



www.yearofthesalamander.org



Year of the Salamander Slide Show Script

1. **Welcome to the Year of the Salamander program.** Partners in Amphibian and Reptile Conservation (PARC) is working hard this year to raise awareness about salamanders and their important role in our world. (Introduce yourself and the host organization). Today we will talk about how salamanders live and interact with their environment, as well as some challenges and successes in salamander conservation.
2. **There are over 600 species of salamanders, all of which are carnivorous.** North America is home to over 150 of these species. With long bodies, tails, and front and rear limbs, salamanders look similar to lizards but are amphibians, not reptiles with claws and scales. They can regenerate limbs and some have tails that may fall off during attack, allowing them to escape. A few species, such as the Two-toed Amphiuma, have vestigial limbs and may be mistaken for eels.

(Images from upper right-hand corner going clockwise: Red-spotted Newt [*Notophthalmus viridescens viridescens*]; Two-toed Amphiuma [*Amphiuma means*]); Blue-spotted Salamander [*Ambystoma laterale*])

3. **Salamanders require a moist environment to survive and can be found in temperate climates.** Most are semi-aquatic or aquatic in nature. Their skin is permeable to water and gas exchange. Some adult salamanders have lungs, some have gills, while others have neither and breathe directly through their skin.

(Image: Northern Two-lined Salamander [*Eurycea bislineata*])

4. **The skin of a salamander is kept moist by a layer of mucus.** This important discharge aids in protecting them against infection while also reducing friction when in water. It also makes them difficult to grab. Special glands produce toxins of varying levels of toxicity in the skin. These are usually harmless to humans that pick them up but may cause skin irritation and can be lethal if ingested.

(Image: Top: Black-bellied Salamander [*Desmognathus quadramaculatus*]; Bottom: Alpine Newt [*Ichthyosaura alpestris*])

5. **How well a salamander sees varies among species.** Most salamanders have eyes adapted for night vision. Terrestrial salamanders may have flatter lens that allow for better peripheral vision while semi-aquatic species often have shorter ranges on land and

longer in water. Cave dwelling species may have no eyes or eyes that are underdeveloped and covered with a layer of skin. Salamander sight is trichromatic color vision, like humans, but extending into the ultraviolet range.

(Image: Eastern Tiger Salamander [*Ambystoma tigrinum*])

6. **Salamanders do not have external ear openings**, although they do have an opercularis system in the middle ear similar to that of frogs. This system is used to detect low frequency vibrations to warn the animal of an approaching predator.

(Images: Left: Mole Salamander [*Ambystoma talpoideum*]; Right: Fire Salamander [*Salamandra salamandra*])

7. **Salamanders lay shell-less eggs, lacking the hard shells of birds and reptiles that retain moisture.** To compensate, some species attach their eggs to plants under water while others lay their eggs in moist locations nearby, guarded by the mother. Like other amphibians, many salamander species, such as the southern two-lined salamander, hatch from eggs into larvae, with gills and initially no limbs. The limbs develop as the larvae grow. Several species, like the Green Salamander, do not have a larval stage and develop fully formed.

(Images from top left, clock-wise: Green Salamander [*Aneides aeneus*]; Jefferson Salamander Eggs [*Ambystoma jeffersonianum*]; Green Salamander [*Aneides aeneus*]; Southern Two-lined Salamander larvae [*Eurycea cirrigera*])

8. **What good are salamanders? Salamanders, like all other species, are an important part of their native ecosystems.** Salamanders are both predator and prey - thus an important part of food webs. They feed on insects, spiders, worms, snails, and in turn are prey for fish, reptiles, larger amphibians, birds, and some larger invertebrates like crayfish or giant water bugs. Removing salamanders from the food-web can lead to the changes in other animal populations which can often result in degraded or altered environments.

(Image: Eastern Long-tailed Salamander [*Eurycea longicauda longicauda*])

9. **The ability of salamanders to regenerate limbs has sparked the interest of scientists.** Scientists are trying to identify the conditions required for this ability. The goal is to develop a way to aid humans that have lost limbs or suffered spinal cord damage, or to speed the healing process.

(Image: Blue Ridge Two-lined Salamander [*Eurycea wilderae*])

10. **Salamanders are a great tool for teaching people the value of conservation.** Children are often curious about salamanders and can have great fun exploring their environment in search of them. Salamanders used in educational displays can give people an

opportunity to observe, touch, and interact with an animal they don't get to see every day. This creates a fantastic environment for people to learn more about and appreciate the value of these species.

(Images top left clock-wise: Hellbender [*Cryptobranchus alleganiensis*]; Spotted Salamander [*Ambystoma maculatum*]; Spotted Salamander [*Ambystoma maculatum*])

- 11. Salamanders are very aesthetically appealing, with a variety of patterns and colors.** Some display their toxicity with bright spots or stripes while others blend in perfectly with their environments, a beautiful display of camouflage.

(Images from top clock-wise: Alpine Newt [*Ichthyosaura alpestris*]; Four-toed Salamander [*Hemidactylium scutatum*]; Red-spotted Newt [*Notophthalmus viridescens viridescens*]; Jemez Mountains Salamander [*Plethodon neomexicanus*])

- 12. Salamanders have intrinsic value, meaning they are important just because they are,** because they belong here like all other species on our planet, and we, as fellow animals, do not have the right to be a part of their decline. Salamander species deserve to flourish just as all other species do, as part of their natural habitat.

(Image: Fire Salamander [*Salamandra salamandra*])

- 13. Salamanders make great indicators of the health of their environments.** Since their skin and eggs are so permeable, they are highly susceptible to pollution and often one of the first species to suffer from degrading habitat. If water quality is poor, you will not find salamanders there.

(Images: Top: Eastern Red-backed Salamander [*Plethodon cinereus*]; Bottom: Hellbender [*Cryptobranchus alleganiensis*])

- 14. Salamanders can also be indicators of global climate change.** A study in Yellowstone National Park has shown a drastic decline in salamanders. The culprit? Wetlands that are shrinking, some drying up completely due to changing precipitation patterns and temperatures. In 1992, 46 ponds were studied and 43 were found to have salamander populations. By 2006, only 38 of those same ponds even contained any water during the summer and only 21 were found to have salamanders. During the study, scientists witnessed firsthand four wetland communities dry up within days, too quickly for larvae to complete metamorphosis.

(Images from top left clock-wise: Southern Two-lined Salamander [*Eurycea cirrigera*]; Red-spotted Newt [*Notophthalmus viridescens viridescens*]; Eastern Long-tailed Salamander [*Eurycea longicauda longicauda*]; Sierra Newt [*Taricha torosa sierrae*])

- 15. What threatens salamanders?** Like most species, salamanders suffer from loss and fragmentation of habitat. Salamanders need wetlands to live and breed, but these areas are often filled in to build homes or businesses. Many salamanders also rely on upland forest habitats. Certain forest harvest practices use heavy equipment that can damage the

delicate forest floor ecosystems necessary to salamanders. Construction of roads, parking lots, and developments can result in a loss of cover and create physical barriers, making these animals susceptible to being stepped on or run over by vehicles. Road runoff such as road salts and oils pollute nearby wetland breeding sites.

(Both images: Spotted Salamander [*Ambystoma maculatum*])

- 16. There is a lack of public awareness.** In certain parts of the globe it is common for salamanders to be used for fishing bait for species such as bass, while other people intentionally hurt salamanders without regard for their intrinsic value as living beings. And in some cases, some people may not realize the harm they can cause. Picking up a salamander with chemicals on your skin, such as sun screen or bug spray, can cause great damage to these sensitive animals, while the movement of people from one wetland to another without taking strict precautions can transmit disease or deadly fungus from one area to another.

(Image: Spring Salamander [*Gyrinophilus porphyriticus*])

- 17. An example of a salamander conservation success story can be found at the Saint Louis Zoo in Missouri.** Only two months after the U.S. Fish and Wildlife Service granted the Ozark Hellbender salamander species protection under the Endangered Species Act, 185 juveniles were hatched in a first-ever successful attempt to breed the species in captivity. With less than 600 in the wild, an additional 185 individuals greatly increases their population while also giving hope to future accomplishment.

(Image: Top: Eastern Hellbender [*Cryptobranchus alleganiensis alleganiensis*]; Bottom: Hellbender [*Cryptobranchus alleganiensis*])

- 18. What can you do?** Join a salamander conservation group, don't collect salamanders from the wild, report your salamander sightings, create habitat, volunteer for amphibian "Big nights" when they migrate across roads to their breeding ponds, and most importantly, educate yourself and spread the word to friends, co-workers, and family.

(Image: Three-lined Salamander [*Eurycea guttolineata*])

- 19. Thank you for your interest in Year of the Salamander.** To learn more, follow YOS on Facebook, or log onto the website to get updates and download YOS monthly newsletter and calendar.

(Image: Marbled Salamander [*Ambystoma opacum*])