HUDSONIA HARLEM VALLEY BIODIVERSITY MANUAL SUPPLEMENT

Upland Deciduous Forest

Included here are mature, or recovered second-growth deciduous forests of upper and middle slopes, benches and low ridges with fairly deep soils. These forests stand in contrast to floodplain forests and mature mesophytic forests of valley flats and low hills and slopes Soils tend to be shallower, better-drained and rockier. Oaks, rather than maples, typically are dominant in the canopy. A number of described forest community types fall under this category, including oak-tuliptree forest, chestnut oak forest and Appalachian oak-hickory forest (Edinger et al. 2002, Reschke 1990). Here we include also oak-maple, oak-beech, oak-ash and other hardwood forest assemblages.

Vegetation

Oaks, especially northern red oak and chestnut oak, are common canopy trees, along with hickories, white ash, black birch, red maple and sugar maple. Beech is occasionally co-dominant with red oak or chestnut oak. Low tree and shrub layers vary from dense to very sparse, depending upon drainage, depth of soil to bedrock, and slope stability. Subcanopy trees may include smaller individuals of canopy species, or species of low stature such as hop-hornbeam, American hornbeam (in wetter soils), moosewood, flowering dogwood and shadbush. Common tall shrubs include witch hazel, maple-leaf viburnum and mountain laurel, the last often in association with low heaths such as pale blueberry and black huckleberry, indicators of low-nutrient, acidic soils. The invasive shrubs Japanese barberry, winged spindle-bush and morrow honeysuckle are often common in forest understories, and may be present in tracts of mature forest adjacent to young forests in which these invasives became established after logging or clearing.

Herbaceous cover varies considerably, from near absence of herbs to fairly dense (20-50% cover). Dense herb layers are seldom very diverse, often consisting of monotypic stands, especially of ferns, sedges or grasses. These plants tend to spread vegetatively, forming patches varying from a few square meters to hundreds of square meters in area. Common ferns include New York fern, Christmas fern and woodferns (*Dryopteris* spp). Common broad-leaved herbs include white wood aster, blue-stem goldenrod, and white snakeroot. Grasses and grass-like plants tend to dominate the ground of drier upland forests: poverty grasses (*Danthonia* spp.), common hairgrass (*Deschampsia flexuosa*), Pennsylvania sedge (*Carex pensylvanica*) and clubrush (*Tricophorum planifolium*). Rocky forests often include specialized herbs growing on large boulders and small outcrops; these include rock polypody fern, whorled white aster (*Aster acuminatus*) and Solomon seals (*Polygonatum* spp.).

In the northern part of the study area, on mountain slopes and on the Rensselaer Plateau, northern woody species such as paper birch (*Betula papyrifera*), American mountain ash (*Sorbus americana*), hobblebush (*Viburnum lantanoides*), mountain holly (*Ilex montana*) and sour-top blueberry (*Vaccinium myrtyloides*) become increasingly frequent in upland deciduous forests, along with herbs such as round-leaf violet (*Viola rotundifolia*), painted trillium (*Trillium undulatum*), northern enchanter's nightshade (*Circaea alpina*), rose twisted-stalk (*Streptopus roseus*) and New England sedge (*Carex novae-angliae*). In the southern part of the subregion tuliptree (*Liriodendron tulipifera*), black birch (*Betula lenta*) and black oak (*Quercus velutina*) are common elements of deciduous forest, while species of northern affinity such as yellow birch and paper birch are rare.

Fauna

Black rat snake (*Elaphe obsoleta obsoleta*) and northern copperhead (*Agkistrodon mokasen*) are regionally-rare reptiles of deciduous forests with varied terrain, including rocky slopes, open sunny areas and accessible drinking water. Eastern box turtle (*Terrapene carolina carolina*) uses upland deciduous

forest habitat for foraging, nesting and overwintering. Large, unbroken areas of deciduous forest support large mammals such as black bear and eastern coyote.

Indicators and Identification

Topographic position above valley level, well-drained soils, abundance of oaks in canopy, low levels of invasives and species characteristic of early recovery after disturbance.

Biodiversity Values

Rare plant species occurring primarily in upland deciduous forests include state-rare glaucous sedge *Carex glaucodea* (NHP rank S1) (recorded from Stissing Mountain and Curtis Mountain) and regionally-rare small-flowered wood-rush (*Luzula parviflora*) in the Mt. Riga uplands (Barbour 1994). Upland forests support a wide variety of animal life, including rare species such as marbled, Jefferson and blue spotted salamanders, which live in large forest tracts and breed in intermittent woodland pools on benches of slopes and on the broad summits of low hills. Large tracts of upland deciduous forest are critical for interior forest breeding bird species, supported by an abundance of tree seeds and buds, and leaf-eating or wood-eating insects such as caterpillars and beetle larvae. Early hairstreak (*Erora laeta*), a regionally rare butterfly, may occur in beech groves in rocky uplands (R. Dirig, personal communication). Native giant silk moths such, especially luna moth (*Actias luna*) and polyphemus moth (*Antheraea* p*olyphemus*) maintain large populations in oak-hickory forests.

Substrates

Most soils of upland forests contain a substantial amount of rock, typically glacially-transported fragments. These rocky soils of glacial origin are called “till,” and were directly deposited by ice transport, unlike the water-borne (alluvial) glacial gravel, sand and silt soils more common in valleys. Till tends to drain rapidly due to the high rock content and the typical sloping gradient of the underlying bedrock. Rapid drainage tends to favor oaks over other trees, and to render conditions harsh for shallow-rooted herbs.

Surface Waters

Water in these forests tends to be absorbed by the deep till soils and any excess drained away downslope, either underground or in intermittent streams. Less frequently, water accumulates over a shelf of impermeable bedrock, standing in basins as vernal pools, or surfacing laterally on the slope below as a spring seep. Vernal pools and seep slopes may contain rare flora and regionally-rare fauna such as four-toed salamander and spring salamander.

Extent

Large contiguous areas of upland forest increase toward the northern, less developed part of the region. The largest of these areas (tens of thousands of acres) are on the Rensselaer Plateau which extends north beyond the area covered by this manual. Upland deciduous forest occurs interspersed with conifer forest, mesophytic lowland forest, ravine forest and swamp forest in nearly unbroken forest tracts of the Brace Mountain - Mount Riga ridge system. Smaller patches of upland forest occur throughout the Harlem Valley, Putnam-Westchester Hills region and eastern Westchester uplands, on small hills and rocky plateaus. Saxon Woods Park in Scarsdale, Westchester County, has an exemplary oak-tuliptree forest on picturesque rocky terrain of a former country estate.

Distribution

Throughout the region, but more frequent and less fragmented toward the north.

Quality

Many high-quality examples on public lands, including state parks and Appalachian Trail corridor in southern section; very large matrix forest areas in northern section, including public and private lands.

Human Uses

Timber harvesting, pasture when cleared, hunting, more recently subject to clearing and landscaping for residential development, as lowland areas have become increasingly occupied by commercial development.

Sensitivities, Impacts

An especially resilient habitat, with a history of repeated recoveries, upland forest is nevertheless sensitive to plant diseases (e.g. dogwood blight in 60s-70s, chestnut blight in early 20th century), insect outbreaks (gypsy moth, forest tent caterpillar) and invasive plants (garlic mustard). Well-drained, relatively shallow upland forest soils may be more affected by acid precipitation than deeper, moister lowland soils. Fragmentation of large forested areas has increased in recent decades, exposing forest edges to these impacts, as well as dumping of refuse and degradation from recreation vehicles by local residents.

Conservation and Management

Landscape-scale preservation planning underway by Rensselaer-Taconic Land Conservancy in the northern sector, including acquisitions and easements, is an example of the kind of planning needed to protect large areas of forest. Westchester County Parks has science-based management for high-quality forests in county park lands. Ecologically-oriented forest management practices are being developed and encouraged by state and federal agencies (e.g. NYSDEC, U.S. Department of Agriculture Cooperative Extension programs, and U.S. Forest Service). Landowners seeking to manage forest tracts ecologically and sustainably might consult Morsbach 2002 or Davis et al. 2005.

Examples on Public Access lands

Taconic State Park
Columbia County

Capital District Wildlife Management Area
Town of Berlin, Rensselaer County (RP)

Depot Hill Multiple Use Area
Putnam County

Ward Pound Ridge Reservation
Pound Ridge, Westchester County

Saxon Woods Park
Scarsdale, Westchester County

References

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