Pitch Pine-Oak Forest

Pitch pine-oak forest in the Long Island Central Pine Barrens

Photo credits: *Gregory J. Edinger*

System Terrestrial

Subsystem Forested Uplands

Did you know?
The pitch that was produced from pitch pine (Pinus rigida) sap was used to seal seams in ships and preserve wood during the American colonial period. The pitch can be obtained by scraping it off the tree in areas that have been wounded naturally, or by cutting marks along the tree's bark. Therefore, unlike other pines, few pitch pines were logged during this time period. If the cuts were made infrequently, the tree was not damaged.

Summary

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

Rarity G4G5, S4

A global rarity rank of G4G5 means: Apparently or Demonstrably Secure globally - Uncommon to common in the world, but not rare; usually widespread, but may be rare in some parts of its range; possibly some cause for long-term concern due to declines or other factors. More information is needed to assign a single conservation status.
A state rarity rank of S4 means: Apparently secure in New York State.

Conservation Status in New York

There are about a hundred occurrences statewide (number may be artificially elevated by development fragmentation). Several documented occurrences have good viability and several are protected on public land or private conservation land. This community has a restricted statewide distribution (correlated to pine barrens and sandy soils). Most examples are moderate in size and a few are high quality. Several pitch pine-oak forests are threatened by fire suppression.

Short-term Trends

The acreage of pitch pine-oak forest in New York has probably declined slightly in recent decades due to fire suppression, disturbance by off-road vehicles, trash dumping, and development. The number of pitch pine-oak forests may have increased slightly from historical numbers as formerly large matrix examples were fragmented by development into numerous large and small patches.

Long-term Trends

The acreage of pitch pine-oak forests in New York has probably declined substantially from historical numbers due to fire suppression, fragmentation, disturbance by off-road vehicles, trash dumping, and development. The number of pitch pine-oak forests may have increased substantially from historical numbers as formerly large matrix examples were fragmented by development into numerous large and small patches.

Conservation and Management

Threats

As a fire-dependent natural community, the primary threat to pitch pine-oak forests is the suppression of fire. Other threats to this community include fragmenting development (e.g., residential development, roads), recreational overuse (e.g., ATVs, hikers, mountain bikes, trash dumping), and habitat alteration (e.g., excessive logging, construction of utility ROWs). Several examples of pitch pine-oak forest are threatened by invasive species, such as Japanese barberry (Berberis thunbergii), black locust (Robinia pseudoacacia), multiflora rose (Rosa multiflora), buckthorn (Rhamnus cathartica), Asiatic bittersweet (Celastrus orbiculatus), Japanese honeysuckle (Lonicera japonica), and garlic mustard (Alliaria petiolaris).The oak trees in pitch pine-oak forests may be threatened by the non-native gypsy moth (Lymantria dispar) which is one of North America's most destructive forest pests. The gypsy moth is known to feed on the foliage of hundreds of species of plants in North America but its most common hosts are oaks (Quercus spp.) and aspen (Populus spp.). Gypsy moth populations are typically eruptive in North America; in any forest stand densities may fluctuate from near 1 egg mass per ha to over 1,000 per ha. When densities reach very high levels, trees may become completely defoliated. Several successive years of defoliation, along with other biotic and abiotic stress factors, may ultimately result in tree mortality (McManus et al. 1980, Liebold 2003).

Conservation Strategies and Management Practices

Develop and implement presribed burn plans at appropriate sites. Reduce or minimize fragmenting features, such as roads, abandoned clearings, unnecessary trails, etc. Restrict mountain bikes and ATVs to designated trails and least sensitive areas, and prevent dumping of trash.

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 regenerating trees and shrubs are not so heavily browsed that they cannot replace overstory trees. 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 developments 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

Survey for occurrences statewide to advance documentation and classification of pitch pine-oak forests. A statewide review of pitch pine pine-oak forests is desirable. Continue searching for large sites in good condition (A- to AB-ranked).

Research Needs

Research the composition of pitch pine-oak forests statewide in order to characterize variations (e.g., coastal plain, inland, and northern types). Collect sufficient plot data to support the recognition of several distinct pitch pine-oak forest types based on composition and by ecoregion. Determine the optimal fire regime for this community.

Rare Species

Bird Dropping Moth (*Cerma cora*)
Stargrass (*Aletris farinosa*)
Barrens Dagger Moth (*Acronicta albarufa*)
Variable Sedge (*Carex polymorpha*)
Red-banded Hairstreak (*Calycopis cecrops*)
Barratt's Sedge (*Carex barrattii*)
Dusted Skipper (*Atrytonopsis hianna*)
Frosted Elfin (*Callophrys irus*)
Herodias or Pine Barrens Underwing (*Catocala herodias gerhardi*)
Waxed Sallow (*Chaetaglaea cerata*)
A Noctuid Moth (*Chytonix sensilis*)
Mottled Duskywing (*Erynnis martialis*)
Trinerved White Boneset (*Eupatorium album var. subvenosum*)
Inland Barrens Buckmoth (*Hemileuca maia maia*)
Barrens Itame (*Speranza exonerata*)
Two-striped Cord Grass Moth (*Macrochilo bivittata*)
Karner Blue (*Plebejus melissa samuelis*)
Edwards' Hairstreak (*Satyrium edwardsii*)
Northern Oak Hairstreak (*Satyrium favonius ontario*)
Pine Barrens Zanclognatha (*Zanclognatha martha*)
Slender Crabgrass (*Digitaria filiformis*)
Reznicek's Sedge (*Carex reznicekii*)
Jack Pine Looper (*Macaria marmorata*)
Tiger Salamander (*Ambystoma tigrinum*)
Bushy Rockrose (*Crocanthemum dumosum*)
Little-leaf Tick-trefoil (*Desmodium ciliare*)
Broad-lined Catopyrrha (*Erastria coloraria*)
Oakes' Evening-primrose (*Oenothera oakesiana*)
Wild Pink (*Silene caroliniana ssp. pensylvanica*)
Pine Devil (*Citheronia sepulcralis*)

Richard's Fungus Moth (*Metalectra richardsi*)
Packard's Lichen Moth (*Cisthene packardii*)
Gordian Sphinx (*Sphinx gordius*)
Aureolaria Seed Borer (*Pyrrhia aurantiago*)
Large Grass-leaved Rush (*Juncus biflorus*)
Serrate Round-leaf Boneset (*Eupatorium pubescens*)
Minute Duckweed (*Lemna perpusilla*)
St. Andrew's Cross (*Hypericum hypericoides ssp. multicaule*)
Velvety Bush-clover (*Lespedeza stuevei*)
False China-root (*Smilax pseudochina*)
Flax-leaf Whitetop (*Sericocarpus linifolius*)
Pine Barren Bellwort (*Uvularia puberula*)
Few-flowered Nutrush (*Scleria pauciflora var. caroliniana*)
Swamp Oats (*Sphenopholis pensylvanica*)
Flowering Pixiemoss (*Pyxidanthera barbulata*)
Orange Milkwort (*Polygala lutea*)
Coastal Goldenrod (*Solidago latissimifolia*)
Whip Nutrush (*Scleria triglomerata*)

Identification Comments

A mixed forest that occurs on well-drained sandy soils of glacial outwash plains or moraines. The dominant canopy species are pitch pine (Pinus rigida) with one or more of the following oaks: black oak (Quercus velutina), red oak (Q. rubra), scarlet oak (Q. coccinea), and white oak (Q. alba). The relative abundance and distribution of the pitch pine and oak species varies greatly. The shrub layer is well developed, with scattered patches of scrub oak (Q. ilicifolia), and an extensive cover of blueberries (Vaccinium angustifolium, V. pallidum) and huckleberries (Gaylussacia baccata). The herbaceous layer is sparse and may include bracken fern (Pteridium aquilinum), pennsylvania sedge (Carex pensylvanica), and wintergreen (Gaultheria procumbens) (Edinger et al. 2002).

The Best Time to See

During midsummer, two species of lowbush blueberry come into fruit, producing a tasty snack.

Characteristics Most Useful for Identification

Pitch pine-oak forests are mature, closed canopy forests with a variable relative abundance of pitch pine and oak species, an extensive layer of heath low shrubs, and scattered patches of scrub oak. This community is present in areas of outwash plains and moraines.

Elevation Range

Known examples of this community have been found at elevations between 10 feet and 730 feet.

Similar Ecological Communities

Appalachian oak-pine forest: Appalachian oak-pine forest communities are made up of any of the oaks present in pitch pine-oak forests, and usually white pine (Pinus strobus), which has a canopy percent cover of at least 25%. When pitch pine is present and abundant in this community, it is typically located on thin rocky soils.

Coastal oak-heath forest: Coastal oak-heath forest communities feature the same oak species as pitch pine-oak forests, but they have a very low percent cover of pitch pine (<1%) in the canopy. The two communities have similar understory species compositions.

Pitch pine-oak-heath woodland: Pitch pine-oak-heath woodland communities are pine barrens communities of the coastal plain region that have a vegetation structure between a shrub-savanna and a woodland. The canopy of this community is more sparse than that of pitch pine-oak forests, and the understory has species characteristic of coastal plain barrens, such as bearberry (Arctostaphylos uva-ursi) and heathers (Hudsonia spp.).

Pitch pine-heath barrens: Pitch pine-heath barrens is a shrub-savanna community that has a very open canopy (with 30-60% cover), and an extensive shrub layer dominated by heath species and sweet fern (Comptonia peregrina). In contrast, pitch pine-oak forests are closed-canopy mature communities.

Pitch pine-scrub oak barrens: Pitch pine-scrub oak barrens is a shrub-savanna community that has a very open canopy (with 20-60% cover), and an extensive shrub layer dominated by scrub oak and scrub chestnut oak (Quercus prinioides). In contrast, pitch pine-oak forests are closed-canopy mature communities.

Characteristic Species

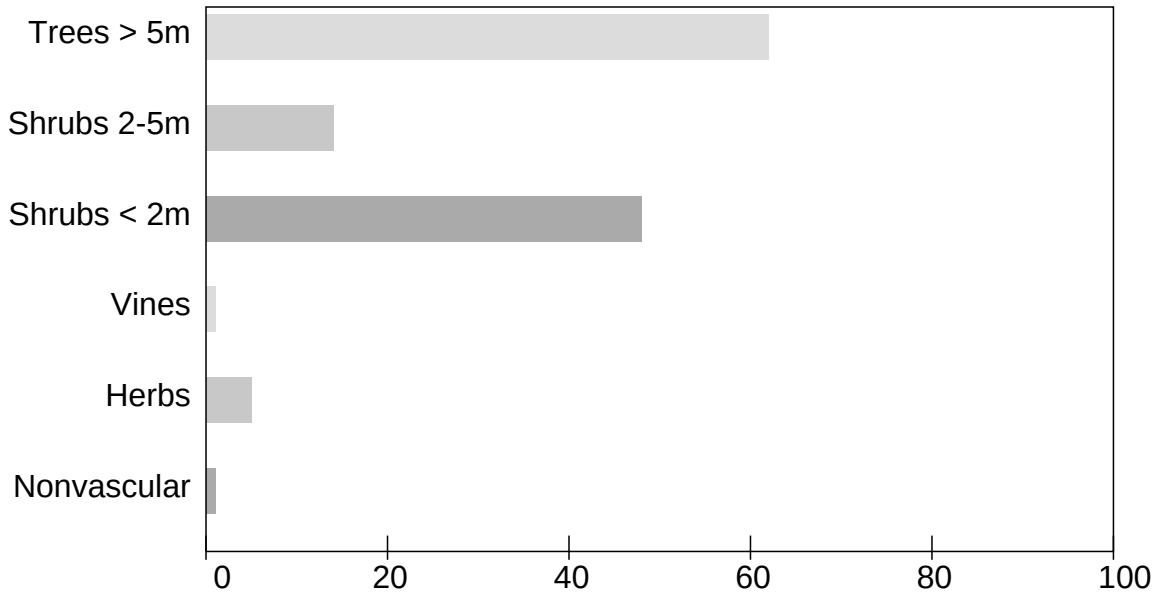
Trees > 5m
Red Maple (*Acer rubrum*)
Pitch Pine (*Pinus rigida*)
Eastern White Pine (*Pinus strobus*)
White Oak (*Quercus alba*)
Scarlet Oak (*Quercus coccinea*)
Red Oak (*Quercus rubra*)
Black Oak (*Quercus velutina*)

Shrubs 2-5m
Scrub Oak (*Quercus ilicifolia*)
Highbush Blueberry (*Vaccinium corymbosum*)

Shrubs < 2m
Black Huckleberry (*Gaylussacia baccata*)
Lowbush Blueberry (*Vaccinium angustifolium*)
Early Lowbush Blueberry (*Vaccinium pallidum*)

Herbs
Pennsylvania Sedge (*Carex pensylvanica*)
Teaberry (*Gaultheria procumbens*)

Canada May-flower (*Maianthemum canadense*)
Eastern Bracken (*Pteridium aquilinum*)



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

Eastern White Pine - Red Pine - Pitch Pine Forest (CEGL006259)

Pitch Pine - (Black Oak, Scarlet Oak, Rock Chestnut Oak) Forest (CEGL006290)

Pitch pine - Oak Forest (CEGL006381)

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.

North-Central Appalachian Pine Barrens (CES202.590)

Central Appalachian Oak and Pine Forest (CES202.591)

Atlantic Coastal Plain Northern Upland Pitch Pine Barrens (CES203.269)

Additional Resources

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