

## HUDSONIA HARLEM VALLEY BIODIVERSITY MANUAL SUPPLEMENT

### Conifer Forest

Several types of conifer forest occur in the study area, in a variety of landscape settings and physical conditions. In most examples one species of coniferous tree is dominant. Upland conifer forests are discussed here, while wet conifer forests are discussed under “Conifer Swamp.” Subsumed under this habitat type are the following Natural Heritage communities: pitch pine-oak forest, hemlock-northern hardwood forest, pine-northern hardwood forest, spruce-northern hardwood forest, spruce flats, balsam flats, mountain spruce forest and mountain fir forest (Edinger et al.2002). Conifer plantations may provide habitat for some native plants and animals typical of natural conifer forests. For the study area we draw a loose distinction between northern and southern conifer forests.

### Vegetation and flora

Northern conifer forests in the study area resemble boreal spruce-fir forests common in the Catskill and Adirondack mountains, but contain fewer northern elements. Red spruce is more typical of upland forests than black spruce (dominant in many northern conifer swamps). Balsam fir is rare in the study area, except on the Rensselaer Plateau. Eastern hemlock, red maple, yellow birch and paper birch are common associates of red spruce on north slopes and cool ravines of the Taconic Range, and cooler areas of the Rensselaer Plateau. Hemlock and white pine are the most common conifers in the southern portion of the study area, and often grow together. Associated shrubs and small trees include hobblebush, northern fly honeysuckle, and mountain maple in northern conifer forests; and witch hazel, striped maple and mountain laurel in southern conifer forests. On drier sites along ridge crests and upper slopes pitch pine may be dominant in association with oaks. Heaths such as mountain laurel, black huckleberry and blueberries are typical understory shrubs.

Common herbs in most conifer forests include starflower (*Trientalis borealis*), Canada mayflower (*Maianthemum canadense*) and partridgeberry (*Mitchell repens*). Whorled wood aster (*Aster acuminatus*), woodferns (*Dryopteris* spp.) and common polypody fern (*Polypodium virginianum*) are common in conifer forests on steep slopes with rock exposures. Herbs characteristic of northern conifer forests include shining clubmoss (*Huperzia lucidulum*), mountain wood sorrel (*Oxalis montana*), bluebead lily (*Clintonia borealis*), and rose twisted stalk (*Streptopus roseus*) (McVaugh 1958).

### Fauna

Red-backed vole (*Clethrionomys gapperi*), red squirrel (*Tamiasciurus hudsonicus*) and porcupine (*Erethizon dorsatum*) are common mammals of conifer forests. Characteristic birds include olive-sided flycatcher (*Contopus borealis*), golden-crowned kinglet (*Regulus satrapa*), Swainson’s thrush (*Catharus ustulatus*), solitary vireo (*Vireo solitarius*), Blackburnian warbler (*Dendroica fusca*), pine warbler (*D. pinus*), and crossbills (*Loxia* spp.). Because conifer needles are difficult for most caterpillars to eat and digest, butterflies and moths are relatively scarce in conifer forests.

## **Indicators and Identification**

A preponderance of conifers is the obvious identifying feature. A threshold of 50% conifers by number or canopy cover might be a reasonable dividing line between conifer and hardwood forests. The ratio of conifers to deciduous trees may be highly variable, even within a contiguous forest tract. Such differences may be categorically problematic, but are not particularly important ecologically.

## **Biodiversity Values**

During winter storms conifers provide effective shelter for animals, for birds in branches and against trunks, for mammals such as rabbits and hares under low branches at ground level. Evergreen branches capture snow, leaving areas of shallow snow or bare ground under trees, allowing birds and small mammals to forage for seeds, tubers and arthropods. Two rare northern giant silk moths are found in conifer forests. Caterpillars of the pine imperial moth (*Eacles imperialis pini*) feed on pines, and those of the Columbia silkmoth (*Hyalophora columbia*) feed on tamarack. Both moths are reported from the Adirondacks, and may be found in conifer forests in the northern portion of the study area.

## **Extent**

Conifer forest tracts in the study area are relatively small, and embedded in the larger matrix of mostly deciduous forest communities. The largest contiguous areas of conifer forest are in the northern portion of the study area, especially the Rensselaer Plateau and northern Taconic range.

## **Distribution**

Conifer forests occur throughout the study area, mostly in locations with somewhat extreme conditions of moisture, climate, light and substrate. These places include cool ravines, high rock ridges, sandy soils and acidic or alkaline soils.

## **Quality**

First-growth, old-growth or mature forest of any kind are uncommon in the study area, more so in low-lying terrain where harvesting is easier and cheaper. As in most of the Northeast the oldest trees are in rugged terrain where trees experience greater stress, and consequent stunting and decreased longevity.

## **Human Uses**

Harvesting of conifers (e.g. hemlock for tanning, pine and spruce for lumber) has declined relative to harvesting of hardwoods, which remains robust due to specialty markets (e.g. furniture, flooring, veneer) and fuel wood. The market for evergreen branches and foliage has also declined, and farm-grown Christmas trees have largely replaced wild-grown ones.

## **Sensitivities, Impacts**

Conifers are more vulnerable than hardwoods to winter storms, which can topple trees or break limbs with weight of snow or force of wind. Insect outbreaks have affected some species.

Hemlock wooly adelgid (*Adelgis tsugae*) has decimated hemlocks in much of the southern part of the region, and recovery there is uncertain. Occasional outbreaks of spruce budworm in plantations may occasionally jump to wild spruce stands. Conifer needles are tough, tannin-rich and acidic, so conifers might appear to be less susceptible to atmospheric acidity than deciduous trees, but this may not be the case. It remains to be seen how climate change may affect conifer forests in the region and elsewhere..

## **Conservation and Management**

Monitoring for adelgid invasion (especially northward movement) is important to preserve hemlock stands. Eastern white pine, though native, is highly invasive in old fields and young forests. Culling of small pines may be necessary to retain a balance of forest trees on formerly cleared lands and along forest edges where sunlight is considered important to maintaining biodiversity or other management goals.

## **Examples on Public Access lands**

Dyken Pond Environmental Education Center, Towns of Berlin, Grafton and Postenkill, Remsselaer County. This 210 ha (520 acre) preserve has a variety of conifer forests, including hemlock-northern hardwood, pine-northern hardwood, spruce-northern hardwood, balsam flats and spruce flats.

Grafton Lakes State Park has a large area of spruce-hemlock coniferous forest.

Stone Church Preserve in the Town of Dover has an exemplary hemlock-northern hardwood forest and a cool ravine along Stone Church Brook.

## **References**

Edinger et al. 2002. Ecological Communities of New York State, second edition. New York Natural Heritage Program, Latham NY. 134 p.

Miller, N., ed. 1998. Botanical Resources Inventory of the Dyken Pond Environmental Education Center. Rensselaer-Taconic Land Conservancy. Troy, NY. 13 p. + plant list & maps.

McVaugh, R. 1958. Flora of the Columbia County Area, New York. New York State Museum and Science Service Bulletin 360. The University of the State of New York. Albany, NY 400 p.



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