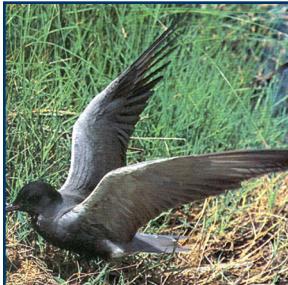


Maine River Wetland Complex



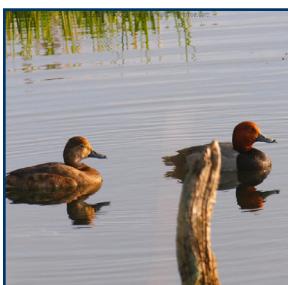
WHY IS THIS AREA SIGNIFICANT?

This focus area includes an enormous wetland complex encompassing several natural community types that extend in a broad mosaic along the Maine River forming a 4,200 acre peatland network, one of the largest wetland complexes in the region.



OPPORTUNITIES FOR CONSERVATION

- » Educate recreational users about the ecological and economic benefits provided by the focus area.
- » Encourage best management practices for forestry, vegetation clearing, and soil disturbance activities near significant features to maintain ecological functions and values, habitat connectivity for wildlife, hydrologic processes, and watershed protection.
- » Maintain intact forested buffers along water bodies and wetlands to protect water quality and provide valuable riparian habitat for wildlife.
- » Monitor and remove invasive plant populations.
- » Work with landowners to encourage sustainable forest management practices on remaining privately owned forest lands in and around the focus area.



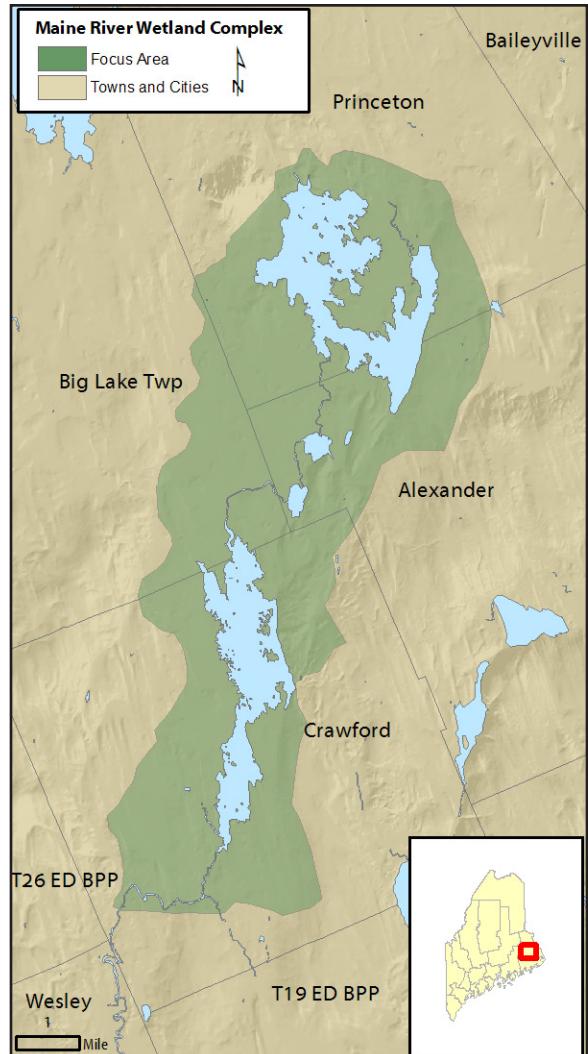
For more conservation opportunities, visit the Beginning with Habitat Online Toolbox: www.beginningwithhabitat.org/toolbox/about_toolbox.html.



Public Access Opportunities

- » Sunrise Tree Farm Public Access Easement, New England Forestry Foundation/State of Maine
- » Pocomoonshine Lake Boat Access, MDIFW

Photo credits, top to bottom: MDIFW, MNAP, Paul Cyr, MNAP, Ethan Nedeau



Biophysical Region

- Maine Eastern Interior
- Maine-New Brunswick Lowlands

Rare Animals

- Black Tern
- Brook Floater
- Atlantic Salmon

Rare and Exemplary Natural Communities

- Dwarf Shrub Bog
- Maritime Huckleberry Bog
- Raised Level Bog Ecosystem
- Unpatterned Fen Ecosystem

Significant Wildlife Habitats

- Inland Waterfowl and Wading Bird Habitat
- Deer Wintering Area



Unpatterned Fen Ecosystem, Maine Natural Areas Program

FOCUS AREA OVERVIEW

An enormous wetland complex encompassing numerous natural community types extends in a broad mosaic from Pocomoonshine Lake south along the Maine River to Crawford Lake. The Middle Ground Peatlands in Pocomoonshine Lake are alone over 600 acres. Together with additional areas extending south toward Crawford Lake and west along Allen Stream in Township 21, these wetlands form a 4,200 acre peatland network -- one of the largest wetland complexes in the Eastern Interior Eco-Region of Maine.

Peatland ecosystems include unpatterned open basin fens and level bogs. Within these peatlands, finer-scale natural community types include mixed tall sedge fen (the most abundant type), sweetgale mixed shrub fen, leatherleaf boggy fen, dwarf shrub bog, and bog moss lawn, as well as small upland islands supporting red spruce- mixed conifer woodland. In general, the three "fen" types are closer and hydrologically connected to the lakeshore, while the "bogs" -- dwarf shrub bog and moss bog lawn -- are further isolated from the lakeshore. These natural community types grade into one another in a manner that makes it difficult to define their distinct boundaries on the ground; their approximate boundaries are most accurately delineated through air photos.

Dominant plants in these natural communities are characteristic of riverine, lacustrine, and emergent systems in the region. Rush beds of bayonet rush (*Juncus militaris*) border Pocomoonshine Lake, Crawford Lake, and the Maine River. Inland from the lakeshore these marshes grade into mixed tall sedge fens dominated by slender sedge (*Carex lasiocarpa*). Other common species include sweet gale (*Myrica gale*), three-way sedge (*Dulichium arundinaceum*) and brown-fruited rush (*Juncus pelocarpus*). Sweetgale mixed shrub fen vegetation continues to the north of Crawford Lake, where additional plants include buttonbush (*Cephalanthus occidentalis*), the sedges *Carex utriculata* and *Carex lacustris*, arrowhead (*Sagittaria latifolia*), meadowsweet (*Spiraea alba*), winterberry (*Ilex verticillata*), blue flag (*Iris versicolor*), bog willow (*Salix pedicellaris*) and swamp candles (*Lysimachia terrestris*). Patches dominated by few-seeded sedge (*Carex oligosperma*), leatherleaf (*Chamaedaphne calyculata*) and large cranberry (*Vaccinium macrocarpon*) are frequent within the leatherleaf boggy fens. Also scattered throughout the fens are small open pools and bog moss lawn vegetation that support white beak-rush (*Rhynchospera alba*), round-leaved sundew (*Drosera rotundifolia*), naked bladderwort (*Utricularia cornuta*), spatula-leaved sundew (*Drosera*

Ecological Services of the Focus Area

- Protects water quality of downstream resources.
- Provides high quality habitat for waterfowl, wading birds, deer, and other wildlife.
- Supports regional biodiversity by providing habitat for rare animals and a variety of natural communities.

Economic Contributions of the Focus Area

- Provides wildlife habitat for a number of game species that are seasonally important to Maine's rural economy, including local sporting camps.
- Attracts tourism for wildlife observation, paddling, hunting, and angling.
- Provides high value forest products that support the regional economy.
- Supports valuable salmon, and other cold water fisheries.



Dwarf Shrub Bog, Maine Natural Areas Program

dortmanna) and little floating hearts (*Nymphoides cordata*). This plant likely occurs in many areas of the lake where there is appropriate substrate.

RARE AND EXEMPLARY NATURAL COMMUNITIES

Raised Level Bog Ecosystems are 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 flat and featureless. These bogs are often at least partly treed with black spruce and larch.

Unpatterned Fen Ecosystems are peatlands in which ground-water 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; but though fen and bog vegetation may co-occur, in a fen ecosystem the former is more extensive. This type is broadly defined geographically: in very few locations in southern Maine one may find an Atlantic White Cedar Bog community as a constituent, but far more common statewide would be the Northern White Cedar Woodland Fen community.

intermedia), tawny cotton grass (*Eriophorum virginicum*), three-way sedge, and brown-fruited rush.

On the west side of Crawford Lake, extending inland from the sedge-dominated fens, is a ~275 acre level bog ecosystem. The slope of the bog is approximately 5% and it rises more than eight feet from the sedge fens. White pine (*Pinus strobus*) and black spruce (*Picea mariana*) are scattered sparingly throughout the bog. Black huckleberry (*Gaylussacia baccata*) is the dominant shrub, while Labrador tea (*Rhododendron groenlandicum*), sheep laurel (*Kalmia angustifolia*) and leatherleaf are also abundant. Other frequent plants include rhodora (*Rhododendron canadense*), bog rosemary (*Andromeda polifolia*) and mountain holly (*Nemopanthus mucronatus*).

Upland forests within this focus area are mid-successional coniferous and mixed hardwood stands. Within the isolated upland "islands" of the Middle Ground of Pocomoonshine Lake, white pine, red spruce (*Picea rubens*), red maple (*Acer rubrum*), and quaking aspen (*Populus tremuloides*) are common in the tree layer, with northern red oak (*Quercus rubra*) present in lesser amounts. The shrub and herb layers are quite sparse; species found include lowbush blueberry (*Vaccinium angustifolium*), northern running-pine (*Diphasiastrum complanatum*), striped maple (*Acer pensylvanicum*) and juniper (*Juniperus communis*). Soils are somewhat stony, well-drained fine sandy loams, and some areas show evidence of past burning.

Along the west shore of Crawford Lake, over 50 plants of the rare water awlwort (*Subularia aquatica*) were found beneath a foot of water on gravelly substrate. Associated plants included pipewort (*Eriocaulon aquaticum*), water lobelia (*Lobelia*

Dwarf Shrub Bogs include a dense layer of dwarf heath shrubs that dominate this prototypical open peatland community. Stunted and scattered black spruce and larch trees form <25% cover. Heath shrubs carpet the hummocks and hollows of the peat substrate; sheep laurel or rhodora are typically dominant. Sedges contribute little cover (usually <15%, occasionally 20-25%); the most common is tufted cotton-grass, whose bright white tufts decorate the bog vegetation early in the summer. Insectivorous plants such as pitcher plant and sundew can be quite numerous. The ground surface is covered by a spongy carpet of peat mosses. The floristic composition varies depending upon bog morphology and nutrient availability.

CHARACTERISTIC SPECIES

The extensive wetlands and floating peat mats associated with the river provide excellent **Inland Waterfowl and Wading Bird Habitat**. These areas provide undisturbed nesting habitat and undisturbed, uncontaminated feeding areas and are essential for maintaining viable waterfowl and wading bird populations. Several **Deer Wintering Areas** have also been identified in the focus area. Deer congregate in wintering areas which provide reduced snow depths, ample food and protection from wind.

Nesting habitat for the rare **black tern** (*Chlidonias niger*), has been documented from Mud Lake in 1996. Black terns nest exclusively in large (over 40 acres) shallow freshwater emergent marshes associated with lakes, impoundments, or slow moving streams. They construct their nests on floating mats of dead vegetation or small mudflats and, therefore, fluctuating water levels and nest and chick predation are significant threats to this species. Black terns have not been documented

at this site in recent years, however, and it is thought that fluctuating lake water levels have limited the population here.

The **brook floater** has been documented in the East Machias River, just south of Crawford Lake. The brook floater is a freshwater mussel of Special Concern in Maine that is found among rocks, gravel, and sand in creeks and small rivers. In Maine, this species is generally found among rooted aquatic vegetation in nutrient-poor streams. The brook floater has experienced significant declines throughout its range, and many populations have been extirpated. Even where it is found, populations often consist of just a small number of aging individuals. Maine may hold some of the best remaining populations of this species anywhere in its range.

Two active bald eagle nest sites have been recorded in the focus area. **Bald eagles** nest along sea coasts, inland lakes and major rivers. Breeding habitat includes large trees, primarily old white pines, in close proximity (less than one mile) to water where food is abundant and human disturbance is minimal. Bald eagles were nearly extirpated throughout their range because of widespread use of environmental contaminants. Due to a wide variety of efforts to protect bald eagle nest sites through provisions of the Maine Endangered Species Act, bald eagles have now made a dramatic recovery and were removed from the State's Endangered species list in 2009. They are currently listed as a species of Special Concern. They continue to receive protections by the USFWS under the Bald and Golden Eagle Protection Act.

Spawning and rearing habitat for the State and Federally Endangered **Atlantic salmon** are present in the Maine River. Atlantic salmon require cool, clean and free flowing waters. High value fisheries for black bass are present in the Main River and Upper and Lower Mud Lakes as well.

CONSERVATION CONSIDERATIONS

- » Most of the peatland complex is non-forested, and significant impacts from forestry activities in these open peatlands are unlikely. Some wetland areas supporting merchantable black spruce and northern white cedar are interspersed among the open peatlands, however. Cedar stands in particular are sensitive to timber harvesting, and they should be avoided entirely or harvested only on frozen ground, retaining at least two-thirds canopy closure.
- » The ecological integrity of wetlands, including all the processes and life forms they support, is dependent on the maintenance of the current hydrology and water quality of these systems. 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. In addition, improperly sized and installed crossing structures such as



Brook Floater Mussel, Ethan Nedeau

Focus Areas of Statewide Ecological Significance: Maine River Wetland Complex

- culverts can block fish and invertebrate passage through stream channels often resulting in aquatic habitat fragmentation. Future management activity should avoid additional impacts to the site's hydrology.
- » Around lakeshores and rivershores, implementation of standard Best Management Practices and conformance with LURC shoreland zoning standards should ensure that the peatland remains intact and pristine.
 - » Emergent wetlands are very susceptible to infestation from invasive species such as purple loosestrife (*Lythrum salicaria*). At this time, no invasive species have been observed, but if loosestrife is discovered it should be noted and promptly removed.
 - » Although Crawford Lake is impounded at its outlet (the East Machias River), based on the topography of the area it does not appear that the small dam has significantly altered the vegetation adjacent to the lake.
 - » In general, threats to these peatlands include peat mining, cranberry harvesting, timber harvest around the forested perimeters, and development.

- » 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.
- » 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 Habitats.



Raised Bog Ecosystem, Maine Natural Areas Program

RARE SPECIES AND EXEMPLARY NATURAL COMMUNITIES OF THE FOCUS AREA

	Common Name	Scientific Name	State Status*	State Rarity Rank	Global Rarity Rank
Animals	Black Tern	<i>Chlidonias niger</i>	E	S2B	G4
	Brook Floater	<i>Alasmidonta varicosa</i>	T	S3	G3
Natural Communities	Dwarf Shrub Bog	Sheep laurel dwarf shrub bog	S4	G5	
	Maritime Huckleberry Bog	Huckleberry - crowberry bog	S3	G3G5	
	Raised Level Bog Ecosystem	Raised level bog ecosystem	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.