**		
Eastern Towhee	*Pipilo erythrophthalmus*	Shrubland		Audubon
Indigo Bunting	***Passerina cyanea***	**Shrubland**		**Audubon**
Prairie Warbler*	*Dendroica discolor*	Shrubland		Audubon
Willow Flycatcher	*Empidonax trailli*			Audubon
Wetland Birds				
Green Heron	*Butorides virescens*			
Least Bittern***	*Ixobrychus exilis*			Audubon, DEC
Swamp Sparrow	***Melospiza georgiana***	**Wetland**		
Birds of Other Habitats				
American Woodcock	*Scolopax minor*	Open/forest		Audubon
Belted Kingfisher	*Megaceryle alcyon*	open water	Y	Audubon
Whip-poor-will	*Caprimulgus vociferus*	Shrub/pine barren		Audubon

* denotes NYS Species of Greatest Conservation Need (SGCN)
** denotes NYS Species of Special Concern and SGCN
*** denotes NYS Threatened Species and SGCN
Species in bold are known to be particularly sensitive (Dewan 2008).

Table 3. Historic Rare plant and Rare Animal Records in the Town of Hillsdale. There are no current records from the New York Natural Heritage Program for the Town of Hillsdale, these are historic records. This information comes from the New York Natural Heritage Program Biodiversity Databases and is publically available from the New York Nature Explorer. More information can be found at http://guides.nynhp.org. More historic plant records can be found on page 6.

Common Name	Description	Scientific Name	State listing
Clay-colored Sparrow*	Rare shrubland bird species	*Spizella padilla*	
Dragon's Mouth Orchid	Rare plant	*Arethusa bulbosa*	Threatened

*While not extant in the NY Natural Heritage database, the Clay-colored Sparrow has been documented at the Hawthorne Valley Farm (see section on Farms on pp5-6).

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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