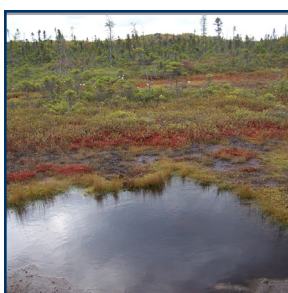


Unity Wetlands



WHY IS THIS AREA SIGNIFICANT?

This large expanse of wetlands and uplands includes a diverse array of natural features, especially of wetland and riparian-associated species and habitats. Several rare plant and animal species, including some of the State's best habitat for rare mussels, have been documented here. In addition, the rivers and tributaries provide spawning and rearing habitat for Atlantic salmon, an Endangered species. Furthermore, the area provides one of the largest remaining unfragmented blocks of land in central Maine, offering a promising opportunity not only for conservation of the area's rarest ecological gems, but also for maintaining wide-ranging common species, from black bear to bobcat, that are becoming increasingly uncommon in more developed landscapes to the south.

OPPORTUNITIES FOR CONSERVATION

- » Educate recreational users about the ecological and economic benefits provided by the Focus Area.
- » Encourage best management practices for forestry, and soil and vegetation disturbance activities near sensitive features.
- » Maintain intact forested buffers along water bodies, wetlands, and important wildlife habitats.
- » Monitor and remove invasive plant populations.
- » Work with willing landowners to permanently protect undeveloped areas and significant features.

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

Rare Animals

- Bald Eagle
- Creeper
- Wood Turtle
- Ribbon Snake
- Sedge Wren
- Tidewater Mucket
- Yellow Lampmussel
- Coral Hairstreak
- Great Blue Heron
- Atlantic Salmon

Rare Plants

- Stiff Arrow-head
- Water Stargrass
- Wild Garlic
- Wild Leek
- MacGregors Rye

Rare and Exemplary Natural Communities

- Raised Level Bog Ecosystem
- Silver Maple Floodplain Forest
- Unpatterned Fen Ecosystem

Significant Wildlife Habitats

- Deer Wintering Area
- Inland Waterfowl and Wading Bird Habitat

Public Access Opportunities

- Sebasticook Regional Land Trust

Photo credits, top to bottom: Maine Natural Areas Program, Sebasticook Regional Land Trust, Ethan Nedeau, Rick Lawrence, Maine Department of Inland Fisheries and Wildlife



Kanokolus Bog, Andy Reed

FOCUS AREA OVERVIEW

This large expanse of wetlands and uplands is centered on Unity Twp., extending east to Unity Pond and west to the Sebasticook River. It includes a diverse array of natural features, especially of wetland and riparian-associated species and habitats and provides expanses of largely intact forest habitat for wide ranging species associated with unfragmented habitat.

The Sebasticook River from the Kennebec River upstream several miles is among the best habitats in the state for at least two rare mussels, the yellow lampmussel and the tidewater mucket. These species, and other freshwater mussels, have been documented in the Focus Area in several locations along the Sebasticook and some of its tributaries (e.g. Twenty-five Mile Stream, Fifteen Mile Stream, Sandy Stream and the outlet of Unity Pond). The rivers and streams here also provide habitat for Atlantic salmon with over 35 kilometers of spawning and rearing habitat identified in the Sebasticook River and its tributaries. The tributaries, wetlands and riparian forests also provide habitat to several other rare species including the ribbon snake, wood turtle, and numerous floodplain plants.

Twenty-five Mile Stream and Fifteen Mile Stream have high-quality stretches of silver maple floodplain forest, a community

type that is rare statewide. Of particular note is the occurrence in the floodplains of bur oak (*Quercus macrocarpa*), an unusual species in Maine whose distribution is centered in this portion of the state. These floodplain forests are among only a very few in the state with bur oak as an important component, which again heightens their conservation priority. Also found in these forests are several unusual wildflowers, including large populations of spring ephemerals such as trout lilies and bloodroot, as well as wild garlic, rare statewide.

Several peatlands have formed in shallow basins over the past several thousand years. Fowler Bog is a 700+ -acre peatland that has formed in a stream valley, where most of the vegetation is still in contact with surface waters (fen, as opposed to bog). Red maple wooded fen vegetation covers much of the area, with some portions more coniferous. Shrubby fens and wet meadows occur along streamsides. Together these communities make up a good example of an unpatterned fen ecosystem.

Nearby, Kanokolus Bog is a raised level bog ecosystem, where peatland vegetation has become raised above the surface water level. This 300-acre bog is more nutrient-poor than Fowler

Bog, with expanses of open sheep laurel dwarf shrub bog bordered by stunted black spruce and larch. Raised bogs are not uncommon in Maine, but are scarce in central and southern regions, and Kanokolus Bog is considered a good example of this type.

In addition, the wetlands in the Focus Area provide over 3,000 acres of high quality Inland Waterfowl and Wading Bird Habitat. These areas provide undisturbed nesting and feeding habitat and are essential for maintaining viable waterfowl and wading bird populations, regionally. Large Deer Wintering Areas are also present here. Deer congregate in wintering areas which provide reduced snow depths, ample food and protection from wind. Finally, several high value Significant Vernal Pools, small seasonal forested wetlands, are distributed throughout the focus area providing habitat to specialized amphibians and invertebrates that only breed in fishless, ephemeral wetlands.

The Sebasticook Regional Land Trust formerly known as the Friends of Unity Wetlands has been active in conserving land in the Unity Wetlands Focus Area.

RARE AND EXEMPLARY NATURAL COMMUNITIES

Silver Maple Floodplain: This community type includes forest dominated by silver maple (>60% cover). Associates include red maple and American elm (up to 30% cover) or, in a few locations, bur oak (up to 25% cover). Widely spaced trees, many with multiple trunks, give a park like feeling. The understory is open and shrubs are sparse. Musclewood may be present and is a good indicator. The lush carpet of herbs changes from spring ephemerals such as trout lilies and bloodroot to dense fern cover in summer. Bryoid cover (mosses, liverworts, and lichens) is minor. Some forests have a berm adjacent to the river channel, and herbaceous species composition here is different from the lower elevation interior of the floodplain.

Although a number of sites have been cleared or pastured in the past, current shoreland regulations help provide protection to a number of these sites. Exotic plant species such as Japanese knotweed, which may displace those native to our area, represent a threat to the integrity of these forests and have degraded some Maine examples.

Some of the characteristic animal species of this community type include northern waterthrush, barred owl, belted kingfisher, bank swallow, and green heron. Both the yellow-throated vireo and blue-gray gnatcatcher, rare birds for central Maine, reach the northern edge of their range in this type in the Unity area. Rare reptiles like wood turtle, spotted turtle, and ribbon snakes feed on amphibian egg masses present in isolated pools within such forests. Wood turtles frequently overwinter in river channels and forage in floodplain forests. The silver-haired bat often roosts in riparian habitats in trees with loose bark.

Ecological Services of the Focus Area

- Serves as an important large block of unfragmented forest habitat for a wide range of species including rare plants, waterfowl, wading birds, deer, moose, bobcat, woodland hawks and other wildlife.
- Retains floodwaters.
- Filters sediments and nutrients, protecting water quality.

Economic Contributions of the Focus Area

- Recharges groundwater.
- Serves as a valuable recreational resource for local residents.
- Provides outdoor classroom opportunities for Unity College and other local schools
- Provides scenic vistas and open space that raise property values.
- Provides working forestland and working farmland.



Fowler Bog, Rick Lawrence

Raised Level Bog Ecosystem: These include flat peatlands in basins with mostly closed drainage, receiving water from precipitation and runoff from the immediate surroundings. Most parts of level bogs are somewhat raised (though not domed), in which case vegetation is almost entirely ombrotrophic (dwarf shrub heath or forested bog). Other parts of the bog are not raised; in this case, vegetation is transitional (in nutrient status) between that of ombrotrophic bogs and minerotrophic fens. In all cases, Sphagnum dominates the ground surface and is the main peat constituent. The surface of the bog is generally flat and featureless though Kanokolus Bog is somewhat unique in that it hosts several secondary sphagnum pools in

the bog mat. These bogs are often at least partly treed with black spruce and larch.

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.

CHARACTERISTIC SPECIES

Creeper (*Strophitus undulates*), listed as Special Concern; **tidewater mucket** (*Leptodea ochracea*) listed as Threatened; and **yellow lampmussel** (*Lampsilis cariosa*), also listed as Threatened, are freshwater mussel species documented within the Focus Area. Freshwater mussels require clean water and certain flow and substrate conditions. They also have a unique life cycle that depends on specific fish species as larval hosts. Maine plays an important role in the conservation of freshwater mussels. With some of the most unspoiled aquatic ecosystems in eastern North America, Maine has some of the most significant remaining populations of several nationally rare freshwater mussel species and the Unity Wetland Focus Area provides some of the best habitat in the state for these species. Maintaining water quality and undisturbed aquatic habitats is essential to maintaining these species.

Atlantic salmon (*Salmo salar*) require cool, clean and free flowing waters. Atlantic salmon, an anadromous species, spends much of its life cycle in ocean waters, but travels great distances to return to its natal stream to spawn. Spawning and rearing habitat includes the gravelly substrates of fast moving streams generally near the headwaters. Dams and poorly designed culverts have blocked the passage of salmon throughout much of the state, preventing this once popular sport fish from accessing the habitats vital its survival.

Ribbon snake (*Thamnophis sauritus*), a species of Special Concern in Maine, is a semi-aquatic snake with yellowish stripes running the length of their long, thin bodies. Habitat types frequented by ribbon snakes include vernal pools, bogs, shrub swamps, forested wetlands, wet meadows, and slow streams. They prefer the periphery of these areas where vegetation and populations of amphibians are abundant. Most of Maine's ribbon snake population occurs in southern and south-central Maine. Due to the high rates of development there, this species is vulnerable to habitat loss, fragmentation, and water quality degradation. The wetland-upland ecology of this snake



Yellow Lampmussel, Ethan Nedeau (Top)
Creeper, Ethan Nedeau (Bottom)

puts it at further risk due to inadequate regulations protecting riparian and upland habitat around many smaller wetlands

Wood turtles (*Glyptemys insculpta*), also a species of Special Concern in Maine, is primarily a northeastern species that is declining throughout its range. Maine, likely hosts some of the largest and most viable remaining populations in the U.S. The turtles overwinter in well-oxygenated streams and rivers but range widely in adjacent fields and forests for nesting and feeding. Habitat loss and degradation and collection for the pet trade are major threats to this species.

Wild garlic (*Allium canadense*), a rare plant species, is a tight clump of soft, linear, not hollow, keeled leaves with a distinctly onion-like smell. The bulbs are 1-3 cm long and have a fibrous outer coat with diamond-shaped spaces between the nerves.



Fowler Bog, Rick Lawrence

The flowers are pink or white, but are often replaced by sessile bulblets. Wild garlic is usually found in rich wooded bottomlands (hardwood floodplain forests) and in alluvial soils near streams. Vegetative reproduction, both by the inflorescence bulblets and underground bulbs, is common and the plant may become dominant, its leaves forming dense mats over small areas.

CONSERVATION CONSIDERATIONS

- » The most important conservation strategy for aquatic features is maintaining or improving water quality within the watershed. For lands where timber harvest or development continues, buffers should be maintained around all streams, wetlands and ponds. While different species can have different buffering requirements, wider buffers provide better protection for riparian and wetland-dependent species because they not only protect water quality but also provide riparian habitat and corridor functions. Generally, better protection is afforded to wetlands and ponds if vegetation alteration is minimized within 250' of the wetland/upland border. Any timber harvesting within and adjacent to wetlands or adjacent to ponds should be implemented with strict adherence to Shoreland Zoning guidelines and Maine Forest Service Best Management Practices.
- » Freshwater mussels are sensitive to contaminants and changes in water quality and benthic habitat. Maintenance and/or improvement of habitat integrity via protection of riparian buffers is important. 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 freshwater 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 rare mussel habitat consult with an MDIFW biologist to assist with planning, and refer to the Maine Forest Service's Forestry Best Management Practices handbook or the Maine Department of Environmental Protection's Maine Erosion and Sediment Control Recommendations.
- » Improperly sized culverts and other stream crossing structures can impede movement of fish and aquatic invertebrates effectively fragmenting local aquatic ecosystems and ultimately leading to local extirpation of some species. Future management should maintain or restore the sites natural hydrology by monitoring culvert function and up-

grading culvert size for improved aquatic organism passage and accommodation of high storm water flows.

- » 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 of appropriate techniques for removal. For more information on invasive plants visit: <http://www.maine.gov/doc/nrimc/mnap/features/invasives.htm>.
- » Timber harvest in the vicinity of rare plant populations, and in floodplain forests generally, should be avoided or carefully planned to avoid adverse impacts to the biota. Machinery should not be used on the site when the ground is not frozen, as the moist ground is susceptible to rutting and soil compaction and destruction of sensitive understory flora.
- » Wetlands in particular may be vulnerable to degradation

from incidental uses related to increasing residential development. Buffers can play a major role in protection here. ORV use of the area is locally heavy, and care needs to be taken that ORVs stay on existing trails and remain out of all wetlands when the ground is not frozen.

- » Conservation planning for upland and floodplain forests should include setting some areas aside from timber harvest to allow for the development of some unmanaged forest for species associated with late successional conditions.
- » 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 and natural communities adjust their ranges to warmer climate conditions.
- » Conservation easements, fee ownership, and tree growth and open space treatments are also appropriate conservation approaches within the focus area.



Kanokolus Bog, Sebasticook Regional Land Trust

RARE SPECIES AND EXEMPLARY NATURAL COMMUNITIES OF THE FOCUS AREA

	Common Name	Scientific Name	State Status*	State Rarity Rank	Global Rarity Rank
Animals	Bald Eagle	<i>Haliaeetus leucocephalus</i>	SC	S4B,S4N	G5
	Creepier	<i>Strophitus undulatus</i>	SC	SNR	G5
	Wood Turtle	<i>Clemmys insculpta</i>	SC	S4	G4
	Ribbon Snake	<i>Thamnophis sauritus</i>	SC	S3	G5
	Sedge Wren	<i>Cistothorus platensis</i>	E	S1B	G5
	Tidewater Mucket	<i>Leptodea ochracea</i>	T	S2	G3G4
	Yellow Lampmussel	<i>Lampsilis cariosa</i>	T	S2S3	G3G4
	Coral Hairstreak	<i>Satyrrium titus</i>	SC		
	Great Blue Heron	<i>Ardea herodias</i>	SC		
	Atlantic Salmon	<i>Salmo salar</i>	E		
Plants	Stiff Arrow-head	<i>Sagittaria rigida</i>	T	S2	G5
	Water Stargrass	<i>Zosterella dubia</i>	SC	S3	G5
	Wild Garlic	<i>Allium canadense</i>	SC	S2	G5
	Wild Leek	<i>Allium tricoccum</i>	SC	S3	G5
Natural Communities	Raised Level Bog Ecosystem	Raised level bog ecosystem		S4	GNR
	Silver Maple Floodplain Forest	Silver maple floodplain forest		S3	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.