Rich Mesophytic Forest



Rich mesophytic forest



Photo credits: DJ Evans

System Terrestrial

Subsystem Forested Uplands

Did you know?

Black bugbane, or black cohosh (Cimicifuga racemosa), a common plant of rich mesophytic forests, has long been used as an herbal medicine to relieve inflammation, and for a variety of conditions that afflict women. Native tribes of eastern North America were known to use this plant in teas for soaking, or in a combination with other herbs as an oral medicine. Early settlers used black cohosh to treat menstrual symptoms, to relieve pain in childbirth, and as an anti-inflammatory agent against arthritis, rheumatism, and lung and nervous disorders. It is now commonly used in Europe to relieve symptoms associated with menopause, and is considered to be an effective alternative to hormone-replacement therapy.

Summary

Protection Not listed in New York State, not listed federally.

Rarity G4, S2

A global rarity rank of G4 means: Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.

A state rarity rank of S2 means: Typically 6 to 20 occurrences, few remaining individuals, acres, or miles of stream, or factors demonstrably make it very vulnerable in New York State.

Conservation Status in New York

There are probably a few hundred occurrences statewide. A few documented occurrences have good viability and a few are protected on public land or private conservation land. This community has a limited statewide distribution and includes a few large, high quality examples. The current trend of this community is probably stable for occurrences on public land, or declining slightly elsewhere due to moderate threats related to development pressure and logging.

Short-term Trends

The number and acreage of rich mesophytic forests in New York have probably declined in recent decades as result of clearing for agriculture and development.

Long-term Trends

The number and acreage of rich mesophytic forests in New York have probably declined substantially from historical numbers likely correlated with the onset of agricultural and development.

Conservation and Management

Threats

Threats to forests in general include changes in land use (e.g., clearing for development), forest fragmentation (e.g., roads), and invasive species (e.g., insects, diseases, and plants). Other threats may include over-browsing by deer, fire suppression, and air pollution (e.g., ozone and acidic deposition). When occurring in expansive forests, the largest threat to the integrity of rich mesophytic forests are activities that fragment the forest into smaller pieces. These activities, such as road building and other development, restrict the movement of species and seeds throughout the entire forest, an effect that often results in loss of those species that require larger blocks of habitat (e.g., black bear, bobcat, certain bird species). Additionally, fragmented forests provide decreased benefits to neighboring societies from services these societies often substantially depend on (e.g., clean water, mitigation of floods and droughts, pollination in agricultural fields, and pest control) (Daily et al. 1997). Rich mesophytic forests with American beech are threatened by beech bark disease. Beech bark disease causes significant mortality and defect in American beech (Fagus grandifolia). The disease results when bark, attacked and altered by the beech scale (Cryptococcus fagisuga), is invaded and killed by fungi, primarily Nectria coccinea var. faginata and sometimes N. galligena (Houston and O'Brien 1983). Rich mesophytic forests are threatened by development (e.g., residential, agricultural, industrial), either directly within the community or in the surrounding landscape. Other threats include habitat alteration (e.g., roads, excessive logging, mining, plantations, deer over-browsing), and recreational overuse (e.g., hiking trails, ATVs, trash dumping, camping). A few rich mesophytic forests are threatened by invasive species, such as garlic mustard (Alliaria petiolata) and Japanese barberry (Berberis thunbergii).

Conservation Strategies and Management Practices

Management should focus on activities that help maintain regeneration of the species associated with this community. Deer have been shown to have negative effects on forest understories (Miller et al. 1992, Augustine & French 1998, Knight 2003) and management efforts should strive to ensure that regenerating trees and shrubs are not so heavily browsed that they cannot replace overstory trees. Avoid cutting old-growth examples and encourage selective logging in areas that are under active forestry.

Development and Mitigation Considerations

Strive to minimize fragmentation of large forest blocks by focusing development on forest edges, minimizing the width of roads and road corridors extending into forests, and designing cluster developments that minimize the spatial extent of the development. Development projects with the least impact on large forests and all the plants and animals living within these forests are those built on brownfields or other previously developed land. These projects have the added benefit of matching sustainable development practices (for example, see: The President's Council on Sustainable Development 1999 final report, US Green Building Council's Leadership in Energy and Environmental Design certification process at http://www.usgbc.org/).

Inventory Needs

Inventory any remaining large and/or old-growth examples. Continue searching for large sites in good condition (A- to AB-ranked).

Research Needs

Research the composition of rich mesophytic forests in glaciated and unglaciated settings in order to characterize variations.

Rare Species

James' Sedge (Carex jamesii)

Woodland Bluegrass (Poa sylvestris)

Twin-leaf (Jeffersonia diphylla)

Prothonotary Warbler (*Protonotaria citrea*)

Virginia Snakeroot (Endodeca serpentaria)

Bald Eagle (Haliaeetus leucocephalus)

Longtail Salamander (Eurycea longicauda)

Wild Hydrangea (*Hydrangea arborescens*)

Woodland Agrimony (Agrimonia rostellata)

Fairy Wand (Chamaelirium luteum)

Puttyroot (Aplectrum hyemale)

Nodding Pogonia (Triphora trianthophora)

Blunt-lobe Grape Fern (Botrychium oneidense)

Carey's Sedge (Carex careyana)

West Virginia White (Pieris virginiensis)

Two-ranked moss (Pseudotaxiphyllum distichaceum)

Purple Cress (Cardamine douglassii)

Lowland Fragile Fern (Cystopteris protrusa)

Sky-blue Aster (Symphyotrichum oolentangiense)

Identification Comments

Rich mesophytic forest communities are hardwood or mixed forests that resemble the mixed mesophytic forests of the Allegheny Plateau south of New York, but are slightly less diverse. This community occurs on rich, fine-textured soils that are favorable for the dominance of a wide variety of tree species. Canopy codominants of at least five species, a well developed, diverse shrub layer, and a relatively rich herbaceous layer are

characteristic of rich mesophytic forests. In New York, rich mesophytic forests are best developed in the unglaciated portions of the Allegheny Plateau. In Cattaraugus County, New York this forest typically occurs at mid to upper elevations (Edinger et al. 2002).

The Best Time to See

Because the key to distinguishing a rich mesophytic forest from related types is its vascular plant composition and diversity, it is easiest to identify the community during the growing season, from late May through summer. Striking seasonal leaf color can be enjoyed in the fall.

Characteristics Most Useful for Identification

A canopy with a large number of codominant species helps identify this forest. Cucumber magnolia (Magnolia acuminata) is characteristic of this community type and is sometimes codominant in the canopy. Canopy codominants include five or more of the following species: red oak (Quercus rubra) red maple (Acer rubrum), white ash (Fraxinus americana), American beech (Fagus grandifolia), sugar maple (Acer saccharum), black cherry (Prunus serotina), cucumber tree (Magnolia acuminata), and black birch (Betula lenta). The shrub layer is well developed, and the herb layer is rich and includes some southern Appalachian species such as yellow mandarin (Disporum lanuginosum), running strawberry bush (Euonymus obovatus), and black bugbane (Cimicifuga racemosa).

Elevation Range

Known examples of this community have been found at elevations between 300 feet and 2360 feet.

Similar Ecological Communities

Allegheny oak forest: Allegheny oak forest is also restricted to western New York and best developed in the unglaciated Allegheny Plateau region of the state. Allegheny oak forest is a summit and south-facing, upper slope community type. Rich mesophytic forest can be distinguished from Allegheny oak by the lack of chestnut oak (Quercus montana) and the lack of, or very low density of, black oak (Quercus velutina). The short shrub layer of Allegheny oak forest is typically dominated by heaths such as blueberry (Vaccinium pallidum), whereas the shrub layer of rich mesophytic forest is a mix of tree seedlings, saplings, and tall shrub species.

Oak-tulip tree forest: Oak-tulip tree forests are found on moist, well drained sites in southeastern New York and have not been documented in western New York. Tulip tree (Liriodendron tulipifera) is typically codominant in oak-tulip tree forests and only rarely occurs in rich mesophytic forests in New York.

Beech-maple mesic forest: Rich mesophytic forest can be distinguished from beech-maple mesic forest by the predominance of rich herbs that include some southern species (yellow mandrin, running strawberry bush, black bugbane), and by the circumneutral fine textured soils. Beech-maple mesic forest communities, in contrast, generally occur on more acidic soils.

Maple-basswood rich mesic forest: Rich mesophytic forest can be distinguished from maple-basswood rich mesic forest by the presence of trees such as cucumber magnolia (Magnolia acuminata) and rich herbs including some southern Appalachian species, such as yellow mandarin (Disporum lanuginosum), running strawberry bush (Euonymus obovatus), and black bugbane (Cimicifuga racemosa).

Characteristic Species

Trees > 5m

Red Maple (Acer rubrum)

Sugar Maple (Acer saccharum)

Sweet Birch (Betula lenta)

American Beech (Fagus grandifolia)

White Ash (Fraxinus americana)

Cucumber Magnolia (*Magnolia acuminata*)

Wild Black Cherry (*Prunus serotina*)

Red Oak (Quercus rubra)

Shrubs 2-5m

Striped Maple (Acer pensylvanicum)

Mountain Maple (*Acer spicatum*)

American Hornbeam (Carpinus caroliniana)

American Chestnut (Castanea dentata)

Beaked Hazelnut (Corylus cornuta)

American Witch-hazel (Hamamelis virginiana)

Red Elderberry (Sambucus racemosa)

Shrubs < 2m

Allegheny Blackberry (Rubus allegheniensis)

Herbs

White Baneberry (Actaea pachypoda)

White Snakeroot (Ageratina altissima var. altissima)

Small White Leek (*Allium tricoccum*)

Bearded Shorthusk (*Brachyelytrum erectum*)

Appalachian Sedge (Carex appalachica)

White-edge Sedge (Carex debilis)

Finely-nerved Sedge (Carex leptonervia)

Pennsylvania Sedge (Carex pensylvanica)

Rosy Sedge (Carex rosea)

Blue Cohosh (Caulophyllum thalictroides)

Black Snakeroot (Cimicifuga racemosa)

Slender Wood Reedgrass (Cinna latifolia)

Blue Bead-lily (Clintonia borealis)

Ground Pine (*Dendrolycopodium obscurum*)

Eastern Hay-scented Fern (Dennstaedtia punctilobula)

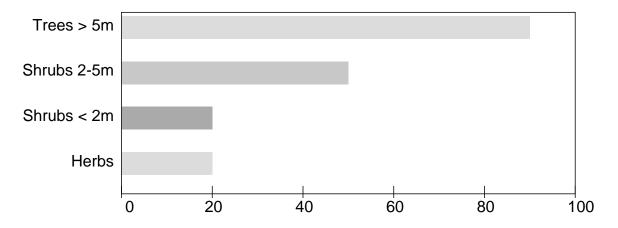
Evergreen Woodfern (*Dryopteris intermedia*)

Running Strawberry Bush (*Euonymus obovata*)

White Wood-aster (Eurybia divaricata)

Round-leaved Liverleaf (Hepatica nobilis)

Shining Clubmoss (*Huperzia lucidula*)
Tall Millet-grass (*Milium effusum*)
Indian-pipe (*Monotropa uniflora*)
Common Solomon's-seal (*Polygonatum biflorum*)
Christmas Fern (*Polystichum acrostichoides*)
Yellow Fairybells (*Prosartes lanuginosa*)
Northern Starflower (*Trientalis borealis*)
Sessile-leaved Bellwort (*Uvularia sessilifolia*)
Roundleaf Violet (*Viola rotundifolia*)



This figure helps visualize the structure and "look" or "feel" of a typical rich mesophytic forest. Each bar represents the amount of "coverage" for all the species growing at that height. Because layers overlap (shrubs may grow under trees, for example), the shaded regions can add up to more than 100%.

International Vegetation Classification System Associations

This New York natural community encompasses all or part of the concept of the following International Vegetation Classification (IVC) natural community associations. These are often described at finer resolution than New York's natural communities. The IVC is developed and maintained by NatureServe.

Sugar Maple - White Ash - American Basswood - Tuliptree / Black Cohosh Forest (CEGL006237)

NatureServe Ecological System Associations

This New York natural community falls into the following ecological system(s). Ecological systems are often described at a coarser resolution than New York's natural communities and tend to represent clusters of associations found in similar environments. The ecological systems project is developed and maintained by NatureServe.

Southern and Central Appalachian Cove Forest (CES202.373)

Additional Resources

Links

References

- Braun, E. Lucy. 1950. Deciduous forests of Eastern North America. Macmillan Publ. Co. Inc., New York, N.Y.
- Eaton, S.W. and E.F. Schrot. 1987. A flora of the vascular plants of Cattaraugus County, New York. Bull. Buffalo Society Natural Sci. 31: 1-235.
- Edinger, Gregory J., D.J. Evans, Shane Gebauer, Timothy G. Howard, David M. Hunt, and Adele M. Olivero (editors). 2002. Ecological Communities of New York State. Second Edition. A revised and expanded edition of Carol Reschke's Ecological Communities of N
- Gordon, R.B. 1937. The primeval forest types of southwestern New York. New York State Museum Bull. No. 321, Albany, NY.
- Keys, Jr.,J.; Carpenter, C.; Hooks, S.; Koenig, F.; McNab, W.H.; Russell, W.;Smith, M.L. 1995. Ecological units of the eastern United States first approximation (cd-rom), Atlanta, GA: U.S. Department of Agriculture, Forest Service. GIS coverage in ARCINFO format, selected imagery, and map unit tables.
- NatureServe. 2005. NatureServe Central Databases. Arlington, Virginia. USA
- Reschke, Carol. 1990. Ecological communities of New York State. New York Natural Heritage Program, New York State Department of Environmental Conservation. Latham, NY. 96 pp. plus xi.
- Shanks, R.E. 1966. An ecological survey of the vegetation of Monroe County, New York. Proc. Rochester Academy Sci. 11:108-252.

New York Natural Heritage Program

625 Broadway, 5th Floor, Albany, NY 12233-4757 Phone: (518) 402-8935 acris@nynhp.org This project is made possible with funding from:

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