

BOGS OF THE POCONO REGION

by Jason Smith

The Pocono Region is highly blessed with abundant surface water resources, including lakes, ponds, streams, and wetlands. “Wetlands” is a very broad term and includes many different types of systems. For example, wooded wetlands are known as “swamps” and herbaceous wetlands are known as “marshes.” The type of wetland may be further defined by the soil characteristics; organic material or mineral soils composed of sand, silt, and clay particles derived from decayed or eroded bedrock. All wetlands have a mineral soil base. Many of these systems, however, exhibit characteristics that cause a build-up of organic materials to overlay the mineral soil base. The organic material, or peat, is the result of countless years of deposition of plant materials under conditions of anoxia (without oxygen). Under such conditions,



the bacteria which would otherwise decompose the organic materials are not able to survive. Such peat accumulating wetlands are commonly known as “peatlands.” Finally, the term “peatlands” may be further broken down into two basic types – nutrient poor “bogs” and nutrient rich “fens.” In the Poconos, bogs predominate over fens as the geology leads to naturally nutrient poor and acidic soil and water conditions. Fens typically occur in areas with limestone bedrock where pH values are higher (due to buffering by the limestone which contains calcium carbonate) and nutrients are more plentiful. In contrast to bogs, fens have great species diversity which is largely attributed to the more favorable growing conditions.

Bogs are some of the most unique and interesting natural features found throughout our local landscape in Northeastern Pennsylvania. What are “bogs,” exactly? As previously stated, the term most commonly refers to wetlands that accumulate organic material, or peat, and which are fairly nutrient poor. To the purist, however, the definition must also incorporate a provision for very high acidity and low species diversity. Such systems are known by the scientific community as “true bogs.” The combination of adverse conditions that are experienced in true bogs is what makes them so unique. Only special, highly evolved plant species can withstand the permanent soil saturation, very low pH (typically 3-

5 standard units), oxygen depleted soils, extremely low nutrients, and generally unstable ground found in the bog environment.

Bogs may form as the result of various natural processes. In our region, bogs are most commonly formed through a process known as “lake fill,” whereby the slow but steady accumulation of organic materials eventually displaces all of the open water with saturated peat. The bogs in the Poconos have formed during the past 13 to 15 thousand years, since the end of the last ice-age and the retraction of the Wisconsin Glacier, which reached its terminus in the Pocono Region. As a result of glacial processes, natural lakes and vast inundated shallow depressions abound throughout this region. These natural features have served as prime areas for the development of bogs and other types of wetlands.



In order to live and grow in bogs, plants have had to develop very special and fascinating capabilities. Trees and larger shrubs have had to contend with unstable soils for canopy support and nutrient poor anoxic soils for vital nutrients. Similarly, herbaceous plants have had to overcome the nutrient poor conditions and constant soil saturation. To accommodate life in this harsh environment, trees and shrubs have developed shallow spreading root systems which provide both greater support for the heavy canopies and increased exposure to the bog surface where the majority of free nutrients are available for root uptake. Perhaps the most interesting

plant adaptation found in the bog environment is the evolution of certain herbaceous and aquatic species to become “carnivorous.” The pitcher plant, sundews, and bladderworts have all developed means by which to lure insects, amphibians, and other small organisms into their “traps” where they are then slowly digested to extract their essential nutrients. Nitrogen is the primary nutrient that these carnivorous plants must obtain for growth and reproduction. Other bog plants may obtain sufficient quantities of nitrogen through their root systems, or in some cases, they have developed special means to extract nitrogen from the atmosphere through a process called “nitrogen fixation.” Other special adaptations of bog species include nutrient conservation and year round photosynthesis through “evergreenness,” plant tissue support through development of air sacs or aerenchyma tissue (development of air pockets within stems, leaves, and seeds), and development of



adventitious roots which grow from the trunks and lower limbs for additional support. Some species, like the “viney” cranberry, are simply opportunistic and gain their needed support above the wet boggy surface by just growing on top of the surrounding surface plants.

Bogs are not essential to many faunal, or animal, species. However, there are certain rare insects that, just like the afore mentioned floral species, have developed special means to grow, live, and survive in the harsh bog environment. There are no vertebrates that are completely dependent for the bog environment for their life functions. However, many vertebrates including bears, deer, moose, and numerous bird species do frequent bogs for purposes of food, rest, sleep, spawning, and rearing of their young.

Historically, humans used bogs for thousands of years for various functions, including religious ceremonies, burial grounds, food, medicine, and heating fuel. In more recent times, however, our use of bog resources, as with so many of our other natural resources, has exceeded nature’s ability to assimilate and replenish that which is being used. Many of our bogs have been destroyed by peat mining and by conversion to developable uplands or to recreational lakes. Fortunately, through scientific study and research, we have come to understand the values of our wetlands and water resources, and we have implemented laws and other means for their protection.

Northeastern Pennsylvania is the southernmost home to “true bogs” in all of the northeastern United States. We are very fortunate to have these wondrous natural features in our midst, and should both enjoy and protect them to their fullest!

While many bogs occur naturally throughout our local environment, visiting them may be quite treacherous, as they are typically surrounded by a virtually impenetrable wall of tall and thick shrubs. If you would like to get a great taste of a beautiful local bog, you should contact the Monroe County Conservation District at (570) 629-3060 for a guided tour of the Tannersville Bog. You will not be disappointed!