

THE RED-SPOT

by Andrew L. Shiels

“Newt”! It’s a word that conjures up images of fairy tales and witchcraft. Who hasn’t read at least one children’s story in which a fairy tale character has been turned into a newt? Likewise, one of the oft-quoted favorite ingredients in the fabled witches brew is “eye of newt.” Thus, from childhood we’ve come to associate newts with otherworldly characteristics. In this case, it may be well-deserved because newts are indeed unusual creatures. In Pennsylvania, the red-spotted newt (*Notophthalmus viridescens viridescens*) is very common. In fact, it has been recorded from almost every county. Pennsylvania is about at the center of this species’ range in eastern North America. The red-spotted newt is perhaps our most recognized and often seen salamander.

Newts are relatively easy to identify, although there are distinct differences between adults and juveniles. Adult newts are olive-green on top and light to golden-yellow on the underside. Many small black spots or speckles are distributed all over the body. The “red-spotted” portion of the name comes from the six to 20 red or orange spots encircled by black halos, arranged in two rows along the back. Adults range in length up to 6 inches.

Juvenile newts are known as efts or red efts. They live on land for several years and are often a vivid orange color. The bright-orange coloration makes them stand out on the forest floor. However, their bright color is actually a warning to would-be predators that they are toxic and distasteful. In shape, they resemble smaller versions of the adults. Also, even though they are typically bright orange, they still show the spots encircled by black halos. Efts are small and range in length to about 2.5 inches. Newts that are in the process of changing from juveniles to adults are referred to as transformers, and they basically have the shape and size of the juvenile but their coloration gradually darkens from bright orange to olive. Depending on the stage of their transformation, they can be a light olive or orange-brown.

Newts exhibit a unique and complex life cycle. Life for a red-spotted newt begins in an aquatic habitat. Newts may breed in ponds, marshes and small lakes from fall through spring. As many as several hundred eggs are deposited in the spring, attached individually to submerged vegetation. The eggs hatch in around 30 days. The larvae are fully aquatic and emerge from the pond in about two months

to begin life on land. When they leave the pond their gills are resorbed and they develop lungs. At this point they are called efts. Efts live a land-based existence for one to two years and then return to the water to live life as an adult and eventually breed. When they metamorphose into adults, they retain their lungs and remain air breathers. This alternating of habitats and the physiological processes needed to exist in such diverse environments are unique in the animal world. Scientists continue to study newts to learn about the complex physiological processes that must take place to allow these transitions.

Newts occupy a variety of habitats. Adults can be found in temporary ponds, streams, shallow lake edges, swamps and bogs. In the spring and fall, newts can often be seen suspended in the water column just below the surface. This is particularly true in bog areas or ponds, which are relatively acidic and have few or no fish that prey on them. Efts prefer woodlands and may roam miles from water. They inhabit leaf litter and live under the cover of rocks, fallen logs and decaying bark. Newts eat small invertebrates, worms and insects, which they find among the leaf litter. Efts are most often seen during damp conditions on spring or late summer/early fall mornings following a rainfall or heavy dew. At times they seem to be everywhere on the forest floor. There have been many observations over the years of newt “marches,” or migrations. They typically occur during the early fall. They are most likely a movement of efts toward ponds or lakes where they will begin their transformation into adults.

Newts are associated with forested areas. The large areas of forested habitats that remain in Pennsylvania are crucial to survival for most of our other salamander species. A majority of our salamanders require forested habitats and the cover, soil moisture, humidity and diversity of foods and microhabitats that they provide. As organisms that are always in contact with the soils, rocks or waters of the Commonwealth, they are also among the first species to be adversely affected by habitat disturbance or pollutants.

Soil moisture is important to the survival of efts because it aids in decomposition of leaf litter, which provides habitat for the newt and its prey. Moist conditions aid in respiration through the skin, which occurs in addition to lung breathing. Drying or elimination of forested areas reduces or eliminates the population of newts in an area.

T E D N E W T

Good forest conservation practices benefit newts and other woodland salamanders.

Newts are unique in their ecology and life history. No other Pennsylvania salamander begins life as an aquatic larva with gills, becomes an air-breathing, land-dwelling juvenile with lungs, and then returns to an aquatic existence. The red-spotted newt and all other salamanders are members of the Class Amphibia, which also includes frogs, toads and caecilians. There are some 400 salamander species in the world with nine families, 24 genera and over 125 species residing in North America. Pennsylvania is home to five families, 11 genera, and 22 salamander species. On the global and continental scales, Pennsylvania contains an impressive diversity of salamanders and represents an important crossroads of habitats and species assemblages.

In the case of the newt, the real story is perhaps more interesting than the fairy tales. Even though they don't possess mystical powers, their way of life is indeed mysterious and worthy of our attention. In a way, it is paradoxical that a species so common can be so complex. Many Pennsylvania amphibians and reptiles have equally interesting stories.

For more information on the red-spotted newt and all of Pennsylvania's

amphibians and reptiles, visit the Commission's web site, www.fish.state.pa.us. On the main page's left side, hold your cursor over "Non-game Species" and navigate to "Amphibians & Reptiles." ☐



Illustration-Tom Duran Jr.