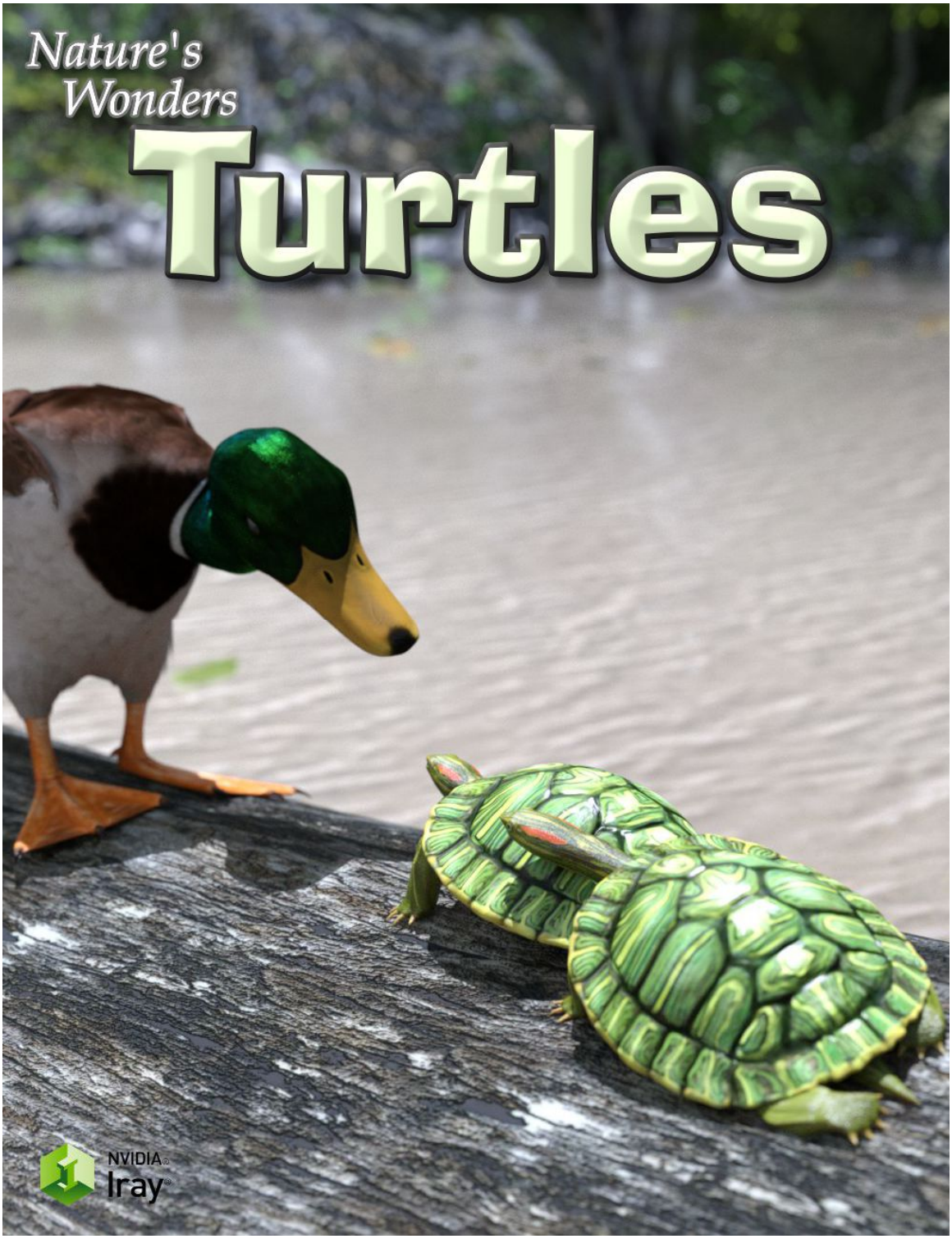


A 3D Model set by Ken Gilliland

Nature's Wonders

Turtles

Manual

Field Guide

Nature's Wonders

Turtles

Introduction

Turtles are characterized by a special bony shell developed from their ribs and acting as a shield. A "turtle" may refer to the order as a whole (American English) or to fresh-water and sea-dwelling *testudines*. The earliest known members of this group date from 220 million years ago, making turtles one of the oldest reptile groups and a more ancient group than snakes or crocodilians. There are 356 known living species today, many of which are highly endangered.

Overview and Use

This set uses a common model to recreate digitally the Turtle species included in this and future volumes. Each species uses specific morphs from the generic model to single-out its unique features.

- **Models included in this volume:**
  - **Natures Wonders Turtle Base** - This model is used with all Turtles/Tortoises included in this set. There are 3 versions of this model:
    - In the DAZ Studio version, the "Turtle" character will work for 3Delight or Iray renders.
    - In the Poser version, there are two "Turtle" characters. The "Turtle" cr2 is intended for FireFly renders and the "Turtle P11" is intended for SuperFly renders.

Creating a Specific Turtle using Poser

1. For this example, we'll create the Red-eared Slider.
2. Load Poser, select the FIGURES library and go to the Nature's Wonders Reptiles folder.
3. To create a Red-eared Slider, use the "Nature's Wonders Turtle" base model.
4. Go to the POSES library, then to the Nature's Wonders Reptiles/Turtles of the World folder and the Firefly or Superfly sub-folder.
5. Select the Red-eared Slider (or a turtle of your choice) and load/apply it to the Turtle base model by clicking the mouse. This species pose contains both the morph and texture settings to turn the generic model into the selected Turtle.

Creating a Specific Turtle using DAZ Studio

1. For this example, we'll create the Red-eared Slider.
2. Load DAZ Studio and go to the "Animals", "Nature's Wonders", "Reptiles " folder.
3. To create a Red-eared Slider, use the "Nature's Wonders Turtle" base model.

4. Go to the “Turtles of the World” folder and select the folder of which renderer you want to use, 3Delight or Iray.
5. Now select the Red-eared Slider (or a turtle of your choice) by clicking the mouse. This “properties” preset contains both the morph and texture settings to turn the generic model into the selected turtle.

Leg Joint Issues & Species Master Control

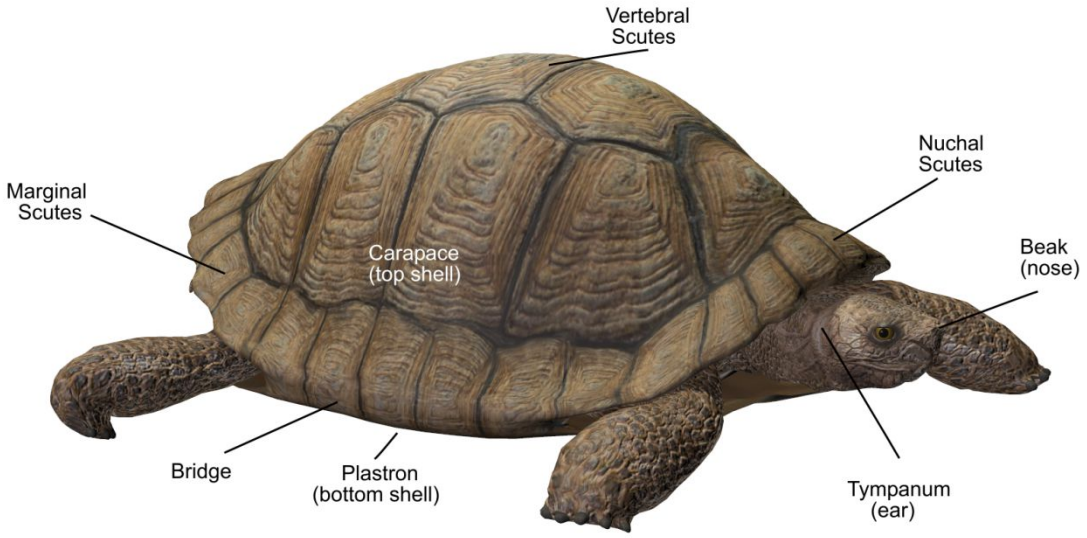
In order to get the legs to tuck into the shell, certain liberties had to be taken with the limits of the leg joints. The limits in these leg areas are very lax to accommodate the bending required to fold the legs. A certain amount of common sense is required in manually posing these areas to avoid poke-through with the legs and shell.

A certain type of turtle species may use a “Master Control”. Master controls can be found in the “Creation Controls/Species Shapes” tree in the BODY section of the model. These master controls turn on (use) numerous creation controls to approximate a certain type of species. For example, the “Slider” master control when set to “1” will morph the model into a Slider species. While this is an easy way to get a species shape (rather than individually dialing each Creation Control), it does have limitations.

A Species Master Control may lock out use of some of the Creation Controls when used on top of the dialed Master Control. The reason for this is the individual controls limits. An individual morph with a MIN=0 and MAX=1 which is set to “1” with a Master Control can’t dial back to “0” on the individual control because the limits don’t allow negative numbers (MIN=0, not MIN=-1). The best work-around for this is to edit the individual dials parameters and edit the limits accordingly.

About Turtles

Turtle, (order *Testudines*), are any reptile with a body encased in a bony shell. Although numerous animals, from invertebrates to mammals, have evolved shells, none has an architecture like that of turtles. The turtle shell has a top (carapace) and a bottom (plastron). The carapace and plastron are bony structures that usually join one another along each side of the body, creating a rigid skeletal box. This box, composed of bone and cartilage, is retained throughout the turtle's life. Because the shell is an integral part of the body, the turtle cannot exit it, nor is the shell shed like the skin of some other reptiles.



There are approximately 356 species of turtles living on land in all continents except Antarctica and in both salt water and fresh water. Tortoises (family *Testudinidae*) live exclusively on land and have anatomic features distinguishing them from other turtles, but the term tortoise has long been used to refer to other terrestrial *testudines* as well, such as the box turtle and the wood turtle. Similarly, terrapin was sometimes used to describe any aquatic turtle but is now largely restricted to the edible diamondback terrapin (*Malaclemys terrapin*) of the eastern United States.

The turtle's shell is an adaptation that protects it from predators, which compensates for the reptile's slow crawling speed. The carapace and plastron each arose from two types of bone: dermal bones that form in the skin and endochondral bone (bone arising from cartilage) derived from the skeleton. Evolution has intricately linked these two types of bone to produce the shell of modern turtles. The carapace consists of 10 trunk vertebrae and their ribs, which are overlain by and fused to dermal plates. Another series of dermal plates forms the perimeter of the carapace. The plastron usually contains four pairs of large plates and a single one centered near the front (the anteromedial plate); these plates are large dermal bones, although the anterior ones may contain parts of the shoulder girdle. The shell is variously modified and shaped to meet the needs of defense, feeding, and movement.

All the turtles senses are well-developed, and they are used in avoiding predators and in finding and capturing food. The eyes have the typical anatomy of other vertebrates having good vision. Aquatic turtles have eyes that quickly adjust for aerial or aquatic vision, seeing well in both situations. Tortoises appear to have colour vision, but colour vision is untested for most turtles. Turtles, particularly aquatic ones, do not have strong olfactory senses, but all are capable of smelling. Tortoises instinctively empty their bowels in water to hide their scent. Some aquatic species have protuberances on the chin in the form of tubercles and papillae. These appear to be mainly tactile, although some are chemosensory (the ability to sense particular chemical stimuli). The turtle ear has

an eardrum flush with the surface of the head. A single bone, the stapes, transmits sound to the inner ear.

In the United Kingdom, the word “turtle” is used for water-dwelling species, including ones known in the US as terrapins, but not for terrestrial species, which are known only as tortoises.

It has been reported that wood turtles are better than white rats at learning to navigate mazes. They do, however, have a very low encephalization quotient (relative brain to body mass), and their hard shells enable them to live without fast reflexes or elaborate predator avoidance strategies. In the laboratory, turtles (Pseudemys nelsoni) can learn novel operant tasks and have demonstrated a long-term memory of at least 7.5 months. Case studies even exist of turtles playing.

Some turtles, particularly small terrestrial and freshwater turtles, are kept as pets. Among the most popular are Russian tortoises, spur-thighed tortoises, and red-eared sliders.

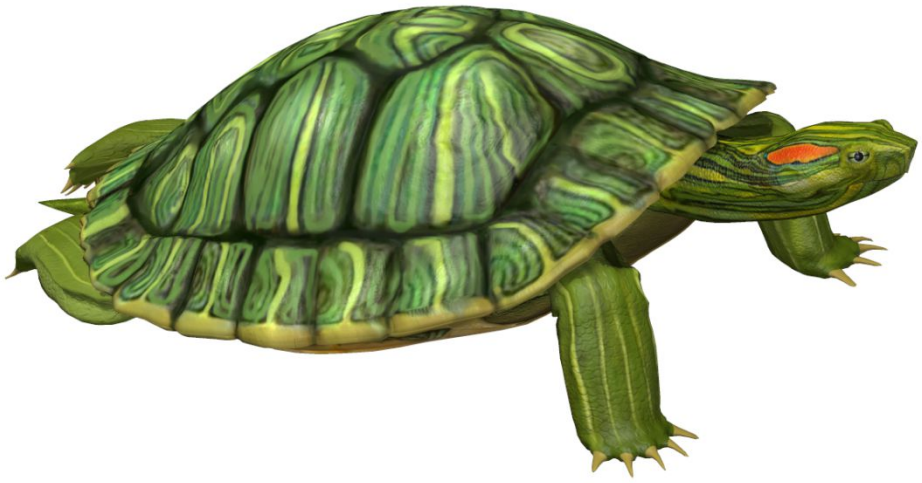
The flesh of turtles, calipash or calipee, was and still is considered a delicacy in a number of cultures. Turtle soup has been a prized dish in Anglo-American cuisine, and still remains so in some parts of Asia. Turtle plastrons are widely used in traditional Chinese medicine.

In February 2011, the Tortoise and Freshwater Turtle Specialist Group published a report about the top 25 species of turtles most likely to become extinct, with a further 40 species at very high risk of becoming extinct. This list excludes sea turtles, however, both the leatherback and the Kemp's ridley would make the top 25 list.

Turtles and tortoises are at a much higher risk of extinction than many other vertebrates. Of the 263 species of freshwater and terrestrial turtles, 117 species are considered Threatened, 73 are either Endangered or Critically Endangered and 1 is Extinct. Of the 58 species belonging to the family Testudinidae, 33 species are Threatened, 18 are either Endangered or Critically Endangered, 1 is Extinct in the wild and 7 species are Extinct. 71% of all tortoise species are either gone or almost gone. Asian species are the most endangered, closely followed by the five endemic species from Madagascar. Turtles face many threats, including habitat destruction, harvesting for consumption, and the pet trade. The high extinction risk for Asian species is primarily due to the long-term unsustainable exploitation of turtles and tortoises for consumption and traditional Chinese medicine, and to a lesser extent for the international pet trade.

Red-eared Slider

Trachemys scripta elegans



It is also known as the red-eared terrapin, is a semiaquatic turtle belonging to the family *Emydidae*. It is a subspecies of the pond slider. Red-eared sliders get their name from the small red stripe around their ears. The "slider" in their name comes from their ability to slide off rocks and logs and into the water quickly.

Habitat: The red-eared slider originated in the warm climates in the southeastern United States, in areas around the Mississippi River and the Gulf of Mexico . Their native areas range from southeast of Colorado to Virginia and Florida.

In nature, they inhabit areas with a source of still, warm water, such as ponds, lakes, swamps, creeks, streams, or slow-flowing rivers. Living in these areas allows them to leave the water easily by climbing onto rocks or tree trunks so they can warm up in the sun. They are often found sunbathing in a group or even on top of each other. They also require abundant aquatic plants, as these are the adults main food, although they are omnivores. Turtles in the wild always remain close to water unless they are searching for a new habitat or when females leave the water to lay their eggs.

Status: Not threatened. The red-eared slider is included in the list of the world's 100 most invasive species according to the IUCN. Although it is native to the southern United States and northern Mexico, it has become established in other places because it is the most popular pet turtle in the world and some owners release it into the wild, where it has become an invasive species and out-competes native species.

Diet: Red-eared sliders are omnivores. Juveniles require a higher proportion of animal protein, while adults consume more plant matter.

Identification: Young red-eared sliders are bright green with yellow markings and a red stripe just behind the eyes. Colors dull with age. The carapace can reach more than 40 cm (16 in) in length, but the average length ranges from 15 to 20 cm (6 to 8 in). The females of the species are usually larger than the males. Males do have longer tails than females. They typically live between 20 and 30 years, although some individuals have lived for more than 40 years. Their life expectancy is shorter when they are kept in captivity. The quality of their living environment has a strong influence on their lifespans and well being.

Breeding and Behavior: Red Eared Sliders do not hibernate, but actually brumate to varying degrees. In the wild, red-eared sliders brumate over the winter at the bottoms of ponds or shallow lakes, where they become less active, but do occasionally rise to the surface for food or air. They generally become inactive in October, when temperatures fall below 10 °C (50 °F). During this time, the turtles enter a state of sopor, during which they do not eat or defecate, they remain nearly motionless, and the frequency of their breathing falls. Individuals usually brumate underwater, but they have also been found under banks and rocks, and in hollow stumps. In warmer winter climates, they can become active and come to the surface for basking. When the temperature begins to drop again, however, they quickly return to a brumation state. Sliders generally come up for food in early March to as late as the end of April.

Courtship and mating activities for red-eared sliders usually occur between March and July, and take place under water. During courtship, the male swims around the female and flutters or vibrates the back side of his long claws on and around her face and head, possibly to direct pheromones towards her. The female swims toward the male and, if she is receptive, sinks to the bottom for mating. If the female is not receptive, she may become aggressive towards the male. Courtship can last 45 minutes, but mating takes only 10 minutes.

On occasion, a male may appear to be courting another male, and when kept in captivity may also show this behaviour towards other household pets. Between male turtles, it could be a sign of dominance and may preclude a fight. Young turtles may carry out the courtship dance before they reach sexual maturity at five years of age, but they are unable to mate.

After mating, the female spends extra time basking to keep her eggs warm. She may also have a change of diet, eating only certain foods, or not eating as much as she normally would. A female can lay between two and 30 eggs depending on body size and other factors. One female can lay up to five clutches in the same year, and clutches are usually spaced 12 to 36 days apart. The time between mating and egg-laying can be days or weeks. The actual egg fertilization takes place during the egg-laying. This process also permits the laying of fertile eggs the following season, as the sperm can remain viable and available in the female's body in the absence of mating. During the last weeks of gestation, the female spends less time in the water and smells and scratches at the ground, indicating she is searching for a suitable place to lay her eggs. The female excavates a hole, using her hind legs, and lays her eggs in it.

Incubation takes 59 to 112 days. Late-season hatchlings may spend the winter in the nest and emerge when the weather warms in the spring. Just prior to hatching, the egg contains 50% turtle and 50% egg sac. A new hatchling breaks open its egg with its egg tooth, which falls out about an hour after hatching. This egg tooth never grows back. Hatchlings may stay inside their eggshells after hatching for the first day or two. If they are forced to leave the eggshell before they are ready, they will return if possible. When a hatchling decides to leave the shell, it still has a small sac protruding from its plastron. The yolk sac is vital and provides nourishment while visible, and several days later it will have been absorbed into the turtle's belly. The sac must be absorbed, and does not fall off. The split, where the sac was attached, must heal on its own before the turtle is able to swim. The time between the egg hatching and water entry is 21 days.

Damage to or inordinate motion of the protruding egg yolk, enough to allow air into the turtle's body, results in death. This is the main reason for marking the top of turtle eggs if their relocation is required for any reason. An egg turned upside down will eventually terminate the embryo's growth by the sac smothering the embryo. If it manages to reach term, the turtle will try to flip over with the yolk sac, which would allow air into the body cavity and cause death. The other fatal danger is water getting into the body cavity before the sac is absorbed completely and while the opening has not completely healed yet.

The sex of red-eared sliders is determined by the incubation temperature during critical phases of the embryos' development. Only males are produced when eggs are incubated at temperatures of 22–27 °C (72–81 °F), whereas females develop at warmer temperatures. Colder temperatures result in the death of the embryos.

Special Thanks to:

... to my beta tester, FlintHawk and Chris Creek *(for suggesting the turtle model)*

Sources:

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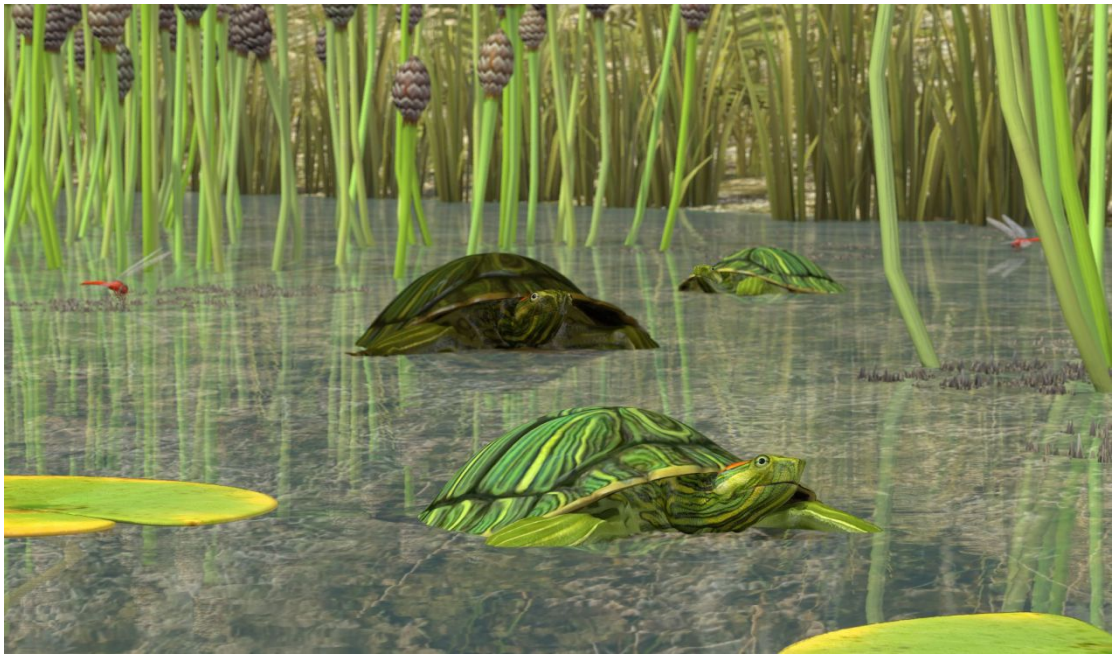
- National Wildlife Federation http://www.nwf.org
- US Fish and Wildlife Service https://www.fws.gov
- California Turtle & Tortoise Club https://tortoise.org
- The Turtle Room https://theturtleroom.com/
- Wikipedia http://wikipedia.org

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