**Macrogroup:** Central Hardwood Swamp

**Description:**
A hardwood forest of upland and wetland species occurring in depressions or poorly drained lowlands throughout the northern glaciated Midwest and Lower New England. Pin oak dominates in many areas; other common (sometimes dominant) trees include swamp white oak, bur oak, black gum, sweet gum, and red maple. Areas with more dense tree cover have less shrub and herbaceous cover than the dense understory associated with more open canopies. Buttonbush, winterberry, and alder are typical shrubs; various sedges and cinnamon fern are common in the herb layer. Composition changes with fluctuating moisture levels. It is not known how modeled examples in coastal areas from New Jersey to southern Maine (light green) may differ from those in interior valleys and depressions (dark green).

**Ecological Setting and Natural Processes:**
Occurs on poorly drained uplands or in depressions associated with glacial features such as tilplains, lakeplains or outwash plains. Soils often have an impermeable clay layer that can create a shallow, perched water table. Saturation periods vary, and seasonal drought is possible. Flooding, drought and fire can influence system dynamics.

**Similar Habitat Types:**
Vegetation and topographic setting of this small patch wetland system, which has its core distribution in the glaciated Midwest, is similar to that of the Glacial Marine & Lake Wet Clayplain Forest, which was the dominant pre-settlement forest of the Champlain Valley and northwestern NY.

**Crosswalk to State Name Examples:**
Forested Inland Wetland - Unspecified (CT), Black Gum-Pin Oak-Swamp White Oak "Perched" Swamp (MA), Wetlands - Forested Wetlands And Bogs (PA), Oak-Pine-Northern Hardwood Forest - Valley Clayplain Forest (VT), Red Maple - Elm - Lady Fern Silt Forest (NH)
Places to Visit this Habitat:
Saratoga National Historical Park | NY
Overpeck County Park | NJ
Great Meadows National Wildlife Refuge | MA
Rogers Island Wildlife Management Area | NY

Associated Species: Appendix lists scientific names
BIRDS: barred owl, great crested flycatcher, northern waterthrush, veery, wood duck
HERPTILES: eastern hog-nosed snake, northern leopard frog, black racer
PLANTS: black maple (Acer nigrum), canada moonseed (Menispermum canadense), climbing fern (Lygodium palmatum), common hackberry (Celtis occidentalis), common sneezeweed (Helenium autumnale), cut-leaved evening-primrose (Oenothera laciniata), foxtail sedge (Carex alopecoidea), frank's sedge (Carex frankii), georgia bulrush (Scirpus georgianus), hairy wild rye (Elymus villosus), narrowleaf springbeauty (Claytonia virginica), purple cress (Cardamine douglassii), swamp agrimony (Agrimonia parviflora)

Species of Concern (G1-G4): Appendix lists scientific names
BIRDS: American bittern, bald eagle, black rail, cerulean warbler
INSECTS: Brook Snaketail
PLANTS: Culver's-root (Veronicastrum virginicum), many-fruit false-loosestrife (Ludwigia polycarpa)

Predicted Habitat Loss to Development
This chart shows the predicted loss of habitat over the next five decades (11,076 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 222 acres per year.

Habitat Connectedness Index
This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.

Age Class Distribution
This chart shows the average age of trees associated with this habitat based on forest Inventory data. For non-forested systems or small habitats the average age is influenced by the surroundings.

Habitat Patch Distribution
The average patch size for this habitat is 8 acres and the largest single patch is 219 acres. This chart shows the proportion of the habitat that is in each patch-size class.

North-Central Interior Wet Flatwoods
http://nature.ly/HabitatGuide
Description:
A forest-shrubland mosaic encompassing a range of woody vegetation on barrier islands, near-coastal strands, and bluffs at the outer edge of the coastal plain. Defined by its proximity to maritime environments, and usually species-poor, the vegetation includes narrow bands of forests or woodlands, often featuring stunted trees with contorted branches and dense vine layers. A range of trees may be present depending upon location and degree of protection from most extreme maritime influences. They may include some combination of pines (like pitch, Virginia, loblolly, and shortleaf pine) and oaks (scarlet, black, scrub, post) as well as eastern red cedar, black cherry, American holly, sassafras, and red maple. The shrub layer may be dense; the herb layer is often sparse.

Ecological Setting and Natural Processes:
Soils are generally fine to coarse sand with some organic material mixed into the top layers; there is sometimes a thick duff layer. Groundwater levels vary, and have a strong influence on vegetation composition and structure. This habitat type encompasses both upland and embedded wetland environments. Maritime forest vegetation is subject to stresses like salt spray, high winds, dune deposition, sand shifting and blasting, and occasional overwash.

Similar Habitat Types:
Maritime forests very often border and interfinger with dune, swale and sandy beach habitats. A similar system with more southern tree, shrub, and herb species has been described for the Central Atlantic Coastal Plain; it ranges south from southeast Virginia.

Crosswalk to State Name Examples:
Upland Woodland And Shrub - Coastal Shrublands (CT), Maritime Red Cedar Woodland (DE), Maritime Oak-Holly Forest/Woodland (MA), Maritime Forest (MD), Maritime Wooded Dune (NH), Coastal Dune Woodland (NJ), Maritime Holly Forest (NY), Maritime Woodland (RI), Maritime Loblolly Pine Forest (VA)

Crosswalk to State Wildlife Action Plans:
Upland Woodland and Shrub - Coastal Shrublands (CT), Beach and Dune Habitats (DE), Upland Forest (MA), Maritime Forests and Shrublands (MD), Coastal Hardwoods (NY), Forest Habitat - Mixed Forest (VA)
Places to Visit this Habitat:
Bluff Point State Park | CT
Cape Cod National Seashore | MA
Assateague Island National Seashore | MD
Mashomack Preserve | NY
Chincoteague National Wildlife Refuge | VA

Associated Species: Appendix lists scientific names
BIRDS: black-and-white warbler, blue-winged warbler, carolina wren, common yellowthroat, eastern towhee, gray catbird, ovenbird, prairie warbler, white-eyed vireo (south), yellow-breasted chat (south)

MAMMALS: eastern mole, gray squirrel, long-tailed weasel, meadow vole, white-footed mice

HERPTILES: eastern hognose snake

PLANTS: Northern Blazingstar (Liatris scariosa var. novaean- Angliae), Lion's-foot (Prenanthes serpentaria), Sundial Lupine (Lupinus perennis), Butterfly Milkweed (Asclepias tuberosa), Eggleaf Rosette Grass (Dichanthelium ovale var. ovale), Eastern Silvery Aster (Symphyotrichum concolor), Small White Leek (Allium tricoccum), Coastal Plain Blue-eyed-grass (Sisyrinchium fuscatum), Yellow Thistle (Cirsium horridulum var. horridulum)

Species of Concern (G1-G4): Appendix lists scientific names
HERPTILES: copperhead, eastern box turtle

INSECTS: coastal heathland cutworm, Delaware skipper, graphic moth, little glassywing, southern broken dash, the pink streak

PLANTS: Bushy Rockrose (Helianthemum dumosum), Broom Crowberry (Corema conradii), Nantucket Shadbush (Amelanchier nantucketensis), Slender Blue Flag (Iris prismatica)

Predicted Habitat Loss to Development
This chart shows the predicted loss of habitat over the next five decades (23,614 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 472 acres per year.
Central Appalachian Dry Oak-Pine Forest

Macrogoup: Central Oak-Pine

Description:
An oak or oak-pine forest of dry sites, characterized by a variable mixture of drought tolerant oaks (chestnut oak, white oak, red oak, black oak, scarlet oak) and pines (pitch, white, Virginia). It occurs broadly in the Central Appalachians and northern Piedmont ecoregions, most commonly as a large (to very large) patch habitat. It has a much more limited range in New England, where hickories may be present. Community structure ranges from open woodlands to closed forest. Heath shrubs are common in the understory; the herb layer is often sparse and lacks diversity. In the absence of fire this system may tend to succeed to hemlock and locally common hardwoods.

Ecological Setting and Natural Processes:
A habitat of dry rolling hills, high sunny slopes and ridgetops, where soils are often thin, well-drained, and nutrient-poor. Bedrock substrates are variable, and can influence herb diversity. Disturbance agents include fire, windthrow, and ice damage, and gypsy moths can wreak havoc in the oak overstory periodically.

Similar Habitat Types:
Drier than, and often found upslope from the Northeast Interior Dry-Mesic Oak Forest system. Drier and more oaky, and again upslope from the Appalachian (Hemlock-)Northern Hardwood system. A more moderate and less exposed habitat than Central Appalachian Pine-Oak Rocky Woodland, which most often occurs as a small patch within it.

Crosswalk to State Name Examples:
Dry Acidic Oak Forest On Stratified Sand And Gravel (CT), Central Appalachian/Northern Piedmont Chestnut Oak Forest (DE), Mixed Oak Forest (MA), Mixed Oak - Heath Forest (MD), Oak - Pine Forest (ME), Dry Red Oak - White Pine Forest (NH), Upland Forests - Mixed Deciduous-Coniferous Forest (NJ), Allegheny Oak Forest (NY), Dry Oak - Heath Woodland (PA), Deciduous Forests - Deciduous Forest Oak/Oak (RI), Central Appalachian / Piedmont White Pine - Xeric Oak Forest (VA), Dry Oak Forest (VT), Oak/Heath And Oak/White Pine Forests (WV)

Crosswalk to State Wildlife Action Plans:
Upland Forest - Dry Oak Forests (CT), Hardwood Forest - Chestnut oak forests (DE), Upland Forest (MA), Dry Oak-Pine Forests (MD), Deciduous and Mixed Forest (ME), Appalachian Oak Pine Forest (NH), Upland forests - mixed deciduous-coniferous forest (NJ), Oak-Pine Forest (NY), Deciduous/Mixed Forest (upland) (PA), Deciduous Forests - Deciduous Forest Oak/Oak (RI), Forest Habitat - Mixed Forest (VA), Oak-Pine-Northern Hardwood Forest - Dry Oak Forest (VT), Oak/Heath and Oak/White Pine Forests (WV)
Places to Visit this Habitat:
Savage River State Forest | MD
Delaware Water Gap | NJ
Bald Eagle State Forest | PA
George Washington and Jefferson National Forest | VA
Monongahela National Forest | WV

Associated Species: *Appendix lists scientific names*
BIRDS: black-and-white warbler, eastern wood-pewee, ovenbird, pine warbler, prairie warbler, scarlet tanager, summer tanager (south), eastern whip-poor-will, worm-eating warbler

MAMMALS: black bear, red-backed vole, short-tailed shrew, southern flying squirrel, white footed mouse

HERPTILES: black racer, northern redback salamander, redbelly snake, ringneck snake, ring-neck snake, spotted salamander

PLANTS: allegheny crowfoot (Ranunculus allegheniensis), chestnut oak (Quercus prinus), deerberry (Vaccinium stamineum), downy arrowwood (Viburnum rafinesquianum), hound’s tongue (Cynoglossum boreale), mountain laurel (Kalmia latifolia), rattlesnake-weed (Hieracium venosum), scarlet oak (Quercus coccinea), spotted wintergreen (Chimaphila maculate)

Species of Concern (G1-G4): *Appendix lists scientific names*
BIRDS: cerulean warbler, golden-winged warbler

HERPTILES: black rat snake, five-lined skink, timber rattlesnake

INSECTS: New Jersey tea inchworm, orange sallow mothred-winged sallow moth, early hairstreak, red-winged sallow

PLANTS: Kate’s mountain clover (Trifolium virginicum), white alumroot (Heuchera alba), sword-leaved phlox (Phlox buckleyi), mountain parsley (Taenidia montana), climbing fumitory (Adlumia fungosa)

Central Appalachian Dry Oak-Pine Forest

© Eric Sorensen (Vermont Fish & Wildlife)

http://nature.ly/HabitatGuide
**Central Appalachian Pine-Oak Rocky Woodland**

**Macrogoup: Central Oak-Pine**

- **Description:** A mixed forest or woodland of pitch pine and/or Virginia pine mixed with dry-site oaks (primarily scrub oak, scarlet oak, and chestnut oak). Red pine and shortleaf pine may also occur. Some areas have a fairly well-developed heath shrub layer; a graminoid herb layer dominated by Pennsylvania sedge, poverty grass, and common hairgrass may be more prominent in others. The vegetation is patchy, with woodland as well as open portions, or even sparse cover on dry rocky hilltops and outcrops.

- **Ecological Setting and Natural Processes:** This forest occurs as relatively small patches on exposed ridgetops, hilltops and outcrops, at elevations ranging up to about 4000 feet. The substrate rock is granitic or other acidic lithology, including traprock in New England. Conditions are dry, and soils are thin and nutrient-poor. This system experiences moderately intense fires naturally every 5 to 25 years; fire history largely determines the vegetation character of individual occurrences.

- **Similar Habitat Types:** Patches of this habitat are most often on exposed sites within larger occurrences of Central Appalachian Dry Oak-Pine Forest. Overlaps with Northern Appalachian-Acadian Rocky Heath Outcrop at the northern end of its range, but lacks spruce and some other northern species. Oakier than Southern Appalachian Montane Pine Forest and Woodland, and without table mountain pine.

- **Crosswalk to State Name Examples:** Subacidic Rocky Summit/Outcrop (CT), Ridgetop Pitch Pine/Scrub Oak (MA), Montane Pine - Oak Woodland (MD), Oak - Pine Woodland (ME), Appalachian Oak - Pine Rocky Ridge (NH), Ridgetop Pitch Pine-Scrub Oak Forest (NJ), Pitch Pine-Oak-Heath Rocky Summit (NY), Pitch Pine - Scrub Oak Woodland (PA), Central Appalachian Xeric Chestnut Oak - Virginia Pine Woodland (VA), Pitch Pine-Oak-Heath Rocky Summit (VT), Dry Rocky Pine/Oak Forests And Woodlands (WV)

- **State Distribution:** CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VA, VT, WV

- **Total Habitat Acreage:** 566,276

- **Percent Conserved:** 38.4%

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**Crosswalk to State Wildlife Action Plans:** Unique and Man-Made - Traprock Ridges (CT), Rocky Cliffs, Ridgetops, Talus Slopes, and Other Similar Habitats (MA), Early Successional Forests - Shrub-dominated natural communities (MD), Dry Woodlands and Barrens (ME), Talus Slopes and Rocky Ridges - Rocky Ridges (NH), Upland forests - mixed deciduous-coniferous forest (NJ), Oak-Pine Forest (NY), Deciduous/Mixed Forest (upland) (PA), Thicket/Shrub Habitats - Naturally occurring barrens (PA), Forest Habitat - Mixed Forest (VA), Oak-Pine-Northern Hardwood Forest - Pitch Pine-Oak-Heath Rocky Summit (VT), Dry Rocky Pine/Oak Forests and Woodlands (WV)
Places to Visit this Habitat:
Savage River State Forest | MD
Harriman State Park | NY
Bald Eagle State Forest | PA
George Washington and Jefferson National Forest | VA
Monongahela National Forest | WV

Associated Species:  Appendix lists scientific names

BIRDS:  black-and-white warbler, broad-winged hawk, ovenbird, pine warbler, prairie warbler, scarlet tanager, summer tanager (south), wood thrush, worm-eating warbler

MAMMALS:  bobcat

HERPTILES:  blue-spotted salamander, coal skink, black-bellied salamander, eastern box turtle, eastern hog-nosed snake, eastern rat snake, fence lizard, five-lined skink, four-toed salamander, marbled salamander, northern copperhead

PLANTS:  ledge spike-moss (Selaginella rupestris), mountain laurel (Kalmia latifolia), mountain sandwort (Minuartia groenlandica), new jersey tea (Ceanothus americanus), northern blazingstar (Liatris scariosa), purple clematis (Clematis occidentalis), scarlet oak (Quercus coccinea), scrub oak (Quercus ilicifolia), yellow false foxglove (Aureolaria pedicularia)

Species of Concern (G1-G4): Appendix lists scientific names

BIRDS:  cerulean warbler, peregrine falcon, eastern whip-poor-will

MAMMALS:  allegheny woodrat, appalachian cottontail, eastern small-footed myotis, kittingy red-backed vole, long-tailed shrew, northern myotis, southern flying squirrel

HERPTILES:  big levels salamander, green salamander, jefferson salamander, timber rattlesnake, white-spotted salamander

INSECTS:  aureolaria seed borer, barrens chaetaglaea, barrens itame, barrens xylotype, blueberry sallow, edward's hairstreak, Gerhard's underwing moth, northern barrens tiger beetle, oblique zale, pine-devil moth, pink sallow, red-winged sallow, similar underwing, sleepy duskywing, southern pine sphinx, the buckmoth

Central Appalachian Pine-Oak Rocky Woodland

The average patch size for this habitat is 7 acres and the largest single patch is 1,202 acres. This chart shows the proportion of the habitat that is in each patch-size class.

This chart shows the average age of trees associated with this habitat based on forest inventory data. For non-forested systems or small habitats the average age is influenced by the surroundings.

This chart shows the predicted loss of habitat over the next five decades (9,984 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 200 acres per year.

This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this chart shows the proportion of the habitat in each connectedness class.
**Macrogroup: Central Oak-Pine**

**Description:**
A hardwood forest largely dominated by oaks, often mixed with pine. White, red, chestnut, black, and scarlet oaks are typical, and American holly is sometimes present. Sassafras, birch, aspen, and hazelnut are common associates in earlier-successional areas. In the northern half of the range, conditions can grade to dry-mesic, reflected in the local abundance of beech. A heath shrub layer is common; the herbaceous layer is sparse. In southern-more occurrences in Maryland or Virginia, pines (shortleaf, Virginia, and particularly loblolly) may be important, even strongly dominant canopy trees. The pine component is usually an indication of past human disturbance.

**Ecological Setting and Natural Processes:**
These forests occur on sandy to gravelly glacial deposits and outwash from Long Island north, and on deep, acidic, coarse-textured soils on the flat to rolling landscapes of the coastal plain to the south. A thick duff layer and dry conditions make this system subject to periodic fires, which in turn encourage oak regeneration.

**Similar Habitat Types:**
In the northern 2/3 of its range, this system shares dry sandy coastal plain landscapes with Pitch Pine Barrens. From southern New Jersey south, it forms a mosaic with Southern Atlantic Coastal Plain Mesic Hardwood Forest, which occupies lower, moister positions in a stream-dissected landscape.

**Crosswalk to State Name Examples:**
Upland Forest - Dry Oak Forests (CT), North Atlantic Coastal Oak-Holly Forest (DE), Coastal Forest/Woodland (MA), Mesic Mixed Hardwood Forest (MD), Deciduous And Mixed Forest (ME), Appalachian Oak Pine Forest (NH), Mesic Coastal Plain Mixed Oak Forest (NJ), Coastal Oak-Beech Forest (NY), Sweet Gum - Oak Coastal Plain Forest (PA), Mixed Oak – American Holly Forest (RI), Coastal Plain Mixed Oak / Heath Forest (VA)

**Crosswalk to State Wildlife Action Plans:**
Upland Forest - Dry Oak Forests (CT), Hardwood Forest - Chestnut oak forests (DC), Coastal Plain Upland Forests (DE), Upland Forest (MA), Loblolly Pine – Oak Forests (MD), Deciduous and Mixed Forest (ME), Appalachian Oak Pine Forest (NH), Upland forests - deciduous forest (NJ), Coastal Hardwoods (NY), Deciduous/Mixed Forest (PA), Deciduous Forests - Deciduous Forest Oak/Holly (RI), Forest Habitat - Deciduous Forest (VA)
Places to Visit this Habitat:
Nehantic State Forest | CT
Redden State Forest | DE
Great Bay National Wildlife Refuge | NH
Connetquot River State Park Preserve | NY
James River National Wildlife Refuge | VA

Associated Species:  Appendix lists scientific names

BIRDS:  barred owl, brown-headed nuthatch (south), black-and-white warbler, carolina wren, eastern towhee, great crested flycatcher, ovenbird, pine warbler, prairie warbler, scarlet tanager, veery (north), wood thrush

MAMMALS:  masked shrew, meadow vole, red-backed vole, southern flying squirrel, white footed mice, woodland jumping mouse

HERPTILES:  mole salamander, spotted turtle

PLANTS:  Lion’s-foot (Prenanthes serpentaria), Northern Blazingstar (Liatris scariosa), Redtop Panicgrass (Panicum rigidulum), Few-flower Nutrush (Scleria pauciflora), Eastern Silvery Aster (Symphyotrichum concolor), Purple Needlegrass (Aristida purpurascens), Post Oak (Quercus stellata), Pale Green Orchid (Platanthera flava), Large Whorled Pogonia (Isotria verticillata)

Species of Concern (G1-G4):  Appendix lists scientific names

BIRDS:  yellow-throated warbler

MAMMALS:  delmarva fox squirrel

HERPTILES:  eastern box turtle, green snake, marbled salamander

INSECTS:  frosted elfin

PLANTS:  Featherfoil (Hottonia inflata), Sandplain Flax (Linum intercursum), Bushy Rockrose (Helianthemum dumosum), Swamp-pink (Helonias bullata), Rose Coreopsis (Coreopsis rosea), Cranefly Orchid (Tipularia discolor), Allegheny Mountains Crowfoot (Ranunculus allegheniensis), Small Whorled Pogonia (Isotria medeoloides), Creeping St. John’s-wort (Hypericum adpressum), Long-beaked Baldrush (Rhynchospora scirpoides), Tall Bushclover (Lespedeza stuevei)

North Atlantic Coastal Plain Hardwood Forest
Macrogroup: Central Oak-Pine

Description:
A dry, fire-adapted forest with a variable canopy of pitch pine, a tall-shrub layer dominated by scrub oak, and a low-shrub layer characterized by blueberry and other heaths. Other oaks (scarlet, black, chestnut, white) are also sometimes present. Composition and structure vary with fire frequency. In general, tree oaks are more prevalent in those stands having a longer fire-return interval, while fire frequencies of eight to ten years foster the growth of "pine plains," dwarf pine stands one meter in height. Dwarf-shrubs such as lowbush blueberry, bearberry and golden-heather typify the field layer of pine plains. Scrub oak stands may occur without pine cover, particularly in low-lying areas where cold-air drainage inhibits pine growth.

Ecological Setting and Natural Processes:
This system favors low-nutrient, deep sandy soils in dry, flat settings on the coastal plain. Historically large occurrences in southeastern Massachusetts and on Long Island have been largely degraded or destroyed, but sizable and relatively intact examples still exist in New Jersey. Occasional small barrens peripheral to the main distribution occur from southern Maine to Maryland.

Similar Habitat Types:
On the coastal plain of New Jersey, the pitch pine lowland system often occurs immediately adjacent to the upland pitch pine barrens system, where the water table is close to the surface. These upland pitch pine barrens are similar in structure and composition to the Northeastern Interior Pine Barrens system, but each system has species not shared by the other.

Crosswalk to State Name Examples:
Pitch Pine-Oak Forest/Woodland (MA), Upland Forests - Pitch Pine-Oak Forest (NJ), Pitch Pine-Scrub Oak Barrens (NY), Pitch Pine Woodland/Barrens (RI)

State Distribution: MA, NJ, NY, RI

Total Habitat Acreage: 491,551
Percent Conserved: 46.8%

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Crosswalk to State Wildlife Action Plans:
Pitch Pine/Scrub Oak (MA), Upland forests - pitch pine-oak forest (NJ), Coastal Coniferous Barrens (NY), Pitch Pine Communities - Evergreen Forest Pitch Pine/Scrub Oak Barren (RI)
Places to Visit this Habitat:
Cape Cod National Seashore | MA
Myles Standish State Forest | MA
Brendan T. Byrne State Forest | NJ
Wharton State Forest | NJ
Rocky Point Natural Resource Management Area | NY

Associated Species:  Appendix lists scientific names

BIRDS: brown thrasher, chipping sparrow, common yellowthroat, eastern towhee, field sparrow, ovenbird, pine warbler, prairie warbler, eastern whip-poor-will

HERPTILES: box turtle, eastern kingsnake, tiger salamander, northern pine snake, northern black racer, northern red-bellied cooter, red cornsnake, timber rattlesnake

INSECTS: comet darter, common sanddragon, cow path tiger beetle, pine woods underwing, spiny oakworm moth, The buckmoth

PLANTS: Few-flower Nutrush (Scleria pauciflora), Post Oak (Quercus stellata), Little Ladies'-tresses (Spiranthes tuberosa), Northern Blazingstar (Liatris scariosa var. novae-angliae), Butterfly Milkweed (Asclepias tuberosa), Purple Needlegrass (Aristida purpurascens), Nuttall's Milkwort (Polygala nuttallii)

Species of Concern (G1-G4): Appendix lists scientific names

BIRDS: long-eared owl (winter)

HERPTILES: pine barrens treefrog

INSECTS: barrens dagger moth, Barrens itame, Blueberry gray, Coastal barrens buckmoth, Frosted elfin, Karner blue butterfly, Pine barren bluet, Pine barren lycia, Pine barren underwing, Pine barren zale, Precious underwing

PLANTS: bicknell's hawthorn (Crataegus bicknellii), broom crowberry (Coremna conradii), eastern silvery aster (Symphyotrichum concolor), pine barren gentian (Gentiana autumnalis), pine barrens boneset (Eupatorium resinorum), plynouth gentian (Sabatia kennedyana), sandplain flax (Linum intercursum), stiff tick-trefoil (Desmodium obtusum), tall bushclover (Lespedeza stuevei), white-bracted boneset (Eupatorium leucolepis)

Predicted Habitat Loss to Development

The average patch size for this habitat is 7 acres and the largest single patch is 6,876 acres. This chart shows the proportion of the habitat that is in each patch-size class.

This chart shows the average age of trees associated with this habitat based on forest inventory data. For non-forested systems or small habitats the average age is influenced by the surroundings.

This chart shows the predicted loss of habitat over the next five decades (50,993 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 1,020 acres per year.

This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.

North Atlantic Coastal Plain Pitch Pine Barrens

http://nature.ly/HabitatGuide
Central Oak-Pine

Macrogroup: Central Oak-Pine

Description:
An oak-dominated, mostly closed canopy forest that occurs as a matrix (dominant) type through the central part of our region. Oak species characteristic of dry to mesic conditions (e.g., red, white, black, and scarlet oak) and hickories are dominant in mature stands. Chestnut oak may be present but is generally less important than other oak species. Red maple, black birch, and yellow birch may be common associates. Heath shrubs are often present but not well developed. Local areas of limy bedrock, or colluvial pockets, may support forests that reflect the richer soils. With a long history of human habitation, many of the forests are mid-successional, in which pines (typically Virginia or white) or tuliptree may be codominant or dominant.

Ecological Setting and Natural Processes:
Moderate moisture and heat loading are characteristic for this oaky system. It occurs at low to mid elevations, where the topography is flat to gently rolling, occasionally steep. Substrate bedrock and soils are commonly but not always acidic. Chestnut was formerly a prominent tree in these forests.

Drier oak-pine systems (Central Appalachian Dry Oak-Pine Forest, CA Pine-Oak Rocky Woodland) are often upslope; mesic covey or wetland systems may be embedded in low landscape positions. A split along purely geographic lines separates this system from similar Southern Appalachian Oak Forests in southern WV, in lieu of more natural ecological or floristic distinctions.

Crosswalk to State Name Examples:
Dry Subacidic Forest (CT), Central Appalachian Dry-Mesic Chestnut Oak-Northern Red Oak Forest (DE), Dry, Rich Acidic Oak Forest (MA), Acidic Oak - Hickory Forest (MD), Dry-Mesic Inland Mixed Oak Forest (NJ), Appalachian Oak-Hickory Forest (NY), Dry Oak-Heath Forest (PA), Black Oak-Scarlet Oak/Heath Forest (RI), Central Appalachian Dry-Mesic Chestnut Oak - Northern Red Oak Forest (VA), Oak/Hickory And Dry/Mesic Oak Forest (WV)

Crosswalk to State Wildlife Action Plans:
Hardwood Forest - Mixed oak-beech forests (DC), Mesic Deciduous Forests (MD), Upland forests - deciduous forest (NJ), Oak Forest (NY), Deciduous/Mixed Forest (upland) (PA), Forest Habitat - Deciduous Forest (VA), Oak/Hickory and Dry/Mesic Oak Forest (WV)
Places to Visit this Habitat:
Green Ridge State Forest | MD
Delaware Water Gap | NJ
Sproul State Forest | PA
George Washington and Jefferson National Forest | VA
Monongahela National Forest | WV

Associated Species: Appendix lists scientific names

**BIRDS:** black-and-white warbler, broad-winged hawk, cerulean warbler, eastern wood-pewee, great crested flycatcher, Louisiana waterthrush, ovenbird, red-bellied woodpecker, scarlet tanager, summer tanager (south), eastern whip-poor-will, wood thrush, veery, worm-eating warbler

**MAMMALS:** black bear, red-backed vole, short-tailed shrew, white footed mouse

**HERPTILES:** northern redback salamander, ringneck snake, redbelly snake, spotted salamander

**PLANTS:** American wintergreen (Pyrola americana), basil beebalm (Monarda clinopodia), blunt-lobed woodsia (Woodsia obtusa), bottlebrush grass (Elymus hystrix), common alexanders (Zizia aurea), early buttercup (Ranunculus fascicularis), shinleaf (Pyrola elliptica), sicklepod (Arabis canadensis)

**Species of Concern (G1-G4): Appendix lists scientific names**

**BIRDS:** golden-winged warbler

**MAMMALS:** eastern small-footed myotis, kirtatiny red-backed vole, virginia big-eared bat

**HERPTILES:** big levels salamander, milk snake, peaks of otter salamander

**INSECTS:** American snout, Appalachian grizzled skipper, underwing moth (Catocala reecta), clouded underwing, dark stoneroot borer moth, flypoison borer moth, habilis underwing, northern metalmark, mournful underwing, yellow stoneroot borer moth

**PLANTS:** climbing fern (Lygodium palmatum), goldenseal (Hydrastis canadensis), small whorled pogonia (Isotria medeoloides)

Northeastern Interior Dry-Mesic Oak Forest

The average patch size for this habitat is 13 acres and the largest single patch is 20,946 acres. This chart shows the proportion of the habitat that is in each patch-size class.

This chart shows the average age of trees associated with this habitat based on forest Inventory data. For non-forested systems or small habitats the average age is influenced by the surroundings.

This chart shows the predicted loss of habitat over the next five decades (783,733 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 15,675 acres per year.

This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.
**Central Oak-Pine Macrogroup:**

**Description:**
A fire-adapted system of Northeast glacial sandplains, typically an open woodland but sometimes including patches of closed-canopy forest and herbaceous openings. Pitch pine is the usual dominant; red oak, white pine, and gray birch are common associates. A tall-shrub layer of scrub oak or dwarf chinkapin oak is characteristic, as is a low-shrub layer of heath and sweetfern. Small changes in elevation create pockets with saturated soil, where shrubs such as hazelnut, buttonbush, highbush blueberry, and alder form dense cover. Grassy areas dominated by little bluestem, native lupine, and other forbs, provide habitat for rare invertebrates like the frosted elfin. Black racer and eastern ribbon snake are associated with this habitat.

**Ecological Setting and Natural Processes:**
Occurs on outwash plains, stabilized sand dunes, and glacial till. Soils are coarse-textured, acidic, well-drained to xeric, and low in nutrients. These barrens always have a history of recurrent fires, and fire is required to maintain them. Favorable sites tend to be ideal for development, and because of this and the suppression of fire, high quality remnant patches of any size are rare. Largest remaining patches are a few hundred to about 1000 acres.

**Similar Habitat Types:**
With similar ecological dynamics, this system could be regarded as an inland version of the North Atlantic Coastal Plain Pitch Pine Barrens.

**Crosswalk to State Wildlife Action Plans:**
Upland Woodland and Shrub - Pitch Pine/Scrub Oak Woodlands (CT), Pitch Pine/Scrub Oak Community (MA), Pitch Pine - Scrub Oak Barren (ME), Pitch Pine - Scrub Oak Woodland (NH), Pitch Pine-Heath Barrens (NY), Pitch Pine Communities - Evergreen Forest Pitch Pine-Oak Barren (RI), Pine-Oak-Heath Sandplain Forest (VT)
Places to Visit this Habitat:
- Waterboro Barrens Preserve | ME
- White Lake State Park | NH
- Macomb State Forest | NY
- Rome Sand Plains Preserve | NY
- Arcadia Management Area | RI

Associated Species: Appendix lists scientific names

**BIRDS:** american woodcock, blue jay, common nighthawk, common yellowthroat, eastern towhee, field sparrow, pileated woodpecker, pine warbler, prairie warbler, ruffed grouse, whip-poor-will

**HERPTILES:** blanding’s turtle, eastern box turtle, eastern ribbonsnake, northern black racer

**INSECTS:** big sand tiger beetle (Cicindela formosa), inland barrens buckmoth (Hemileuca maia), midland clubtail (Gomphus fraternus), pine woods underwing (Catocala sp.), similar underwing (Catocala similis), sleepy duskywing (Erynnis brizo)

**PLANTS:** Canada frostweed (Helianthemum canadense), hairy lettuce (Lactuca hirsuta), large whorled pogonia (Isotria verticillata), plains frostweed (Helianthemum bicknellii), racemed milkwort (Polygala polygama), Wild lupine (Lupinus perennis)

Species of Concern (G1-G4): Appendix lists scientific names

**BIRDS:** whip-poor-will

**INSECTS:** barrens daggermoth, barrens metarranthis moth, blueberry sallow, chain dot geometer, coastal barrens buckmoth, coastal heathland cutworm, Edward’s hairstreak, Gerhard’s underwing, imperial moth, melshheimer’s sack bearer, noctuid moth, oblique zale, pine barrens itame, pine barrens lycia, pine barrens zale, pine barrens zanclognatha, pine pinion, pine-devil moth, pink sallow, similar underwing, southern pine sphinx, spiny oakworm, the buckmoth, twilight moth

**PLANTS:** low bindweed (Calystegia spithamaea), broom crowberry (Corema conradii)

Predicted Habitat Loss to Development
This chart shows the predicted loss of habitat over the next five decades (1,328 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 27 acres per year.

Habitat Patch Distribution
The average patch size for this habitat is 14 acres and the largest single patch is 1,247 acres. This chart shows the proportion of the habitat that is in each patch-size class.

Age Class Distribution
This chart shows the average age of trees associated with this habitat based on forest inventory data. For non-forested systems or small habitats the average age is influenced by the surroundings.

Habitat Connectedness Index
This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.
Acidic Cliff and Talus

Macrogoup: Cliff and Talus

Description:
A sparsely vegetated cliff or talus slope formed on granitic, sandstone, or other acidic bedrock. The lack of soil, highly acidic bedrock, and constant erosion, limits the vegetation to mosses, lichens, and herbs growing on bare rock or crevices, and to sparse trees and shrubs rooted in deeper soil pockets. Lichen cover may be extensive. In the Central Appalachians, red-cedar trees, poison ivy vines and rock polypody ferns are characteristic. Birch or spruce replaces red cedar in the north, where a shrubland of heaths and reindeer lichen may develop where cold air accumulates at the sheltered bottom of slopes. Areas of concentrated seepage are sometimes present. In the Cumberland region, a mosaic of cavelike "rockhouses" and associated sandstone box canyons are typical.

Ecological Setting and Natural Processes:
Landforms in this system are associated with steeper mountains and hills, river bluffs, and gorges. In some cases this system may take the form of upper-slope boulderfields without adjacent cliffs, where talus forms from freeze/thaw action on the bedrock. This system is prone to harsh climatic conditions; frequent disturbances include drought stress and wind and storm damage. Mass movement of rocks can also reset the ecological clock.

Similar Habitat Types:
Cliff and talus systems have also been modeled for those steep landforms on other (calcareous and circumneutral) lithologies.

Crosswalk to State Name Examples:
Acidic Cliffs/Talus (CT), Acidic Rock Cliff Community (MA), Acidic Cliff And Bluff (MD), Acidic Cliff - Gorge/Spruce Talus Woodland (ME), Boreal/Temperate Acidic Cliff (NH), Silicaceous Rock Outcrop Community (NJ), Cliff Community/Acidic Talus Woodland (NY), Birch (Black-Gum) Rocky Slope Woodland (PA), Central Appalachian / Piedmont Acidic Cliff (VA), Boreal/Temperate Acidic Cliff (VT), Rock Outcrops/Cliffs/Talus (WV)

State Distribution: CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VA, VT, WV

Total Habitat Acreage: 561,802
Percent Conserved: 48.2%

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Crosswalk to State Wildlife Action Plans:
Unique and Man-Made - Traprock Ridges (CT), Rocky Cliffs, Ridgetops, Talus Slopes, and Other Similar Habitats (MA), Rock Outcrops and Cliffs (MD), Cliff Face and Rocky Outcrops (ME), Cliffs (NH), Cliff and Talus (NY), Rock Habitats (PA), Barren Habitat - Balds (VA), Cliffs and Talus Slopes - Boreal Acidic Cliff (VT), Cliffs and Talus Slopes - Open Talus (VT), Cliffs and Talus Slopes - Temperate Acidic Cliff (VT), Rock Outcrops/Cliffs/Talus (WV)
Places to Visit this Habitat:
Baxter State Park | ME  
White Mountain National Forest | NH  
Slide Mountain | NY  
Elk State Forest | PA  
Monongahela National Forest | WV

Associated Species:  *Appendix lists scientific names*

**BIRDS:** golden eagle, common raven, turkey vulture

**MAMMALS:** bobcat, eastern pipistrelle, porcupine

**HERPTILES:** broad-headed skink, eastern wormsnake, fence lizard, five-lined skink

**PLANTS:** boreal stitchwort (*minuartia rubella*), Carolina leafflower (*phyllanthus caroliniensis*), common butterwort (*pinguicula vulgaris*), fragrant cliff woodfern (*dryopteris fragrans*), Goldie's woodfern (*dryopteris goldiana*), hoary draba (*draba cana*), robbins' milkvetch (*astragalus robbinsii var. minor*), rock sandwort (*minuartia stricta*), small-flower bittercress (*cardamine parviflora*), smooth yellow false foxglove (*aureolaria flava*), summer grape (*vitis aestivalis var. bicolor*), white mountain saxifrage (*saxifraga paniculata*)

Species of Concern (G1-G4): *Appendix lists scientific names*

**BIRDS:** peregrine falcon

**MAMMALS:** allegheny woodrat, rock vole

**HERPTILES:** northern copperhead, timber rattlesnake

**PLANTS:** green spleenwort (*Asplenium trichomanes-ramosum*), Alabama lipfern (*Cheilanthes alabamensis*), silverling (*Paronychia argyrocoma*)

Acidic Cliff and Talus

The average patch size for this habitat is 7 acres and the largest single patch is 2,038 acres. This chart shows the proportion of the habitat that is in each patch-size class.

This chart shows the average age of trees associated with this habitat based on forest inventory data. For non-forested systems or small habitats the average age is influenced by the surroundings.

This chart shows the predicted loss of habitat over the next five decades (10,430 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 209 acres per year.

This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.

© Maine Natural Areas Program

http://nature.ly/HabitatGuide
**Description:**
A sparsely vegetated beach, dune, or barrier island on unconsolidated sand and shell sediments on the Atlantic coast. A range of plant communities may be present, but trees and shrubs are restricted to sheltered areas. Constantly shifted by winds and floods, the dynamic disturbance regimes largely limit vegetation to pioneering, salt-tolerant, succulent annuals. Sea-rocket and Russian thistle are usually most numerous and characteristic. Areas that are permanently or semipermanently flooded with freshwater support pond or marsh-like vegetation, and are affected by salt spray or overwash during periodic storm events. Both upland and non-flooded wetland vegetation are included in this system and it is broadly defined in terms of floristic composition.

**Ecological Setting and Natural Processes:**
Extensive, exposed, sandy coastlines range from North Carolina to southern Maine (rocky coasts replace these). Dominant ecological processes include frequent salt spray, saltwater overwash, and sand movement. Although sand beaches extend landward above mean high tide, they are constantly impacted by waves and may be flooded by high spring tides and storm surges. Constant salt spray and rainwater maintain moist conditions.

**Similar Habitat Types:**
Difficulties modeling 2 maritime systems separately (Northern Atlantic Coastal Plain Dune and Swale, and Northern Atlantic Coastal Plain Sandy Beach) resulted in combining them into this one for mapping purposes.

**Crosswalk to State Name Examples:**
Coastal Sand Dunes/Intertidal Beaches And Shores (CT), Beach And Dune Habitats (DE), Maritime Dune Community (MA), Maritime Dune Grassland/Woodland (MD), Dune Grassland (ME), Coastal Interdunal Marsh/Swale (NH), Coastal Dune Shrubland/Grass Community (NJ), Maritime Dunes (NY), Maritime Herbaceous Dune (RI), North Atlantic Mixed Dune Grassland (VA)

**Crosswalk to State Wildlife Action Plans:**
Upland Herbaceous - Coastal Dune (CT), Tidal Wetland - Intertidal Beaches and Shores (CT), Beach and Dune Habitats (DE), Interdunal Wetlands (DE), Coastal Dunes, Beaches, and Small Islands - Maritime Beach Strand/Dune Communities (MA), Coastal Beaches, Dunes, and Mudflats (MD), Unconsolidated Shore (Beaches and Mudflats) (ME), Coastal Sand Dunes (NH), Beaches (NJ), Dunes (NJ), Maritime Dunes (NY), Maritime Dunes (NY), Sparsely Vegetated Habitats - Beach Grass Dune (RI), Intertidal - Estuarine Beaches Unspecified (RI), Barren Habitat - Beach (VA)
Places to Visit this Habitat:
Cape Henlopen State Park | DE
Cape Cod National Seashore | MA
Assateague Island National Seashore | MD
Fire Island National Seashore | NY
Chincoteague National Wildlife Refuge | VA

Associated Species:  
BIRDS: american oystercatcher, arctic tern, barn owl, black skimmer, caspian tern, chuck-will's-widow, common tern, gadwall, horned lark, ipswich sparrow, laughing gull, least tern, northern harrier, red knot, roseate tern, roseate tern, royal tern, vesper sparrow, willet

MAMMALS: eastern mole, long-tailed weasels, red fox

HERPTILES: american toad, eastern hognose snake, fowler's toad

PLANTS: American beachgrass (Ammophila breviligulata, coast-blite goosefoot (Chenopodium rubrum), oysterleaf (Mertensia maritima), saltmarsh aster (Symphyotrichum subulatum), sea lyme-grass (Leymus mollis ssp mollis), seabeach amaranth (Amaranthus pumilus), seabeach knotweed (Polygonum glaucum), seabeach needlegrass (Aristida tuberculosa), slender sea purslane (Sesuvium maritimum)

Species of Concern (G1-G4):  
BIRDS: least tern, piping plover, red knot, roseate tern

HERPTILES: diamondback terrapin, eastern spadefoot

INSECTS: beach tiger beetle (Cicindela hirticollis), bethany beach firefly (Photuris bethaniensis)

PLANTS: beach plum (Prunus maritima), sand-heather (Hudsonia tomentosa)

This chart shows the predicted loss of habitat over the next five decades (8,263 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 165 acres per year.

This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.
Coastal Grassland & Shrubland

Macrogroup: Coastal Grassland & Shrubland

Description:
A heathland/grassland complex of acidic, nutrient-poor and very well drained soils in coastal areas of southern New England and New York. The vegetation is maintained by extreme conditions and periodic fire or other disturbance. The system has a variable structure and may occur as heathlands, grasslands, or support a patchwork of grass and shrub vegetation. Characteristic species include huckleberry, bearberry, broom crowberry, Nantucket shadbush, golden heather, blueberry, little bluestem, and Pennsylvania sedge. They are important habitat for several bird and other animal species including the short-eared owl and regal fritillary, and (along with brushy plains and woodlands) provided habitat for the extinct heath hen.

Ecological Setting and Natural Processes:
This open grassland system of sandy, nutrient-poor, outwash soils has a complex history. The habitat occurs on drought-prone coastal soils with a history of fire, and sustained human management. Persistence is dependent on disturbance. In areas of relatively infrequent disturbance, shrubland or oak woodland may develop, but where fire and other severe disturbances are frequent grasses and herbaceous plants dominate.

Similar Habitat Types:
Often occurs as small to medium-sized patches just inland from the Northern Atlantic Coastal Plain Dune and Swale or Northern Atlantic Coastal Plain Maritime Forest system, and adjacent to Northern Atlantic Coastal Plain Hardwood Forest.

Crosswalk to State Name Examples:
Upland Herbaceous - Sandplain And Other Warm Season Grasslands (CT), Sandplain Grassland (MA), Sandplain Heathland (MA), Maritime Grassland (NY), Maritime Heathland (NY), Maritime Grassland (RI)

Crosswalk to State Wildlife Action Plans:
Upland Herbaceous - Sandplain and Other Warm Season Grasslands (CT), Grasslands - Native upland grasslands (MA), Maritime Dunes (NY), Early Successional Habitats - Coastal Shrubland (RI)
Places to Visit this Habitat:
Harkness Memorial State Park | CT
Cape Cod National Seashore | MA
Middle Moors | MA
Heckscher State Park | NY
Sachuest Point National Wildlife Refuge | RI

Associated Species:  Appendix lists scientific names
BIRDS: american oyster catcher, barn owl, bobolink, grasshopper sparrow, horned lark, northern harrier, piping plover, short-eared owl, vesper sparrow
MAMMALS: hoary bat, meadow vole, short-tailed shrew
HERPTILES: eastern spadefoot toad, northern red-bellied cooter
INSECTS: imperial moth (Eacles imperialis), spiny oakworm moth (Anisota stigma)
PLANTS: butterfly milkweed (asclepias tuberosa), eastern silvery aster (symphyotrichum concolor), hairy lettuce (lactuca hirsuta), lion's-foot (prenanthes serpentaria), New England blazingstar (liatris scariosa), nuttall's milkwort (polygala nuttallii), purple cudweed (gamochaeta purpurea), purple needlegrass (aristida purpurascens), st. andrew's-cross (hypericum hypericoides), thymeleaf pinweed (lechea minor)

Species of Concern (G1-G4): Appendix lists scientific names
BIRDS: Henslow's sparrow, seaside sparrow
MAMMALS: beach vole
INSECTS: chain dotted geometer (Cingilia catenaria), chain fern borer moth (Papaipema stenocelis), noctuid moths (Abagrotis nefascia, Chaetaglaea cerata), pink sallow (Psectraglaea carnosa), regal fritillary (Speyeria idalia), straight lined mallow moth (Bagisara rectifascia)
PLANTS: broom crowberry (Corema conradii), bushy rockrose (Helianthemum dumosum), hyssopleaf hedge-nettle (Stachys hyssopifolia), nantucket shadbush (Amelanchier nantucketensis), sandplain flax (Linum intercursum)

Predicted Habitat Loss to Development
This chart shows the predicted loss of habitat over the next five decades (5,731 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 115 acres per year.

Habitat Connectedness Index
This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.

North Atlantic Coastal Plain Heathland and Grassland  http://nature.ly/HabitatGuide
Macrogroup: Coastal Plain Swamp

Description:
A forested swamp of peat-accumulating basins in the coastal plain from southern Maine down to the Delmarva Peninsula. Atlantic white cedar is characteristic and often dominant; red maple may also be an important species, especially after logging. Black spruce is occasional in examples in the northern part of the region. Herbaceous species are typically more abundant than dwarf shrubs in the understory, which includes alder, great laurel, high-bush blueberry, winterberry, swamp azalea, and sphagnum moss. The saturated hydrology is evidenced by sphagnum-based hummock-and-hollow microtopography.

Ecological Setting and Natural Processes:
Basins are often configured along streams and rivers of the coastal plain. Relatively shallow water-saturated peat overlies mineral sediments in these swamps. Standing water generally occurs for half of the growing season or longer. The acidic soils are poor in nitrogen and phosphorus and often have a high iron content.

Similar Habitat Types:
May be similar compositionally to other acidic swamps in shallow basins in the region (like North-Central Appalachian Acidic Swamp), except for the prominence of Atlantic white cedar. The peat layer is deeper, and the canopy trees shorter and less dense, in the more northerly Boreal-Laurentian-Acadian Acidic Basin Fen.

Crosswalk to State Name Examples:
Acidic Atlantic White Cedar Basin Swamp (CT), Coastal Plain Atlantic White Cedar-Red Maple Swamp (DE), Coastal Atlantic White Cedar Swamp (MA), Atlantic White Cedar Swamp (ME), Atlantic white cedar-yellow birch-pepperbush swamp (NH), Forested Wetlands - White Cedar Swamps (NJ), Coastal Plain Atlantic White Cedar Swamp (NY), Atlantic White Cedar Swamp (RI)

Crosswalk to State Wildlife Action Plans:
Forested Inland Wetland - Atlantic White Cedar Swamps (CT), Atlantic White Cedar Non-tidal Wetlands (DE), Forested Swamps (MA), Forested wetlands - white cedar swamps (NJ), Atlantic White Cedar Swamp (NY), Forested Wetlands - Forested Coniferous Wetland White Cedar (RI)
Places to Visit this Habitat:

- Pachaug State Forest | CT
- James Branch Nature Preserve | DE
- Freetown-Fall River State Forest | MA
- Brendan T. Byrne State Forest | NJ
- Wharton State Forest | NJ

Associated Species: Appendix lists scientific names

- BIRDS: northern waterthrush, veery, wood duck
- INSECTS: ebony boghaunter, elfin skimmer, great purple hairstreak, owlet moth, pennsylvania firefly, spatterdock darter, sphagnum sprite
- PLANTS: bayonet rush (Juncus militaris), bushy bluestem (Andropogon glomeratus), coast sedge (Carex exilis), fibrous bladderwort (Utricularia fibrosa), heartleaf twayblade (Listera cordata), seaside alder (Alnus maritima), smooth winterberry holly (Ilex laevigata), southern bladderwort (Utricularia juncea), ten-angle pipewort (Eriocaulon decangulare), tickseed sunflower (Bidens coronata), white beakrush (Rhynchospora alba)

Species of Concern (G1-G4): Appendix lists scientific names

- HERPTILES: blue-spotted salamander, carpenter frog, four-toed salamander, spotted turtle
- INSECTS: coastal swamp metarranthis moth, Hessel's hairstreak, pitcher plant borer moth, plant hopper, spatterdock darter, sphagnum sprite, a firefly (photuris tremulans), a moth (Exyra fax)
- PLANTS: swamp-pink (Arethusa bulbosa), yellow nodding ladies'-tresses (Spiranthes ochroleuca)

© Robert Coxe (Delaware Species Conservation & Research Program)

Habitat Patch Distribution

- The average patch size for this habitat is 10 acres and the largest single patch is 1,791 acres. This chart shows the proportion of the habitat that is in each patch-size class.

Age Class Distribution

This chart shows the average age of trees associated with this habitat based on forest Inventory data. For non-forested systems or small habitats the average age is influenced by the surroundings.

Predicted Habitat Loss to Development

This chart shows the predicted loss of habitat over the next five decades (1,960 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 39 acres per year.

Habitat Connectedness Index

This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.
Coastal Plain Swamp

Macrogroup: Coastal Plain Swamp

Ecological Setting and Natural Processes:
A basin hardwood swamp of seasonally flooded coastal plain habitats from Long Island south to Virginia. Characteristic tree species include red maple, sweet gum, black gum, willow oak, and green ash. Loblolly pine is not uncommon south of Delaware Bay. Although supporting some seepage indicators, it is also affected by overland flow.

Crosswalk to State Name Examples:
Northeastern Pin Oak-Swamp White Oak Forest (DE), Coastal Plain - Piedmont Acidic Seepage Swamp (MD), Cape May Lowland Swamp (NJ), Red Maple-Sweetgum Swamp (NY), Wetlands - Forested Wetlands And Bogs (PA), Outer Piedmont / Inner Coastal Plain Upland Depression Swamp (VA)

Crosswalk to State Wildlife Action Plans:
Coastal Plain Forested Floodplains and Riparian Swamps (DE), Forested Seepage Wetlands (MD), Forested wetlands - hardwood swamps (NJ), Coastal Red Maple-Black Gum Swamp (NY), Wetlands - Forested Wetlands and Bogs (PA), Wetland Habitat - Forested (VA)
Places to Visit this Habitat:
Bombay Hook National Wildlife Refuge | DE
Pocomoke River State Forest | MD
Wharton State Forest | NJ
Chincoteague National Wildlife Refuge | VA
Presquile National Wildlife Refuge | VA

Associated Species: [Appendix lists scientific names]

BIRDS: american black duck, hooded warbler, prothonotary warbler, red-shouldered hawk, wood duck

MAMMALS: river otter, mink

HERPTILES: barking treefrog, carpenter frog, cope's gray treefrog, new jersey chorus frog, southern leopard frog, tiger salamander

INSECTS: bar-winged skimmer, golden-winged skimmer, mantled baskettail, southern sprite, sparkling jewelwing, sphagnum sprite

PLANTS: american lotus (Nelumbo lutea), awned meadow-beauty (Rhexia aristosa), awned mountainmint (Pycnanthemum setosum), big-head rush (Juncus megacephalus), blue maiden-cane (Amphicarpum purshii), canby's lobelia (Lobelia canbyi), new jersey rush (Juncus caesariensis), nuttall's lobelia (Lobelia nuttallii), pale false foxglove (Agalinis skinneriana), red turtlehead (Chelone obliqua)

Species of Concern (G1-G4): [Appendix lists scientific names]

HERPTILES: Mabee's salamander

INSECTS: Bethany beach firefly, A slug moth, banner clubtail, checkered white, eastern pinebarrens tiger beetle, elfin skimmer, Franck's sphinx, golden aster flower moth, great purple hairstreak, Hessel's hairstreak, Laura's clubtail, Martha's pennant, pale bluet, sable clubtail, selys' sundragon, treetop emerald, violet dart, Virginia piedmont water boatman

PLANTS: cypress swamp sedge (Carex joorii), rose coreopsis (Coreopsis rosea)

The average patch size for this habitat is 6 acres and the largest single patch is 3,190 acres. This chart shows the proportion of the habitat that is in each patch-size class.

This chart shows the average age of trees associated with this habitat based on forest Inventory data. For non-forested systems or small habitats the average age is influenced by the surroundings.

This chart shows the predicted loss of habitat over the next five decades (67,635 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 1,353 acres per year.

This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.
Emergent Marsh

Macrogroup: Emergent Marsh

Description:
A freshwater emergent or submergent marsh dominated by herbaceous vegetation and associated with isolated basins, edges of streamways, and seepage slopes. Typical plants include cattails, marsh fern, touch-me-not, pondweeds, water lilies, pickerelweed, and tall rushes, species that tolerate sustained inundations and do not persist through the winter. Scattered shrubs are often present and usually total less than 25% cover. Trees are generally absent and, if present, are scattered. Zonation within a marsh is associated with water depth and length of inundation. This is a very broadly defined system, with many variants distributed widely in the Northeast.

Ecological Setting and Natural Processes:
Freshwater marshes are associated with lakes, ponds, headwater basins and slow-moving streams, impoundments, ditches, or any low lying basin that collects water. Such basins are often flat-bottomed and shallow, or marsh vegetation forms a ring around the edge of deeper basins. They typically occur on muck over mineral soil, and as part of a larger wetland complex that may include forested or shrubby swamps, peatlands, and/or open water.

Similar Habitat Types:
Very often occurs with Laurentian-Acadian Wet Meadow-Shrub Swamp, acidic or circumneutral forested swamps, peatlands, and floodplain vegetation in large, diverse complexes.

Crosswalk to State Name Examples:
Herbaceous Inland Wetland - Freshwater Marshes (CT), Bulrush Deepwater Marsh (DE), Deep Emergent Marsh (MA), Cattail Marsh (ME), Emergent Marsh (NH), Robust Emergent Marsh (NJ), Deep Emergent Marsh/Backwater Slough (NY), Cattail Marsh (PA), Emergent Marsh (RI), American Lotus Aquatic Bed (VA), Cattail Marsh (VT), Emergent Marsh (MD)

State Distribution: CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VA, VT, WV

Total Habitat Acreage: 906,723
Percent Conserved: 21.6%

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Crosswalk to State Wildlife Action Plans:
Herbaceous Inland Wetland - Freshwater Marshes (CT), Marshes and Wet Meadows - Deep Emergent Marsh (MA), Emergent Marsh and Wet Meadows (ME), Marsh and Shrub Wetlands (NH), Freshwater Marsh (NY), Wetlands - Emergent Freshwater (PA), Emergent Wetlands - Freshwater Wetland Unspecified (RI), Marshes and Sedge Meadows - Cattail Marsh (VT)
Places to Visit this Habitat:
Moosehorn National Wildlife Refuge | ME
Wharton State Forest | NJ
Five Ponds Wilderness Area | NY
Green Mountain National Forest | VT
Canaan Valley National Wildlife Refuge | WV

Associated Species: Appendix lists scientific names

BIRDS: american bittern, american black duck, blue-winged teal, common gallinule, great blue heron, least bittern, marsh wren, pied-billed grebe, sora, swamp sparrow, virginia rail, wood duck

MAMMALS: eastern cottontail, meadow jumping mouse, mink, moose, muskrat, raccoon, southern bog lemming, virginia possum, water shrew

HERPTILES: blue-spotted salamander, northern leopard frog, northern spring peeper, red-spotted newt, spotted turtle

INSECTS: bar-winged Skimmer, ringed emerald, spatterdock darner

PLANTS: autumnal water-starwort (Callitriche hermaphroditica), floating pennywort (Hydrocotyle ranunculoides), hardstem bulrush (Schoenoplectus acutus), marsh felwort (Lomatogonium rotatum), marsh hedge-nettle (Stachys pilosa), whorled pennywort (Hydrocotyle verticillata)

Species of Concern (G1-G4): Appendix lists scientific names

BIRDS: black tern, king rail, northern harrier

MAMMALS: water shrew

HERPTILES: wood turtle, blanding’s turtle

INSECTS: bogbean buckmoth, broadtailed shadowdragon, eyed brown, granitosa fern moth, little bluet, Martha’s pennant, scarlet bluet, spatterdock darner, two-spotted skipper

PLANTS: blue maiden-cane (Amphicarpum purshii), fly-poison (Amianthium muscitoxicum), northeastern bladderwort (Utricularia resupinata), ohio goldenrod (Oligoneuron ohiense), Robbins’ spikerush (Eleocharis robbinsii), sago pondweed (Potamogeton pectinatus), Sartwell’s sedge (Carex sartwellii), slender arrowhead (Sagittaria teres), Walter’s sedge (Carex striata), watermeal (Wolffia papulifera)

© Maine Natural Areas Program

Laurentian-Acadian Freshwater Marsh

http://nature.ly/HabitatGuide
Large River Floodplain

Description:
A complex of wetland and upland vegetation on floodplains of medium to large rivers in Atlantic drainages. They are typical of larger rivers but they can occur on smaller rivers where the stream gradient is low and a broad floodplain develops. The vegetation complex includes floodplain forests in which silver maple, sycamore, box elder, and cottonwood are characteristic, as well as herbaceous sloughs, shrub wetlands, ice scours, riverside prairies, and woodlands. Most areas are underwater each spring; microtopography determining how long the various habitats are inundated. Depositional and erosional features may both be present depending on the particular floodplain.

Ecological Setting and Natural Processes:
Floodplains form on land adjacent to a stream or river that experiences periodic flooding when the river overflows its banks. A variety of microtopographic features form as a result of annual river activity. This broadly-defined system includes vegetation on deep alluvial deposits, on depositional levees and bars, in backwater sloughs, and (rarely) on bedrock where rivers cut through resistant geology.

Similar Habitat Types:
Shares dynamic processes with all other large river floodplain systems. Most similar to the silver maple-dominated Northern Appalachian-Acadian Large River type. Human impacts on this and other floodplain habitats regionally have made large, high quality occurrences rare.

Crosswalk to State Name Examples:
Floodplain Forest (CT), Silver Maple-Elm Floodplain Forest (DE), Major-River Floodplain Forest (MA), Montane - Piedmont Bottomland Forest (MD), Silver maple-wood nettle-ostrich fern floodplain forest (NH), Floodplain Forest (NJ), Floodplain Forest (NY), Silver Maple Floodplain Forest (PA), Silver Maple/Sycamore Floodplain Forest (RI), Piedmont / Central Appalachian Floodplain Swamp (VA), Silver Maple-Ostrich Fern Riverine Floodplain Forest (VT), Floodplain Forests And Swamps (WV)

State Distribution:
CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VA, VT, WV

Total Habitat Acreage: 254,862
Percent Conserved: 19.8%

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Crosswalk to State Wildlife Action Plans:
Forested Inland Wetland - Floodplain Forests (CT), Floodplains (DC), Riparian Forests (MA), Floodplain Forests (MD), Floodplains - Major river silver maple floodplains (NH), Floodplains (NJ), Floodplain Forests (NY), Riparian Thickets/Forests (PA), Wetland Habitat - Forested (VA), Floodplain Forests - Silver Maple-Sensitive Fern Riverine Floodplain Forest (VT), Floodplain Forests and Swamps (WV)
Places to Visit this Habitat:
Rachel Carson National Wildlife Refuge | ME
Iroquois National Wildlife Refuge | NY
Allegheny National Forest Non-Reserved | PA
George Washington and Jefferson National Forest | VA
Bald Mountain Natural Area | VT

Associated Species: *Appendix lists scientific names*

**BIRDS:** alder flycatcher, bald eagle, cerulean warbler, northern waterthrush, red-shouldered hawk, veery, warbling vireo, willow flycatcher, wood duck, yellow warbler, yellow-throated vireo

**MAMMALS:** big brown bat, eastern pipistrelle, little brown myotis, long-tailed weasel, mink, moose, northern long-eared bat, northern short-tailed shrew, raccoon, red bat, river otter, silver-haired bat, virginia possum

**HERPTILES:** copperhead, leopard frog, northern water snake, marbled salamander, mole salamander, pickerel frog

**INSECTS:** brook snaketail, lake emerald, riffle snaketail, riverine clubtail

**PLANTS:** basil beebalm (*Monarda clinopodia*), green dragon (*Arisaema dracontium*), canada moonseed (*Menispermum canadense*), nodding trillium (*Trillium flexipes*), smooth bur-marigold (*Bidens laevis*),

**Species of Concern (G1-G4): *Appendix lists scientific names***

**BIRDS:** american bittern, prothonotary warbler

**HERPTILES:** blandings turtle, jefferson salamander, wood turtle

**INSECTS:** cobblestone tiger beetle, Newman’s brocade, A ground beetle, little bluet, Maine snaketail, riverine clubtail

**PLANTS:** american lotus (*Nelumbo lutea*), coast violet (*Viola brittoniana*), eastern prairie white-fringed orchid (*Platanthera leucophaea*), heartleaf plantain (*Plantago cordata*), limestone wild petunia (*Ruellia strepens*), long’s bulrush (*Scirpus longii*), maryland bur-marigold (*Bidens bidentoides*), navel-shape corn-salad (*Valerianella umbilicata*), stalked bulrush (*Scirpus pedicellatus*), tidal spikerush (*Eleocharis aestuans*)

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The average patch size for this habitat is 5 acres and the largest single patch is 3,512 acres. This chart shows the proportion of the habitat that is in each patch-size class.

This chart shows the average age of trees associated with this habitat based on forest inventory data. For non-forested systems or small habitats the average age is influenced by the surroundings.

This chart shows the predicted loss of habitat over the next five decades (15,637 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 313 acres per year.

This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.
**Macrogroup: Northern Hardwood & Conifer**

**Description:**
A mixed forest dominated by white pine, red oak, and hemlock in varying proportions. Red maple and white and black oak are common associates, and northern hardwoods like white ash and American beech can appear as minor components. This forest of low to moderate moisture is usually closed canopy and can be heavily coniferous, with some nearly pure stands of white pine and red maple; hemlock is often more abundant in moister settings. This system type occurs over broad areas, but most of it is in early to mid-successional stages and heavily fragmented. It may well be that it is more widespread and abundant as a result of human occupation of and changes to the New England landscape.

**Ecological Setting and Natural Processes:**
Usually occurs on flat to rolling glacial landscapes on nutrient-poor, sandy substrates, and is often found near water or wetlands. Upper elevation limit is about 1000’ to 1200’ (305-365m) in central Massachusetts and southern New Hampshire, but it is usually considerably lower.

**Similar Habitat Types:**
Often grades upslope to Appalachian (Hemlock-)Northern Hardwood, which has a stronger hardwood component. To the north, grades into Laurentian-Acadian Pine-Hemlock-Hardwood Forest, but it is not a Laurentian-Acadian system (from which white and black oak are essentially absent). Laurentian-Acadian Northern (Pine-)Oak Forests are cooler and drier, and feature red pine.

**Crosswalk to State Name Examples:**
White Pine-Oak Forest (MA), Oak-Hickory Forest (ME), Mixed Oak/White Pine Forest (RI)
Places to Visit this Habitat:
Pachaug State Forest | CT
Harold Parker State Forest | MA
Sebago Lake State Park | ME
Great Bay National Wildlife Refuge | NH
Arcadia Management Area | RI

Associated Species:  *Appendix lists scientific names*

**BIRDS:** black-and-white warbler, blue-headed vireo, brown creeper, eastern wood-pewee, hermit thrush, ovenbird, pine warbler, scarlet tanager, veery, wood thrush

**MAMMALS:** black bear, gray fox, gray squirrel, northern flying squirrel, southern flying squirrel, white-footed mouse

**HERPTILES:** jefferson salamander, marbled salamander, black rat snake, eastern hognose snake, eastern worm snake, northern black racer, northern copperhead, northern redbelly snake


Species of Concern (G1-G4):  *Appendix lists scientific names*

**BIRDS:** eastern whip-poor-will

**INSECTS:** red-winged sallow, ringed boghaunter

**PLANTS:** small whorled pogonia (*Isotria medeoloides*), climbing fern (*Lygodium palmatum*), plymouth gentian (*Sabatia kennedyana*)

Northeastern Coastal and Interior Pine-Oak Forest

© Patricia Swain (Massachusetts Division of Fisheries & Wildlife/Natural Heritage & Endangered Species Program)
Northern Hardwood & Conifer Macrogroup:

Description:
A hardwood forest of sugar maple, American beech, and yellow birch, sometimes mixed with, and sometimes dominated by, eastern hemlock. Northern red oak and white oak occur commonly, but do not dominate. Black cherry, black birch, white pine, and tuliptree are typical on nutrient rich or historically disturbed sites. This forest system is broadly defined, and is the only one to occur in at least parts of all 13 states of the Northeast and Mid-Atlantic. It is the dominant forest type in the central and northern part of its range (Allegheny Mountains northward through central New England), and occurs as smaller patches in more protected locations to the south.

Ecological Setting and Natural Processes:
This habitat type is an ecological generalist in much of its range, occupying low to mid-elevations on a variety of landforms and bedrock types. Drier, typic, and moist/cool variants occur along a gradient from higher, more exposed sites to lower, more protected ones. To the south, the hemlock wooly adelgid and a warming climate may push this system to more closely resemble Southern Appalachian Oak Forests.

Similar Habitat Types:
The hardwood mix in this system has a more Appalachian character than those found in cooler Laurentian-Acadian Northern Hardwood Forests. The L-A Pine-Hemlock-Northern Hardwood Forest is similar to this system, but also favors cooler settings. Northeastern Coastal and Interior Pine-Oak Forest replaces it in lower relief areas on the coastal plain, and is more pine-rich.

Crosswalk to State Wildlife Action Plans:
Upland Forest - Coniferous Forests (CT), Upland Forest (MA), Northern Conifer - Hardwood Forests (MD), Deciduous and Mixed Forest (ME), Hemlock Hardwood Pine Forests (NH), Upland forests - mixed deciduous-coniferous forest (NJ), Mixed Northern Hardwoods (NY), Deciduous/Mixed Forest (upland) (PA), Deciduous Forests - Deciduous Forest Beech-Maple (RI), Forest Habitat - Mixed Forest (VA), Northern Hardwood Forest - Hemlock-Northern Hardwood Forest (VT), Hemlock forests (WV)
Places to Visit this Habitat:
Tunxis State Forest | CT
Savage River State Forest | MD
Allegany State Park | NY
Allegheny National Forest Non-Reserved | PA
Monongahela National Forest | WV

Associated Species: Appendix lists scientific names
BIRDS: barred owl, blackburnian warbler, black-throated blue warbler, black-throated green warbler, chesnut-sided warbler, eastern wood-pewee, hermit thrush, louisiana waterthrush, ovenbird, ruffed grouse, scarlet tanager, wood thrush

MAMMALS: black bear, fisher, gray fox, northern flying squirrel, porcupine, smoky shrew, southern flying squirrel, white-footed mouse, woodland jumping mouse

HERPTILES: northern redbelly snake

PLANTS: broad beech fern (Thelypteris hexagonoptera), flowering dogwood (Cornus florida), four-leaved milkweed (Asclepias quadrifolia), perfoliate bellwort (Uvularia perfoliata), round-leaved tick trefoil (Desmodium rotundifolium), spicebush (Lindera benzoin), squawroot (Conopholis americana), pinedrops (Pterospora andromedea)

Species of Concern (G1-G4): Appendix lists scientific names
BIRDS: brown creeper, canada warbler, northern goshawk

MAMMALS: allegheny woodrat, indiana myotis, southern rock vole, southern water shrew, virginia northern flying squirrel

HERPTILES: cheat mountain salamander, eastern massasauga, green salamander, mountain earth snake, northern spring salamander

INSECTS: early hairstreak butterfly, spicebush swallowtail butterfly, west virginia white

PLANTS: American ginseng (Panax quinquefolius), appalachian blue violet (Viola appalachiensis), black bugbane (Actaea racemosa), Case's ladies'-tresses (Spiranthes casei), hairy beardtongue (Penstemon hirsutus), laurentian bladder fern (Cystopteris laurentiana), mountain bugbane (Actaea podocarpa), small skullcap (Scutellaria parvula)

© Maine Natural Areas Program

Appendix lists scientific names

http://nature.ly/HabitatGuide
**Northern Peatland**

**Macrogroup:** Northern Peatland

**Description:**
A dwarf-shrub peatland of small basins south of the coldest regions of the Northeast down to near the glacial boundary, where stagnated ice left coarse deposits and glacial depressions. Vegetation is dominated by heath shrubs and dwarf-shrubs (e.g., leatherleaf), with patches of sedges and forbs. Some peatlands may have a sparse tree layer (black spruce, larch, pitch pine). Although these are often called bogs, because the glacial "kettleholes" and small basins they form in are generally closed (i.e., without inlets or outlets of surface water), in most cases they should technically be called fens (albeit nutrient-poor ones) because the vegetation remains in contact with the groundwater.

**Ecological Setting and Natural Processes:**
The nutrient-poor substrate and the reduced throughflow of water create conditions fostering the development of peat and peatland vegetation. In deeper basins, the vascular vegetation grows on a peat mat over water, with no mineral soil development.

**Similar Habitat Types:**
Occur mostly south of the range of Boreal-Laurentian-Acadian Acidic Basin Fen. Similar to Laurentian-Acadian Conifer-Hardwood Acid Swamp, though with basin-associated landscape settings and vegetation typical of a more temperate climate.

**Crosswalk to State Name Examples:**
Shrub Inland Wetland - Bogs: (CT), Level Bog (MA), Leatherleaf Boggy Fen (ME), Highbush blueberry - mountain holly wooded fen (NH), Glacial Bog (NJ), Black Spruce-Tamarack Bog (NY), Leatherleaf – Bog-Rosemary Bog (PA), Dwarf Shrub Fen/Bog (RI), Open Peatlands - Dwarf Shrub Bog (VT)

**Crosswalk to State Wildlife Action Plans:**
Shrub Inland Wetland - Bogs: (CT), Peatlands - Fens (MA), Peatlands (ME), Peatlands - Open Peatlands (NH), Open Acidic Peatlands (NY), Wetlands - Forested Wetlands and Bogs (PA), Shrub Wetlands - Shrub Bog Unspecified (RI), Open Peatlands - Dwarf Shrub Bog (VT)

**State Distribution:**
CT, MA, ME, NH, NJ, NY, PA, RI, VT

**Total Habitat Acreage:** 83,789

**Percent Conserved:** 38.1%

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Places to Visit this Habitat:
Waterboro Barrens Preserve | ME
Hickory Lake State Forest | NY
Delaware State Forest | PA
Erie National Wildlife Refuge - Seneca Division | PA
Pymatuning State Park | PA

Associated Species:  *Appendix lists scientific names*

**BIRDS:** alder flycatcher, blue-winged teal, Wilson’s snipe, northern harrier, northern waterthrush, swamp sparrow, white-throated sparrow, willow flycatcher, yellow-bellied flycatcher

**MAMMALS:** meadow jumping mouse, masked shrew, snowshoe hare, southern red-backed vole

**HERPTILES:** queen snake, ribbon snake

**INSECTS:** azure bluet, green-striped darner, Henry’s elfin, lilypad clubtail, northern bluet, petite emerald, ski-tipped emerald, sweetflag spreading

**PLANTS:** bog goldenrod (*Solidago uliginosa*), bog rosemary (*Andromeda polifolia*), flatleaf bladderwort (*Utricularia intermedia*), common labrador tea (*Ledum groenlandicum*), northern comandra (*Geocaulon lividum*), northern green orchid (*Platanthera aquilonis*), pod grass (*Scheuchzeria palustris*), sword bogmat (*Wolffiella gladiata*), twig-rush (*Cladium mariscoides*)

Species of Concern (G1-G4):  *Appendix lists scientific names*

**BIRDS:** olive-sided flycatcher, rusty blackbird

**MAMMALS:** snowshoe hare

**HERPTILES:** Blanding’s turtle, jefferson salamander

**INSECTS:** Appalachian eyed brown, attenuated bluet, black dash, bog copper, bog elfin, bogbean buckmoth, bronze copper, chain fern corer moth, coastal bog metarranthis, dusky azure, ebony boghaunter, elfin skimmer, four-lined chocolate moth, Harris’s checkerspot, Hessel’s hairstreak, incurvate emerald, mottled darner, new England bluet, pitcher plant borer moth, pitcher plant moth, ringed boghaunter, sundew cutworm Moth

**PLANTS:** swamp-pink (*Arethusa bulbosa*), white-fringe orchis (*Platanthera blephariglottis*)

---

The average patch size for this habitat is 9 acres and the largest single patch is 2,839 acres. This chart shows the proportion of the habitat that is in each patch-size class.

This chart shows the average age of trees associated with this habitat based on forest inventory data. For non-forested systems or small habitats the average age is influenced by the surroundings.

This chart shows the predicted loss of habitat over the next five decades (1,711 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 34 acres per year.

This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, thus this chart shows the proportion of the habitat in each connectedness class.
## Northern Swamp

### Description:

A hardwood or occasionally mixed swamp of alkaline wetlands associated with limestone or other calcareous substrate in the southern portion of the region. Red maple and black ash are the dominant deciduous trees in most examples. Conifers may include larch, but typically not northern white cedar, which is characteristic of more northern wetlands. The canopy can be variable, as there may be shrubby or herbaceous openings within the swamp. A diverse ground cover is made up of some combination of herbs indicative of nutrient-rich conditions, ferns, and bryophytes characteristic of fens.

### Ecological Setting and Natural Processes:

This forested wetland occurs at low to mid elevations. They are found in poorly drained depressions or at the margins of stream valley bottoms, where higher pH and/or nutrient levels are associated with a rich flora. The substrate is primarily mineral soil, but there may be some peat development. Basin settings may still be hydrologically connected to nearby streams.

### Similar Habitat Types:

Similar to Laurentian-Acadian Alkaline Conifer-Hardwood Swamp, but with vegetation characteristic of a warmer climate. North-Central Appalachian Acidic Swamps include mixed swamps in the same part of the Northeast, but in less enriched settings, with different tree dominance and a less rich flora. Small patch rich fens may be embedded within the larger swamp complex.

### Crosswalk to State Name Examples:

Circumneutral Maple/Ash Basin Swamp (CT), Central Appalachian Basic Seepage Swamp (DE), Red Maple-Black Ash Swamp (MA), Montane Basic Seepage Swamp (MD), Red Maple - Black Ash Swamp (NH), Calcareous Seepage Swamp (NJ), Red Maple-Tamarack Peat Swamp (NY), Red Maple - Black Ash Palustrine Forest (PA), Red Maple/Ash Swamp (RI), Central Appalachian Basic Seepage Swamp (VA), Hardwood Swamps - Calcareous Red Maple-Tamarack Swamp (VT), Wetlands - Scrub/Shrub Swamps (PA)

### State Distribution:

CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VA, VT, WV

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### Total Habitat Acreage:

830,818

### Percent Conserved:

12.0%
Places to Visit this Habitat:
Salmon River State Forest | CT
Willowdale State Forest | MA
Wallkill River National Wildlife Refuge | NJ
Montezuma National Wildlife Refuge | NY
Canaan Valley National Wildlife Refuge | WV

Associated Species: Appendix lists scientific names
BIRDS: alder flycatcher, american black duck, blue-winged teal, least flycatcher, northern waterthrush, red-shouldered hawk, swamp sparrow, willow flycatcher, wood duck
MAMMALS: beaver
HERPTILES: four-toed salamander, longtail salamander, northern cricket frog, red-eyed slider, southern leopard frog, spotted salamander
INSECTS: Acadian hairstreak, bog tiger moth, frosted whiteface, Kennedy's emerald
PLANTS: big shellbark hickory (Carya laciniosa), bitternut hickory (Carya cordiformis), dwarf dogwood (Cornus canadensis), four-flower loosestrife (Lysimachia quadriflora), naked bishop's-cap (Mitella nuda), pumpkin ash (Fraxinus profunda), purple avens (Geum rivale), southern leopard frog (Rana pipiens), showy lady's-slipper (Cypripedium reginae), yellow sedge (Carex flava)

Species of Concern (G1-G4): Appendix lists scientific names
INSECTS: sable clubtail (Gomphus rogersii)
PLANTS: autumn willow (Salix serissima), Engelmann's spikerush (Eleocharis engelmannii), Hill's pondweed (Potamogeton hillii), many-headed sedge (Carex sychnocephala), prairie straw sedge (Carex suberecta), short-fruit rush (Juncus brachycarpus), spreading globeflower (Trollius laxus), weak stellate sedge (Carex seorsa)

© Elizabeth Thompson (Vermont Land Trust)
**Northern Swamp**

**Macrogroup:** Northern Swamp

**Description:**
A conifer or mixed conifer-hardwood swamp of poorly drained acidic substrates throughout central New England and the Central Appalachians, encompassing a broad range of basin, seepage, and stream-associated wetland communities. Hemlock is usually present and may be dominant. It is often mixed with deciduous wetland trees such as red maple or black gum. Spruce is rarely present. Basin swamps tend to be more nutrient-poor than seepage swamps; in some settings, the two occur adjacent to each other with the basin swamp vegetation surrounded by seepage swamp vegetation on its upland periphery.

**Ecological Setting and Natural Processes:**
Occurs at low to mid elevations (generally <2000 feet) in poorly drained depressions that may be in proximity to a stream. The acidic substrate is mineral soil, often with a component of organic muck; if peat is present, it usually forms a thin layer over the mineral soil rather than a true peat substrate.

**Similar Habitat Types:**
Similar to the Northern Appalachian-Acadian Conifer-Hardwood Acidic Swamp system, but with vegetation characteristic of a warmer climate. North-Central Interior and Appalachian Rich Swamps occur in the same region, but in more enriched hydrologic settings. Small patch poor fens may be embedded within larger wetland complexes of this type.

**Crosswalk to State Name Examples:**
Acidic Red Maple-Ericaceous Basin Swamp (CT), Red Maple/Tussock Sedge Wooded Marsh (DE), Hemlock/Inland Atlantic White Cedar Swamp (MA), Montane - Piedmont Acidic Seepage Swamp (MD), Red Maple - Skunk Cabbage Swamp (NH), Inland Red Maple Swamp (NJ), Red Maple-Hardwood Swamp (NY), Red Maple - Mixed Shrub Palustrine Woodland (PA), Hemlock/Hardwood Swamp (RI), Central Appalachian Low-Elevation Acidic Seepage Swamp (VA), Red Maple-White Pine-Huckleberry Swamp (VT)

**State Distribution:**
CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VA, VT, WV

**Total Habitat Acreage:** 1,505,822

**Percent Conserved:** 19.1%

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**Crosswalk to State Wildlife Action Plans:**
Forested Inland Wetland - Red/Black Spruce Swamps (CT), Forested Swamps (MA), Upland Depression Swamps (MD), Forested wetlands - hardwood swamps (NJ), Mixed Hardwood Swamp (NY), Wetlands - Forested Wetlands and Bogs (PA), Forested Wetlands - Forested Deciduous Wetland Unspecified (RI), Wetland Habitat - Forested (VA), Softwood Swamps - Hemlock Swamp (VT)
Places to Visit this Habitat:
Pachaug State Forest | CT
Douglas State Forest | MA
Great Swamp National Wildlife Refuge | NJ
Stewart State Forest | NY
Delaware State Forest | PA

Associated Species:  *Appendix lists scientific names*

**BIRDS**:  blue-headed vireo, great-crested flycatcher, green heron, green-winged teal, northern waterthrush, veery, wood duck, yellow-bellied flycatcher

**MAMMALS**:  black bear, golden mouse, northern flying squirrel, snowshoe hare

**HERPTILES**:  spotted turtle

**INSECTS**:  arctic skipper, belted whiteface, boreal bluet, common sanddragon, emerald spreadwing, great blue skimmer, harlequin darner

**PLANTS**:  bog rosemary (*Andromeda polifolia*), boreal bog sedge (*Carex magellanica*), bushy cinquefoil (*Potentilla paradoxa*), canada lily (*Lilium canadense*), common labrador tea (*Ledum groenlandicum*), creeping snowberry (*Gaultheria hispidula*), hairy hedge-nettle (*Stachys pilosa*), smooth gooseberry (*Ribes hirtellum*), swamp dock (*Rumex verticillatus*), sweet bayberry (*Myrica gale*),

Species of Concern (G1-G4):  *Appendix lists scientific names*

**BIRDS**:  loggerhead shrike, olive-sided flycatcher

**INSECTS**:  Amber-winged spreadwing, attenuated bluet, bog elfin, bog oligia, broad-lined catopyrrha, chain fern corer moth, macrochilo louisiana, northern brocade moth, white corporal

**PLANTS**:  Collins' sedge (*Carex collinsii*), dwarf azalea (*Rhododendron atlanticum*), golden puccoon (*Lithospermum caroliniense*), incurved umbrella-sedge (*Cyperus aristatus*), many-fruit false-loosestrife (*Ludwigia polycarpa*), mitchell's sedge (*Carex michelliana*), tall beakrush (*Rhynchospora macrostachya*), tall bentgrass (*Agrostis altissima*)

North-Central Appalachian Acidic Swamp

This page contains information about a specific ecosystem, including places to visit, associated species, and metric charts for predicting habitat loss to development and age class distribution. The charts illustrate the proportion of habitat in each connectedness class and the predicted loss of habitat over the next five decades if loss continues at the same rate as 1990-2000. The average rate of loss is 2,085 acres per year.
Macrogoup: Rocky Coast

State Distribution: CT, MA, ME, NH, NY, RI

Total Habitat Acreage: 7,706
Percent Conserved: 16.6%

Crosswalk to State Name Examples:
Unique And Man-Made - Coastal Bluffs And Headlands (CT), Marine Intertidal: Rocky Shore (MA), Crowberry - Bayberry Headland (ME), Coastal Rocky Headland (NH), Marine Rocky Intertidal (NY), Rocky Shore (RI)

Description:
An open rocky shoreline found in the narrow zone between the high tide line and the upland wooded areas. These intertidal zones of solid rock are often covered with seaweeds that tolerate extremes of exposure to winds, waves, currents, and ice-scour. Blue-green algae are common in the high intertidal zones; barnacles in the mid-intertidal zone; mussels in the lower intertidal. Diagnostic species include seaweeds (Irish moss, rockweed, knotted wrack, hollow-stemmed kelp) and invertebrates (blue mussels, common periwinkles, dogwhelks, and springtails). Tide pools provide nurseries for lumpfish, sea snails, pollock, and other fish. Many bird species frequent these: purple sandpiper, ruddy turnstone, sanderling, black-bellied plover, American oystercatcher, and pectoral sandpiper.

Ecological Setting and Natural Processes:
This system is found on rocky shores from the New England coast to the Canadian Maritimes. Slopes vary from flat rocks to cliffs. The intertidal zone widens with increasing maritime influence, and subjects these landscapes to extremes of wind, salt spray, and fog. Many coastal islands in this zone have graminoid-shrub areas that were maintained by sheep grazing and that now persist even after grazing has ceased.

Similar Habitat Types:
Other bare rock system types in which environmental conditions discourage the growth of trees and many other types of vegetation include Great Lakes Alvar, Southern and Central Appalachian Mafic Glade and Barrens, among others, though obvious biogeographic and ecological differences exist. Maritime forests and coastal heathlands and grasslands are often just inland.

Crosswalk to State Wildlife Action Plans:
Unique and Man-Made - Coastal Bluffs and Headlands (CT), Rocky Coastlines (MA), Rocky Coastlines and Islands (ME), Coastal Islands (NH), Intertidal - Estuarine Rocky Shore Bedrock (RI)
Places to Visit this Habitat:
Selden Neck Island State Park | CT
Boston Harbor Islands State Park | MA
Petit Manan National Wildlife Refuge | ME
Hither Hills State Park | NY
Bay Islands | RI

Associated Species: Appendix lists scientific names
BIRDS: american black duck, atlantic puffin, black duck, common eider, great black-backed gull, great cormorant, herring gull, leach's storm petrel, northern gannet, razorbill, wintering purple sandpiper

INSECTS: crowberry blue butterfly

PLANTS: beach plum (Prunus maritima), bird's-eye primrose (Primula mistassinica), marsh felwort (Lomatogonium rotatum), nova scotia false foxglove (Agalinis neoscotica)

Species of Concern (G1-G4): Appendix lists scientific names
INSECTS: crowberry blue butterfly

© Maine Natural Areas Program

Appendix lists scientific names

Acadian-North Atlantic Rocky Coast
http://nature.ly/HabitatGuide
Macrogoup: Tidal Marsh

Description:
A complex of tidally influenced marshes from the coastal shore on up the tidal rivers of the Northern Atlantic Coastal Plain. This habitat includes salt marsh, brackish marsh, and freshwater tidal marsh. A salt marsh profile features a low regularly flooded marsh dominated by salt marsh cordgrass; a higher irregularly flooded marsh dominated by saltmeadow cordgrass and saltgrass; low hypersaline pannes characterized by saltwort; and a salt scrub ecotone characterized by marsh elder, groundsel-tree, and switchgrass. Brackish areas support salt marsh cordgrass, giant cordgrass, narrowleaf cattail, and bulrush. Freshwater tidal areas include wild rice marshes, and forbs such as water hemp, and rosemallow.

Ecological Setting and Natural Processes:
The salt/brackish/oligohaline-freshwater gradient tracks the degree to which intertidal flats are removed from the open ocean. Brackish marshes can occur along upper edges of salt marshes and along tidal rivers. Freshwater tidal marshes occur on the upper reaches of large rivers influenced by tidal flooding beyond the reach of the salt wedge. Marshes of lower salinity levels are best developed in Chesapeake and Delaware Bays.

Similar Habitat Types:
These marshes are generally more extensive than those along the coast north of the coastal plain (Acadian Coastal Salt Marsh). They experience lunar tides, as opposed to the irregular wind-driven tides of the Atlantic Coastal Plain Embayed Region Freshwater and Brackish Marshes of southeast Virginia, and tend to be more productive than marshes there.

Crosswalk to State Name Examples:
Salt/Brackish Intertidal Marsh (CT), North Atlantic High/Low Salt Marsh (DE), Estuarine Intertidal: Salt Marsh (MA), Tidal Mesohaline Marsh (MD), Spartina Saltmarsh (ME), Salt Marshes (NH), Salt Marsh Complex (NJ), High/Low Salt Marsh (NY), Freshwater Tidal Mixed High Marsh (PA), Salt Marsh (RI), High/Low Salt Marsh (VA), Intertidal Flat (NH)

Crosswalk to State Wildlife Action Plans:
Tidal Wetland - Tidal Wetlands (CT), Emergent Tidal Wetlands (DC), Freshwater Tidal Forested and Scrub-Shrub Wetlands (DE), Freshwater Tidal Marshes (DE), Estuaries (MA), Tidal Marshes (MD), Estuarine Emergent Saltmarsh (ME), Salt Marshes (NH), Tidal salt marsh (NJ), Salt Marsh (NY), Wetlands - Emergent Estuarine (PA), Intertidal - Estuarine Intertidal Emergent Brackish Marsh (RI), Wetland Habitat - Emergent (VA)
Places to Visit this Habitat:
Bombay Hook National Wildlife Refuge | DE
Assateague Island National Seashore | MD
Edwin B. Forsythe National Wildlife Refuge | NJ
Fire Island National Seashore | NY
Chincoteague National Wildlife Refuge | VA

Associated Species:  Appendix lists scientific names

BIRDS:  american oystercatcher, arctic tern, black skimmer, black-crowned night-heron, clapper rail, common tern, forster's tern, glossy ibis, great egret, gull-billed tern, little blue heron, marsh wren, northern harrier, osprey, royal tern, tricolored heron, willet, yellow-crowned night-heron

MAMMALS:  north american least shrew

INSECTS:  big bluet, Needham's skimmer, salt marsh skipper

PLANTS:  american sea-blite (Suaeda calceoliformis), dwarf glasswort (Salicornia bigelovii), large marsh pink (Sabatia dodecandra), salt reedgrass (Sparrtina cynosuroides), saltmarsh bulrush (Schoenoplectus maritimus), saltmarsh false foxglove (Agalinis maritima), sea pink (Sabatia stellaris), seacoast angelica (Angelica lucida), seaside heliotrope (Heliotropium curassavicum)

Species of Concern (G1-G4):  Appendix lists scientific names

BIRDS:  black rail, king rail, least tern, red knot, roseate tern, saltmarsh sparrow, seaside sparrow

HERPTILES:  diamondback terrapin, loggerhead, rainbow snake

INSECTS:  checkered white, maritime sunflower borer moth, seaside goldenrod borer moth, spartina borer moth

PLANTS:  large salt marsh aster (Aster tenuifolius), Parker's pipewort (Eriocaulon parkeri), roland's sea-blite (Suaeda rolandii), saltmarsh fleabane (Pluchea odorata), salt-marsh sedge (Carex recta), saltmarsh spikerush (Eleocharis halophila), seabeach dock (Rumex pallidus), seabeach knotweed (Polygonum glaucum), sea-chickweed (Honckenya peploides), seaside alder (Alnus maritima)

North Atlantic Coastal Plain Tidal Salt Marsh

http://nature.ly/HabitatGuide
Macrogroup: Wet Meadow / Shrub Marsh

**Description:**
A shrub-dominated swamp or wet meadow on mineral soils characteristic of the glaciated Northeast and scattered areas southward. Examples often occur in association with lakes and ponds or streams, and can be small and solitary pockets or, more often, part of a larger wetland complex. The habitat can have a patchwork of shrub and herb dominance. Typical species include willow, red-osier dogwood, alder, buttonbush, meadowsweet, bluejoint grass, tall sedges, and rushes. Trees are generally absent or thinly scattered.

**Ecological Setting and Natural Processes:**
Shrub swamps and wet meadows are associated with lakes and ponds and along headwater and larger streams where the water level does not fluctuate greatly. They are commonly flooded for part of the growing season but generally do not have standing water throughout the season. This is a dynamic system that may return to marsh in beaver-impounded areas or succeed to wooded swamp with sediment accumulation or water subsidence.

**Similar Habitat Types:**
Most often occurs with Laurentian-Acadian Freshwater Marsh, acidic or circumneutral forested swamps, peatlands, and floodplain vegetation in large, diverse complexes.

**Crosswalk to State Name Examples:**
Shrub Inland Wetland - Shrub Thickets (CT), Eastern Tussock Sedge Meadow (DE), Shrub Swamp (MA), Shrub Swamp (MD), Mixed Graminoid - Shrub Marsh (ME), Mixed Tall Graminoid - Scrub-Shrub Marsh (NH), Streamside/Lakeside Shrub Swamp (NJ), Sedge Meadow/Shrub Swamp (NY), Tussock Sedge Marsh (PA), Shrub Swamp (RI), Ridge And Valley Calcareous Spring Marsh (VA), Sedge Meadow (VT)

**Crosswalk to State Wildlife Action Plans:**
Shrub Inland Wetland - Shrub Thickets (CT), Marshes and Wet Meadows - Wet Meadow (MA), Emergent Marsh and Wet Meadows (ME), Marsh and Shrub Wetlands (NH), Forested wetlands - scrub-shrub (NJ), Wet Meadow/Shrub Swamp (NY), Wetlands - Scrub/Shrub Swamps (PA), Emergent Wetlands - Emergent Marsh Shallow/ Wet Meadow (RI), Marshes and Sedge Meadows - Sedge Meadow (VT)
Places to Visit this Habitat:
Redden State Forest | DE
Chesapeake Forest Lands | MD
Wharton State Forest | NJ
Debar Mountain Wild Forest | NY
Canaan Valley National Wildlife Refuge | WV

Associated Species: Appendix lists scientific names

**BIRDS:** alder flycatcher, american woodcock, common yellowthroat, least bittern, nashville warbler, northern waterthrush, ruddy duck, sedge wren, swamp sparrow, tennessee warbler, veery, wilson's warbler, wilson's snipe, yellow warbler

**MAMMALS:** eastern cottontail, meadow jumping mouse, new england cottontail, northern bog lemming, northern short-tailed shrew, raccoon, smoky shrew, snowshoe hare, southern bog lemming, star-nosed mole, virginia possum, water shrew

**HERPTILES:** blue-spotted salamander, northern leopard frog, ribbon snake, spotted turtle

**PLANTS:** northern adder's-tongue (Ophioglossum pusillum), auricled twayblade (Listera auriculata), greater marsh-bellflower (Campanula uliginosa), swamp birch (Betula pumila), swamp lousewort (Pedicularis lanceolata)

**Species of Concern (G1-G4): Appendix lists scientific names**

**BIRDS:** american bittern, black tern, rusty blackbird, three-toed woodpecker

**MAMMALS:** southern bog lemming

**HERPTILES:** Blanding's turtle, bog turtle, jefferson salamander, pine barrel treefrog, wood turtle

**INSECTS:** Clayton's copper butterfly, comet darner, don skipper, ebony boghaunter, elderberry long-horned beetle, helicta satyr, incurvate emerald, mottled darner, mulberry wing, tomah mayfly

**PLANTS:** bead pinweed (Lechea pulchella), branching bur-reed (Sparganium androcladum), Long's bulrush (Scirpus longii), Ogden's pondweed (Potamogeton ogdenii), Pursh's goldenrod (Solidago uliginosa), stout smartweed (Polygonum robustius), Walter's paspalum (Paspalum dissectum)

This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.