Coastal Oak-Hickory Forest

Coastal oak-hickory forest

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System	Terrestrial
Subsystem	Forested Uplands

Did you know?
Pignut hickory (Carya glabra), and sweet pignut hickory (Carya ovalis) are two species of hickory that occur within coastal oak-hickory forests. These two species of hickory are actually very difficult to distinguish from each other most of the year. The main difference between the two species is the husk of the fruit. "The fruit of pignut hickory is pearshaped and the husks splits only about halfway down. This last feature is the only trustworthy one, since the other characteristics intergrade" (Harlow 1957).

Summary

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

Rarity G4, S3

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 S3 means: Typically 21 to 100 occurrences, limited acreage, or miles of stream in New York State.

Conservation Status in New York

There are less than 10 documented occurrences statewide. These occurrences have good viability and are protected on private or public conservation land. The community is restricted to interior portions of coastal lowlands in Suffolk and possibly Nassau Counties and is concentrated on knolls and mid to upper slopes of moraines. The acreage, extent, and condition of coastal oak-hickory forests in New York is suspected to be declining.

Short-term Trends

The acreage, extent, and condition of coastal oak-hickory forests in New York is suspected to be declining due to fragmentation and extirpation from residential and commercial development, heavy deer browse, and invasive species.

Long-term Trends

The number, extent, and viability of coastal oak-hickory forests in New York are suspected to have declined substantially over the long-term. These declines are likely correlated with the settlement of Long Island and the subsequent residential, agricultural and commercial development.

Conservation and Management

Threats

The threats to the coastal oak-hickory forest are many and varied: displacement of the community by commercial and residential development; invasive species; roads and trails causing forest fragmentation and erosion; and deer browse. Some of the invasive species that have been observed in the forest include Japanese barberry (Berberis thunbergii), Black locust (Robinia pseudo-acacia), bittersweet (Celastrus orbiculatus), garlic mustard (Alliaria petiolata) and multiflora rose (Rosa multiflora). Deer browse on seedlings and saplings are causing a loss of forest canopy regeneration.

Conservation Strategies and Management Practices

To promote a dynamic forest mosaic, allow natural processes, including gap formation from blowdowns and tree mortality, as well as, in-place decomposition of fallen coarse woody debris and standing snags, to operate, particularly in mature and old growth examples (Spies and Turner 1999). Management efforts should focus on the control or local eradication of invasive exotic plants and the reduction of white-tailed deer densities. Consider deer exclosures or population management, particularly if studies confirm that canopy species recruitment is being affected by heavy browse. Generally, 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 and French 1998, Knight 2003) and management efforts should strive to ensure that tree and shrub seedlings are not so heavily browsed that they cannot replace overstory trees. If active forestry must occur, use silvicultural techniques and extended rotation intervals that promote regeneration of a diversity of canopy, subcanopy and shrub species over time (Busby et al. 2009) while avoiding or minimizing both short-term and persistent residual disturbances such as soil compaction, loss of canopy cover due to logging road construction, and the unintended introduction of invasive plants.

Development and Mitigation Considerations

Fragmentation of coastal forests should be avoided. It is also important to maintain connectivity with adjacent natural communities, not only to allow nutrient flow and seed dispersal, but to allow animals to move between them seasonally. 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/). A cross-section of coastal oak-hickory forest occurrences should be protected, including the largest ones, the most mature ones, and the ones in the best landscape block.

Inventory Needs

Survey for additional large examples in central to western Suffolk County. Some leads to follow up on include Caleb Smith State Park, Wildwood State Park, and Butler-Huntington Preserve among others.

Research Needs

A critical assessment of the long-term effects of heavy deer browse on this community, particularly addressing oak and other canopy species seedling recruitment, is needed.

Rare Species

Black-edge Sedge (*Carex nigromarginata*)
Red-banded Hairstreak (*Calycopis cecrops*)
Slender Pinweed (*Lechea tenuifolia*)
Southern Arrowwood (*Viburnum dentatum var. venosum*)
Bushy Rockrose (*Crocanthemum dumosum*)
Persimmon (*Diospyros virginiana*)
White-m Hairstreak (*Parrhasius m-album*)
Small White Snakeroot (*Ageratina aromatica var. aromatica*)
Dwarf Hawthorn (*Crataegus uniflora*)
White Milkweed (*Asclepias variegata*)
Globose Flatsedge (*Cyperus echinatus*)
Scotch Lovage (*Ligusticum scothicum ssp. scothicum*)
St. Andrew's Cross (*Hypericum hypericoides ssp. multicaule*)

Identification Comments

The forest is usually codominated by two or more species of oaks, usually white oak (Q. alba), black oak (Quercus velutina) and chestnut oak (Q. montana). Scarlet oak (Quercus coccinea) is also a common associate. Mixed with the oaks, usually at moderate densities, are one or more of the following hickories: pignut (Carya glabra), mockernut (C. alba), and sweet pignut (C. ovalis). These hickories can range from nearly pure stands to as little as about 25% cover. There is typically a subcanopy stratum of small trees and tall shrubs including flowering dogwood (Cornus florida) and highbush blueberry (Vaccinium corymbosum). The shrublayer and groundlayer flora may be diverse. Common low shrubs include maple-leaf viburnum (Viburnum acerifolium), blueberries (Vaccinium angustifolium, V. pallidum) and black huckleberry (Gaylussacia baccata). Characteristic groundlayer herbs are Swan's sedge (Carex swanii), panic grass (Panicum dichotomum), poverty grass (Danthonia spicata), cow-wheat (Melampyrum lineare), spotted wintergreen (Chimaphila maculata), rattlesnake weed (Hieracium venosum), white wood aster (Aster divaricatus), false Solomon's seal (Maianthemum racemosum), Pennsylvania sedge (Carex pensylvanica), and white goldenrod (Solidago bicolor).

The Best Time to See

Early spring is a good time to catch many of the understory trees and shrubs in bloom. Flowering dogwood and maple-leaf viburnum provide visual sprays of color in the spring. Mid to late summer is a good time to snack on ripening blueberries and huckleberries.

Characteristics Most Useful for Identification

A hardwood forest with oaks (Quercus spp.) and hickories (Carya spp.) codominant that occurs in dry well-drained, loamy sand of knolls, upper slopes, or south-facing slopes of glacial moraines of the Atlantic coastal plain.

Elevation Range

Known examples of this community have been found at elevations between 4 feet and 150 feet.

Similar Ecological Communities

Coastal oak-heath forest: This is a large patch to matrix low diversity hardwood forest that typically occurs on dry, well-drained, sandy soils of glacial outwash plains or moraines of the Atlantic coastal plain. The forest is usually codominated by two or more species of oaks: scarlet oak (Quercus coccinea), white oak (Q. alba) and black oak (Q. velutina). Chestnut oak (Quercus montana) is also a common associate. Pitch pine (Pinus rigida) and trees of other genera, if present, typically occur at less than 1% cover each in the canopy. The shrublayer is well-developed typically with a low, nearly continuous, cover of dwarf heaths such as blueberries (Vaccinium pallidum, V. angustifolium) and black huckleberry (Gaylussacia baccata). Coastal oak-heath forests differ from coastal oak-hickory forests from the lack of hickory in the overstory, having a low continuous cover of heath species in the shrub layer, and a general overall low diversity of shrubs and herbaceous plants.

Coastal oak-beech forest: This is a hardwood forest with oaks (Quercus spp.) and American beech (Fagus grandifolia) codominant that occurs in dry well-drained, loamy sand of morainal coves of the Atlantic coastal plain. Some occurrences are associated with maritime beech forest. Beech can range from nearly pure stands to as little as about 25% cover. The forest is usually codominated by two or more species of oaks, usually black oak (Quercus velutina) and white oak (Q. alba). Scarlet oak (Quercus coccinea) and chestnut oak (Q. montana) are common associates. Red oak (Quercus rubra) may be present at low density and is a key indicator species along with sugar maple (Acer saccharum) and paper birch (Betula papyrifera). There are relatively few shrubs and herbs. Coastal oak-beech forests differ from coastal oak-hickory forests due to the significant amount of beech in the canopy, and by typically having poorer diversity in the herbaceous plant strata.

Coastal oak-laurel forest: This is a large patch low diversity hardwood forest with broadleaf canopy and evergreen subcanopy that typically occurs on dry well-drained, sandy and gravelly soils of morainal hills of the Atlantic coastal plain. This forest is similar to the chestnut oak forest of the Appalachian Mountains; it is distinguished by lower abundance of chestnut oak (Quercus montana) and absence of red oak (Quercus rubra), probably correlated with the difference between the sand and gravel of glacial moraines

versus the bedrock of mountains.

Coastal oak-holly forest: This is a mixed deciduous-evergreen broadleaf forest that occurs on somewhat moist and moderately well drained silt and sandy loams in low areas on morainal plateaus. The elevation afforded by the raised plateau protects these areas from overwash and salt spray. In New York State, this forest is best developed on the narrow peninsulas of eastern Long Island. The trees are usually not stunted, and are removed from the pruning effects of severe salt spray. Coastal oak-holly forests differ from coastal oak-hickory forests from the lack of significant hickory in the overstory, being generally on moister sites, and typically having less species diversity.

Appalachian oak-hickory forest: This is a hardwood forest that occurs on well-drained sites, usually on ridgetops, upper slopes, or south- and west-facing slopes. The soils are usually loams or sandy loams. This is a broadly defined forest community with several regional and edaphic variants. The dominant trees include one or more of the following oaks: red oak (Quercus rubra), white oak (Q. alba), and black oak (Q. velutina). Mixed with the oaks, usually at lower densities, are one or more of the following hickories: pignut (Carya glabra), shagbark (C. ovata), and sweet pignut (C. ovalis). Common associates are white ash (Fraxinus americana), red maple (Acer rubrum), and hop hornbeam (Ostrya virginiana). This forest is typically somewhat enriched with a subcanopy stratum of small trees and tall shrubs. Appalachian oak-hickory forests differ from coastal oak-hickory forests in that they only occur north of the Coastal Lowlands ecozone.

Characteristic Species

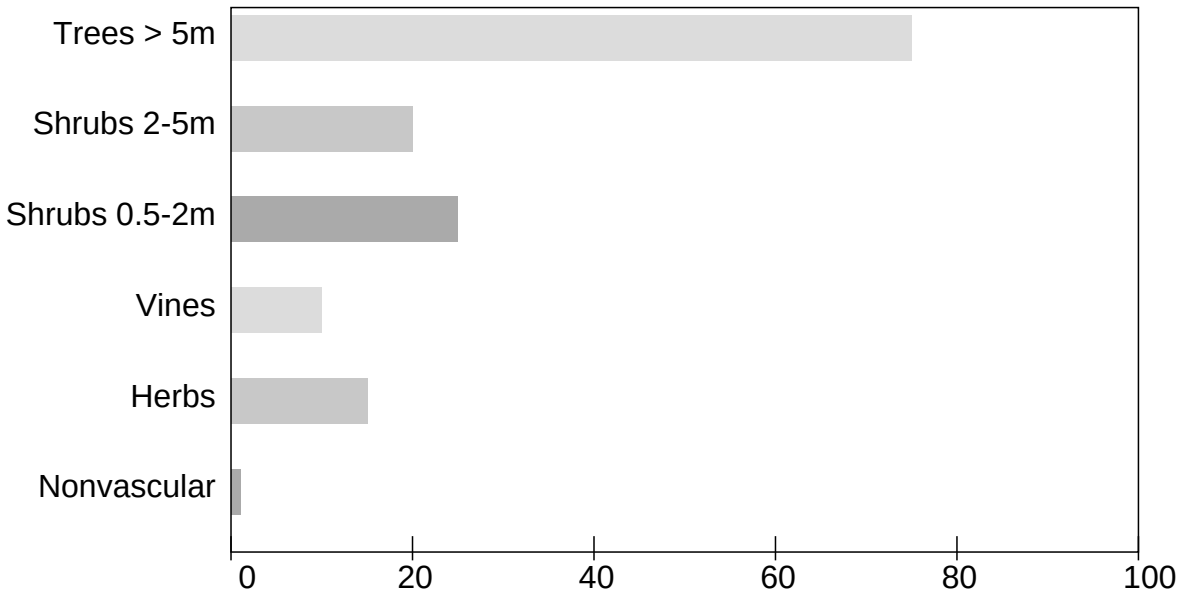
Trees > 5m
Red Maple (*Acer rubrum*)
Sugar Maple (*Acer saccharum*)
Mockernut Hickory (*Carya alba*)
Bitternut Hickory (*Carya cordiformis*)
Pignut Hickory (*Carya glabra*)
Shagbark Hickory (*Carya ovata*)
Flowering Dogwood (*Cornus florida*)
Black Walnut (*Juglans nigra*)
Wild Black Cherry (*Prunus serotina*)
White Oak (*Quercus alba*)
Swamp White Oak (*Quercus bicolor*)
Scarlet Oak (*Quercus coccinea*)
Chestnut Oak (*Quercus montana*)
Pin Oak (*Quercus palustris*)
Red Oak (*Quercus rubra*)
Post Oak (*Quercus stellata*)
Black Oak (*Quercus velutina*)
Sassafras (*Sassafras albidum*)

Shrubs 2-5m
Red Maple (*Acer rubrum*)
Oblong-leaf Serviceberry (*Amelanchier canadensis*)
Mockernut Hickory (*Carya alba*)
Pignut Hickory (*Carya glabra*)

Shagbark Hickory (*Carya ovata*)
Flowering Dogwood (*Cornus florida*)
American Witch-hazel (*Hamamelis virginiana*)
Common Winterberry (*Ilex verticillata*)
Spicebush (*Lindera benzoin*)
Photinia arbutifolia
White Oak (*Quercus alba*)
Scarlet Oak (*Quercus coccinea*)
Chestnut Oak (*Quercus montana*)
Pin Oak (*Quercus palustris*)
Red Oak (*Quercus rubra*)
Black Oak (*Quercus velutina*)
Sassafras (*Sassafras albidum*)
Highbush Blueberry (*Vaccinium corymbosum*)
Mapleleaf Viburnum (*Viburnum acerifolium*)

Shrubs 0.5-2m
Coast Pepper-bush (*Clethra alnifolia*)
Flowering Dogwood (*Cornus florida*)
Teaberry (*Gaultheria procumbens*)
Black Huckleberry (*Gaylussacia baccata*)
Scarlet Oak (*Quercus coccinea*)
Chestnut Oak (*Quercus montana*)
Red Oak (*Quercus rubra*)
Black Oak (*Quercus velutina*)
Highbush Blueberry (*Vaccinium corymbosum*)
Early Lowbush Blueberry (*Vaccinium pallidum*)
Mapleleaf Viburnum (*Viburnum acerifolium*)
Southern Arrowwood (*Viburnum dentatum*)

Herbs
Wild Sarsaparilla (*Aralia nudicaulis*)
Pennsylvania Sedge (*Carex pensylvanica*)
Swan Sedge (*Carex swanii*)
Spotted Wintergreen (*Chimaphila maculata*)
Wavy Hair Grass (*Deschampsia flexuosa*)
White Wood-aster (*Eurybia divaricata*)
Canada May-flower (*Maianthemum canadense*)
New York Fern (*Thelypteris noveboracensis*)



This figure helps visualize the structure and "look" or "feel" of a typical coastal oak-hickory 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.

Dry Oak-Hickory Forest (CEGL006336)

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.

Atlantic Coastal Plain Northern Dry Hardwood Forest (CES203.475)

Additional Resources

Links

Long Island Botanical Society
http://libotanical.org/
NatureServe Explorer
http://www.natureserve.org/
The Nature Conservancy - Long Island Chapter
http://www.nature.org/wherewework/northamerica/states/newyork/preserves/art13653.html

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This project is made possible with funding from:

- New York State Department of Environmental Conservation Hudson River Estuary Program
- Division of Lands & Forests, Department of Environmental Conservation
- New York State Office of Parks, Recreation and Historic Preservation

Information for this guide was last updated on Mar 18, 2013
This guide was authored by