



AMPHIBIANS

Status: Common Native

TIGER SALAMANDER

(*Ambystoma tigrinum*)

Description

Tiger salamanders are 4-legged, tailed *amphibians*. Adult salamanders are often mistaken for lizards. Unlike reptiles, *amphibians* have moist, scaleless skin, bulging eyes, and no claws on their feet. Adult tiger salamanders have a broad head, a long sticky tongue, and a mouth shaped almost like a smile. Their four legs extend from the sides of their bodies, giving them a peculiar gait. The adult normal body length for a tiger salamander is 6 to 8 inches (15 - 20 cm) with a record length of 13 inches (33 cm). They are easily recognized by their olive or yellow bars, blotches, or spots along their black or brownish body.

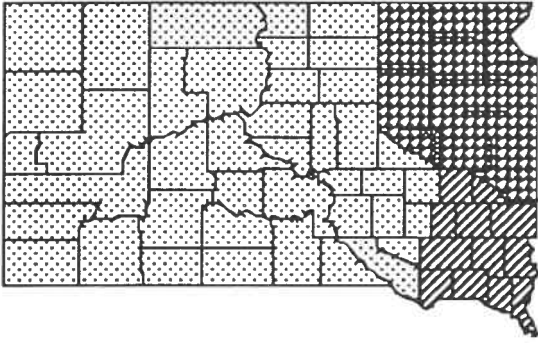
When first hatched in the water, tiger salamander *larvae* are tiny, almost transparent and without legs. They have external gills that extend in long feathery plumes to take oxygen from the water. They rapidly grow to almost adult size and develop legs. Tiger salamander *larvae* and mudpuppies (a salamander in the genus *Necturus* that lives only in *aquatic* habitats and never transforms into a *terrestrial* form) look very much alike and are often confused. To add to the confusion, tiger salamander larvae are sometimes used for fishing bait and sold by bait shops as "mudpuppies." One way to tell the two salamanders apart is



by their toes. Tiger salamanders have 5 toes on their hind feet and only 4 on their front, while mudpuppies have only 4 toes on each foot.

Distribution

The tiger salamander is the only salamander species found in South Dakota. They are found statewide, but three different *subspecies* exist in the state. The most widely distributed form



Approximate Distribution of Tiger Salamander Subspecies: Blotched subspecies (light stipples); Gray subspecies (plaid in northeast); and Eastern subspecies (diagonal lines in southeast).

in South Dakota, the blotched tiger salamander (*A.t. melanostictum*), is found west river and over a large area east of the Missouri River. The gray tiger salamander (*A.t. diaboli*) is found in the northeastern part of the state and the eastern tiger salamander (*A.t. tigrinum*) is found in the southeastern counties. However, tiger salamanders have been so widely transported as fish bait they are now established in many localities and it is difficult to define their natural *ranges*.

Natural History

In spring, tiny, almost transparent tiger salamander *larvae* hatch out of their eggs. Like all *amphibian* eggs, these are shell-less and laid in fresh water. The *aquatic larvae* are aggressive predators, eating water fleas, insect *larvae*, other *invertebrates*, and some *vertebrates*, including other salamander *larvae*. They grow rapidly through the summer in ponds, streams, roadside ditches, and other water sources. Eventually, tiger salamanders develop air-breathing lungs and leave the water. Occasionally, some individuals may retain their gills and *aquatic* form while becoming sexually mature, as does the mudpuppy. Many species of *vertebrate* animals will prey on salamander *larvae* and adults.

By fall, many tiger salamanders will have traveled considerable distances from their place of hatching. Sluggish and shy, they travel only for the mating season and during heavy rains. They spend most of their adult lives in soft soil and under logs. To avoid temperature and moisture extremes, tiger salamanders use the burrows of various rodents and crayfish. At night they hunt small insects, earthworms, and any other small creatures that they can swallow, capturing their prey with a quick sideways snap of their jaws. Salamanders do not have external ears or ear drums and probably "hear" through sensing vibrations with their feet! Winter finds them *hibernating* deep in moist mammal burrows, buried in the earth, or hiding in protected areas below the frost line.

As winter ends, tiger salamanders come out of hibernation to return to their ancestral breeding ponds. Eastern tiger salamanders are very early spring breeders. They may actually gather in deep water under ice to perform their courtship rituals. The *nocturnal* journey to the breeding pond is a dangerous time for salamanders. If the landscape has developed over the years, they may have to cross roads, backyards, and other obstacles. It is not known exactly how they find their way back to their breeding sites, but studies have concluded that it may be that some salamanders can determine the position of the sun by polarized light. The males arrive first. Once the females arrive, the tiger salamanders engage in a water-ballet of courting activities. Eventually the male deposits a package of sperm on the bottom of the pond. The female swims over this package and picks it up. Within her body the package dissolves and the eggs are fertilized by the sperm. She then deposits, in clumps of 2 to 3, the sticky fertilized eggs on various sticks or weed masses near the water's edge. There are reports of females laying up to 1000 eggs. Normal incubation takes place in 2 to 3 weeks, but the timing depends on the

water temperature. Development is accelerated in warmer temperatures.

Tiger Salamanders In The Classroom

A useful resource for maintaining animals in the classroom is the appendix of the Project WILD book: "Guidelines for Responsible Use of Animals in the Classroom," a National Science Teachers Association position statement. Especially after a rain, teachers can easily find themselves inundated with injured, improperly handled salamanders brought in by enthusiastic students. Teachers are responsible for instructing students in the proper acquisition, care, and disposition of classroom animals. It is wise to think through ahead of time how you are going to obtain, care for and dispose of animals at the conclusion of the unit of study.

Salamanders can be kept easily in a classroom in an aquarium filled with several inches of moist dirt, a source of water, and a secure, ventilated cover. Students could design controlled experiments to study salamander behavior, food and habitat preferences, and reactions to stimuli. Salamanders eat live prey which must be purchased or raised. Purchasing mealworms or crickets from a pet store for an entire school year for one salamander may be expensive, but the salamander can be fed cheaply if earthworms, grasshoppers,

and mealworms are captured and raised in the classroom. A South Dakota student who kept one of these salamanders as a pet for several years, reported that it burrowed under the mud each winter and came out of hibernation each spring within 2 weeks of Easter, even though it was housed indoors. Salamanders secrete a mucus to keep their skin surface moist and some salamander species also secrete a mild poison to deter predators. For this reason, hands should always be moistened before and washed after handling salamanders.

Management Considerations

Salamanders are important animals in the *aquatic* ecosystems of South Dakota. They are dependent on clean water and the presence of healthy wetland habitats. It is legal to collect these animals for personal use as pets or for scientific study. They make good classroom pets, but responsible, humane treatment of animals always should be emphasized with students.

South Dakota residents may catch limited numbers of salamanders for use and sale as bait. For details about the regulations pertaining to this use of salamanders, refer to the most recent South Dakota Fishing Handbook published by the S.D. Game, Fish, and Parks Department.

Glossary

Aquatic - referring to fresh water.

Amphibian - a cold-blooded, smooth-skinned vertebrate of the class Amphibia, such as a frog or salamander, that characteristically hatches as an aquatic larva with gills.

Hibernate - to be in a state of dormancy during the winter in which metabolic activity and heart rate are reduced.

Invertebrate - any animals that lacks an internal skeleton of cartilage or bone.

Larva (plural: larvae or larvas) - the newly hatched, often worm-like, immature form of various animals that differs markedly in form and appearance from the adult.

Metamorphosis - the series of distinct stages in the development from egg to adult. In amphibians the aquatic larva that have gills and live in water, transforms into an adult that lives on land and has air-breathing lungs.

Nocturnal - active at night.

Subspecies - populations of a species that are physically or behaviorally different from other populations within the species but still capable of interbreeding.

Range - the geographic region in which a plant or an animal normally lives or grows.

Terrestrial - living on land.

Vertebrate - those animals with a backbone.

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Selected Resources for Teachers

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