



Peatlands

Habitat Stewardship Series

NEW HAMPSHIRE WILDLIFE ACTION PLAN

Recognizing peatlands



Floating peat mat

Peatlands are wetland ecosystems that contain peat, a spongy, organic material formed by partially decayed wetland plants. Typically found in cool climates, peatlands are associated with acidic or stagnant water that is low in oxygen.

The most common type of peat is “Sphagnum peat,” made up of layers of *Sphagnum* moss. *Sphagnum* plants float, and as they grow along the edges of ponds or slow-moving streams, they expand onto the surface of the water. As older plants die, new plants grow on top, thickening and strengthening the peat mat, which may eventually cover the entire pond. Visitors to these peatlands may experience the peat mat trembling underfoot as it floats, giving rise to the term “quaking bog.” The peat mat also provides a surface on which other vegetation can grow.

The water in many peatlands is highly acidic and lacking in nutrients, creating growing conditions for a very distinct group of plants.

- **Bogs** receive very little surface water flow and are among the most acidic peatlands. They are generally dominated by shrubs like leatherleaf and bog laurel.
- **Fens** are peatlands associated with moving water, either along a river or lake, or with a stream that flows into or out of the peatland. Fens range from very acidic (where the plants resemble those found in bogs) to mildly acidic, and are dominated by a combination of sedges and shrubs.
- **Peat swamps** are peatlands dominated by trees. There are many different types of these forested wetlands, with black spruce and larch swamps common in the northern part of the state, and red maple swamps more common in central and southern New Hampshire.

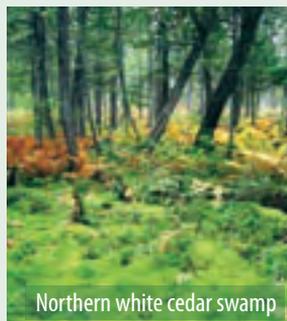
The NH Natural Heritage Bureau finds, tracks, and helps conserve New Hampshire’s rare plants and exemplary natural communities, many of which are peatlands. The “Visiting NH’s Biodiversity” portion of their website has brochures, profiles and photos of many of New Hampshire’s most unique and pristine peatlands (go to www.nhnaturalheritage.org).



Philbrick-Cricenti Bog
New London



Fen in Connecticut River
Headwaters Natural Area



Northern white cedar swamp

Why are peatlands important?

Peatlands add significantly to New Hampshire's biodiversity. At least 550 different plants grow in peatlands in the state, many of them highly-specialized to their environment. Peatlands also provide habitat for a unique collection of animals, including the ringed boghaunter, a rare dragonfly that breeds in open peatlands in southern New Hampshire. In the north, peat bogs are a favored habitat of bog lemmings and spruce grouse.

Rare and unique species

Peatlands may be most notable for the distinctive plants they support, such as the carnivorous pitcher plant and sundew, or for the variety of colorful orchids that grow there. The New Hampshire Natural Heritage Bureau tracks fifty-four rare plant species that occur in some type of peatland habitat. Many insects found in peatlands depend on a single peatland plant species for food or to complete their life cycle. For example, in the northeast there are four different insects and one mite that depend on pitcher plants for their survival.



Pitcher plant

Threats to peatlands

Like other wetlands, peatlands are threatened by development (by filling and draining), especially in fast-growing parts of the state. Peatlands are particularly sensitive habitats and are vulnerable to changes in the uplands that surround them. Runoff from agricultural fields, lawns, and commercial irrigation can have significant effects on peatland vegetation. Lime and fertilizer runoff can increase nutrients and can raise the pH (i.e., reduce the acidity) of peatland waters. These changes can increase the rate of decay of peatland soils, potentially destroying the peat mat.

Timber harvesting can also significantly alter forested peatlands. If harvesting occurs when soils are not completely frozen and the ground is not snow-covered, equipment can damage or destroy fragile peat soils. Additionally, if a peat swamp undergoes a particularly intensive harvest such as a clearcut, the loss of trees can alter the hydrology of the peatland. This can result in a higher water table, preventing trees from regenerating on the wetter soils and potentially altering the vegetation structure for decades.

Where are peatlands?

In central and southern New Hampshire, peatlands are often associated with interesting geological features called "kettleholes." These circular depressions were created by large ice blocks left behind by retreating glaciers and support wetlands called "kettlehole bogs." Black spruce swamps and northern white cedar swamps are unusual wetlands found mostly in the north, while red maple swamps (common) and Atlantic white cedar swamps (rare) occur mostly in the south. Good examples of peatlands include Philbrick-Cricenti Bog in New London, Ponemah Bog in Amherst, and Hurlbert (northern white cedar) Swamp in Stewartstown.

Stewardship Guidelines

for peatlands

- Peatlands are very vulnerable to changes in water flow and the level of the water table. **Damming of streams** flowing in or out of a peatland will change water level patterns and can lead to damage to the peat mat and changes in vegetation.
- Although most peatlands are not traditional waterfowl habitat, they are unique habitats in their own right for a wide variety of animals and plants. Peatland communities **should not be excavated** to create open water areas for waterfowl.
- **Don't use heavy machinery** on peatland soils to avoid negative impacts to plant and animal species or disruption of the wetland's hydrology through rutting or soil compaction.
- **Maintain brush and other woody material** in and around peatlands to provide cover for small mammals, amphibians, and reptiles.
- **Avoid repeated trampling of peatland vegetation.** ATVs and other off-highway recreation vehicles (OHRVs) should not be allowed in or around peatlands. Trails for these vehicles should be located at least 100 feet from any peatland to deter drivers from entering.
- At popular peatland destinations, walking access for the public should be on **raised boardwalks** to protect peatland soils and vegetation. Some wildlife species live in the *Sphagnum* and are sensitive to repeated trampling, including bog lemmings and boghaunter larvae.
- **Avoid public access near rare plants, especially orchids.** Collectors can decimate populations. Insects that depend on the bog plants will therefore lose their habitat.
- New Hampshire Fish and Game tracks all sightings of rare animals. If you have information about a wildlife species of conservation concern (or want to learn more), contact NH Fish & Game's Wildlife Division at 603-271-2461.
- For land conservation efforts to successfully protect peatland wildlife, **uplands surrounding peatlands need to be protected** as well. A 300 foot buffer of upland, undisturbed by human development or agriculture, protects water resources and habitat for many species.
- Timber harvesting in peatlands should be limited to selection, thinning, or some other **partial harvest**, and restricted to periods of frozen ground and snow cover.
- Always **consult a licensed New Hampshire forester** before conducting at timber harvest on your property. Understand and follow all laws pertaining to the harvesting of trees near wetlands and peatlands. Follow established Best Management Practices, and harvest timber near wetlands only when the soils are either frozen (winter) or very dry (summer).

Floating walkway over Mud Pond Bog



Grass-pink orchid

Species Focus

of conservation concern

Bog Lemming

There are two species of bog lemming found in New Hampshire: northern (which is very rare) and southern. Both have very short tails, distinguishing them from voles and other small rodents. They inhabit peatlands, digging burrows 6-12" beneath the peat. They also build runways through surface vegetation, which they use for foraging on the tender parts of grasses and sedges (look for distinctive piles of bright green fecal pellets). In the summer, bog lemmings may nest in surface runways instead of underground nests, making them particularly vulnerable to trampling. Lemming populations fluctuate greatly and are poorly understood.



Bog Lemming

Rusty Blackbird

Rusty blackbirds are a northern species (e.g. Canada) that occasionally breeds in northern New Hampshire, nesting in dense conifers such as spruce, or in thick shrubs at the edge of peatlands. Rusty blackbirds return to the same nesting site year after year and defend large territories, rarely nesting within a half mile of the nearest pair. Rusty blackbirds are commonly seen migrating through New Hampshire in spring and fall. They form large flocks, often mixed with red-winged blackbirds, brown-headed cowbirds, and common grackles.



Rusty Blackbird

Ringed boghaunter dragonfly

This state-endangered dragonfly breeds in peatlands with *Sphagnum* moss and open pools of water. The larvae stay in the water for up to three years before emerging as inconspicuous black- and brown-banded adults. They are among the earliest dragonflies to emerge in spring, usually during the first two weeks of May. Adults spend much of their time foraging on flying insects in nearby woodlands. This dragonfly has been identified in only a few peatland habitats, all of which are located in southeastern New Hampshire, near housing developments. Protecting the remaining woodlands near these peatlands is critical to the survival of this dragonfly.



Ringed boghaunter dragonfly

Wildlife found in peatlands

Many wildlife species use peatlands for part of their life cycle, whether for breeding, feeding, cover or nesting. Below are some examples of species that depend on peatland habitats. Be on the lookout for these species and other wildlife associated with peatlands. Follow stewardship guidelines to help maintain or enhance peatlands. Species of conservation concern--those wildlife species identified in the Wildlife Action Plan as having the greatest need of conservation--appear in **bold** typeface.

- **Blanding's turtle****
- **Eastern towhee**
- **Mink frog**
- Southern bog lemming
- **Northern bog lemming**
- **Palm warbler**
- **Ribbon snake**
- **Ringed boghaunter dragonfly****
- **Rusty blackbird**
- **Spotted turtle***
- **Spruce grouse**

* state-threatened species

** state-endangered species

Where to get help

If you have information about a wildlife species of conservation concern, contact NH Fish & Game's Wildlife Division at 603-271-2461. Contact the UNH Cooperative Extension Wildlife Specialist at 603-862-3594 for technical assistance for landowners or your community.

Publications and assistance on forestry and wildlife topics are available through the UNH Extension Educators in Forest Resources in each county. Contact information for each UNH Cooperative Extension office is provided below. Additional publications, contact information, resources, and web versions of all brochures in the Habitat Stewardship Series are available on the UNH Cooperative Extension website at: nhwoods.org.

Belknap County	603-527-5475	Grafton County	603-787-6944	Rockingham County	603-679-5616
Carroll County	603-447-3834	Hillsborough County	603-641-6060	Strafford County	603-749-4445
Cheshire County	603-352-4550	Merrimack County	603-225-5505	Sullivan County	603-863-9200
Coos County	603-788-4961				

Authorship

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About the Habitat Stewardship Series

Much of the land in New Hampshire is privately owned. These individuals are the primary stewards of our wildlife and forests, and also our clean water, scenic views, fresh air, natural and cultural heritage, and recreational resources. The Habitat Stewardship Series has been created to help landowners and land managers recognize the habitats critical for wildlife species at risk, and to illustrate the role private landowners can play in sustaining those species through conservation, management, and sound land stewardship.

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