



the
GOPHER TORTOISE

by Zander Srodes

Linda Soderquist
FSWS

TORTOISE HISTORY

The gopher tortoise has been living on the earth for 500,000 to 2 million years. The Pleistocene Epoch, which is part of the Quaternary Period, is when history first documents the gopher tortoise. Tortoises are one of the oldest species still living on earth.

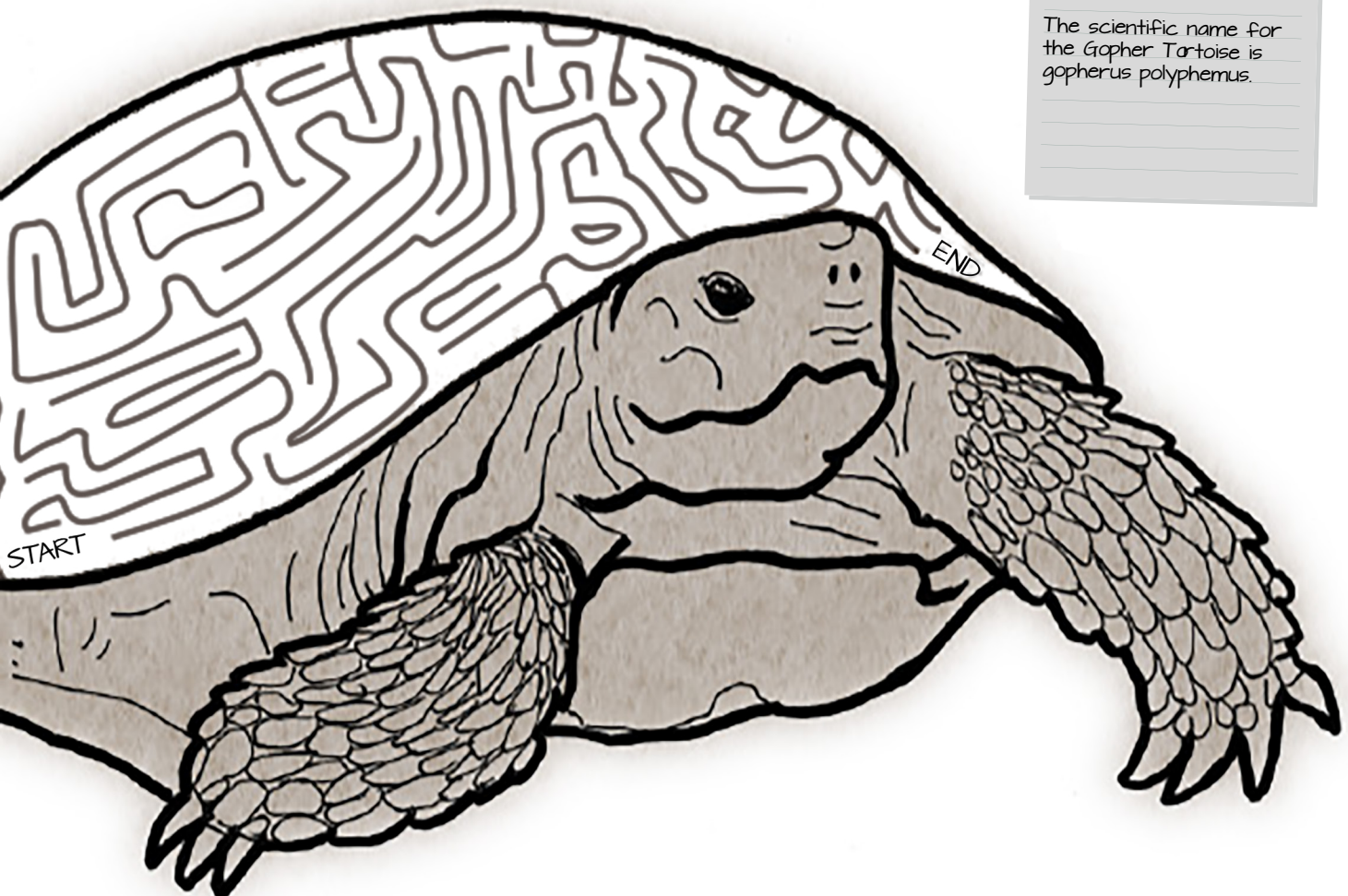
Turtle like creatures first appeared in the Jurassic period. Fossils of modern sea turtles date back to the Cretaceous Period, 66 to 144 million years ago. These turtles were swimming the oceans when dinosaurs roamed the planet. Many species of turtles and tortoises evolved in the Tertiary Period, as there were giant and small species.

Paleontologists have unearthed the fossils of giant tortoises that probably didn't dig burrows. They would be similar to the Galapagos and Aldabra tortoises that still live today. These giant tortoises depended on their large size for survival.

The desert tortoise in the southwest and the Texas tortoise are other tortoise species living in the United States. Over time, factors that have led to the elimination of tortoises are climate change, loss of vegetation as a food source, and being hunted. The gopher may still be walking the earth as a result of its ability to dig a burrow.

TORTOISE TRUTH

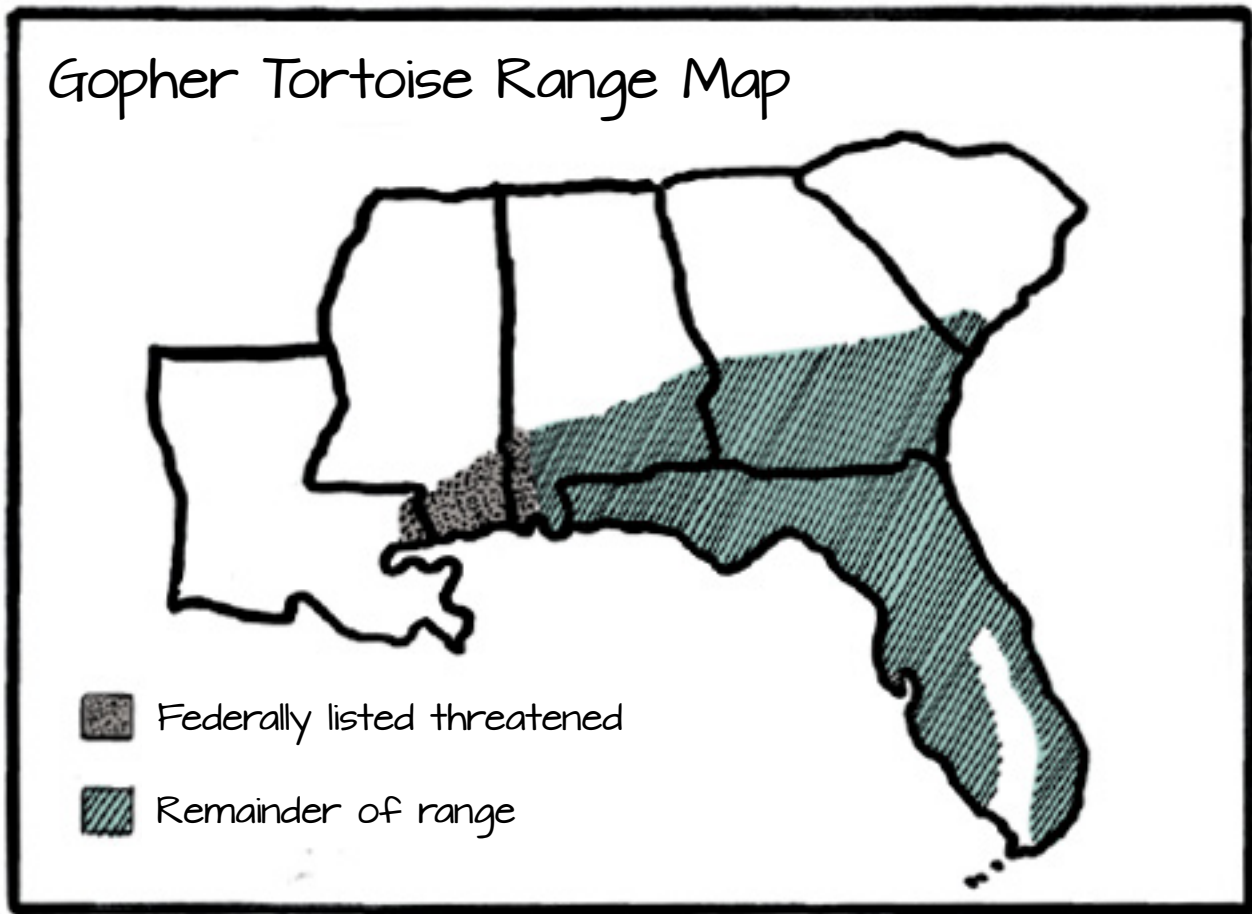
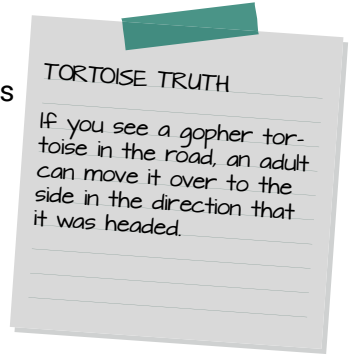
The scientific name for the Gopher Tortoise is *Gopherus polyphemus*.



WHERE DO THEY LIVE?

Gopher tortoises are found in all 67 counties in Florida. They also **inhabit** eastern Louisiana, and the southern portion of Alabama, Georgia, Mississippi, and South Carolina.

The gopher tortoise is a land animal that is found living in the scrub, pine habitat, and coastal dune area of the southeastern U.S. The **scrub** is an area where the trees are short and scrubby and the soil very sandy. Low evergreens and oaks will grow in this area. There are two types of pine habitats that the gopher tortoise will live in. One is the **pine flatlands**; these are low wet areas that have a lot of saw palmetto bushes. They are common in south Florida. The other is called the **sandhill** or **high pine** community, and is dominated by longleaf pines and grasses. Gopher tortoises also inhabit **coastal dune** areas, where some vegetation grows on mounds of sand. Sea grape, railroad vine, sand spur, and sea oats can exist on the coastal dunes.



Label the States: LA Louisiana AL Alabama GA Georgia
SC South Carolina MS Mississippi FL Florida

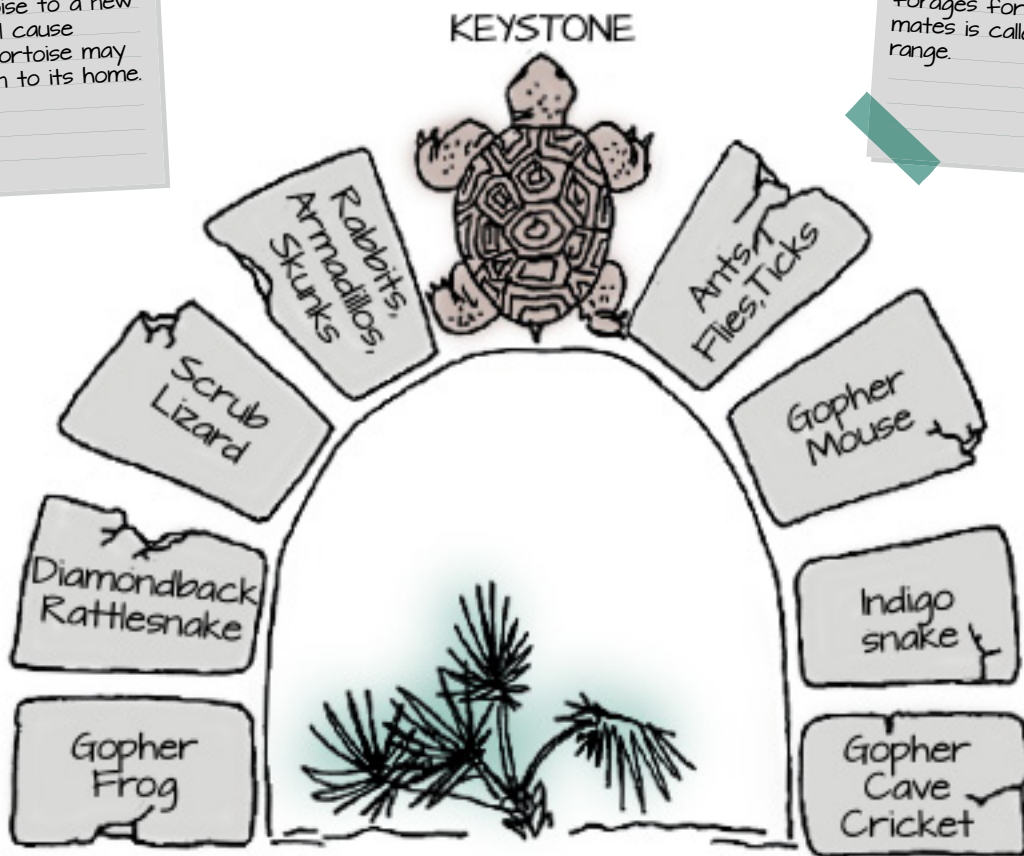
A KEYSTONE SPECIES

The gopher tortoise is often referred to as a keystone species because of its impact on the environment. To be named a keystone species, the animal must keep the environment it lives in stable. The word keystone comes from an architectural term dealing with the construction of a building, meaning that if one key part were removed the whole building would tumble down. The gopher tortoise is called a keystone species because of its burrow. The gopher tortoise burrow offers shelter and nesting grounds to many other species. The species that live in the gopher tortoise burrows are not capable of digging their own underground shelters. Without the shelter dug by the tortoises, small rodents and some snake species would die off. Other species use the burrows as hiding places from predators. Some species live in the burrow with the tortoise and some occupy vacant burrows. The gopher tortoise's presence directly affects the well being of the other animals in its **ecosystem**. The tortoise provides **sustainability** to its community.

A tortoise will dig many burrows. Gopher tortoises that live in hot areas will use the burrow to escape the sun. The burrow is cool in the summer and warm in the winter. The gopher tortoise will make its burrow just wide enough to allow it to turn around inside the hole. There is only one entrance to the burrow. Burrows can be as deep as 10 feet below the surface, and it will gently slope downward. A burrow can be as short as 6 to 10 feet. Others are as long as 40 feet.

TORTOISE TRUTH
Kids, it is important not to move a tortoise to a new location. It will cause stress. The tortoise may try to return to its home.

TORTOISE TRUTH
The area where a Gopher Tortoise digs its burrow, forages for food, and mates is called its home range.



BURROW BUDDIES

The gopher tortoise burrows are especially important because the burrows dug by the tortoise can provide homes for other animals. This is called **commensal** living, a place where other animals can live and raise their young. Juvenile tortoises, the Florida mouse, lizards, diamondback rattlesnakes, and toads all spend time in the burrow. The burrow also provides a home for larger mammals, rabbits, armadillos, skunks, opossums, and foxes. Even the scrub jay and burrowing owl spend time below ground. The endangered indigo snake also relies on the burrow for its offspring. The gopher frog, gopher scarab beetle, gopher cricket, and the gopher moth, are **obligates**, which means they are rarely found anywhere but in the burrows that the tortoise digs. Many **invertebrates**, such as worms, scorpions, spiders, ticks, and flies also inhabit the burrow. Ants and beetles are probably the most common.

As many as 360 species visit the burrow at one time or another. These animals do not harm the tortoise. In fact the tortoise doesn't seem to mind the guests. This is an example of **biodiversity**.

The gopher tortoise provides the burrow for a variety of animals, to live different lifestyles in the same location.

TORTOISE TRUTH

A gopher tortoise burrow ends in a room that is never too hot or cold, and is always slightly moist.

When the burrow is currently a home of a gopher tortoise, it will have a half moon shaped opening. It will be clean of debris and have a sandy entrance. After a gopher tortoise has abandoned a burrow, other animals like owls, armadillos, or foxes may occupy the burrow. The opening will be round and not quite as clean.



ANATOMY

Gopher tortoises, like most **reptiles**, are **ectothermic**, which means they are cold blooded. The tortoise can use its dark shell to absorb heat from the sun and regulate its body temperature. The shell acts like armor and can protect its body. It also serves to camouflage the tortoise and helps it blend in with nature. The shovel like design of their feet aids them in efficiently digging a burrow.

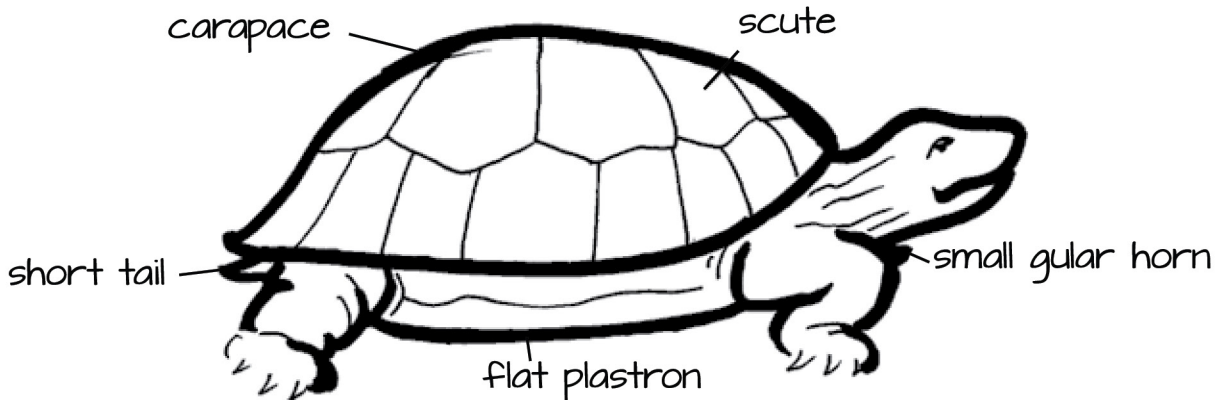
The shell is made of bone. A tortoise can pull its head inside the shell. It is able to pull its legs up close to its body. The legs are covered with very tough skin. When pulled in tight, the legs cover the opening in front of the head. The tortoise can never leave its shell. The shell is covered with **scutes**. These are hard covering plates on the shell, or **carapace**. The shell underneath the tortoise is called the **plastron**.

TORTOISE TRUTH

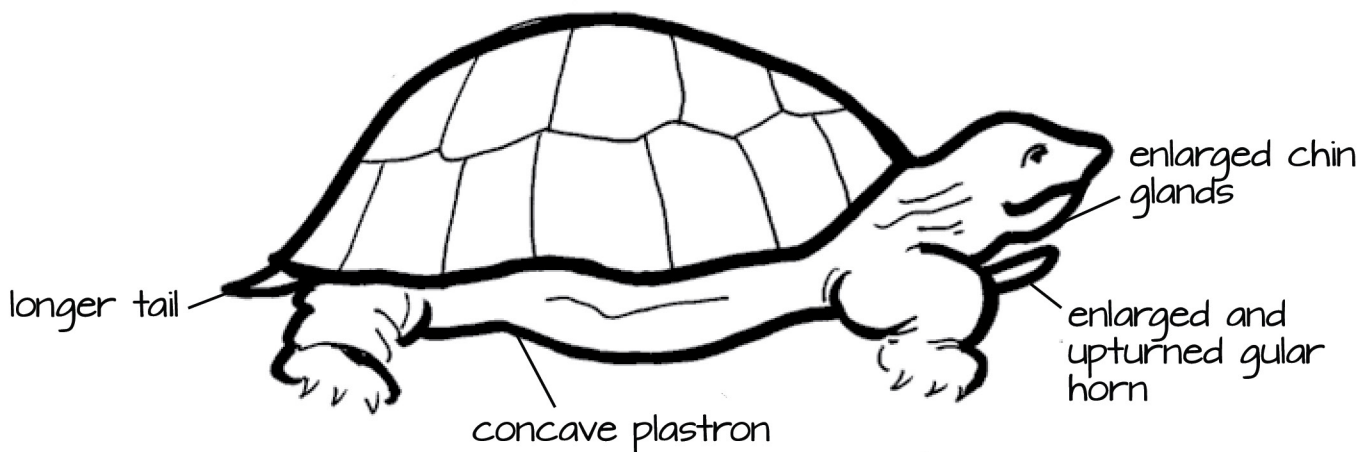
When a tortoise sees another tortoise, it may make movements that look like head bobbing, following the other tortoise, touching noses, or ramming. They are usually not very social.

The best way to determine the **gender** of a tortoise is by looking at the plastron. A male has a concave plastron, while the bottom shell of the female is flat. When young, the females might be smaller, but as adults the female tortoises grow larger than the males.

FEMALE

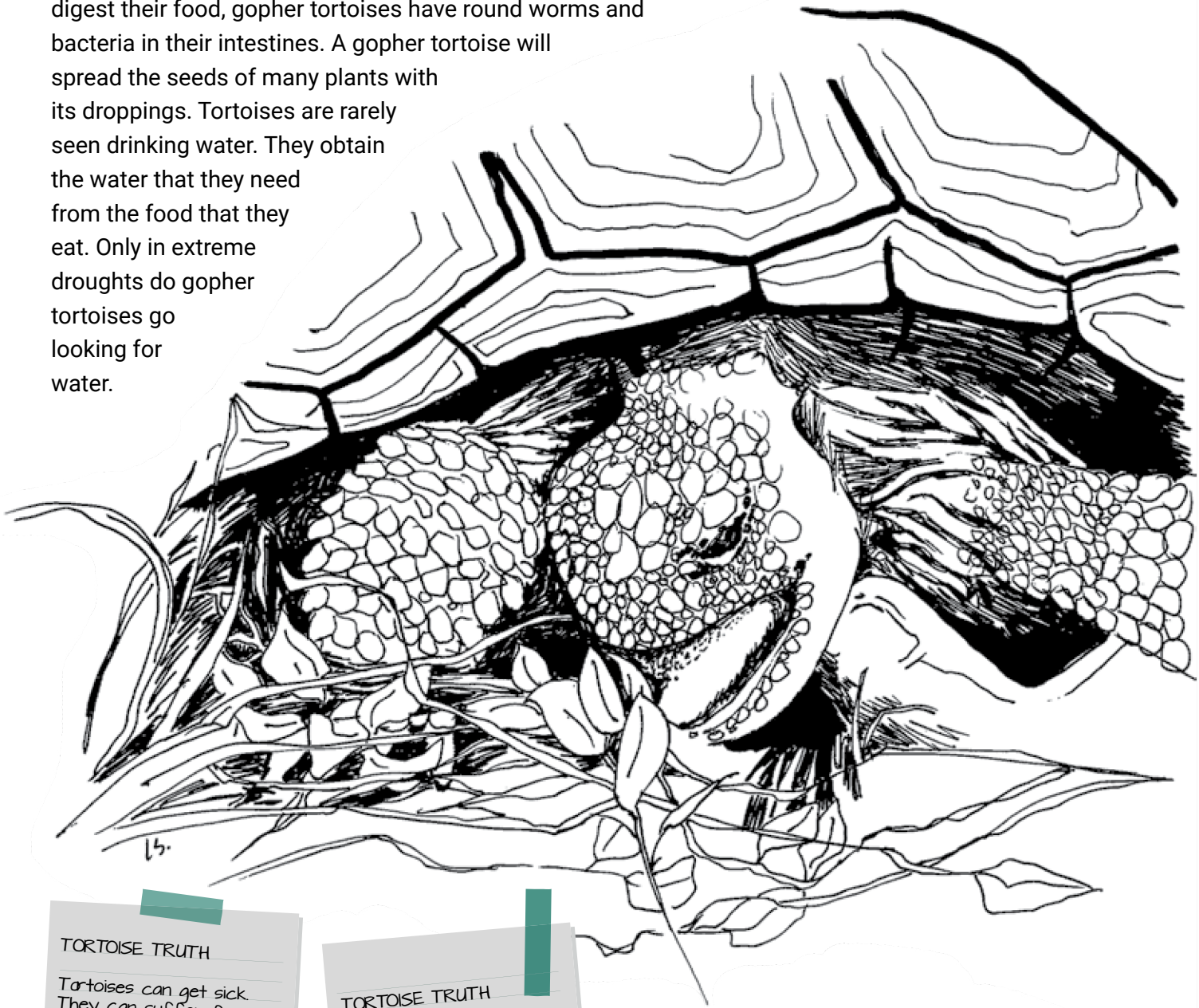


MALE



WHAT DO THEY EAT?

Tortoises are **herbivores**, which means they eat plants. Gopher tortoises seek out plants using their eyes and sense of smell. The tortoise will put its nose up into a plant to get a sniff before it takes a bite. They eat the leaves, stems, fruit, and flowers of plants. Some of their favorites are: sea grape, stinging nettle, lantana, gopher apple, bracken fern, Mexican clover, poison ivy, beautyberry, and prickly pear cactus. A basic in the diet of the gopher tortoise is the many varieties of grass. Tortoises do not have teeth; they have a beak that they use to cut the foliage. Then the tortoise uses its tongue to pull food into its mouth. To digest their food, gopher tortoises have round worms and bacteria in their intestines. A gopher tortoise will spread the seeds of many plants with its droppings. Tortoises are rarely seen drinking water. They obtain the water that they need from the food that they eat. Only in extreme droughts do gopher tortoises go looking for water.



TORTOISE TRUTH

Tortoises can get sick. They can suffer from respiratory disease. It causes them to wheeze, have a runny nose, and swollen eyelids. There is no vaccine or cure.

TORTOISE TRUTH

If a tortoise is moved to a new location and it is ill, it can spread the contagious respiratory infection to other tortoises. Don't move gopher tortoises.

NESTING

It takes a tortoise a long time to mature. In Florida it takes approximately 10 to 15 years, but up to 20 years in Georgia. A female tortoise will lay an average of 6 eggs. Some lay as few as 3 and some as many as 15. She will lay one clutch, a group of eggs, in May or June. The eggs will take between 80 to 90 days to **incubate** in Florida. The temperature of the sandy area that the eggs are laid in determines if the hatchlings will be male or female tortoises. The warmer the nest the more female hatchlings there will be.

TORTOISE TRUTH

Scientists that study Gopher Tortoises are called "herpetologists."



The eggs look like ping pong balls. The hatchlings are 2 inches in size at birth. The shell of the juvenile tortoise is yellow and brown. The top shell, the **carapace**, will stay soft for 6 to 7 years. Some young tortoises stay in an adult burrow and some dig their own. They will also hide under vegetation and logs.

ON LAND AND SEA

Gopher tortoises are land **reptiles**, unlike their water-dwelling cousins the sea turtles. There are some distinctive difference, and some similarities. Tortoises and sea turtles both have a strong **carapace** to protect their bodies. Neither the tortoise nor the sea turtle have external ears. A key difference is their mode of transportation. The tortoise has strong tough feet and legs that they use to move their body from place to place. The sea turtle needs a different adaptation for movement in the water; it has flippers.

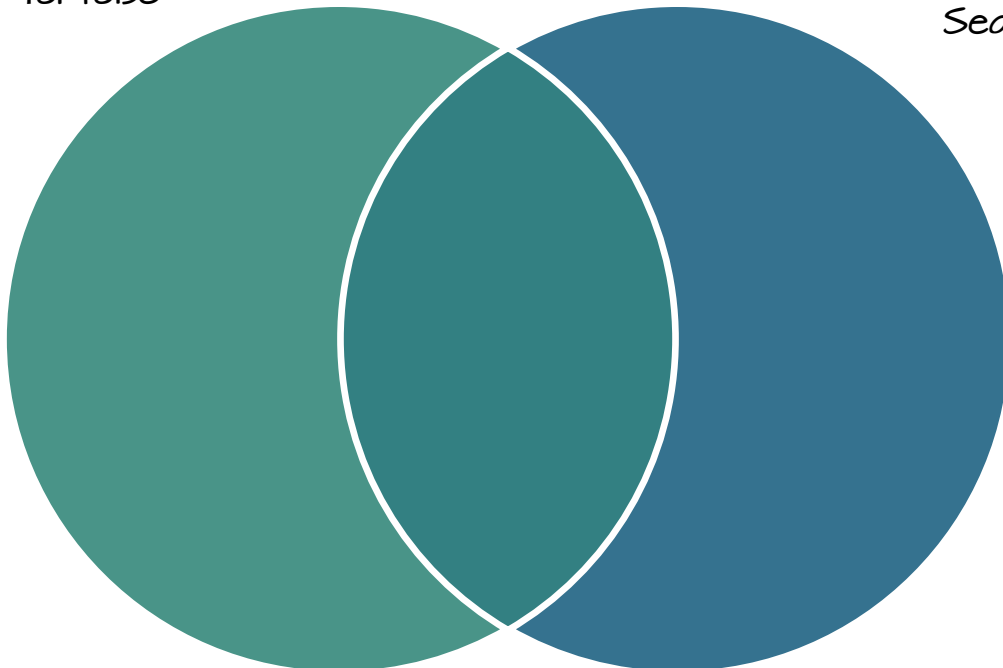
Sea turtles are larger than gopher tortoises. An average adult tortoise is approximately 10 to 12 inches long. Some grow as large as 16 inches. They weigh up to 30 pounds. Even the smallest sea turtles, Hawksbills and Kemps Ridleys, are bigger. Loggerhead sea turtles can weigh between 200 and 300 pounds. The giant leatherback turtle can weigh up to 1,000 pounds.

A sea turtle is not confined to one part of the world. They are **pelagic**, swimming around in the ocean. The tortoise has a home range of a little less than 4 acres for males and less than 2 acres for females. Both species' nests are similar as they lay eggs in the sand. A sea turtle will come out of the water to lay her eggs on the beach. The sea turtle doesn't stay near where the ega are laid, as she will return to the water. The gopher tortoise will lay her eggs on the apron of her burrow. The apron is the sandy area at the entrance to the tunnel.

Both sea turtles and tortoises live a long time. A gopher tortoise can live from 40 to 60 years in the wild. Some live to be 100 years old. Sea turtles also live a long time. Many live to be 40 or 50 years old. A few estimates place 75 years as the longest they can live.

Gopher Tortoise

Sea Turtle



WORD SEARCH

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O O B P K A B U A U O O Y F R
A C R W E I G P L B E T E T C
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Z H L O O R O R L B S E D E A
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I K T F B U B I C Y X Y W Z E

BURROW
CARAPACE
CLUTCH
COMMENSAL
ECOSYSTEM
ECTOTHERMIC
HERBIVORES

HERPETOLOGIST
KEYSTONE
OBLIGATES
PLASTRON
SCRUB
SCUTES
TORTOISE

TORTOISE TRUTH

There are federal and state laws that make it illegal to keep a gopher tortoise, dig up its burrow, or disturb it.

ON LAND AND SEA

As the number of gopher tortoises declines, we need to look upon ourselves to make a difference to improve their plight. Gopher tortoises are considered threatened in every state where they roam. New home construction is causing loss of habitat, which is having a deadly side effect on this species. Urban growth is encroaching upon the tortoise community.

There are many small efforts that we can all make to help this docile creature exist on the earth into the future. The destruction of the natural environment that tortoises and other species dwell in will continue to lead to their decline. Gopher tortoises need undeveloped land with plenty of food and space to dig their burrows. Tortoises are run over by cars and bulldozers are burying them in their burrows. It is time to protect the gopher tortoise.

We all need to be more aware of our actions and their effect on the ecosystem. This means thinking larger than just the gopher tortoise. Know the importance of the gopher tortoise to its habitat. Educate your friends and family about what you know.

There are many other animals in our world that are facing the same struggle as the tortoise. It is up to us, as young people, to be the voice of the environment. Take action for something you believe in. If you feel strongly about our Florida panthers or our nesting loggerhead sea turtles, come up with an idea. Teachers and adults will help you to put your idea into action. Be a part of preserving the habitat of all species, not just the human kind.

Zander

DIG DEEPER

Design your own bumper sticker to support conservation.

DIG DEEPER

Research one of the hundreds of species that a gopher tortoise burrow shelters.

GLOSSARY

Biodiversity: The variety of species that make up a community.

Carapace: A thick hard case or shell made of bone that covers the body of a turtle or tortoise.

Commensal: Animals that live together, as in the burrow; one species derives some benefit, and the other is unaffected.

Ecosystem: The interaction of a community of organisms, plants, and animals in their environment.

Ectotherms: Cold-blooded animals who rely on their environment to regulate body temperature.

Gender: The sex of an organism.

Herbivore: An animal that gets its energy from eating plants, and only plants.

Incubate: The time a tortoise egg needs to develop in a nest before hatching.

Inhabit: To live in or occupy a particular place.

Invertebrates: Animals without internal skeletons or backbones, such as worms and insects.

Obligates: An organism that can only exist under particular environmental conditions.

Paleontologist: A scientist who studies fossils and life of former geologic eras.

Pelagic: Living in the open ocean, as opposed to along the shore or on land.

Plastron: The under portion of the shell of a turtle or tortoise. It is made up of several hinged plates that are connected to the carapace.

Reptile: Classification of animals that include: turtles, tortoises, crocodiles, alligators, snakes, and lizards.

Respiratory Infection: A disease that affects the breathing system of the body; the lungs that take in and distribute oxygen.

Scute: An external bony plate or scale.

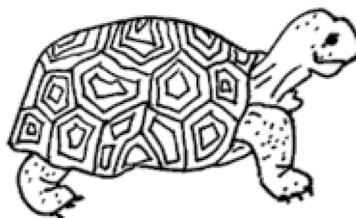
Sustainability: Maintaining ecological balance; using natural resources without destroying the ecology of an area.

ABOUT THE AUTHOR

Zander Srodes grew up on Palm Island, a bridgeless, barrier island on the southwest Florida coast. When he was 11 years old, he began giving “Turtle Talks,” a conservation presentation on sea turtles, at schools, libraries and nature events. Zander has written Turtle Talks and The Gopher Tortoise Activity Book. Zander received the Mote Marine Lab Sea Turtle Conservationist Award in 2002, the Eco-Hero Award from Action for Nature and the Florida Wildlife Federation Youth Conservationist Award in 2005. He has also been granted the Brower Award from Earth Island Institute and the Gloria Barron Prize In 2007, Zander was honored with the Keep Sarasota Beautiful, Volunteer of the Year Award. He also accepted the Presidential Environmental Youth Award and the Prudential Spirit of Community of Award. You can find out more about Zander at zandersrodes.weebly.com

ABOUT THE ILLUSTRATOR

Linda Soderquist retired from teaching elementary education in Venice, Florida. She is a watercolor artist, who regularly shows her work in galleries and exhibits. She resides on Little Gasparilla Island, a bridgeless, barrier island off southwest Florida. Over the years, Linda has been active in many areas of environmental conservation, and is presently a volunteer water quality monitor with CHEVWQMN. She is the primary permit holder for all sea turtle activities on Little Gasparilla Island, and is responsible for turtle nest data collection, investigating disorientations, and gathering information on standings. You can find out more about Linda at lindasislandart.com



FROM THE AUTHOR

The writing of this booklet was inspired by Danny Kett. Thanks to Ben Yates, Ecologist at Mosaic Fertilizer for reviewing the information and input on ideas for the activity book. Special thanks for Laura Wewerka for edits to the Gopher Tortoise Activity Book. Ms. Wewerka is the Public Information and Educational Chair of the Gopher Tortoise Council. For more information on gopher tortoises, visit their site at www.gophertortoisecouncil.org

Most of all, thank you to Linda Soderquist, who has beautifully illustrated this activity book and also mentored me since I was eleven, believing that a kid can make a difference in the environment.

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