Macrogoup: 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 tillplains, 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 franks), 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-losestrife (Ludwigia polycarpa)

North-Central Interior Wet Flatwoods

© D.J. Evans (New York Natural Heritage Program)

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

**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.

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

**Total Habitat Acreage:** 42,742

**Percent Conserved:** 28.4%

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**Crosswalk to State Name Examples:**
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)

**Crosswalk to State Wildlife Action Plans:**
Upland Woodland and Shrub - Pitch Pine/Scrub Oak Woodlands (CT), Pitch Pine/Scrub Oak (MA), Dry Woodlands and Barrens (ME), Pine Barrens (NH), Pine Barrens (NY), Thicket/Shrub Habitats - Naturally occurring barrens (PA), Pitch Pine Communities - Evergreen Forest Pitch Pine-Oak Barren (RI), Oak-Pine-Northern Hardwood Forest - 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, melsheimer’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
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.

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 (1,328 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 27 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: 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 (Tulularia 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)

© Robert Coxe (Delaware Species Conservation & Research Program)
Macrogoup: Central Oak-Pine

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. novae-angliae), Lion's-foot (Prenanthes serpenstaria), 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)

North Atlantic Coastal Plain Maritime Forest

The average patch size for this habitat is 4 acres and the largest single patch is 385 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 (23,614 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 472 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 Appalachian Pine-Oak Rocky Woodland

Macrogroup: 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, kittatiny 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 xyloptery, 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

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.
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.

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.

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 - 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), Oak - Heath Woodland (PA), Deciduous Forests - Deciduous Forest Oak/Heath (RI), Central Appalachian / Piedmont White Pine - Xeric Oak Forest (VA), 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:  
**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):  
**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

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

**Similar Habitat Types:**
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 (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
Sprout 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, kittatiny 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 relecta), 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)

© Gary P. Fleming (Virginia Department of Conservation & Recreation Natural Heritage Program)
Acidic Cliff and Talus

Macrogroup: 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 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), Cliff 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)

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%
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 leaf-flower (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)
Circumneutral Cliff and Talus

Macrogoup: Cliff and Talus

Description:
A sparsely vegetated cliff or steep talus slope formed on calcareous sandstone or shale or other moderately calcareous bedrock. The vegetation varies from sparse to patchy as the lack of soil and constant erosion restricts vegetation growth to rock crevices or soil pockets. Trees are typically present and may form woodland or even forest vegetation. Basswood, ash, and bladdernut are woody indicators of the enriched setting; northern white cedar is sometimes present. The herb layer is typically not extensive but includes at least some species that are indicators of high nutrient conditions.

Ecological Setting and Natural Processes:
Vertical or near-vertical cliffs and steep talus slopes where weathering and/or bedrock lithology produce circumneutral to calcareous pH and heightened nutrient availability. Substrates include calcareous sandstone, calcareous shale, or other sedimentary mixtures containing limestone or dolomite. This system occurs at low to mid elevations from central New England south to Virginia and West Virginia.

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

Crosswalk to State Name Examples:
Circumneutral Cliffs (CT), Circumneutral Rock Cliff Community (MA), Basic Cliff (MD), Cliffs (NH), Traprock Glade/Rock Outcrop Community (NJ), Talus Cave Community (NY), Calcareous Opening/Cliff (PA), Northern White-Cedar Cliff Woodland (VA), Cliffs And Talus Slopes - Temperate Calcareous Cliff (VT), Rock Outcrops/Cliffs/Talus (WV)

State Distribution: CT, MA, MD, ME, NH, NJ, NY, PA, VA, VT, WV
Total Habitat Acreage: 56,454
Percent Conserved: 35.7%

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Crosswalk to State Wildlife Action Plans:
Rocky Cliffs, Ridgetops, Talus Slopes, and Other Similar Habitats (MA), Rock Outcrops and Cliffs (MD), Cliffs (NH), Cliff and Talus (NY), Rock Habitats (PA), Forest Habitat - Mixed Forest (VA), Cliffs and Talus Slopes - Temperate Calcareous Cliff (VT), Rock Outcrops/Cliffs/Talus (WV)
Places to Visit this Habitat:
Kaaterskill Forest | NY
Sproul State Forest | PA
George Washington and Jefferson National Forest | VA
Bald Mountain Natural Area | VT
Monongahela National Forest | WV

Associated Species:  Appendix lists scientific names
BIRDS: bank swallow, eastern phoebe, raven, turkey vulture
MAMMALS: bobcat, porcupine, red-backed vole, rock vole, short-tailed shrew
HERPTILES: black rat snake, copperhead, fence lizard, five-lined skink, timber rattlesnake
PLANTS: cliff muhly (Muhlenbergia sobolifera), climbing fumitory (Adlumia fungosa), downy arrow-wood (Viburnum rafinesquinum), glade fern (Diplazium pycnocarpon), ledge spike-moss (Selaginella rupestris), linear-leaved milkweed (Asclepias verticillata), michaux’s stitchwort (Minuartia michauxii), narrowleaf vervain (Verbena simplex), northern stickseed (Hackelia deflexa), purple clematis (Clematis occidentalis), rock crowfoot (Ranunculus micranthus), upland boneset (Eupatorium sessilifolium), wallrue spleenwort (Asplenium ruta-muraria)

Species of Concern (G1-G4): Appendix lists scientific names
PLANTS: back’s sedge (Carex backii), black maple (Acer nigrum), goldie’s wood fern (Dryopteris goldiana)

© West Virginia Division of Natural Resources

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)
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-bliute 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)

© Robert Coxe (Delaware Species Conservation & Research Program)
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 blue stem, 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)
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.
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)
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 darner, 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 darner, sphagnum sprite, a firefly (photuris tremulans), a moth (Exyra fax)
PLANTS: swamp-pink (Arethusa bulbosa), yellow nodding ladies'-tresses (Spiranthes ochroleuca)

North Atlantic Coastal Plain Basin Peat Swamp
**Emergent Marsh**

**Description:**
A freshwater emergent or submersent 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)
- Cat-Tail 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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<td>2,373</td>
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<td>WV</td>
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<td>6,766</td>
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<tr>
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<td>61</td>
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</table>

**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
Macrogoup: Glade, Barren and Savanna

Description:
A mosaic of woodlands and open glades on thin soils over limestone, dolostone or similar calcareous rock with its core distribution in the Central Appalachians, but extending well up into New England. In some cases, the woodlands grade into closed-canopy forests. Eastern red-cedar is a common tree, filling in in the absence of fire, and chinquapin oak is indicative of the limestone substrate. In the northern part of its range, northern white cedar may replace red cedar. Other locally occurring trees and shrubs are sugar maple, red and white oak, pignut hickory, eastern redbud, and hackberry. Prairie grasses are often dominant in the herb layer, and forb richness is often high, supporting species such as tall larkspur, american harebell, columbine, and four-leafed milkweed.

Ecological Setting and Natural Processes:
A moderately dry patch community that forms in shallow soils at high landscape positions (upper slopes, ridgetops), at elevations up to about 2500 feet. It is known widely through the region. Fire is sometimes an important natural disturbance vector, but open physiognomies may also be maintained by drought and landslides. Lower elevation examples are often in highly fragmented agricultural landscapes.

Similar Habitat Types:
Similar to Southern Ridge and Valley Calcareous Glade and Woodland, but on higher and more convex landforms, and farther north. As conditions become less dry, soil deepens, and the canopy closes, this system usually grades into Northeast Interior Dry-Mesic Oak Forest, or Appalachian or (farthest north) Laurentian-Acadian Northern Hardwoods.

Crosswalk to State Name Examples:
Upland Woodland And Shrub - Red Cedar Glades (CT), Yellow Oak Dry Calcareous Forest (MA), Montane Dry Calcareous Forest And Woodland (MD), Limestone Glade (NJ), Limestone Woodland/Red Cedar Rocky Summit (NY), Yellow Oak - Redbud Woodland (PA), Ridge And Valley Dolomite Woodland (VA), Limestone Barrens And Glades (WV)

Crosswalk to State Wildlife Action Plans:
Upland Forest - Calcareous Forests (CT), Upland Woodland and Shrub - Red Cedar Glades (CT), Rocky Cliffs, Ridgetops, Talus Slopes, and Other Similar Habitats (MA), Barrens and Dry Glades (MD), Grassland Habitats - Naturally occurring barrens (PA), Forest Habitat - Mixed Forest (VA), Calcareous Forests and Woodlands (WV), Limestone Barrens and Glades (WV)
Places to Visit this Habitat:
Green Ridge State Forest | MD
Nescopeck State Park | PA
George Washington and Jefferson National Forest | VA
George Washington National Forest | WV
Monongahela National Forest | WV

Associated Species:  Appendix lists scientific names
BIRDS: cerulean warbler, eastern whip-poor-will, golden-winged warbler, prairie warbler, yellow-breasted chat

INSECTS: compton tortoiseshell

PLANTS: barren strawberry (Waldsteinia fragarioides), downy arrow-wood (Viburnum rafinesquianum), chinquapin oak (Quercus muehlenbergii), glade flax (Linum sulcatum var. sulcatum), hairy beardtongue (Penstemon hirsutus), hairy pinweed (Lechea mucronata), orange-grass st. john’s-wort (Hypericum gentianoides), prairie ragwort (Packera plattensis), running serviceberry (Amelanchier humilis), smoke hole bergamot (Monarda fistulosa ssp. 1), violet bushclover (Lespedeza violacea), western hairy rockcress (Arabis hirsuta), western wallflower (Erysimum capitatum)

Species of Concern (G1-G4): Appendix lists scientific names
HERPTILES: Wehrle’s salamander, west virginia spring salamander

INSECTS: Carolyn’s cave springtail, cavern sheet-web Spider, Hubbard’s cave beetle, Maddens cave beetle, natural bridge cave beetle, Seneca cave beetle, and many other cave beetle, mites, springtails and spiders

PLANTS: cliff stonecrop (Sedum glaucophyllum), hidden spike-moss (Selaginella eclipses), tall larkspur (Delphinium exaltatum), three-lobed violet (Viola triloba)

Predicted Habitat Loss to Development
This chart shows the predicted loss of habitat over the next five decades (12,363 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 247 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-Central Appalachian Large River Floodplain

Macrogroup: 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%

<table>
<thead>
<tr>
<th>State</th>
<th>Habitat %</th>
<th>Acreage</th>
<th>GAP 1&amp;2 (acres)</th>
<th>GAP 3 (acres)</th>
<th>Unsecured (acres)</th>
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<tbody>
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<td>142,677</td>
<td>10,582</td>
<td>15,936</td>
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<tr>
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<td>131</td>
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<td>9</td>
<td>70</td>
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<td>1</td>
<td>0</td>
<td>89</td>
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<td>82</td>
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<td>30</td>
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<tr>
<td>RI</td>
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<td>19</td>
<td>0</td>
<td>2</td>
<td>17</td>
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</table>

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 aestuaria

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.
**Macrogoup: Northern Hardwood & Conifer**

**Description:**
A hardwood forest dominated by sugar maple, American beech, and yellow birch; white ash is common on some sites, and hemlock and red spruce are frequent but minor canopy associates. Paper birch, red maple, aspen, and white pine are common in successional stands. This is the "matrix" forest in the northern part of our region, within which upland and wetland systems that occur at smaller scale are embedded. Rich expressions of this habitat type, with herb, shrub, and canopy layers of high diversity, occur over areas of calcium-rich bedrock and in cool, moist sites; forests on acidic till or in areas of granitic (or similar) bedrock are relatively poor floristically. Variability in climate, substrate, and exposure, can lead to stands proportionally higher in conifers or red oak.

**Ecological Setting and Natural Processes:**
A broadly defined ecological generalist, this system is found on slopes, hills, and flats, on a wide variety of bedrocks and tills. It occurs at low to moderate elevations that vary with latitude, but generally from 800 to 2200 feet. Blowdowns of small and relatively large scale, or snow and ice loading, are the most frequent forms of natural disturbance; these forests do not easily ignite easily and burn. Old growth examples are rare in the Northeast.

**Similar Habitat Types:**
Grades into Laurentian-Acadian Pine-Hemlock-Hardwood Forest or Appalachian (Hemlock-)Northern Hardwoods at lower elevation; and into a yellow birch-red spruce variant, then Acadian-Appalachian Montane Spruce-Fir-Hardwood Forest, on slopes and ridges above. Red Oak-Northern Hardwood Forests are sometimes in small to large patches in warmer settings within this system.

**Crosswalk to State Wildlife Action Plans:**
Upland Forest (MA), Deciduous and Mixed Forest (ME), Northern Hardwood – Conifer Forest (NH), Mixed Northern Hardwoods (NY), Deciduous/Mixed Forest (upland) (PA), Northern Hardwood Forest - Northern Hardwood Forest (VT)
Places to Visit this Habitat:
October Mountain State Forest | MA
Baxter State Park | ME
White Mountain National Forest | NH
Ferris Lake | NY
Green Mountain National Forest | VT

Assorted Species: Appendix lists scientific names

BIRDS: black-and-white warbler, Blackburnian warbler, black-throated blue warbler, black-throated green warbler, eastern wood pewee, hermit thrush, northern saw-whet owl, ovenbird, pine warbler, ruffed grouse, scarlet tanager, veery, 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 red-bellied snake, smooth greensnake, spring salamander

PLANTS: bristly black currant (Ribes lacustre), broad beech fern (Phegopteris hexagonoptera), mountain woodfern (Dryopteris campyloptera), pale jewel-weed (Impatiens pallida), squirrel-corn (Dicentra canadensis), swamp red currant (Ribes triste), twinflower (Linnaea borealis)

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

BIRDS: olive-sided flycatcher

HERPTILES: jefferson salamander, wood turtle

INSECTS: early hairstreak (Eurora laeta), eastern veined white (Pieris oleracea)

PLANTS: American ginseng (Panax quinquefolius), bailey's sedge (Carex baileyi), climbing fumitory (Adlumia fungosa), Goldie's woodfern (Dryopteris goldiana), hooker's orchis (Platanthera hookeri), nodding pogonia (Triphora trianthophora), northern mountain-ash (Sorbus decora), northern wild monkshood (Aconitum noveboracense), summer sedge (Carex aestivalis), tinged sedge (Carex tincta)

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 (54,514 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 1,090 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.
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-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)

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**Habitat Patch Distribution**

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<th>Patch Size Classes</th>
<th>Acres</th>
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<td>1 to 5</td>
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</tr>
<tr>
<td>5 to 10</td>
<td></td>
</tr>
<tr>
<td>10 to 100</td>
<td></td>
</tr>
<tr>
<td>100 to 1000</td>
<td>18,000</td>
</tr>
<tr>
<td>1000+</td>
<td>14,000</td>
</tr>
</tbody>
</table>

The average patch size for this habitat is 19 acres and the largest single patch is 39,064 acres. This chart shows the proportion of the habitat that is in each patch-size class.

**Age Class Distribution**

<table>
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<th>Age (Years)</th>
<th>Percent of Habitat</th>
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<tr>
<td>20 to 40</td>
<td>10</td>
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<td>40 to 60</td>
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<td>60 to 80</td>
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<td>80 to 100</td>
<td>10</td>
</tr>
<tr>
<td>100 to 140</td>
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</table>

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**

<table>
<thead>
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<th>Decade</th>
<th>Acreage</th>
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<td>19,000,000</td>
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<tr>
<td>2060</td>
<td>18,500,000</td>
</tr>
</tbody>
</table>

This chart shows the predicted loss of habitat over the next five decades (667,316 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 13,346 acres per year.

**Habitat Connectedness Index**

| Degree of Fragmentation (0=Highly Fragmented & 100= Highly Connected) |
|-------------------------|-----------------------------|
| Percent of Habitat      |                              |
| 0 to 25                 | 60                           |
| 25 to 50                | 40                           |
| 50 to 75                | 20                           |
| 75 to 100               | 0                            |

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.

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Appalachian (Hemlock)-Northern Hardwood Forest

© Maine Natural Areas Program

http://nature.ly/HabitatGuide
Northern Hardwood & Conifer

Description:
A coniferous or mixed forest widespread in the glaciated northeast. White pine, hemlock, and red oak are typical canopy dominants. Red maple is common, and other hardwoods like sugar maple, beech, and birch also occur. Red spruce and balsam fir are uncommon associates, and oaks besides red oak are essentially absent from these forests. This forest system may be considered transitional between northern hardwood forests at higher elevations and to the north, and the warmer Appalachian hemlock-hardwoods and oak-pine forests at lower elevations and to the south. It ranges from the northeastern U.S. to adjacent Canada, and westward to the Great Lakes and upper Midwest. These forests are early and mid-successional in many areas, and often reflect an agricultural history.

Ecological Setting and Natural Processes:
These dry to mesic forests usually occur on low-nutrient loamy-to-sandy soils on a wide range of landforms at lower elevations, mostly below about 2000'. As with most other forest types in the region, single tree blowdowns and gap replacement are the most common disturbance/regeneration event. Fire is infrequent.

Similar Habitat Types:
Hardwoods dominate in Northern Hardwood Forests, which are often adjacent to this system in cooler settings. Pine is less important than hemlock in the Appalachian (Hemlock-Northern Hardwood Forest, which also has a wider variety of oaks and other hardwoods. Red pines are characteristic and often dominant in the drier Laurentian-Acadian Northern Pine-Oak system.

Crosswalk to State Name Examples:
Hemlock Forest (ME), Hemlock - White Pine Forest (NH), Pine-Northern Hardwood Forest (NY), Deciduous/Mixed Forest (Upland) (PA), Hemlock-Northern Hardwood Forest (VT), Northern Hardwoods-Hemlock-White Pine forest (MA)
Places to Visit this Habitat:
Warwick State Forest | MA
Sunkhaze Meadows National Wildlife Refuge | ME
White Mountain National Forest | NH
Wilcox Lake | NY
Green Mountain National Forest | VT

Associated Species: Appendix lists scientific names
BIRDS: black-and-white warbler, Blackburnian warbler, black-throated blue warbler, eastern wood-pewee, hermit thrush, northern saw-whet owl, northern waterthrush, ovenbird, pine warbler, ruffed grouse, scarlet tanager, veery, wood thrush, yellow-bellied sapsucker

MAMMALS: deer mouse, red squirrel, southern red-backed vole

HERPTILES: northern redbelly snake

PLANTS: barren strawberry (Waldsteinia fragarioides), mountain laurel (Kalmia latifolia), giant pinedrops (Pterospora andromedea), green adder’s-mouth (Malaxis unifolia), loesel’s twayblade (Liparis loeselii), sand violet (Viola adunca), scarlet oak (Quercus coccinea), slender mountain ricegrass (Piptatherum pungens), spreading-pod rockcress (Boechera grahamii)

Species of Concern (G1-G4): Appendix lists scientific names
BIRDS: olive-sided flycatcher, eastern whip-poor-will, northern goshawk

MAMMALS: american pygmy shrew, eastern small-footed myotis, indiana myotis, new england cottontail

HERPTILES: Blanding’s turtle, bog turtle, timber rattlesnake, wood turtle

INSECTS: early hairstreak, red-winged sallow

PLANTS: american chestnut (Castanea dentata), variable sedge (Carex polymorpha)

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http://nature.ly/HabitatGuide
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 Wildlife Action Plans:
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*)

© Patricia Swain (Massachusetts Division of Fisheries & Wildlife/Natural Heritage & Endangered Species Program)
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)
**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), boreal bog sedge (Carex magellanica), 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)

**Predicted Habitat Loss to Development**
- Average rate of loss is 34 acres per year.

**Habitat Patch Distribution**
- 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.

**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 (1,711 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 34 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.

© Maine Natural Areas Program

Macrogoup: Northern Swamp

Description:
A forested swamp of alkaline wetlands associated with limestone or other calcareous substrate in the northern part of the glaciated northeast. Northern white cedar is often present and may dominate the canopy or be mixed with other conifers or with deciduous trees, most commonly red maple or black ash. Some examples can be almost entirely deciduous and dominated by black ash. Red-osier dogwood is a common shrub. The herb layer tends to be more diverse than in acidic swamps, due to higher pH and nutrient level. Small open fenny areas may occur within the wetland. The moss layer is often extensive and diverse. Seepage may influence parts of the wetland, but the hydrology is dominated by the basin setting.

Ecological Setting and Natural Processes:
These forested wetlands are uncommon in the glaciated northeast except in areas with extensive limestone or similar substrate. The substrate is typically mineral soil, but there may be some peat, and there is often direct contact with alkaline groundwater.

Similar Habitat Types:
Similar to North-Central Interior and Appalachian Rich Swamp, but with a flora characteristic of a cooler climate. Northern Appalachian-Acadian Conifer-Hardwood Acidic Swamp occupy the same part of the region, but are found in less enriched settings. Small patch Laurentian-Acadian Alkaline Fens are often embedded within the larger swamp complex.

Crosswalk to State Name Examples:
Forested Inland Wetland - Northern White Cedar Swamps (CT), Black Ash Red-Maple-Tamarack Calcareous Seepage Swamp (MA), Northern White Cedar Swamp (ME), Northern White Cedar - Balsam Fir Swamp (NH), Northern White Cedar Swamp (NY), Hardwood Swamps - Red Maple-Black Ash Seepage Swamp (VT)
Plates to Visit this Habitat:
Moosehorn National Wildlife Refuge | ME
Sunkhaze Meadows National Wildlife Refuge | ME
Lake Umbagog National Wildlife Refuge | NH
High Peaks Wilderness Area | NY
Saranac Lakes | NY

Associated Species: Appendix lists scientific names

BIRDS: black-backed woodpecker, canada warbler, golden-crowned kinglet, gray jay, northern waterthrush, palm warbler, red-shouldered hawk, american three-toed woodpecker, veery, white-throated sparrow, wood duck, yellow-bellied flycatcher

MAMMALS: masked shrew, mink, red-backed vole, short-tailed shrew

PLANTS: bog aster (Oclemena nemoralis), fairy slipper (Calypso bulbosa), green adder's-mouth (Malaxis unifolia), hoary willow (Salix candida), lapland buttercup (Ranunculus lapponicus), loesel's twayblade (Liparis loeselii), nodding trillium (Trillium flexipes), pink wintergreen (Pyrola asarifolia), swamp thistle (Cirsium muticum), yellow bellied flycatcher

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

BIRDS: olive-sided flycatcher, yellow rail

INSECTS: Clayton's copper butterfly

PLANTS: fen mosses (Calliergon spp, Meesia triquetra, Paludella squarrosa, Scopodium scorpioides, Tomentypnum falcifolium), bog jacob's-ladder (Polemonium vanbruntiae), eastern prairie white-fringed orchid (Platanthera leucophaea), lake-cress (Armoracia lacustris), marsh valerian (Valeriana uliginosa), northern yellow lady's-slipper (Cypripedium parviflorum), prickly hornwort (Ceratophyllum echinatum), rugulose grape-fern (Botrychium rugulosum), sartwell's sedge (Carex sartwellii), small skullcap (Scutellaria parvula var. parvula), three-lobed violet (Viola triloba), white adder's-mouth (Malaxis monophyllos)

© Charles Ferree (The Nature Conservancy)

Appendix lists scientific names

http://nature.ly/HabitatGuide
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)

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 mitchelliana), tall beakrush (Rhynchospora macrostachya), tall bentgrass (Agrostis altissima)

North-Central Appalachian Acidic Swamp

Appendix lists scientific names

© Hal Malde

http://nature.ly/HabitatGuide
Northern Swamp

Macrogroup: 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

Total Habitat Acreage: 830,818
Percent Conserved: 12.0%

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Crosswalk to State Wildlife Action Plans:
Forested Inland Wetland - unspecified (CT), Forested Swamps (MA), Forested Seepage Wetlands (MD), Mixed Hardwood Swamp (NY), Wetlands - Forested Wetlands and Bogs (PA), Wetlands - Scrub/Shrub Swamps (PA), Forested Wetlands - Forested Deciduous Wetland Unspecified (RI), Hardwood Swamps - Calcareous Red Maple-Tamarack Swamp (VT)
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, spotted salamander

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)

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North-Central Interior and Appalachian Rich Swamp
http://nature.ly/HabitatGuide
Northern Appalachian-Acadian Conifer-Hardwood Acidic Swamp

Macrogoup: Northern Swamp

Description:
A conifer or mixed forested swamp of permanently saturated basins with seasonal standing water. Characteristic of the glaciated Northeast, this habitat may develop in peat moss or mineral soil. In peat, trees form a partial to full cover and stunted to well-developed black spruce and larch are dominant. Heath shrubs and sedges are common in the understory, although the dwarf-shrub layer is less well-developed than in open acidic peatlands. In mineral soil, red maple, red spruce, and balsam fir are the most typical trees; ash may be common in some locations. The herbaceous and shrub layers tend to be fairly species-poor; catberry, tall ferns (cinnamon, interrupted, sensitive), and wetland sedges are typical.

Ecological Setting and Natural Processes:
Occurs in permanently saturated basins and depressions that may have standing water seasonally. Peat moss or mineral soil is the primary substrate, but many examples are associated with streamways, and the more minerotrophic conditions (groundwater contact) yield nutrient levels somewhat higher than in a true bog.

Similar Habitat Types:
Similar to North-Central Appalachian Acidic Swamp, but with a flora characteristic of a cooler climate. Occurs in much of the same area as Laurentian-Acadian Alkaline Conifer-Hardwood Swamp, but experiences less groundwater nutrient enrichment and a generally less diverse flora. Small patch poor fens are often embedded within the larger swamp complex.

Crosswalk to State Name Examples:
Forested Inland Wetland - Red/Black Spruce Swamps (CT), Red Spruce Swamp (MA), Hemlock - Hardwood Pocket Swamp (ME), Black Spruce Swamp (NH), Spruce-Fir Swamp (NY), Red Maple - Mixed Shrub Palustrine Woodland (PA), Spruce-Fir-Tamarack Swamp (VT)

State Distribution: CT, MA, ME, NH, NY, PA, VT

Total Habitat Acreage: 1,311,922
Percent Conserved: 38.0%

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<td>0%</td>
<td>2</td>
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<td>2</td>
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</table>

Crosswalk to State Wildlife Action Plans:
Forested Inland Wetland - Red/Black Spruce Swamps (CT), Forested Swamps (MA), Forested Wetland (ME), Peatlands - Forested Peatlands (NH), Mixed Hardwood Swamp (NY), Wetlands - Forested Wetlands and Bogs (PA), Hardwood Swamps - Red Maple-Sphagnum Acidic Basin Swamp (VT)
Places to Visit this Habitat:
- October Mountain State Forest | MA
- Acadia National Park | ME
- White Mountain National Forest | NH
- Debar Mountain Wild Forest | NY
- Green Mountain National Forest | VT

Associated Species: Appendix lists scientific names
- BIRDS: black-backed woodpecker, Blackburnian warbler, blackpoll warbler, gray jay, green heron, Lincoln's sparrow, Nashville warbler, northern parula, northern waterthrush, swamp sparrow, Wilson's warbler, wood duck
- MAMMALS: Canada lynx, masked shrew, red-backed vole, silver-haired bat
- HERPTILES: blue-spotted salamander, spotted salamander
- INSECTS: hoary comma, spicebush swallowtail butterfly, water-willow stem borer
- PLANTS: large water-starwort (Callitriche heterophylla), largeleaf avens (Geum macrophyllum), spicebush (Lindera benzoin), swamp lousewort (Pedicularis lanceolata), swamp saxifrage (Saxifraga pensylvanica), swamp white oak (Quercus bicolor)

Species of Concern (G1-G4): Appendix lists scientific names
- BIRDS: olive-sided flycatcher, rusty blackbird, American three-toed woodpecker
- MAMMALS: water shrew
- HERPTILES: Blanding's turtle, bog turtle, Jefferson salamander, spring salamander, wood turtle
- INSECTS: beaverpond clubtail, bird dropping moth, bog elfin, Clayton's copper butterfly, pygmy snaketail, twilight moth
- PLANTS: mosses (Calliergon obtusifolium, Calliergon richardsonii), creeping rush (Juncus subtilis), marsh valerian (Valeriana uliginosa), Nova Scotia false foxglove (Agalinis neoscotica), slender spikerush (Eleocharis nitida)

Predicted Habitat Loss to Development

This chart shows the predicted loss of habitat over the next five decades (5,190 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 104 acres per year.
Acidic Rocky Outcrop

Macrogroup: Outcrop & Summit Scrub

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

Total Habitat Acreage: 197,404
Percent Conserved: 55.9%

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<th>GAP 3 (acres)</th>
<th>Unsecured (acres)</th>
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<td>VT</td>
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<td>91</td>
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<td>6</td>
<td>84</td>
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Description:
A sparsely vegetated system on resistant acidic bedrock such as sandstone, quartzite, or granite. The vegetation is a mosaic of woodlands and open glades reflecting the proportion of rock surface to thin soil. At higher elevation or in northern regions characteristic trees, sometimes stunted, include black spruce, red pine, red oak, and scarlet oak. Carpets of low heath shrubs or reindeer lichens are typical. At low to mid elevation stunted red oak, white pine, and red spruce are characteristic over low heath shrubs such as lowbush blueberry, huckleberry, and chokeberry. An open jack pine/heath shrub woodland community on nearly level sandstone pavement in northeastern New York falls into this system. Lichens, mosses, and scattered herbs dominate the ground cover.

Ecological Setting and Natural Processes:
Ridge, summit, dome, or flat plain of resistant acidic bedrock like sandstone or granite. The surface is largely bare rock widths thin soil mats around the edges and in other patches. Exposure, thin soils, and occasional fire are the major factors in keeping the vegetation open. This system is distributed throughout the Northern Appalachian region with a distinct variant in the St Lawrence -Champlain Valley. small patch

Similar Habitat Types:
Similar to the glade and barrens systems farther south, in which environmental stresses and lithochemical factors restrict some vegetation types and promote others. The northern New York flat rock variant is analogous to the Southern Piedmont Granite Flatrock and Outcrop in Virginia.

Crosswalk to State Name Examples:
Upland Herbaceous - Grassy Glades And Balds (CT), Rocky Cliffs, Ridgetops, Talus Slopes, And Other Similar Habitats (MA), Rocky Summit Heath (ME), Red Spruce - Heath - Cinquefoil Rocky Ridge (NH), Red Pine Rocky Summit (NY), Red Pine Forest Or Woodland (VT)

Crosswalk to State Wildlife Action Plans:
Upland Herbaceous - Grassy Glades and Balds (CT), Rocky Cliffs, Ridgetops, Talus Slopes, and Other Similar Habitats (MA), Cliff Face and Rocky Outcrops (ME), Talus Slopes and Rocky Ridges - Rocky Ridges (NH), Rocky Outcrop (NY), Outcrops and Upland Meadows - Boreal Outcrop (VT)
Places to Visit this Habitat:
Baxter State Park | ME
Appalachian Trail | NH
White Mountain National Forest | NH
West Canada Lake | NY
Green Mountain National Forest | VT

Associated Species: Appendix lists scientific names
BIRDS: blackpoll warbler

PLANTS: alpine bilberry (vaccinium uliginosum), alpine sweet grass (hierochloe alpina), bigelow’s sedge (carex bigelowii), canada mountain ricegrass (piptatherum canadense), douglas' knotweed (polygonum douglasii), mountain sandwort (minuartia groenlandica)

Species of Concern (G1-G4): Appendix lists scientific names
BIRDS: Bicknell's thrush, three-toed woodpecker
INSECTS: early hairstreak
PLANTS: appalachian sandwort (minuartia glabra)

Acidic Rocky Outcrop
© George Gress (The Nature Conservancy, Pennsylvania)

Appendix lists scientific names

http://nature.ly/HabitatGuide
**Acadian-North Atlantic Rocky Coast**

**Macrogroup: Rocky Coast**

**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 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)

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

**Total Habitat Acreage:** 7,706

**Percent Conserved:** 16.6%

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**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

The average patch size for this habitat is 2 acres and the largest single patch is 81 acres. This chart shows the proportion of the habitat 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 (689 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 14 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
Ruderal Shrubland & Grassland (NLCD 52/71)

Macrogroup: Ruderal Shrubland & Grassland

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

**Total Habitat Acreage:** 1,733,552

**Percent Conserved:** 3.5%

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**Crosswalk to State Name Examples:**
Not Mapped

**Ecological Setting and Natural Processes:**
Not in Guide

**Similar Habitat Types:**
Not in Guide

**Crosswalk to State Wildlife Action Plans:**
Not Mapped
Places to Visit this Habitat:
Not Mapped

Associated Species:  *Appendix lists scientific names*

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

---

**Habitat Patch Distribution**

The average patch size for this habitat is 2 acres and the largest single patch is 2,755 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 (92,563 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 1,851 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.
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)

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

**Total Habitat Acreage:**
920,107

**Percent Conserved:**
45.2%

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<td>120</td>
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<td>117</td>
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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 (Spartina 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), salt marsh goosegrass (Puccinellia fasciculata), 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)

Predicted Habitat Loss to Development

This chart shows the predicted loss of habitat over the next five decades (54,284 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 1,086 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 Tidal Salt Marsh

http://nature.ly/HabitatGuide
Macrogroup: Urban/Suburban Built

Description:
NOT IN GUIDE

Ecological Setting and Natural Processes:
NOT IN GUIDE

Similar Habitat Types:
NOT IN GUIDE

Crosswalk to State Name Examples:
Not Mapped

Crosswalk to State Wildlife Action Plans:
Not Mapped
Places to Visit this Habitat:  
Not Mapped

Associated Species:  Appendix lists scientific names

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

Habitat Patch 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.

Age Class Distribution

This chart shows the predicted loss of habitat over the next five decades (174,310 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 3,486 acres per year.

Predicted Habitat Loss to Development

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.

Developed (NLCD 21-24 & 31)
Open Water (NLCD-NHD open water)

Macrogroup: Water

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

Total Habitat Acreage: 11,074,953
Percent Conserved: 3.8%

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<th>Unsecured (acres)</th>
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<td>NJ</td>
<td>5%</td>
<td>503,540</td>
<td>30,773</td>
<td>3,235</td>
<td>469,532</td>
</tr>
<tr>
<td>PA</td>
<td>4%</td>
<td>425,717</td>
<td>41,215</td>
<td>21,327</td>
<td>363,175</td>
</tr>
<tr>
<td>RI</td>
<td>3%</td>
<td>298,418</td>
<td>376</td>
<td>2,658</td>
<td>295,384</td>
</tr>
<tr>
<td>CT</td>
<td>3%</td>
<td>279,838</td>
<td>2,915</td>
<td>9,189</td>
<td>267,734</td>
</tr>
<tr>
<td>NH</td>
<td>2%</td>
<td>245,902</td>
<td>2,561</td>
<td>12,317</td>
<td>231,024</td>
</tr>
<tr>
<td>VT</td>
<td>2%</td>
<td>245,859</td>
<td>1,351</td>
<td>8,020</td>
<td>236,488</td>
</tr>
<tr>
<td>DE</td>
<td>2%</td>
<td>181,593</td>
<td>1,211</td>
<td>3,147</td>
<td>177,235</td>
</tr>
<tr>
<td>WV</td>
<td>1%</td>
<td>146,571</td>
<td>5,048</td>
<td>20,582</td>
<td>120,941</td>
</tr>
<tr>
<td>DC</td>
<td>0%</td>
<td>4,548</td>
<td>1</td>
<td>14</td>
<td>4,533</td>
</tr>
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</table>

Description:
NOT IN GUIDE

Ecological Setting and Natural Processes:
NOT IN GUIDE

Similar Habitat Types:
NOT IN GUIDE

Crosswalk to State Name Examples:
Not Mapped

Crosswalk to State Wildlife Action Plans:
Not Mapping
Places to Visit this Habitat:
Not Mapped

Associated Species: Appendix lists scientific names

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

The average patch size for this habitat is 32 acres and the largest single patch is 4,524,884 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 (36,820 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 736 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: 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: Blandings’s turtle, bog turtle, jefferson salamander, pine barrens 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)

Predicted Habitat Loss to Development

The average patch size for this habitat is 4 acres and the largest single patch is 1,460 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 (26,569 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 531 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.