

Ecology of the Appalachian Trail at Bear Mountain, Orange County, NY.

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Located in the geographic center of New York's Hudson Highlands, Bear Mountain supports many of the ecological features that make the region so biologically interesting. The mountain lies near the northern terminus of the Appalachian Oak-Hickory forest type within the eastern deciduous forest biome. The dominant community type is **chestnut oak forest** (Fig. 1), a hardwood forest of well-drained sites in glaciated portions of the Appalachians (Edinger et al, 2002). Most forested uplands on the mountain support this community. Chestnut and red oak are the dominant canopy trees. The shrub layer consists of various heaths including black huckleberry, mountain laurel, and blueberry. Dominant groundlayer plants include Pennsylvania sedge and pin-cushion moss. Due to the bedrock geology, soils are acidic and limit the flora to mainly acid tolerant species. The organic soil layer, being rather thin, gives way to well-drained mineral soils and bedrock along eroded sections of the AT.

Large exposures of bedrock and areas with thin soils on the upper reaches of the mountain provide conditions for **pitch-pine-oak heath rocky summit** and **rocky summit grassland** communities. Warm, dry conditions predominate at these sites, leading to an assemblage of drought-adapted species. In the former type, characteristic plants include pitch pine, scrub oak, blueberry, common hairgrass, and cow-wheat. Bedrock openings may be carpeted with mosses and lichens in areas away from foot traffic.

Rocky summit grassland has a limited distribution on the mountain along a series of open plateaus on the southwestern flank. Characteristic species include little bluestem, poverty grass, dittany, Indian grass, and eastern red cedar. Several large colonies of prickly pear cactus – an incongruous sight to most AT hikers – occur in this community not far from the current AT. While these summit habitats contain abundant exposed bedrock, a resistant substrate for permanent trails, the open terrain also invites hikers to wander off trail in search of vistas, presenting a management conundrum for trail planners. Maintenance of trail markers and educational signage in these habitats may lessen hiker impacts on the plant community.

Oak-tulip tree forest is found lower on the mountain in moist ravines and areas with deeper organic soils. This forest type is more diverse and typically includes a mixture of oak (red, scarlet, black, white), tulip tree, beech, black birch, and red maple. Owing to better growing conditions, trees in this community attain a larger size and, with time, form impressive stands of extremely tall, large diameter specimens. Beneath these giants, a subcanopy stratum of small trees and tall shrubs typically includes flowering dogwood, red maple, black cherry, and witch hazel. Blueberries and maple leaf viburnum are common low shrubs. Potential exists for a diverse shrub and groundlayer flora, although at Bear Mountain excessive deer browsing has taken its toll on plant diversity. What remains within reach of deer are mostly highly unpalatable native plants (e.g., wood ferns) as well as exotic invasives disliked by deer (e.g., barberry). Japanese Stiltgrass, a recent arrival and increasingly pervasive exotic, forms dense ground cover in many low lying areas with rich, moist soils. As trails may facilitate its spread, planners should consider control measures following trail construction in these areas.

The fauna of Bear Mountain State Park includes most terrestrial vertebrate species typical of eastern oak forests. The white-tailed deer is the most abundant large mammal, while the black bear and eastern coyote have become more common in recent years. Mid-to-small sized carnivores are well-represented by the red fox, gray fox, eastern skunk, otter, mink, long-tailed and short-tailed weasels, and raccoon. Bobcats are extremely rare. The opossum is the only native marsupial in the park. Rodentia include the woodchuck, beaver, muskrat, chipmunk, eastern grey squirrel, southern flying squirrel, red squirrel, meadow vole, red-backed vole, white-footed mouse, and jumping mice (woodland and meadow). Porcupines are notably absent. The Allegheny woodrat, an inhabitant of cliff faces and talus slopes, was extirpated from the New York Highlands by the late 1980s. Only one lagomorph, the eastern cottontail rabbit, is known from the park, though its cousin the New England cottontail may also be present. Insectivores likely include the smoky, masked, short-tailed, long-tailed, and pigmy shrew, as well as the star and hairy-tailed mole. The eastern mole, described as a common local species in late 1890s, has not been reported in recent years. Bat diversity is probably high based on a recent trapping survey on the nearby West Point Military Reservation, where seven of NY's nine bat species were captured.

Reptile and amphibian fauna are also extremely diverse. Fourteen of New York's seventeen snake species have been reported from the Hudson Highlands. Bear Mountain likely supported a colony of the State threatened timber rattlesnake in the recent past, although most indications suggest it is now extirpated. Similarly, the state endangered northern fence lizard was reported in the 1980's from a location one-half mile west of Bear Mountain but has not been seen since. As this species is frequently seen by hikers at known occurrences elsewhere in the Highlands, it is unlikely that it has persisted undetected on Bear Mountain. The region's only other lizard, the five-lined skink, is still common around rock outcrops. The black rat snake, northern black racer, eastern garter snake, and eastern box turtle are the most frequently encountered reptiles by hikers on Bear Mountain.

Amphibians are also well represented in the area. Intermittent woodland pools provide breeding locations for mole salamanders (spotted, marbled, and possibly Jefferson's) and wood frogs. Four-toed salamanders breed in sphagnum swamps while two-lined, northern dusky, and northern red salamanders occupy stream and seep habitats. Two Plethodontid species, the red-backed and slimy salamander, as well as the red eft stage of the eastern newt are found in drier upland habitats. Anurans are represented by both the American and Fowler's toad, as well as, in order of increasing size, the northern spring peeper, gray tree frog, wood frog, pickerel frog, green frog, and bull frog.

Doodletown, a forested valley just south of Bear Mountain, is well known for the diversity of passerine birds during spring migration. Seventy bird species were reported to breed locally during the recently completed New York Breeding Bird Atlas (2000-2004). Common summer residents include the ovenbird, red-eyed vireo, eastern phoebe, wild turkey, and eastern towhee. Turkey vultures, and increasingly black vultures, soar above Bear Mountain most months of the year and nest in cave-like depressions amongst boulder piles. Raptor viewing opportunities for hikers exist at an annual Hawk Watch site located on the eastern side of the mountain.

