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A Field Guide to South Dakota Turtles

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A Field Guide to

SOUTH DAKOTA TURTLES

**EC919 South Dakota State University | Cooperative Extension Service | USDA
U.S. Geological Survey | South Dakota Cooperative Fish and Wildlife Research Unit
South Dakota Department of Game, Fish & Parks**

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EC919 South Dakota State University | Cooperative Extension Service | USDA
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On the covers:
Snapping Turtle

We have no trouble recognizing a turtle, regardless of its shape, size, or color. Besides the ones we see in outdoor South Dakota, we also know turtles from mythology and folklore, such as the tale of the race between the hare and the tortoise (land turtle).

Although turtles rouse our curiosity and interest, we know relatively little about them. We do know that in South Dakota they are a major part of both aquatic and terrestrial ecosystems. However, their populations are declining throughout the world due to loss of habitat, over-collection for the food market and pet trade, and road mortality.

Status of South Dakota turtles

Of the seven turtle species in South Dakota, five are listed as endangered, threatened, or rare by the South Dakota Department of Game, Fish & Parks. The Blanding's turtle is state endangered; the false map turtle is state threatened; and the smooth softshell, spiny softshell, and ornate box turtles are rare. More research is needed, because we don't even know if the Blanding's turtle still exists in the state.

If you have new sightings or information about the five endangered, rare, or threatened turtle species described in this field guide or know about any new species for the state, you can contribute to science by contacting the South Dakota Department of Game, Fish & Parks Natural Heritage Program at doug.backlund@state.sd.us or (605) 773-4345.

Turtles are important to us because they are indicators of the health of their environments. If you find a false map turtle, for example, it will be in relatively unpolluted water because mollusks, this turtle's main food, grow in clean, clear water. Blanding's turtles also require wetlands and small streams that are clean and healthy.

Some species of turtles are a source of meat and are often commercially marketed. Turtles are popular pets, and it is reported that over a million dollars are spent annually in the U.S. on them. Turtles, as well as books on their care, should be purchased only at reputable pet stores. Do NOT remove a turtle from the wild to keep as a pet. Wild turtles can carry diseases and are not meant to be captive.

Remember that some species of pet turtles can live to be over 60 years old; purchasing one is a life-long commitment.

Fossil record and evolution

Fossil records tell us that turtles have successfully lived and reproduced around the world for the past 200 million years.

Turtles started out as marine reptiles called Permian anapsids 66-145 million years ago when much of the central portion of North America including much of South Dakota, was covered by a sea. After these marine reptiles died, they were covered in layers of mud and chalk. Following the Mesozoic era, the fossils were lifted up above sea level (Martin 1995).

Because of the continuous erosion that occurs west of the Missouri River in South Dakota, fossils over 70 million years old are still being uncovered. In the fall of 1996, a 12-foot-long sea turtle called archelon from the Cretaceous period (73 million years ago) was found near Chamberlain.

Permian anapsids began as torpedo-shaped fish covered with small scales. Eventually, their bodies widened and flattened and their feet became webbed. These were changes necessary to survive in slower moving waters. The hard shell of some turtles evolved when their ribs and vertebrae fused to form a bony plate.

Ancient turtles were also protected by sharp scutes (large bony scales) because turtles did not gain the ability to withdraw their head and limbs into their shells until the end of the Mesozoic era. Over time, they evolved into different groups of turtles with traits useful for their specific environments. Most terrestrial turtles evolved during the Miocene to Pleistocene periods 23 million years ago to 4,000 years ago. Webbing between their toes disappeared through time, and the turtles changed to a mostly herbivorous diet because of their bulky box-like shells, which made it difficult to move quickly.

Most mud and snapping turtles retained their heavy shell for protection, while more aquatic turtles evolved a lighter shell for increased movement. Members of the Trionychidae (softshell) family developed a lighter shell, probably to enhance their buoyancy in the water and make feeding easier (Bond 2003).

General turtle information

The protective shell makes turtles unique. Most turtles have a bony carapace (upper shell) and plastron (lower shell) connected by a bridge on each side. The shell enables the turtle to tuck its tail, legs, and head inside for protection. Softshell turtles have a pliable carapace and plastron.

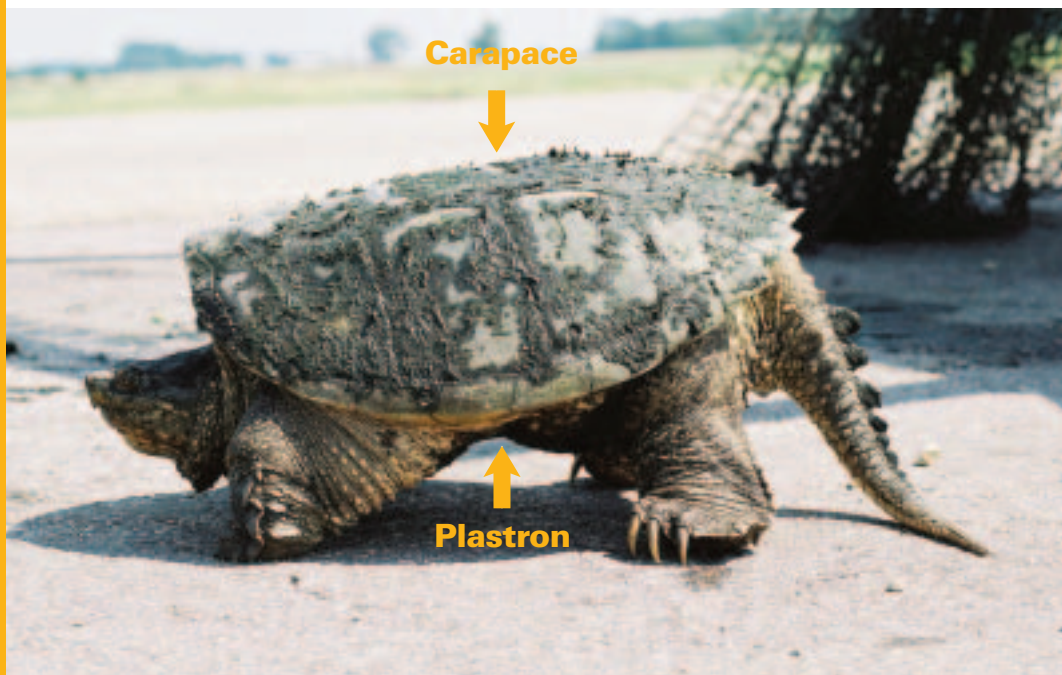
Turtles lack teeth, but they have strong jaws and sharp claws. Turtles have good sight and smell but poor hearing. The skin of a turtle reduces water loss and protects the animal from scrapes and abrasions. As turtles grow, they shed the outer covering of their



Posterior serrations on the carapace

No posterior serrations





Anatomy of a snapping turtle, our most prehistoric-looking species

scutes (scales on the outer layer of their shells). This enables turtles to dispose of parasites that may have accumulated as well as to increase their shell size for protection and growth. Young turtles usually shed scutes more often than large, old turtles.

Turtle reproduction is bisexual with both sexes contributing genetic material to the next generation. Courtship behavior varies among species. All turtles in South Dakota lay shelled amniote (fluid-filled) eggs in shallow nests, and the young emerge after an unattended incubation period, which varies between species. Baby turtles are miniature replicas of the adults. There is no adult care of the eggs or the young, and the young must rely on their instinctive ability to survive and find suitable habitat.

Predation of turtle nests is primarily by raccoons (*Procyon lotor*), opossums (*Didelphis virginiana*), foxes (*Vulpes vulpes*), thirteen-lined ground squirrels (*Spermophilus tridecemlineatus*), and skunks (*Mephitis mephitis*). Hatchlings are eaten by fish, larger turtles, wading birds, and carnivorous mammals. Thousands of turtles are killed each year by automobiles. Be careful to avoid running over migrating turtles as most of these are females looking for nesting sites.

If you encounter a turtle crossing the road, you can help by moving it to the side of the road where it was heading. Don't put it back where it came from, because it will just have to endanger itself by crossing the road again. It knows where it wants to go.

Mature female turtles are usually larger than the males of the same species, with the exceptions of Blanding's turtles and snapping turtles where the males are larger than



Male turtles have long, thick tails...

...and long front claws





Female turtles have short, thin tails...

... and short front nails



the females. In most species in South Dakota, males have long front claws and long thick tails and females have shorter front claws and short thin tails.

Turtles are lung breathers, although they are able to obtain oxygen from the water through special membranes in the cloaca, which enables them to be submerged for long periods of time. In winter, all species in South Dakota hibernate in burrows or in the mud under water.

Turtles vary in their food requirements. Hatchling and juvenile turtles are primarily carnivorous and feed mostly on worms, aquatic insects, snails, fish, and crayfish. As they grow older, they may become herbivorous and consume both aquatic and terrestrial vegetation or they may become omnivorous or stay carnivorous. Western painted, snapping, Blanding's, false map, and ornate box turtles are omnivorous species, whereas smooth and spiny softshells are highly carnivorous species.

Longevity in turtles also can vary by species, but some are known to live over 100 years. The average life span is 15-20 years. Age to maturity can also vary from 4 (smooth softshells) to over 20 years (Blanding's).

Licensing is required from the South Dakota Department of Game, Fish & Parks to harvest turtles in South Dakota. It is unlawful to harvest any endangered, threatened, or rare species such as the Blanding's, false map, spiny softshell, smooth softshell, or ornate box turtles in South Dakota. Refer to the South Dakota Department of Game, Fish & Parks Fishing Handbook for the most current regulations.

Taxonomy of South Dakota turtles

There are 245 species of turtles known in the world. In the U.S., 56 species are known; they occur in both aquatic and terrestrial habitats. Seven turtle species from three different families are reported in South Dakota in a variety of habitats and regions across the state.

The family Trionychidae includes 22 species of softshell turtles in 6 genera found across Asia, Africa, and North America. Three species live in the U.S., and two of these occur in South Dakota. Softshells can be identified by their highly webbed feet, long snorkel-like nose, leather-covered shell, and round "pancake" shape. They can move extremely fast on land or in the water. They usually are found in major rivers and occasionally in larger lakes and ponds.

The family Emydidae consists of 85 species of pond and land turtles in 31 genera, and they occur worldwide with the exception of Australia. There are 49 species of this family in the U.S., and four species occur in South Dakota. Most of these turtles can be found in a wide range of aquatic habitats where, except for the ornate box turtle, they spend most of their time in or around the water. Turtles of this family can be identified by their well-developed carapace and plastron. They are colorful turtles with unique patterns of yellow, green, or red.

The family Chelydridae has only two species of snapping turtles, which are both found in the United States and Canada. Only one, the common snapping turtle, is found in South Dakota. Turtles of this family are characterized by a massive head, large carapace, small x-shaped plastron, and long tail with bony plates. They are highly aquatic and are rarely seen out of the water except for nesting and early spring basking.

Capturing techniques

Turtles should be left alone—remember five of the seven species in South Dakota are “listed.” If you see a turtle population in jeopardy for any reason, call your local Game, Fish & Parks official for assistance before trying to capture and move the turtles.

Baited hoop nets are the most effective method for capturing all species of turtles in South Dakota except the ornate box turtle. Use a drift fence or hand capture this species.

Placing nets near vegetation and habitat where a turtle would naturally occur such as basking logs, submerged vegetation, or sandy shorelines will increase the chances of capturing a turtle. There is no standard method for capturing turtles, but anything you do should minimize distress to the animal.

Turtle handling

Some species of turtles are known for their aggressive disposition and potential to cause serious injury. The first rule for safe turtle handling is to keep the head and feet away from your body. All turtle species are capable of inflicting a serious injury.

The two most aggressive species of turtles in South Dakota are the snapping and spiny softshell turtle. When picked up, spiny softshells will bite and scratch vigorously. The safest way to hold one is by grasping the base of the hind legs and the posterior edge of the carapace with the head pointed away from your body to prevent it from scratching or biting. Smooth softshells can also be held this way, although they are much less aggressive.

Snapping turtles should be handled with extreme care and caution. They will continuously snap and try to bite. The best way to handle one is by grasping the base of its tail and holding it with its head pointed away from your body. However, if a large (20 pounds or more) snapping turtle is held or carried by the tail, its vertebrae can pull apart, causing temporary or sometimes permanent paralysis to the turtle.

All other species of turtles that occur in South Dakota can be held or carried by firmly grasping the sides of the carapace with the head pointed away from your body. Most turtles will become calm after a brief struggle if they are turned over onto their back (carapace), although some turtles still will continue to struggle.



Setting baited hoop net

Baited hoop net





Shallow, fast-flowing creek with numerous basking rocks used by Spiny Softshell Turtles

Permanent open-water wetland used by Snapping and Western Painted Turtles



Turtle habitats

Six of the seven turtle species are found around streams, lakes, rivers, and wetlands of the state; however, the fully terrestrial ornate box turtle is only known to occur in the grassy sand hills of south-central and central South Dakota.

Human encroachment—expansion in agriculture and development—has resulted in substantial changes in or destruction of these vital habitats. Possible detrimental effects to the turtle populations are relatively unknown.

Turtles are excellent indicators of the status of the environment in which they live. If you see a turtle sunning itself by a wetland, it's likely the wetland is healthy. Turtles are highly sensitive to slight habitat changes that may not be readily apparent to us. These habitat changes may affect turtle populations before we even become aware that something has happened.

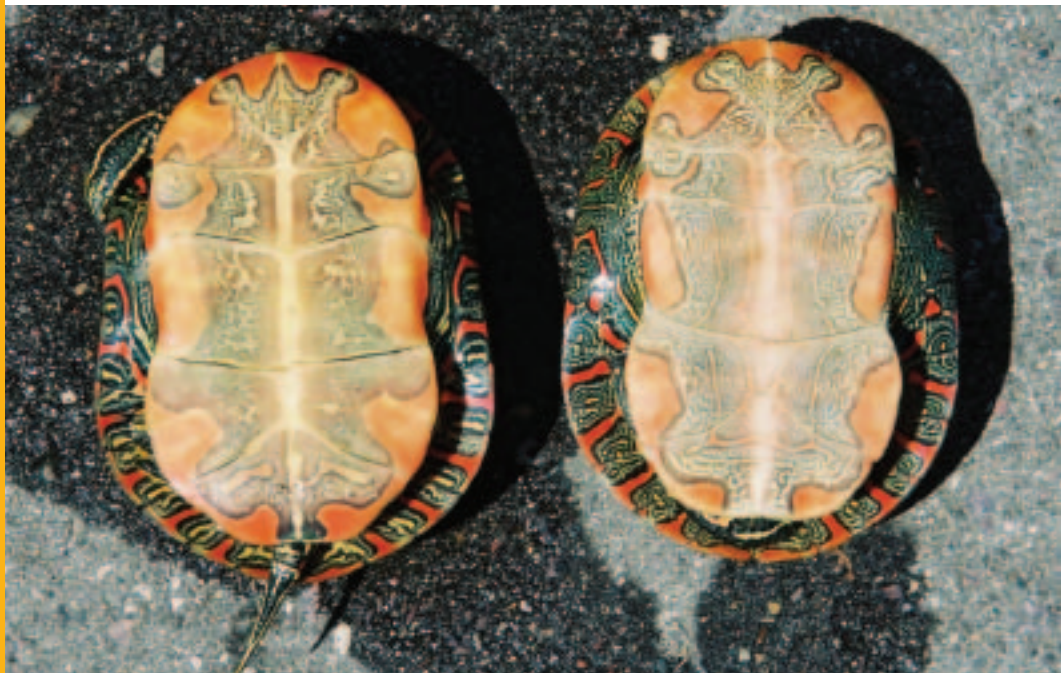
Snapping Turtle laying eggs. All South Dakota turtles lay hard-shelled or leathery eggs





Western Painted Turtle

Western Painted Turtle plastron



Western Painted Turtle (*Chrysemys picta bellii*)

Average adult size: carapace length, 16.2 cm (6.4 inches)
weight, 450 g (1 pound)

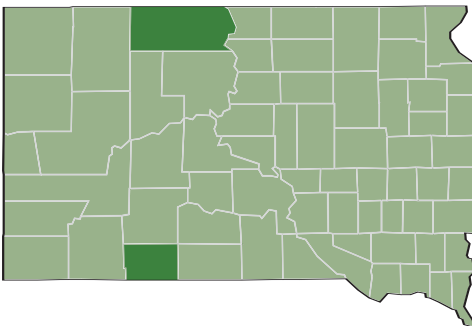
Identification: Western painted turtles are the most common and colorful turtles in South Dakota. They are small to medium sized and can be identified by their intricate pattern of red, orange-red, yellow, and black on their plastron as well as the bright yellow stripes on their dark skin.

Life history: These turtles have one of the longest active periods of any turtles in South Dakota. They emerge from hibernation in late March, weather permitting, and re-enter into hibernation in late October (Oldfield and Moriarty 1994). Western painted turtles are omnivorous and have a fixed tongue, so they must swallow their food underwater. Egg laying begins in May, and females lay approximately 10 eggs per clutch. Incubation lasts for 72-80 days, and the young emerge in early fall, although they do sometimes hibernate as hatchlings in the nest. Western painted turtle hatchlings can tolerate freezing of extracellular fluids during overwintering as long as there is adequate snow cover (Ernst et al. 1994).

Most species of turtles, including the western painted turtle, have temperature dependent sex determination. At soil temperatures greater than 30 C (86 F) only female turtles are produced in the nest. At soil temperatures from 20 to 27 C (60-81 F) only male turtles are produced. Both sexes are produced with temperatures less than 20 C (60 F) or between 28 and 30 C (82 to 86 F) (Ernst et al. 1994).

Western painted turtles can live to be over 40 years old in the wild. The western painted turtle is collected for biological supply companies, but probably not in great numbers in South Dakota.

Distribution and Habitat: Western painted turtles can be found in any permanent body of water across the state of South Dakota that has rocks and/or logs in the mud to facilitate hibernation and basking.



- Specimens captured or sighted in South Dakota (2002-2003).
- Sightings by professional biologists (prior to 2003).
- No specimens reported during or prior to this study.



Snapping Turtle with algae on its shell

Hatchling Snapping Turtle, about 3 days old and 2 inches long



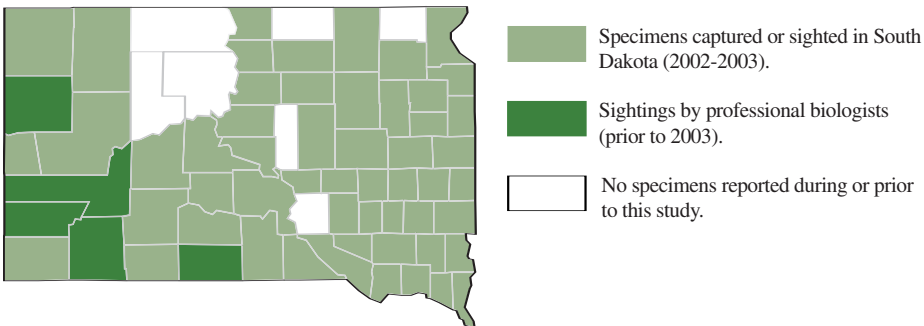
Snapping Turtle (*Chelydra serpentina*)

Average adult size: carapace length, 29.3 cm (11.5 inches)
weight, 5,807 g (12.8 pounds)

Identification: Snapping turtles are the largest and most aggressive turtles in South Dakota. They are also one of the more common turtles. The largest specimen captured and recorded in the state was a female weighing over 44 pounds. Snapping turtles can be identified by their dark carapace with three longitudinal keels that wear down through the years, jagged margins along the back edge of the carapace, a tail that is long relative to body length, and a small x-shaped plastron. At maturity, female snapping turtles are, on average, smaller than males.

Life history: Snapping turtles are known for their aggressive nature and large powerful jaws. Like the western painted turtle, the snapping turtle is omnivorous and has a fixed tongue. Sexual maturity is reached between 5 and 7 years of age, and egg laying occurs in open, sandy areas in early June. Like western painted turtles, snapping turtle sex is dependent upon temperature. Eggs hatch after approximately 55 days, and most hatchlings emerge from the nest in the fall (Ernst et al. 1994). Because large turtles are usually harvested for human consumption, only a few snapping turtles live to be over 40 years old.

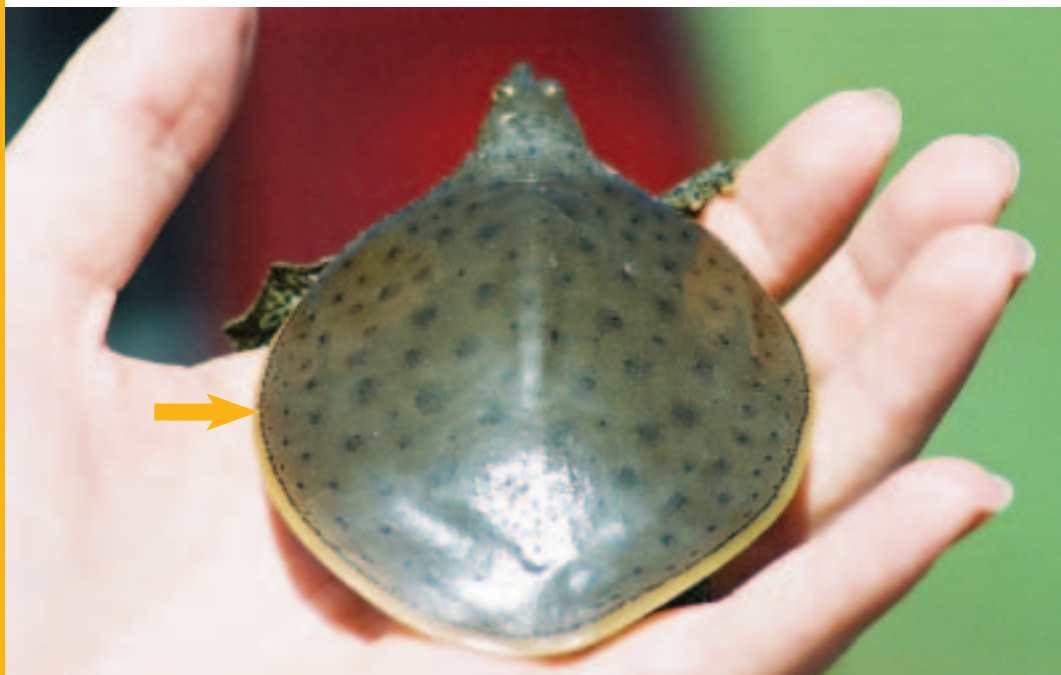
Distribution and habitat: Snapping turtles can be found in any permanent body of water in South Dakota, including wetlands, lakes, streams, rivers, ponds, and ditches. They are occasionally seen basking in the spring on logs or rocks near water. Basking helps kill the algae on the carapace; the algae cause the strong swamp odor that is common to snapping turtles.





Spiny Softshell Turtle, note spines on front edge of carapace

Juvenile Spiny Softshell Turtle, note dark line around edge of carapace



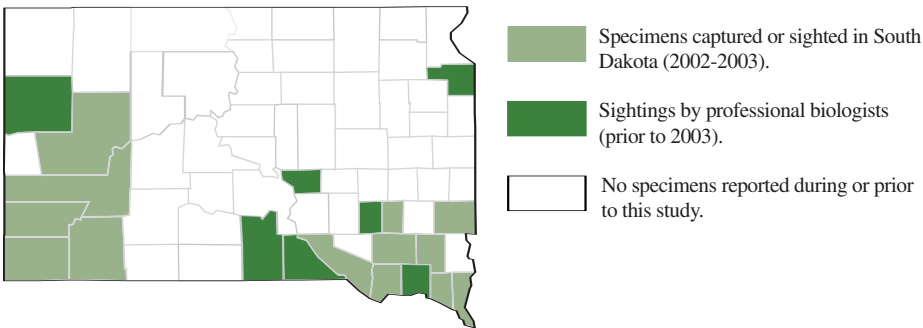
Spiny Softshell Turtle (*Apalone spinifera*)

Average adult size: carapace length, 15.2 cm (6 inches)
weight, 2,050 g (4.5 pounds)

Identification: Spiny softshells can be identified by their patterned yellow and green carapace with prominent ocelli (eye-like spots) and a dark line running along the margin of the carapace. The spiny softshell can be distinguished from the smooth softshell by the small spines on the front edge of the carapace and its sandpaper texture on the entire carapace. Also, in contrast to smooth softshell turtles, spiny softshells have lateral extensions in the nasal septum (nostrils) of their long tubular snouts. Spiny softshell turtles have a black-bordered yellow stripe that runs back from the snout, around the eyes, and onto the neck. Males are usually smaller than the females in this species.

Life history: Spiny softshell turtles, like snapping turtles, are very aggressive compared to other turtles in South Dakota. Spiny softshells are omnivorous, become active in mid-May, and usually nest in June and early July. Spiny softshell turtles typically lay 15-20 hard-shelled eggs, incubation lasts for 65-77 days, and most hatchlings emerge in the fall (Ernst et al. 1994). Softshell turtle eggs are hard-shelled (like those of chickens), whereas the rest of the aquatic turtle species and box turtles have leathery eggs. Spiny softshell turtles are unique in that their sex is determined by their genetics rather than by temperature as with most turtles. Individuals of this species can live over 20 years.

Distribution and habitat: This species is a very fast swimmer that frequents rivers, large lakes, streams, and reservoirs with sandy or muddy bottom substrates in which they overwinter.





Lateral extensions in the nasal septum of the Spiny Softshell Turtle



Smooth Softshell Turtle, note lack of lateral extensions in the snout



Smooth Softshell Turtle

Smooth Softshell Turtle plastron



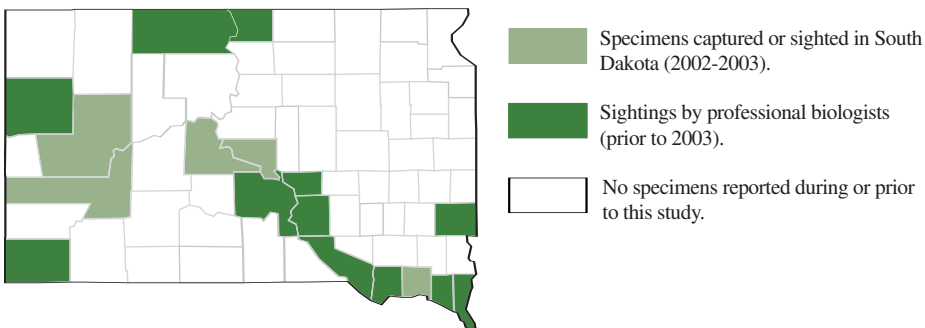
Smooth Softshell Turtle (*Apalone mutica*)

Average adult size: carapace length, 25.8 cm (10.2 inches)
weight, 1,270 g (2.8 pounds)

Identification: These turtles can be identified by their flat round “pancake” shaped shell, which is very flexible and leather-like. The carapace lacks spines on the front edge and is brown-gray with scattered small dots or dashes. These turtles have long tubular snouts with no lateral extensions. Males are usually much smaller than the females. Another identifying characteristic is a black-bordered cream line that extends from each eye to the neck.

Life history: Smooth softshell turtles have paddle-shaped feet that aid their movement in the water. They are more carnivorous throughout their life than other species. Smooth softshells become active in mid-May and usually nest in June or early July. Incubation lasts for 65-77 days, and most hatchlings emerge in the fall (Ernst et al. 1994). Smooth softshell turtles, like spiny softshells, are unique in that their sex is determined by their genetics rather than by temperature. Maximum lifespan is about 20 years for individuals of this species.

Distribution and habitat: Smooth softshell turtles can be found in large rivers with moderate to fast currents, such as portions of the Missouri River. They prefer soft sand or mud bottom substrates. This species basks and nests on sandbars in or near a river channel. In 2002 and 2003, no smooth or spiny softshells were captured north of Oahe Dam on the Missouri River. This may be because Oahe Dam, which was built in the late 1950s, may have created a barrier to their movement up the Missouri River.





False Map Turtle

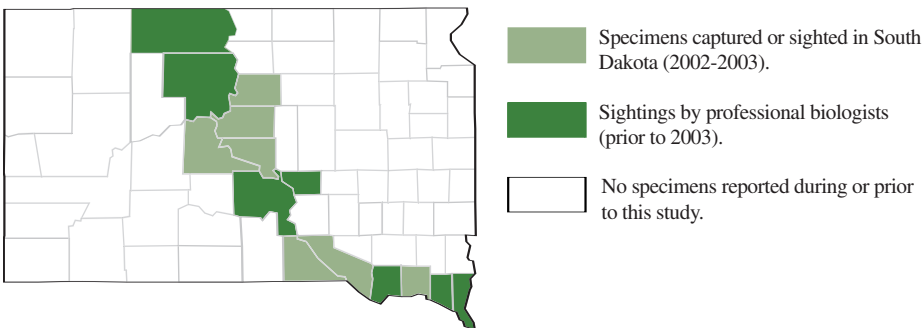
False Map Turtle (*Graptemys pseudogeographica*)

Average adult size: carapace length, 18.1 cm (7.1 inches)
weight, 743 g (1.6 pounds)

Identification: False map turtles can be identified by their black-tipped vertebral keels and dark brown, olive, or black shells. These turtles also have a prominent backward yellow “L” above each eye and three yellow necklines that reach the eye. The carapace has a netlike pattern of faint yellow or orange lines. Males of this species are usually much smaller than the females. False map turtles can be distinguished from the similar-appearing western painted turtle by their black-tipped vertebral keels, yellow head markings, and lack of a colorful plastron.

Life history: As do all aquatic turtle species, false map turtles lay their eggs in open sandy areas close to their wetland habitats. They usually lay two clutches of eggs per season from late May to early July. Incubation lasts from 60 to 75 days, and hatchlings usually emerge in September or hibernate in the nest and emerge early the following spring (Ernst et al. 1994). The sex of false map turtles is determined by temperature. False map turtles primarily eat mollusks, plant material, insects and fish. They usually overwinter in the soft substrates of a river bottom. This species is wary of humans and difficult to approach. Individuals of this species are known to live up to 35 years and possibly longer in captivity.

Distribution and habitat: False map turtles can be found in large rivers and their associated oxbows, as well as in wetlands close to the river. They prefer soft substrates, abundant vegetation, and basking sites that are protected from shore predators. The false map turtle is a state-threatened species in South Dakota. Confirmed sightings should be reported to South Dakota Natural Heritage Program, South Dakota Department of Game, Fish & Parks, 523 East Capital-Foss Building, Pierre, SD 57501.





False Map Turtle, note backwards yellow "L's"

Left, adult female False Map Turtle; right, adult male False Map Turtle, note black-tipped vertebral keel





Sandy grasslands of south-central South Dakota, Western Ornate Box Turtle habitat



Western Ornate Box Turtle

Plastron of the Western Ornate Box Turtle



Western Ornate Box Turtle

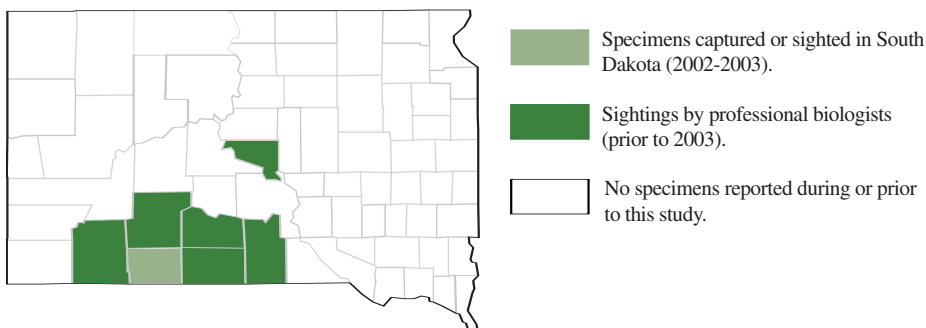
(*Terrapene ornata ornata*)

Average adult size: carapace length, 13.1 cm (5.2 inches)
weight, 320 g (0.7 pound)

Identification: Western ornate box turtles can be identified by their small, rounded shell that is dark with yellow stripes. They have double-hinged plastrons, so they can entirely enclose within their shells. They are the only true box turtle in South Dakota. The eye of an adult male has a red iris, whereas an adult female has a yellowish brown iris. The posterior portion of the plastron is also slightly concave on adult male ornate box turtles.

Life history: Ornate box turtles are mainly carnivorous, and their diet consists primarily of insects and earthworms but they also consume vegetation. Ornate box turtles overwinter in burrows dug in sandy soils. They usually nest in small burrows in open, well-drained areas. Nesting occurs in June with clutches of four to six eggs. Egg development lasts for approximately 60 days, and hatchlings may sometimes overwinter in the nest (Ernst et al. 1994). Ornate box turtles have temperature-determined sex. Individuals can live to be over 40 years old in captivity, and they are extensively collected for the pet trade.

Distribution and habitat: Ornate box turtles are the only fully terrestrial turtles found in South Dakota. This species occurs in the sandhills and open grasslands in the south-central and central part of the state.





Blanding's Turtle (from Oldfield and Moriarty, 1994)

Habitat where Blanding's Turtles occur



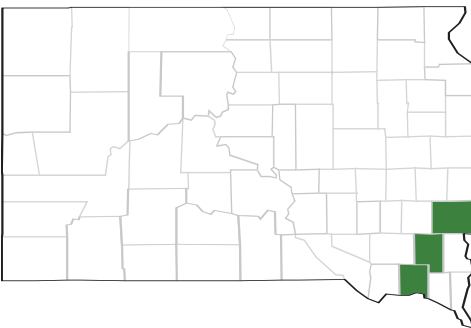
Blanding's Turtle (*Emydoidea blandingii*)

Average adult size: carapage length, 15.3 cm (6 inches)
weight, up to 1,360 g (3 pounds)

Identification: Blanding's turtles are the rarest turtles in South Dakota. They can be identified by their high, domed carapace, notched upper jaw, and bright yellow chin and throat. Blanding's turtles have a reputation of looking like they are always smiling. Females are smaller than males at maturity.

Life history: Members of this species are semi-box turtles because only the front edge of their plastron is hinged, which does not fully protect the turtle from predators. Blanding's turtles are omnivorous. Unlike other aquatic turtles, they do not need to swallow their food items underwater. Nesting occurs during early June with 8 to 10 eggs per nest. Egg development lasts approximately 60 days, with most hatchlings emerging in the fall (Ernst et al. 1994). Blanding's turtles have temperature dependent sex determination. Many individuals of this species are known to be at least 60 years old, and they can live up to 100 years.

Habitat and distribution: Blanding's turtles are very shy. They favor open, slow moving waters such as backwaters, wetlands, and ponds with abundant vegetation where they can overwinter in the muddy bottoms. There are currently only three records of Blanding's turtles in South Dakota. They are known to occur locally in border counties in Minnesota, northern Nebraska, and throughout most of Iowa, so they are expected to also occur in southeastern South Dakota. The Blanding's turtle is listed as a state-endangered species in South Dakota. Confirmed sightings should be reported to South Dakota Natural Heritage Program, South Dakota Department of Game, Fish & Parks, 523 East Capital-Foss Building, Pierre, SD 57501.



■ Records from the South Dakota Natural Heritage Program (1963-2003).

□ No specimens reported during or prior to this study.



Sarah Bandas measuring and weighing a Western Painted Turtle during her study

Identification keys to South Dakota turtles

- 1A. Turtle has a soft shellgo to Key 1
- 1B. Turtle has a hard shellgo to Key 2

Key 1

- 1A. Front edge of carapace spiny, deviated nasal septum (see page 19)
.....Spiny Softshell Turtle
- 1B. Front edge of carapace smooth, smooth nasal septum (see page 23)
.....Smooth Softshell Turtle

Key 2

- 1A. Plastron one piecego to 2
- 1B. Plastron hingedgo to 4

- 2A. Serrations on posterior edge of carapace (see page 5)go to 3
- 2B. No serrations on posterior edge of carapace (see page 15)
.....Western Painted Turtle

- 3A. Yellow “L” behind each eyeFalse Map Turtle
- 3B. Plastron brown and reducedSnapping Turtle

- 4A. Yellow underside of neckBlanding’s Turtle
- 4B. Yellow stripes on carapaceOrnate Box Turtle



Western Painted Turtles basking

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Turtles...

... are those splashes you hear when approaching a lake shore, those “rocks” that move, the “crawler” crossing the road at any cost (if you can do it safely, you should pull over and help him but DON'T put him back where he came from, he'll just start out again).

Maybe we don't give turtles enough credit. They are the stuff of mythology, religion, and folklore. They are an integral part of the history of North Africans, Native Americans, Chinese, and other groups around the world. Turtles were here before the dinosaurs —and you notice which animal is still around.

But turtles in South Dakota often live a precarious existence. Five of the seven species found in our state are “listed,” that is, those five are either state endangered, state threatened, or rare. Since the presence of turtles tells us about the health of their environment—a part of our environment, too—we should take some time to understand these creatures and where they live.