

Pine Barrens Treefrog

by Jim Sciascia and Sherry Meyer

Pine Barrens treefrogs are more often heard than seen. A visit to a Pinelands cedar swamp in early June usually will be rewarded with the sound of the rapid and nasal *quonk-quonk-quonk* call of this unique species. One of the reasons it is heard more often than seen is its diminutive size. Measuring from 1.13 to 1.75 inches in length, it is our fourth smallest frog, larger only than the cricket, spring peeper and chorus frogs.

Despite its small size, those fortunate enough to see one truly will be impressed. Vibrant green and boldly marked, the Pine Barrens treefrog (*Hyla andersonii*) is one of New Jersey's most beautiful amphibians. A purple stripe bordered by a thin yellowish-white line extends from the snout through the eye down each side of the body. Although the underparts are white, there are vibrant orange patches beneath the hind legs, showing a flash of color when the frog jumps. There is a purplish tinge to the throat, which is particularly visible on the male.

Its striking appearance is not the only factor contributing to its uniqueness. The distribution of the Pine Barrens treefrog is remarkable. In New Jersey, it occurs only within portions of nine counties that contain the Pinelands ecosystem. What makes its distribution remarkable is that the closest population to New Jersey's is located 500 miles south, in North Carolina. The only other areas in which it occurs are portions of South Carolina, south-central Alabama and along the Florida panhandle. The New Jersey population is the largest stronghold for this species throughout its entire range. The Pine Barrens treefrog requires specialized habitats, such as Atlantic white cedar swamps and pitch pine lowlands that are carpeted with dense mats of sphagnum moss. During most of the year, the population is scattered amongst the trees and shrubs of both upland and wetland Pinelands habitat. In early May, the urge to breed concentrates the population at temporary woodland ponds, white

cedar or cranberry bogs, and seepage areas along tributaries of major rivers and streams that serve as breeding ponds. Preferred habitat consists of an open canopy, a dense shrub layer and heavy ground cover. Rare orchids, sundews and pitcher plants are other Pineland specialties that often occur at breeding sites.

Pine Barrens treefrog breeding ponds, which may dry up by mid summer, contain between 4 and 24 inches of water. The water is clean, yet very acidic, with pH values as low as 3.4. Studies have shown that most other amphibian species can not successfully reproduce in such acidic conditions. This evolutionary adaptation by the Pine Barrens treefrog has successfully reduced habitat competition with other frog species that cannot tolerate low pH.

The male calling activity, which often is initiated prior to sunset, peaks during humid June evenings when temperatures exceed 68°F. Males may vocalize from the ground or within vegetation near the breeding pond and may call from the same location on different evenings. Although a few individuals may call into mid July, vocal activity typically concludes early in that month.

One female may deposit as many as 1,000 eggs. To minimize the risk of losing an entire clutch, female treefrogs scatter individual eggs throughout a breeding pond. The eggs, which are fertilized externally by the male, hatch into tadpoles in one to two weeks. Tadpoles consume algae, microscopic invertebrates and aquatic vegetation. Depending on weather conditions and rainfall, the tadpoles transform into tailed "froglets" in 80 to 100 days. Following transformation during late July, August and sometimes September, juvenile frogs disperse into woods, bogs and wet meadows. Fat reserves stored in the tail sustain the froglets until they are able to capture their own prey, such as grasshoppers, crickets, beetles, spiders, ants, flies and other insects. Treefrogs hide within ground cover or perch in trees during the day and emerge at night to forage.

Although the Pine Barrens treefrog

occurs sporadically throughout its discontinuous range in the eastern United States, large populations of this species were historically common in the Pine Barrens of southern New Jersey. By the 1970's, habitat destruction and water degradation had led to the loss of many historic colonies and threatened existing populations. As a result, the Pine Barrens treefrog was listed as an endangered species in New Jersey in 1979. The DEP's Endangered and Nongame Species Program has carefully documented the locations of Pine Barrens treefrog populations over the last 20 years and the database containing these locations guides protection of its habitats. Fortunately, the land use restrictions placed on endangered species habitats by both the Pinelands Commission and the Coastal Area Facility Review Act now provide protection for Pine Barrens treefrog populations. However, vigilance is still warranted to protect against the secondary impacts of growth and development that may be as damaging to populations as habitat destruction. Factors that endanger the Pine Barrens aquifer, including pollution and lowering of the water table will negatively affect Pine Barrens treefrog populations. Also, pH increases resulting from agricultural liming or dilution may affect treefrog breeding or prohibit larval development. Increased pH levels allow establishment of aggressive competitors like the bullfrog, a competitor and predator of both larval and adult Pine Barrens treefrogs.

The Pine Barrens treefrog serves as a barometer of Pinelands ecosystem health. Water quality protection and habitat preservation will benefit the Pine Barrens treefrog and the hundreds of distinctive plant and animal species that rely on this unique ecosystem.

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