

## Open Uplands & Barrens

### **Description:**

Open uplands and barrens in the Hudson River Valley encompass a variety of ecological communities, including grasslands, pitch pine-scrub oak barrens, serpentine barrens, and rocky summit grasslands. Many of these community types are rare and support threatened, endangered, or special concern species. In general these habitat types are dominated by non-woody plant species. Much of the information on open uplands and barrens presented below is adapted from Kiviat and Stevens (2001).

- Grasslands

Grassland habitats include a variety of ecological communities, from native grassland communities to successional old fields to agricultural habitats, including cropland and pastureland. Fields abandoned from crops, livestock grazing, mowing, or other management become covered by grasses, forbs, shrubs, saplings or root sprouts of trees. Oldfields often support diverse vegetation with a variety of plant species and may provide habitat for rare birds, plants, and butterflies. Some grasslands in the state are native and were maintained historically by natural and human-induced burning.

These communities are important for a number of grassland bird species including the field sparrow, grasshopper sparrow, vesper sparrow, Henslow's sparrow, bobolink, mourning dove, upland sandpiper, horned lark, and northern harrier. Grassland communities provide essential habitat for these species for breeding, nesting, foraging, rearing young, and roosting (Sample and Mossman 1997).

- Pitch pine-scrub oak barrens

This is a shrub-savanna community with pitch pine as the dominant tree. Pitch pine may grow in dense thickets of small trees (dwarf pine plains), or in a more open canopy (as in the Albany Pine Bush). The dominant shrub layer includes scrub oak with a lower shrub layer composed of sweet-fern, blueberries, and black huckleberry. Scrub oak thickets cover 60 to 80% of the community, and contain small patches of grassland. These grasslands are dominated by big bluestem, little bluestem, and Indian grass. Representative forbs include bush-clovers, pinweed, milkwort, goat's-rue, and wild lupine.

Pitch pine-scrub oak barrens occur on deep, glacial sands (usually derived from the bottoms of drained glacial lakes). The sandy soils are generally nutrient-poor and moderately well drained to somewhat excessively drained, creating poor growing conditions for most plant species. Sand plains, more than any other habitat, are periodically swept by fires, which may kill the tops of woody plants, but not the crowns from which new shoots rapidly grow. Topography may be flat or hilly, the result of former moving dunes now stabilized by the overlying vegetation. Barrens may contain streams, wetlands, vernal pools and patches of mesophytic forests (in moist place

such as stream valleys), grassland, or bare sand with only mosses and lichens. Herbs are few, but include species not found in other habitats.

Characteristic fauna includes frosted elfin, the federally endangered Karner blue butterfly, rufous-sided towhee, common yellowthroat, field sparrow, prairie warbler, brown-headed cowbird, indigo bunting, brown thrasher, and whip-poor-will.

- Rocky summit grasslands

Rocky summit grasslands are found in the Highlands on rocky summits and exposed slopes of hills. They occur on non-carbonate bedrock (e.g., quartzite, sandstone, schist) and carbonate bedrock (e.g., limestone, dolomite). Many of the community occurrences have originated following fires.

Characteristic flora includes little and big bluestem, common hairgrass, poverty-grass, and Indian grass. Common forbs include downy and other goldenrods, bristly sarsaparilla, rock-cresses, and rock polypody. Foliose and crustose lichens may be abundant. Mosses are usually present in small patches.

- Serpentine barrens

Within New York State, this grass-savanna community is known only from Staten Island. A variety of grasses and forbs characterize the community, and trees and shrubs comprise approximately 20-40 and 15-30% of the flora, respectively. The Arogos skipper is a characteristic butterfly of the serpentine barrens.



Grasshopper sparrow. Photo by Mary Tremain.

### **Ecological Importance:**

Open upland and barrens communities provide habitat for a number of rare animal and plant species in the Hudson River Estuary corridor, most notably grassland birds, invertebrates, and timber rattlesnake. Grassland species, particularly grassland-breeding birds that expanded their range into New York following the extensive clearing of forests for agriculture, are now declining in the state due to reforestation.

Some grassland species such as grasshopper sparrow are declining throughout their former range, including areas outside of New York State.

Grassland bird species of particular interest include northern harrier, upland sandpiper, sedge wren, bobolink, eastern meadowlark, grasshopper sparrow, Henslow's sparrow, and vesper sparrow. Fields and field edges are important feeding habitats for eastern bluebird. Grasslands are known to support rare plants, especially on calcareous soils. Rare plant species found in wetland areas of the Shawangunk grasslands include Frank's sedge, Bush's sedge, small white aster, swamp agrimony, coontail, and pointed watermeal. More common species in oldfields include goldenrods, asters, Kentucky bluegrass, orchard grass, little bluestem, gray dogwood, multiflora rose, berries, hawthorns, stag-horn sumac, eastern red cedar, gray birch, red maple, black locust, oaks, quaking aspen

and white pine. Dry oldfields may support any of several rare butterflies, including the Aphrodite fritillary.

Rocky grasslands provide habitat for the threatened timber rattlesnake. Other reptiles and amphibians that may use these habitats include northern copperhead, eastern hognose



Rocky summit grassland. Photo courtesy of Kathryn Schneider.

snake, black rat snake, worm snake, eastern fence lizard, five-lined skink, eastern box turtle, slimy salamander, and marbled salamander. Rocky summits are important for rare and uncommon mammals, such as bobcat, fisher, porcupine, and boreal redback vole.

Sand plain communities are in themselves rare and specialized. The deep, sandy soils support greater biodiversity of non-woody plants and other groups of

organisms. Herbs such as wild lupine, sandspur, purple boneset, eyebane, stiff gentian, dotted horsemint and blunt-leaf milkweed do not occur naturally on rock substrates. In the Northeast, buck moth, which in the larval stage feeds on leaves of scrub oak, occurs almost exclusively in sand barrens and rarely in rocky barrens. Over 300 species of vertebrates, over 1,500 species of plants, and over 10,000 species of invertebrates have been reported from the Albany sand plains area (Kiviat and Stevens 2001).

### **Conservation Strategies:**

One threat to these areas in the Hudson River Valley is the conversion of these open canopy habitats into closed canopy forest that do not support the typical plant and animal species. Additionally, invasion by exotic plant species can out-compete native species. Therefore, in addition to land protection, management activities aimed at maintaining these habitats should be implemented. This may involve a combination of techniques (e.g., mowing, burning, brush hog clearing) designed to maintain a specific community or reduce the amount of woody vegetation. However, the timing of these management techniques must be carefully considered in relation to the biology of the species that are present. In some cases, habitat restoration may be warranted (e.g., serpentine barrens on Staten Island).

Grasslands are generally tolerant of human use. However, areas known to support rare plants, rare breeding birds, or rare butterflies should be protected from human disturbance. Rocky summit grasslands may be protected by minimizing habitat fragmentation, soil erosion, and direct and indirect disturbance to wildlife from recreational, extractive, and other land uses. Rocky summit grasslands and other grasslands are threatened by succession, often as a result of fire suppression. Habitats of rare species may require management such as infrequent mowing, selective removal of trees, or prescribed fire to retard development of tree cover.

Land protection may be implemented through a variety of methods including acquisition (on a voluntary, willing seller basis), conservation easements, cooperative land agreements, and outreach. Grassland bird management is an example of how land protection strategies may be used to benefit a variety of species. Areas managed for grassland birds should be at least 250 acres in size, but preferably larger (Vickery et al. 1997). Opportunities to provide adequate habitat for grassland bird species in the Hudson River Valley may come primarily through cooperative land agreements that, collectively, meet minimum habitat requirements. Sample and Mossman (1997) provide detailed recommendations for managing habitat for grassland birds.



Red fox. Photo courtesy of Cornell University.

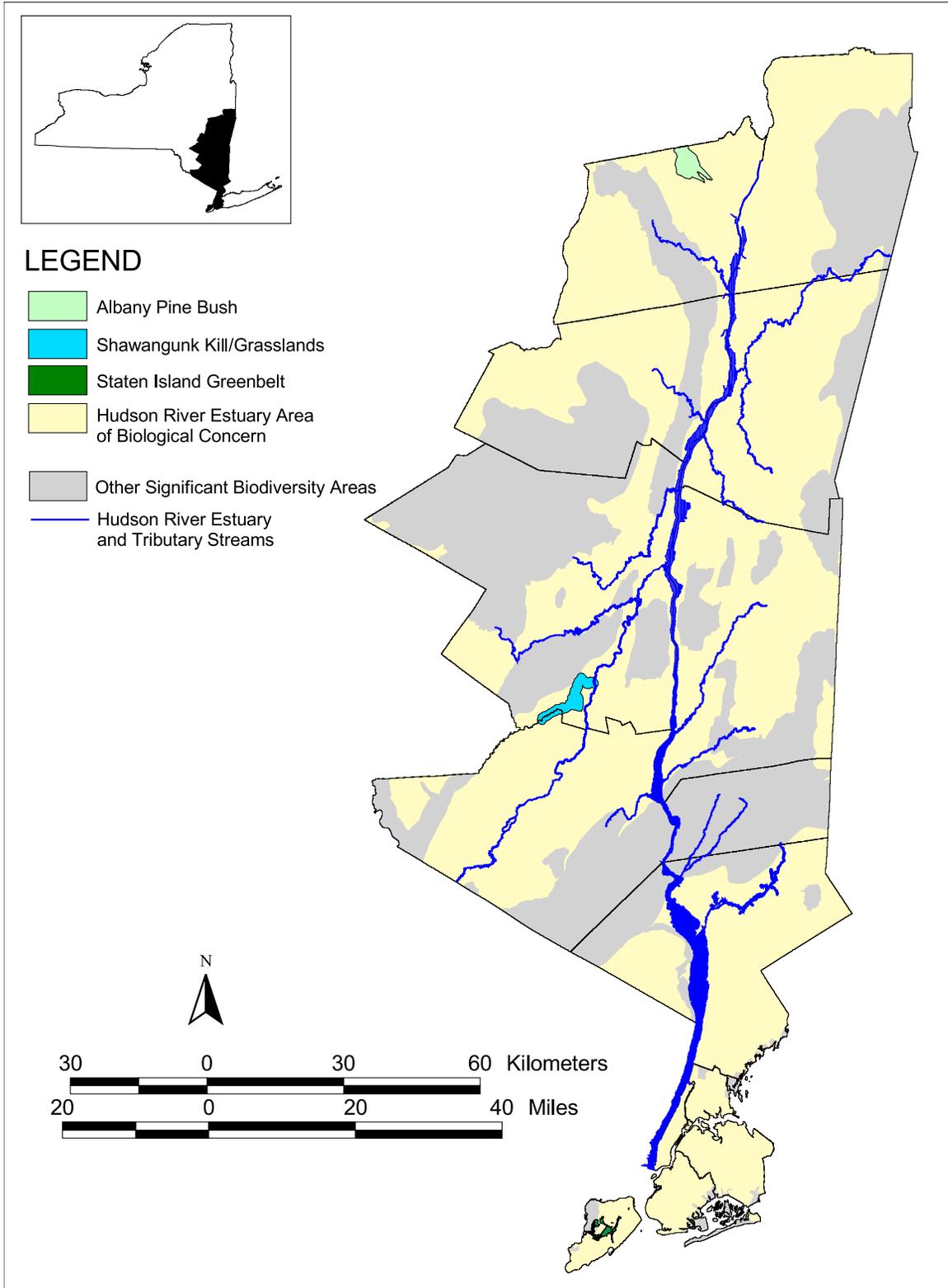
Within the Hudson River Estuary corridor, cropland, old field/pasture, and barrens comprise approximately 6.5, 1.7, and 0.1% of the land area, respectively (Smith et al. 2001). Because the majority of the Hudson River Valley's open uplands are considered cropland, outreach to the agricultural community may be especially relevant. Developing Best Management Practices for farming activities (e.g., tilling, planting, harvesting, crop and pasture rotation, pesticide and fertilizer use) as they relate to grassland bird conservation should be a priority.

**Biodiversity areas notable for open uplands & barrens (Figure 9):**

- Albany Pine Bush
- Shawangunk Kill/Shawangunk Grasslands
- Staten Island Greenbelt

**Other biodiversity areas that contain open uplands or barrens:**

- Delaware/Mongaup Rivers
- Harlem Valley Calcareous Wetlands
- Highlands
- Jamaica Bay and Beaches
- Palisades
- Shawangunk Ridge



**Figure 9.** Significant biodiversity areas in the Hudson River Estuary corridor notable for open uplands and barrens.