

## Frogs of the Bog

"One or two chances, that's all you got," I thought as I watched the lone male wood frog (*Lithobates sylvaticus*) croaking in a vernal pool along the Little Menomonee River in extreme northern Milwaukee County. This was the first wood frog reported from the county in over 70 years. As I watched him in a headlamp, all alone in this contaminated Superfund site, I realized this was one tough frog. Eventually his kind would reclaim this area, once again spreading the primary energy in the pond across the land, in the form of hopping frog flesh. Wood frogs have relatively short lives (3-5 years), with typically one or two chances to breed, but they lay a lot of eggs (up to 1,500). They use temporary ponds for breeding, a habitat that is not stable, and during drought years reproductive output is often zero. The key to their persistence is prolific egg production coupled with effective juvenile dispersal to constantly find and exploit new ponds. They persist on a landscape by using the existing ponds as a source to recolonize the ponds where reproduction failed. This strategy works only where there are multiple ponds connected by suitable habitat on a landscape the frogs can traverse. At the Bog, a friendly landscape of diverse habitats is preserved and protected.



The wood frog is commonly observed in and around the Bog. It spends most of its short life roaming the forest floor searching for invertebrate prey. Mostly nocturnal, it spends the winter in underground nooks and crannies, such as root channels and small depressions under a thick layer of rotting leaves or moss. Wood frogs are amazingly freeze tolerant, able to produce an antifreeze that helps get them through the winter. Two or three winters are normally a lifetime experience. In spring, wood frogs are the first frog to breed, arriving at small temporary ponds and shallow marshes often before they are completely ice free. Their soft quacking call is an early sign of spring. After breeding, the frogs disperse into the surrounding forest.

Other Bog frogs such as the eastern gray treefrog (*Hyla versicolor*), spring peeper (*Pseudacris crucifer*) and boreal chorus frog (*Pseudacris maculata*) have similar strategies of short lives but high reproductive output and good dispersal abilities. They also exploit the fickle temporary ponds. These species are common residents in and around the Bog, with treefrogs and spring peepers utilizing more forested habitats and chorus frogs more open and grassy habitats. All are often heard but rarely seen. Peepers and chorus frogs call in early spring, with familiar peeps and trills. With patience and a headlamp, stalking these frogs at night can be rewarding. They usually call from right at the water surface at the base of plant stems. Treefrogs give their bird-like warbling call later (about the time leaf-out begins), and often from shoreline bushes and trees up to 10 feet high. All three species are most active on rainy or humid nights, when they can be found crossing roads. Treefrogs sometimes hunt insects around outdoor lights and lighted windows at night.



**Spring peeper** Gary Casper photo

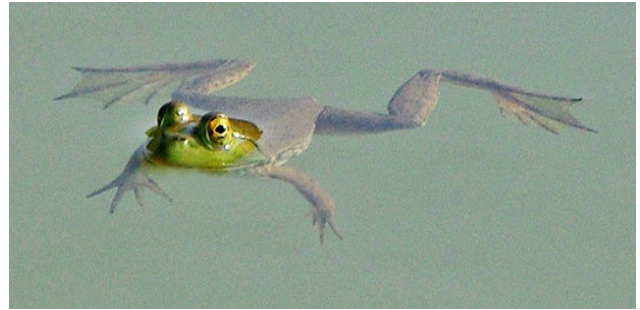


**Gray Treefrog** Gary Casper photo

Somewhat more long-lived frogs are the very aquatic American bullfrog (*Lithobates catesbeianus*) and northern green frog (*Lithobates clamitans melanota*). These frogs spend most of their time along shorelines of permanent lakes and streams, and are the last frogs to call, usually in June. The deep bass note of the American bullfrog carries far, while the short twang of the green frog can be heard for many weeks over an extended breeding period. Both these frogs hibernate on the bottom of lakes and streams, and neither is freeze tolerant. Both are highly prolific, laying thousands of eggs each year. The Bog lakes support these frogs, and they are occasionally found in deeper isolated wetlands as well. Bullfrogs are famous for their cannibalism and undiscerning taste, basically stuffing anything that moves into their gaping mouths, with scorpions, bats, small alligators and muskrats all recovered from stomachs.



**Green frog**



**Bullfrog**

The eastern American toad is another common Bog dweller, with very generalist taste in habitats, found in many residential settings such as gardens, but also in woodlots, forests and meadows. Very terrestrial, toads visit water only when they breed in May. Their long trills can be heard varying in pitch by the size of the toad and the pitch of its neighbors, resulting in interesting harmonies in the chorus. Like the wood frog group, toads hibernate on land, but rather than being freeze tolerant, they are good burrowers, digging underground to escape the freezing cold. Their soft bellies absorb water to help wait out dry periods. Like bullfrogs, they are highly prolific, laying up to 20,000 eggs. While they do use temporary ponds, they also breed in permanent waters, laying strings of eggs wrapped around shoreline vegetation. Toad eggs hatch quickly, in less than two weeks, and the tadpoles are distasteful to predators. As adults, toads sport large poison glands just behind their eyes, which serve as protection. Many gardeners welcome them for their insect control capacity.



**American toads** Gary Casper photo

The northern leopard frog (*Lithobates pipiens*) is the most complicated Bog frog. Like bullfrogs, they hibernate on lake and stream bottoms, and are not freeze tolerant. They occupy natural shoreline habitats, where vegetation provides cover. In early spring they leave their deeper, colder hibernating waters for warm shallow marshes and temporary ponds, where they breed. The soft snoring calls do not carry far, and up to 6,000 eggs are laid in globular masses. These hatch and undergo a larval period before transforming in July or August, when froglets leave the ponds. Meanwhile, upon leaving the breeding sites the adult frogs spend most of their summer foraging on land, in meadows and around forest edges, sitting out dry periods in protected hummocks. Summer rains often bring them out in numbers. Come fall, a migration back to permanent water takes place for hibernation. This complex life history takes a typical frog on a journey through three critical habitats each year - the permanent waters for hibernation, the shallow temporary wetlands for breeding, and the upland summer foraging sites. Intact landscapes providing these features are needed, and the Bog provides.

Frog numbers are always in flux, with reproductive success varying from year to year, based on unpredictable weather patterns. Frogs have evolved to survive this uncertainty through a complex system of high reproductive output and good dispersal potential, so habitats can be constantly recolonized. Habitat fragmentation can compromise this strategy, and stymie the return of frogs to places where weather knocks them out for a few years. That is why we need the Bog, and other large natural areas like it. To prevent long term amphibian decline habitats need to be connected, without major barriers to stop the frogs such as expressways and large developed areas. With a little planning, the frogs can do just fine.

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#### **Further Reading**

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- USGS Frog Call Quiz: : <http://www.pwrc.usgs.gov/frogquiz/>