REPTILES AND AMPHIBIANS
THIRD - FIFTH

Life Science TEKS	
Third Grade:	3.9A, 3.10A, 3.10B, 3.10C
Fourth Grade:	4.9A, 4.10A, 4.10B, 4.10C
Fifth Grade:	5.9A, 5.10A, 5.10B, 5.10C

Vocabulary

adaptation, amphibian, behavior, climate, cold blooded, endothermic, exothermic, gastrolith, metamorphosis, predator, reptile, spinal column, vertebrae, vertebrate, warm blooded

Pre-Show Activity

Pre-Show Lesson: Adaptations

Post this question on the board: What adaptations do reptiles and amphibians have?

Materials:

Per class: picture of a frog and a lizard (Appendix A-1), picture of snake vertebrae (Appendix A-3), thermometer

Per group: container with rough piece of material (imitation snake skin), container with Jell-O, container with tapioca pudding in water, container with a couple grapes on sand, copy of various reptile and amphibian pictures (Appendix A-4)

Per student: copy of the Reptile and Amphibian booklet (Appendix A-2)

Procedure:

1. Hold up a picture of a frog and a lizard. The frog picture should be labeled “Amphibian” and the lizard should be labeled “Reptile” (see Appendix A-1). Ask students what they know about these animals.

2. Give each group two containers: one with a rough piece of material, maybe a piece of imitation snake skin, and a container with some prepared Jell-O. Students will describe how

the content of each container feels. Ask students which one they think feels more like reptile skin and which one represents amphibian skin. Students will draw a picture or explain each skin type on the skin page in their reptile and amphibian booklet. Lead them to understand the importance of amphibian's skin to their survival. Students will complete the skin page of the booklet by explaining how each type of skin helps the organism to survive.

Teacher Information:

Thin-skinned Amphibians
Most amphibians have thin skin that is very permeable (allowing liquids and gases to pass through it easily). This is important for two reasons. First, it means that their skin helps them breathe, since oxygen passes easily through it. Second, it means that amphibians lose a lot of water through their skin. This is why most amphibians are found in moist or humid environments, where they can re-load their water reserves.

Scaly Skin Is In! (Reptiles)
Reptiles have dry, scaly skin. But they don't need moisturizer! Their special covering actually helps them hold in moisture and lets them live in dry places.
Reptile scales are not separate, detachable structures -- like fish scales. Instead, they are connected in a "sheet," which is the outermost layer of skin. Every so often, this layer of skin is shed and replaced. In some reptiles the skin flakes off in chunks. In snakes, the skin is usually shed in one piece.
What about turtles and tortoises? You may not think of their shells as being scaly, but they are! They are complex structures made up of bones and scales that develop from the outer layer of skin. It's natural body armor!
Source: St. Louis Zoo: http://www.stlzoo.org/animals/abouttheanimals/amphibians/

3. Give each group two containers: one with tapioca pudding in a container of water and one with a few grapes laid on land. Students will describe how the content of each container feels. Ask students, which one do you think feels more like a reptile's eggs and which one represents amphibian eggs? Lead students to understand that all animals need to reproduce or their species will die out. Reptiles and amphibians lay eggs. Amphibians lay their eggs in water because their young start out living in water. They will go through metamorphosis and eventually develop lungs and move to land. Reptiles lay their eggs on land because their young already have lungs, so they build their homes on land. Students will complete the egg page in the Reptile and Amphibian booklet.

4. Show students a picture of a snake skeleton and have them guess what it is (Appendix A-3). Have students feel their own backbone and discuss the fact that all vertebrates, including reptiles and amphibians, have backbones and internal skeletons. Another word

for backbone is vertebrae. Lead students to understand that the purpose of the backbone is to help give structure to the body. It also protects the spinal cord, which has all the nerves that are the main pathway between your brain and your nervous system. Students will complete the backbone page in the Reptile and Amphibian book.

5. Have students look at a thermometer in the room and read it. Discuss what the room temperature is. Tell students to feel their forehead. How does it feel compared to the room temperature: warmer, colder or the same? Ask students what their temperature is right now. Take your temperature and show students what the thermometer says. Ask students what the temperature in the room is. Show them a thermostat or thermometer set to room temperature. Ask students: "How is it possible that my body and your bodies are a different temperature than this room?" Explain to students that mammals, like us, are warm-blooded. We have a special adaptation which allows us to keep our body at a constant temperature, 98.6 degrees Fahrenheit. Reptiles and amphibians do not have this adaptation. They are called cold blooded. This means that if they were in this room right now, their temperature would be the same as the room (repeat the temperature of the room). Ask: "If they were in a place where the temperature was 105 degrees Fahrenheit, what would their temperature be? What would your temperature be?" Explain to students that many people prefer to use the words *endothermic* (warm-blooded) and *exothermic* (cold-blooded). The blood of reptiles and amphibians is not actually cold. Being exothermic means they depend on external sources to keep their body warm. This has some advantages. Since their bodies do not have to work as hard to keep their body temperature warm, they do not require as much food or energy. They can go without food for long periods of time. This allows them to live in places that do not have enough food sources to support warm blooded animals like birds and mammals. Animals that are endothermic have to eat a lot more because they need fuel for their bodies in order to produce the heat to stay warm. The advantage of being endothermic is that organisms can live in colder climates because their body will keep itself warm. Students will complete the body temperature page in the Reptile and Amphibian book.

6. Give students various pictures of reptiles and amphibians. Have students classify the pictures as reptile or amphibian (see Appendix A-4). Go over the results with the class. Have students make a list of examples of reptiles and amphibians on the cover of their booklet and/or draw a picture of the animal examples.

7. Students can make a Venn diagram comparing the characteristics of Reptiles and Amphibians.

Post-Show Enrichment Activities

Activity One: Show Review

Procedure:

1. The teacher will review facts/non-facts from the show. Students will give a thumbs up if they agree or a thumbs down if they disagree.

   Possible facts: (Change a word to make it incorrect.)

   - A snake is a reptile.
   - Scientists believe that amphibians have been around longer than dinosaurs.
   - A female crocodile protects the nest.
   - A male crocodile will eat his baby crocodile.
   - Some alligators swallow rocks, or gastroliths, to help them smash up the food in their stomach.
   - Blue is a warning color.
   - Alligators are only found in the United States and China.
   - Lizards blink and snakes do not.
   - Lizards can hear and snakes cannot.
   - Turtles can live in land or water.
   - The shell of the turtle is the backbone and ribs.
   - Sea turtles cannot pull any part of their body into their shell.
   - A snake smells with its tongue.

Activity Two: Reptile and Amphibian Adaptations

Materials: resource books or internet access, characteristic/behavior form (Appendix A-5)

Procedure:

1. Assign each student a reptile or amphibian to research. Students will need resource books or the Internet to complete their research.

2. Students will fill out the form in Appendix A-5 explaining the characteristics and behaviors that their organism has in order to meet its needs.

3. You may also want to have students put an “I” next to each behavior if it is inherited (a behavior that the organism is born knowing how to do), or an “L” if it is a learned behavior (a behavior that the organism must be taught).

Activity Three: Amphibian Life Cycle Ideas

Materials: tadpoles, *Animal Life Cycles: Growing and Changing (Nature's Changes)* by Bobbie Kalman, frog life cycle flip book (Appendix A-6)

Procedure:

1. Find some tadpoles to bring into your classroom. You can often find these in a long standing puddle or a pond. If you cannot find any naturally, there are several educational suppliers online.
2. Students will observe and draw the life cycle changes in their science notebooks.
3. Read a book about the life cycle of a frog and one about the life cycle of a lizard. One suggestion is *Animal Life Cycles: Growing and Changing (Nature's Changes)* by Bobbie Kalman**.** This book explains both life cycles.
4. Students will make a frog life cycle flip book (see Appendix A-6).

   Procedure:

   1. Pass out one frog life cycle sheet per student.
   2. Have students number their life cycle, so that they really study each stage and know the frog life cycle well.
   3. Have students color their life cycle, and then cut them out neatly, each about the same size.
   4. Have students put their life cycles in order (they can do this ahead of time by placing numbers in the circles provided, but once they cut them out they will end up reordering them anyway).
   5. Give each student three sheets of construction paper. They should fold them in half twice and then cut along the fold lines to make four equal squares. They should do this for each sheet, ending up with 12 squares.
   6. Have the students arrange their life cycle tiles in the correct order on their desks. Then they will glue each picture on the right side of each square of construction paper. Remind them that if they glue the tiles in the same spot on each page, the effect will be better.
   7. An extra half sheet of construction paper can be used to make a cover for their book. They should draw a picture of the animal or plant they have chosen on the cover.
   8. Once the glue is dry, make sure the stages are in order one more time and staple the books together.
   9. Have the students pass their books around so that they can all try the flipbooks.

5. Compare the life cycle of a frog to the life cycle of a lizard. Older students may want to create a Venn diagram.

Activity Four: Toad Overload

Materials: Toad Overload by Patricia Seibert
Procedure:

1. Read a book like *Toad Overload* by Patricia Seibert. This book is about the cane toad being introduced in Florida to solve an insect problem that did more harm than good.
2. Students can make a cause and effect chart in their notebooks as you read.
3. For younger students, the teacher may need to make the chart in front of the class.
4. Discuss the problems introducing a non-native organism can have on an ecosystem. You may want to watch the cane toad video: **http://www.invasivespeciesinfo.gov/animals/canetoad.shtml**

If you do not have a copy of *Toad Overload*, you can use the article about pythons in Florida (Appendix A-7). You will need to read this with younger students and explain what is happening.

Appendix

A-1

Graphic Source: How Stuff Works

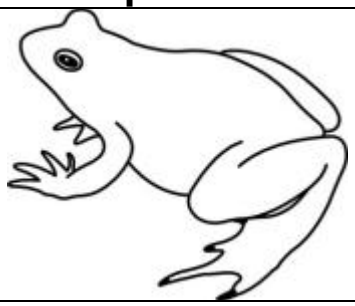
Amphibian

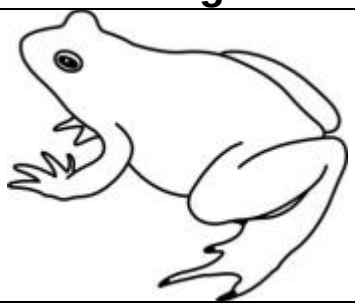
Graphic Source: Wikipedia

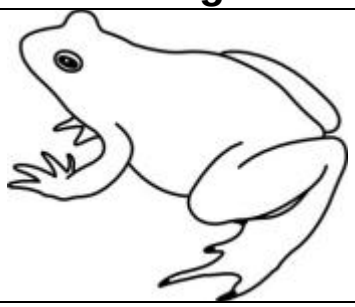
Reptile

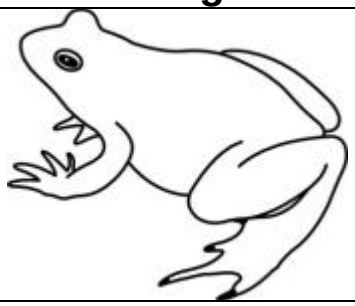
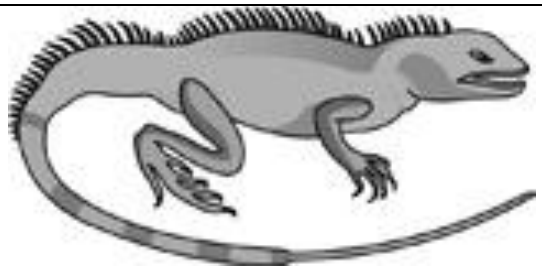
A-2

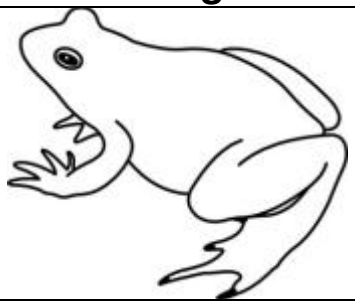
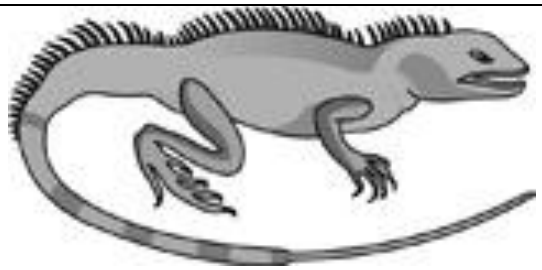
Graphic Source for frog and lizard: classroomclipart.com

Amphibians	Reptiles
	
Examples:	**Examples:**

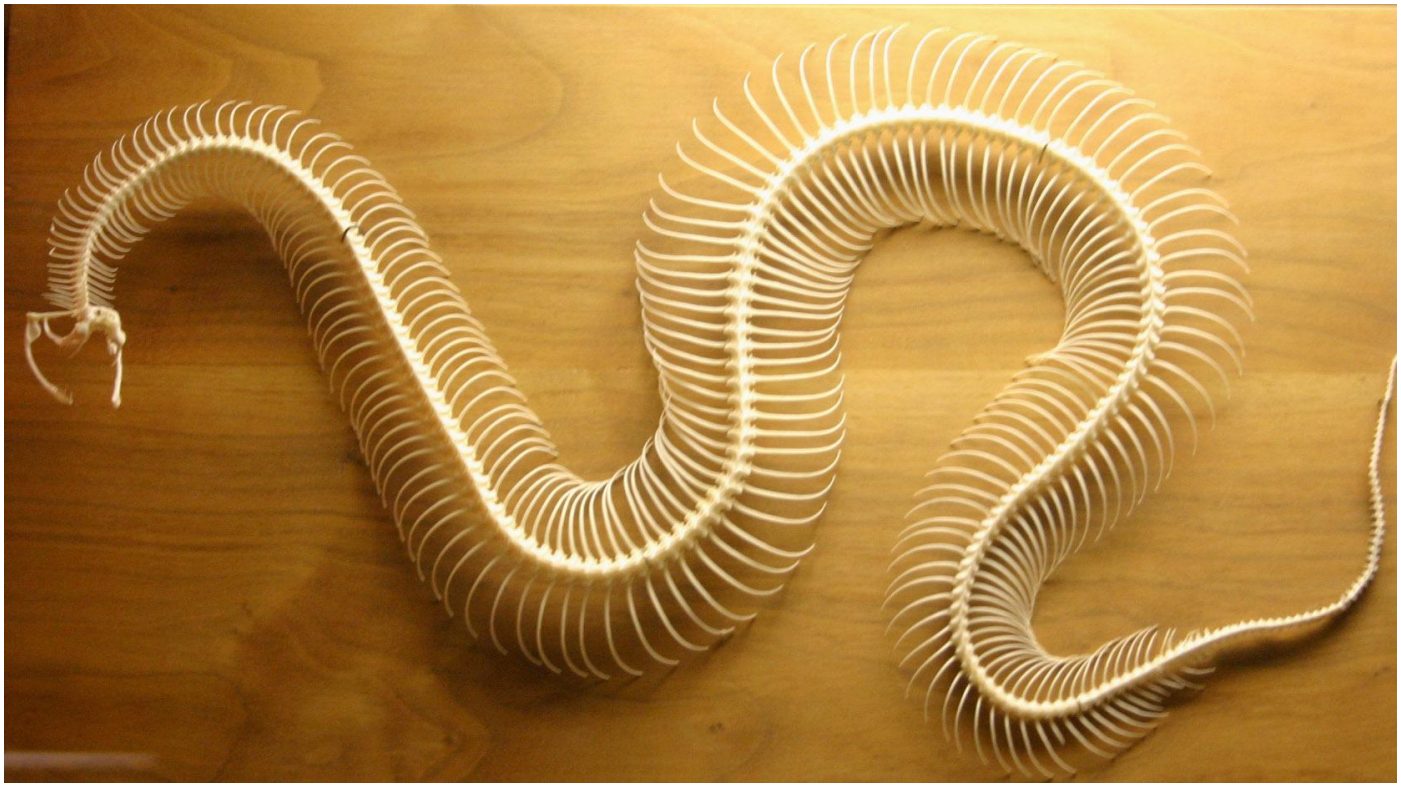
Frog	Lizard
	
Description of skin: **How does it help the frog survive?**	**Description of skin:** **How does it help the lizard survive?**

Frog	Lizard
	
Description of eggs: **How does it help the frog survive?**	**Description of eggs:** **How does it help the lizard survive?**

Frog	Lizard
	
Description of body temperature: **How does it help the frog survive?**	**Description of body temperature:** **How does it help the lizard survive?**

Frog	Lizard
	
Description of backbone: **How does it help the frog survive?**	**Description of backbone:** **How does it help the lizard survive?**

A-3



Graphic Source: Wikipedia

A-4

Reptile and Amphibian Pictures

The following pictures are all from Wikipedia

Snake

Turtle

Lizard

Crocodile

Salamander

Frog

Caecilian

A-5

Name: _____ Date: _____

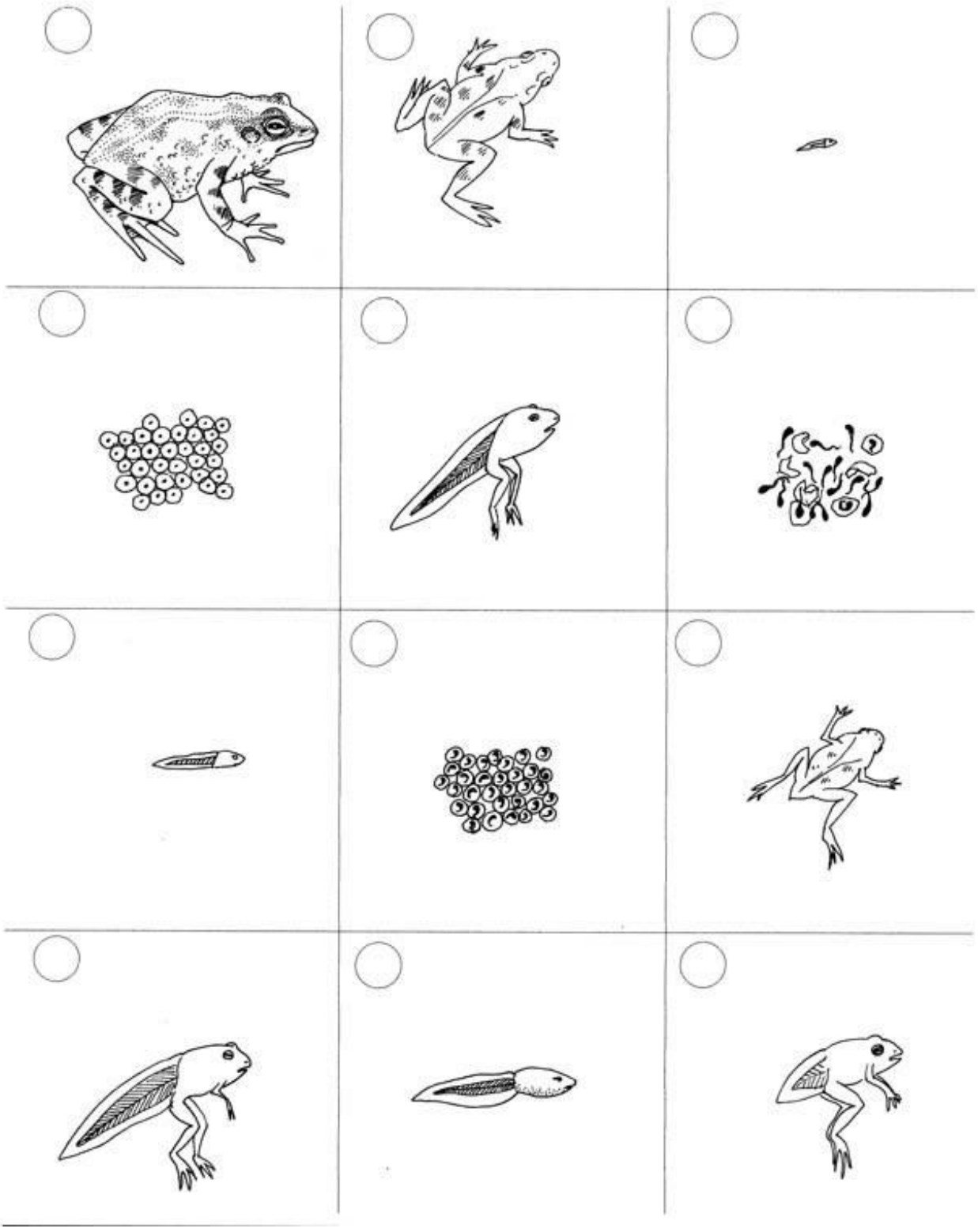
Adaptations to Help Animals Compete for Needs

Directions: List a characteristic and behavior for each of the needs below and explain how it helps your organism survive.

Name of Organism:

	Characteristic	**Behavior**
Environment (shelter, climate, predators)		
Water		
Food		
Oxygen		
Reproduce		

A-6



Source for flip book:

Amsel, Sheri. “Life Cycle Activities.” Life Cycle Flip Books. Exploring Nature Educational Resource. © 2005 - 2012. July 23, 2012. http://exploringnature.org/db/detail.php?dbID=32&detID=2301

A-7

Science News for Kids

By Stephen Ornes / February 14, 2012

This was one of the many pythons discovered during the Everglades CISMA African Python Survey in 2010. Credit: Melissa Miller/USGS Volunteer

You've probably been "as hungry as a bear." But in the Everglades in southern Florida, you'll sound more local by comparing your hunger to a python. That's because in this region's swamplands, giant snakes called Burmese pythons gobble alligators, birds, raccoons, opossums — even 80-pound deer.

With their ferocious appetites, the snakes have made their presence known to residents and scientists alike. In two new studies, researchers report that in areas where the pythons roam, the mammal population has dropped dramatically. Numbers of deer, bobcats, fox and rabbits are far below what they were 20 years ago, before the pythons arrived.

Federal officials think Burmese pythons were first released into the rugged wilds of the Everglades between 15 and 30 years ago. Since then, the snakes — native to Asia — have gotten comfortable in their new home. Most of the 30,000 or so that now slither through the swamps were probably born there. Others come from pet owners who release the pythons when they get too big.

Scientists know about the pythons' eating habits because of the wide variety of animals, including alligators and large mammals, that have been found in the snakes' stomachs, says Michael Dorcas, who led one of the new studies. "But until now, there hadn't been any indication that the snakes were altering the ecosystem," he told *Science News*.

An ecosystem includes all the living things, like animals and plants and other organisms, in a particular region. Dorcas, an ecologist at Davidson College in North Carolina, studies how organisms interact with each other and the environment they share.

The Everglades' wet fields, mangrove forests and cypress groves are hard for humans to explore. To count animals, Dorcas and his colleagues had to get creative. They took to the roads, driving 313 nights between 2003 and 2011, to count all of the mammals — dead or alive — they saw.

Then, they compared their observations to animal counts made from the road during 51 nights in the 1990s.

Burmese pythons let loose in the Florida Everglades are a problem for the swamplands' alligators and mammals. Credit: Bob DeGross/NPS

Rabbits, among the region's most common animals in the 1990s, had vanished from the more recent count. The numbers of opossums and raccoons had dropped by 98 percent between the two counts, which means that if the scientists counted 100 of the animals in the 1990s, they counted only two in the 2000s. Across the board, the numbers of small and medium-sized mammals had dropped.

Biologist Joshua Holbrook of Florida Atlantic University in Davie, who worked on another recent study of the region, said he and his collaborator Thomas Chesnes, of Florida's Palm Beach Atlantic University, turned up similar results. They also drove around southern Florida to estimate how the ecosystem has changed. Over four nights of driving on Everglades roads, the scientists counted only nine mammals. On another stretch of driving, over five nights, they didn't count any.

"Within the Burmese python's Florida range … it seems that the sighting of any mammal (especially small mammals) is a rare occurrence," Holbrook and Chesnes reported in their study.

Efforts are underway to rescue the Everglades from the pythons. Government officials have already removed more than 1,000 Burmese pythons from the area, but that has barely made a difference. In January 2012, the U.S. Department of the Interior officially made it illegal for people to bring Burmese pythons — or other giant snakes like anacondas and some constrictors — into the country.

And the Florida Fish and Wildlife Conservation Commission has just started holding what they call "amnesty" days for pet owners who want to give up pythons and other pets that are not native to Florida. The agency has begun organizing occasional, one-day events around the state so that people can surrender their exotic pets free of charge with no questions asked. "Every attempt will be made to place all healthy animals with qualified adopters," this Florida commission says. Its programs will accept nonnative reptiles, amphibians, birds, fish, mammals and invertebrates. But forget Fido and Puss. The program will not find new homes for conventional pets like dogs, cats and ferrets.

http://www.sciencenewsforkids.org/2012/02/pythons-overtake-everglades/