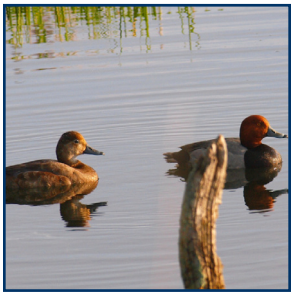
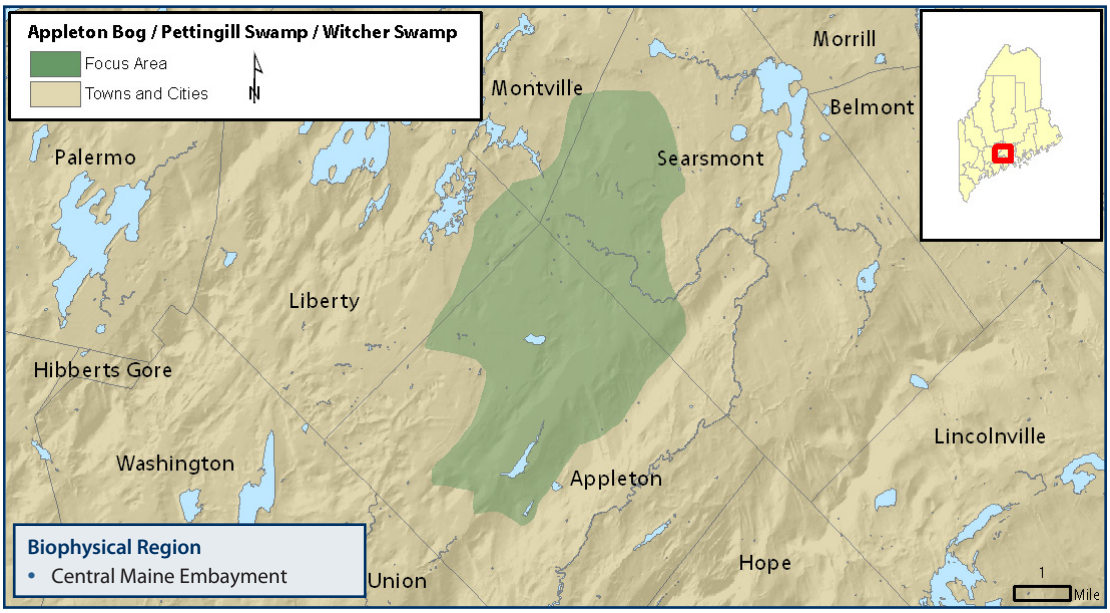
Beginning with HABITAT

Focus Areas of Statewide Ecological Significance

Appleton Bog-Pettingill Swamp-Witcher Swamp





WHY IS THIS AREA SIGNIFICANT?

The three large wetlands that make up Appleton Bog, Witcher Swamp, and Pettingill Swamp represent rare and exemplary examples of unpatterned fen, spruce- larch wooded bog, and Atlantic white cedar bog as well as one of the largest Atlantic white cedar swamps in the state. Because these wetlands function in part as headwaters of the St. George River, this area also provides flood and water quality protection for the St. George River. The proximity of the three large wetlands, and their combined habitat diversity, suggest that they may be viewed as one large conservation entity.

OPPORTUNITIES FOR CONSERVATION

» Educate recreational users about the ecological and economic benefits provided by the Focus Area.
» Work with willing landowners to permanently protect remaining undeveloped areas.
» Encourage town planners to improve approaches to development that may impact Focus Area functions.
» Encourage best management practices for forestry, vegetation clearing, and soil disturbance activities.
» Encourage landowners to maintain intact forested buffers along water bodies and wetlands.
» Monitor and remove invasive plant populations.

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

Photo credits, top to bottom: Maine Department of Inland Fisheries and Wildlife, Maine Natural Areas Program (middle 3 photos), Paul Cyr (bottom photo)

Rare Animals
Creeper
Upland Sandpiper

Rare Plants
Atlantic White-cedar

Rare and Exemplary Natural Communities
Atlantic White Cedar Bog
Atlantic White Cedar Swamp
Black Spruce Bog
Red Maple Fen
Unpatterned Fen Ecosystem

Significant Wildlife Habitats
Inland Wading Bird and Waterfowl Habitat
Deer Wintering Area

Public Access Opportunities
• Appleton Bog Preserve, TNC

Atlantic White Cedar, Maine Natural Areas Program

FOCUS AREA OVERVIEW

Appleton Bog, Witcher Swamp, and Pettingill Swamp are three ~1,000 acre wetlands separated by a narrow upland ridge and the St. George River.

Appleton Bog is the northernmost occurrence of an Atlantic white cedar swamp, and it is one of the largest Atlantic white cedar swamps in the state. Appleton Bog flows northward into the St. George River via Harriet Brook and the Dead River. The site contains three pure stands of Atlantic white cedar, a rare species, as well as red maple swamp, unpatterned fen, and other wetland types that are part of an approximately 1,000 acre wetland complex. Newbert Pond, a 30-acre kidney-shaped pond and the location of a historic pondweed record, is embedded within the wetland complex. Nearly 1,000 acres at Appleton Bog are owned by The Nature Conservancy. This protected land includes most of the Atlantic white cedar swamp, as well as a small portion of surrounding uplands.

The **Pettengill Swamp/Whitney Bog** complex is a 1,100 acre peatland that occupies a broad valley at a watershed divide. The northern part of the complex (Whitney Bog) is adjacent to and drains into the St. George River, while the southern part (Pettingill Swamp) drains southward into the Medomak River. In aggregation, this unpatterned fen ecosystem contains multiple types: red maple woodland fen, dwarf shrub bog, tussock sedge meadow, shrub fen dominated by sweet gale and meadowsweet, and black spruce bog.

Witcher Swamp flows southward into the St. George River. It is a 900 acre wetland dominated by a forested bog which is comprised of different sub-types: northern white cedar swamp, northern white cedar fen, and black spruce bog.

RARE AND EXEMPLARY NATURAL COMMUNITIES

Unpatterned Fen Ecosystem: Fens are peatlands in which groundwater or water from adjacent uplands moves through the area. As a result, plants are exposed to more nutrients, and the vegetation is typically different and more diverse than that of bogs. Peat is moderately- to well-decomposed and of variable thickness. The vegetation consists predominantly of sedges, grasses, reeds, and *Sphagnum* mosses. Bog communities, dominated by heath shrubs, may be present; though fen and bog vegetation may co-occur, in a fen ecosystem the former is more extensive.

Atlantic White Cedar Bog: These peatlands are dominated by

dwarf heath shrubs with a sparse tree layer of Atlantic white cedar. Sheep laurel, Labrador tea, dwarf huckleberry, and other heath shrubs can form an almost continuous carpet beneath the stunted cedars. Leatherleaf is a common shrub. Herbs are sparse. The bryoid layer is well developed with peat moss covering the ground and forming the substrate.

These bogs occur as part of larger peatlands, and maintaining the hydrologic integrity of the entire wetland with upland buffers is key. The cedars generally remain small, and therefore are of limited economic value. Most known sites in Maine are in conservation ownership. Frequent birds associated with this community include common yellowthroat and northern waterthrush. These wetlands provide habitat for the rare Hessel's hairstreak butterfly, which feeds on Atlantic white cedar in its larval stage.

Atlantic White Cedar Swamp: These densely forested communities allow little direct light to the forest floor. The canopy is usually a uniform cover of Atlantic white cedar with occasional black spruce and red maple; in some sites, red maple may be co-dominant. The ground is a mosaic of moss covered hummocks and hollows. Where light penetrates the canopy, shrubs such as highbush blueberry, black huckleberry, mountain holly, or winterberry may be prominent. The herb layer features dense patches of tree regeneration in some openings. Herbaceous species are typically more abundant than dwarf heath shrubs.

Most occurrences of this community type occur in rapidly growing southern Maine. Because of this and because the timber is valuable, these occurrences are vulnerable. All of Maine's stands have been harvested in the past; some are now mature. Their perpetuation appears to be partially dependent on disturbance events such as blowdowns or fire. In the absence of such events, cedar may be replaced by more shade tolerant species such as red maple and hemlock. The quality of Atlantic white cedar swamps may also be impaired by filling, water quality degradation, water level changes, and timber harvesting. These forested wetlands provide habitat for a variety of conifer nesting birds and for the rare Hessel's hairstreak butterfly, which feeds on Atlantic white cedar in its larval stage.

CHARACTERISTIC SPECIES

Atlantic white cedar (*Chamaecyparis thyoides*) is an evergreen tree, up to 25 m high, with small, scale-like leaves and characteristic cedar fragrance. Atlantic white cedar can be distinguished from northern white cedar, which is common and widespread in Maine, because the branchlets bearing the leaves are rounded, not flattened; by the bluish-green color of the foliage (as opposed to the yellowish-green of northern white cedar); and by the fruits which are small and spherical rather than elongate.

In the few large occurrences in Maine (i.e. more than ten acres of *Chamaecyparis*-dominated wetland), the species has regenerated well after previous harvests. Small populations are less likely to regenerate. Conservation might, however, best be addressed to the overall community (Atlantic white cedar swamp, for example) as an ecological unit, allowing natural processes to dominate. Managers first need to consider whether it is the individual trees or the integrated forest community that is of interest.

Ecological Services of the Focus Area

- Provides flood and water quality protection for the St. George River.
- Supports regional biodiversity by providing habitat for rare plants, animals, and natural communities.
- Provides high quality habitat for waterfowl, wading birds, deer, and other wildlife.

Economic Contributions of the Focus Area

- Serves as a valuable recreational resource for local residents.
- Provides wildlife habitat for a number of game species that are seasonally important to Maine's rural economy.
- Provides high value forest products that support the regional economy.

The Saint George River provides habitat for freshwater mussels, including the **creeper** *(Strophitus undulates*). Although widely distributed across the state and throughout its range, the creeper mussel is rarely abundant. Usually fewer than ten individuals are found at a single location, and there is considerable question about the long-term viability of such small populations. Consequently, this species has been listed as Special Concern in Maine. The creeper prefers clean, flowing water, and thus habitat degradation and pollution have probably affected this species.

Upland sandpipers (*Bartramia longicauda*), a state Threatened species, inhabit a large area of blueberry fields that straddle the watershed boundary along Appleton Ridge. This site is of moderate value to upland sandpipers, but is one of only three to five sites occupied annually in the Mid-Coast area. Upland sandpipers require large open fields (greater than 150 acres). This species was more common when a higher percentage of the state was in farmland. As grasslands disappeared and converted to forests, upland sandpiper populations declined. They are now among the rarest of grassland birds in the Northeast. Maine has the largest upland sandpiper population in the

region and plays an important role in the conservation of this species. Habitat protection, enhancement and management are key to species' recovery

The large wetlands provide important **Deer Wintering Areas** and **Inland Waterfowl and Wading Bird Habitat**. Deer congregate in wintering areas which provide reduced snow depths, ample food and protection from wind while the wetlands and open water areas provide undisturbed nesting habitat and undisturbed, uncontaminated feeding areas and are essential for maintaining viable waterfowl and wading bird populations.

CONSERVATION CONSIDERATIONS

» Threats to these systems include hydrologic alteration (from changes in water flow or impoundment of waterways), development of adjacent uplands and associated water quality impacts, invasive species such as purple loosestrife, and timber harvesting practices.

» With regard to timber harvesting, strict adherence to Shoreland Zoning guidelines and Maine Forest Service Best Management Practices should help to maintain that the wetlands remain intact. Ideally, however, large areas of forested wetland could be set aside in forever wild condition.

» Appropriate conservation strategies include tree growth and open space tax treatments, conservation easements, and fee ownership.

» Degradation of free-flowing aquatic habitat (e.g damming, channelization, flow diversion, improperly installed or maintained culverts or watershed disturbance) is one of the greatest causes for the loss of riverine aquatic species like freshwater mussels. Care should be taken to avoid alterations to the natural hydrologic regime within and upstream of the focus area.

» Maintenance and/or improvement of water quality and habitat integrity via protection of riparian buffers is essential. Any activities that may potentially degrade water quality or negatively alter habitat type (including substrate, flow rate, water levels) should be avoided. A minimum of 250-foot contiguous, forested buffer is recommended on waterways that provide habitat for rare, threatened, and endangered mussel species. Likewise, because larval fresh¬water mussels require a specific fish host, activities that may result in changes to the fish community or prevent access by fish should be avoided. When designing projects near known mussel habitat consult with a MDIFW biologist to assist with planning, and refer to the Maine Forest Service's Forestry

Atlantic White Cedar Swamp, Maine Natural Areas Program

Best Management Practices handbook or the Maine Department of Environmental Protection's Maine Erosion and Sediment Control Recommendations.

» Threats to upland sandpipers include nest and brood predators, particularly from animals such as house cats, skunks, and raccoons, and mowing during nesting and brood-rearing. Appropriate conservation strategies for this species include traditional low-bush cultivation and other methods that incorporate periodic (e.g., biennial) pruning during the dormant season (May to early August).

» 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 for wintering deer and wading birds and waterfowl. 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	Creeper	*Strophitus undulatus*	SC	SNR	G5
	Upland Sandpiper	*Bartramia longicauda*	T	S3B	G5
Plants	Atlantic White-cedar	*Chamaecyparis thyoides*	SC	S2	G4
Natural Communities	Atlantic White Cedar Bog	Atlantic white cedar bog		S1	G3G4
	Atlantic White Cedar Swamp	Atlantic white cedar swamp		S2	G3G5
	Black Spruce Bog	Spruce - larch wooded bog		S4	G3G5
	Red Maple Fen	Red maple wooded fen		S4	GNR
	Unpatterned Fen Ecosystem	Unpatterned fen ecosystem		S4	GNR

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.