

Massabesic Forest South



WHY IS THIS AREA SIGNIFICANT?

The Massabesic Forest - South Focus Area supports one of the state's largest Atlantic white cedar swamps, a rare natural community, as well as a high concentration of pocket swamps and vernal pools, all within an extensive undeveloped forested landscape. High concentrations of swamps and vernal pools in undeveloped forested landscapes are becoming increasingly rare in Maine. The swamps, vernal pools and forested upland areas provide high quality habitat for a variety of plant and wildlife species, including several rare species.

OPPORTUNITIES FOR CONSERVATION

- » Work with willing landowners to permanently protect remaining undeveloped areas and significant features.
- » Encourage town planners to improve approaches to development that may impact Focus Area functions.
- » Maintain enhanced riparian buffers and natural hydrology.
- » Encourage best management practices for forestry, vegetation clearing, and soil disturbance.
- » Limit habitat fragmentation.
- » Limit use of pesticides, especially aerial spraying.

For more conservation opportunities, visit the Beginning with Habitat Online Toolbox: www.beginningwithhabitat.org/toolbox/about_toolbox.html.

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Rare Animals

- Hessel's Hairstreak Butterfly
- Spotted Turtle
- Wood Turtle
- Blanding's Turtle
- Common Musk Turtle
- Ringed Boghaunter Dragonfly

Rare Plants

- Atlantic White-Cedar
- Spotted Wintergreen
- Smooth Winterberry Holly
- Columbia Water-Meal

Rare and Exemplary Natural Communities

- Atlantic White Cedar Swamp

Significant Wildlife Habitats

- Deer Wintering Area
- Inland Wading Bird and Waterfowl Habitat
- Significant Vernal Pool

Public Access Opportunities

- » USFS Massabesic Experimental Forest



Atlantic White Cedar Swamp, Maine Natural Areas Program

FOCUS AREA OVERVIEW

The Massabesic Forest - South Focus Area covers approximately 6,500 acres and includes several thousand acres of undeveloped forest and wetlands located in the south end of the towns of Alfred and Lyman. Contributing to the biological significance of the area are extensive Atlantic white cedar swamps and other types of wetlands including pocket swamps, shrub swamps, and vernal pools. Concentrations of pocket swamps and vernal pools in undeveloped, forested landscapes are becoming increasingly rare in Maine. These areas provide critical habitat for rare plants and animals that are restricted to southern Maine. In addition, this site is one of only four in the state known to support a population of the state Endangered Hessel's hairstreak butterfly. The larvae of this rare butterfly subsist solely on Atlantic white cedar leaves.

The area is underlain by glacial till, including moraine formations, and by glacio-marine deposits, both of which impede drainage and help create this unusually high density of wetlands. Although the area is bisected by a number of roads, it is likely that the interior of each of the remaining unfragmented forested blocks has never been cleared for farming or pasture due to the poor quality of the soils. The forest through much of the area is dominated by oak and pine, and the wetlands are largely dominated by red maple, Atlantic white cedar, and vari-

ous shrubs. Timber harvesting has probably been the primary historical use of these lands.

NATURAL COMMUNITIES

The Focus Area includes one of Maine's largest **Atlantic white cedar swamps**, a rare natural community type known from only a handful of locations in southern and midcoast Maine. This habitat type is characterized by a mostly closed-canopy of Atlantic white cedar that is mixed with black spruce or red maple. Openings within the swamp typically include high-bush blueberry, mountain holly, and winterberry, with patches of ferns and sedges. Dense mosses cover the hummock-and-hollow ground surface. Often, Atlantic white cedar forms a dense canopy that allows little light penetration and limits understory growth. Since Atlantic white cedar seedlings are relatively intolerant of shade, some form of disturbance (e.g., fire, wind throw, or timber harvesting) may be required to regenerate this species.

CHARACTERISTIC SPECIES

The pocket swamps and vernal pools in an undeveloped landscape provide habitat to a variety of species. Vernal pools are ephemeral wetlands that typically fill with water from snow melt and spring run-off and often dry out over the course

of the summer. They offer critical breeding habitat for some species of amphibians and invertebrates such as wood frogs, spotted and blue-spotted salamanders, and fairy shrimp. The seasonal nature of the temporary pools maintains a fishless environment conducive to the successful breeding of these animals. Vernal pools are also used as feeding and breeding habitat by many other animals such as spring peepers, grey tree frogs, and other common amphibians, as well as several rare species. The amphibians and aquatic invertebrates that are dependent on these ponds for survival are an important food resource for other forest dwellers such as turtles, snakes, birds, and small mammals.

The wetlands and uplands in this Focus Area support three of Maine's rare turtle species: the state Endangered **Blanding's turtle**, the state Threatened **spotted turtle**, and the Special Concern **wood turtle**. Spotted and Blanding's turtles are generally found only in the southern most part of the state where increasing development contributes to loss of habitat, habitat fragmentation, and road kill. These species are most frequently associated with complexes of small, acidic wetlands and vernal pools in large, intact forested landscapes. They also use small streams, shrub swamps, forested swamps, wet meadows, and emergent marshes. Although these turtles spend most of their time in the water, they readily travel overland between wetlands during the spring and summer months. Upland habitats are also critical for basking, aestivating (a period of late summer inactivity), and nesting. Wood turtles are generally found near clear streams and rivers in forested areas where they make extensive use of the riparian zone adjacent to the river channel, as well as the productive vernal pools or sloughs that are often found there.

Spotted, Blanding's and wood turtles have evolved relatively long adult life spans to offset the long time it takes to reach reproductive maturity (15 yrs or more) and to offset high levels of nest and juvenile mortality. Because of this unusual life history, spotted, Blanding's and wood turtle populations occur at low densities, and thus populations are highly vulnerable to any human sources of adult mortality. Road mortality and collecting for pets, for example, can be extremely deleterious, as the attrition of just a few individuals every year can lead to the long-term decline and extinction of a local population. The secondary effects of human development – increased predator populations (e.g., dogs, cats, raccoon, skunks), water, light and noise pollution, filling of small wetlands, and blocking upland travel corridors (roads, rail beds, yards) – also impact populations. Spotted and Blanding's turtles are strictly protected from take (collecting, possession, or killing) by the Maine Endangered Species Act.

Two rare invertebrate species also occur within the Focus Area. One of the species is the **ringed bog haunter**, a globally rare dragonfly. Ringed bog hunters depend on small

Ecological Services of the Focus Area

- Provides habitat for wading birds and waterfowl as well as rare species
- Supports regional biodiversity by providing habitat for rare species and natural communities
- Retains sediments and nutrients protecting water quality in the nearby Mousam and Kennebunk Rivers
- Stores floodwaters

Economic Contributions of the Focus Area

- Recharges groundwater
- Provides forest products
- Provides opportunities for recreation including hunting, hiking and wildlife watching.
- Experimental Forest offers education and research opportunities

acidic pocket swamps and vernal pools to complete their life cycle. The ringed boghaunter is among the earliest dragonflies to emerge in the state, with adult emergence occurring in early May. Reproductive sites are typically small, acidic pocket swamps where patches of "Sphagnum soup" are interspersed with sedges, ferns, or shrubs. Although portions of these wetlands dry up during summer months, some permanent open water generally persists. Adult dragonflies typically frequent upland forested areas up to several hundred feet from their natal wetland to bask and forage before returning to breed. Ringed boghaunter is currently listed as state threatened in Maine because of its limited range and number of populations and close association with smaller wetlands that do not receive adequate protection under the state's wetland protection rules.

The other rare invertebrate known from the Massabesic Forest – South Focus Area is the globally rare and state Endangered **Hessel's Hairstreak butterfly**. This butterfly is found exclusively near swamps and bogs where its host plant is abundant – Atlantic white cedar – and the Massabesic forest hosts one of only three known populations of Hessel's Hairstreak in Maine. While probably never common on the northern end of its range, Hessel's Hairstreak is now vulnerable to extinction due to the incremental loss and fragmentation of remaining cedar swamps from logging and development activity in rapid growth areas of York County. Both the ringed boghaunter and Hessel's hairstreak are strictly protected from take (collecting, possession, or killing) by the Maine Endangered Species Act.

Three high to moderate value **Inland Wadingbird and Waterfowl Habitats** have been mapped within the Massabesic Forest-South Focus Area. These include emergent wetlands associated with Carlisle Brook, and other unnamed non-forested wetlands within the Focus Area. A **wading bird colony** is known from the central most open wetland system within the Focus Area. A single large **Deer Wintering Area** occupies the central portion of this Focus Area and includes a mix of upland and wetland softwood dominated forest types. Large 1,500 acre Deer Wintering Area provides valuable habitat for wintering deer and protection from deep snow and cold temperatures. In addition, Carlisle brook supports native brook trout.

Four rare plants, **spotted wintergreen**, **Atlantic white cedar**, **smooth winterberry holly**, and **Columbia water-meal** have all been documented in this area. Spotted wintergreen tends to inhabit mixed woods with full to partial canopy on slight slopes. All Maine populations of spotted wintergreen are small and apparently vulnerable to loss. Smooth winterberry holly typically grows in or on the edge of pocket swamps and Atlantic white cedar swamps. Columbia water-meal is a small free floating aquatic species of still waters.

CONSERVATION CONSIDERATIONS

- » The integrity of wetlands and the processes and life forms they support including rare plants and animals are dependent on the maintenance of the current hydrology and water quality of the site. Intensive timber harvesting, vegetation clearing, soil disturbance, new roads, and development on buffering uplands can result in greater runoff, sedimentation, and other non-point sources of pollution that can degrade the high quality natural systems that occur here. Improperly sized crossing structures such as culverts can impede movement of fish and aquatic invertebrates effectively fragmenting local aquatic ecosystems and ultimately leading to local extirpation of some species. Future management activity should avoid additional impacts to the site's hydrology.
- » No activities should be permitted that could lead to the loss or degradation of turtle wetlands including filling, dredging, sedimentation, or changing of hydrology unless the activity is approved by MDIFW.
- » A minimum 250-foot forested buffer zone should be maintained around target wetlands with known rare animal locations. All wetlands, regardless of size, within 1/4 mile of mapped turtle locations should be considered potential habitat for these wide ranging species, and protected from direct impacts, and buffered by forested upland.
- » Impervious surfaces such as yards, buildings, parking lots, and roads should be minimized in the upland landscape within 1/4 mile of rare animal wetlands. Natural forest habitat should predominate the landscape. Intensive developments that concentrate human populations and road traffic within 1/4 mile of turtle wetlands should be avoided including subdivisions and service centers.
- » Less pervasive is degradation from incidental uses related to the increasing residential development in the area. Riparian



*Top- Blanding's Turtle, Jonathan Mays
Bottom- Hessel's Hairstreak, MDIFW*

- ian buffers can also play a major role in protection here. Care needs to be taken that ORV's stay on existing trails and remain out of all wetlands when the ground is not frozen. Existing trails should be reviewed with particular recreation and access needs in mind, and trails closed if they run counter to protection needs. Fragmenting features should be minimized where possible.
- » Low-intensity cutting (single tree or small group selection, firewood harvest) is likely compatible with sensitive features as long as operators avoid wetlands. Winter harvests are recommended to minimize impacts to rare plants, animals, and wetland systems. Close adherence to Best Management Practices for forestry activities near vernal pools (available from Maine Audubon Society at 207-781-6180 ext. 222 or bwilson@maineaudubon.org) will generally ensure the protection of wetland habitats and the amphibian food source

they supply.

- » Conservation planning for upland features should include setting some areas aside from timber harvesting to allow for the development of some unmanaged forest ecosystems.
- » No activities should be permitted that could lead to the loss or degradation of Atlantic white cedar swamps hosting Hessel's hairstreak including filling, ditching, polluting, or changes to the water level.
- » A minimum 250 foot upland forested buffer zone should be maintained around Atlantic white cedar swamps hosting the Hessel's hairstreak. A buffer of ½ mile should be used for these sites when spraying pesticides for control of gypsy moths and other pests.
- » With expected changes in climate over the next century, plant and wildlife species will shift their ranges. Maintaining landscape connections between undeveloped habitats will provide an important safety net for biodiversity as species adjust their ranges to future climate conditions.
- » Invasive plants and aquatic organisms have become an increasing problem in Maine and a threat to the state's natural communities. Disturbances to soils and natural vegetation and introductions of non-native species to terrestrial and aquatic habitats can create opportunities for colonization. Landowners and local conservation groups should be made aware of the potential threat of invasive species, of methods to limit establishment, and/or of appropriate techniques for removal. For more information on invasive plants visit: <http://www.maine.gov/doc/nrimc/mnap/features/invasives.htm>.
- » This area includes Significant Wildlife Habitat. Land managers should follow best management practices with respect to forestry activities in and around wetlands, shoreland areas, and Significant Wildlife Habitat. Vegetation removal, soil disturbance and construction activities may require a permit under the Natural Resources Protection Act. Contact MDIFW for more information.

RARE SPECIES AND EXEMPLARY NATURAL COMMUNITIES OF THE FOCUS AREA

	Common Name	Scientific Name	State Status*	State Rarity Rank	Global Rarity Rank
Animals	Hessel's Hairstreak Butterfly	<i>Callophrys hesseli</i>	E	S1	G3G4
	Spotted Turtle	<i>Clemmys guttata</i>	T	S3	G5
	Wood Turtle	<i>Clemmys insculpta</i>	SC	S4	G4
	Blanding's Turtle	<i>Emys blandingii</i>	E	S2	G4
	Common Musk Turtle	<i>Sternotherus odoratus</i>	SC	S3	G5
	Ringed Boghaunter Dragonfly	<i>Williamsonia lintneri</i>	T	S1	G2
Plants	Atlantic White-Cedar	<i>Chamaecyparis thyoides</i>	SC	S2	G4
	Spotted Wintergreen	<i>Chimaphila maculata</i>	E	S1	G5
	Smooth Winterberry Holly	<i>Ilex laevigata</i>	SC	S2	G5
	Columbia Water-Meal	<i>Wolffia columbiana</i>	T	S2	G5
Natural Communities	Atlantic White Cedar Swamp	Atlantic White Cedar Swamp		S2	G3G5

State Status*

- E** Endangered: Rare and in danger of being lost from the state in the foreseeable future, or federally listed as Endangered.
- T** Threatened: Rare and, with further decline, could become endangered; or federally listed as Threatened.
- SC** Special Concern: Rare in Maine, based on available information, but not sufficiently rare to be Threatened or Endangered.

*State status rankings are not assigned to natural communities.

State Rarity Rank

- S1** Critically imperiled in Maine because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres).
- S2** Imperiled in Maine because of rarity (6–20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
- S3** Rare in Maine (on the order of 20–100 occurrences).
- S4** Apparently secure in Maine.
- S5** Demonstrably secure in Maine.

Global Rarity Rank

- G1** Critically imperiled globally because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation.
- G2** Globally imperiled because of rarity (6–20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
- G3** Globally rare (on the order of 20–100 occurrences).
- G4** Apparently secure globally.
- G5** Demonstrably secure globally.