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BIOLOGICAL RESOURCES IN A PROPOSED CRITICAL ENVIRONMENTAL AREA, TOWN OF RHINEBECK, DUTCHESS COUNTY, NY

A Preliminary Report

By

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The Town of Rhinebeck Conservation Advisory Board proposes the establishment of a Critical Environmental Area in the part of eastern Rhinebeck bounded by Route 9G (west), Route 308 (north), the Milan town line (east), and Slate Quarry Road or the Clinton town line (south) (Figure 1). This document describes some of the biological resources of conservation importance that are known or likely to occur in that area.

A Critical Environmental Area (CEA) is a geographic area designated by the municipality, the county, or the state because of special natural or cultural characteristics. The purpose of the designation is to alert landowners, developers, planners, and regulatory agencies to the features of concern, so that harm to important areas can be minimized, or environmental hazards can be avoided. The establishment of CEAs is authorized under subdivision 6 NYCRR 617.14(g) of the State Environmental Quality Review regulations (SEQR).

An area may be designated a CEA if it has:

- a feature that is a benefit or threat to human health;
- an exceptional natural setting;
- exceptional social, historic, archaeological, recreational, or educational values; or
- an inherent ecological, geological or hydrological sensitivity to change that may be adversely affected by any physical disturbance (<http://www.dec.ny.gov/permits/6184.html>).

The Rhinebeck Conservation Advisory Board has proposed this CEA designation because of the concentration of unusual and high-quality habitats in a relatively unfragmented landscape. For example:

- extensive unfragmented forest;
- at least 5 meadows larger than 25 acres;
- at least 32 intermittent woodland pools;
- at least 6 kettle shrub pools;
- numerous other small and large wetlands;

- large areas of crest, ledge, and talus habitat, including one small oak-heath barren; and
- forested reaches of the Landsman Kill and Crum Elbow Creek, and many forested tributaries.

In a recent study of habitats in Rhinebeck (Reinmann and Stevens 2007), Hudsonia delineated two “Priority Conservation Areas” (“Slate Quarry” and “Hilltop”) in this area due to the unusual natural features. The area is known to support wildlife species of conservation concern such as Jefferson salamander, blue-spotted salamander, Cooper’s hawk, and red-shouldered hawk (all NYS Species of Special Concern) (Reinmann and Stevens 2007), and Blanding’s turtle (NYS Threatened) (Gay Hanson, Jason Tesauro, pers. comm.).

The habitats identified by Hudsonia in the proposed CEA are shown in Figure 1, and a few of the habitat types are described below. Rarity ranks of species mentioned below are from Kiviat and Stevens (2001), Young (2010), the New York Natural Heritage Program (2014), and the New York State Department of Environmental Conservation (<http://www.dec.ny.gov/animals/7494.html>).

Large Forests

The proposed CEA contains a contiguous forested area of more than 1000 acres, the largest unfragmented forest in Rhinebeck (Reinmann and Stevens 2007). Large forests provide critical habitats for many area-sensitive species of conservation concern—including raptors, songbirds, reptiles, amphibians, and large mammals—that are disappearing from our increasingly fragmented rural landscapes. Forests also provide many essential services that benefit the human community, such as climate moderation and carbon sequestration, and protection and maintenance of water supplies. Intact forests of any size promote efficient water infiltration through the soils and reduce the volumes of rapid overland runoff. Forest preservation is thus an effective means of maintaining the quality and quantity of groundwater and surface water for Rhinebeck’s streams, ponds, and drinking-water wells.

Crest, Ledge, and Talus

“Crests” and “ledges” are rocky habitats where bedrock is exposed at the ground surface, and “talus” refers to the accumulation of rock fragments below a steep ledge. These habitats can occur at any elevation but crests are often on hilltops or knoll summits, and ledges on steep hillsides. Soils in these areas are shallow, and vegetation is often sparse and stunted, but some areas are well-forested. These habitats are used by many kinds of wildlife, and sometimes support rare species of plants and animals. Rocky crests with a sparse or absent tree canopy are used by snakes of conservation concern (e.g., northern copperhead, black rat snake, black racer) for basking and breeding, and deep crevices in nearby ledges or the talus itself are used for overwintering. A number of rare sedges, ferns, and wildflowers occur on crests and ledges in the region. Talus provides habitat for the slimy salamander, eastern small-footed bat (NYS Species of Special Concern), and many other small animals. The forests of the proposed CEA have large areas of crest, ledge, and talus habitats (Figure 1). Northern copperhead has been found in this area, and there appears to be plenty of good basking, breeding, foraging, and overwintering habitat for copperhead and other snakes of conservation concern.

A small area of “**oak-heath barren**”—a special kind of crest habitat—was found here by Reinmann and Stevens (2007). This is a regionally uncommon habitat type with a distinctive plant community, sometimes including rare plants such as reflexed sedge (NYS Endangered) or clustered sedge (NYS Threatened). Oak-heath barrens also may support rare butterflies that use scrub oak, little bluestem, or lowbush blueberry as their larval food plants; for example, northern oak hairstreak (NYS Species of Greatest Conservation Need), Horace’s duskywing, Leonard’s skipper, and brown elfin (all regionally rare).

Large Meadows

There are many upland meadows in the proposed CEA. The ecological values of upland meadows, including active cropland, hayfields, pastures, abandoned fields, and similar areas, can differ widely according to the size, types of vegetation present, and current and past disturbance history (e.g. tilling, mowing, grazing, pesticide applications) of the meadow. Undisturbed meadows tend to develop diverse plant communities of grasses, forbs, and shrubs and support an array of wildlife, including invertebrates, reptiles, mammals, and birds. Several species of rare butterflies, such as Aphrodite fritillary, dusted skipper, Leonard’s skipper, swarthy skipper, meadow fritillary, and striped hairstreak use upland meadows that support their particular host plants. Upland meadows can be used for nesting by Blanding’s turtle, wood turtle, spotted turtle, box turtle, painted turtle, and snapping turtle. Large hayfields or pastures dominated by grasses may support grassland-breeding birds—depending on the mowing schedule or intensity of grazing—while intensively cultivated crop fields have comparatively little wildlife habitat value until after cultivation has ceased. Grassland breeding birds such as grasshopper sparrow (NYS Species of Special Concern), vesper sparrow (NYS Species of Greatest Conservation Need), savannah sparrow, eastern meadowlark, and bobolink (both SGCN) use extensive meadow habitats for nesting and foraging. Wild turkeys forage on invertebrates and seeds in upland meadows. Upland meadows often have large populations of small mammals (e.g., meadow vole) and can be important hunting grounds for raptors, foxes, and eastern coyote. The dramatic decline of grassland breeding birds in the Northeast has been attributed to the loss of large patches of suitable meadow habitat; many of these bird species need large (>25 ac) meadows undivided by fences or hedgerows. The proposed CEA has at least five meadows larger than 25 acres, and one of those exceeds 100 acres.

Intermittent Woodland Pools

An intermittent woodland pool is a small, shallow wetland mostly or entirely surrounded by forest and isolated from streams and other wetlands. It typically has standing water during winter and spring but dries up by mid- or late summer. The absence of fish—due to the isolation and the seasonal drying of the pool—is key for a special group of amphibians that require fish-free breeding and nursery habitats: marbled salamander, Jefferson salamander (both NYS Species of Special Concern), spotted salamander, and wood frog. The surrounding forest provides leaf litter and other organic debris that constitutes the base of the pool’s food web. The forest also provides essential habitat for the pool-breeding amphibians during the non-breeding seasons. Intermittent woodland pools also provide habitat for many other organisms (such as fingernail clams and fairy shrimp) that depend on the seasonal drying, and are used by many other wildlife species for foraging and rehydrating. The 32 intermittent woodland pools and the large surrounding areas of upland forest in the proposed CEA offer plenty of year-round habitat and safe travelways between pools and forest for amphibians and other wildlife of these habitats.

Kettle Shrub Pools

A kettle shrub pool is a seasonally or permanently flooded shrubby wetland in a glacial kettle—a depression formed by a block of ice stranded from the retreating glacier. The wetland usually has a significant area of open water and thickets of buttonbush or other tall shrubs. These wetlands are typically isolated from streams, although some may have a small intermittent inlet or outlet. Kettle shrub pools have ecological values similar to those of intermittent woodland pools, and are also the core wetland habitat for the Blanding's turtle (NYS Threatened) in Dutchess County. This turtle spends the winter and early spring in such pools, and uses a variety of other wetland and upland habitats during the warm months of the year, often traveling long distances from the home pool. Blanding's turtles have been found within the proposed CEA, and the presence of six kettle shrub pools and intact habitat areas between the pools suggests that there could be a significant Blanding's turtle population here.

Streams

The proposed CEA has two major perennial streams—the Landsman Kill and the Crum Elbow Creek—and many smaller streams. The Landsman Kill is the largest stream in Rhinebeck, rising in Milan, winding generally east to west through the CEA area and then generally westward through the town, and ultimately emptying into the Hudson River at Vanderburgh Cove. West of White Schoolhouse Road the stream has been designated a trout stream by NYSDEC, indicating the clear, cool, conditions needed to support trout and other stream organisms that do not tolerate siltation and other kinds of pollution. The Landsman Kill has a broad forested floodplain for much of its length within the proposed CEA, which helps stabilize the stream channel, absorb floodwaters, and maintain high-quality stream water quality and instream habitats. [EK will check notes for Schuyler House property; musk turtle?]

The Crum Elbow Creek, another major Hudson River Tributary, drains large areas in the towns of Clinton, Rhinebeck, and Hyde Park, as well as the southeastern corner of Rhinebeck. In the vicinity of the proposed CEA the Crum Elbow is designated a Class A stream, a classification reserved for water bodies used as drinking water sources. The broad forested floodplain of the Crum Elbow contributes to the good water quality and habitat quality of the stream. Wood turtle (NYS Species of Special Concern) is known to use other parts of the Crum Elbow, and may be present in the vicinity of the proposed CEA.

The fish and aquatic invertebrate communities of perennial streams may be diverse, especially in clean-water streams with unsilted bottoms. Brook trout and slimy sculpin (both regionally scarce) are two native fish species that require clear, cool streams for successful spawning. The wood turtle uses perennial streams year-round, but also uses other nearby streams and wetland and upland habitats in the warm months for foraging, basking, resting, and nesting, sometimes travelling long distances from the home stream. Perennial stream corridors are used by many other species of fish and wildlife, providing essential water sources and habitats for many plant, vertebrate, and invertebrate species. Perennial streams and their riparian zones, including sand and gravel bars, provide nesting or foraging habitat for many species of birds, such as spotted sandpiper, belted kingfisher, tree swallow, bank swallow, winter wren (regionally rare breeder), Louisiana waterthrush (NYS Species of Greatest Conservation Need), great blue heron, and green heron. Many bat species, including Indiana bat (NYS Endangered), use perennial stream corridors for foraging. Muskrat, beaver, mink, and river otter (NYS Species of Greatest Conservation Need) are some of the mammals that regularly use stream corridors.

Intermittent streams may flow for a few days or for many months during the year, but ordinarily dry up at some time during years of normal precipitation. They are the headwaters of most perennial streams, and are significant water sources for lakes, ponds, and wetlands of all kinds. The condition of these streams therefore influences the water quantity and quality of those larger water bodies and wetlands. The land cover and land uses in the watersheds of these streams greatly influences the downstream response to large rainstorms and snowmelt events.

Intermittent streams provide microhabitats not present in perennial streams, supply aquatic organisms and organic drift to downstream reaches, and can be important local water sources for wildlife (Meyer et al. 2007). Their loss or degradation in a portion of the landscape can affect the presence and behavior of wildlife populations over a large area (Lowe and Likens 2005). Although intermittent streams have been little studied by biologists, they have been found to support rich aquatic invertebrate communities, including regionally rare mollusks (Gremaud 1977) and dragonflies. Both perennial and intermittent streams provide breeding, larval, and adult habitat for northern dusky salamander (regionally vulnerable) and northern two-lined salamander. The forests and (sometimes) meadows adjacent to streams provide foraging habitats for adults and juveniles of these species. Numerous intermittent streams feed the perennial streams of the proposed CEA. Most appear to be well-buffered by forest habitats and have substantially forested watersheds (Figure 1).

Other Habitats

Other habitats in the proposed CEA include **red cedar woodland, upland shrubland, wet meadow, calcareous wet meadow, marsh, and hardwood swamp**. All of these are important for native biodiversity, and the whole complex of habitats increases the value of this area for the many wildlife species that use multiple habitats to fulfill their life needs. For example, the American woodcock (NYS Species of Greatest Conservation Need) nests and forages in shrub thickets and young woods, but needs open fields for courtship displays; the wood duck (regionally vulnerable) nests in forests, but uses nearby wetlands for nursery and foraging habitat; and bobcat (regionally vulnerable) uses den sites remote from human disturbance for resting and nursery areas, but hunts over large areas of upland forests, swamps, and meadows.

Just west of White Schoolhouse Road are several active **gravel mines** (mapped as “**waste ground**” in Figure 1). Although the active parts of gravel mines often have little habitat value, once mining has ceased such areas can support an array of uncommon native plants and animals that take advantage of the highly disturbed conditions. Rare plant species known to inhabit inactive parts of gravel mines or abandoned mines include rattlebox (NYS Endangered), slender pinweed (NYS Threatened), field dodder (NY Natural Heritage Program rank S1), and slender knotweed (NYS Rare). Several snake and turtle species of conservation concern, including eastern hognose snake (NYS Species of Special Concern), Blanding’s turtle, and wood turtle, may use the open, gravelly areas of gravel mines for burrowing, foraging, or nesting habitat. Bank swallow and belted kingfisher often nest in the stable walls of active or inactive portions of soil mines. Bare, gravelly, or otherwise open areas provide nesting grounds for spotted sandpiper, killdeer, and possibly whip-poor-will or common nighthawk (both NYS Species of Special Concern).

The bedrock of much of the proposed CEA has been identified as shale, limestone, and conglomerate in the Germantown formation (Fisher et al. 1970). Limestone caves are known in the vicinity of Eighmyville, and may be present elsewhere in the proposed CEA. Deep mines and caves with high humidity and temperatures around the mean annual air temperature [ca. 50° F (15° C)] are commonly used by several species of cave bats—such as northern long-eared bat (proposed for the federal Endangered list), little brown bat, big brown bat, eastern pipistrelle, and small-footed bat (NYS Species of Special Concern)—for winter hibernation and daytime roosting in late summer and fall. We do not know if any caves in the proposed CEA are suitable for bat use, but the question should be explored if future land use proposals arise in the areas of limestone bedrock. Cave bats are under acute threat from white-nose syndrome, an emergent infectious disease that has decimated populations of eastern small-footed bat, little brown bat, eastern pipistrelle, and northern long-eared bat in New York. Big brown bat is also at risk. Caves and crevasses of the study area can also provide habitat for other kinds of wildlife such as salamanders, snakes, mammals (e.g., hibernating black bear), and terrestrial invertebrates. Limestone outcrops, as well as limestone erratics and other calcareous glacial deposits in the proposed CEA could support rare plants of those habitats such as walking fern (regionally uncommon), smooth cliffbrake, small-flowered crowfoot (both NYS Threatened), or yellow harlequin (NY Natural Heritage Program Watch List).

PROCEDURES FOR ESTABLISHING A CEA

Before establishing a CEA, the town must 1) publish a public notice that describes the proposed boundaries and special environmental characteristics that justify the designation, and 2) hold a public hearing. Once the CEA is adopted by the town board, the town must file the map, the written justification, and proof of a public hearing with the state and regional offices of NYSDEC and with all town and county agencies that may be involved in funding or regulatory approvals within the CEA (6 NYCRR 617.14[g]). The NYSDEC will publish a notice of the CEA in the Environmental Notice Bulletin

REGULATORY CONSEQUENCES

Designation of a CEA provides no automatic protection of areas within the CEA. It merely draws greater attention to the importance of the area, and the particular features of concern that should be taken into account when locating and designing new projects, conducting environmental reviews, and making regulatory decisions. The designation does not extend or restrict the permitting authority of any agency, but helps to ensure that the features of concern are duly considered in land use planning, reviews, and decisions.

Once the CEA has been formally established, any proposed activities that would impair the important environmental characteristics of the CEA are considered to be significant adverse impacts on the environment, and thus “warrant specific, articulated consideration in determining the significance of any Type I or Unlisted actions that may affect the CEA” (6 NYCRR 617.7[c][1][iii] and 617.14 [g][4]). Also, the designation of a CEA is itself subject to SEQR, ordinarily as an Unlisted Action.

REFERENCES CITED

Fisher, D.W., Y.W. Isachsen, and L.V. Rickard. 1970. Geologic map of New York (lower Hudson sheet). Map and Chart Series 15. 1:250,000, 100 ft. contour. New York State Museum and Science Service, Albany.

Gremaud, P. 1977. The ecology of the invertebrates of three Hudson Valley brooklets. Senior project, Bard College, Annandale, NY. 61 p.

Kiviat, E. and G. Stevens. 2001. Biodiversity assessment manual for the Hudson River estuary corridor. New York State Department of Environmental Conservation, Albany. 508 p.

Lowe, W.H. and G.E. Likens. 2005. Moving headwater streams to the head of the class. *BioScience* 55(3):196-197.

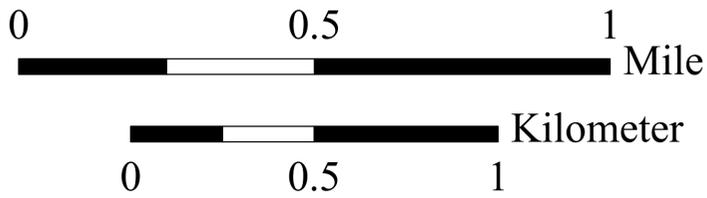
Meyer, J.L., D.L. Strayer, J.B. Wallace, S.L. Eggert, G.S. Helfman, and N.E. Leonard. 2007. The contribution of headwater streams to biodiversity in river networks. *Journal of the American Water Resources Association* 43(1):86-103.

Reinmann, A. and G. Stevens. 2007 Significant habitats in the Town of Rhinebeck, Dutchess County, New York. Report to the Town of Rhinebeck, the Dyson Foundation, and the Dutchess Land Conservancy. Hudsonia Ltd., Annandale, NY. 132 p.

New York Natural Heritage Program. 2014. Rare animals status list, May 2014. New York Natural Heritage Program, Albany. 19 p.

Young, S. M. (ed). 2010. New York rare plants status lists, June 2010. New York Natural Heritage Program, Albany. 97 p. + appendices.

Proposed Critical Environmental Area



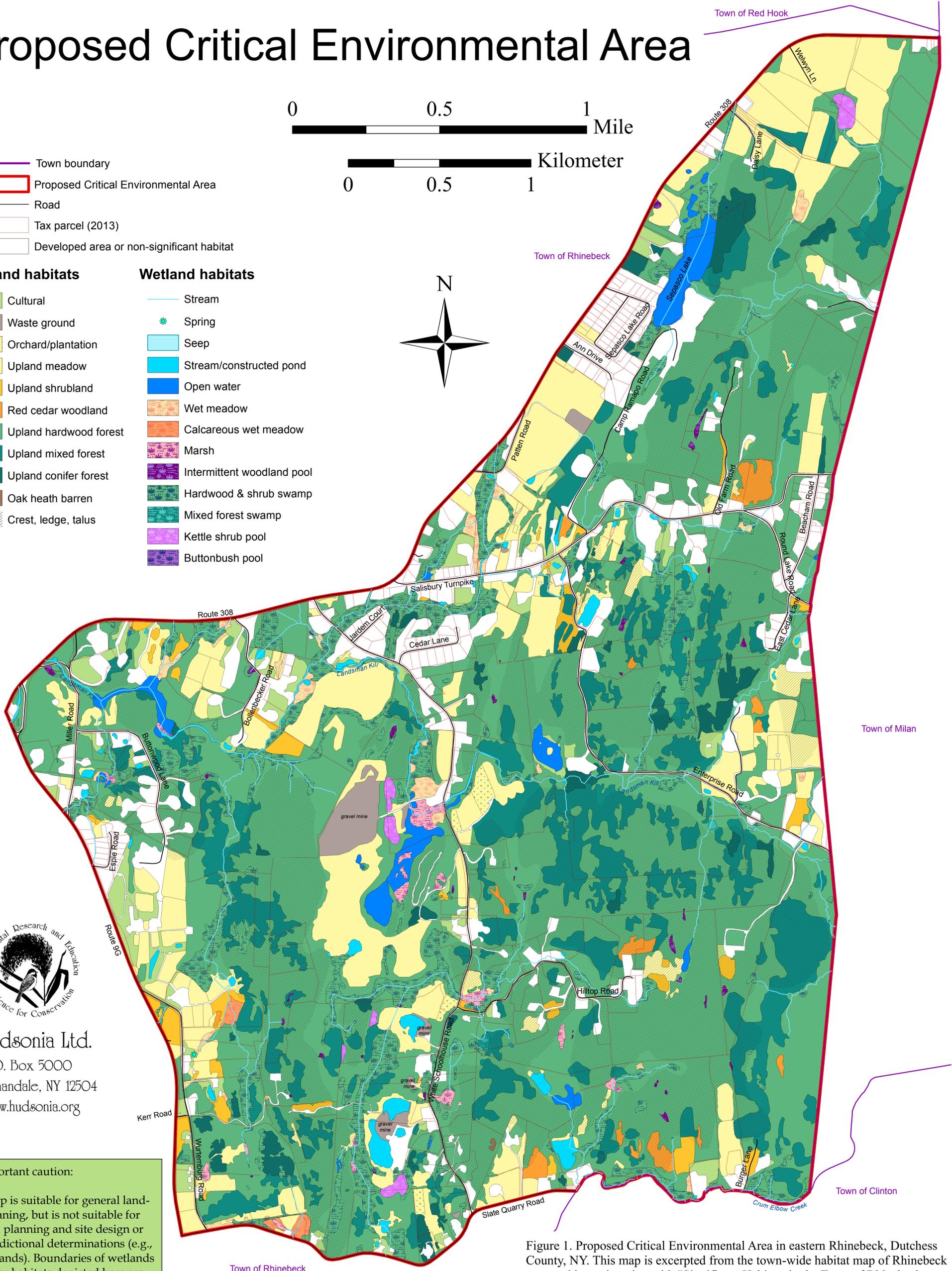
- Town boundary
- Proposed Critical Environmental Area
- Road
- Tax parcel (2013)
- Developed area or non-significant habitat

Upland habitats

- Cultural
- Waste ground
- Orchard/plantation
- Upland meadow
- Upland shrubland
- Red cedar woodland
- Upland hardwood forest
- Upland mixed forest
- Upland conifer forest
- Oak heath barren
- Crest, ledge, talus

Wetland habitats

- Stream
- Spring
- Seep
- Stream/constructed pond
- Open water
- Wet meadow
- Calcareous wet meadow
- Marsh
- Intermittent woodland pool
- Hardwood & shrub swamp
- Mixed forest swamp
- Kettle shrub pool
- Buttonbush pool



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An important caution:
 This map is suitable for general land-use planning, but is not suitable for detailed planning and site design or for jurisdictional determinations (e.g., for wetlands). Boundaries of wetlands and other habitats depicted here are only approximate.

Figure 1. Proposed Critical Environmental Area in eastern Rhinebeck, Dutchess County, NY. This map is excerpted from the town-wide habitat map of Rhinebeck prepared in conjunction with "Significant Habitats in the Town of Rhinebeck, Dutchess County, NY" (Reinmann & Stevens 2007). Hudsonia Ltd., 2014.