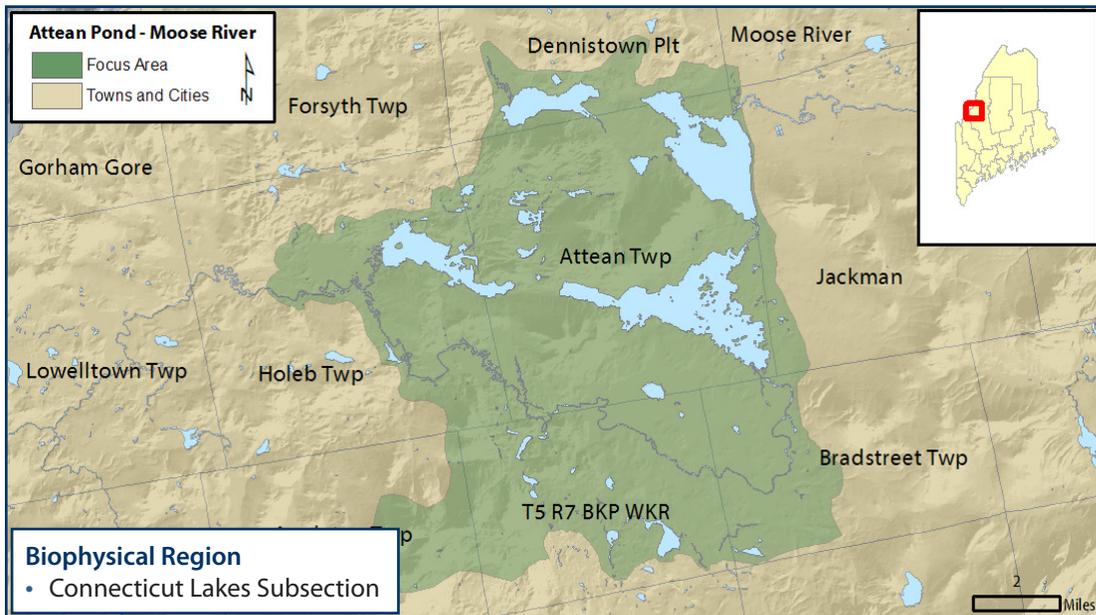
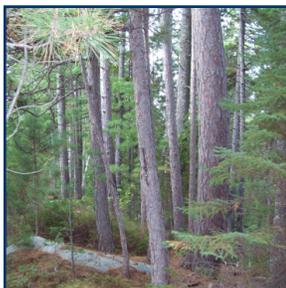


Attean Pond - Moose River



Biophysical Region
• Connecticut Lakes Subsection

WHY IS THIS AREA SIGNIFICANT?

The Attean Pond - Moose River Focus Area encompasses over 56,000 acres of forest, wetlands, lakes, ponds, rivers, and streams, including all of Attean Township. The area includes seven rare plant populations, 19 rare or exemplary natural communities, and Number 5 Bog, a peatland of national significance. The Moose River corridor provides some of the most important habitat in the state for the rare wood turtle, along with other wildlife species. This focus area constitutes a valuable recreational resource, offering remote, undeveloped ponds, a popular canoe trip, and excellent opportunities for hunting, trapping, fishing, and wildlife viewing.

OPPORTUNITIES FOR CONSERVATION

- » Protect sensitive natural features through careful management planning on state-owned lands.
- » Encourage sustainable forest management practices on remaining privately owned forest lands in and around the focus area.
- » Maintain intact forested buffers along the river, ponds, and wetlands to protect water quality and provide valuable riparian habitat for wildlife.
- » Work with willing landowners to secure permanent conservation status for unprotected significant features in the focus area.

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

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Rare Animals

- Quebec Emerald
- Bald Eagle
- Wood Turtle

Rare Plants

- Fragrant Cliff Wood-fern
- Pygmy Water-lily
- Swamp Fly-honeysuckle

Rare and Exemplary Natural Communities

- Alder Thicket
- Black Spruce Barren
- Black Spruce Bog
- Dwarf Shrub Bog
- Jack Pine Forest
- Jack Pine Woodland
- Leatherleaf Bog
- Open Cedar Fen
- Patterned Fen Ecosystem
- Red and White Pine Forest
- Red Pine Woodland
- Rock Outcrop Ecosystem
- Silver Maple Floodplain Forest
- Sweetgale Fen
- Spruce-Fir-Nothorn Hardwood Ecosystem

Significant Wildlife Habitats

- Inland Waterfowl and Wading Bird Habitat
- Deer Wintering Area



Attean Pond, Maine Natural Areas Program

FOCUS AREA OVERVIEW

The key ecological features of this focus area cluster around Moose River, Number 5 Bog, and five large ponds, along with Number 5 and Number 6 Mountains.

The Moose River, which runs through the heart of the focus area, provides important fisheries and wildlife habitat, as well as exceptional recreational opportunities. The Moose River Bow trip is a popular backcountry canoe destination contained entirely within this focus area. Rare wood turtles range along the river corridor throughout the focus area. Several good quality stands of red pine - white pine forest and red pine woodland, both rare communities in Maine, can be found near the river. Lower, wetter areas adjacent to the river support black spruce bog and open cedar fen communities.

One of the largest, most diverse, and least disturbed peatlands in the Eastern U.S., the 1400+acre Number 5 Bog, lies between the river and Attean Pond. Among the wetland types included within this large complex are exemplary examples of a patterned fen ecosystem and open cedar fen community. Adjacent to the bog is the only example of a mature, natural jack pine forest in the interior of the state. Under natural conditions, many jack pine forests depend on fire to regenerate.

Much of this community was clearcut in the 1980s, but this harvest method simulated some aspects of fire and created ideal conditions for jack pine regeneration. Some areas of mature jack pine forest also remain.

The lakes and ponds in this focus area are valuable recreational and ecological resources. These ponds support five populations of the pygmy water-lily, a threatened aquatic plant. Attean Pond and Wood Pond also support active bald eagle nest sites. The smaller Moore Pond, on the southern edge of the focus area, features a rare black spruce barren community along its shores.

The larger lakes in the Attean Pond – Moose River Focus Area support coldwater fish populations, including brook trout,

Public Access Opportunities

- » Little Big Wood Pond Access, MDIFW
- » Moose River Number 5 Bog and Holeb Unit, MPBL
- » Moose River Preserve, TNC

landlocked salmon, and splake. Stocking is necessary to sustain these important recreational fisheries. Brook trout are stocked in many of the smaller ponds in the area and a few have wild populations. Most of the smaller streams in the area have self-sustaining wild brook trout populations.

Number 5 and Number 6 Mountains, in the southwestern portion of the focus area, support a 2000+ acre mosaic of mature forest, cliffs, rock outcrops, and high elevation communities. Together the mature forest communities make up an exemplary spruce – fir – northern hardwoods ecosystem. An extensive rock outcrop ecosystem on the northeast side of Number 5 Mountain includes cliffs, talus slopes, and krummholz (stunted forest at treeline). Within this ecosystem, an acidic cliff community supports a population of the rare fragrant wood fern. Most of the focus area is permanently conserved in the Bureau of Public Lands' Holeb Unit and Number 5 Ecological Reserve, The Nature Conservancy's Moose River Reserve, and a working forest easement.

RARE AND EXEMPLARY NATURAL COMMUNITIES

The **patterned fen** ecosystem is found on gentle, sloping peatlands and features low, parallel to branching peat ridges alternating with wet hollows or shallow pools. This ridge and hollow, or "ribbed," pattern is oriented across the major slope of the site and at right angles to groundwater flow. The vegetation consists of sedges, grasses, reeds, and Sphagnum mosses, though the groundwater chemistry determines whether acidic fen or circumneutral fen communities dominate. The ribbing occupies only a portion of the site, however, and other portions may support dwarf shrub or forested bog vegetation. The patterned fen ecosystem is restricted to the northwestern part of Maine. Number 5 Bog is an excellent example of this ecosystem.

Leatherleaf bogs are peatlands dominated by leatherleaf and other low heath shrubs, such as bog rosemary, small cranberry, sheep laurel, and sweetgale. Sedges and typical bog plants such as pitcher plant and sundew may be mixed with the heath shrubs. These communities occur on acidic, nutrient-poor sites where Sphagnum mosses are found under foot. The hydrological regime, including groundwater flow, is a key factor in the development and maintenance of this community, which is more accurately termed a fen. This community is particularly sensitive to physical disturbances such as recreational trail use. Because vegetation grows very slowly in these nutrient-poor environments, it cannot recover from disturbance as quickly as other community types. Careful management of recreational trail use is recommended. Limiting foot traffic to periods when the ground is frozen or the use of boardwalks can help to minimize impacts from trail use.

Good examples of the rare **red and white pine forest** and **red pine woodland** communities occur on relatively dry, rocky or sandy upland sites within the Holeb public lands just south of the Moose River. Both of these community types frequently occur on sites with a history of fire, and at least part of this area

Ecological Services of the Focus Area

- Provides high quality habitat for waterfowl, wading birds, deer, moose, and other wildlife.
- Supports regional biodiversity by providing habitat for rare plants, animals, and natural communities.
- Wetlands purify and regulate the flow of water entering area lakes and ponds, and the Moose River.
- Provides important habitat for fish and a food source for bald eagles.

Economic Contributions of the Focus Area

- Provides scenic vistas that contribute to Maine's natural character.
- Attracts tourism for paddling, hunting, hiking, camping and wildlife viewing.
- Supports valuable fisheries that attract recreational anglers.
- Provides wildlife habitat for deer and other game species that are seasonally important to Maine's rural economy.
- Provides opportunity for research and education.

burned in the early 1900s.

The **red and white pine forest** is a coniferous, closed canopy forest dominated by red pine. White pine, red spruce, and northern white cedar are the other important canopy tree species. The understory is typically sparse, with scattered-heath shrubs, bracken fern, and wintergreen. Natural forests dominated by red pine are uncommon in Maine, though the species is widely planted. As a result, these exemplary communities make an important contribution to local and regional biodiversity.

Red pine woodlands are open canopy woodlands dominated primarily by red pine. Areas of exposed bedrock are common, and dry site lichens including reindeer moss occur on the bedrock and areas with very thin soils. Less than a dozen red pine woodlands have been documented in Maine. This community type may include rare moths, such as the oblique zale, pine sphinx, and pine pinion, that utilize hard pines as larval host plants, but surveys would be needed to determine if any of these species occur at this site.

CHARACTERISTIC SPECIES

Bald eagles (*Haliaeetus leucocephalus*) 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, once abundant in Maine, were nearly extirpated throughout their range because of

widespread use of environmental contaminants. Due to a wide variety of efforts bald eagles have now made a dramatic recovery, and the species was removed from Maine's Threatened species list in 2009. Active nest sites are still important habitat features that should be a priority for conservation. Bald eagles continue to be protected by the USFWS under the Bald and Golden Eagle Protection Act.

The **wood turtle** (*Glyptemys insculpta*), a species of Special Concern in Maine, is found throughout the river corridors of this focus area. The turtles overwinter in well-oxygenated streams and rivers, and then move into surrounding upland and wetland areas during the summer. Riparian areas, where uplands meet wetlands and water bodies, are crucial habitat. In addition, wood turtles require well-drained, bare soils with ample exposure to sunlight for nesting. Wood turtles, a primarily northeastern species, are declining throughout their range. Maine, however, likely hosts some of the largest and most viable remaining populations in the U.S.

The wood turtle's shell has provided sufficient protection from predators for millions of years, but unfortunately it is no match for car tires, mower blades, or illegal collectors. Wood turtles are long-lived animals that take a minimum of 14 years to reach reproductive age. This, coupled with low hatchling success, places all the more importance on adult survivorship. Recent studies indicate that losing just a few breeding adult turtles each year to anthropogenic causes may lead to the extinction of several wood turtle populations in Maine. Threats from humans include habitat fragmentation, loss and degradation of aquatic habitat, road and mower mortality, and collection for the pet trade.

The **pygmy water-lily** (*Nymphaea leibergii*) is a miniature version of the more common fragrant water-lily, which is found in lakes and ponds throughout Maine. The pygmy water-lily is known from only ten towns in northern Maine. It is listed as Threatened in Maine because it is at the southern limit of its range here and its habitat is naturally scarce. The plant's floating leaves are 4-9 cm (1.5-3.5 in) wide. It has white flowers with yellow stamens similar to those of fragrant water-lily, but much smaller (4-8 cm or 1.5-3 in across). The pygmy water-lily is typically found in shallow, still waters along the shores of cold ponds, swamps, and slow-moving streams. Because this species is found at so few sites in Maine, the cluster of ponds in this focus area represents an important component of the state population.

The **fragrant cliff wood-fern** (*Dryopteris fragrans*) is a small, aromatic, evergreen fern found on cool, shaded rocky outcrops and dry cliffs, often in crevices. It is Endangered in Maine, where it is at the southern limit of its range. Distinguishing features of this fern are the persistent, dead fronds found at



Pygmy Water-lily, Maine Natural Areas Program

the base of each plant. The leathery fronds are tapered at the base, with densely crowded leaflets and whitish-brown sori, or spore-bearing bodies. Its known populations in Maine are in remote areas, yet have been documented as far back as 1885. The smell of the fronds, when handled, resembles violets or raspberries.

CONSERVATION CONSIDERATIONS

- » The newly established Number 5 Bog state Ecological Reserve and adjacent lands protected by The Nature Conservancy will safeguard key features like the bog and jack pine forest in perpetuity. The state conducted baseline monitoring of this Reserve in 2010.
- » Preserving the natural communities and other sensitive features within the focus area will be best achieved by working to conserve the integrity of the larger natural systems in which these features occur. This can be achieved through management planning on state-owned lands and encouraging sustainable forest management on remaining actively managed private lands. Where late successional and old growth stands remain, these should be conserved when possible. Additional areas should also be set aside from timber harvests to allow for the development of some unmanaged forests.
- » The integrity of wetlands and water bodies and the processes and life forms they support are dependent on the water quality and hydrology 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. An adequate buffer should be retained between timber harvest areas and the wetlands. The state minimum

shoreland zoning standards restrict harvest and clearing within 250' of wetland borders. Because different species can have different buffering requirements, better protection will be afforded to the collective wetland plants and animals when larger buffers are used. Any timber harvesting within and adjacent to the wetland should be implemented with strict adherence to state or local Shoreland Zoning guidelines and Maine Forest Service Best Management Practices.

- » The bald eagle nest sites on Attean Pond and Wood Pond are important habitat features that should be protected with buffers from incompatible activities such as timber harvesting during the nesting season. Other threats facing the bald eagle population, including habitat loss, environmental contamination, diminished water quality, and human-caused deaths and injuries, can be mitigated through conservation of the focus area as a whole. Healthy lakes and wetlands with intact forested buffers provide valuable habitat for bald eagles, as well as a diverse array of other wildlife.
- » 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.
- » Wood turtles move back and forth between rivers, riparian habitat, and upland areas to bask, forage, and nest. They are also known to move long distances (commonly 2-3 miles) up and downstream throughout their active season (early spring to fall). As a result, habitat connectivity is crucial to the success of this species. Roads, development, and other human activities can form barriers to turtle movement, and

may even kill enough adult turtles to threaten the viability of a population. Maintaining intact riparian corridors and limiting habitat fragmentation from new roads or development within known turtle habitat is important for the conservation of this species and will also benefit a wide array of rare and common wildlife species. Forestry activities may be compatible with wood turtle conservation if appropriate practices are followed within a 330 foot wide forested riparian management zone for 2.5 miles upstream and 2.5 miles downstream of any documented wood turtle occurrences. MDIFW can provide detailed guidance on forestry activities within this zone.

- » Recreational use of this focus area should be managed to prevent potential negative impacts on important resources and recreational values. Education of users can help to limit any damage from recreational activities, especially in sensitive areas such as picnic areas and campsites along the rivers and pond shores. Visitors should be encouraged to practice minimum impact camping and to minimize off-trail use when hiking or snowmobiling. Proper trail construction and monitoring is also important.
- » 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 focus area includes the Number 5 Bog Ecological Reserve. Research and education are actively encouraged on all state Ecological Reserves. The state has developed a long term ecological monitoring program for Reserves and seeks opportunities to promote research efforts that complement its monitoring program.



Moose River, 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	Bald Eagle	<i>Haliaeetus leucocephalus</i>	SC	S4B,S4N	G5
	Quebec Emerald	<i>Somatochlora brevicincta</i>	SC	S2	G4
	Wood Turtle	<i>Glyptemys insculpta</i>	SC	S4	G4
Plants	Fragrant Cliff Wood-fern	<i>Dryopteris fragrans</i>	SC	S3	G5
	Pygmy Water-lily	<i>Nymphaea leibergii</i>	T	S1	G5
	Swamp Fly-honeysuckle	<i>Lonicera oblongifolia</i>	SC	S3	G4
Natural Communities	Alder Thicket	Alder shrub thicket		S5	G4G5
	Black Spruce Barren	Spruce - heath barren		S2	G5
	Black Spruce Bog	Spruce - larch wooded bog		S4	G3G5
	Dwarf Shrub Bog	Sheep laurel dwarf shrub bog		S4	G5
	Jack Pine Forest	Jack pine forest		S1	G4G5
	Jack Pine Woodland	Jack pine woodland		S3	G3G5
	Leatherleaf Bog	Leatherleaf boggy fen		S4	G5
	Open Cedar Fen	Northern white cedar woodland fen		S4	GNR
	Patterned Fen Ecosystem	Patterned fen ecosystem		S3	GNR
	Red and White Pine Forest	Red pine - white pine forest		S3	G3G4
	Red Pine Woodland	Red pine woodland		S3	G3G5
	Rock Outcrop Ecosystem	Rock outcrop ecosystem		S4	GNR
	Silver Maple Floodplain Forest	Silver maple floodplain forest		S3	GNR
	Spruce - Fir - Northern Hardwoods Ecosystem	Spruce - fir - northern hardwoods ecosystem		S4	GNR
	Sweetgale Fen	Sweetgale mixed shrub fen		S4	G4G5

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.