

Reptiles and Amphibians of the Oak Ridge Reservation

The diversity of reptiles and amphibians (collectively known as “herps”) in an area is a marker of environmental health. Recent surveys by biologists at Oak Ridge National Laboratory (ORNL) have discovered a total of 47 species of herps living on the Oak Ridge Reservation (ORR). Some of those species, such as the spotted dusky salamander, snapping turtle, five-lined skink, and two-lined salamander, are common and occur in large numbers. Other species are rare in the region, such as the four-toed salamander (listed as a species in need of management within the state of Tennessee). The reservation also offers habitats for uncommon, but not state-listed, species such as the northern cricket frog, which has only a sporadic presence in the eastern region of the state.



Black king snakes are common on the ORR. (Photo by B. L. Petersen)

Habitats

The ORR encompasses 33,542 acres with many wetland areas—both natural (e.g., springs, seeps, beaver dams) and created ones—that support large populations of reptiles and amphibians. Terrestrial habitats, such as native warm-season grass fields and upland wooded areas, also offer habitat and resources for several species of reptiles and amphibians. Many of these habitats have been enhanced by biologists and land managers working with state and federal agencies.



Habitats such as this wetland on the Black Oak Ridge Conservation Easement (left) offer homes to species like the marbled salamander. Bearden Creek (right) provides habitat for species like the pickerel frog. (Photos of habitats by R. S. Reasor; photo of marbled salamander by N. R. Giffen; photo of pickerel frog by B. L. Petersen)

Significance of Reptiles and Amphibians on the ORR

Reptiles and amphibians have unique characteristics that allow them to react to possible dangers in their environment. For example, many of them have porous skin that makes them susceptible to toxins. Thus, when confronted with heightened levels of pollutants, amphibian and reptile populations can experience an unusually high mortality rate. Also, because they tend to experience die-offs in unhealthy environments, the absence of certain species can highlight ecosystem problems. Many common herpetological species on the ORR are such indicator species. Thus, by observing the overall abundance and diversity of those species on the ORR, researchers can be alerted to many threats to the local water, soil, or air quality.

Mistaken Identity

Many snake species resemble each other, making it easy to mistake one species for another, especially when a snake is moving quickly and disappears under a rock or log. For instance, the northern copperhead (*Agkistrodon contortrix mokasen*), the only venomous snake known to inhabit the ORR, and the northern water snake (*Nerodia sipedon*) can be found in similar locations and look alike. Thus, snakes should never be approached or handled unless they have been identified by a trained professional.



The northern copperhead (VENOMOUS) (left) and the northern water snake (right) look similar and live in similar habitats. The clearest differences between the species are their banding patterns, but even those distinctions are not likely to be immediately obvious to an untrained observer. (Northern copperhead photo by J. Hamlington; northern water snake photo by T. Mathews)

Threats to Reptiles and Amphibians

Major threats to reptiles and amphibians include loss of wetland habitat. Such loss occurs throughout the United States and is usually directly related to commercial and residential development. Other threats to reptile and amphibian populations include habitat fragmentation, disease, and species-specific viruses, such as frog virus 3, that can cause malformations and large die-offs throughout reptile and amphibian communities.



It is common to see an eastern box turtle using the abundant habitat on the ORR. (Photo by R. S. Reasor)

Protection Efforts

A monitoring program for amphibian and reptile species that inhabit the ORR is ongoing to ensure that population levels remain intact and viable. To alleviate unnecessary habitat loss, environmental impact surveys are conducted to protect wetland and forest habitat whenever any development is proposed. Research on reptile and amphibian diseases and viruses is also being conducted to determine how to keep these populations healthy and intact.

For more information about amphibians and reptiles on the ORR, contact Neil Giffen, ORNL wildlife management coordinator, at 865-241-9421, giffennr1@ornl.gov.

For more information about the DOE National Environmental Research Park, contact Pat Parr, ORNL natural resources manager, at 865-576-8123, parrpd@ornl.gov, or check the National Environmental Research Park website at <http://www.esd.ornl.gov/facilities/nerp/>.