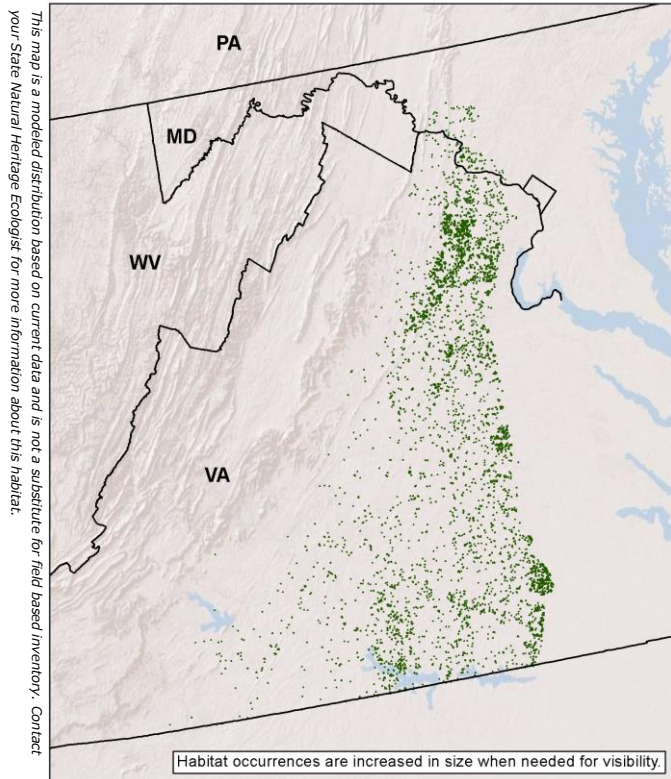




## Macrogroup: Central Hardwood Swamp



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

### Description:

A forested swamp of wetland oaks occurring in small, shallow basins in upland settings where water pools due to limited soil drainage. Most examples are isolated seasonally-flooded wetlands dominated by wetland oaks (pin oak, swamp white oak, laurel oak, willow oak, overcup oak), but a few are treeless or open-canopied ponds. Vegetation is zoned with an outer ring of trees, a more interior ring of shrubs (buttonbush, heaths, greenbrier), vines, and wetland graminoids and ferns, and a central area with or without standing water year round depending on precipitation. Sphagnum moss is sometimes extensive in parts of the pools.

State Distribution: MD, VA

Total Habitat Acreage: 21,559

Percent Conserved: 4.7%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
VA	98%	21,055	36	900	20,118
MD	2%	505	1	76	427

### Ecological Setting and Natural Processes:

Occurs on nearly level Piedmont uplands with clay hardpans and shallow seasonal flooding. Most known examples are on mafic bedrock. Flooding depth is typically shallow (< 25 cm). Soils are typically loamy clays. There is substantial variation among the pools, related to substrate, basin morphology, and geographic location.

### Similar Habitat Types:

Piedmont Hardpan Woodland & Forest is closely related by the importance of an impermeable clay hardpan and the preference for mafic bedrock, and some intermediate gradations occur. Shares some flora with coastal plain depressional wetlands like Central Appalachian Coastal Plain Non-Riverine Swamp and Wet Hardwood Forest.

### Crosswalk to State Name Examples:

Upland Depression Swamps (MD), Piedmont Upland Depression Swamp (VA)

### Crosswalk to State Wildlife Action Plans:

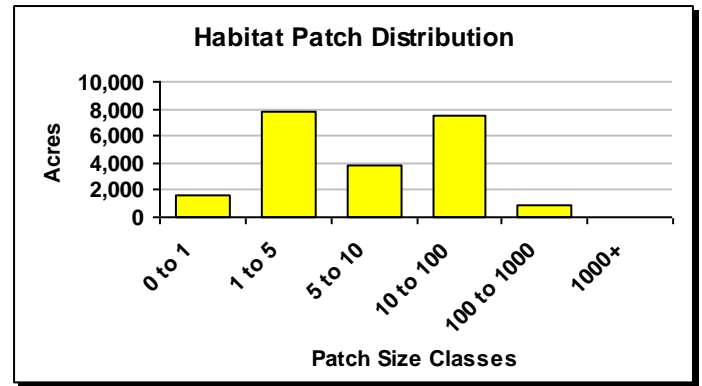
Upland Depression Swamps (MD), Wetland Habitat - Forested (VA)

## Places to Visit this Habitat:

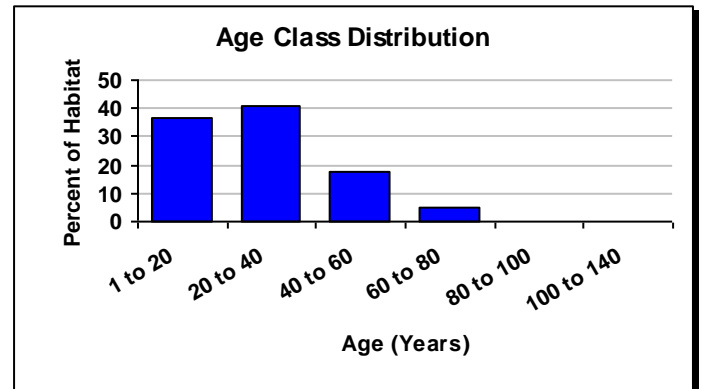
Cumberland State Forest | VA  
 Great Falls Park National Park | VA  
 Pocahontas State Park | VA  
 Powhatan State Park | VA

## Associated Species: *Appendix lists scientific names*

PLANTS: common greenbrier (*Smilax rotundifolia*), manna-grasses (*Glyceria* spp.), marsh hedge-nettle (*Stachys pilosa* var. *arenicola*), overcup oak (*Quercus lyrata*), rushes (*Juncus* spp), Sphagnum mosses (*Sphagnum* spp.), Virginia cut grass (*Leersia virginica*), Wood reed grass (*Cinna arundinacea*), woolly sedge (*Carex pellita*), yellow pitcherplant (*Sarracenia flava*)



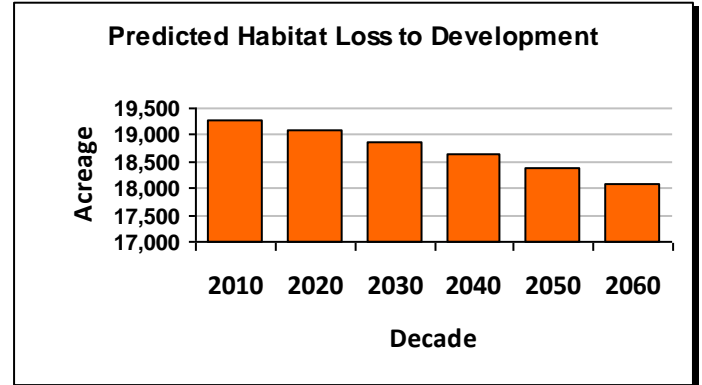
The average patch size for this habitat is 2 acres and the largest single patch is 154 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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.

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

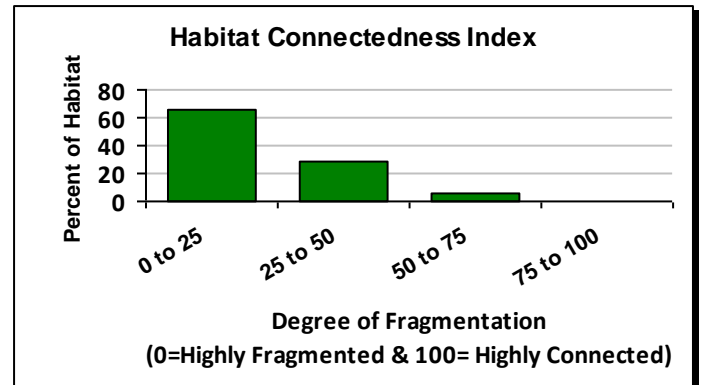
PLANTS: Small's purslane (*Portulaca smallii*), Virginia quillwort (*Isoetes virginica*)



This chart shows the predicted loss of habitat over the next five decades (1,205 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 24 acres per year.



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



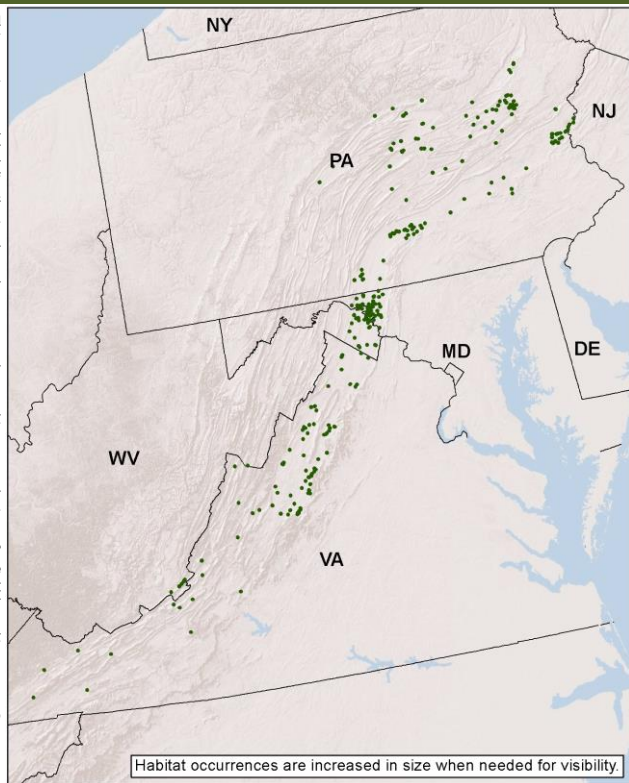
This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.

# Central Interior Highlands and Appalachian Sinkhole and Depression Pond



## Macrogroup: Central Hardwood Swamp

This map is a modeled distribution based on current data and is not a substitute for field based inventory. Contact your State Natural Heritage Ecologist for more information about this habitat.



© Elizabeth Byers (West Virginia Division of Natural Resources)

### Description:

A small pond and wetland habitat with variable vegetation found in basins of sinkholes or other isolated depressions on uplands from the Ozarks east to the northern Piedmont. Water depth may vary greatly on a seasonal basis and may be a meter deep or more in the winter. Some examples become dry in the summer. Structure varies from open water to herb-dominated to shrub-dominated, where buttonbush is a typical component. Tree-dominated examples typically contain oaks, sycamore, green ash, silver maple, and/or black gum. Many of these ponds have their geologic origin as a more-or-less complete karst collapse feature.

**State Distribution:** MD, NJ, PA, VA, WV

**Total Habitat Acreage:** 1,458

**Percent Conserved:** 7.9%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
PA	45%	653	9	23	621
VA	28%	415	54	11	350
MD	16%	232	5	8	219
WV	10%	150	5	0	145
NJ	1%	8	0	0	8

### Ecological Setting and Natural Processes:

Soils are very poorly drained, and surface water may be present for extended periods of time, occasionally becoming dry. Soils may be deep (1 meter or more), consisting of peat or muck, with parent material of peat, muck or alluvium.

### Similar Habitat Types:

Core distribution for this system is in the Ozarks and the hilly plateaus of western Kentucky and Tennessee. Because of their association with limestone geology, these ponds often sit in a fragmented agricultural landscape.

### Crosswalk to State Name Examples:

Upland Depression Swamps (MD), Shenandoah Valley Sinkhole Pond (Typic Type) (VA)

### Crosswalk to State Wildlife Action Plans:

Upland Depression Swamps (MD), Wetlands - Forested Wetlands and Bogs (PA), Wetland Habitat - Forested (VA), Floodplain Forests and Swamps (WV)

## Places to Visit this Habitat:

C & O Canal National Historical Park | MD  
George Washington and Jefferson National Forest | VA

## Associated Species: *Appendix lists scientific names*

**BIRDS:** belted kingfisher, eastern kingbird, green heron, red-shouldered hawk, willow flycatcher, wood duck

**PLANTS:** blackfoot quillwort (*Isoetes melanopoda*), dwarf burrhead (*Echinodorus tenellus*), northern st. john's-wort (*Hypericum boreale*), pretty dodder (*Cuscuta indecora*), seven-angle pipewort (*Eriocaulon aquaticum*)

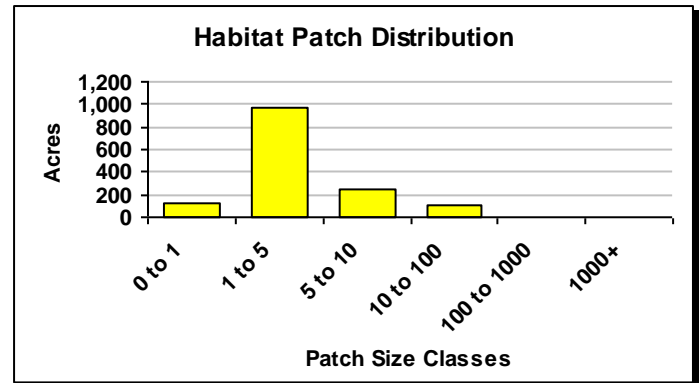
## Species of Concern (G1-G4): *Appendix lists scientific names*

**INSECTS:** *Nannaria ericacea* (a millipede)

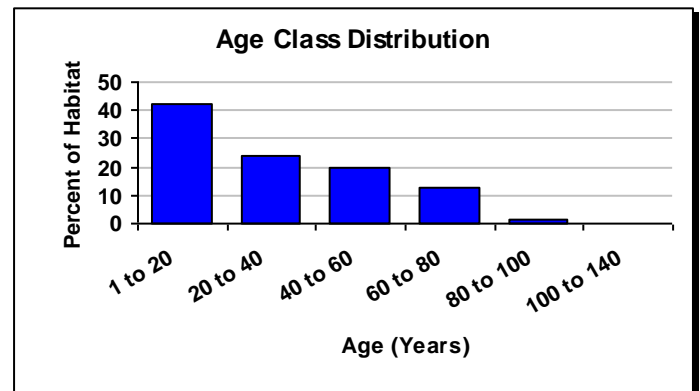
**PLANTS:** northeastern Bulrush (*Scirpus ancistrochaetus*), Virginia Sneezeweed (*Helenium virginicum*)



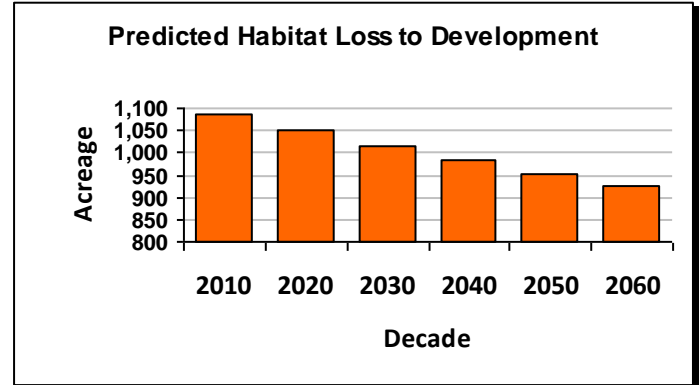
© Elizabeth Byers (West Virginia Division of Natural Resources)



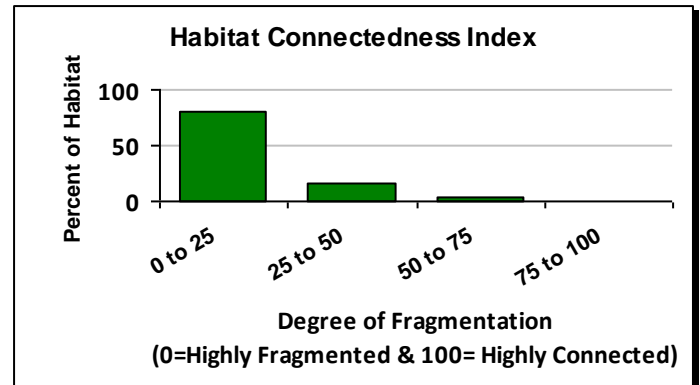
The average patch size for this habitat is 2 acres and the largest single patch is 15 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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.



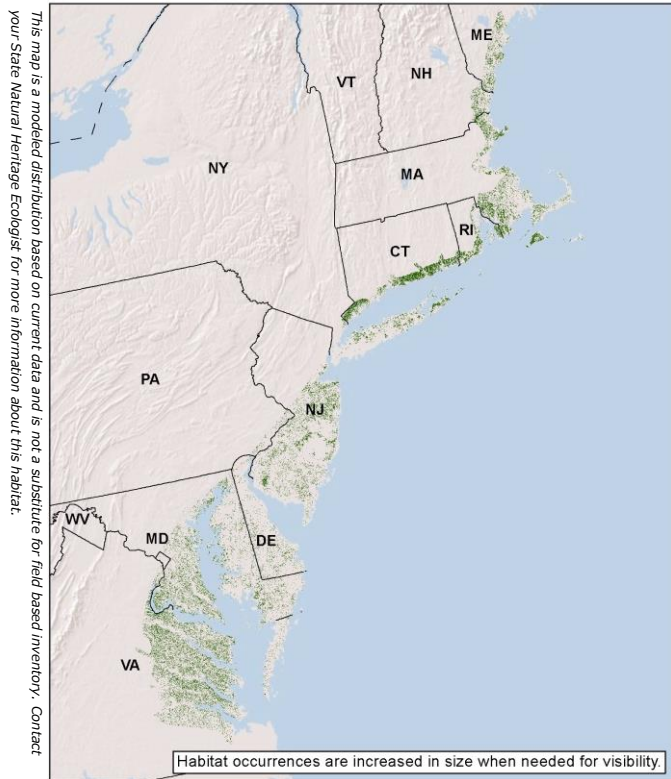
This chart shows the predicted loss of habitat over the next five decades (159 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 3 acres per year.



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: Central Oak-Pine



© Robert Coxe (Delaware Species Conservation & Research Program)

### 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.

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

**Total Habitat Acreage:** 2,145,627

**Percent Conserved:** 16.1%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
VA	30%	640,887	6,989	58,455	575,442
MD	18%	390,546	15,217	63,378	311,950
NJ	14%	307,871	33,545	21,502	252,824
MA	12%	263,921	7,480	56,949	199,492
CT	9%	193,794	10,721	15,363	167,709
NY	4%	87,825	4,814	9,065	73,946
ME	4%	76,298	1,516	4,818	69,964
DE	3%	72,016	2,951	10,883	58,182
RI	3%	65,305	5,315	6,166	53,825
NH	2%	35,847	2,181	5,113	28,553
PA	0%	10,632	478	1,637	8,517
DC	0%	687	0	2	684

### 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 (upland) (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 (*Symphotrichum concolor*), Purple Needlegrass (*Aristida purpurascens*), Post Oak (*Quercus stellata*), Pale Green Orchid (*Platanthera flava*), Large Whorled Pogonia (*Isotria verticillata*)

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

**BIRDS:** yellow-throated warbler

**MAMMALS:** delmarva fox squirrel

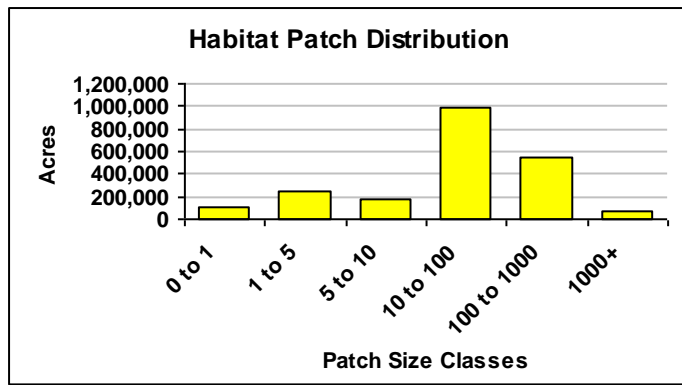
**HERPTILES:** eastern box turtle, green snake, marbled salamander

**INSECTS:** frosted elfin

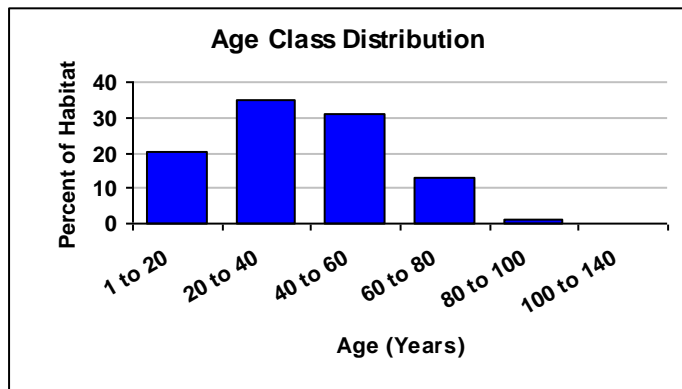
**PLANTS:** Featherfoil (*Hottonia inflata*), Sandplain Flax (*Linum intercursum*), Bushy Rockrose (*Helianthemum dumosum*), Swamp-pink (*Helonias bullata*), Rose Coreopsis (*Coreopsis rosea*), Cranefly Orchid (*Tipularia discolor*), Allegheny Mountains Crowfoot (*Ranunculus allegheniensis*), Small Whorled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



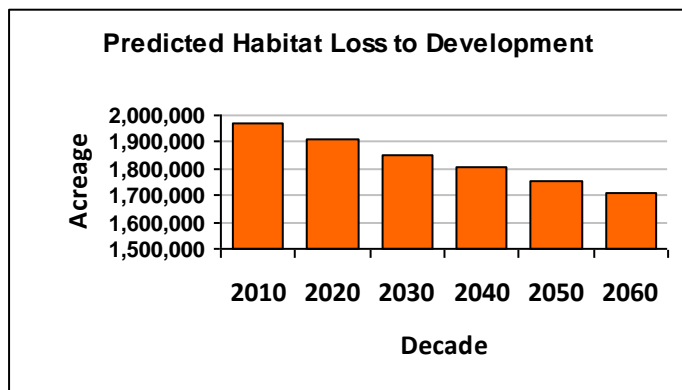
© Robert Coxie (Delaware Species Conservation & Research Program)



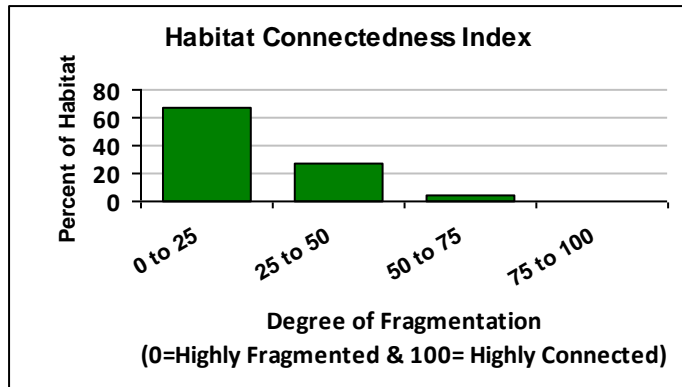
The average patch size for this habitat is 4 acres and the largest single patch is 3,742 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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 (261,920 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 5,238 acres per year.



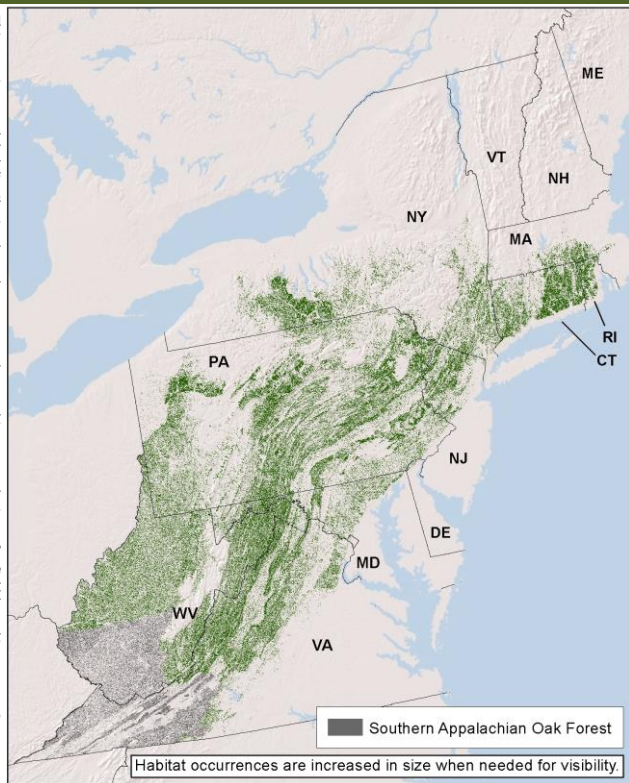
This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.

# Northeastern Interior Dry-Mesic Oak Forest



## Macrogroup: Central Oak-Pine

This map is a modeled distribution based on current data and is not a substitute for field based inventory. Contact your State Natural Heritage Ecologist for more information about this habitat.



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### 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 Wildlife Action Plans:

Hardwood Forest - Mixed oak-beech forests (DC), Mesic Deciduous Forests (MD), Upland forests - deciduous forest (NJ), Oak Forest (NY), Deciduous/Mixed Forest (upland) (PA), Forest Habitat - Deciduous Forest (VA), Oak/Hickory and Dry/Mesic Oak Forest (WV)

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

**Total Habitat Acreage:** 17,032,701

**Percent Conserved:** 19.1%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
PA	37%	6,264,459	220,896	1,188,152	4,855,411
WV	22%	3,732,111	40,981	289,214	3,401,916
VA	15%	2,588,383	299,870	452,215	1,836,298
NY	11%	1,811,589	19,982	155,854	1,635,753
CT	6%	965,419	38,892	123,495	803,032
MD	4%	678,802	60,757	111,810	506,235
NJ	3%	559,819	117,260	47,837	394,722
MA	1%	242,876	5,771	34,365	202,741
RI	1%	179,468	8,231	29,188	142,049
DE	0%	8,229	59	2,573	5,596
DC	0%	1,546	0	0	1,546

### 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)

## 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-lobe 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

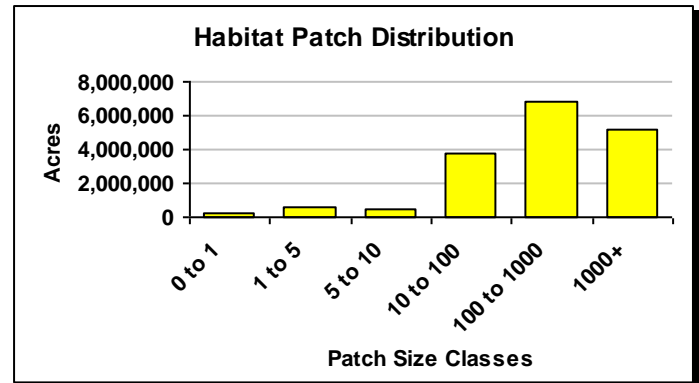
**HERPTILES:** big levels salamander, milk snake, peaks of otter salamander

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

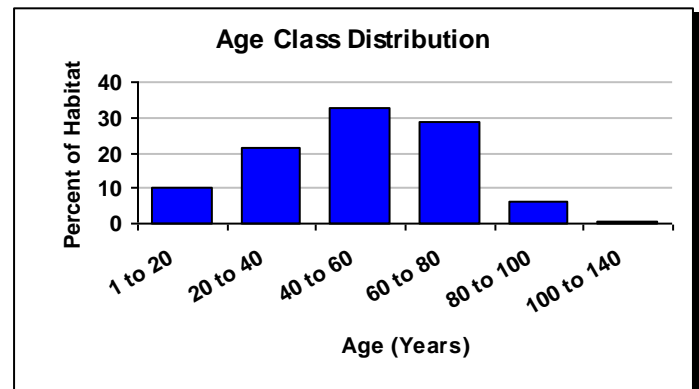
**PLANTS:** climbing fern (*Lygodium palmatum*), goldenseal (*Hydrastis canadensis*), small whorled pogonia (*Isotria medeoloides*)



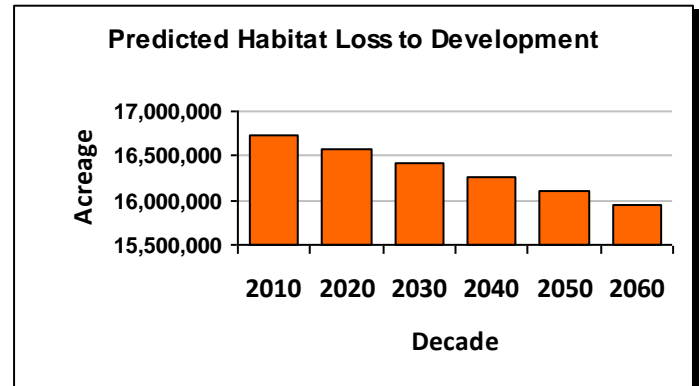
© Gary P. Fleming (Virginia Department of Conservation & Recreation Natural Heritage Program)



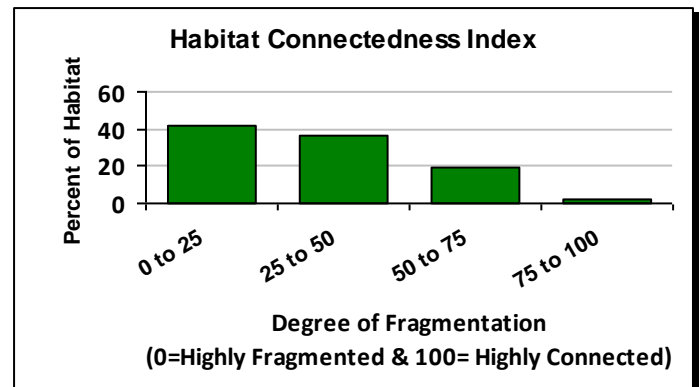
The average patch size for this habitat is 13 acres and the largest single patch is 20,946 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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



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

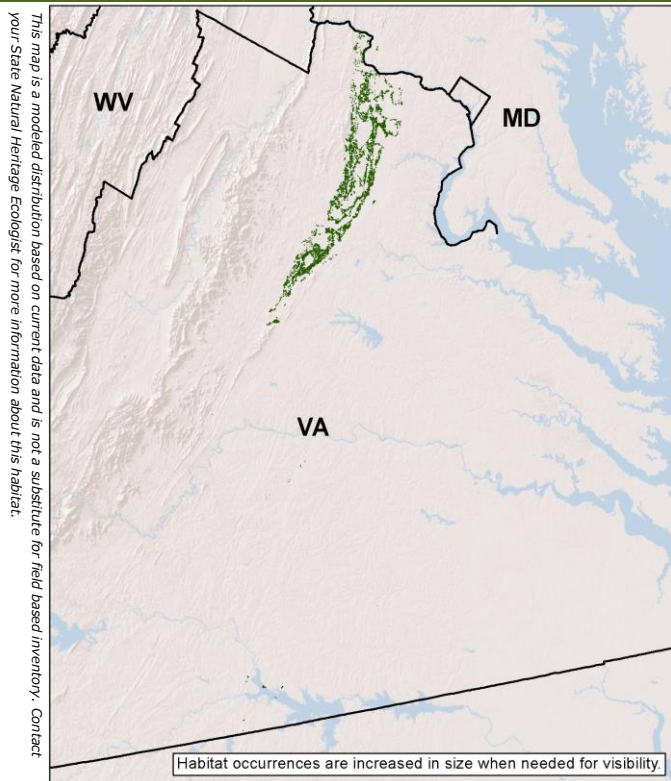


This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.





## Macrogroup: Central Oak-Pine



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

### Description:

A hardwood woodland that occurs where a particularly dense clay hardpan has developed over a range of mafic rocks (igneous rocks rich in iron and magnesium), creating dry conditions for plants despite the presence of deep soil. Open woodlands and more limited areas of shallow glade-like vegetation are the usual cover. Typical canopy trees include white oak, post oak, pignut hickory, and white ash. The open canopy leads to a better developed herb layer than in most Piedmont forests, one that is usually grassy. Some sites may have once supported open prairies or prairie savannas when they burned more frequently.

### State Distribution: MD, VA

Total Habitat Acreage: 49,430

Percent Conserved: 2.4%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
VA	100%	49,216	78	1,023	48,115
MD	0%	214	47	31	136

### Ecological Setting and Natural Processes:

A system of the Virginia and Maryland Piedmont and southward. It is usually on flatter uplands, sometimes on narrow ridges. Most soils that formed on the mafic bedrock are circumneutral to basic. Fire was probably once the most important natural disturbance, but the elimination of fire in the Piedmont makes this difficult to observe on most of the modern landscape. In our region, occurs as small to large patches in a largely agricultural landscape.

### Similar Habitat Types:

This system is distinguished from others in the Piedmont by distinctive occurrence on hardpan soils in particular geologic settings. Usually adjacent to Northeast Interior Dry-Mesic Oak Forest or Southern Piedmont Mesic Forest.

### Crosswalk to State Name Examples:

Dry Oak-Pine Forests (MD), Southern Piedmont Hardpan Forest (VA)

### Crosswalk to State Wildlife Action Plans:

Dry Oak-Pine Forests (MD), Forest Habitat - Deciduous Forest (VA)

## Places to Visit this Habitat:

C & O Canal National Historical Park | MD  
 Bull Run Mountains State Natural Area Preserve | VA  
 Conway Robinson Memorial State Forest | VA  
 Cumberland State Forest | VA

## Associated Species: *Appendix lists scientific names*

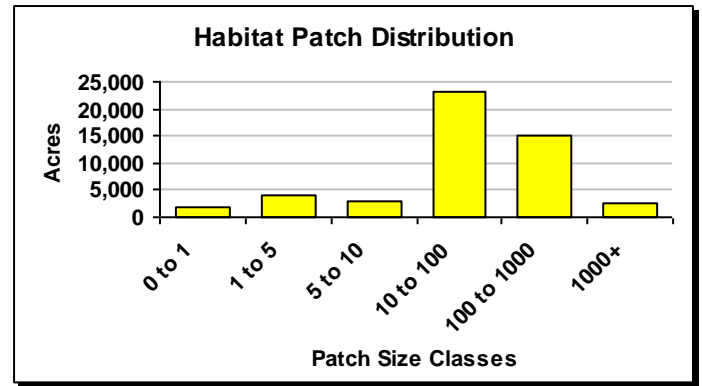
PLANTS: bluehearts (*Buchnera americana*), grove sandwort (*Moehringia lateriflora*), old-field milkvine (*Matelea decipiens*), prairies bold goldenrod (*Oligoneuron rigidum* var. *rigidum*), purple milkweed (*Asclepias purpurascens*), southern shagbark hickory (*Carya carolinae-septentrionalis*), spoon-shape barbara's-buttons (*Marshallia obovata* var. *obovata*), susquehanna cherry (*Prunus pumila* var. *susquehanae*), tall dropseed (*Sporobolus compositus* var. *compositus*), winged-loosestrife (*Lythrum alatum*)

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

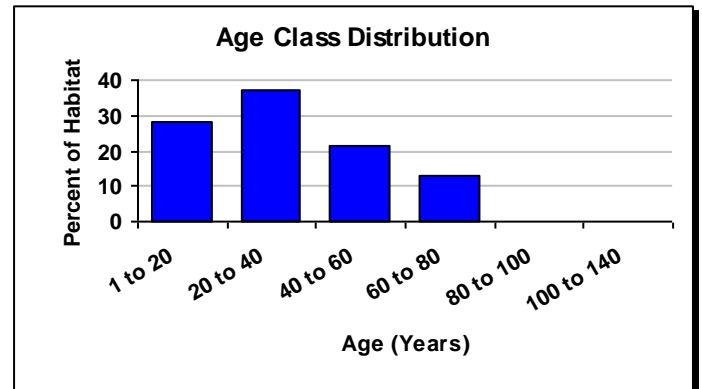
PLANTS: buffalo clover (*Trifolium reflexum*), Torrey's mountainmint (*Pycnanthemum torrei*), winter quillwort (*Isoetes hyemalis*)



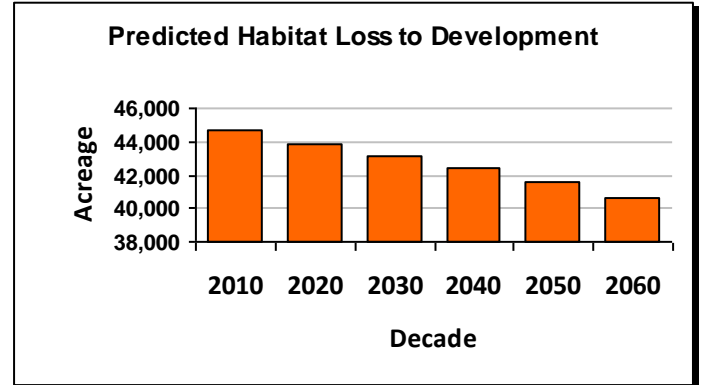
© Gary P. Fleming (Virginia Department of Conservation & Recreation Natural Heritage Program)



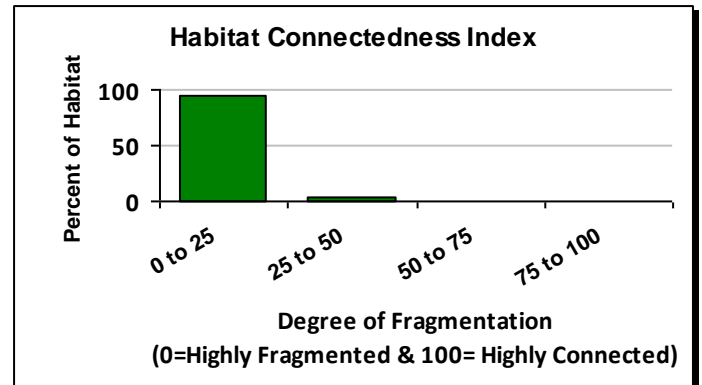
The average patch size for this habitat is 6 acres and the largest single patch is 1,239 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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.



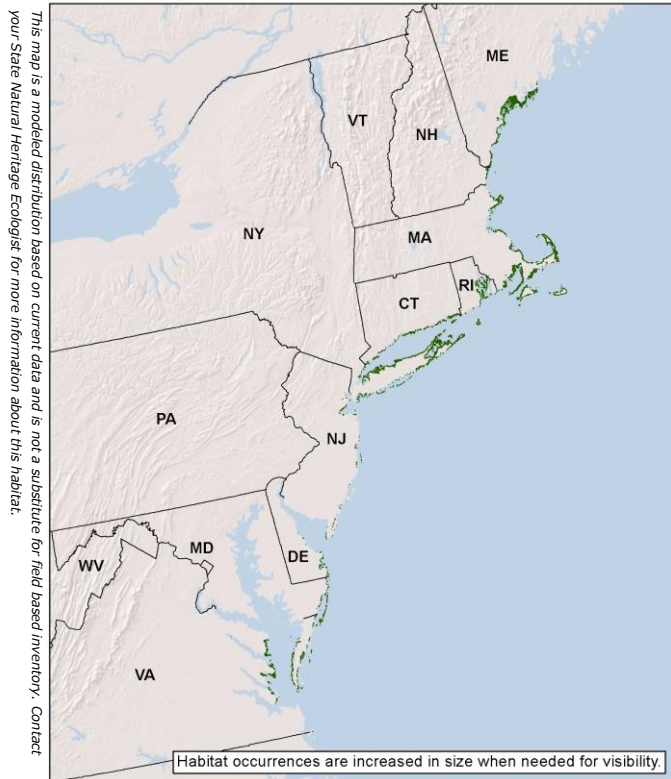
This chart shows the predicted loss of habitat over the next five decades (3,984 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 80 acres per year.



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: Central Oak-Pine



© Robert Coxe (Delaware Species Conservation & Research Program)

### 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 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)

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

**Total Habitat Acreage:** 127,121

**Percent Conserved:** 20.3%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
MA	26%	32,935	5,273	4,733	22,930
ME	25%	32,256	1,977	1,198	29,081
NY	24%	29,958	2,755	2,259	24,944
VA	11%	14,061	1,532	663	11,867
RI	6%	7,968	602	1,453	5,913
CT	4%	5,511	990	394	4,127
NJ	1%	1,266	479	85	703
DE	1%	1,233	18	495	721
MD	1%	1,157	593	116	447
NH	1%	774	5	161	608

### 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)

## 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 serpentina*), Sundial Lupine (*Lupinus perennis*), Butterfly Milkweed (*Asclepias tuberosa*), Eggleaf Rosette Grass (*Dichanthelium ovale* var. *ovale*), Eastern Silvery Aster (*Symphotrichum concolor*), Small White Leek (*Allium tricoccum*), Coastal Plain Blue-eyed-grass (*Sisyrinchium fuscum*), Yellow Thistle (*Cirsium horridulum* var. *horridulum*)

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

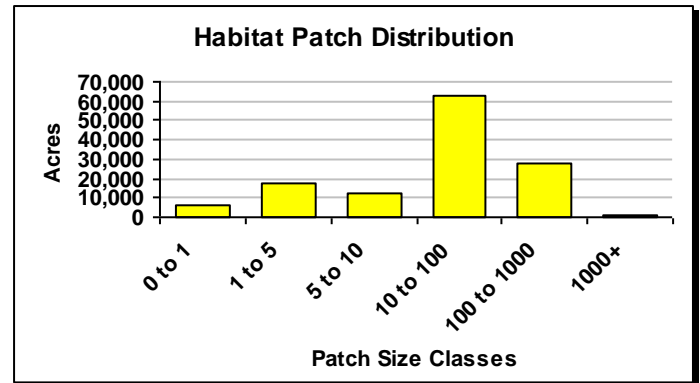
**HERPTILES:** copperhead, eastern box turtle

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

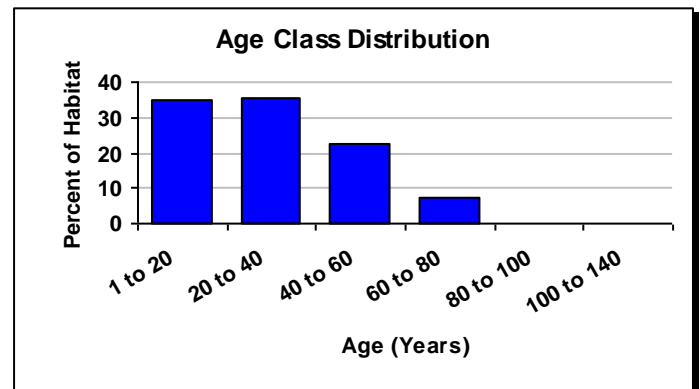
**PLANTS:** Bushy Rockrose (*Helianthemum dumosum*), Broom Crowberry (*Corema conradii*), Nantucket Shadbush (*Amelanchier nantucketensis*), Slender Blue Flag (*Iris prismatica*)



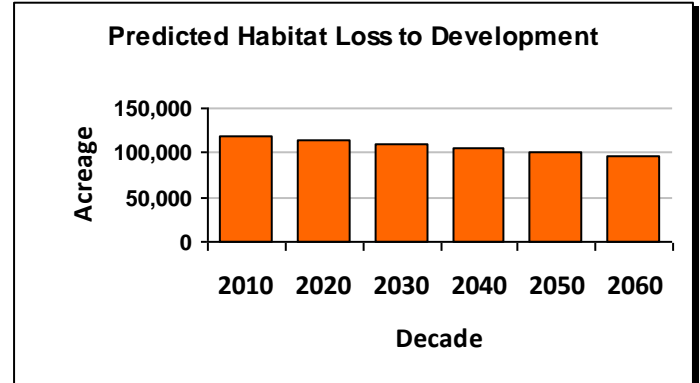
© Robert Coxie (Delaware Species Conservation & Research Program)



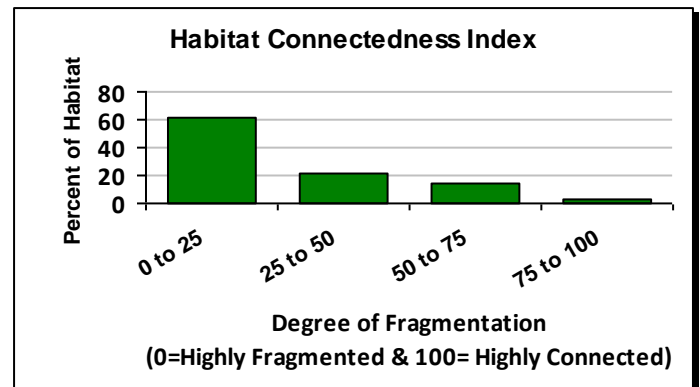
The average patch size for this habitat is 4 acres and the largest single patch is 385 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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.



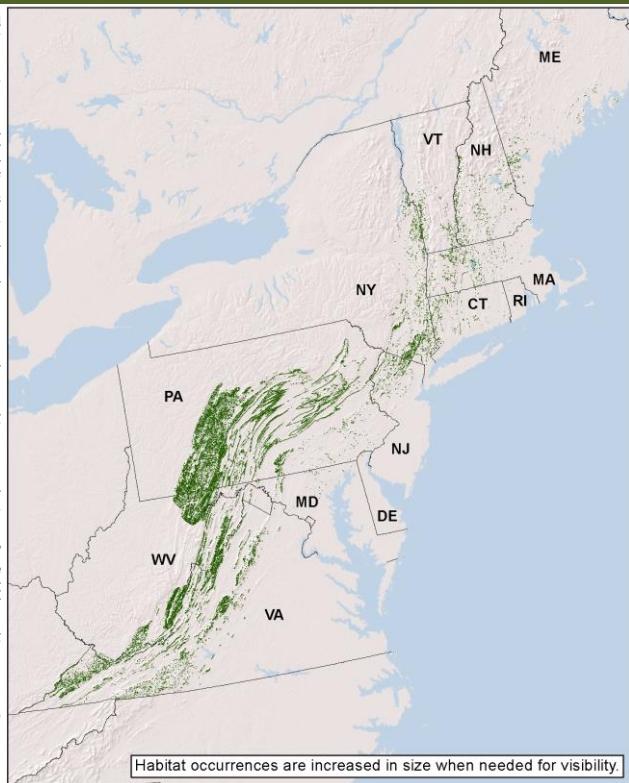
This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.

# Central Appalachian Pine-Oak Rocky Woodland



## Macrogroup: Central Oak-Pine

This map is a modeled distribution based on current data and is not a substitute for field based inventory. Contact your State Natural Heritage Ecologist for more information about this habitat.



© Elizabeth Thompson (Vermont Land Trust)

### 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.

**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%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
PA	55%	310,493	14,587	101,740	194,166
VA	17%	93,666	25,531	25,815	42,321
WV	12%	70,182	3,064	17,481	49,637
MD	5%	28,081	1,416	6,178	20,488
NY	4%	24,145	2,574	6,526	15,045
MA	2%	8,545	463	2,840	5,241
NJ	1%	8,243	3,245	1,440	3,558
NH	1%	7,739	286	1,353	6,099
VT	1%	6,188	192	377	5,619
CT	1%	4,918	653	957	3,309
ME	1%	4,009	321	233	3,455
RI	0%	38	0	5	33
DE	0%	24	1	10	14
DC	0%	4	0	0	4

### 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)

### 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 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

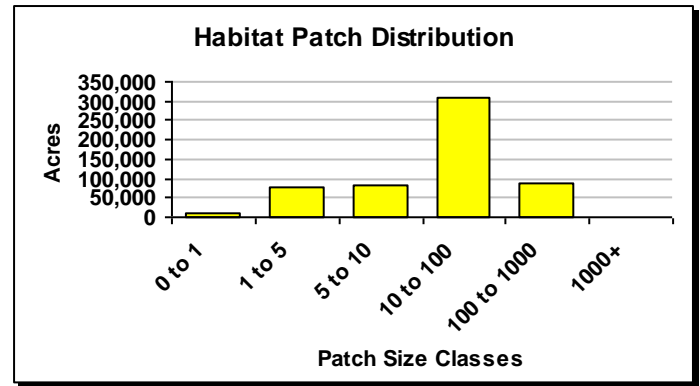
**MAMMALS:** allegheny woodrat, appalachian cottontail, eastern small-footed myotis, kittatiny red-backed vole, long-tailed shrew, northern myotis, southern flying squirrel

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

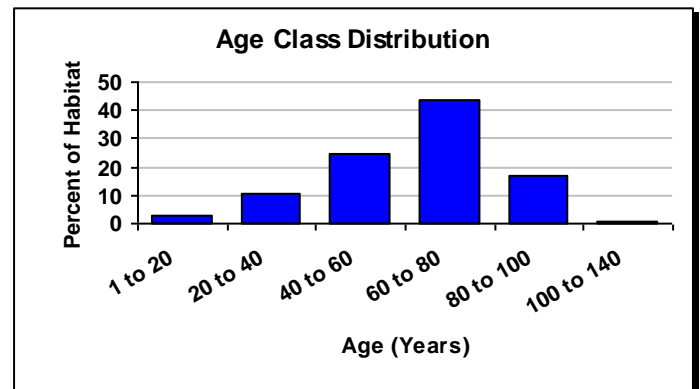
**INSECTS:** aureolaria seed borer, barrens chaetagnalea, barrens itame, barrens xylotype, blueberry sawfly, edward's hairstreak, Gerhard's underwing moth, northern barrens tiger beetle, oblique zale, pine-devil moth, pink sawfly, red-winged sawfly, similar underwing, sleepy duskywing, southern pine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



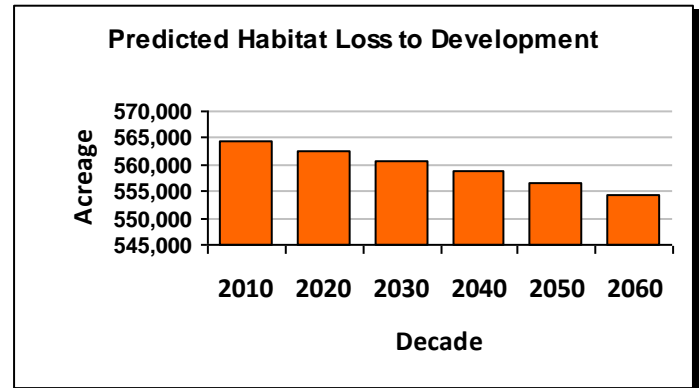
© Maine Natural Areas Program



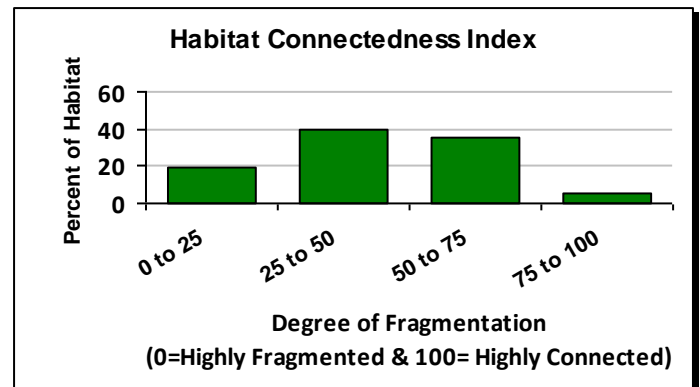
The average patch size for this habitat is 7 acres and the largest single patch is 1,202 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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



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



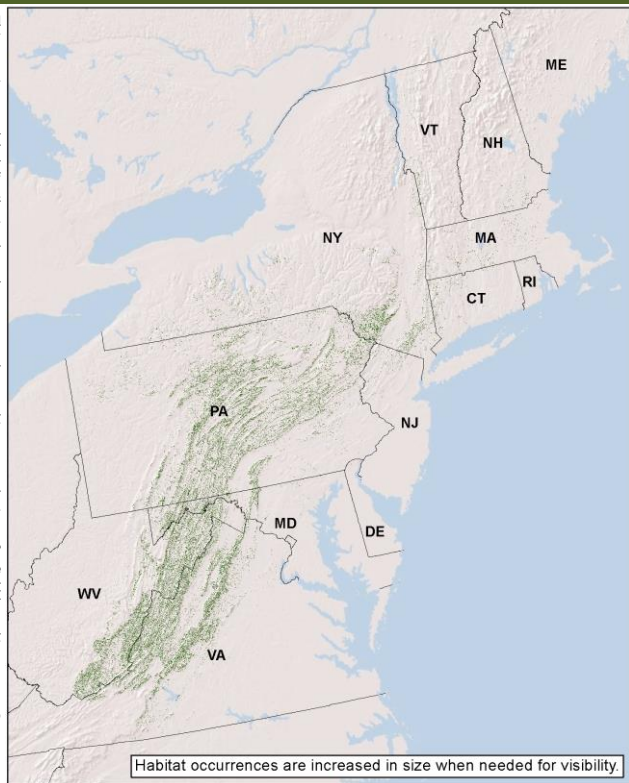
This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.

# Central Appalachian Dry Oak-Pine Forest



## Macrogroup: Central Oak-Pine

This map is a modeled distribution based on current data and is not a substitute for field based inventory. Contact your State Natural Heritage Ecologist for more information about this habitat.



© Elizabeth Thompson (Vermont Land Trust)

### Description:

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

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

**Total Habitat Acreage:** 3,845,317

**Percent Conserved:** 34.1%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
PA	39%	1,496,364	72,782	473,996	949,587
VA	26%	982,148	193,537	237,912	550,699
WV	20%	777,259	19,512	163,916	593,831
NY	8%	316,571	14,301	42,043	260,226
MD	3%	127,564	18,158	29,060	80,346
MA	1%	48,100	2,590	14,475	31,035
CT	1%	27,933	3,177	5,067	19,688
VT	1%	25,031	874	1,934	22,223
NJ	1%	23,303	9,633	3,516	10,154
NH	0%	15,155	270	2,413	12,472
ME	0%	4,783	156	398	4,229
RI	0%	938	16	124	799
DE	0%	164	2	33	129
DC	0%	4	0	0	4

### Crosswalk to State Name Examples:

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

### Ecological Setting and Natural Processes:

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

### Similar Habitat Types:

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

### Crosswalk to State Wildlife Action Plans:

Upland Forest - Dry Oak Forests (CT), Hardwood Forest - Chestnut oak forests (DC), Upland Forest (MA), Dry Oak-Pine Forests (MD), Deciduous and Mixed Forest (ME), Appalachian Oak Pine Forest (NH), Upland forests - mixed deciduous-coniferous forest (NJ), Oak-Pine Forest (NY), Deciduous/Mixed Forest (upland) (PA), Deciduous Forests - Deciduous Forest Oak/Heath (RI), Forest Habitat - Mixed Forest (VA), Oak-Pine-Northern Hardwood Forest - Dry Oak Forest (VT), Oak/Heath and Oak/White Pine Forests (WV)

## Places to Visit this Habitat:

Savage River State Forest | MD  
 Delaware Water Gap | NJ  
 Bald Eagle State Forest | PA  
 George Washington and Jefferson National Forest | VA  
 Monongahela National Forest | WV

## Associated Species: *Appendix lists scientific names*

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

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

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

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

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

**BIRDS:** cerulean warbler, golden-winged warbler

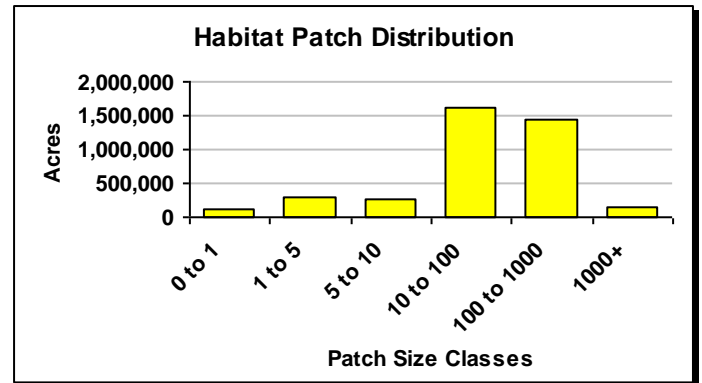
**HERPTILES:** black rat snake, five-lined skink, timber rattlesnake

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

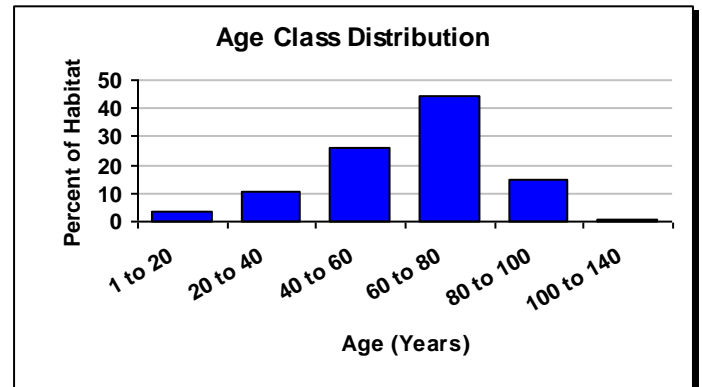
**PLANTS:** Kate's mountain clover (*Trifolium virginicum*), white alumroot (*Heuchera alba*), sword-leaved phlox (*Phlox buckleyi*), mountain parsley (*Taenidia montana*), climbing fumitory (*Adlumia fungosa*)



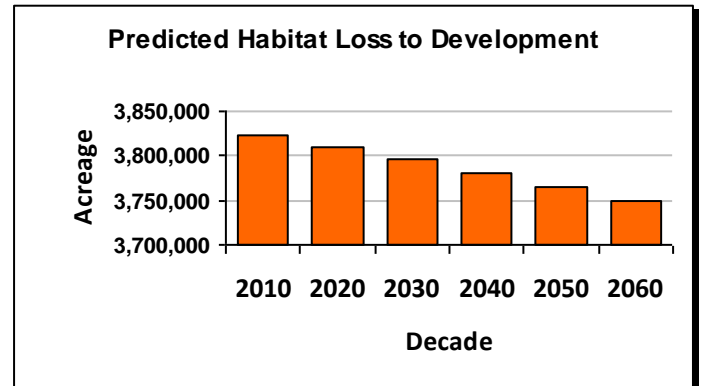
© Eric Sorenson (Vermont Fish & Wildlife)



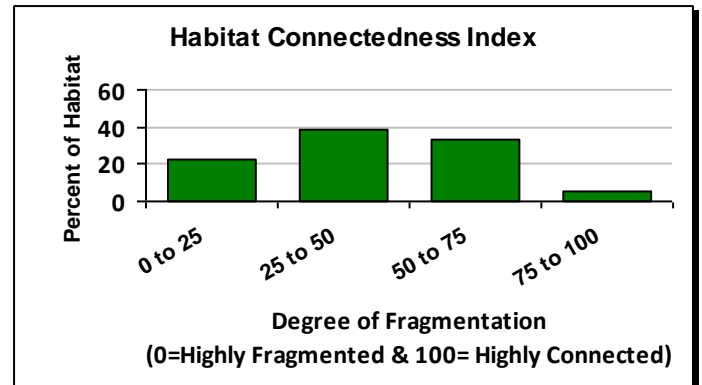
The average patch size for this habitat is 7 acres and the largest single patch is 4,519 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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 (74,813 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 1,496 acres per year.



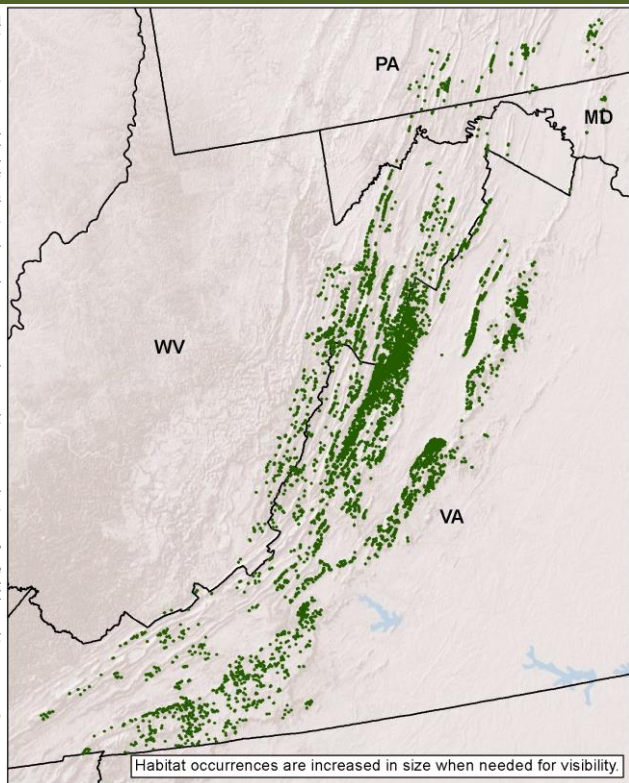
This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.





## Macrogroup: Central Oak-Pine

This map is a modeled distribution based on current data and is not a substitute for field based inventory. Contact your State Natural Heritage Ecologist for more information about this habitat.



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

### Description:

A conifer forest of slopes and ridges at high elevations in the Southern Appalachians. Table mountain pine is typical and often dominant, occurring with pitch pine, Virginia pine, or Carolina hemlock. Chestnut oak, scarlet oak, and scrub oak are usually present and are sometimes abundant in examples that have not burned recently. A dense heath shrub layer is typical; herbs are usually sparse but may be more abundant and shrubs less dense when fires occurred more frequently. Periodic fire presumably also maintained a more open woodland canopy structure in these communities. In some areas pines may be able to maintain dominance due to edaphic conditions, such as very shallow soil or extreme exposure, but most sites appear eventually to succeed to oak in the absence of fire.

### Ecological Setting and Natural Processes:

This system occurs on the most extreme of convex landforms-- sharp ridges and adjacent upper slopes. At the northern end of its range in the central Appalachians, it is found from elevations of about 1750 to 4000 feet. Underlying rocks are acidic and soils are infertile, shallow and droughty. A thick duff layer and volatile heath shrubs create a strongly fire-prone habitat. Disturbance from southern pine beetle outbreaks can be system-changing.

### Similar Habitat Types:

Settings are similar to those for Central Appalachian Pine-Oak Rocky Woodland and Central and Southern Appalachian Montane Oak Forest, and if the pines are lost, the distinction between those systems (and other adjacent oak or oak-pine systems) and the current one becomes blurred.

### Crosswalk to State Wildlife Action Plans:

Dry Oak-Pine Forests (MD), Coniferous Forest (upland) (PA), Forest Habitat - Coniferous Forest (VA), Dry Rocky Pine/Oak Forests and Woodlands (WV)

**State Distribution:** MD, PA, VA, WV

**Total Habitat Acreage:** 33,532

**Percent Conserved:** 69.8%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
VA	75%	25,281	12,297	6,698	6,286
WV	21%	7,014	230	3,390	3,394
PA	3%	1,079	161	511	407
MD	0%	159	48	67	43

### Crosswalk to State Name Examples:

Dry Oak-Pine Forests (MD), Coniferous Forest (Upland) (PA), Carolina Hemlock Forest (VA), Dry Rocky Pine/Oak Forests And Woodlands (WV)

## Places to Visit this Habitat:

Rocky Gap State Park | MD  
 Buchanan State Forest | PA  
 Michaux State Forest | PA  
 George Washington and Jefferson National Forest | VA  
 Monongahela National Forest | WV

## Associated Species: *Appendix lists scientific names*

**BIRDS:** golden-crowned kinglet, red-breasted nuthatch

**PLANTS:** bristly sarsaparilla (*Aralia hispida*), canada frostweed (*Helianthemum canadense*), fragile fern (*Cystopteris fragilis*), green alder (*Alnus viridis*), heart-leaved paper birch (*Betula papyrifera* var. *cordifolia*), roundleaf dogwood (*Cornus rugosa*), sharp-scaled mannagrass (*Glyceria acutiflora*), virginia least trillium (*Trillium pusillum* var. *virginianum*), yellow nodding ladies'-tresses (*Spiranthes ochroleuca*)

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

**BIRDS:** black vulture, peregrine falcon

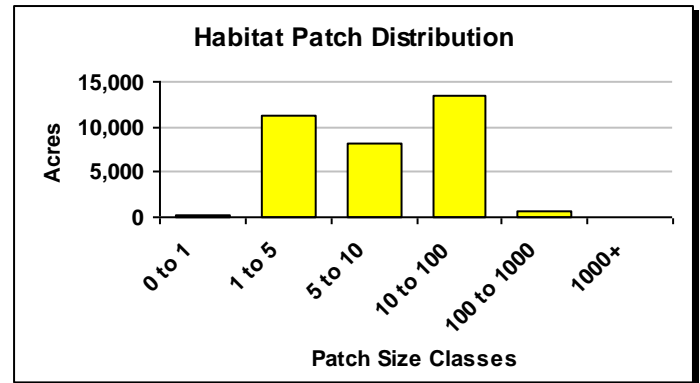
**HERPTILES:** big levels salamander, white-spotted salamander

**INSECTS:** boreal fan moth

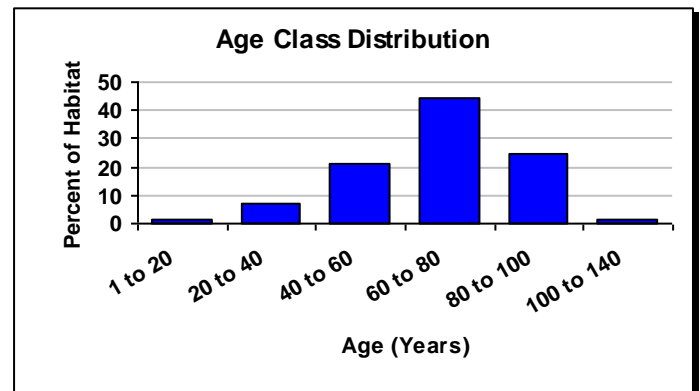
**PLANTS:** silverling (*Paronychia argyrocoma*)



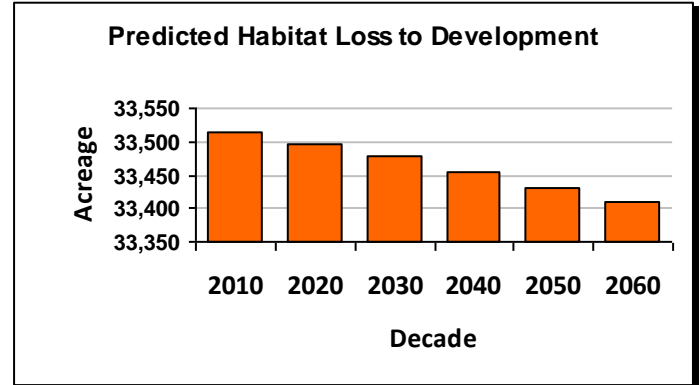
© Gary P. Fleming (Virginia Department of Conservation & Recreation Natural Heritage Program)



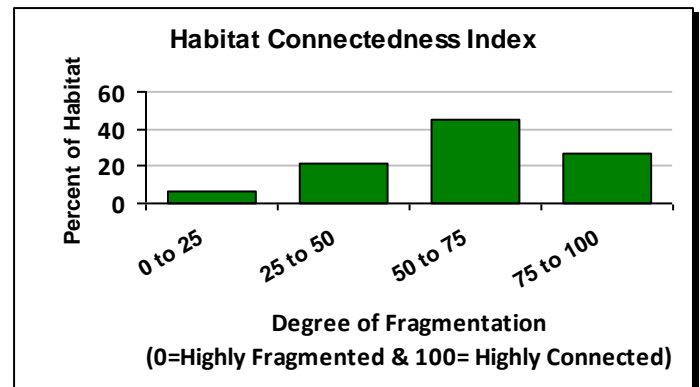
The average patch size for this habitat is 5 acres and the largest single patch is 228 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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 (107 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 2 acres per year.

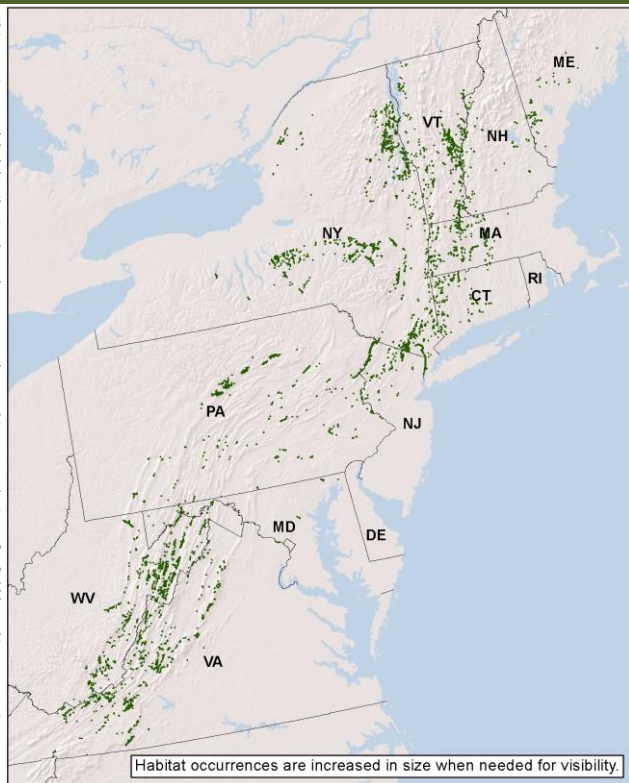


This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.



## Macrogroup: Cliff and Talus

This map is a modeled distribution based on current data and is not a substitute for field based inventory. Contact your State Natural Heritage Ecologist for more information about this habitat.



© West Virginia Division of Natural Resources

### 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.

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

**Total Habitat Acreage:** 56,454

**Percent Conserved:** 35.7%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
NY	27%	15,195	3,598	2,068	9,528
PA	17%	9,864	512	4,339	5,013
WV	15%	8,404	301	1,969	6,133
VA	13%	7,441	1,501	1,187	4,752
VT	11%	6,359	206	565	5,589
MA	7%	3,683	470	1,276	1,937
CT	3%	1,842	296	233	1,313
NJ	2%	1,389	740	129	520
NH	2%	1,010	58	263	689
ME	2%	858	246	49	563
MD	1%	409	150	6	252

### 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)

### 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

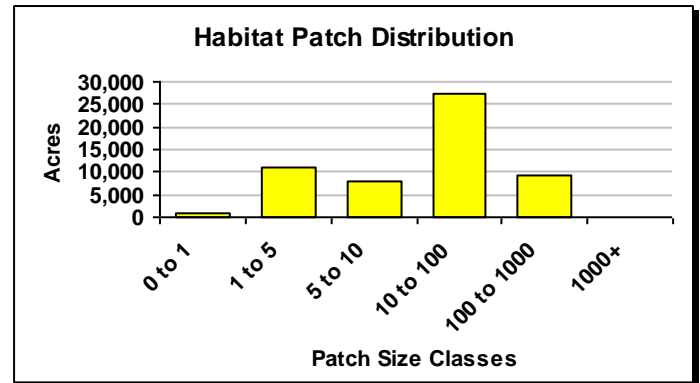
**PLANTS:** cliff muhly (*Muhlenbergia sobolifera*), climbing fumitory (*Adlumia fungosa*), downy arrow-wood (*Viburnum rafinesquianum*), glade fern (*Diplazium pycnocarpon*), ledge spike-moss (*Selaginella rupestris*), linear-leaved milkweed (*Asclepias verticillata*), michaux's stitchwort (*Minuartia 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*

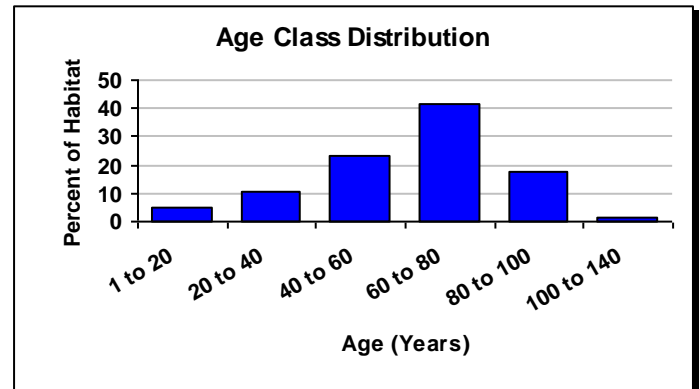
**PLANTS:** back's sedge (*Carex backii*), black maple (*Acer nigrum*), goldie's wood fern (*Dryopteris goldiana*)



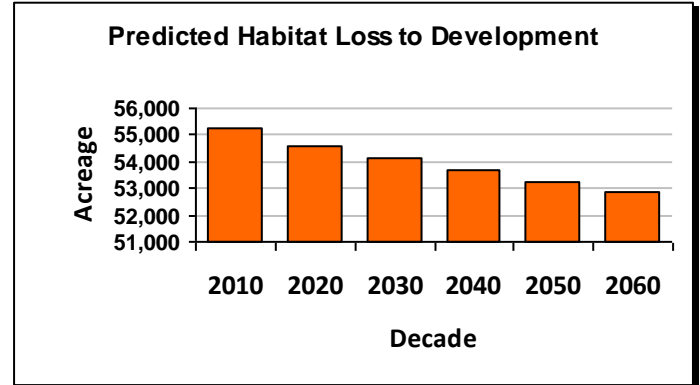
© West Virginia Division of Natural Resources



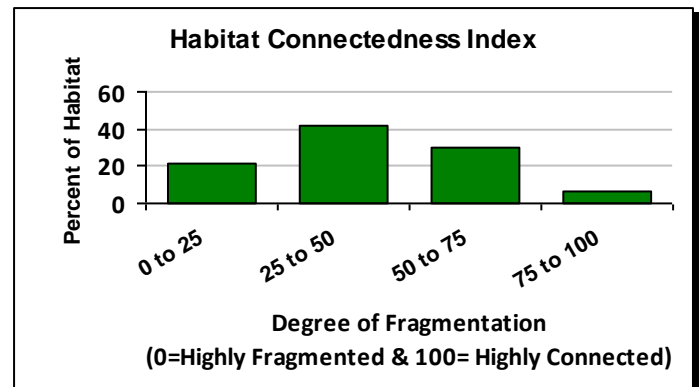
The average patch size for this habitat is 6 acres and the largest single patch is 408 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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 (2,372 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 47 acres per year.

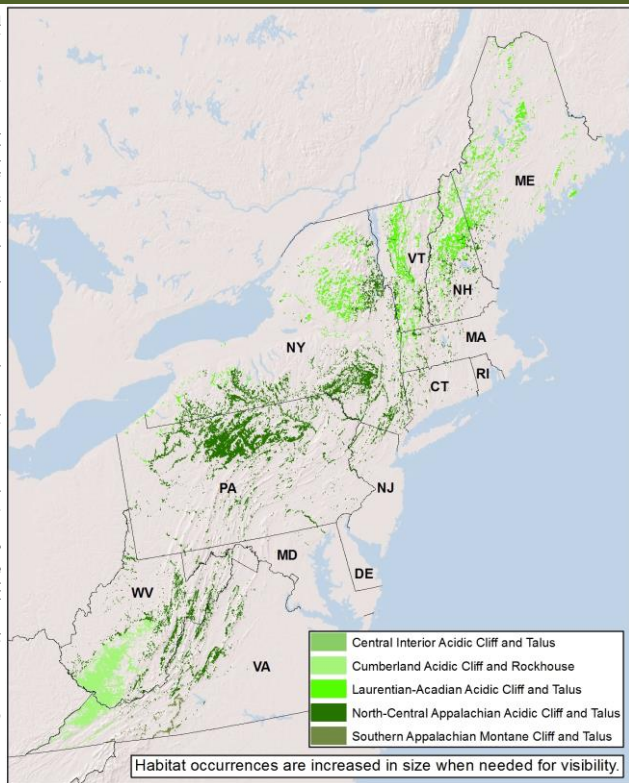


This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.



## Macrogroup: Cliff and Talus

This map is a modeled distribution based on current data and is not a substitute for field based inventory. Contact your State Natural Heritage Ecologist for more information about this habitat.



© Eric Sorenson (Vermont Fish & Wildlife)

### 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 (NY), Rock Habitats (PA), Barren Habitat - Balds (VA), Cliffs and Talus Slopes - Boreal Acidic Cliff (VT), Cliffs and Talus Slopes - Open Talus (VT), Cliffs and Talus Slopes - Temperate Acidic Cliff (VT), Rock Outcrops/Cliffs/Talus (WV)

**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%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
PA	36%	204,775	28,707	101,430	74,638
NY	19%	107,441	35,533	15,398	56,510
WV	16%	90,419	3,952	8,344	78,122
VA	8%	43,020	6,885	7,542	28,592
NH	6%	35,115	17,793	7,648	9,674
ME	6%	35,028	14,019	4,641	16,368
VT	6%	34,675	6,169	7,047	21,459
MA	1%	6,149	1,715	1,313	3,121
NJ	0%	2,675	1,324	531	820
CT	0%	2,061	300	457	1,303
MD	0%	437	72	180	185
DE	0%	4	0	0	4
RI	0%	3	0	0	3
DC	0%	1	0	0	1

### Crosswalk to State Name Examples:

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

## 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

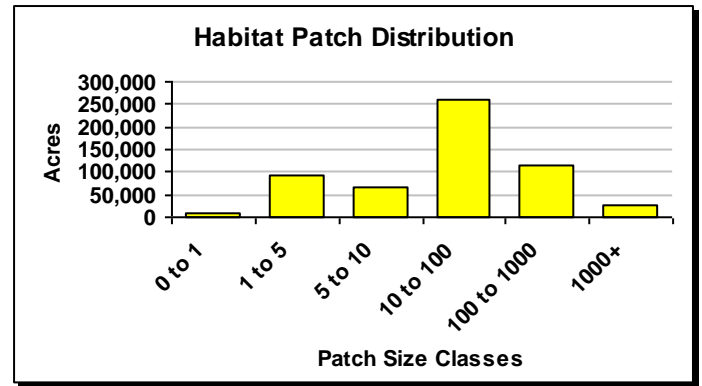
MAMMALS: allegheny woodrat, rock vole

HERPTILES: northern copperhead, timber rattlesnake

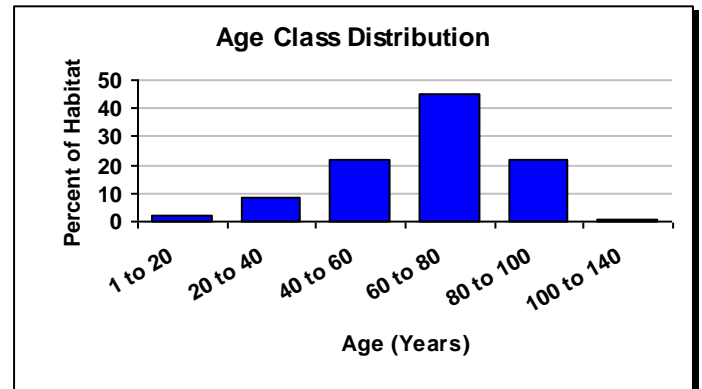
PLANTS: green spleenwort (*Asplenium trichomanes-ramosum*), Alabama lipfern (*Cheilanthes alabamensis*), silverling (*Paronychia argyrocoma*)



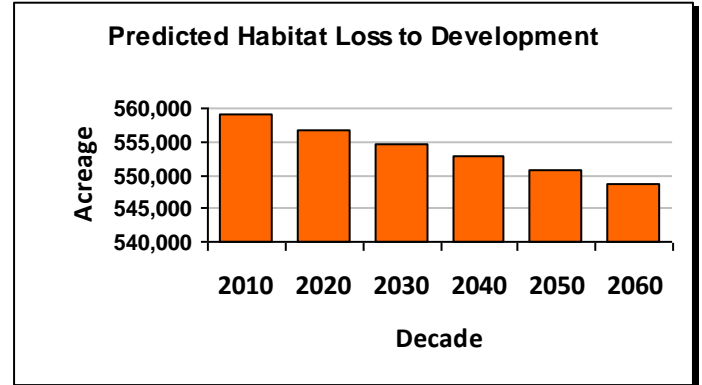
© Maine Natural Areas Program



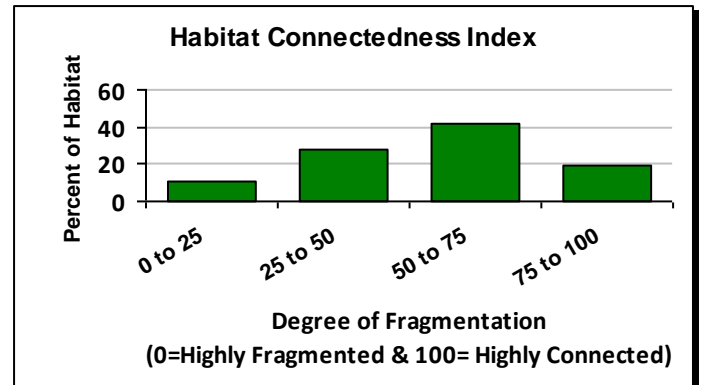
The average patch size for this habitat is 7 acres and the largest single patch is 2,038 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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



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

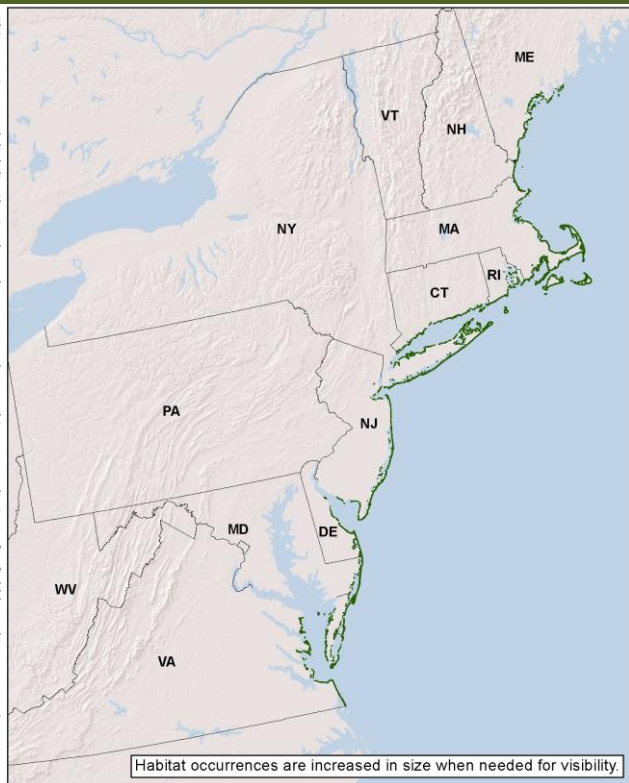


This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.



## Macrogroup: Coastal Grassland & Shrubland

This map is a modeled distribution based on current data and is not a substitute for field based inventory. Contact your State Natural Heritage Ecologist for more information about this habitat.



© Kathleen Strakosch Walz (New Jersey Natural Heritage Program)

### 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.

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

**Total Habitat Acreage:** 96,690

**Percent Conserved:** 37.5%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
MA	37%	35,602	9,686	4,776	21,140
NY	22%	20,888	2,172	3,313	15,403
VA	11%	10,964	4,785	1,702	4,477
NJ	10%	9,985	3,128	57	6,800
ME	5%	4,443	355	109	3,979
DE	4%	4,074	170	1,848	2,056
RI	4%	3,762	357	179	3,226
MD	3%	3,183	2,334	282	567
CT	3%	2,905	349	376	2,180
NH	1%	882	8	243	631

### Crosswalk to State Name Examples:

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

### Crosswalk to State Wildlife Action Plans:

Upland Herbaceous - Coastal Dune (CT), Tidal Wetland - Intertidal Beaches and Shores (CT), Beach and Dune Habitats (DE), Interdunal Wetlands (DE), Coastal Dunes, Beaches, and Small Islands - Maritime Beach Strand/ Dune Communities (MA), Coastal Beaches, Dunes, and Mudflats (MD), Unconsolidated Shore (Beaches and Mudflats) (ME), Coastal Sand Dunes (NH), Beaches (NJ), Dunes (NJ), Maritime Dunes (NY), Maritime Dunes (NY), Sparsely Vegetated Habitats - Beach Grass Dune (RI), Intertidal - Estuarine Beaches Unspecified (RI), Barren Habitat - Beach (VA)

## Places to Visit this Habitat:

Cape Henlopen State Park | DE  
 Cape Cod National Seashore | MA  
 Assateague Island National Seashore | MD  
 Fire Island National Seashore | NY  
 Chincoteague National Wildlife Refuge | VA

## Associated Species: *Appendix lists scientific names*

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

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

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

**PLANTS:** American beachgrass (*Ammophila breviligulata*), coast-blite goosefoot (*Chenopodium rubrum*), oysterleaf (*Mertensia maritima*), saltmarsh aster (*Symphotrichum 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): *Appendix lists scientific names*

**BIRDS:** least tern, piping plover, red knot, roseate tern

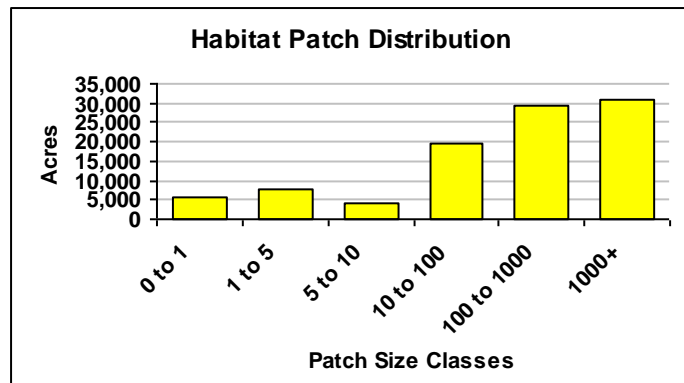
**HERPTILES:** diamondback terrapin, eastern spadefoot

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

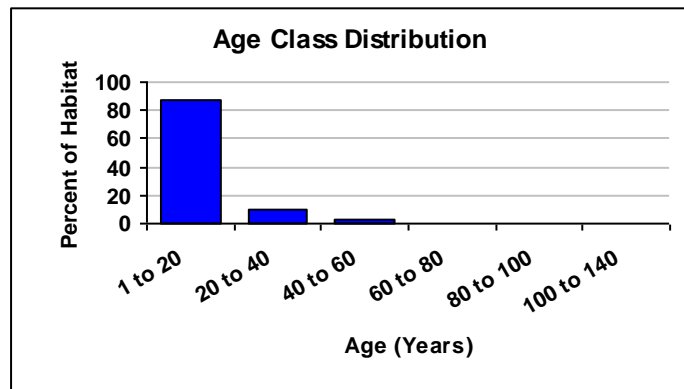
**PLANTS:** beach plum (*Prunus maritima*), sand-heather (*Hudsonia tomentosa*)



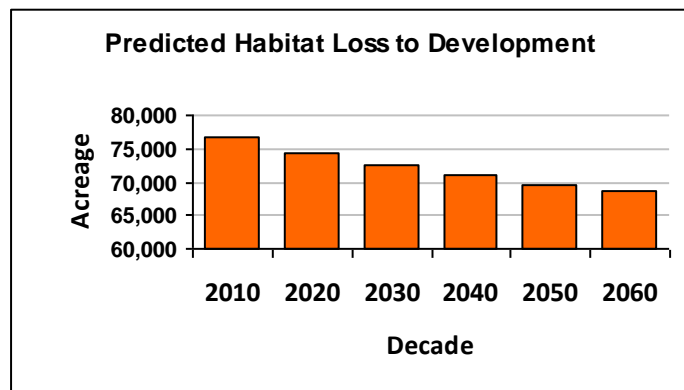
© Robert Coxie (Delaware Species Conservation & Research Program)



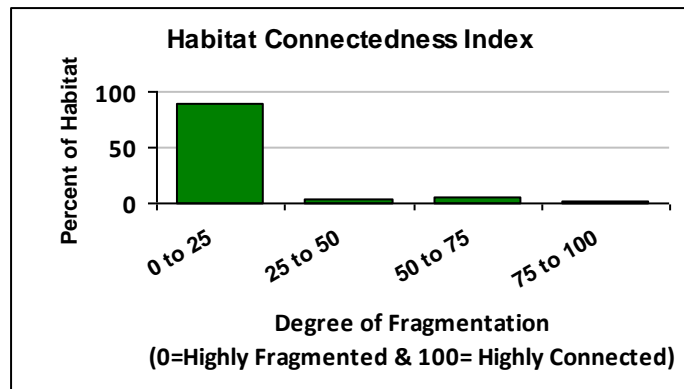
The average patch size for this habitat is 3 acres and the largest single patch is 5,945 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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 (8,263 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 165 acres per year.

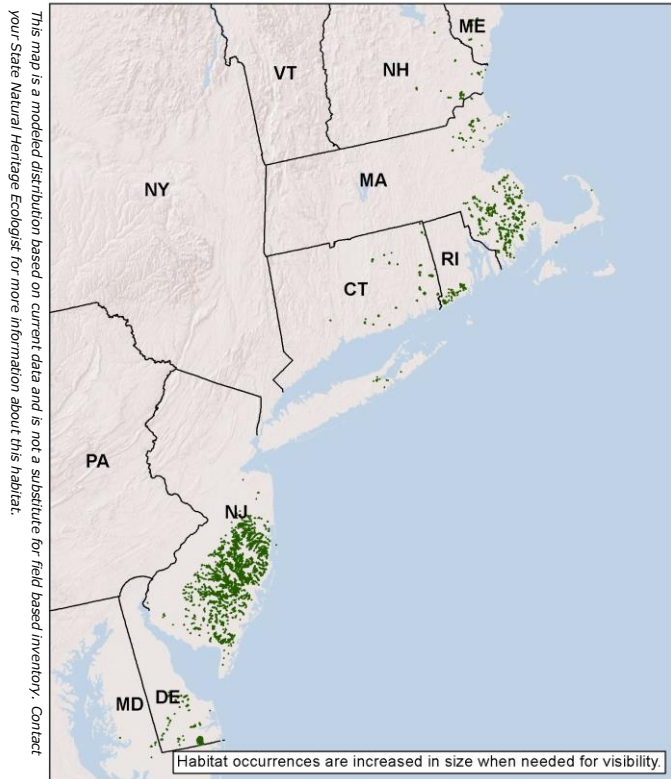


This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.





## Macrogroup: Coastal Plain Swamp



© Keith Love

### 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.

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

**Total Habitat Acreage:** 58,301

**Percent Conserved:** 53.5%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
NJ	61%	35,366	9,187	10,781	15,398
MA	20%	11,830	1,820	3,750	6,259
DE	8%	4,845	127	3,191	1,527
CT	4%	2,480	221	596	1,663
RI	3%	1,750	156	444	1,150
NH	2%	1,158	259	434	464
ME	1%	654	0	106	548
MD	0%	121	15	52	54
NY	0%	97	50	14	33

### 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 (MD), Atlantic White Cedar Swamp (ME), Atlantic white cedar-yellow birch-pepperbush swamp (NH), Forested Wetlands - White Cedar Swamps (NJ), Coastal Plain Atlantic White Cedar Swamp (NY), Atlantic White Cedar Swamp (RI)

### Crosswalk to State Wildlife Action Plans:

Forested Inland Wetland - Atlantic White Cedar Swamps (CT), Atlantic White Cedar Non-tidal Wetlands (DE), Forested Swamps (MA), Forested wetlands - white cedar swamps (NJ), Atlantic White Cedar Swamp (NY), Forested Wetlands - Forested Coniferous Wetland White Cedar (RI)

## Places to Visit this Habitat:

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

## Associated Species: *Appendix lists scientific names*

**BIRDS:** northern waterthrush, veery, wood duck

**INSECTS:** ebony boghaunter, elfin skimmer, great purple hairstreak, owl moth, pennsylvania firefly, spatterdock darter, sphagnum sprite

**PLANTS:** bayonet rush (*Juncus militaris*), bushy bluestem (*Andropogon glomeratus*), coast sedge (*Carex exilis*), fibrous bladderwort (*Utricularia fibrosa*), heartleaf twayblade (*Listera cordata*), seaside alder (*Alnus maritima*), smooth winterberry holly (*Ilex laevigata*), southern bladderwort (*Utricularia juncea*), ten-angle pipewort (*Eriocaulon decangulare*), tickseed sunflower (*Bidens coronata*), white beakrush (*Rhynchospora alba*)

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

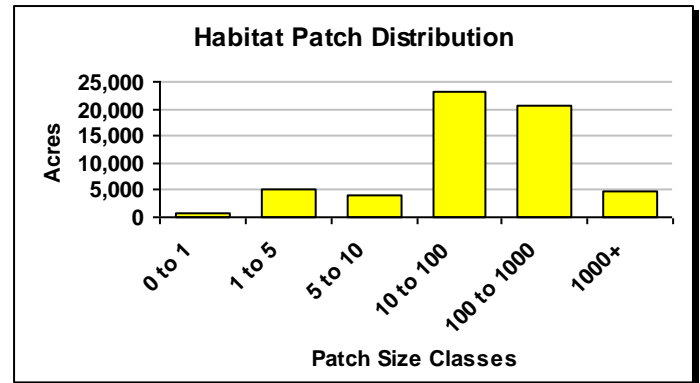
**HERPTILES:** blue-spotted salamander, carpenter frog, four-toed salamander, spotted turtle

**INSECTS:** coastal swamp metarranthis moth, Hessel's hairstreak, pitcher plant borer moth, plant hopper, spatterdock darter, sphagnum sprite, a firefly (*photuris tremulans*), a moth (*Exyra fax*)

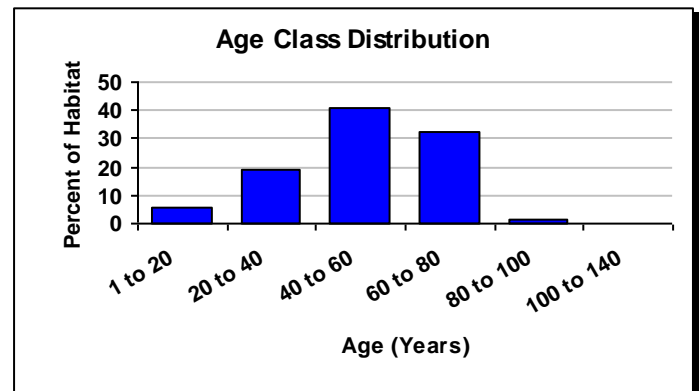
**PLANTS:** swamp-pink (*Arethusa bulbosa*), yellow nodding ladies'-tresses (*Spiranthes ochroleuca*)



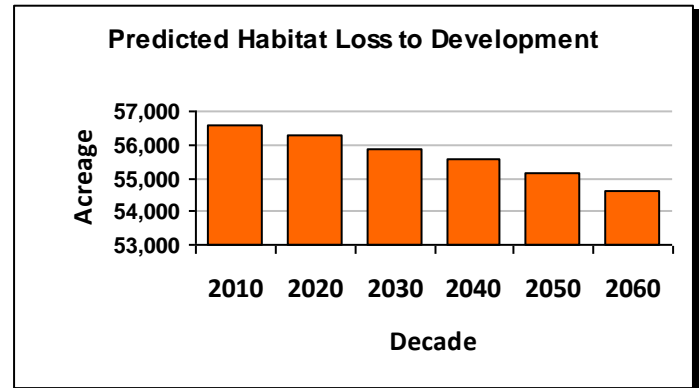
© Robert Coxie (Delaware Species Conservation & Research Program)



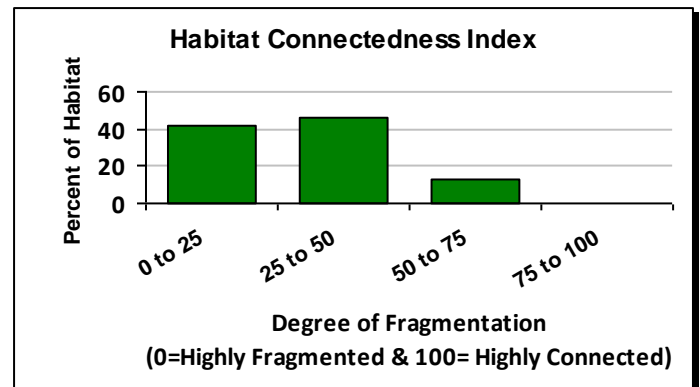
The average patch size for this habitat is 10 acres and the largest single patch is 1,791 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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 (1,960 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 39 acres per year.

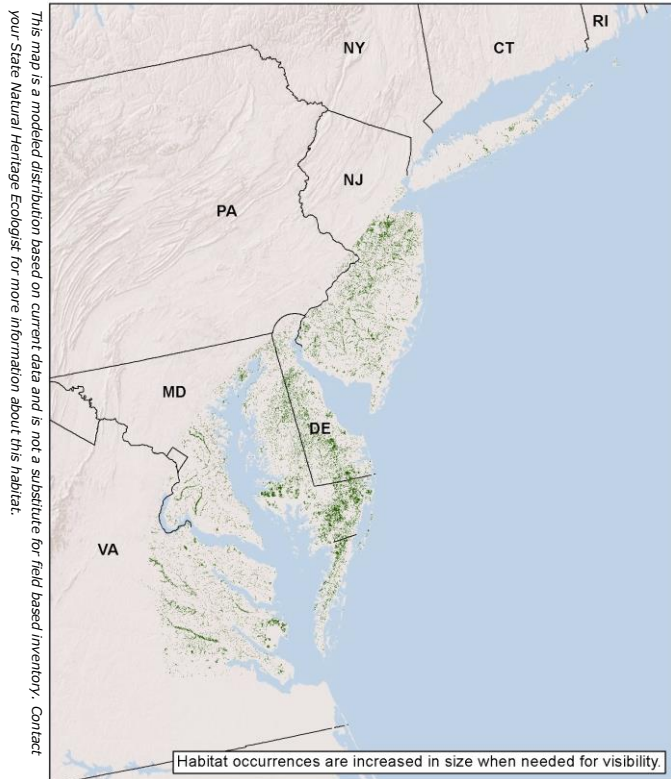


This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.

# North Atlantic Coastal Plain Basin Swamp and Wet Hardwood Forest



## Macrogroup: Coastal Plain Swamp



© Robert Coxe (Delaware Species Conservation & Research Program)

### Description:

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

**State Distribution:** DC, DE, MD, NJ, NY, PA, RI, VA

**Total Habitat Acreage:** 974,772

**Percent Conserved:** 18.9%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
MD	33%	322,976	18,978	56,526	247,473
NJ	27%	266,253	37,988	21,214	207,052
VA	22%	210,232	4,141	11,220	194,871
DE	16%	151,221	8,741	19,630	122,850
NY	2%	18,245	1,319	3,284	13,642
PA	1%	5,123	326	510	4,288
RI	0%	640	139	26	476
DC	0%	81	0	0	81

### Ecological Setting and Natural Processes:

These swamps of poorly drained, relatively shallow depressions are often groundwater-influenced, but are also often configured in large patches along streams and rivers, especially in headwater settings. They occur on mineral soils overlain by a variable organic but non-peaty layer.

### Similar Habitat Types:

Basins that support Northern Atlantic Coastal Plain Basin Peat Swamps are usually more hydrologically isolated than these often active river area-connected swamps, which also lack Atlantic white cedar.

### Crosswalk to State Name Examples:

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

### Crosswalk to State Wildlife Action Plans:

Coastal Plain Forested Floodplains and Riparian Swamps (DE), Forested Seepage Wetlands (MD), Forested wetlands - hardwood swamps (NJ), Coastal Red Maple-Black Gum Swamp (NY), Wetlands - Forested Wetlands and Bogs (PA), Wetland Habitat - Forested (VA)

## Places to Visit this Habitat:

Bombay Hook National Wildlife Refuge | DE  
 Pocomoke River State Forest | MD  
 Wharton State Forest | NJ  
 Chincoteague National Wildlife Refuge | VA  
 Presquile National Wildlife Refuge | VA

## Associated Species: *Appendix lists scientific names*

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

**MAMMALS:** river otter, mink

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

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

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

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

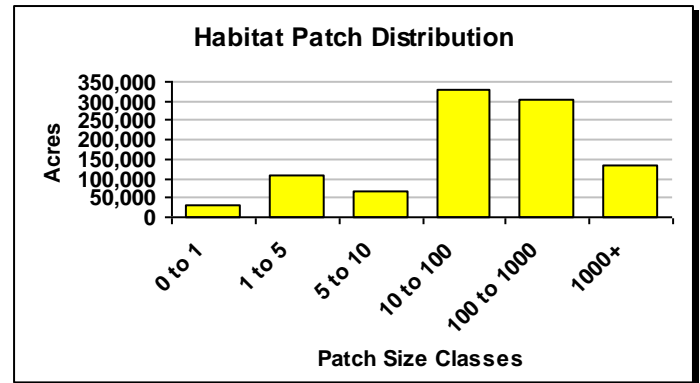
**HERPTILES:** Mabee's salamander

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

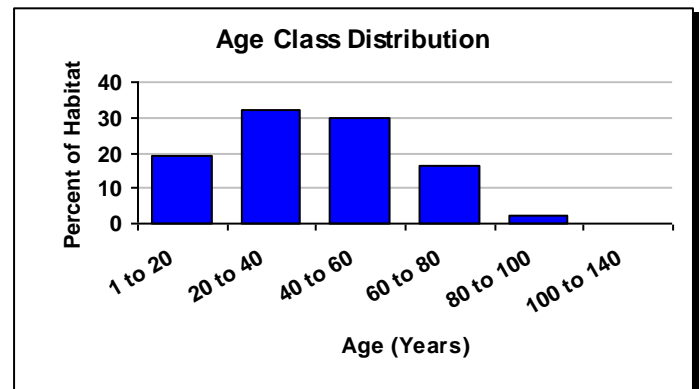
**PLANTS:** cypress swamp sedge (*Carex jooirii*), rose coreopsis (*Coreopsis rosea*)



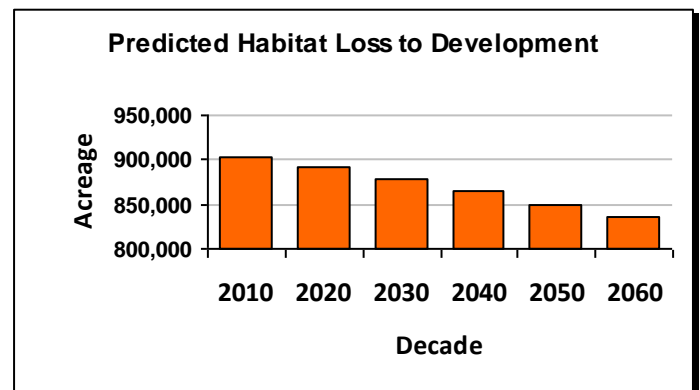
© Robert Coxie (Delaware Species Conservation & Research Program)



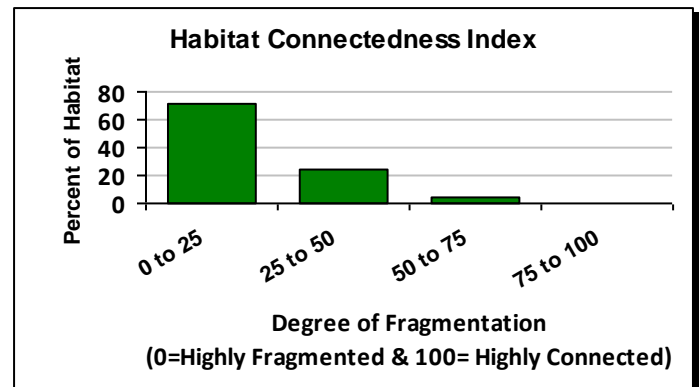
The average patch size for this habitat is 6 acres and the largest single patch is 3,190 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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



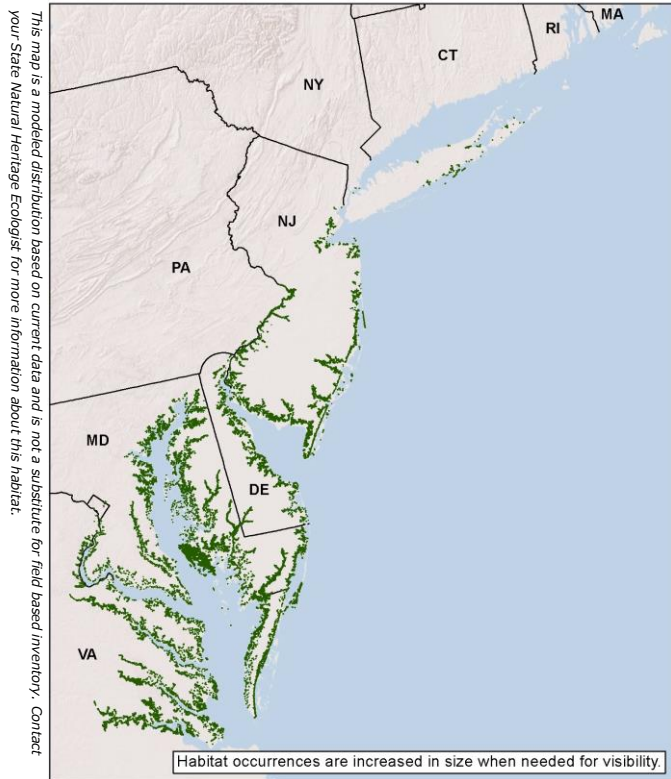
This chart shows the predicted loss of habitat over the next five decades (67,635 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 1,353 acres per year.



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



## Macrogroup: Coastal Plain Swamp



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

### Description:

A tidally flooded hardwood forest and shrubland in lower river floodplains and estuaries of the North Atlantic Coastal Plain. Deciduous hardwood species predominate, especially ash (green or pumpkin), black gum, or water tupelo, along with red maple, American elm, and black willow. Alder and silky dogwood are common shrubs. Lianas and vines are common: poison ivy, greenbrier, and Virginia creeper. Species richness in the herbaceous layer is exceptionally high due to microtopographic features. Regularly flooded hollows primarily support flood-tolerant swamp species such as orange jewelweed, arrow arum, and various smartweeds. Water hemlock, and smallspike false nettle are typical of elevated hummocks.

### Ecological Setting and Natural Processes:

Occurs as small patches in the uppermost portions of tidal rivers that have sufficiently fresh water and short enough flooding to support trees. Stands form distinct pockets and fringes on poorly-drained, slightly acidic tidal muck with high silt and clay content. Most common in the Chesapeake Bay region, but reaching as far up as the lower Hudson River.

### Similar Habitat Types:

In Chesapeake and Delaware Bays, found usually at the upper limit of brackish or fresh and oligohaline tidal marshes. Southern Atlantic Coastal Plain Tidal Wooded Swamp is similar, with a different (but overlapping) suite of species due to biogeographic differences.

### Crosswalk to State Wildlife Action Plans:

**State Distribution:** DC, DE, MA, MD, NJ, NY, PA, VA

**Total Habitat Acreage:** 196,233

**Percent Conserved:** 30.0%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
MD	43%	84,026	13,139	16,589	54,299
VA	29%	56,049	2,686	6,496	46,867
NJ	21%	41,724	13,129	2,827	25,768
DE	6%	11,564	807	2,514	8,243
NY	1%	1,507	384	104	1,020
PA	1%	1,278	221	8	1,050
DC	0%	83	0	3	79
MA	0%	2	0	0	2

### Crosswalk to State Name Examples:

Wind-Tidal Cypress-Gum Swamp (DE), Tidal Hardwood Swamp (MD), Freshwater Tidal Swamp (NJ), Freshwater Tidal Swamp (NY), Northern Coastal Plain Tidal Bald Cypress Forest (VA)

## Places to Visit this Habitat:

Cape Henlopen State Park | DE  
 Blackwater Wildlife Refuge | MD  
 Cape May National Wildlife Refuge | NJ  
 Edwin B. Forsythe National Wildlife Refuge | NJ  
 Chincoteague National Wildlife Refuge | VA

## Associated Species: *Appendix lists scientific names*

**BIRDS:** barred owl, chuck-will's widow, prothonotary warbler, red-shouldered hawk, white-eyed vireo, willow flycatcher, wood duck

**HERPTILES:** eastern narrow-mouthed toad

**INSECTS:** bar-winged skimmer, blue-faced meadowhawk, brown spiketail, fine-lined emerald, golden-winged skimmer, sparkling jewelwing

**PLANTS:** bayonet rush (*Juncus militaris*), maidencane (*Panicum hemitomon*), seaside alder (*Alnus maritima*), southern bladderwort (*Utricularia juncea*), catchfly-grass (*Leersia lenticularis*), clustered beakrush (*Rhynchospora glomerata*), cuckoo-flower (*Cardamine pratensis*), erect coinleaf (*Centella erecta*), gibbous panic-grass (*Sacciolepis striata*), red bay (*Persea palustris*), showy tick-trefoil (*Desmodium canadense*), star duckweed (*Lemna trisulca*)

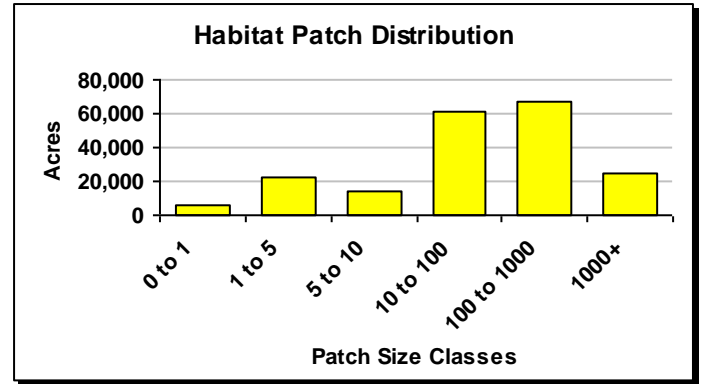
## Species of Concern (G1-G4): *Appendix lists scientific names*

**INSECTS:** Bethany beach firefly, blackwater bluet, Lemmer's noctuid moth, palamedes swallowtail

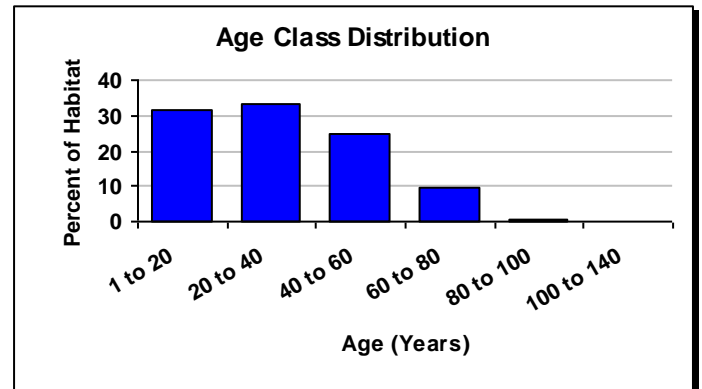
**PLANTS:** American frog's-bit (*Limnobia spongia*), american waterwort (*Elatine americana*), awned mountainmint (*Pycnanthemum setosum*), giant peatmoss (*Sphagnum torreyanum*), marsh rattlesnake master (*Eryngium aquaticum*), Nuttall's lobelia (*Lobelia nuttallii*), pale false foxglove (*Agalinis skinneriana*), reniform sedge (*Carex reniformis*), shoreline sedge (*Carex hyalinolepis*), sweet pinesap (*Monotropsis odorata*), tropical water-hyssop (*Bacopa innominata*), watermeal (*Wolffia papulifera*)



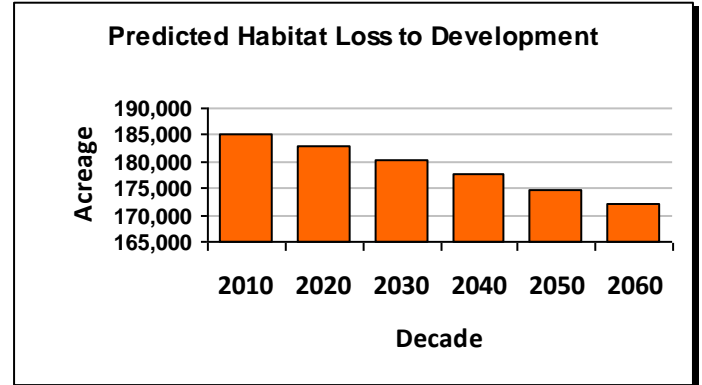
© Gary P. Fleming (Virginia Department of Conservation & Recreation Natural Heritage Program)



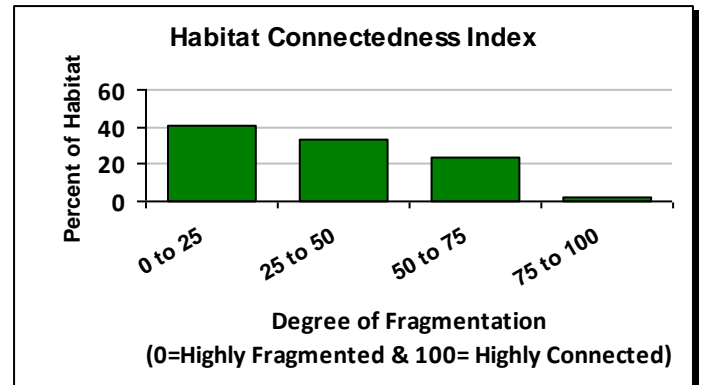
The average patch size for this habitat is 6 acres and the largest single patch is 3,555 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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 (13,082 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 262 acres per year.



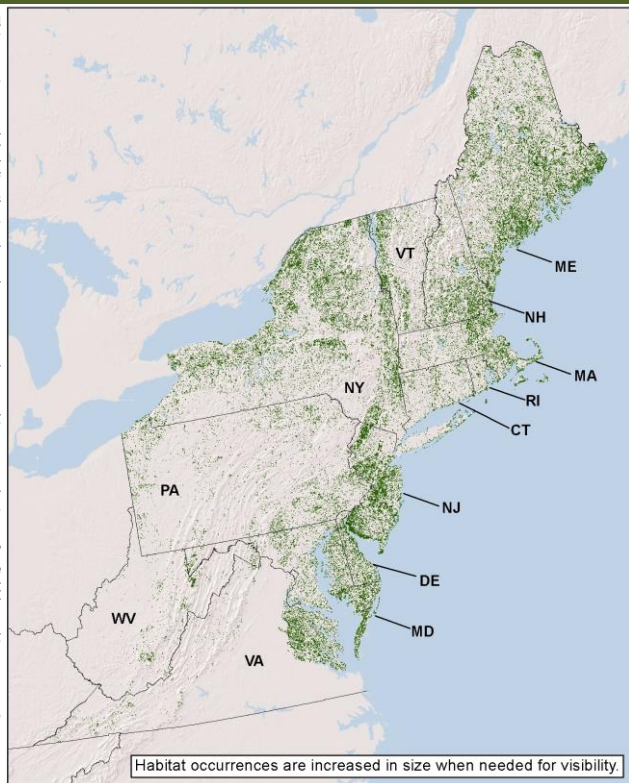
This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.

# Laurentian-Acadian Freshwater Marsh



## Macrogroup: Emergent Marsh

This map is a modeled distribution based on current data and is not a substitute for field based inventory. Contact your State Natural Heritage Ecologist for more information about this habitat.



© Maine Natural Areas Program

### Description:

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

**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%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
ME	25%	225,999	13,432	26,406	186,161
NY	25%	224,007	25,309	27,887	170,811
NJ	11%	98,802	17,497	9,039	72,265
VA	7%	61,229	1,285	3,949	55,995
MA	6%	57,011	4,217	12,825	39,969
MD	6%	52,867	2,802	10,177	39,888
PA	5%	48,783	3,585	4,395	40,802
NH	5%	48,642	2,373	10,747	35,523
VT	4%	39,373	2,385	5,542	31,445
DE	2%	21,773	1,518	3,960	16,294
CT	2%	16,321	1,506	2,964	11,851
WV	1%	6,766	156	244	6,366
RI	1%	5,089	413	1,010	3,666
DC	0%	61	0	0	61

### Crosswalk to State Name Examples:

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

### 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 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

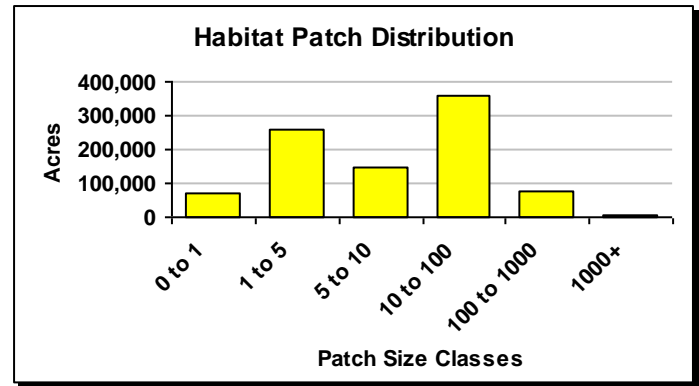
**HERPTILES:** wood turtle, blanding's turtle

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

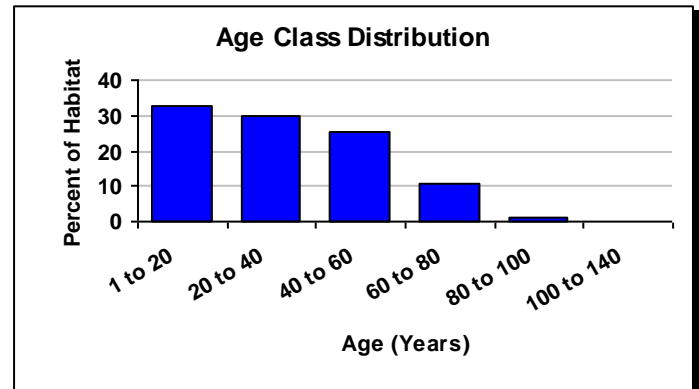
**PLANTS:** blue maiden-cane (*Amphicarpum purshii*), fly-poison (*Amianthium muscitoxicum*), northeastern bladderwort (*Utricularia resupinata*), ohio goldenrod (*Oligoneuron ohioense*), Robbins' spikerush (*Eleocharis robbinsii*), sago pondweed (*Potamogeton pectinatus*), Sartwell's sedge (*Carex sartwellii*),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



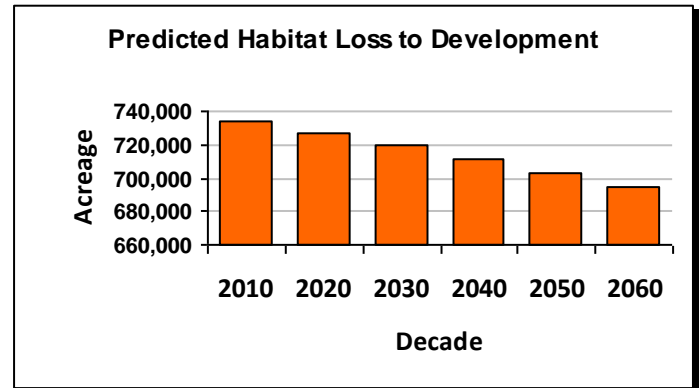
© Maine Natural Areas Program



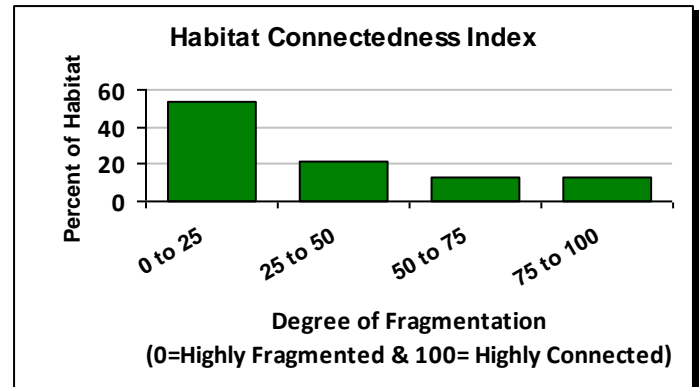
The average patch size for this habitat is 3 acres and the largest single patch is 1,258 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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 (39,208 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 784 acres per year.

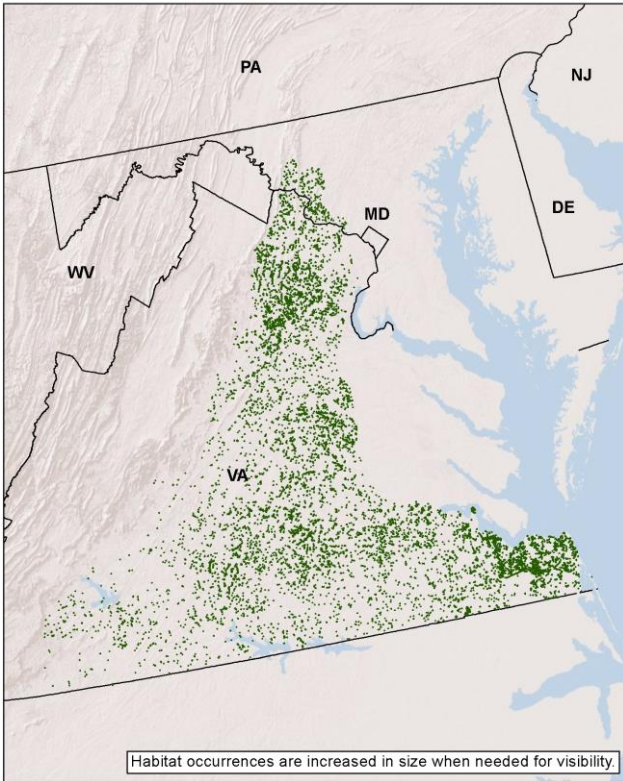


This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.



## Macrogroup: Emergent Marsh

This map is a modeled distribution based on current data and is not a substitute for field based inventory. Contact your State Natural Heritage Ecologist for more information about this habitat.



© Irvine Wilson (Virginia Department of Conservation & Recreation Natural Heritage Program)

### Description:

An herbaceous wetland that occurs in small basins and alluvial environments in the Piedmont and coastal plain of Virginia. Vegetation is zoned according to water depth, length of inundation, and substrate; submergent plants in the deepest water like pondweeds and water lilies give way to emergents like cattails and bulrushes, then shallower water species like arrow-arym and American bur-reed, and finally to species of periodically flooded shorelines like marsh St. John's-wort and various sedges. Most examples are semi-natural, a result of clearing and impoundments by humans and beavers in settings that would normally be swamps. It can fill with sediments over time, allowing woody shrub vegetation to get established, and is often associated with shrub swamps and wet meadows.

### Ecological Setting and Natural Processes:

Occurs most commonly in alluvial settings, at margins of streamways, but also in headwater basins and in small, permanently flooded isolated basins and non-alluvial spring-heads. Substrates are generally muck over mineral soil; water chemistry and available nutrients vary. These systems are dynamic and highly variable; unpredictable perturbations to them can operate on short time scales, like flooding and draining from beaver or human activity.

### Similar Habitat Types:

Similar to Laurentian-Acadian Freshwater Marshes in their hydrologic characteristics and their intimate association with shrub swamps and other wetland types. Difference in biogeography leads to some regionally distinct vegetation. A higher proportion of these marshes are alluvial, and their semi-natural character may make them less stable over time.

### Crosswalk to State Wildlife Action Plans:

**State Distribution:** MD, VA

**Total Habitat Acreage:** 45,739

**Percent Conserved:** 6.4%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
VA	98%	44,788	610	2,143	42,035
MD	2%	951	20	135	796

### Crosswalk to State Name Examples:

Emergent Marsh (MD)

## Places to Visit this Habitat:

Seneca Creek State Park | MD  
Great Dismal Swamp | VA  
North Landing River | VA

## Associated Species: *Appendix lists scientific names*

**HERPTILES:** oak toad (*Bufo quercicus*), lesser siren (*Siren intermedia*)

**PLANTS:** beakrushes (*Rhynchospora* spp.), bushy bluestem (*Andropogon glomeratus*), crossleaf milkwort (*Polygala cruciata*), hairy umbrella-sedge (*Fuirena squarrosa*), highbush blueberries (*Vaccinium corymbosum*), large white fringed orchid (*Platanthera blephariglottis*), large-flowered camas (*Zigadenus glaberrimus*), manna-grasses (*Glyceria* spp.), Meadow beauties (*Rhexia nashii*, *R. petiolata*, *R. mariana*), Nuttall's reed-grass (*Calamagrostis coarctata*), overcup oak (*Quercus lyrata*), panic grasses (*Dichanthelium dichotomum*)

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

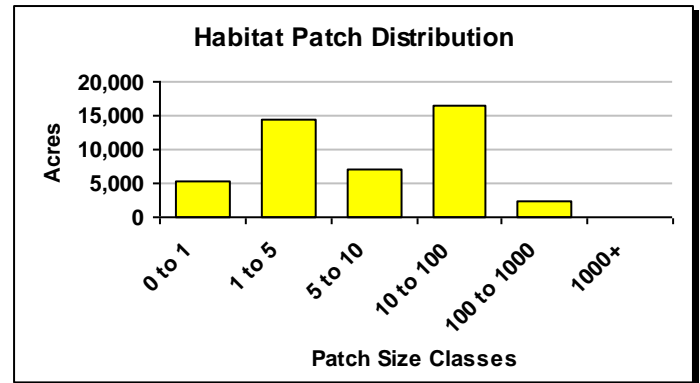
**MAMMALS:** dismal swamp southeastern shrew (*Sorex longirostris fisheri*)

**INSECTS:** Dukes' skipper (*Euphyes dukesi*)

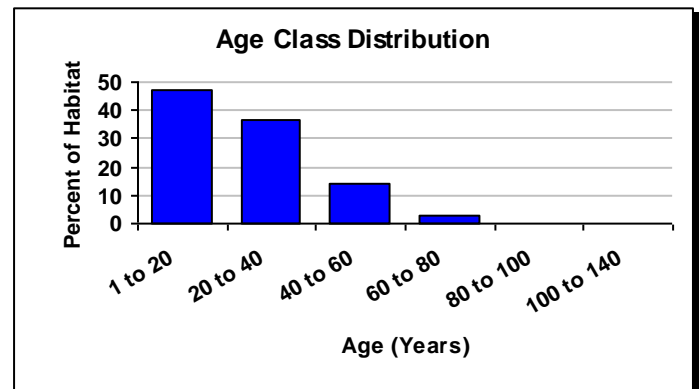
**PLANTS:** Cuthbert's turtlehead (*Chelone cuthbertii*), Hairy seedbox (*Ludwigia pilosa*), Walter's paspalum (*Paspalum dissectum*)



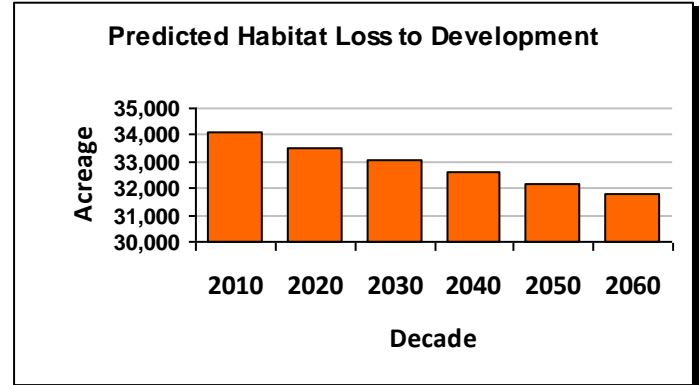
© Irvine Wilson (Virginia Department of Conservation & Recreation Natural Heritage Program)



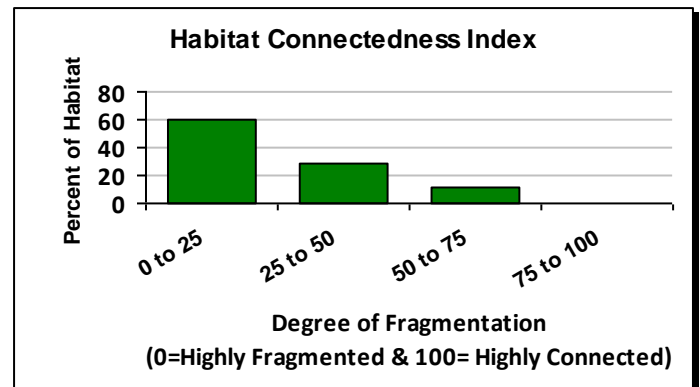
The average patch size for this habitat is 2 acres and the largest single patch is 735 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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 (2,319 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 46 acres per year.



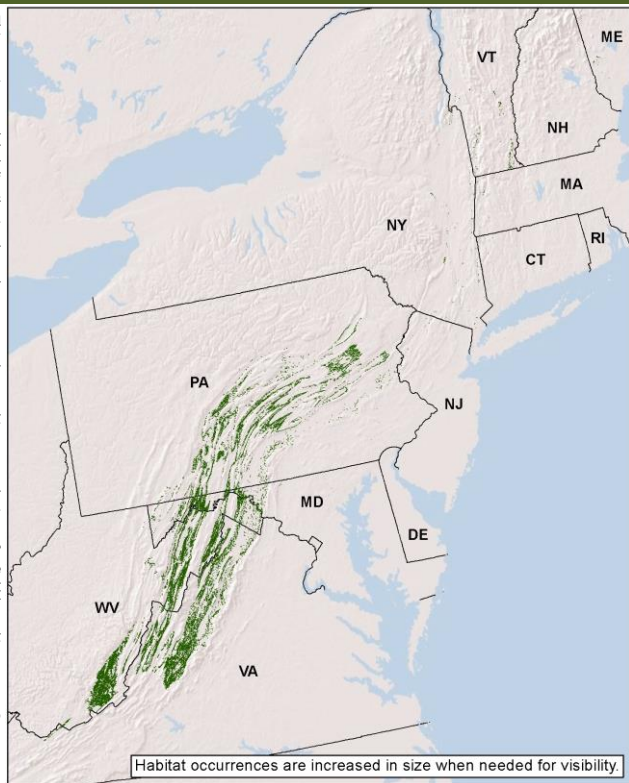
This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.

# Central Appalachian Alkaline Glade and Woodland



## Macrogroup: Glade, Barren and Savanna

This map is a modeled distribution based on current data and is not a substitute for field based inventory. Contact your State Natural Heritage Ecologist for more information about this habitat.



© West Virginia Division of Natural Resources

### 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 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)

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

**Total Habitat Acreage:** 413,498

**Percent Conserved:** 11.6%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
WV	37%	154,340	2,525	9,145	142,669
PA	29%	118,776	1,377	7,485	109,914
VA	27%	110,933	6,795	15,842	88,296
MD	6%	25,052	2,341	1,489	21,222
VT	1%	2,464	221	214	2,029
NY	0%	1,297	107	157	1,033
MA	0%	202	57	0	145
ME	0%	183	1	28	154
NJ	0%	144	28	0	115
CT	0%	92	1	0	91
NH	0%	15	2	2	12

### 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)

## Places to Visit this Habitat:

Green Ridge State Forest | MD  
 Nesciopeck 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*

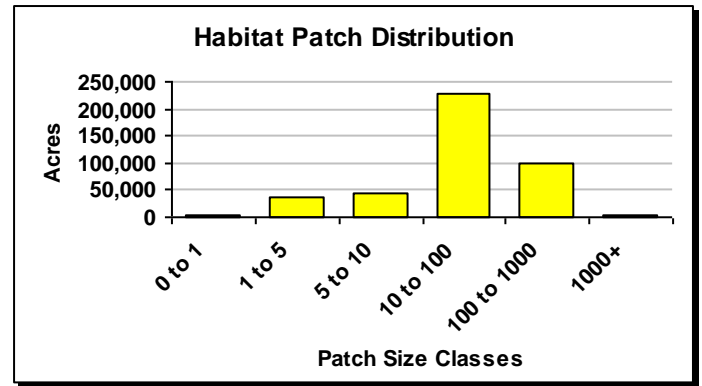
**HERPTILES:** Wehrle's salamander, west virginia spring salamander

**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

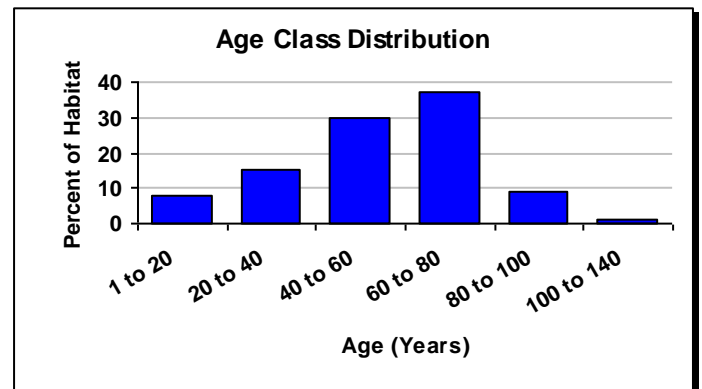
**PLANTS:** cliff stonecrop (*Sedum glaucophyllum*), hidden spike-moss (*Selaginella eclipses*), tall larkspur (*Delphinium exaltatum*), three-lobed violet (*Viola triloba*)



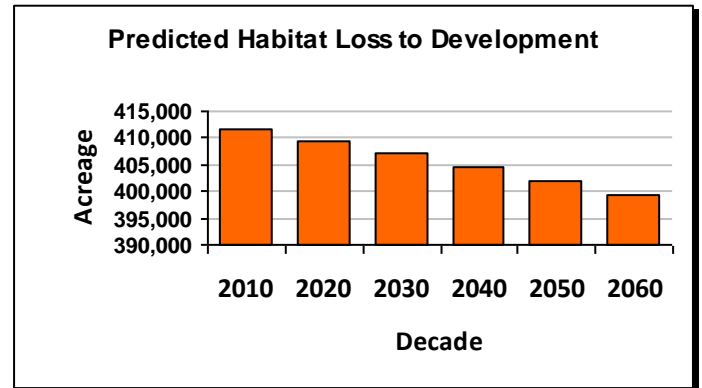
© Gary P. Fleming (Virginia Department of Conservation & Recreation Natural Heritage Program)



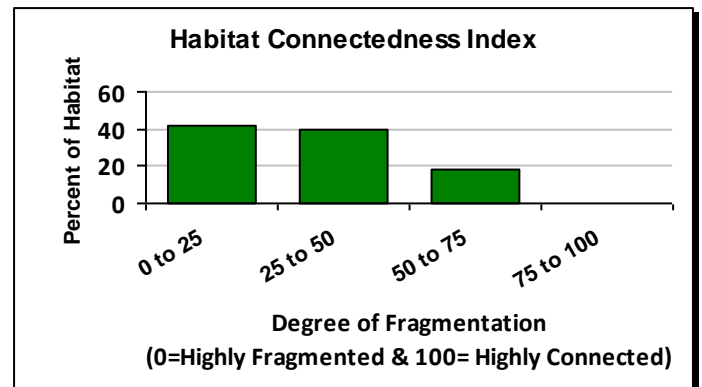
The average patch size for this habitat is 9 acres and the largest single patch is 1,190 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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



This chart shows the predicted loss of habitat over the next five decades (12,363 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 247 acres per year.

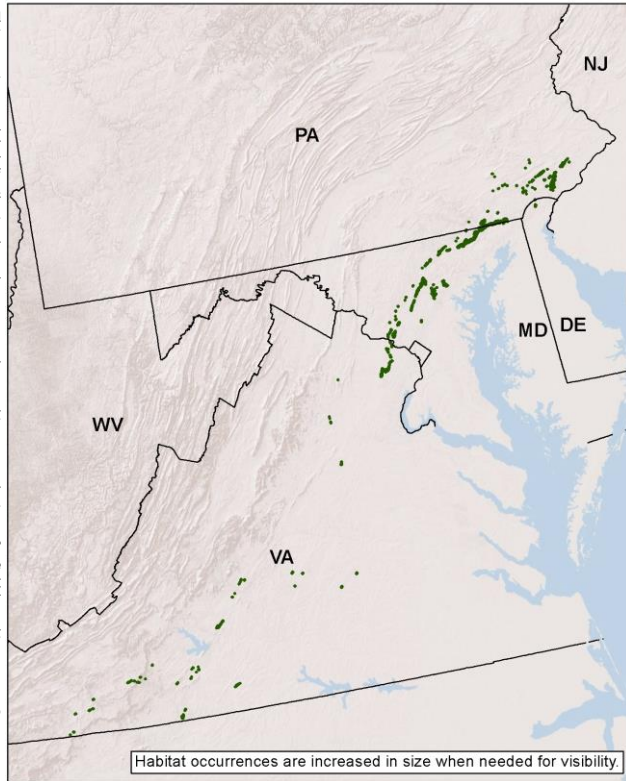


This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.



## Macrogroup: Glade, Barren and Savanna

This map is a modeled distribution based on current data and is not a substitute for field based inventory. Contact your State Natural Heritage Ecologist for more information about this habitat.



© Tom Rawinski (Virginia Department of Conservation & Recreation Natural Heritage Program)

### Description:

An open woodland of distinct vegetation associated with serpentinite, soapstone, dunite, and other ultramafic rock substrates in Maryland, southern Pennsylvania, and Virginia. The open, stunted canopy, often less than 5 meters high, is composed of pitch pine, Virginia pine, white oak, post oak, and/or blackjack oak. Fire suppression probably leads to stronger dominance by pines. Extreme edaphic conditions lead to xerophytic (extremely dry) growing environments, resulting in relatively open structure and a ground cover dominated by prairie grasses and a variety of forbs. Endemics such as serpentine aster and roundleaf farnetree are diagnostic.

**State Distribution:** DE, MD, PA, VA

**Total Habitat Acreage:** 11,954

**Percent Conserved:** 19.7%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
MD	50%	6,031	1,184	330	4,516
PA	33%	3,985	339	490	3,155
VA	16%	1,929	5	1	1,923
DE	0%	10	0	4	6

### Ecological Setting and Natural Processes:

The unusual and extreme soil chemistry determines the distinctive flora of the type, but fire frequency determines the physiognomy of particular examples over time, and many have succeeded to forest cover as a result of fire suppression. This, along with a history of intense habitat fragmentation and quarrying, have left most remnant patches small and in degraded condition.

### Similar Habitat Types:

Similar systems are ones that are distinct because of their association with particular bedrock lithologies and atypical moisture regimes: Appalachian Shale Barrens, Southern Ridge and Valley Calcareous Glade and Woodland, and Great Lakes Alvar, among others. Generally set in a landscape of dry to dry-mesic oak or oak-pine forest patches.

### Crosswalk to State Name Examples:

Serpentine Barren (MD), Serpentine Virginia Pine - Oak Forest (PA), Southern Blue Ridge Ultramafic Woodland (VA)

### Crosswalk to State Wildlife Action Plans:

Barrens and Dry Glades (MD), Grassland Habitats - Naturally occurring barrens (PA), Forest Habitat - Mixed Forest (VA)

## Places to Visit this Habitat:

Patapsco Valley State Park | MD  
 Soldiers Delight Natural Environment Area | MD  
 Goat Hill Serpentine Barrens | PA  
 Ridley Creek State Park | PA  
 Valley Forge State Forest | PA

## Associated Species: *Appendix lists scientific names*

**BIRDS:** blue-winged warbler, eastern whip-poor-will, northern bobwhite, prairie warbler, white-eyed vireo, yellow-breasted chat

**INSECTS:** black-waved flannel moth, juniper hairstreak, Packard's lichen moth, southern variable dart moth

**PLANTS:** bluehearts (*Buchnera americana*), maryland golden-aster (*Chrysopsis mariana*), plains frostweed (*Helianthemum bicknellii*), marsh blazingstar (*Liatris spicata*), grooved yellow flax (*Linum sulcatum*), staggerbush (*Lyonia mariana*), small's ragwort (*Packera anonyma*), pink milkwort (*Polygala incarnata*), sand blackberry (*Rubus cuneifolius*), pink wild bean (*Strophostyles umbellata*), bushy aster (*Symphotrichum dumosum*), porcupine sedge (*Carex hystericina*), tufted hairgrass (*Deschampsia cespitosa*)

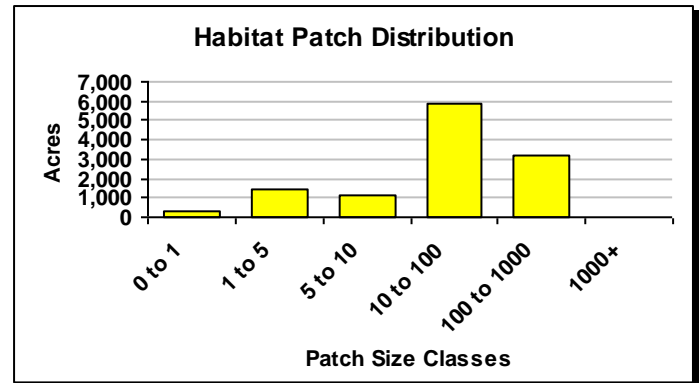
## Species of Concern (G1-G4): *Appendix lists scientific names*

**INSECTS:** Broad-lined catopyrrha, Eastern sedge barrens leafhopper, Falcate orangetip, Joyful holomelina moth, Mottled duskywing, Pure lichen moth, Small tolype

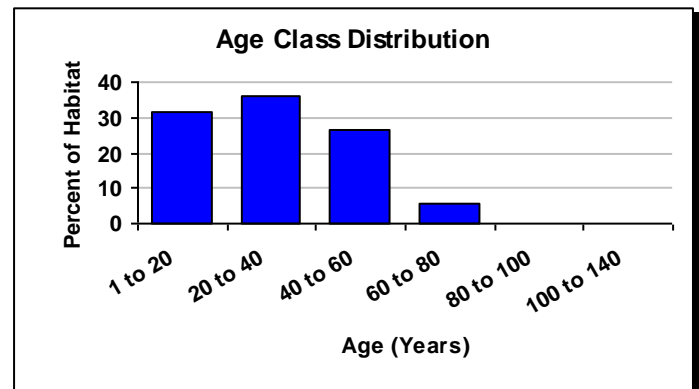
**PLANTS:** broadleaf beardgrass (*Gymnopogon ambiguus*), dwarf prairie willow (*Salix humilis* var. *tristis*), prostrate blue violet (*Viola walteri*), richardson's sedge (*Carex richardsonii*), roundleaf fameflower (*Talinum teretifolium*), serpentine aster (*Aster depauperatus*), striped gentian (*Gentiana villosa*)



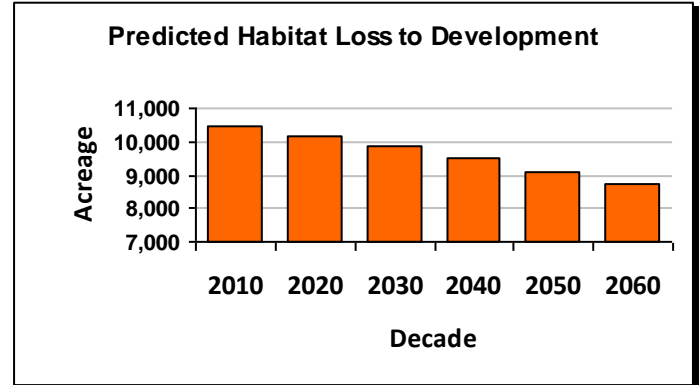
© Tom Rawinski (Virginia Department of Conservation & Recreation Natural Heritage Program)



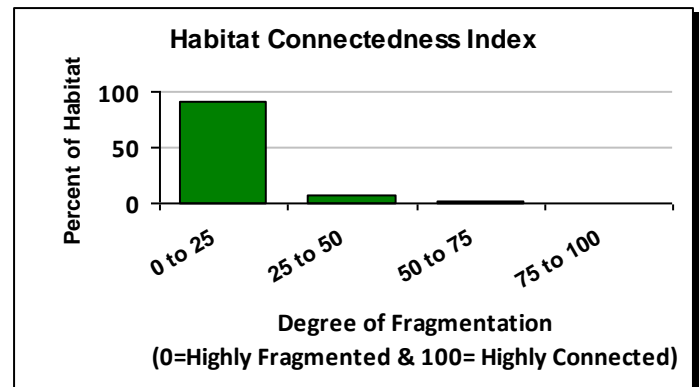
The average patch size for this habitat is 5 acres and the largest single patch is 209 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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.



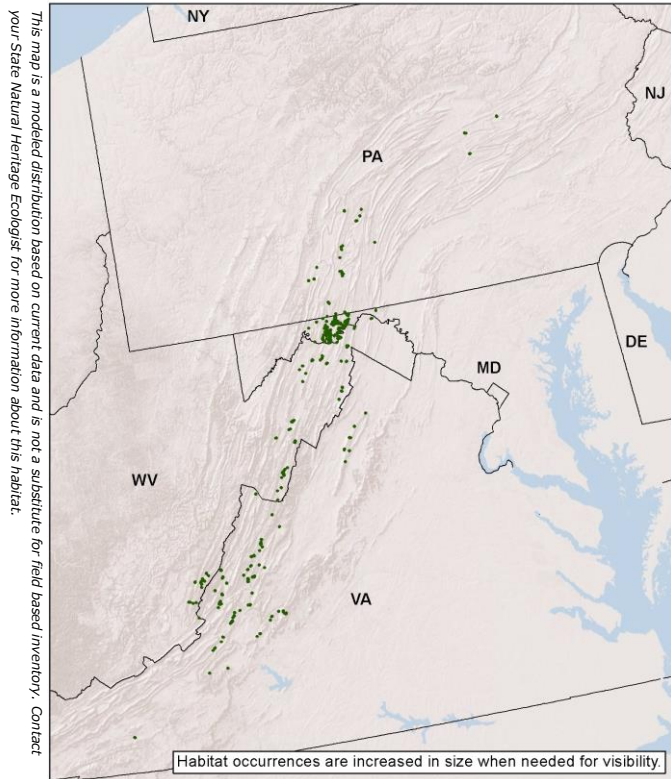
This chart shows the predicted loss of habitat over the next five decades (1,722 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 34 acres per year.



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



## Macrogroup: Glade, Barren and Savanna



© West Virginia Division of Natural Resources

### Description:

A mosaic of woodlands, shrublands, and large open areas of sparse vegetation formed on dry, exposed, steep slopes of unstable shale scree. Dominant trees are primarily stunted red and chestnut oak, scrub oak, pignut hickory, and Virginia pine; on higher-pH substrates the common trees include red-cedar and white ash. Many of these may occur as shrubs, along with prickly pear and various heaths. Shale barren endemics such as shale barren rockcress, shale barren evening primrose and Kate's mountain clover, are diagnostic in the herb layer. This is the distinctive shale barrens of the central Appalachians.

**State Distribution:** MD, PA, VA, WV

**Total Habitat Acreage:** 5,169

**Percent Conserved:** 61.5%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
MD	42%	2,163	375	1,200	588
VA	33%	1,728	874	469	385
WV	17%	871	64	132	674
PA	8%	407	40	23	345

### Crosswalk to State Name Examples:

Shale Barren (MD), Virginia Pine - Mixed Hardwood Shale Woodland (PA), Central Appalachian Shale Barren (Northern Type) (VA), Shale Barrens (WV)

### Ecological Setting and Natural Processes:

Occurs at low to mid elevations (about 800 to 2500 feet) on dry, rocky, steep slopes of fissile shale or solid rock. Slopes are often above steeply cut stream or river beds, commonly with south to west aspects. The lack of soil creates extreme conditions for plant growth. Introduced weeds and quarrying pose the most serious threats to this system.

### Similar Habitat Types:

Similar in form and structure to this system, though lacking its many endemics and near endemics, are barrens and talus systems to the west and south, such as Southern Appalachian Montane Cliff and Talus, Central Interior Highlands Dry Acidic Glade and Barrens, and Southern and Central Appalachian Mafic Glade and Barrens.

### Crosswalk to State Wildlife Action Plans:

Barrens and Dry Glades (MD), Rock Habitats (PA), Forest Habitat - Mixed Forest (VA), Shale Barrens (WV)

## Places to Visit this Habitat:

C & O Canal National Historical Park | MD  
 Green Ridge State Forest | MD  
 Shawnee State Park | PA  
 George Washington and Jefferson National Forest | VA  
 Monongahela National Forest | WV

## Associated Species: *Appendix lists scientific names*

**BIRDS:** eastern whip-poor-will, pine warbler, prairie warbler, worm-eating warbler

**INSECTS:** barrens moth, lead colored lichen moth, Packard's lichen moth, silvery blue, yellow-headed lichen moth

**PLANTS:** bigseed dodder (*Cuscuta indecora*), bluntnose spurge (*Euphorbia obtusata*), eaton's lipfern (*Cheilanthes eatonii*), goose-foot corn-salad (*Valerianella chenopodiifolia*), michaux's stitchwort (*Minuartia michauxii*), narrowleaf bluecurls (*Trichostema setaceum*), ozark milk-vetch (*Astragalus distortus*), prairie violet (*Viola pedatifida*), slender goldenrod (*Solidago erecta*), virginia mountainmint (*Pycnanthemum virginianum*), white meadowsweet (*Spiraea betulifolia*), woodland agrimony (*Agrimonia rostellata*)

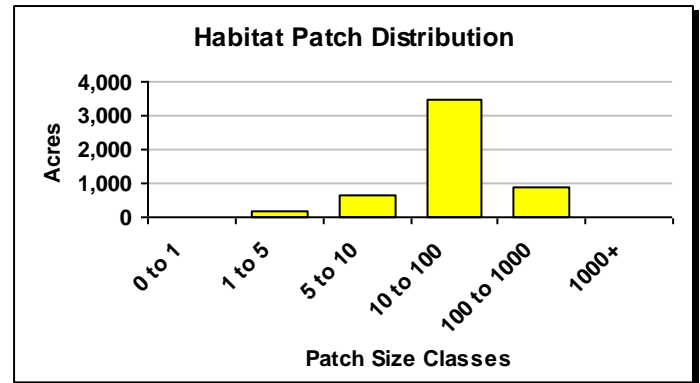
## Species of Concern (G1-G4): *Appendix lists scientific names*

**INSECTS:** Allegheny river cruiser, Appalachian grizzled skipper, northern oak hairstreak, Olympia marble

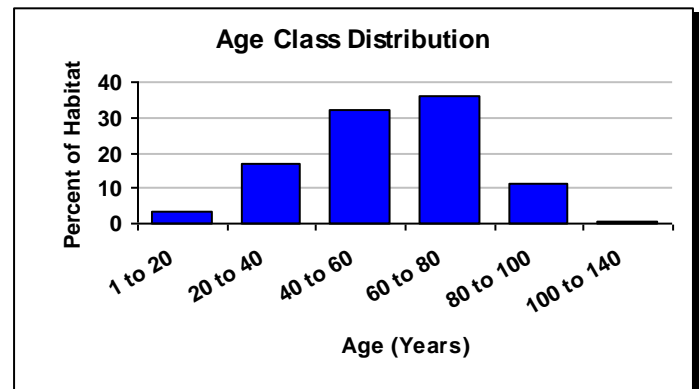
**PLANTS:** alleghany plum (*Prunus alleghaniensis*), allegheny stonecrop (*Sedum telephioides*), appalachian woodsia (*Woodsia appalachiana*), kate's mountain clover (*Trifolium virginicum*), moss phlox (*Phlox subulata*), shale barren bindweed (*Calystegia spithamea*), shale barren evening-primrose (*Oenothera argillicola*), shale barren rockcress (*Arabis serotina*), shalebarren goldenrod (*Solidago arguta*), shale-barren skullcap (*Scutellaria parvula*), shalebarren wild buckwheat (*Eriogonum allenii*), white-hair leatherflower (*Clematis albicoma*), yellow nailwort (*Paronychia virginica*)



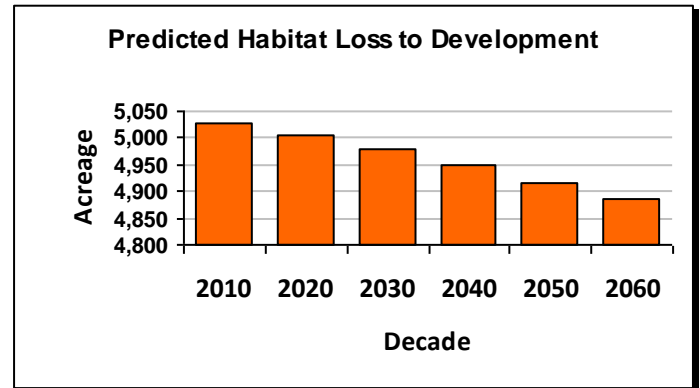
© Jim Vanderhorst (West Virginia Division of Natural Resources)



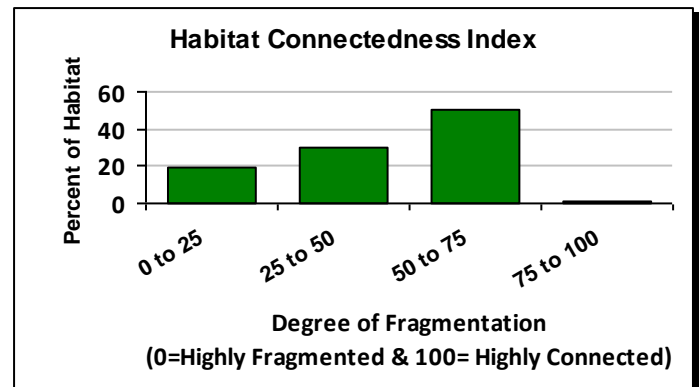
The average patch size for this habitat is 14 acres and the largest single patch is 296 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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 (141 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 3 acres per year.

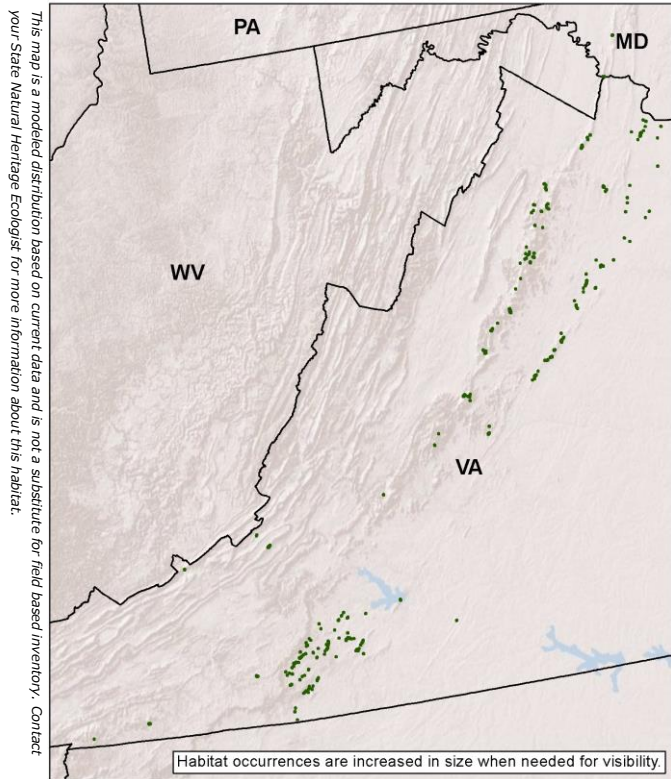


This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.





## Macrogroup: Glade, Barren and Savanna



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

### Description:

A mosaic of open woodland, short-shrub or grassy herbaceous vegetation, and rock outcrops, on shallow soils over predominantly mafic bedrock (igneous rocks rich in iron and magnesium). It generally occurs as a small patch system of a few acres. Vegetation varies according to soil chemistry. Stunted and sparsely distributed tree species include white ash, eastern red cedar, chestnut oak, and dry site hickories. Sumac and ninebark are common species in a shrub layer that may be thick. An herb layer dominated by graminoid species can be fairly dense away from bare rock; some typical forbs are nodding onion, slender knotweed, and woodland sunflower. Bedrock substrates include a variety of igneous and metamorphic rock types such as amphibolite, gabbro, and metabasalt (greenstone).

### Ecological Setting and Natural Processes:

Shallow soils on upper to mid (occasionally steep) slopes are unable to support a closed tree canopy. Examples on amphibolite have a distinctive basic flora, while those on the more acidic substrates have a more acid-loving and depauperate flora. Intermediate examples are more common that either of these extremes. Fire may be an important determinant of vegetation structure; periodic drought and wind storms may also limit canopy density and stature.

### Similar Habitat Types:

Other glades and barrens in this part of the region, similar in form and ecological character but occurring on different bedrock substrates, are Appalachian Shale Barrens, Central Appalachian Alkaline Glade and Woodland, and Southern Piedmont Glade and Barrens. Adjacent habitats are usually more closed canopy dry to dry-mesic oak-dominated forests.

### Crosswalk to State Wildlife Action Plans:

Early Successional Forests - Shrub-dominated natural communities (MD), Forest Habitat - Mixed Forest (VA)

State Distribution: MD, VA

Total Habitat Acreage: 1,456

Percent Conserved: 40.2%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
VA	97%	1,409	484	66	860
MD	3%	47	36	0	11

### Crosswalk to State Name Examples:

Montane - Piedmont Basic Woodland (MD), Southern Blue Ridge High-Elevation Mafic Barren (VA)

## Places to Visit this Habitat:

C & O Canal National Historical Park | MD  
 Appalachian National Scenic Trail | VA  
 Buffalo Mountain State Natural Area Preserve | VA  
 George Washington and Jefferson National Forest | VA

## Associated Species: *Appendix lists scientific names*

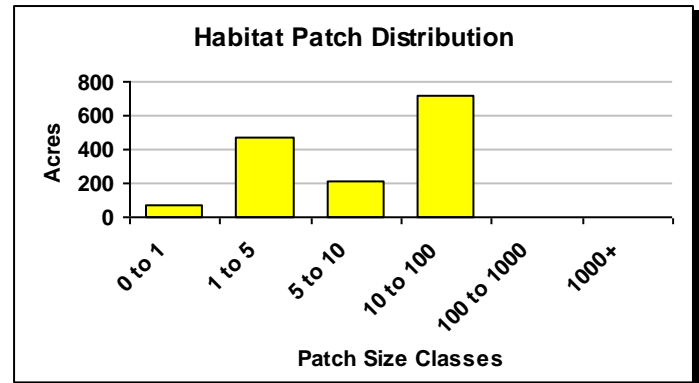
PLANTS: American alumroot (*Heuchera americana*), Appalachian phacelia (*Phacelia dubia*), aromatic sumac (*Rhus aromatica*), blue waxweed (*Cuphea viscosissima*), dwarf skullcap (*Scutellaria parvula*), dwarf-dandelion (*Krigia virginica*), false pennyroyal (*Isanthus brachiatus*), hairy lipfern (*Cheilanthes lanosa*), hoary mountain-mint (*Pycnanthemum incanum*), hoptree (*Ptelea trifoliata*), little bluestem (*Schizachyrium scoparium*), ninebark (*Physocarpus opulifolius*), nodding onion (*Allium cernuum*), Pennsylvania sedge (*Carex pensylvanica*), pink corydalis (*Corydalis sempervirens*), rusty woodsia (*Woodsia ilvensis*), staghorn sumac (*Rhus typhina*), whorled milkweed (*Asclepias verticillata*), woodland sunflower (*Helianthus divaricatus*)

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

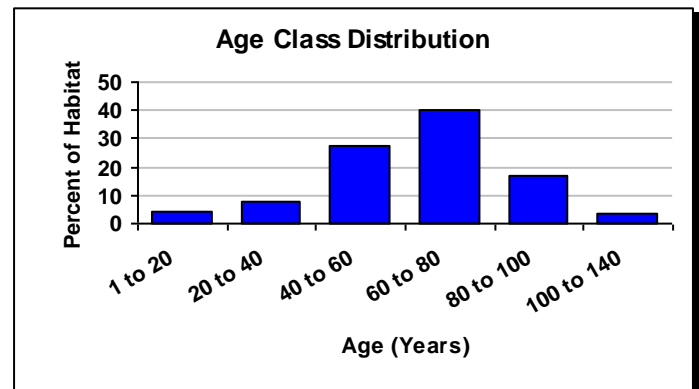
PLANTS: roundleaf fameflower (*Talinum teretifolium*)



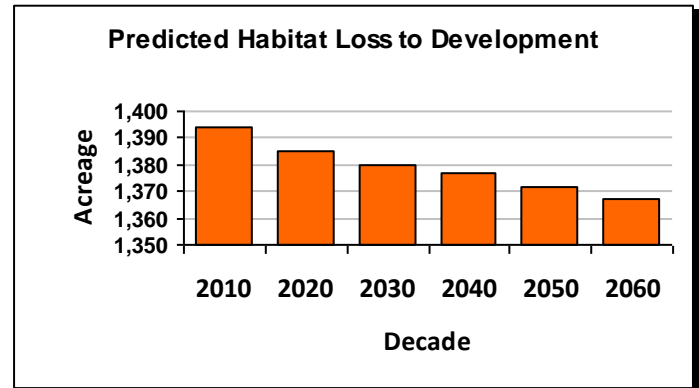
© Gary P. Fleming (Virginia Department of Conservation & Recreation Natural Heritage Program)



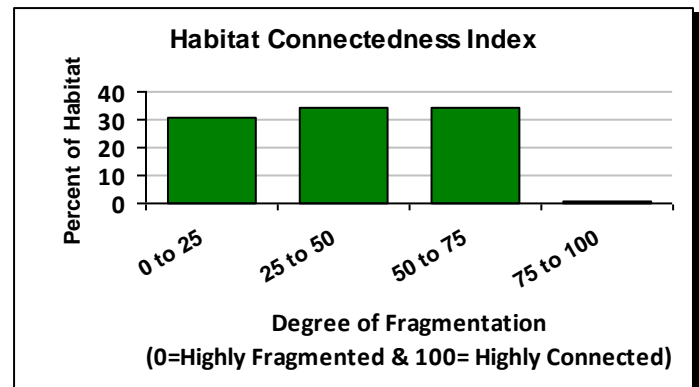
The average patch size for this habitat is 3 acres and the largest single patch is 85 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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.



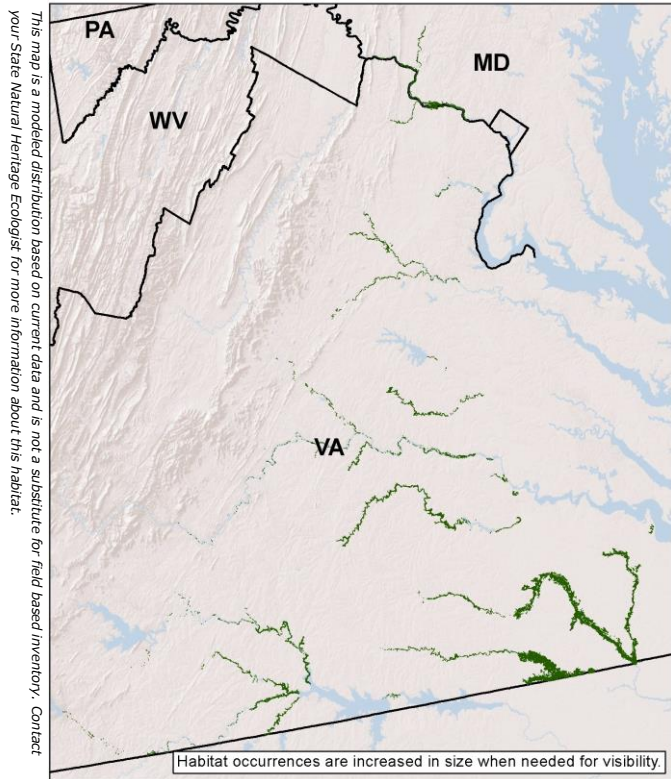
This chart shows the predicted loss of habitat over the next five decades (27 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 1 acre per year.



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: Large River Floodplain



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### Description:

A complex of wetland and upland vegetation on floodplains along larger rivers, where temporary to seasonal flooding affects vegetation composition and dynamics. Vegetation includes both non-forested bar and scour communities and a diverse group of more extensive forests. Microtopographic heterogeneity is high, and forests tend to be differentiated by depositional landforms such as levees, sloughs, terraces, and abandoned channels. Better drained soils may support wet site oaks, shagbark hickory, and sweetgum. Wettest swamps are often dominated by green ash and red maple. Bald cypress may occur, but does not dominate. Understories are generally open, with sedges and grasses or moisture-loving forbs in the herb layer.

### Ecological Setting and Natural Processes:

Occurs along large rivers or streams where topography and alluvial processes have resulted in a well-developed floodplain. River gradients tend to be a bit higher in the Piedmont than on the blackwater and brownwater rivers in the coastal plain. The alluvial soils are variable in texture. High-energy flooding can rework bar and bank communities, while windthrow dominates canopy dynamics.

### Similar Habitat Types:

Like other floodplain types in the Northeast, long linear examples of this habitat in good condition are rare because of their rich alluvial soils, settings favorable to agriculture, and vulnerability to invasive plants. Similar in structure to floodplains in higher valleys to the west, but with a somewhat different suite of bottomland species.

### Crosswalk to State Wildlife Action Plans:

Wetland Habitat - Forested (VA)

### State Distribution: MD, VA

Total Habitat Acreage: 131,403

Percent Conserved: 9.3%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
VA	97%	127,421	1,320	8,163	117,938
MD	3%	3,982	1,350	1,346	1,287

### Crosswalk to State Name Examples:

Coastal Plain - Piedmont Bottomland Forest (MD), Coastal Plain / Piedmont Floodplain Swamp (VA)

## Places to Visit this Habitat:

C & O Canal National Historical Park | MD  
 Mckee Beshers Wildlife Management Area | MD  
 Chub Sandhill State Natural Area Preserve | VA  
 Cumberland State Forest | VA  
 Powhatan State Park | VA

## Associated Species: *Appendix lists scientific names*

HERPTILES: dwarf waterdog (*Necturus punctatus*)

PLANTS: American elm (*Ulmus americana*), black walnut (*Juglans nigra*), boxelder, Canada waterleaf (*Hydrophyllum canadense*), clear-weed (*Pilea pumila*), hackberry (*Celtis occidentalis*), large solomon's-seal (*Polygonatum biflorum*), miami-mist (*Phacelia purshii*), paw-paw (*Asimina triloba*), ravenfoot sedge (*Carex crus-corvi*) spicebush (*Lindera benzoin*), striped violet (*Viola striata*), sweet-shrub (*Calycanthus floridus*), sycamore (*Platanus occidentalis*), Virginia bluebells (*Mertensia virginica*), white snakeroot (*Ageratina altissima*), wild blue phlox (*Phlox divaricata*), wild ginger (*Asarum canadense*), wood-nettle (*Laportea canadensis*), yellow trout-lily (*Erythronium americanum*)

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

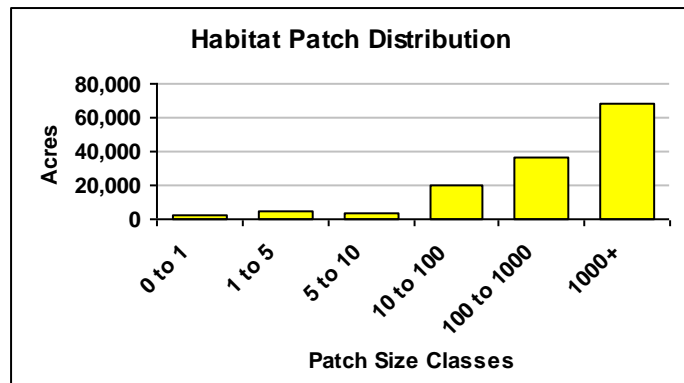
HERPTILES: dwarf waterdog (*Necturus punctatus*)

INSECTS: numerous rare mussels: atlantic pigtoe (*Fusconaia masoni*), roanoke slabshell (*Elliptio roanokensis*), spine-crowned clubtail (*Gomphus abbreviatus*), yellow lampmussel (*Lampsilis cariosa*), yellow lance (*Elliptio lanceolata*)

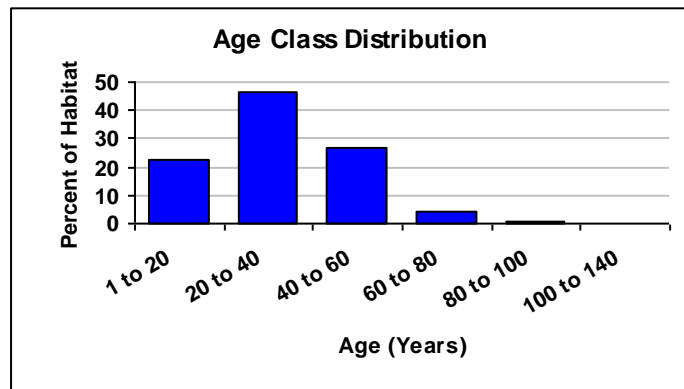
PLANTS: Baldwin's spikerush (*Eleocharis baldwinii*), bog rush (*Juncus elliotii*), large marsh st. john's-wort (*Triadenum tubulosum*), reclining bulrush (*Scirpus flaccidifolius*)



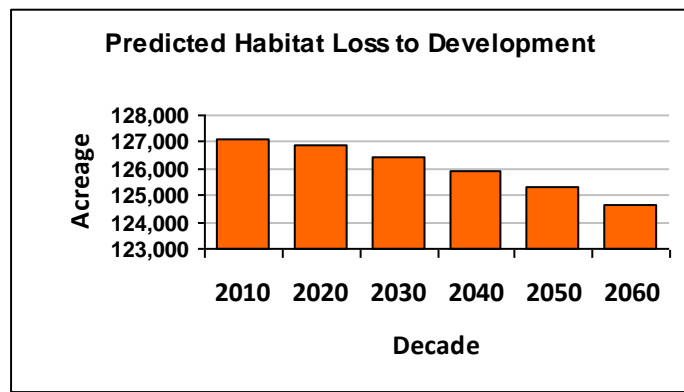
© Katharine Derge (Virginia Department of Conservation & Recreation Natural Heritage Program)



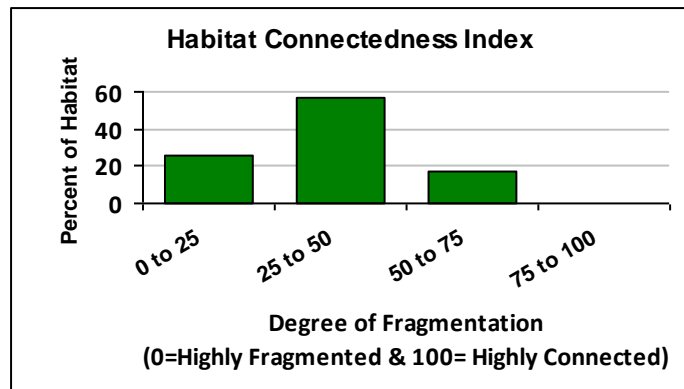
The average patch size for this habitat is 14 acres and the largest single patch is 12,142 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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 (2,517 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 50 acres per year.



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



## Macrogroup: Large River Floodplain

This map is a modeled distribution based on current data and is not a substitute for field based inventory. Contact your State Natural Heritage Ecologist for more information about this habitat.



© Bruce A. Sorrie (Massachusetts Division of Fisheries & Wildlife/Natural Heritage & Endangered Species Program)

### 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.

**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%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
NY	56%	142,677	10,582	15,936	116,158
PA	24%	59,967	2,733	5,826	51,409
ME	4%	11,047	479	2,413	8,155
MA	4%	10,054	1,693	2,251	6,110
NJ	4%	9,846	4,177	520	5,149
NH	2%	4,646	131	778	3,737
CT	2%	4,024	251	980	2,793
MD	1%	3,708	708	298	2,702
VT	1%	3,430	199	324	2,906
VA	1%	3,290	56	131	3,103
WV	1%	1,982	9	70	1,903
DC	0%	90	1	0	89
DE	0%	82	10	30	42
RI	0%	19	0	2	17

### 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)

### 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 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

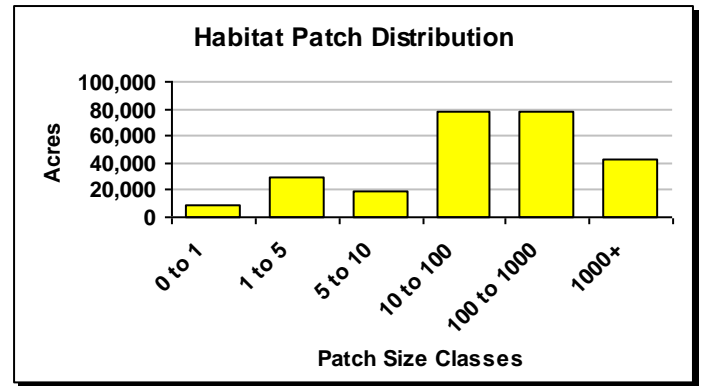
**HERPTILES:** blandings turtle, jefferson salamander, wood turtle

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

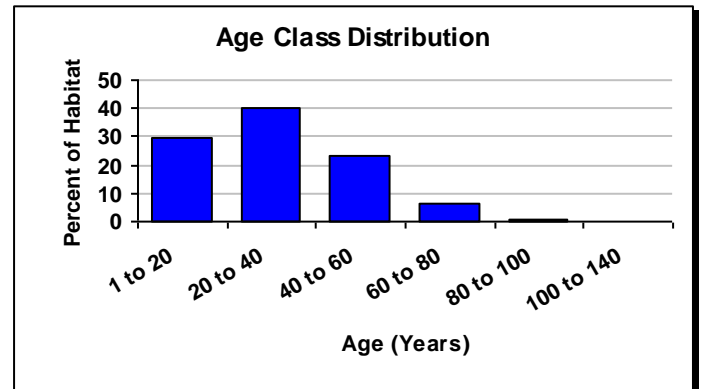
**PLANTS:** american lotus (*Nelumbo lutea*), coast violet (*Viola brittoniana*), eastern prairie white-fringed orchid (*Platanthera leucophaea*), heartleaf plantain (*Plantago cordata*), limestone wild petunia (*Ruellia strepens*), long's bulrush (*Scirpus longii*), maryland bur-marigold (*Bidens bidentoides*),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



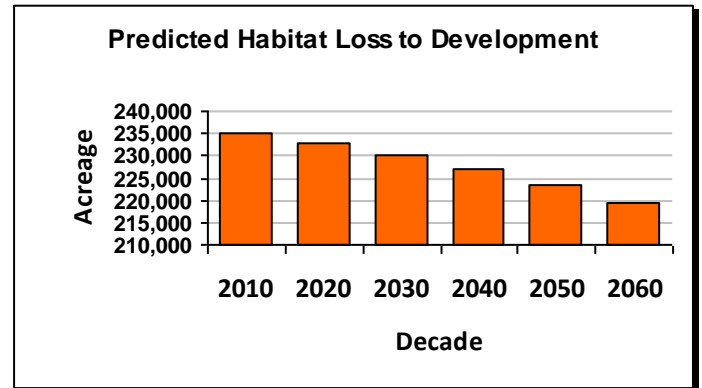
© Michael Batchler



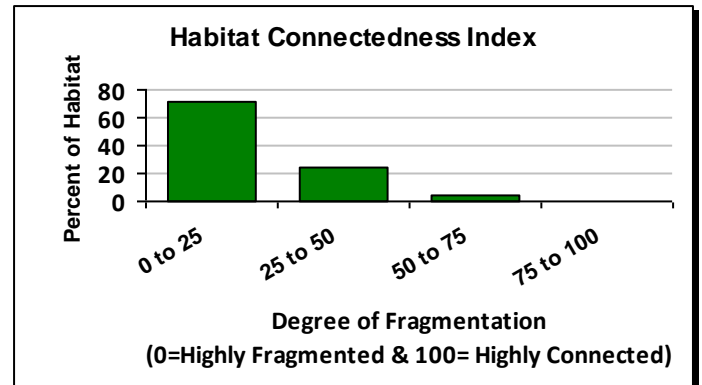
The average patch size for this habitat is 5 acres and the largest single patch is 3,512 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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



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

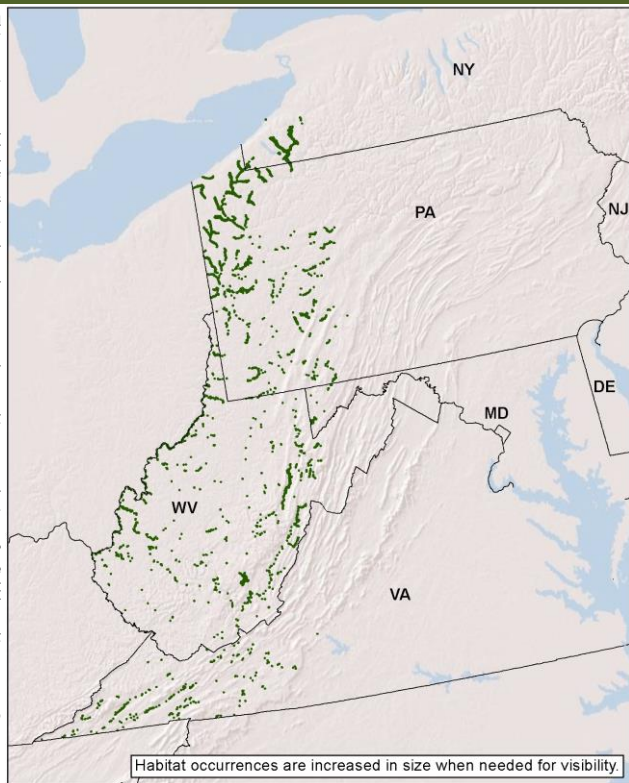


This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.



## Macrogroup: Large River Floodplain

This map is a modeled distribution based on current data and is not a substitute for field based inventory. Contact your State Natural Heritage Ecologist for more information about this habitat.



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

### Description:

A complex of wetland and upland vegetation on floodplains of medium to large rivers in the Ohio River drainages. Vegetation is variable, dominants often include silver maple, sycamore, green ash, American elm, sweet gum, pin oak, and swamp white oak. Understory species are mixed, but include sedges and shrubs such as buttonbush. A single occurrence may extend from river's edge across the outermost extent of the floodplain or to where it meets a wet meadow or upland system. Examples may contain well-drained levees, terraces and stabilized bars, herbaceous sloughs and shrub wetlands. Most areas are inundated at some point each spring; microtopography determines how long the various habitats are inundated.

### Ecological Setting and Natural Processes:

Occurs along large rivers or streams where topography and alluvial processes have resulted in a well-developed floodplain. Soils range from very well-drained sandy substrates to very dense clays. Occasional severe floods can alter the system; exotic shrubs and herbs are a greater threat to floodplain communities than to other terrestrial habitats.

### Similar Habitat Types:

Natural processes are similar to those of other large river floodplain systems. Vegetation may be most similar to Central Appalachian Large River Floodplains. Only a small northeastern portion of the large geographic extent of this system is in our region.

### Crosswalk to State Wildlife Action Plans:

Riparian Thickets/Forests (PA), Wetland Habitat - Forested (VA), Floodplain Forests and Swamps (WV)

**State Distribution:** MD, NY, PA, VA, WV

**Total Habitat Acreage:** 70,068

**Percent Conserved:** 15.6%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
PA	54%	37,533	1,842	6,623	29,068
NY	29%	20,643	8	951	19,685
WV	14%	9,906	90	1,294	8,522
VA	2%	1,672	44	110	1,518
MD	0%	314	4	0	310

### Crosswalk to State Name Examples:

Montane - Piedmont Bottomland Forest (MD), Riparian Thickets/Forests (PA), Piedmont / Central Appalachian River Birch - Sycamore Forest (VA), Floodplain Forests And Swamps (WV)

## Places to Visit this Habitat:

Conewango Swamp Wildlife Management Area | NY  
 Hartson Swamp Wildlife Management Area | NY  
 Erie National Wildlife Refuge - Seneca Division | PA  
 Meadow River Wildlife Management Area | WV  
 Monongahela National Forest | WV

## Associated Species: *Appendix lists scientific names*

**BIRDS:** american bittern, bald eagle, cerulean warbler, green heron, prothonotary warbler, virginia rail, warbling vireo, willow flycatcher

**HERPTILES:** eastern hog-nosed snake, eastern massasauga, eastern ribbonsnake, northern leopard frog, red-eared slider, spiny softshell, upland chorus frog

**INSECTS:** blue-faced meadowhawk, broad-winged skipper

**PLANTS:** greater bladderwort (*Utricularia macrorhiza*), green arrow-arum (*Peltandra virginica*), hairy swamp loosestrife (*Decodon verticillatus*), harbinger-of-spring (*Eriogonum bulbosum*), northern water-plantain (*Alisma triviale*), poison-sumac (*Toxicodendron vernix*), purple-rocket (*Iodanthus pinnatifidus*), river seedbox (*Ludwigia leptocarpa*), shootingstar (*Dodecatheon meadia*), sword bogmat (*Wolffiella gladiata*)

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

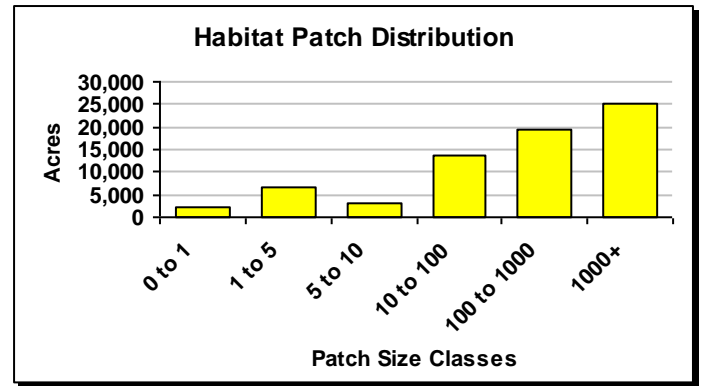
**HERPTILES:** green salamander, hellbender, jefferson salamander

**INSECTS:** eyed brown, two-spotted skipper

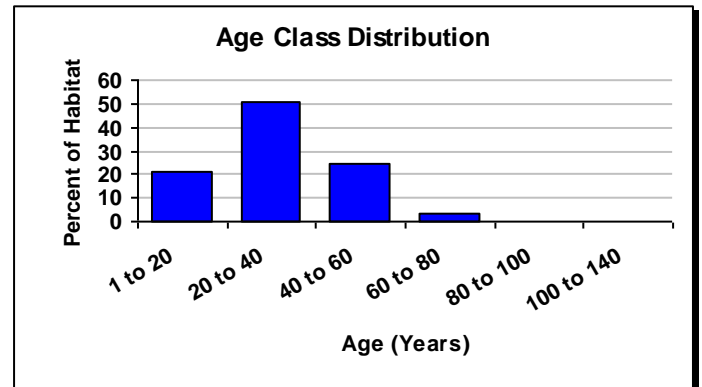
**PLANTS:** Appalachian sedge (*Carex appalachica*), hard-stemmed bulrush (*Schoenoplectus acutus*), large marsh St. John's-wort (*Triadenum tubulosum*), nodding rattlesnake-root (*Prenanthes crepidinea*), stout smartweed (*Polygonum robustius*)



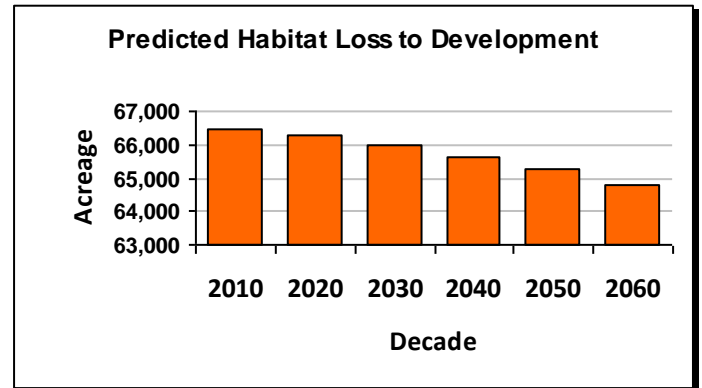
© Gary P. Fleming (Virginia Department of Conservation & Recreation Natural Heritage Program)



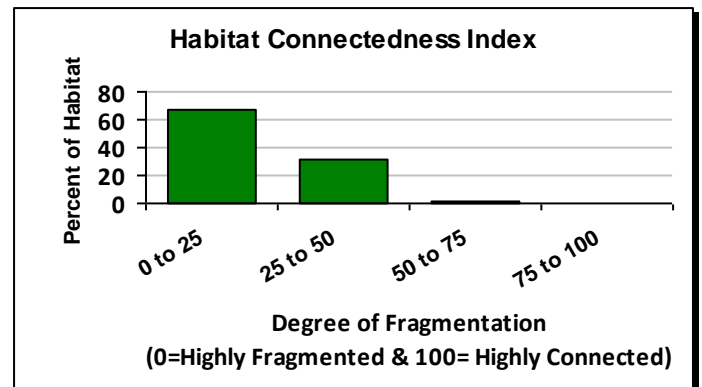
The average patch size for this habitat is 7 acres and the largest single patch is 2,249 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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 (1,659 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 33 acres per year.



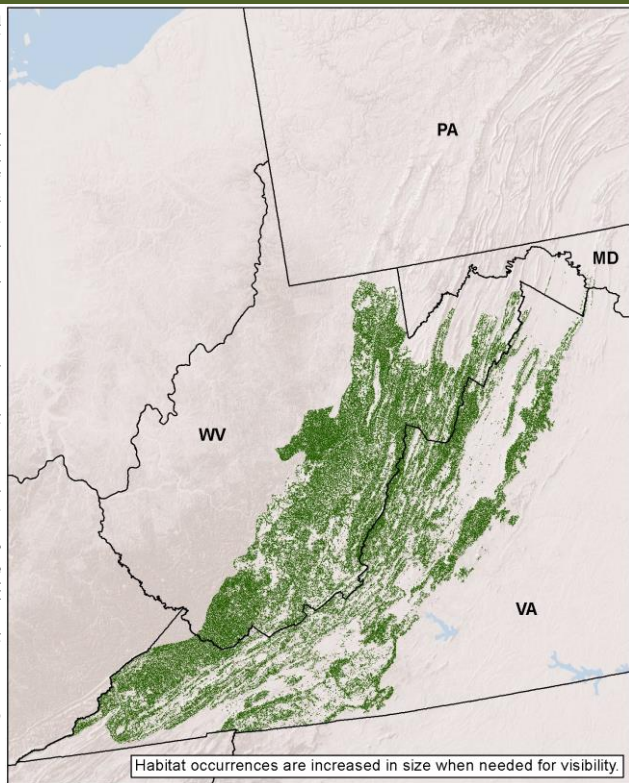
This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.





## Macrogroup: Northern Hardwood & Conifer

This map is a modeled distribution based on current data and is not a substitute for field based inventory. Contact your State Natural Heritage Ecologist for more information about this habitat.



© Brian Streets (West Virginia Division of Natural Resources)

### Description:

A hardwood or mixed forest with a high diversity of mesophytic (moisture loving but non-wetland) trees. Canopy species commonly include yellow buckeye, sugar maple, white ash, basswood, tuliptree, cucumber tree, and American beech, sometimes in a single stand. Hemlock is sometimes present, mostly in acidic coves. Shrub and herb layers are similarly rich, and calcium-bearing and circumneutral bedrock tends to support the richest examples. This forest is typical of sheltered, shady places in the Blue Ridge and central Appalachian Mountains, forming large patches (tens to hundreds of acres) on concave slopes that accumulate nutrients and moisture. These are communities of high diversity and often great structural complexity.

### Ecological Setting and Natural Processes:

Found on sheltered coves and concave slopes. Soils are often rocky and may be coarse or fine-textured, and may be residual, alluvial, or colluvial. Single tree gap-phase regeneration drives stand dynamics; occasional more extreme wind or ice disturbance may operate at a larger scale. Fire is probably not often a significant factor.

### Similar Habitat Types:

The South-Central Interior Mesophytic Forest system is similar to this one but occurs west of the Allegheny Mountains. Dry-mesic forests like Appalachian (Hemlock-)Northern Hardwood and Southern Appalachian Oak tend to occur immediately above, and riparian or floodplain systems just below cove landforms.

### Crosswalk to State Wildlife Action Plans:

Mesic Deciduous Forests (MD), Forest Habitat - Deciduous Forest (VA), Mixed Mesophytic Forest (WV)

**State Distribution:** MD, VA, WV

**Total Habitat Acreage:** 1,014,832

**Percent Conserved:** 33.0%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
WV	56%	571,349	25,693	118,872	426,784
VA	44%	443,212	84,241	105,502	253,469
MD	0%	271	47	47	177

### Crosswalk to State Name Examples:

Mesic Deciduous Forests (MD), Appalachian Rich Cove Forest (VA), Mixed Mesophytic Forest (WV)

## Places to Visit this Habitat:

Blue Ridge Parkway National Park | VA  
 George Washington and Jefferson National Forest | VA  
 Holly River State Park | WV  
 Kumbrabow State Forest | WV  
 Monongahela National Forest | WV

## Associated Species: *Appendix lists scientific names*

**BIRDS:** acadian flycatcher, black-throated blue warbler, cerulean warbler, hooded warbler, louisiana waterthrush, scarlet tanager, blue-headed vireo, swainson's warbler, wood thrush, worm-eating warbler, yellow-throated vireo

**MAMMALS:** allegheny woodrat, appalachian cottontail, eastern small-footed myotis, indiana myotis, long-tailed shrew, southern pygmy shrew, southern rock vole, virginia big-eared bat, virginia northern flying squirrel

**HERPTILES:** common map turtle, eastern hog-nosed snake, eastern ribbonsnake, eastern wormsnake, mountain earth snake, northern coal skink, spiny softshell

**PLANTS:** Loesel's Twayblade (*Liparis loeselii*), Ostrich Fern (*Matteuccia struthiopteris*), Herb-Robert (*Geranium robertianum*), Linear-leaved Willowherb (*Epilobium leptophyllum*)

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

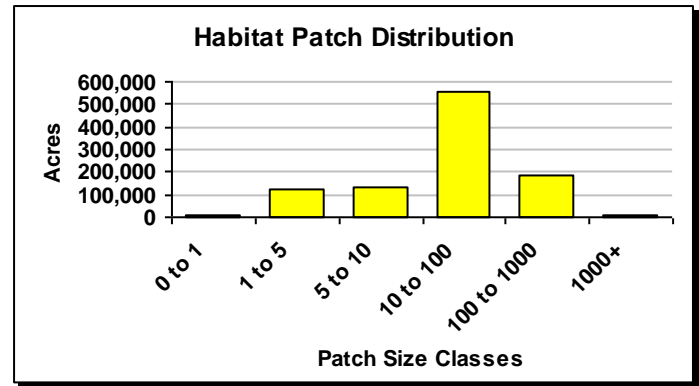
**HERPTILES:** big levels salamander, black mountain salamander, blue ridge two-lined salamander, bog turtle, cheat mountain salamander, common black-bellied salamander, green salamander, midland mud salamander, northern pygmy salamander, peaks of otter salamander, red salamander, shenandoah salamander, shovelnose salamander, upland chorus frog, white-spotted salamander

**INSECTS:** American emerald, northern spreadwing

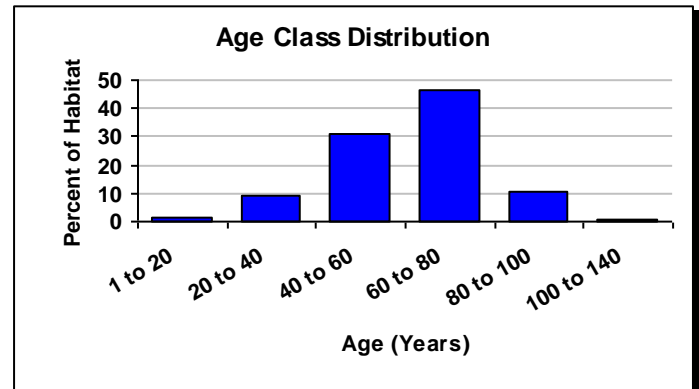
**PLANTS:** appalachian blue violet (*Viola appalachiensis*), appalachian gentian (*Gentiana austromontana*), blue ridge bittercress (*Cardamine flagellifera*), blue wild indigo (*Baptisia australis*), fire-pink (*Silene virginica*) running buffalo clover (*Trifolium stoloniferum*), smoke hole bergamot (*Monarda fistulosa*)



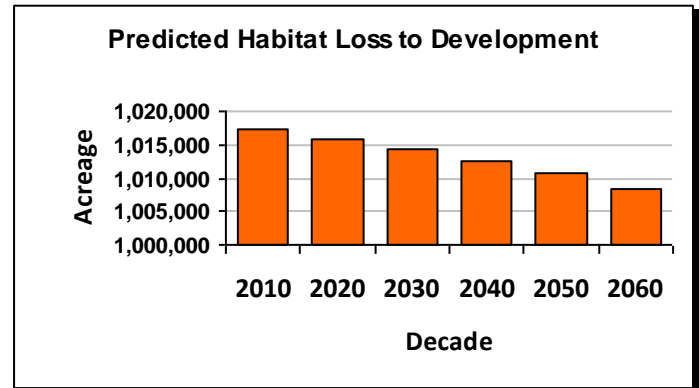
© Jim Vanderhorst (West Virginia Division of Natural Resources)



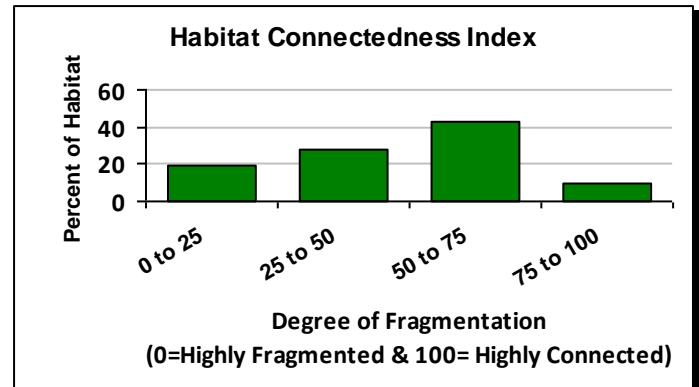
The average patch size for this habitat is 7 acres and the largest single patch is 1,905 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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 (8,843 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 177 acres per year.



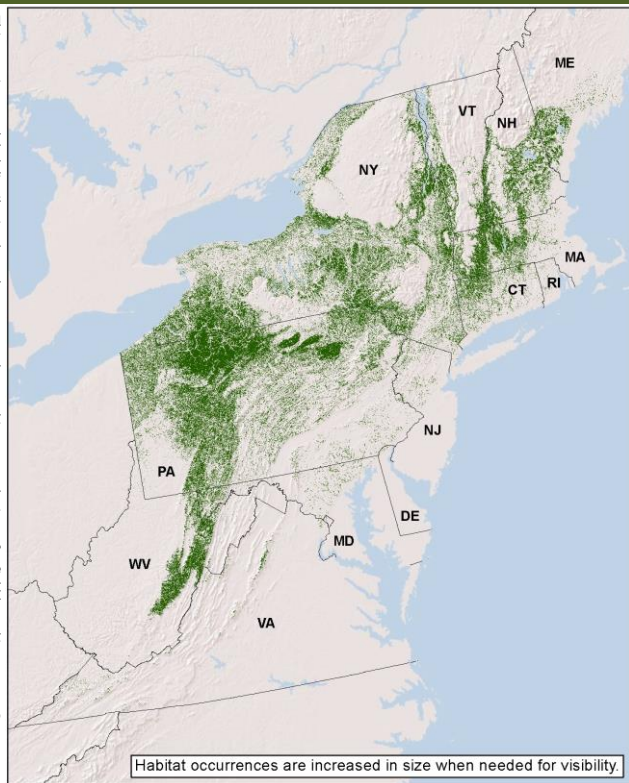
This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.

# Appalachian (Hemlock)-Northern Hardwood Forest



## Macrogroup: Northern Hardwood & Conifer

This map is a modeled distribution based on current data and is not a substitute for field based inventory. Contact your State Natural Heritage Ecologist for more information about this habitat.



© Maine Natural Areas Program

### 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.

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

**Total Habitat Acreage:** 20,995,362

**Percent Conserved:** 20.1%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
PA	39%	8,222,612	277,012	1,806,913	6,138,687
NY	34%	7,076,972	152,324	658,583	6,266,065
NH	6%	1,198,529	27,144	159,115	1,012,270
MA	5%	1,146,700	28,973	293,801	823,926
WV	5%	1,124,973	87,413	350,843	686,717
VT	3%	618,372	11,962	31,754	574,655
CT	3%	584,654	33,138	82,288	469,229
ME	2%	458,159	4,591	19,974	433,594
MD	1%	282,180	22,613	51,901	207,666
VA	1%	137,971	46,141	23,812	68,018
NJ	1%	127,379	35,274	8,106	84,000
RI	0%	11,945	435	4,496	7,014
DE	0%	3,633	40	1,308	2,285
DC	0%	1,283	0	0	1,283

### Crosswalk to State Name Examples:

Cove Forest (CT), Northern Hardwoods-Hemlock-White Pine Forest (MA), Eastern Hemlock - Hardwood Forest (MD), Hemlock Forest (ME), Hemlock - Oak - Northern Hardwood Forest (NH), Mesic Hemlock-Hardwood Forest (NJ), Hemlock-Northern Hardwood Forest (NY), Hemlock (White Pine) - Northern Hardwood Forest (PA), Appalachian Hemlock - Northern Hardwood Forest (VA), Northern Hardwood Forest - Hemlock-Northern Hardwood Forest (VT), Hemlock Forests (WV)

### 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

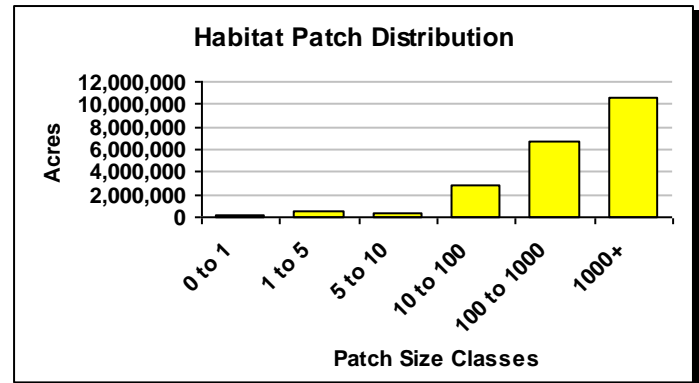
**HERPTILES:** Cheat Mountain salamander, eastern massasauga, green salamander, mountain earth snake, northern spring salamander

**INSECTS:** early hairstreak butterfly, spicebush swallowtail butterfly, west Virginia white

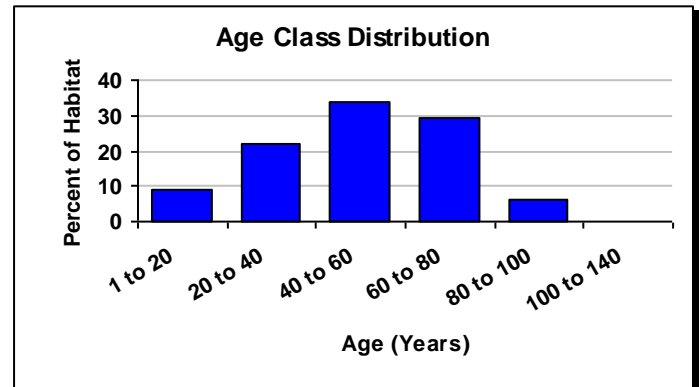
**PLANTS:** American ginseng (*Panax quinquefolius*), Appalachian blue violet (*Viola appalachiensis*), black bugbane (*Actaea racemosa*), Case's ladies'-tresses (*Spiranthes casei*), hairy beardtongue (*Penstemon hirsutus*), Laurentian bladder fern (*Cystopteris laurentiana*), mountain bugbane (*Actaea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



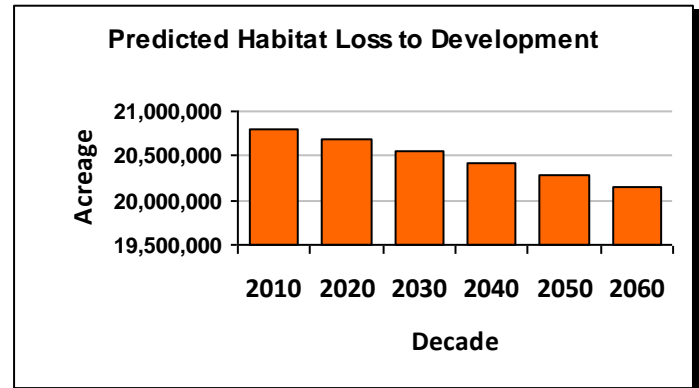
© Maine Natural Areas Program



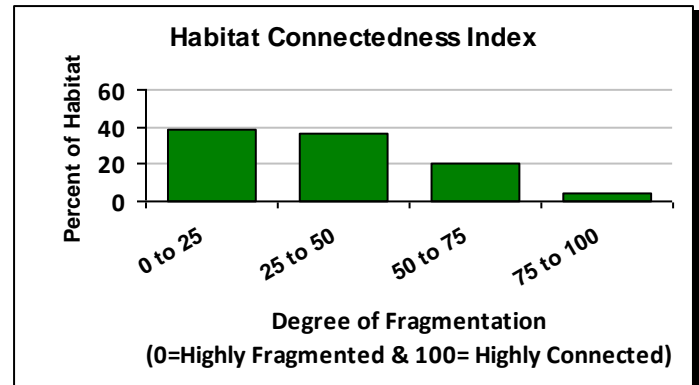
The average patch size for this habitat is 19 acres and the largest single patch is 39,064 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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.



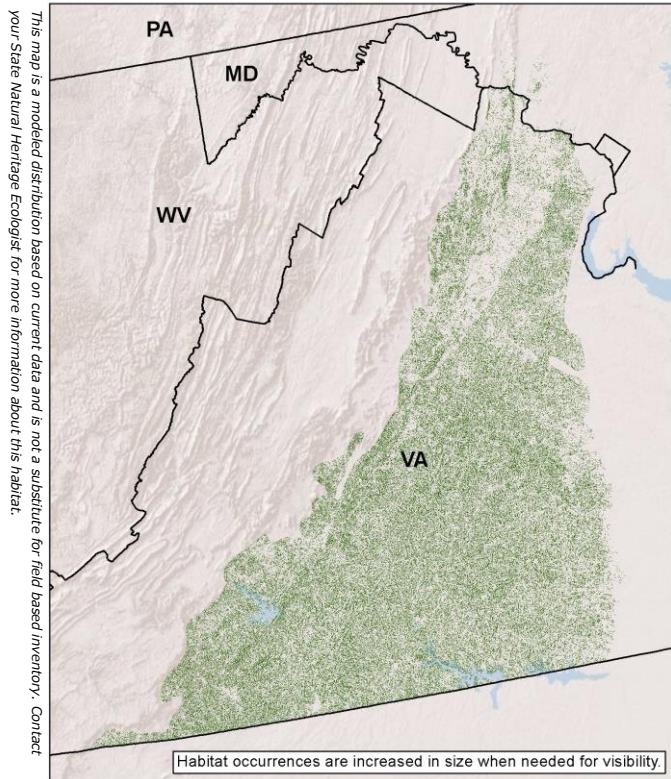
This chart shows the predicted loss of habitat over the next five decades (667,316 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 13,346 acres per year.



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



## Macrogroup: Northern Hardwood & Conifer



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

### Description:

A hardwood forest of moist low or north-facing slopes in the Piedmont. Vegetation is dominated by trees that favor conditions of moderate moisture (sweetgum, white oak, red oak, tuliptree, basswood), with American beech most prominent. Conifers are occasionally abundant. A few places support dense heath shrubs; otherwise shrubs layers tend to be sparse to moderate. Rock chemistry is an important determinant of variation, with denser and more diverse herb layers on richer examples. This system is a prominent part of the ecological mosaic of the Piedmont down to Alabama and Georgia, and only the northernmost part of its range is in our region. It often follows along slopes in stream-dissected areas. Most examples are large patches of tens to hundreds of acres.

### Ecological Setting and Natural Processes:

Occurring on mesic sites in the Piedmont from Virginia southward. Most examples occur on lower or north-facing slopes where topography creates moister and cooler conditions. Fire is naturally infrequent in this system, due to the slopes and moist conditions. If fire does penetrate, it is likely to be low in intensity and may not have significant ecological effects.

### Similar Habitat Types:

Related to Southern Atlantic Coastal Plain Mesic Hardwood Forest, and to the cove forest system of the central and southern Appalachians, but lacks a number of species of those regions. Many occurrences interfinger with Southern Piedmont Dry Oak-(Pine) Forests, on lower, more sheltered sites, and with more mesophytic, less drought-tolerant tree species.

### Crosswalk to State Wildlife Action Plans:

Forest Habitat - Deciduous Forest (VA)

**State Distribution:** MD, VA

**Total Habitat Acreage:** 2,438,858

**Percent Conserved:** 3.4%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
VA	100%	2,433,644	3,579	78,717	2,351,347
MD	0%	5,214	921	454	3,839

### Crosswalk to State Name Examples:

Southern Piedmont Basic Mesic Forest (VA)

## Places to Visit this Habitat:

Appomattox-Buckingham State Forest | VA  
 Cumberland State Forest | VA  
 Fairy Stone State Park | VA  
 Pocahontas State Park | VA  
 Prince Edward-Gallion State Forest | VA

## Associated Species: *Appendix lists scientific names*

**BIRDS:** acadian flycatcher, blue-gray gnatcatcher, chuck-will's-widow, carolina wren, great-crested flycatcher, prairie warbler, red-bellied woodpecker, red-headed woodpecker, summer tanager

**PLANTS:** American holly (*Ilex opaca*), American strawberry-bush (*Euonymus americanus*), big-leaf snowbell (*Styrax grandifolius*), Christmas fern (*Polystichum acrostichoides*), downy rattlesnake-plantain (*Goodyera pubescens*), flowering dogwood (*Cornus florida*), New York fern (*Thelypteris noveboracensis*), partridge-berry (*Mitchella repens*), silky camellia (*Stewartia malacodendron*), Virginia heartleaf (*Hexastylis virginica*), white wood aster (*Aster divaricatus*)

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

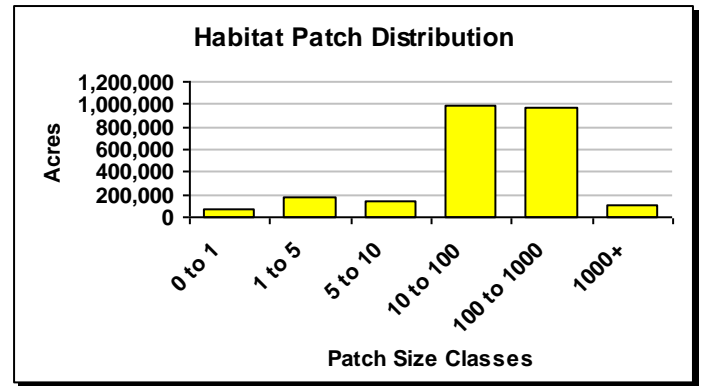
**HERPTILES:** dwarf waterdog, mole salamander, wood turtle

**INSECTS:** Appalachian jewelwing, gray petaltail, Laura's clubtail, mottled duskywing, piedmont clubtail, rapids clubtail, regal fritillary, Selys' sundragon, virginia piedmont water boatman

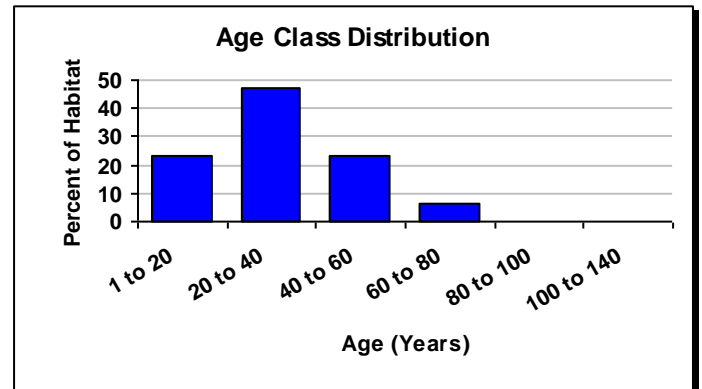
**PLANTS:** small anthered-bittercress (*Cardamine micranthera*)



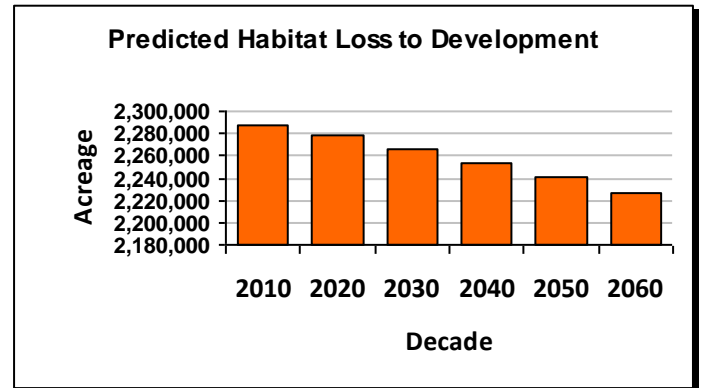
© Gary P. Fleming (Virginia Department of Conservation & Recreation Natural Heritage Program)



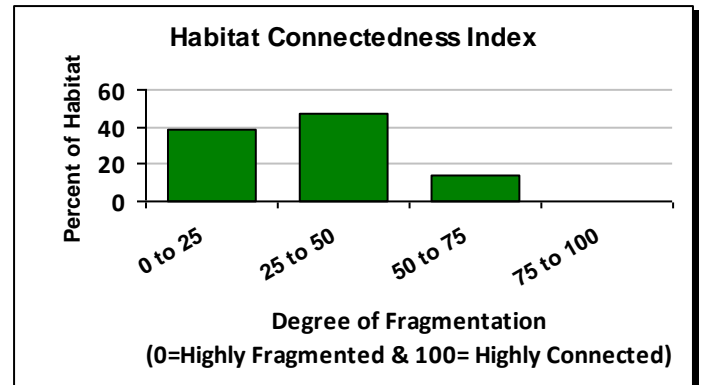
The average patch size for this habitat is 7 acres and the largest single patch is 2,780 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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 (61,818 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 1,236 acres per year.

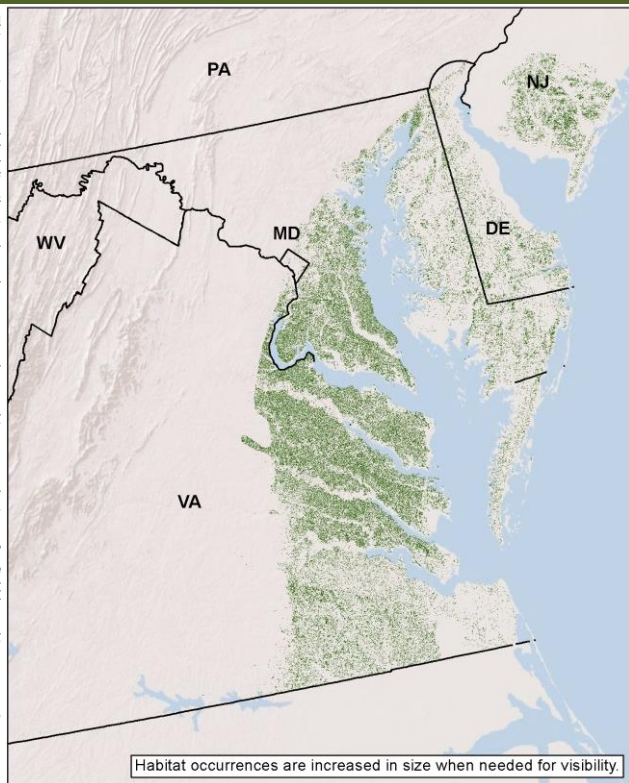


This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.



## Macrogroup: Northern Hardwood & Conifer

This map is a modeled distribution based on current data and is not a substitute for field based inventory. Contact your State Natural Heritage Ecologist for more information about this habitat.



© Robert Coxe (Delaware Species Conservation & Research Program)

### Description:

A hardwood forest of the coastal plain with a significant component of mesophytic (moist but non-wetland) species, such as American beech or southern sugar maple. Upland and bottomland oaks at the mid range of moisture tolerance are usually also present, particularly white oak, but sometimes also southern red oak, cherrybark oak, or Shumard oak. Loblolly pine is sometimes present, but it is unclear if it is a natural component or has entered only as a result of past cutting. Understories are usually well-developed. Shrub and herb layers may be sparse or moderately dense. Ranging south from New Jersey to Georgia, these mostly large patch coastal plain forests occupy a variety of moist sites that are naturally sheltered from frequent fire.

### Ecological Setting and Natural Processes:

Found on lower slopes, along streams and rivers, on mesic flats between drier pine-dominated uplands and floodplains, and on local raised areas within bottomland terraces or wet flats. Soils are variable in texture and pH, excluding only the coarsest sands. Fire is not an important disturbance in this system.

### Similar Habitat Types:

Often adjacent to North Atlantic Coastal Plain Hardwood Forests (in lower landscape position). Differences from mesic forests of the Piedmont are sometimes fairly subtle; substantial floristic differences, however, can exist between examples of this system on acidic and basic substrates.

### Crosswalk to State Wildlife Action Plans:

Hardwood Forest - Mixed oak-beech forests (DC), Coastal Plain Upland Forests - Tuliptree Rich Wood (Coastal Plain variant) (DE), Mesic Deciduous Forests (MD), Forest Habitat - Deciduous Forest (VA)

**State Distribution:** DC, DE, MD, NJ, PA, VA

**Total Habitat Acreage:** 1,932,352

**Percent Conserved:** 12.1%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
VA	58%	1,116,922	11,491	76,722	1,028,709
MD	29%	568,784	22,712	73,354	472,719
NJ	7%	137,699	23,430	8,031	106,238
DE	6%	107,687	3,634	14,012	90,041
DC	0%	1,122	0	11	1,111
PA	0%	139	0	0	139

### Crosswalk to State Name Examples:

Coastal Plain Oak - Beech Forest (MD), Southern Coastal Plain Mesic Mixed Hardwood Forest (VA)

## Places to Visit this Habitat:

Blackbird State Forest | DE  
 Redden State Forest | DE  
 Patuxent Wildlife Research Refuge | MD  
 Belleplains State Forest | NJ  
 Caledon State Park | VA

## Associated Species: *Appendix lists scientific names*

**PLANTS:** American holly (*Ilex opaca*), American hornbeam (*Carpinus caroliniana*), American strawberry-bush (*Euonymus americanus*), big-leaf snowbell (*Styrax grandifolius*), Christmas fern (*Polystichum acrostichoides*), downy rattlesnake-plantain (*Goodyera pubescens*), flowering dogwood (*Cornus florida*), New York fern (*Thelypteris noveboracensis*), silky camellia (*Stewartia malacodendron*), Virginia heartleaf (*Hexastylis virginica*), Small-flower Baby-blue-eyes (*Nemophila aphylla*), Yellow-eyed Grass (*Xyris difformis*), Broad-leaved Beardgrass (*Gymnopogon brevifolius*), Evergreen Bayberry (*Morella caroliniensis*), Black Snakeroot (*Zigadenus densus*), Capitulate Beakrush (*Rhynchospora cephalantha*), Seymeria (*Seymeria cassioides*), Wand-like Three-awn Grass (*Aristida purpurascens*)

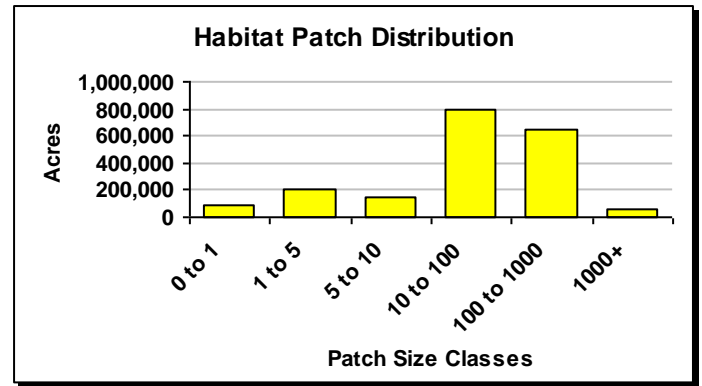
## Species of Concern (G1-G4): *Appendix lists scientific names*

**INSECTS:** sedge forest water scavenger beetle (*hydrochus spangleri*)

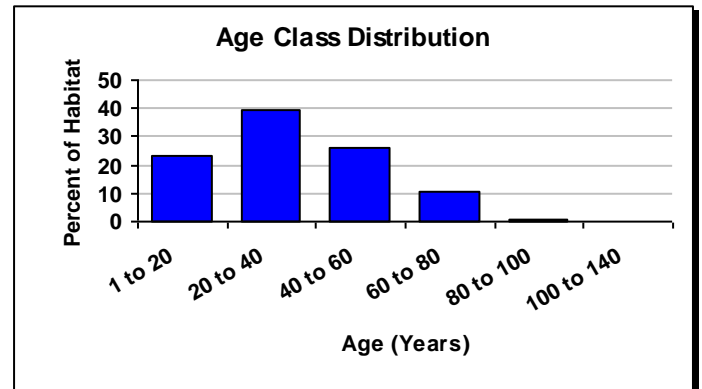
**PLANTS:** Canby's bulrush (*Schoenoplectus etuberculatus*), Canby's lobelia (*Lobelia canbyi*), early paspalum (*Paspalum praecox*), spiked hoary-pea (*Tephrosia spicata*), virginia heartleaf (*Hexastylis virginica*)



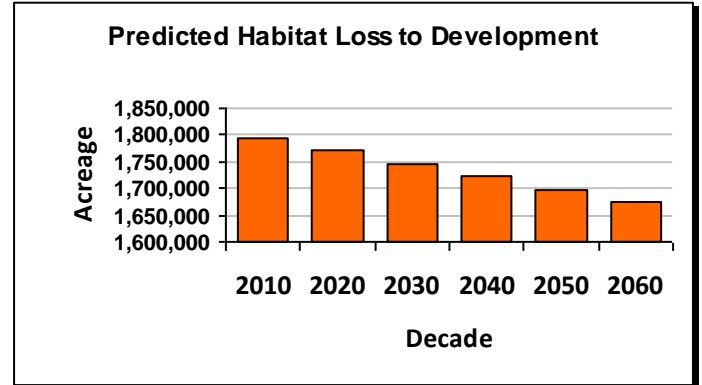
© Robert Coxie (Delaware Species Conservation & Research Program)



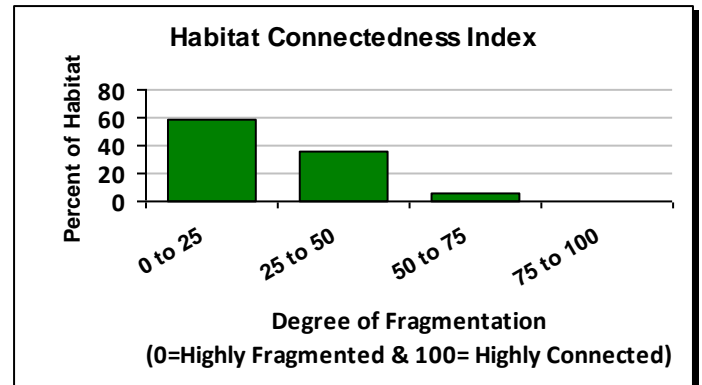
The average patch size for this habitat is 4 acres and the largest single patch is 1,277 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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 (120,282 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 2,406 acres per year.

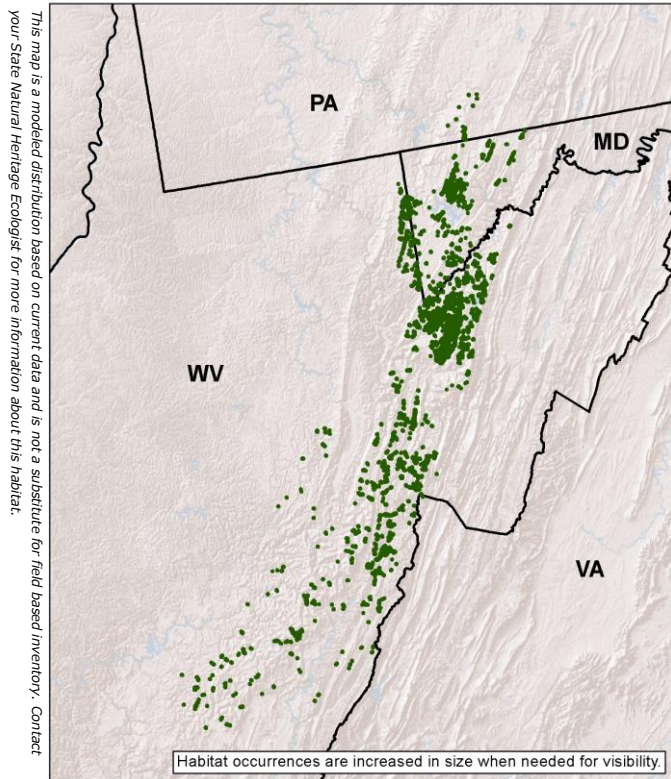


This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.





## Macrogroup: Northern Swamp



© Elizabeth Byers (West Virginia Division of Natural Resources)

### Description:

A wetland complex of forested swamps, shrub swamps, wet meadows and open marshes occurring at high elevations (2400 to 5000 feet) along the high plateau of the Allegheny Mountains. They are mostly in West Virginia, and range in size from a few hectares to about 6000 hectares. Forested swamps are dominated by red spruce, with red maple, hemlock, and yellow birch. Where calcareous bedrock influences seepage water, balsam fir and black ash are typical. Common shrubs are nannyberry, great rhododendron, alder, blueberry, bushy St. Johnswort, winterberry, and black chokeberry. Peat mosses and haircap mosses form a well-developed bryophyte layer. Bogs may occur in undisturbed portions of larger wetlands.

### Ecological Setting and Natural Processes:

These wetlands form where drainage is impounded in high, flat-lying basins by natural dams of resistant sandstone. They are maintained by a mix of seepage, low-energy flooding, beaver activity, and plentiful rainfall. The poorly-drained soils, typically peat-based and acidic to circumneutral, are drained by low-gradient, meandering, headwater streams. Cold air frost pockets are common.

### Similar Habitat Types:

The colder climates of high elevations, and the distinct environmental setting, drive the structure and composition of these wetlands and distinguish them from others in the region.

### Crosswalk to State Wildlife Action Plans:

Bog and Fen Wetland Complexes (MD), High Allegheny Bogs and Fens (WV), High Allegheny Swamp (WV)

**State Distribution:** MD, PA, VA, WV

**Total Habitat Acreage:** 27,695

**Percent Conserved:** 52.0%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
WV	85%	23,437	11,076	2,253	10,109
MD	15%	4,143	959	118	3,066
PA	0%	112	0	4	108
VA	0%	3	3	0	0

### Crosswalk to State Name Examples:

Bog And Fen Wetland Complexes (MD), Mixed Forb – Graminoid Wet Meadow (PA), Central Appalachian / High Allegheny Seepage Bog (VA), High Allegheny Bogs And Fens (WV)

## Places to Visit this Habitat:

Canaan Valley State Park | WV  
Canaan Valley National Wildlife Refuge | WV

## Associated Species: *Appendix lists scientific names*

**BIRDS:** alder flycatcher, american woodcock, blackburnian warbler, black-throated green warbler, red-shouldered hawk, wilson's snipe

**MAMMALS:** snowshoe hare

**PLANTS:** retrorse sedge (*Carex retrorsa*), creeping snowberry (*Gaultheria hispidula*), cyperus-like sedge (*Carex pseudocyperus*), downy willowherb (*Epilobium strictum*), dwarf mistletoe (*Arceuthobium pusillum*), hoary sedge (*Carex canescens*), purple fringeless orchid (*Platanthera peramoena*), rough-leaved aster (*Eurybia radula*), twinflower (*Linnaea borealis*)

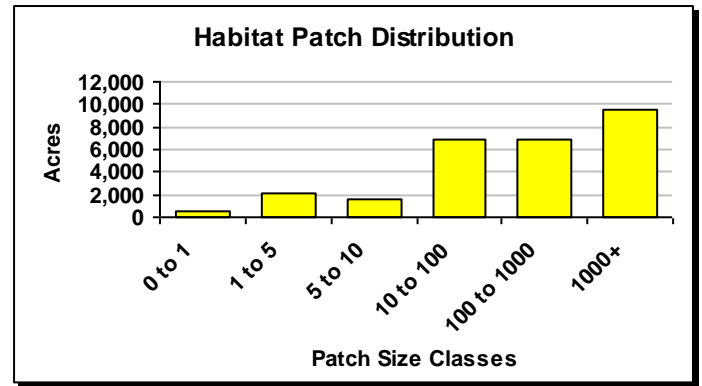
## Species of Concern (G1-G4): *Appendix lists scientific names*

**BIRDS:** american bittern

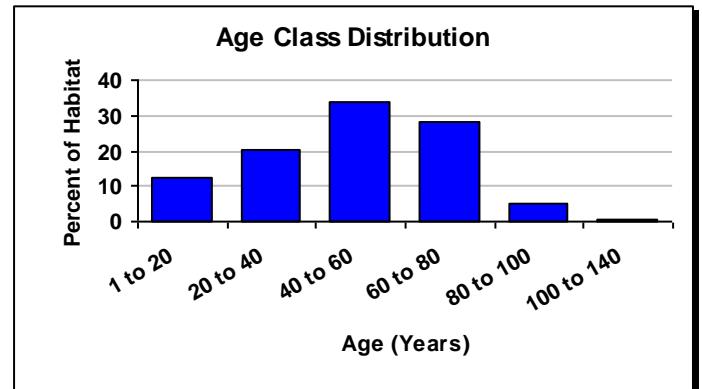
**HERPTILES:** bog turtle



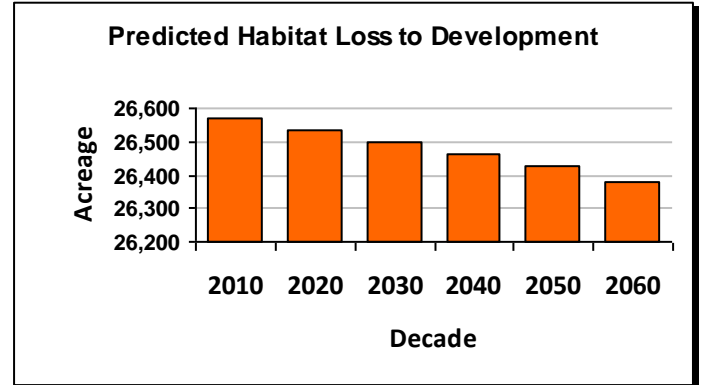
© Elizabeth Byers (West Virginia Division of Natural Resources)



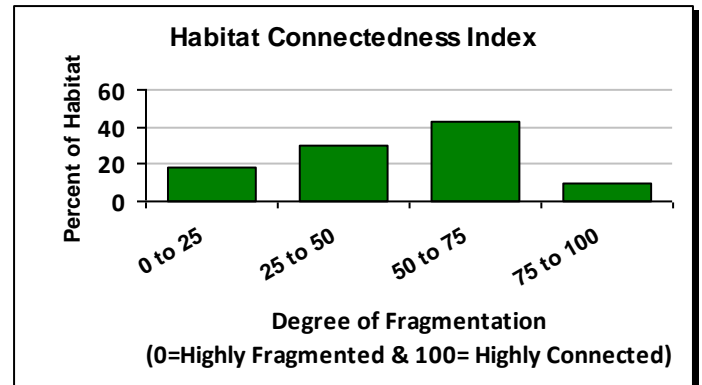
The average patch size for this habitat is 9 acres and the largest single patch is 6,345 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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 (194 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 4 acres per year.



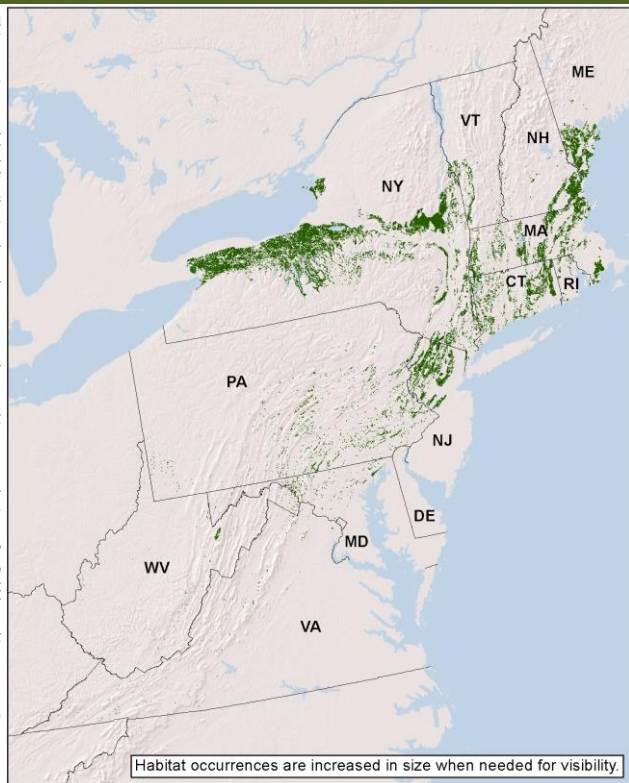
This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.

# North-Central Interior and Appalachian Rich Swamp



## Macrogroup: Northern Swamp

This map is a modeled distribution based on current data and is not a substitute for field based inventory. Contact your State Natural Heritage Ecologist for more information about this habitat.



© Elizabeth Thompson (Vermont Land Trust)

### 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.

**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%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
NY	57%	477,197	8,788	23,091	445,318
MA	12%	97,085	3,219	20,942	72,924
NJ	8%	65,853	14,570	3,360	47,923
CT	7%	61,367	3,321	7,547	50,499
ME	6%	50,962	1,159	2,184	47,618
NH	3%	28,320	1,780	4,476	22,064
PA	3%	28,125	1,271	1,786	25,068
VT	1%	8,935	118	649	8,167
RI	1%	5,679	255	737	4,687
MD	1%	4,219	298	270	3,651
VA	0%	1,932	79	49	1,804
WV	0%	1,096	46	45	1,006
DE	0%	28	0	4	25
DC	0%	19	0	0	19

### 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)

### 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 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*), roundleaf goldenrod (*Solidago patula*), showy lady's-slipper (*Cypripedium reginae*), yellow sedge (*Carex flava*)

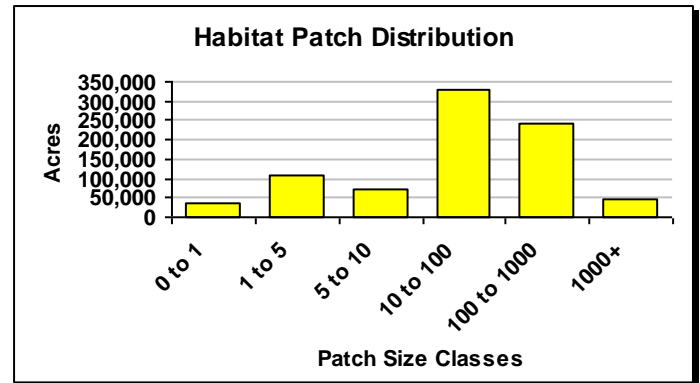
## Species of Concern (G1-G4): *Appendix lists scientific names*

**INSECTS:** sable clubtail (*Gomphus rogersii*)

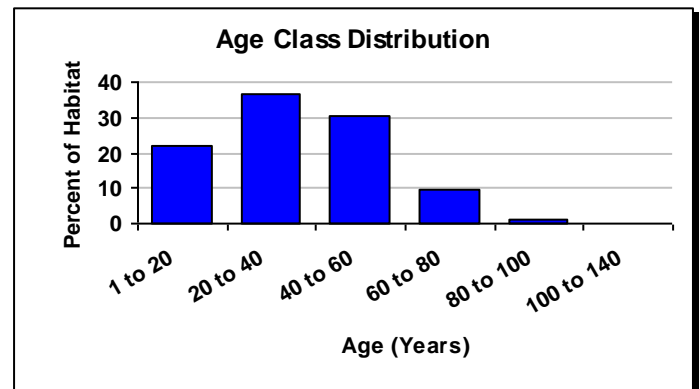
**PLANTS:** autumn willow (*Salix serissima*), Engelmann's spikerush (*Eleocharis engelmannii*), Hill's pondweed (*Potamogeton hillii*), many-headed sedge (*Carex sychnocephala*), prairie straw sedge (*Carex suberecta*), short-fruit rush (*Juncus brachycarpus*), spreading globeflower (*Trollius laxus*), weak stellate sedge (*Carex seorsa*)



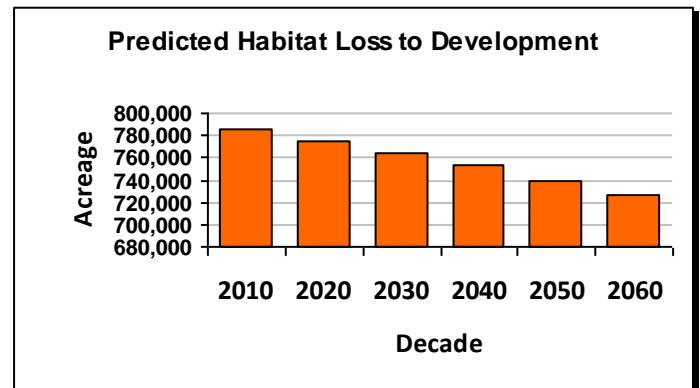
© Elizabeth Thompson (Vermont Land Trust)



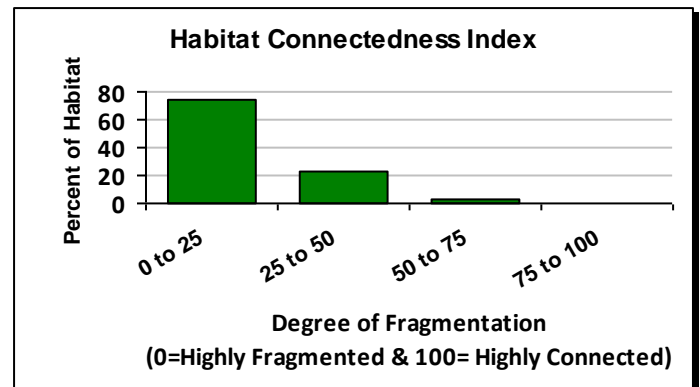
The average patch size for this habitat is 5 acres and the largest single patch is 3,380 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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 (58,581 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 1,172 acres per year.



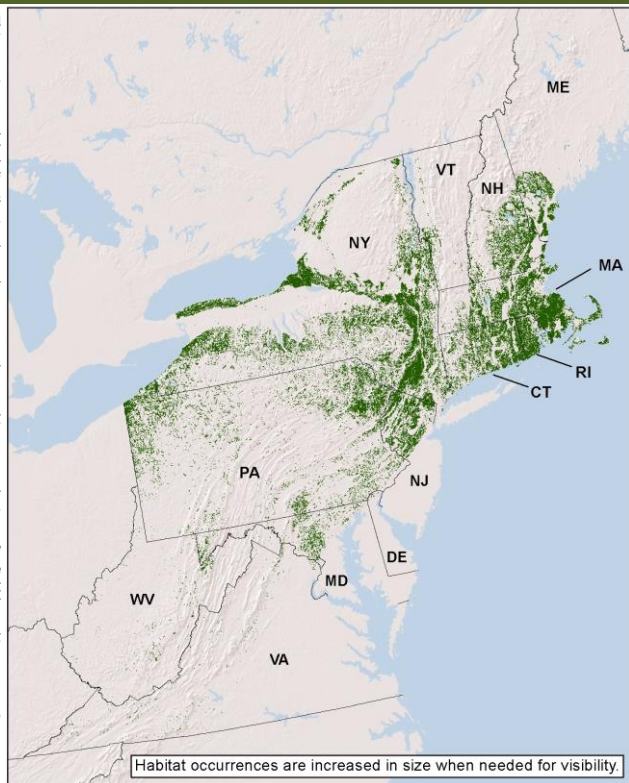
This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.

# North-Central Appalachian Acidic Swamp



## Macrogroup: Northern Swamp

This map is a modeled distribution based on current data and is not a substitute for field based inventory. Contact your State Natural Heritage Ecologist for more information about this habitat.



© Shane Gebauer (New York Natural Heritage Program)

### 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.

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

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

**Percent Conserved:** 19.1%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
NY	38%	573,190	12,114	41,979	519,097
MA	18%	272,643	13,012	62,775	196,856
PA	14%	213,320	15,593	42,685	155,042
CT	7%	112,088	6,555	17,448	88,085
NJ	6%	86,025	18,977	6,977	60,071
NH	6%	85,981	3,020	15,884	67,078
RI	4%	67,734	6,254	13,470	48,010
ME	4%	61,849	1,027	4,633	56,189
MD	1%	15,080	424	2,666	11,991
VT	1%	10,235	149	544	9,542
VA	0%	4,111	113	498	3,500
WV	0%	3,060	22	180	2,857
DE	0%	358	6	137	215
DC	0%	147	0	0	147

### 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)

### 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 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 darter

**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*

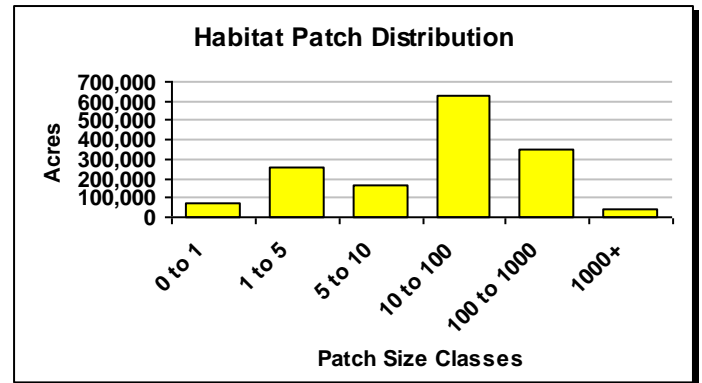
**BIRDS:** loggerhead shrike, olive-sided flycatcher

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

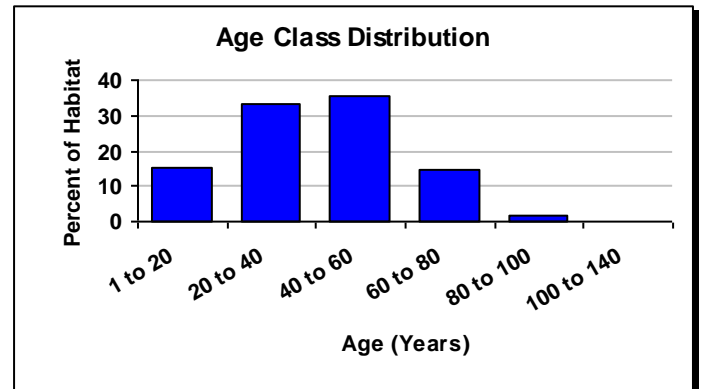
**PLANTS:** Collins' sedge (*Carex collinsii*), dwarf azalea (*Rhododendron atlanticum*), golden puccoon (*Lithospermum caroliniense*), incurved umbrella-sedge (*Cyperus aristatus*), many-fruit false-loosestrife (*Ludwigia polycarpa*), mitchell's sedge (*Carex mitchelliana*), tall beakrush (*Rhynchospora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



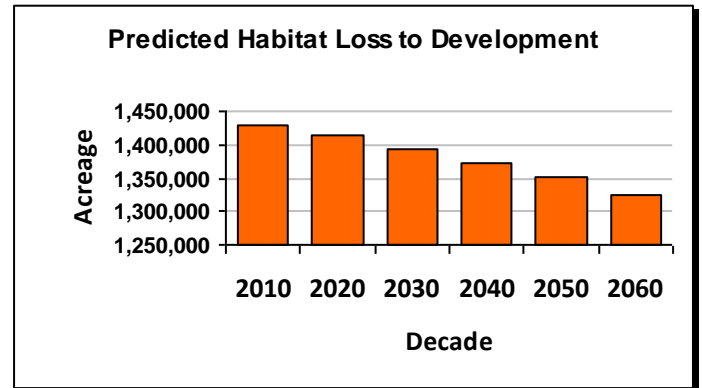
© Hal Malde



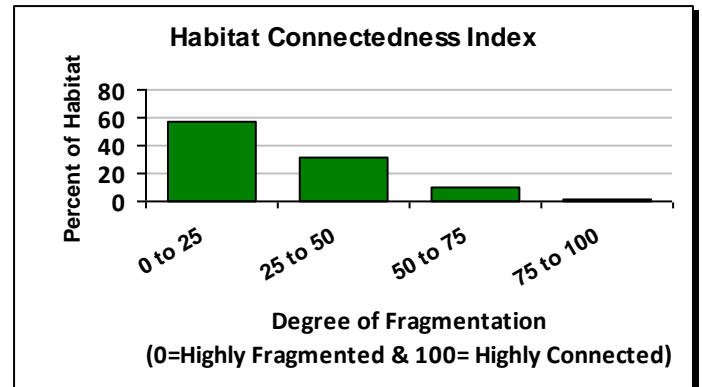
The average patch size for this habitat is 4 acres and the largest single patch is 2,811 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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 (104,239 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 2,085 acres per year.

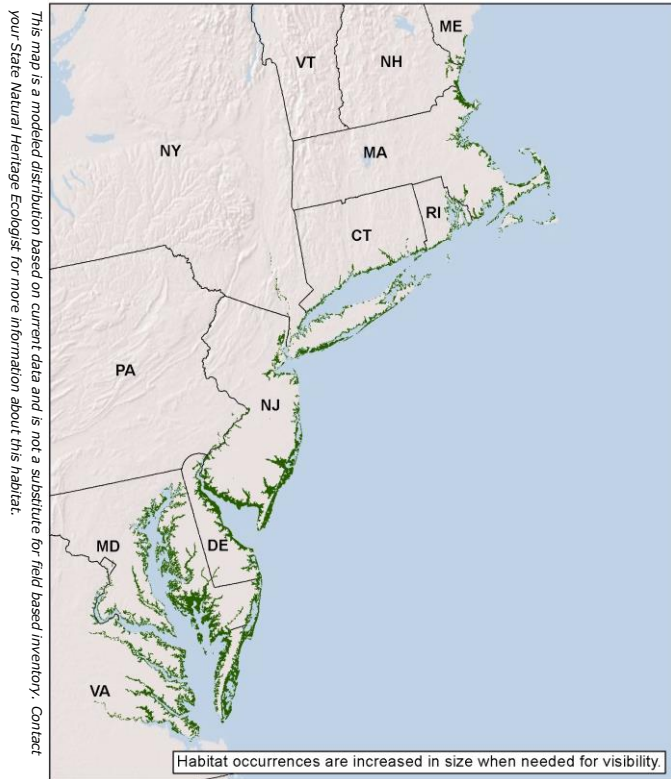


This metric measures how connected or fragmented the land directly surrounding (18 square miles) the habitat is, this the chart shows the proportion of the habitat in each connectedness class.

# North Atlantic Coastal Plain Tidal Salt Marsh



## Macrogroup: Tidal Marsh



© Kathleen Strakosch Walz (New Jersey Natural Heritage Program)

### 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.

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

**Total Habitat Acreage:** 920,107

**Percent Conserved:** 45.2%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
MD	27%	245,840	39,574	66,003	140,264
NJ	25%	228,298	126,237	3,886	98,175
VA	22%	204,148	32,632	55,758	115,758
DE	9%	85,398	16,761	25,547	43,090
MA	7%	67,163	11,057	16,240	39,867
NY	5%	49,268	6,189	3,152	39,927
CT	2%	18,538	2,751	4,088	11,699
RI	1%	8,583	1,213	1,116	6,254
NH	1%	7,214	601	1,155	5,458
ME	0%	3,901	1,600	82	2,219
PA	0%	1,636	516	58	1,062
DC	0%	120	0	3	117

### Ecological Setting and Natural Processes:

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

### Similar Habitat Types:

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

### Crosswalk to State Name Examples:

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

### Crosswalk to State Wildlife Action Plans:

Tidal Wetland - Tidal Wetlands (CT), Emergent Tidal Wetlands (DC), Freshwater Tidal Forested and Scrub-Shrub Wetlands (DE), Freshwater Tidal Marshes (DE), Estuaries (MA), Tidal Marshes (MD), Estuarine Emergent Saltmarsh (ME), Salt Marshes (NH), Tidal salt marsh (NJ), Salt Marsh (NY), Wetlands - Emergent Estuarine (PA), Intertidal - Estuarine Intertidal Emergent Brackish Marsh (RI), Wetland Habitat - Emergent (VA)

## Places to Visit this Habitat:

Bombay Hook National Wildlife Refuge | DE  
 Assateague Island National Seashore | MD  
 Edwin B. Forsythe National Wildlife Refuge | NJ  
 Fire Island National Seashore | NY  
 Chincoteague National Wildlife Refuge | VA

## Associated Species: *Appendix lists scientific names*

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

**MAMMALS:** north american least shrew

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

**PLANTS:** american sea-blite (*Suaeda calceoliformis*), dwarf glasswort (*Salicornia bigelovii*), large marsh pink (*Sabatia dodecandra*), salt reedgrass (*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

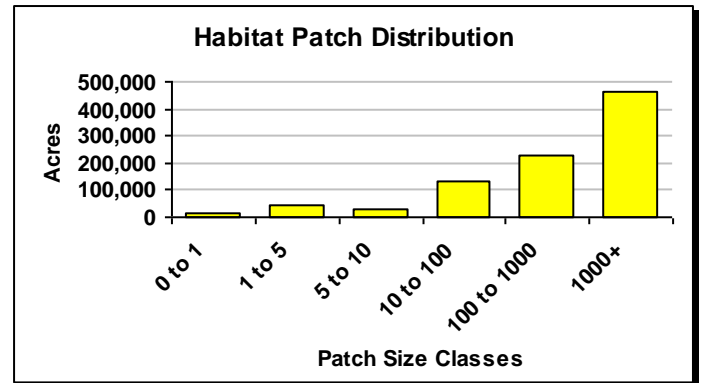
**HERPTILES:** diamondback terrapin, loggerhead, rainbow snake

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

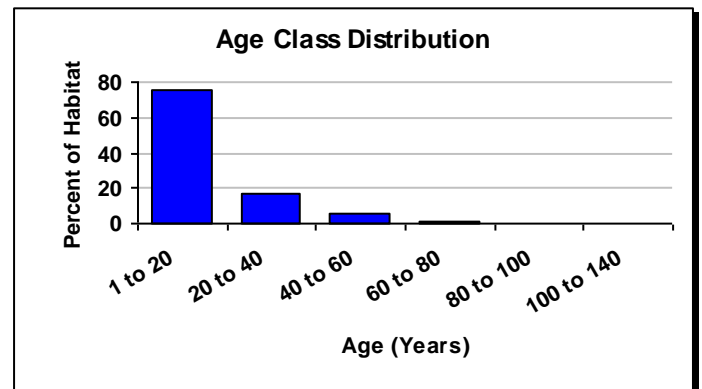
**PLANTS:** large salt marsh aster (*Aster tenuifolius*), Parker's pipewort (*Eriocaulon parkeri*), roland's sea-blite (*Suaeda rolandii*), salt marsh goosegrass (*Puccinellia fasciculata*), saltmarsh fleabane (*Pluchea odorata*), salt-marsh sedge (*Carex recta*), saltmarsh spikerush (*Eleocharis halophila*),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



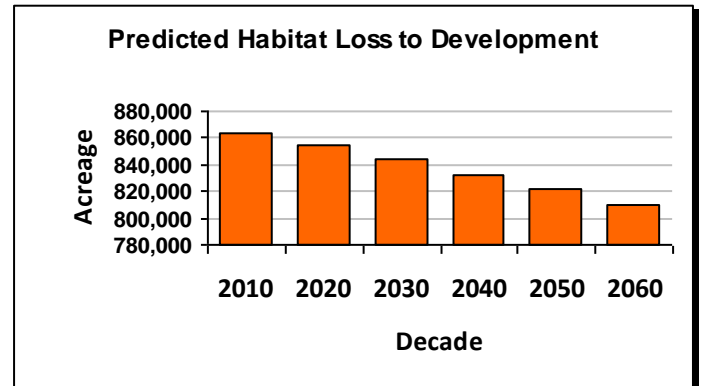
© Martin Rapp (New Jersey Natural Lands Trust)



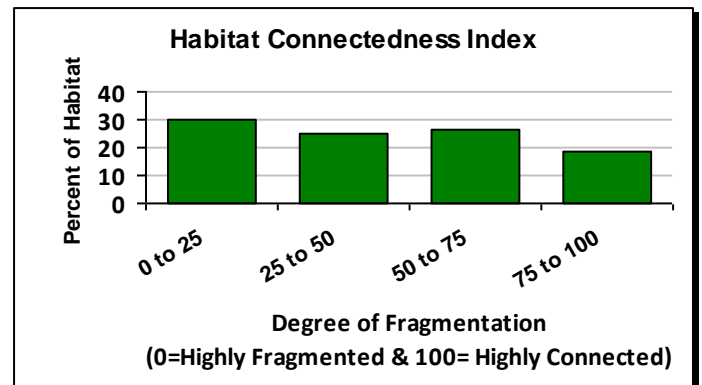
The average patch size for this habitat is 11 acres and the largest single patch is 19,464 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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 (54,284 acres) if loss continues at the same rate as 1990-2000. The average rate of loss is 1,086 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.

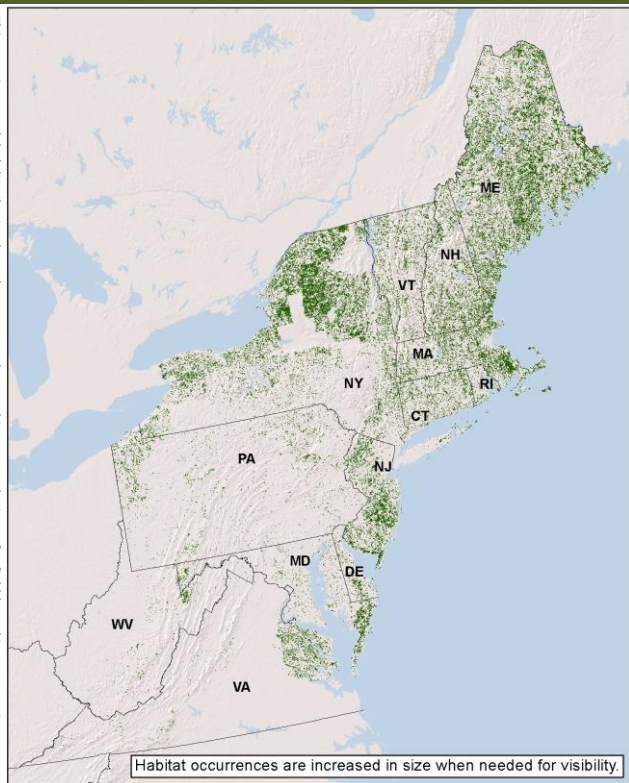


# Laurentian-Acadian Wet Meadow-Shrub Swamp



## Macrogroup: Wet Meadow / Shrub Marsh

This map is a modeled distribution based on current data and is not a substitute for field based inventory. Contact your State Natural Heritage Ecologist for more information about this habitat.



© Maine Natural Areas Program

### 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.

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

**Total Habitat Acreage:** 990,077

**Percent Conserved:** 25.5%

State	State Habitat %	State Acreage	GAP 1&2 (acres)	GAP 3 (acres)	Unsecured (acres)
ME	30%	297,075	11,928	39,478	245,668
NY	30%	293,979	59,329	38,332	196,318
MA	8%	76,718	4,358	17,980	54,380
NJ	7%	68,351	16,148	9,221	42,983
NH	6%	59,721	3,582	12,416	43,723
VT	4%	42,135	989	5,797	35,350
VA	4%	40,237	574	2,543	37,121
PA	4%	39,797	2,410	4,691	32,696
MD	3%	29,043	1,395	10,655	16,993
CT	2%	23,347	1,741	3,387	18,219
DE	1%	11,617	1,182	2,441	7,994
RI	1%	5,130	497	1,390	3,244
WV	0%	2,928	29	320	2,579

### 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)

### 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 Wildlife Action Plans:

Shrub Inland Wetland - Shrub Thickets (CT), Marshes and Wet Meadows - Wet Meadow (MA), Emergent Marsh and Wet Meadows (ME), Marsh and Shrub Wetlands (NH), Forested wetlands - scrub-shrub (NJ), Wet Meadow/Shrub Swamp (NY), Wetlands - Scrub/Shrub Swamps (PA), Emergent Wetlands - Emergent Marsh Shallow/ Wet Meadow (RI), Marshes and Sedge Meadows - Sedge Meadow (VT)

## Places to Visit this Habitat:

Redden State Forest | DE  
 Chesapeake Forest Lands | MD  
 Wharton State Forest | NJ  
 Debar Mountain Wild Forest | NY  
 Canaan Valley National Wildlife Refuge | WV

## Associated Species: *Appendix lists scientific names*

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

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

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

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

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

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

**MAMMALS:** southern bog lemming

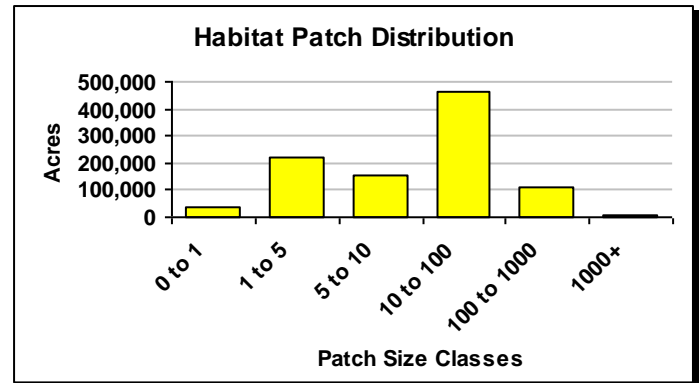
**HERPTILES:** Blanding's turtle, bog turtle, jefferson salamander, pine barrens treefrog, wood turtle

**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

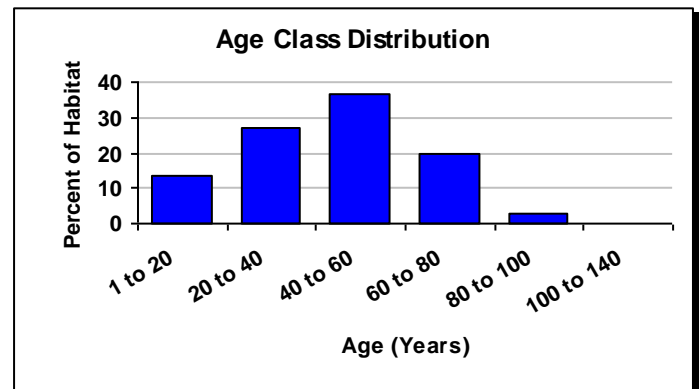
**PLANTS:** bead pinweed (*Lechea pulchella*), branching bur-reed (*Sparganium angrocladum*), Long's bulrush (*Scirpus longii*), Ogden's pondweed (*Potamogeton ogdenii*), Pursh's goldenrod (*Solidago uliginosa*), stout smartweed (*Polygonum robustius*), Walter's paspalum (*Paspalum dissectum*)



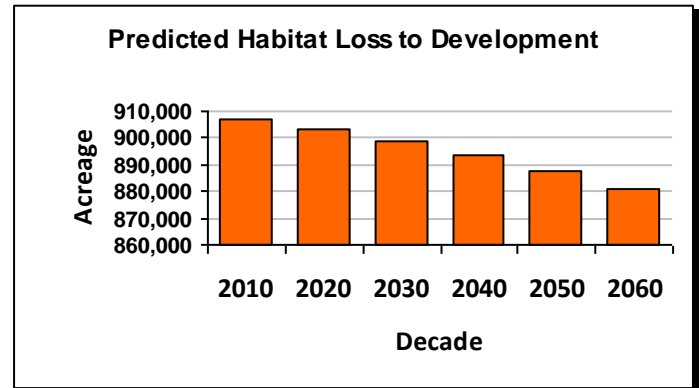
© Maine Natural Areas Program



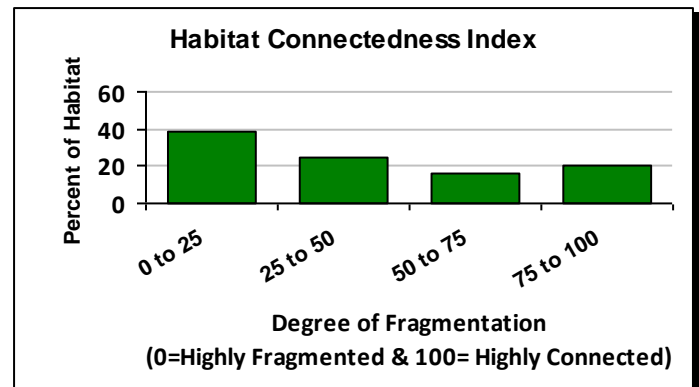
The average patch size for this habitat is 4 acres and the largest single patch is 1,460 acres. This chart shows the proportion of the habitat that is in each patch-size class.



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.