

## Significant Habitat Descriptions:

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## Cave & Cliff Habitats

### **Description:**

Caves: Caves in the Hudson River Valley include natural rock formations as well as abandoned mines. Both provide important roosting and wintering habitat for a number of bat species. Ice cave talus communities with unique plant communities also exist on the Shawangunk Ridge.

Cliffs: Cliff communities occur on vertical exposures of resistant rock with minimal soil development and vegetation. Cliffs have shallow, droughty soils, are exposed to the brunt of winter and summer weather, and are generally difficult places for plants to grow. These communities range from bare rock, lichen or moss-covered rock, and grass or forb dominance, to (occasionally) shrub thickets and tree groves or forest. Bedrock types that predominate along the Hudson River Estuary include diabase, granite, gneiss, schist, quartzite, sandstone, slate, and shale, approximately in order from harder to softer rocks. Cliff communities are also found on rocky hills or ridges underlain by “carbonate” rock: limestone, marble, and similar types of rock composed mainly of calcium carbonate.



Calcareous cliff community. Photo by Andrew Finton.

The trees growing on cliffs are generally stunted and many dead or damaged trees are often present. Among the most typical trees on harder bedrock are red oak, chestnut oak, red maple, and pitch pine. Typical trees on softer bedrock are basswood, sugar maple, white ash, hackberry, chestnut oak, and American beech. Crevice-using animals (e.g., winter wren, porcupine, small mammals, several species of snakes) are associated with cliff communities.

### **Ecological Importance:**

Caves: Caves in the Hudson River Estuary corridor are critical for a number of bat species, including several that are rare. Bats use these caves as winter hibernacula because temperatures remain stable. Characteristic bats that use caves include little brown bat, Keen’s bat, big brown bat, and eastern pipistrelle. Rare species include the eastern small-footed bat and the federally endangered Indiana bat, which hibernates in limestone caves. The Hudson River Estuary corridor is an especially important area for rare bats in New York State, because it contains approximately 40% of the state occurrences of the eastern small-footed bat and three of the eight Indiana bat hibernacula in the state (Finton et al. 2000).

Ice cave talus communities occur on rock and soil at the base of talus slopes and emit cold air where winter ice remains throughout the summer. The vegetation in the immediate area is distinctive because it includes species that occur in much cooler

climates (e.g., black spruce, hemlock, mountain ash, creeping snowberry). Some rare bryophytes have also been found in these communities. Other characteristic wildlife include timber rattlesnake and certain small mammals (Reschke 1990).

Cliffs: Because of their unique geology, cliffs are important for a number of plant and animal species. Rare plants that may occur in cliff communities include mountain spleenwort, prickly pear, purple cliffbrake, and three-toothed cinquefoil. Cliff areas provide overwintering habitat for a number of snakes. Cliffs and crests constitute many of the important pathways for migrating hawks. The common raven and peregrine falcon nest on cliffs. A characteristic invertebrate of shale cliffs is the silvery blue butterfly. West of the Hudson River the falcate orange tip butterfly occurs where rock-crests are abundant. An extremely rare earthstar fungus, *Geastrum pectinatus*, has been found on a limestone boulder within the Hudson River Estuary corridor (Kiviat and Stevens 2001).

### **Conservation Strategies:**

Caves: Because of their critical importance as bat hibernacula, inventories of caves in the Hudson River Valley should be continued. All carbonate formations should be inspected for caves. If a cave is located, assistance from an amateur or professional cave specialist should be sought. Cave entrances can be dangerous. Appropriate conservation measures should be taken to protect these communities from land-use practices that would threaten their long-term viability. A buffer is needed around the mouths of caves in order to support the species that use them, particularly bats. Mining activities close to cave habitats can cause physical disturbances that disrupt bat communities. Spelunking can also be disruptive, and should be discouraged in caves known to be used by bats.

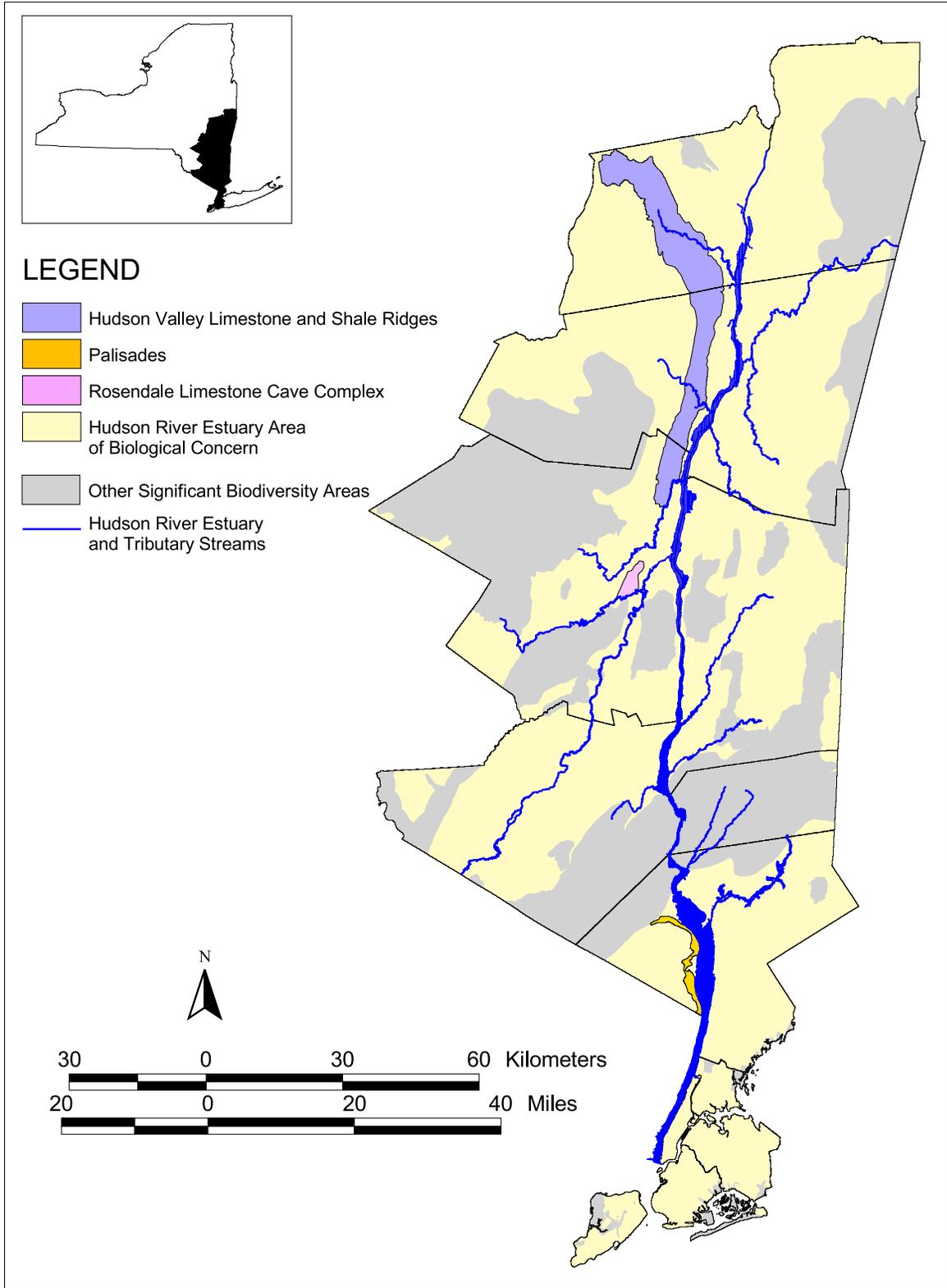
Cliffs: Cliff communities in the Hudson River Valley can be negatively impacted by disturbances associated with clearing, heavy pedestrian use, and soil damage by off-road vehicles. All of these activities lead to invasion by weedy introduced plants. Additionally, Reschke (1990) points out that more data on cliff communities are needed. Some of these areas are also extremely popular for rock climbing. Therefore, conservation strategies should address land-uses that threaten the viability of these communities and should include outreach, easements, and balancing recreation with conservation. In some cases, restoration of damaged areas should be considered.

#### **Biodiversity areas notable for cave and cliff habitats (Figure 7):**

- Hudson Valley Limestone and Shale Ridges
- Palisades
- Rosendale Limestone Cave Complex

#### **Other biodiversity areas that contain cave and cliff habitats:**

- Catskill Mountains
- Harlem Valley Calcareous Wetlands
- Highlands
- Shawangunk Ridge



**Figure 7.** Significant biodiversity areas of the Hudson River Estuary corridor notable for cave and cliff habitats.