

Lesson 3. Coastal Reptiles - Mangrove Snake

Lesson Objectives:

- This section focuses on the Mangrove Water Snake.
- The student will become familiar with its physiology, habitat, and its role in the Mangrove Swamp.

There's no doubt about it: Snakes are fascinating! They may not inspire much affection, but they certainly generate interest. The crowds that visit reptile houses at zoos throughout the world testify to the extraordinary appeal of these remarkable reptiles. It's difficult to put your finger exactly on what makes snakes so interesting. Undoubtedly it differs for different people. Some are excited by the fact that some species of snakes are deadly. But for most people, it's probably just that snakes are so incredibly different from the more familiar vertebrates like cows and chickens. How can an animal be so ridiculously long and thin? How can it move without legs? How can it swallow a prey item larger than its head? Why does it have lidless eyes and a forked tongue?



The secretive nature of snakes in the wild makes them seem rare. Of the relatively few snake encounters most people have throughout a lifetime, many (if not all) sightings will be of nonpoisonous snakes. Still, the best advice upon encountering any snake in the wild is to keep a respectful distance and do not attempt to handle or molest the snake. When compared with some of the snake species found in other countries, none of Florida's snakes are considered aggressive.

Several can be quite dangerous however. Of the six poisonous snakes found in Florida, only the cottonmouth (*Agkistrodon*

piscivorous) is known to inhabit

These very dangerous snakes closely resemble several of the nonpoisonous water snakes (genus *Nerodia*) and are difficult to differentiate in the field. Behavior offers some of the best clues. Cottonmouths often stand their ground or crawl away slowly. Water snakes usually flee quickly or drop with a splash in the water. Cottonmouths vibrate their tails when excited; water snakes do not. A thoroughly aroused cottonmouth throws its head upward and backward and holds its mouth wide open, revealing a whitish interior - origin of the name cottonmouth. A dead specimen can easily be distinguished from a nonpoisonous water snake by the cottonmouth's facial pits, single anal plate, and single row of scales under the tail. Be extremely cautious when approaching or handling recently killed poisonous snakes, however, since they retain the ability to strike and inject venom for some time (even long deceased individuals contain their deadly venom and injection system).

Water snakes inhabit nearly all aquatic habitats in Florida and can usually be seen basking on

brackish water environments. overhanging branches or on the bank. These snakes typically drop into the water to escape at the slightest provocation but will often bite savagely if cornered or caught. Most will leave a series of puncture wounds, typically in a horseshoe shape. Snakes have four rows of posteriorly recurved teeth in the upper jaw and two rows in the lower jaw which are responsible for this distinctive horseshoe shaped wound. Some of the large water snakes may produce a series of lacerations as well.

The mangrove water snake (*Nerodia clarkii compressicauda*) is found along the southern coasts of Florida as well as Cuba. Although it is not a rare snake, it is rarely seen because its habits and the habitat in which it lives - dense mangrove swamps.

This medium-sized snake is extremely variable in color and reaches a maximum length of about 90-cm (approximately 3 feet). The mangrove water snake is the only nonpoisonous water snake that occurs in the brackish mangrove swamps. Cottonmouths have been observed in **brackish water** environments but it is thought

to be only a temporary habitat for them. The mangrove water snake spends most of its time in or near mangrove estuaries. The mangrove **intertidal zone**, with its nearby shallow estuary, is a primary nursery and feeding ground for many marine species, including blue crab, mullet, snapper, shrimp and red drum. Subject to daily tidal flooding, this habitat is rich in nutrients and provides abundant food items for all its inhabitants. In addition to the mangrove water snake and occasional cottonmouth, other reptiles found in the mangrove estuaries of the southeast U.S. include the American crocodile, diamondback terrapin, and occasionally the yellow rat snake and alligator.

The mangrove water snake gives birth to live young during the summer months but does not take care of the young after birth. Typical broods for this snake number from 1-25 depending upon the size of the mother. The young are fully developed and leave their mother immediately, feeding on small fishes within days. The primary food items for water

snakes are fishes and amphibians, however, the mangrove water snake is limited to fishes since amphibians cannot survive in the salt water of the estuaries. Although the mangrove water snake lives in this brackish water, it requires fresh water to survive. In fact, it will die if it drinks the saline water in which it lives. They obtain most of the fresh water they need from the water found in fishes they eat, but individuals have been observed drinking rain water as a source of fresh water. These unique snakes survive in a saline environment without the benefit of a gland to excrete excess salts from its body.

Instead, they have evolved behavioral adaptations for living in a saline environment. First, they do not ingest the fishes they catch while still in the water but bring the fish onto the bank or up into a nearby tree to swallow. This limits the amount of salt water secondarily ingested during the swallowing of the prey. Second, its skin is impermeable to the surrounding salt water.

Conservation of the Mangrove Snake Habitat

Fragile coastal habitats, plants and animals are rapidly disappearing because human population continues to rise and develop those areas. People who live on the shoreline dislike having their view blocked by grown mangroves, so they cut the trees back or remove them. This disrupts the mangrove snake's habitat. Local laws have been enacted that prohibit the removal of cutting back of mangroves without government approval.

The protection of mangrove forests should be an essential part of the environmental program. As in the case of the interior wetlands, the protection of the functional integrity of mangrove wetlands precludes virtually any alteration. The same protection is therefore needed against excavation, filling, grading, draining, vegetation clearing, release of pollutants, solid roadways, and other blockages. It is particularly important that mangrove areas not be drained, by canals or otherwise.

Activity 3-1. Classroom Discussion

<http://pelotes.jea.com/nvsnake.htm>

1. What is a snake? A snake is a reptile without legs. A reptile usually has scales, lays eggs, breathes air, and doesn't spend much time taking care of its babies. It is also cold-blooded, which means that its body doesn't stay the same temperature all the time. (Our bodies stay at 98.6 F all day.) Snakes get very cold on winter days and very hot in the summer. Because of this, snakes usually stay in burrows during very hot and cold weather. A burrow is a hole in the ground where they can live.
2. What do snakes eat? All snakes are carnivores (car-ni-vor-z) or meat-eaters. There are no snakes that can eat people in Florida.

Small snakes eat bugs and frogs. Larger ones eat fish, birds, mice, and rabbits. They use sharp teeth and strong muscles to catch the prey. If the prey animal is bigger than the snake's mouth, the snake can dislocate (unhinge) its bottom jaw to fit the big animal in.

3. What about venom? Venom is a poison the snake puts into its prey through its fangs (teeth). This kills the prey so the snake can eat it. The snakes on this page do NOT have venom. They must kill their prey by biting it, squeezing it, or just by swallowing it alive. Since they have no venom, they have other ways to protect themselves. Some look like other venomous snakes. Some rattle their tail like a rattlesnake to fool you. Others swim, climb, and slither fast to help them get away. Some even play dead or squeeze out a nasty smelling goo to make the predator go away.

4. How has Florida's growth and population increases affected the mangrove snake and its habitat?

Student Information Sheet 3. Coastal Reptiles III: Mangrove Snake



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