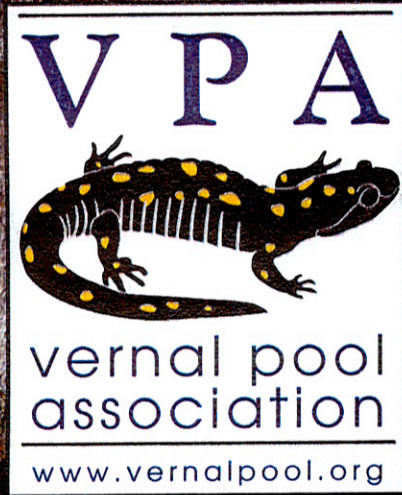


Vernal Pool Life



A poster collection
for your classroom

Spring 2007

These posters were designed and developed by Field Biology classes at Reading Memorial High School between 1998 and 2004. Many of the posters have been redesigned and rewritten several times over the years. Others have changed little from the original concept.

In all cases, the posters have been edited for correct science. The actual layout and design remain true to the final versions of 2004. These posters comprise an excellent example of students producing educational material for other students.

This set of posters is in flux. Your set will include between 42 and 48 posters as we determine the posters to be included in the final set.



Road Effects on Vernal Pools

As vast networks of roads continue to be constructed, vernal pool habitats are being adversely affected. Even though only a small amount of land is actually covered by roads, their effects can be detrimental in numerous ways. The construction of roads alters nearby physical conditions such as soil quality and tree density as well as displacing animals and killing plants. Roads can also permanently fragment habitats, isolate portions of animal populations, and disrupt animal movement.



Massive paved highways and even small dirt lanes in the vicinity of vernal pools can be barriers to successful species migration. Vernal pool amphibians migrate from uplands to pools in early spring. A major reason roads are barriers to these migrations is vehicles killing the animals. Increased road traffic is followed by increased species mortality rates. Often the entire population of a species will migrate on the same night, resulting in mortality from which the population cannot recover. Salamanders usually fare worse than frogs because they are slower-moving and “freeze” in response to vehicles. Roads with “Jersey barriers” or high curbing can be absolute barriers to migration. Curbs may trap animals in the roadway where they are more susceptible to traffic or may be flushed into drainage systems.





SNAPPING TURTLE

Common snapping turtles can be recognized by a long tail, large head, beaked jaw and deeply serrated shell. This prehistoric looking reptile is the largest fresh water turtle in New England. Being voracious eaters, they consume almost anything that they can fit in their mouths including aquatic vegetation, insects, fish and amphibians, as well as small mammals and ducklings.

Because snapping turtles require a year-round aquatic habitat, they are more commonly found in permanent bodies of water such as lakes, ponds and marshes. However, snapping turtles will travel to vernal pools for

a variety of reasons. Being the top predator within a vernal pool, the turtle finds food sources such as insects and amphibians readily available. Vernal pools serve as a safe and convenient resting stop while snappers are moving from one wetland to another. The turtles may also lay their eggs near a vernal pool in order for their offspring to have a food source close by once they hatch.

Although vernal pools provide snapping turtles with many resources, the turtles do not make them a permanent home because the pools will eventually dry up. Once the snapping turtle's stay is over, it will travel back to a permanent wetland.

Leech

A close-up photograph of a black leech resting on a person's hand. The leech is positioned diagonally across the frame, from the bottom left towards the top right. The hand is held palm up, with fingers slightly curled. The leech's body is segmented and has a dark, almost black color with some lighter, brownish spots. The background is a dark, solid color, making the hand and leech stand out.

Leeches are found in warm, still waters. They are nocturnal and prefer habitats where there is shelter under plants, stones and debris. The leeches that are found in vernal pools survive dry periods by burrowing into mud, losing considerable weight, and constructing a small mucus-lined cell. In this condition, leeches can survive for more than four weeks. Although leeches often attach themselves to skin, they rarely feed on human blood. Leeches are both scavengers and predators. They feed on dying and decaying aquatic invertebrates, as well as amphibian eggs and small vernal pool organisms.

SALAMANDER EGGS

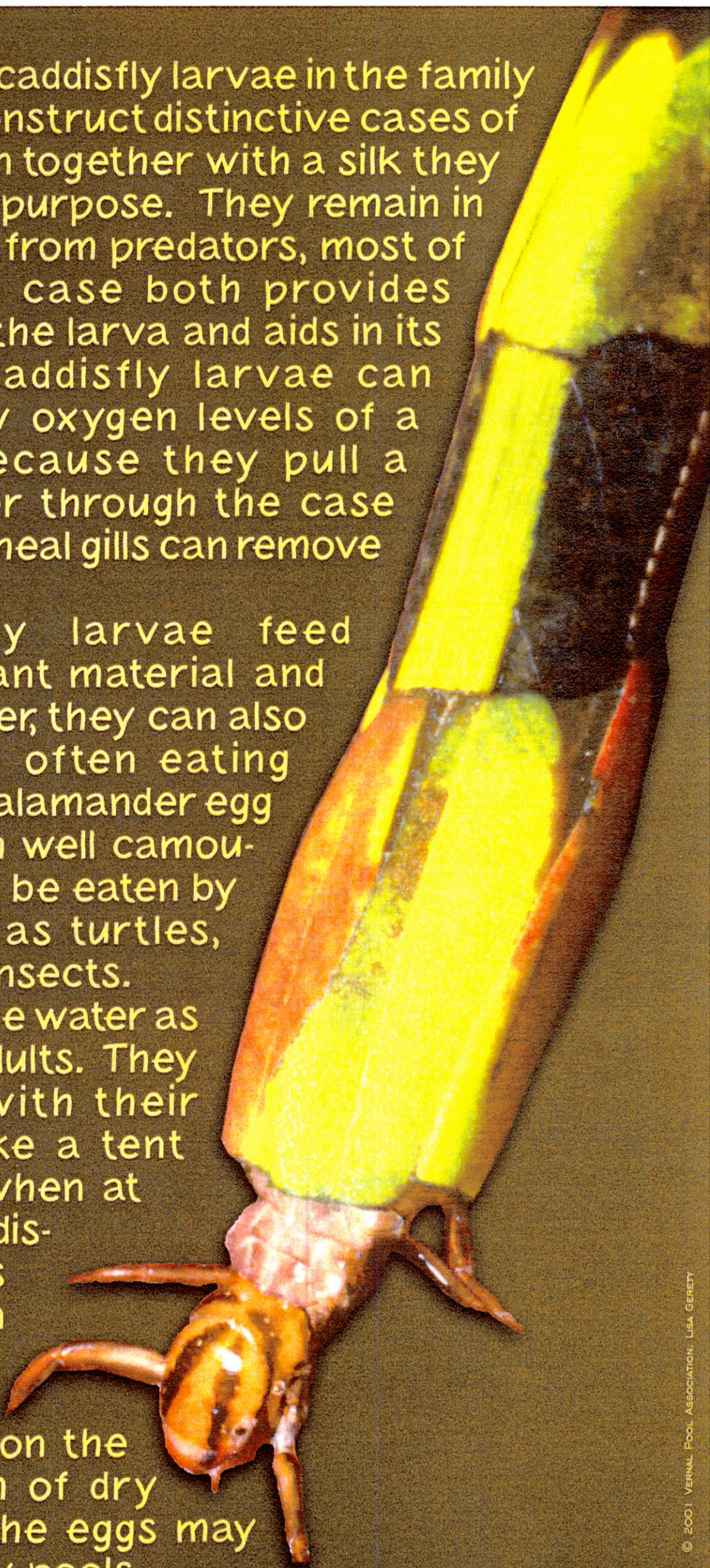
The eggs of salamanders face many difficulties during their period of development, yet their preservation is key to the continuance of salamander populations. The salamanders that utilize vernal pools depend upon several factors for the protection of their eggs. The eggs are surrounded by a vitelline membrane and one or more jelly layers. The eggs may either be grouped together collectively in an egg mass or distributed sparingly throughout the vernal pool. The jelly layers and membranes protect the eggs from drying if they are exposed by a temporary drop in water level. Also, the membranes provide a defensive barrier against predators. The chief predator of salamander eggs is the caddisfly larva, which extends its body through the defensive jelly barrier and feeds on the embryos in the center. Other predators include the spotted turtle and chironomid midge larvae. Despite these threats of predation, salamanders maintain a steady rate of survival, partially due to the vast number of eggs produced.

LEAF-ROLLING CADDISFLY

The leaf-rolling caddisfly larvae in the family *Phryganeidae* construct distinctive cases of cut leaves woven together with a silk they produce for this purpose. They remain in the case, hidden from predators, most of the time. The case both provides camouflage for the larva and aids in its respiration. Caddisfly larvae can survive the low oxygen levels of a vernal pool because they pull a current of water through the case where their tracheal gills can remove oxygen from it.

The caddisfly larvae feed primarily on plant material and detritus. However, they can also be predacious, often eating embryos out of salamander egg masses. Though well camouflaged, they may be eaten by predators such as turtles, frogs and large insects.

Larvae leave the water as flying mothlike adults. They may be seen with their wings folded like a tent over the body when at rest. Female caddisflies lay eggs once a year on the surface of the water, on vegetation, and on the exposed bottom of dry vernal pools. The eggs may overwinter in dry pools.



EASTERN GARTER SNAKE

The eastern garter snake is black, brown or greenish with a yellow stripe down each side of its body. These common snakes live in many upland habitats including the woods near vernal pools. They are semiaquatic and may hunt in the shallow waters of vernal pools where they eat primarily frogs, toads, aquatic snails, earthworms and amphibian larvae. Garter snakes are preyed upon by birds, skunks, opossums, raccoons and even domestic house cats. When handled, they release a harmless, musky secretion for defense. A mature garter snake can grow to as long as thirty inches, but their size is usually between fourteen and twenty-four inches. Garter snakes give birth to between twelve and sixty live young each spring.



Bullfrog

The bullfrog (*Rana catesbeiana*) has been introduced to many areas well beyond its original range and now is the most widespread frog species in North America. The adult measures in length from 3.5 to 6.5 inches and ranges in color from brown to light green. They can be found anywhere except extremely warm climates and high elevations. Bullfrogs live in bodies of water such as lakes, ponds, slow-moving streams and vernal pools with long water periods. Because their growth from tadpole to frog can take up to 3 years, they require a permanent or semipermanent body of water for egg laying and larval development. During winter, adults burrow into mud at the bottom of a water body. Their diet consists of any moving creature small enough to fit inside their mouth, such as insects, small snakes, turtles and birds. The bullfrog will even eat its own kind.

