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TORTOISES AND TURTLES

Common Musk Turtle

Sternotherus odoratus

Sternotherus odoratus is a small, almost entirely aquatic turtle from eastern North America. The shell grows to only 8-13 cm, but the animal can live for many decades. The species is most active at dusk and at night, is a poor swimmer and needs a filtered tank with relatively shallow water, a hot lamp and UVB. When it feels threatened, it releases a foul-smelling fluid.

Family: Kinosternidae Former name: *Kinosternon odoratum*

KEY FACTS

THE ANIMAL

Adult size	**8-13 cm** total length incl. tail
Lifespan	**20-50 years**
Active	**At dusk and at night**
Lifestyle	**Aquatic**
Habitat	**Wetland**
Difficulty	**Beginner**

CARE

Min. enclosure	**80 × 40 × 45 cm** L × W × H for 1 adult
Temperature, day	**24-29 °C**
Basking spot	**30-35 °C**
Temperature, night	**20-24 °C**
Humidity	**50-80%**
Water	**Aquaterrarium** depth 15-25 cm
Water temperature	**22-26 °C**
UVB	**Essential** Ferguson zone 2
Diet	**Insects, complete diet, plants, vertebrates and worms/snails**
Kept	**Singly or in pairs**

BREEDING

Reproduction	**Egg-laying**
Sexually mature	**48-120 months**
Clutch size	**1-6 eggs**
Clutches per year	**1-4**
Incubation	**60-86 days** at 25-28 °C

PROTECTION AND PAPERWORK

CITES	**Appendix II**
EU annex	**Annex B**
IUCN	**Least Concern (LC)**

About the species

Sternotherus odoratus is one of the smallest turtles in North America. All measurements in the text are shell length (carapace). Adults are 8-13 cm, and males are slightly larger than females. The shell is elongated, narrow and highly domed, blackish brown with irregular black streaks or spots and often overgrown with algae. The central keel is distinct in juveniles and flattens out in adults. The plastron is small, yellow or cream with dark spots, and it has only one non-functional hinge. Skin can be seen between the plates of the plastron, which distinguishes the species from the *Kinosternon* species. The skin is greyish black with yellow spots and stripes on the legs and neck.

The head has a narrow, pointed snout and two yellow stripes on each side, one above and one below the eye. The stripes are most distinct in young animals. Small sensory barbels sit on the chin and throat. The male has a larger head, a longer tail that is broad at the base and thinner towards the tip, and patches of scales on the hind legs, which he uses to hold on to the female. Newly hatched young measure about 25 mm and are the smallest turtles in North America.

The turtle has glands along the edges of the plastron that release an orange, foul-smelling fluid when the animal is frightened. This explains the species name, which comes from Latin *odor* (smell). The release of scent often diminishes in animals that are handled. With good care the species typically lives 20-50 years, and the greatest known age in captivity is just under 55 years.

Distribution and habitat

Sternotherus odoratus is native to eastern North America: from southern Ontario and Quebec in Canada through New England and the eastern and central states of the USA to Florida and the Gulf Coast, and west to Wisconsin, Illinois, south-eastern Kansas, eastern Oklahoma and eastern Texas. The species occurs from sea level to about 1,170 m.

Outside the native range there are a few introduced populations, for example in California and Germany. The countries on the map show only the native range.

> **Native range:** United States and Canada.

HABITAT

Sternotherus odoratus lives in lakes, ponds, slow rivers and swamps, preferably in shallow, clear, densely vegetated water. The water depth is rarely more than 2 m. The animals walk mostly along the bottom and swim poorly. The species is most active at dusk and at night, and it is more nocturnal in the southern parts, where the nights are warmer.

The animals bask on branches and forks above the water, from which they drop into the water. They climb fairly well, up to about 2 m above the water. On land they are seen only in rain or to lay eggs, and they rarely move between separate bodies of water. On average they cover about 27 m a day.

When the water becomes colder than about 10 °C, the animals go into winter dormancy and bury themselves about 30 cm down in the mud. In the south-eastern USA they breed all year round, with peaks in spring and autumn.

Read more: Brumation and the seasons

Care

THE ENCLOSURE

Keep the animal in an aquarium or a low tub, not in an ordinary terrarium. The tub must be at least five times as long as the shell and half as wide as it is long, but never smaller than 80 × 40 cm for an adult. The species walks along the bottom and swims poorly, so floor area matters more than water depth. A tub of 80 × 40 × 45 cm gives about 80 litres with 25 cm of water and a rim 20 cm above the water, and that is the minimum for one adult. A pair needs at least 100 × 50 cm. The species climbs well, so the aquarium must have a lid, and the furnishings must not form a staircase up to the rim.

The water depth must be shallow enough that the animal can stand with its hind legs on the bottom and reach its head above the surface without swimming. Make a depth gradient with flat stones, and provide a floating platform or a stone as a land area. A bottom of medium-sized stones or no substrate at all is easiest to clean. Plants and hides give security.

Preferably keep one animal. Two males must not be kept together. A male kept with a female may chase her persistently, so they must be able to be separated. Two females can be kept together if there is room.

The species is a messy eater and swims poorly, so the current must be weak. Choose a filter rated for at least 2-3 times the volume of water, without creating a strong current. A separate feeding tub makes cleaning easier.

TEMPERATURE

The water should be 22-26 °C, and a water heater is normally necessary. Avoid heating cables or heat mats under the tank, because the animal walks along the bottom and can burn itself. Place the water heater behind a plastic guard. If the room is warm enough, the heater can be dispensed with; measure the temperature over a couple of weeks before the animal moves in.

The surface of the basking spot should be 30-35 °C, and the air above the water about 29 °C. Use a heat lamp, possibly a ceramic heat emitter in a metal dome. At night the temperature may fall a little; 20-24 °C is an estimate. Branches and edges above the water must not come too close to the heat lamp.

Adult animals tolerate cooler water, down to room temperature, when they have a warm basking spot; young animals need warm water of about 25 °C. In the wild the species goes into winter dormancy when the water becomes colder than about 10 °C and buries itself in the mud. Winter dormancy is not necessary in captivity.

Read more: Heat and temperature

HUMIDITY AND WATER

The turtle's humidity is the water itself, so the relative humidity of the air is not decisive and is not documented in more detail for the species; 50-80 % in the room is ample. The air above the tank must not be cold or draughty, because this increases the risk of respiratory infections.

The water quickly becomes dirty because the species is a messy eater. Use water without chlorine, and change part of the water regularly. Clean the tank thoroughly every few months.

Read more: Humidity, misting and ventilation

WATER AND WATER QUALITY

The water is the animal's living space. The water depth is 15-25 cm for adult animals and lower for juveniles, with shallower areas where the animal can rest. The depth must be shallow enough that the animal can stretch its neck and breathe without swimming, and only part of the tank needs to be deep. The temperature is 22-26 °C (see Temperature).

Use a filter that filters both mechanically and biologically and is rated for at least 2-3 times the volume of water. An internal filter is normally sufficient when the current is weak. Use water without chlorine. Connect all electrical equipment near the water to a residual current device (RCD), and unplug it with dry hands before touching the filter.

LIGHTING AND UVB

UVB is necessary for the animal to produce vitamin D3 and absorb calcium. Even if the animal does not always come out of the water, there must be a basking spot with a lamp so that it can choose. The Ferguson zone is not documented for the species; zone 2 is an estimate based on the species being crepuscular and not always basking. Use a high-quality UVB tube over the basking spot, with no glass or plastic in between, and replace the tube regularly, as its output declines.

The light should be on for about 12 hours a day and off for 12 hours. Let the animal be able to retreat into shade or a hiding place.

Read more: Lighting and UVB Read more: Calcium, vitamins and supplements

FEEDING

Sternotherus odoratus is omnivorous but mainly carnivorous. In the wild it eats small snails, mussels, crayfish, aquatic insects such as dragonfly and damselfly larvae, worms, small tadpoles, eggs and carrion, and a little plant matter and seeds. Adults eat mostly in the water. The species has difficulty catching prey, because it cannot create suction, so the food must lie right in front of the mouth.

In captivity earthworms, pieces of fish and shrimp, crickets, bloodworms, farmed snails, black soldier fly larvae, mealworms and pellets for aquatic turtles are accepted. Greens such as duckweed, Canadian waterweed and spinach can be offered in small amounts. Feeding frequency and quantity are not documented for the species; give only what the animal eats in a short time, and remove leftovers.

The species is a messy eater, so a separate feeding tank is an advantage; there calcium and vitamins can be sprinkled on the food. Feeder insects should first be given calcium-rich food.

Read more: Feeder animals: keeping and breeding Read more: Rearing tadpoles

BEHAVIOUR AND HANDLING

Sternotherus odoratus is shy and walks mostly along the bottom. It is not an animal to pick up: it can bite with its long, mobile neck and release a foul-smelling fluid. If the animal has to be moved, hold it at the rear of the shell and keep your fingers back. The release of fluid often diminishes in animals that are handled.

The animal can climb, so provide a lid. It does best alone. Several females can be kept together in a large tank, but two males must not.

Breeding

SEXUAL MATURITY AND SEXING

The male has a larger head, a longer tail with a broad base and thin tip and patches of scales on the hind legs, and he grows slightly larger than the female. Males are sexually mature after 4-6 years at about 6 cm shell length and females after 8-10 years at about 8 cm.

MATING

Mating takes place in the water. In the south-eastern USA the species breeds all year round, with peaks in spring and autumn. The male chases the female, nudges her shell, bites her head and sits on her, and the female can store sperm from autumn through winter. Courtship is rough, so the pair must be watched, and the female must be able to get away.

EGG-LAYING AND CLUTCHES

The female lays 1-6 eggs per clutch, about 19 × 25 mm, and 1-4 clutches a year. The highest known number of eggs in a season is 9. She digs a shallow nest, often under logs or in shade, and several females can share a nest. The eggs have a thick but brittle shell. Provide the female with a box of soil or sand on the land area, so that she has somewhere to dig.

INCUBATION

The eggs hatch after 60-86 days. With artificial incubation 25-28 °C is suitable, and the eggs then hatch after about 70 days. The sex is determined by the incubation temperature: above 28 °C almost only females are produced, and below 25 °C almost only males. The incubation humidity is not known for the species. In the wild some young stay in the nest all winter and seek water only in spring.

Read more: Incubating eggs

REARING THE YOUNG

The young are about 25 mm and 1.6-3.2 g at hatching and have a high keel on the shell. They need shallow water, plants and hiding places and small feeder insects. The water should be about 25 °C, and the basking spot about 35 °C. Feeding frequency for young animals is not known for the species. Keep the young separate from adult animals and make sure all of them get food.

Health and common mistakes

Turtles hide illness, so watch for changes. Weigh and measure the animal regularly, and keep a log of weight, appetite and behaviour. A healthy animal has a smooth shell without lumps, clear eyes and is active and inquisitive.

Typical problems and mistakes in care: - Lack of UVB or calcium: this causes a deformed shell with pyramided scutes and bone disease. - Respiratory infection from air that is too cold or too damp: runny nose, watery eyes and lethargy. - Dirty water, especially because the species is a messy eater. - Incorrect layout, where the animal cannot reach the surface without swimming.

All reptiles can be symptom-free carriers of *Salmonella* and infect humans. Wash your hands before and after contact with the animal, water and equipment. After a bite, rinse the wound under running water and clean it with mild soap.

See a vet with experience in reptiles if the animal loses weight, does not eat, has an open mouth or seems lethargic.

Read more: Quarantine and hygiene

Always ask someone who knows

This guide is a good place to start, but it cannot replace experience. Animals differ, and much of what matters most is learned from people who have kept the species for years. Talk to a breeder, an experienced keeper or a vet who knows reptiles and amphibians before you get the animal - and again if anything looks wrong.

The full guide with map and updates: herpy.org/en/tortoises-and-turtles/sternotherus-odoratus