



Vermont Fish and Wildlife Habitat Fact Sheet

Many people regard bogs as places to be avoided, as soggy wastelands unsuitable for agriculture, forestry, recreation, or other worthwhile activity. But as a special kind of wetland, bogs are significant and intriguing ecosystems, unlike any other. On the world scale, they occupy enormous portions of Canada, Russia, and Scandinavia, where they are used for many commercial purposes, including mining for fuel substances, building material, and peat moss. Though most in Vermont are tiny by comparison with the bogs of those countries, the state boasts some fine, unspoiled ones.

The occurrence of bogs in Vermont depends on several key environmental factors, abundance of water being one of the most influential. North in Canada, the boglike landscapes spread for thousands of unending miles as "muskeg." There water is almost always available, since evaporation is reduced by the short ice-free season and in many areas the permanently frozen ground (permafrost) just below the surface acts as a barrier to the downward-percolating water. But in Vermont, where summers can be somewhat dry and permafrost does not exist, bogs have developed only in depressions where drainage is slowed or stopped and water collects in the low areas. With impeded water flow and little or no oxygen supplied from the outside, decaying plant and animal remains

rapidly consume what oxygen is available in the basins. Eventually, the waters become deficient in oxygen and stagnate. At that point, dead matter cannot be well decomposed, as the agents of decay (primarily bacteria and fungi) cannot live without oxygen. This is also the reason that bogs, contrary to their popular impression, do not have a "marshy" or "swampy" smell. The relatively rapid decaying of organic matter in swamps and marshes (due to the presence of oxygen that allows decomposers to function) releases great quantities of methane and other gases, which build in the mucks until they bubble out, especially when the sediments are disturbed. In bogs, however, this process is greatly slowed and reduced, so odors cannot be detected. Whatever dies here is "pickled" in this acidic, watery environment. In this way, the organic matter accumulates as peat builds into mats in which plants and animals are often preserved intact. In fact, in some European bogs human bodies (probably those of executed prisoners) have been most perfectly preserved for thousands of years

Plants

The bog plants growing in the mat are among the most exotic and beautiful of North American flora. Many are found only in bogs, partners to the rigorous features of these places. And, no bog exactly resembling another in physical, chemical, and biological

characteristics, the bog's vegetation may include many species or few; a plant may blanket the mat in one bog and be absent in the next.

Plants of the bog have to contend with a gamut of adverse conditions: a sterile "soil," where nutrients are hard to come by, since organic matter is little decomposed; acidic water within the mat; scant oxygen for respiration and growth; direct exposure to the elements, especially in treeless bogs; unsteady footing for roots; and, always, the wetness. In many ways, as said earlier, these conditions are similar to those in the tundra on the mountaintops, and though individual species may differ in these two places, the manner in which their plants handle the problems is much the same. Indeed, two families-sedges and heaths-are among the most prevalent plants in both areas.

Ironically, though water is pervasive in bogs and is essential to their formation and development, it is largely unavailable to bog plants, mostly because of the acidity of the peat waters. The plants have acquired several adaptations that allow them to conserve what water they manage to collect. Sedges have thick, solid stems and narrow-bladed leaves, both of which reduce potential evaporating surfaces. Sphagnum mosses have two types of cells, live ones at the mat surface that manufacture food and absorb water from the rain and air, and dead subsurface ones that act as

water-storage vessels. Common heaths-leatherleaf, Labrador tea, bog laurel, bog rosemary, blueberries, cranberries, and others-have tough, woody stems and firm, leathery leaves, both attributes helping to restrict the amount of water passing through the plants to the outside.

Wildlife

The strange lure of bogs does not rest with plants and wild flowers alone. A good variety of insects in the bog attract some food-seeking vertebrates, such as the four-toed salamander, which works its slow way over and through the moist sphagnum mosses. In bogs with open water, painted turtles are not uncommon, being seen with their heads poking above the water surface or swimming along the edge of the mat. The small bog turtle one would expect to be found in Vermont bogs, as it is in neighboring New York State, but so far it has not been sighted here. The turtle is rare even in its main Western and Southern range, where it seems to be almost exclusive to bogs and boglike habitats.

Mammalian inhabitants are mostly small rodents that feed on the vegetation and stay within its protection. Of particular interest is the southern bog lemming (lemmings are vole-like natives of the north, especially boreal and tundra regions.) This tiny lemming uses runways and tunnels in the bog mat for traveling from place to place, and for nesting and raising its young.

Birds

The bird life of the bog is not exceptionally rich, but a few fairly rare species may appear, some even nesting. Breeding here has been ascertained, though infrequently, for the Lincoln's sparrow, a northern

species that builds its nest well hidden in the sphagnum mat. The red-capped palm warbler, another rare but possibly Vermont-nesting bird, uses two habitats: bogs in breeding season, open grasslands and fields in migration. One might see a yellow-bellied flycatcher higher up in the trees of a bog, waiting for a flying insect to come near, or hear the mighty call of the tiny ruby-crowned kinglet from the thick maze of spruce branches. One might also see a small flock of rusty blackbirds flying over to the swamp trees outside the bog.

Excerpted from Charles Johnson's book
Nature of Vermont