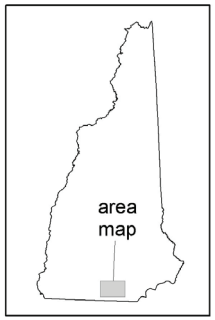
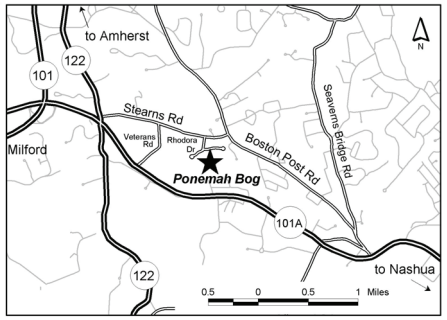
DIRECTIONS

From Nashua: Take Rte. 101A west for 5 miles. Turn right on Boston Post Rd. Go 2 miles, then turn left on Stearns Rd. Go 0.3 miles, then take a left on Rhodora Dr. and go straight ahead to parking for the Sanctuary.

From Milford/Amherst: Go east on Rte. 101A for 0.5 miles, then turn left on Rte. 122. Immediately turn right on Stearns Rd and go 1.1 miles. Turn right on Rhodora Dr. and go straight ahead to parking for the Sanctuary.





PROPERTY USE GUIDELINES

Please, for the protection of the area and its inhabitants, and for everyone's safety and enjoyment:

- -Foot travel only; please stay on the marked trails
- -Walk only on the boardwalk in the bog
- -No pets, horses, bicycles, or motor vehicles allowed
- -No hunting, firearms, camping, fires, swimming, or smoking
- -Do not collect or disturb plants or animals
- -Please respect private property

ABOUT NEW HAMPSHIRE AUDUBON

New Hampshire Audubon is an independent statewide membership organization whose mission is to protect New Hampshire's natural environment for wildlife and for people. It operates nature centers throughout the state that provide educational programs for children and adults. It is also involved in research projects, protects thousands of acres of wildlife habitat, and advocates for sound public policy on conservation issues. For information on New Hampshire Audubon, including membership, volunteering, programs, and publications, call (603) 224-9909 or go to their website at www.nhaudubon.org.

KETTLE HOLE BOGS

About 18,000 years ago, New Hampshire was covered by a continental ice sheet almost a mile thick. Today, kettle hole bogs are found where big chunks of glacial ice were left stranded and partially buried in the landscape as the glaciers melted. The ice chunks subsequently melted, leaving ponds in depressions in the ground, with no hydrologic inlets or outlets. Over thousands of years, peat moss progressively filled in the kettle holes from the edges inward toward the pond centers. Most still have a central bog pond with a floating mat border, while some have filled the kettles entirely with peat, obscuring the former ponds under floating or grounded peat mats. Precipitation is the primary water source for these peatlands, but their watersheds are often small, with very limited terrestrial runoff influence. Kettle hole bogs are broadly distributed in NH, but concentrated in the central and southern portions of the state where kettle hole formation in glacial outwash was more abundant.

The natural community sequence from the upland border towards the center of the kettle hole at Ponemah Bog is tall shrub fen or black spruce swamp, followed by a dense leatherleaf / black spruce bog zone, and then a floating, reddish-colored open carpet of extremely dwarfed shrubs, patches of *Sphagnum* moss pools, and mud-bottoms. There is still a pond of open water in the center of the bog, fringed by a floating marshy peat mat. The vegetation of kettle hole bogs is dominated by species indicative of acidic, nutrient-poor conditions, such as scattered, stunted black spruce, numerous dwarf heath shrubs (such as leatherleaf, sheep laurel, bog laurel, and small cranberry), liverworts, bladderworts, and white beak-rush.

This brochure was created by the NH Natural Heritage Bureau as part of a series designed to educate the public about the state's special plants and natural communities. More site guides and profiles are available on the Visiting NH's Biodiversity program page at:

www.nhnaturalheritage.org

New Hampshire
Natural Heritage
Bureau

NH Division of Forests & Lands - DRED
172 Pembroke Road - PO Box 1856
Concord, NH 03301-1856
(603) 271-2215

The DFL is an equal opportunity employer and educator.

NH Natural Heritage Bureau

Visiting New Hampshire's Biodiversity

Ponemah Bog

a property owned and managed by

New Hampshire Audubon

N.H.AUDUBON

This brochure was paid for with funds from the NH Conservation License Plate
www.mooseplate.com

TRAIL DESCRIPTION: The trail network here is about ¾ mile long and takes about 45 minutes to complete at a leisurely pace. The early part of the trail is a woods path. The part in the bog is all on narrow boardwalks. Please stay on the trails as portions of them cross private land.

From the parking area, head east on the Bog Trail (yellow blazes) into the woods. The dry forest here consists of white and pitch pine trees as well as a variety of oaks and a few red maples. Lowbush blueberry occurs in the understory. Look and listen for whip-poor-wills and eastern towhees. At a trail junction, the Bypass Trail (red blazes) continues straight towards the bog. Bear right and walk to a wooden observation deck overlooking the bog. From here you see most of the site, including the peat mat, the pond, and the upland forest edge. Continuing on the trail, pass a small marshy swamp. At the next junction with the Bypass Trail, bear right and descend the slope.

Stepping onto the boardwalks, you arrive at the edge of the peatland. Thousands of years ago this entire basin was open water, a pond about 100 acres in size. Over time, shrubs that are specialized in growing at the edges of ponds, such as water willow (*Decodon verticillatus*) and leatherleaf (*Chamaedaphne calyculata*), grow out into the open water. *Sphagnum* moss then grows on the wet stems of these shrubs and the whole mass slowly spreads over the surface, providing a mat for other plants to take root in. Eventually, the accumulation of living and dead moss and plant matter allows other plants to grow, and peat gradually fills the pond. This is a classic example of a form of ecological succession called *hydrarch* succession.

Today, the shrub thicket here at the edge of the bog is a ***highbush blueberry - mountain holly wooded fen*** community. Common heath shrubs that can be seen are sheep laurel (*Kalmia angustifolia*), bog laurel (*Kalmia polifolia*), leatherleaf (*Chamaedaphne calyculata*), bog rosemary (*Andromeda polifolia* var. *glaucophylla*), highbush blueberry (*Vaccinium corymbosum*), winterberry (*Ilex verticillata*), and rhodora (*Rhododendron canadense*). Many of these plants have adaptations such as hairy leaves that allow them to conserve moisture in the acidic bog environment. Black spruce and larch trees also grow well here.

Farther along, the shrubs diminish in height, species composition changes, and a more open zone begins. Soft tufts of cottongrass (*Eriophorum virginicum*) bob in the breeze. The community type here is ***leatherleaf - sheep laurel shrub bog***, which in turn transitions to ***Sphagnum rubellum - small cranberry moss carpet***, with occasional microhabitats and other communities, such as ***liverwort - horned bladderwort mud-bottoms***, embedded within.

Scars from old peat-harvesting ditches are apparent here a short way from the boardwalk, sometimes looking like muddy lines in the peat mat. Features that may be similar in appearance are the tracks made by animals that live in and around the bog as they head for the open water.

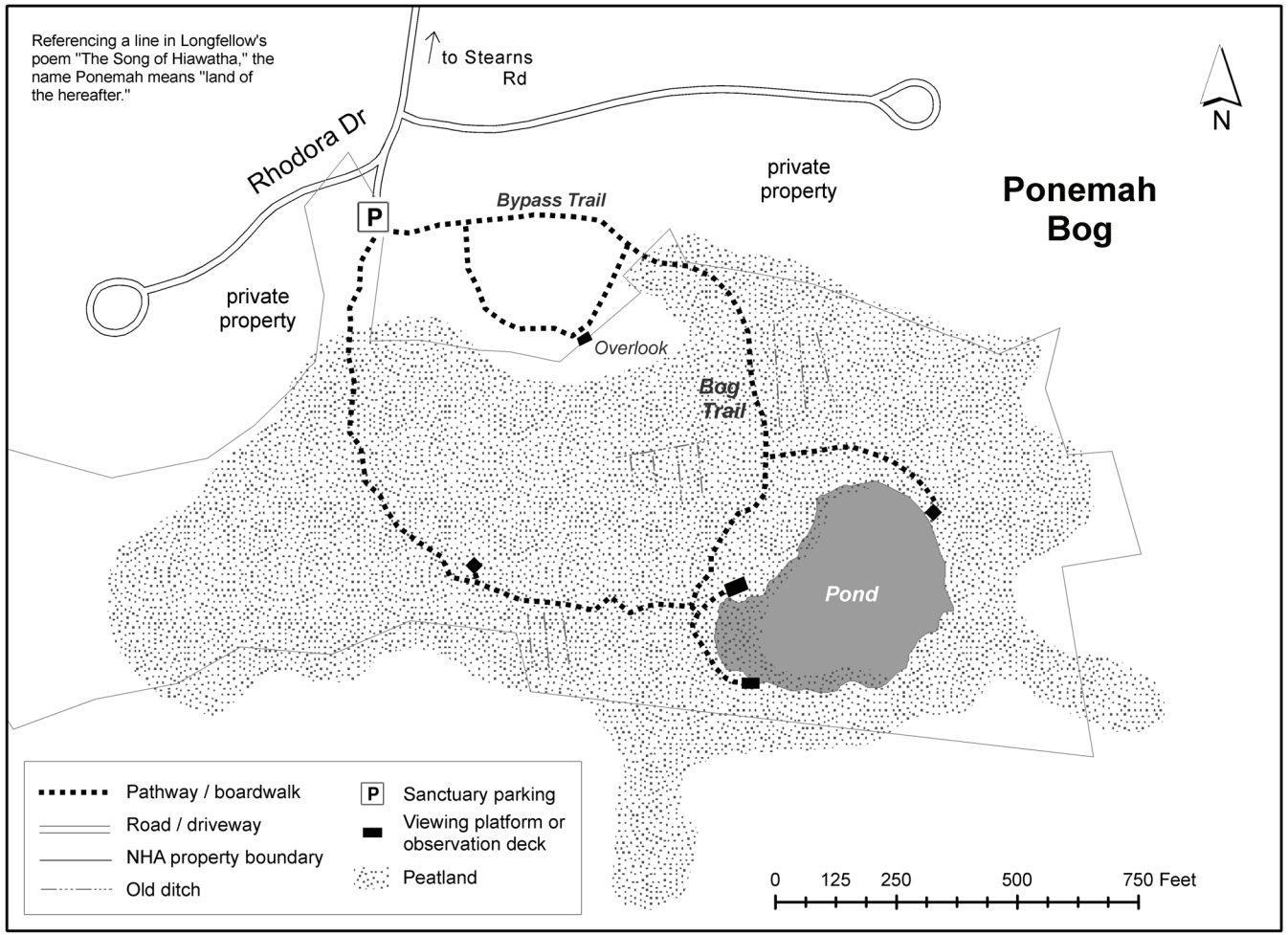
In addition to the bog's acidity, which inhibits the growth of many species, it is a very nutrient-poor setting due to anaerobic (low oxygen) conditions which slow the decomposition of dead organic matter. Several species offset the lack of nutrients by trapping and digesting insects. These include pitcher plants (*Sarracenia purpurea*), horned bladderworts (*Utricularia cornuta*), and tiny sundews (*Drosera rotundifolia*), all of which can be seen low to the ground on the mat.

A typical characteristic of this saturated, nutrient-poor environment is dwarfed vegetation. Trees that are able to survive out here do so in a stunted, bonsai-like form, putting on little woody growth each year and never growing very tall.

A few acres of open water remain in the center of the bog, fringed by a ***floating marshy peat mat*** community. Turtles are often spotted sunning in various locations around the pond. Muskrat and heron can also be seen here. Plants found in and around the water of the pond include arrow arum (*Peltandra virginica*), water willow (*Decodon verticillatus*), and white waterlily (*Nymphaea odorata*).

An assortment of native orchid species grow in Ponemah Bog. Their showy blooms can best be seen from late spring to mid summer. A wide variety of birds can be seen here throughout the year, including blue jays, hawks, warblers, nuthatches, and sparrows. This bog is also home to many colorful dragonflies and damselflies.

Follow the rest of the trail to return to the parking area, passing by patches of ***bog rosemary - sedge fen***. Be careful leaving the bog as there is sometimes more water at the edges (a "moat") due to runoff from the upland.



Map and photo by Ben Kimball, November 2005.