herpy

TORTOISES AND TURTLES

Russian Tortoise

Testudo horsfieldii

Testudo horsfieldii is a small, hardy steppe tortoise from Central Asia with four claws on each foot and a great talent for digging. The shell reaches 13-25 cm in length, and the species can live for 40-50 years. It does best in a large, dry enclosure with sun, outdoors in summer, and a cool hibernation.

Family: Testudinidae Former name: *Agrionemys horsfieldii; Agrionemys horsfieldi*

KEY FACTS

THE ANIMAL

Adult size	**13-25 cm** total length incl. tail
Lifespan	**40-50 years**
Active	**By day and at dusk**
Lifestyle	**Terrestrial and burrowing**
Habitat	**Desert and semi-desert**
Difficulty	**Intermediate**

CARE

Min. enclosure	**200 × 100 × 50 cm** L × W × H for 1 adult
Temperature, day	**24-29 °C**
Basking spot	**35-38 °C**
Temperature, night	**20-23 °C**
Humidity	**40-60%**
Water	**Water dish**
UVB	**Essential** Ferguson zone 3
Winter rest	**4-6 °C** 8-16 weeks
Diet	**Plants**
Kept	**Singly or in groups**

BREEDING

Reproduction	**Egg-laying**
Sexually mature	**120 months**
Clutch size	**2-6 eggs**
Clutches per year	**1-4**
Incubation	**60-75 days** at 30-31 °C

PROTECTION AND PAPERWORK

CITES	**Appendix II**
EU annex	**Annex B**
IUCN	**Vulnerable (VU)**

About the species

Testudo horsfieldii is a small tortoise with a rounded-oval, low shell that is flat along the back. The shell is light brown, yellowish green or olive with dark blotches on the large scutes, and the plastron is often patchily dark or entirely black. The skin is yellowish brown. The species has four claws on each foot, where the other *Testudo* species have five on the forelegs, and the tip of the tail ends in a hard, bony spur. The rear marginal scutes are enlarged and often slightly serrated.

The shell length (carapace) is 13-25 cm, 15-20 cm in most adults. Females grow largest, while males are typically 13-18 cm. The male has a longer tail, often held to the side, and longer claws. The female has a short, thick tail. The species is the type species of the genus *Agrionemys*, in which it has often been placed, but it is now generally regarded as a *Testudo*. Several subspecies have been described, but they are not widely recognised, and animals in the trade are identified as the species.

The species name honours the naturalist Thomas Horsfield. In 1968 two animals of the species flew around the Moon aboard the Soviet probe Zond 5, making them among the first living creatures to do so.

T. horsfieldii is robust and active, but it is not a pet for frequent handling. It needs a lot of floor space, sun and an annual hibernation, and it is not fully grown until the age of 20-30. In captivity the species can hybridise with other *Testudo* species, so it must not be kept together with them.

Read more: Brumation and the seasons

Distribution and habitat

The species lives in Central Asia: southern Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan, north-eastern Iran, Afghanistan, northern Pakistan and the far west of China (Xinjiang). It is found up to about 2,400 m in Afghanistan.

Reports of its occurrence in Armenia and Nepal are unconfirmed, and the species does not occur in Russia proper. It is not native to Europe. Populations are under pressure from collection for the trade, overgrazing, agriculture and war.

> **Native range:** Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan, Iran, Afghanistan, Pakistan and China.

HABITAT

The species lives on dry steppe, in stony semi-desert and on sandy or clayey soil with sparse vegetation. It is most often found near springs and streams, where grasses and herbs are most lush.

Life is lived in burrows. The animals dig tunnels 80-200 cm long with a widened chamber at the end where they can turn around, and they spend the midday heat and the night underground. Spring is the peak season: the animals emerge in March-May, mate straight away and eat fresh herbs for as long as they are succulent. The active period is short, about three months of the year. When summer turns hot and the plants dry out, the animals dig down and go into summer dormancy. In winter they hibernate at about 4-5 °C deep in the burrow, while the temperature at the surface can fall below freezing.

Care

THE ENCLOSURE

Floor area is what matters most, not height. A glass terrarium is not suitable: the air quickly becomes humid and stuffy, and there is no room to move. Indoors, an open tortoise table is best, with a length of at least 8 times and a width of 4 times the expected shell length of the animal. Less space is often used successfully, but the general recommendation is 8 × 4 times the shell length. For an adult tortoise of 25 cm, that gives at least 200 × 100 cm, and 200 × 200 cm is better. The sides must be opaque and about 50 cm high, because the species climbs surprisingly well. Each additional tortoise needs at least 1 m² more.

The best solution is an outdoor enclosure in summer, in a sunny spot with shade and good drainage, supplemented by a greenhouse or a covered section for cold and wet weather. The wall must be smooth and opaque, for example of concrete blocks, at least 45 cm high, and extend at least 30 cm into the ground. Cover with netting against foxes and birds of prey. Small juveniles are kept indoors until they are about 10 cm. In a cool northern European climate the animal must be indoors or in a heated house when the daytime temperature no longer stays above about 20 °C and when nights fall below 10 °C.

The substrate must be very dry and well drained, for example 60 % sand and 40 % topsoil, at least 10 cm deep for juveniles and 15 cm for adults, so the animal can dig in. Damp clay soil and lawn cause skin, shell and respiratory infections; on clay soil, dig out to a depth of 30 cm and fill with gravel and sandy soil. Provide hides of cork bark and flat stones, and a humid hide at the cool end. Remove droppings daily, and change the substrate completely every few months indoors.

TEMPERATURE

Indoors there must be a basking spot of 35-38 °C, a cool zone of 24-29 °C and 20-23 °C at night. Use one or two heat spots over the basking spot and, if needed, a ceramic heater on a thermostat for the night, and measure with digital thermometers at both ends. If the whole enclosure is above about 30 °C, the animal becomes stressed: in the wild it digs in to avoid the summer heat and is only out in the morning and evening.

Outdoors the animals need no extra heat on warm summer days, but when the nights fall below 10 °C, there must be a hide with light-free heat (ceramic heater or radiant panel) set to about 16 °C. A greenhouse in a sunny spot gets warm enough on most days.

Hibernation: the species hibernates in the wild, and healthy animals should do so in captivity. The temperature must be 4-6 °C, as close to 5 °C as possible, for 8-16 weeks, also for large animals. If the temperature falls towards 2.5 °C, there is a risk of frost, and above 10 °C for a longer time the animal draws on its reserves and wakes. See the section on health for

preparation and checks.

Read more: Heat and temperature

HUMIDITY AND WATER

The species is adapted to a dry climate, so the enclosure is kept dry and well drained, with a relative humidity of about 40-60 %. There must, however, always be a humid hide, for example a cave or box filled with damp soil at the cool end, because the burrows in the wild are far more humid than the air outside. Juveniles are the most prone to dehydration and are kept slightly more humid, 40-75 %, highest at night. Spray the substrate, not the animal.

Juveniles should sit in lukewarm, shallow water for 10-15 minutes 2 times a week so they get enough fluid. Otherwise keep the animal dry: if the substrate stays constantly wet, it can cause shell rot (infection of the shell).

Read more: Humidity, misting and ventilation

WATER AND WATER QUALITY

There must always be a shallow, wide dish of fresh water, for example a plant saucer, sunk into the substrate so the animal can easily get in and out. The water must reach no higher than the animal's knees. The tortoise fouls the water quickly, so it must be changed daily, and the dish scrubbed with an animal-safe disinfectant once a week.

Read more: Quarantine and hygiene

LIGHTING AND UVB

The species is diurnal and needs both strong light and UVB (Ferguson zone 3) all year indoors, with a UV index of about 3-4 at the basking spot. Use a reflective T5 HO tube with 10-12 % UVB, about a third of the length of the enclosure, mounted on the warm side close to the heat lamp. The distance depends on the tube, reflector and mesh, so measure the UV index with a UVI meter, and replace the tube according to the manufacturer's instructions.

UVB is not strong enough as ambient light, so supplement with a powerful LED lamp of about 6500 K that covers most of the enclosure. Keep the light on for 14 hours in summer and 10 hours in winter. Outdoors, artificial light is unnecessary.

Read more: Lighting and UVB

FEEDING

T. horsfieldii is herbivorous and needs a high-fibre, low-protein and low-sugar diet. The staple is grasses, leaves, flowers and the herbs that grow wild: dandelion, clover, plantain, thistles, daisies and mallow, as well as flowers from the same plants. Everything must be free of pesticides. Lettuces such as endive and romaine can be used as filler. Hay and grass from the lawn supplement the diet. Variety is the key to a balanced diet. Spinach, cabbage, broccoli and the like are given only rarely and in small amounts, and fruit only very rarely, because sugar burdens digestion.

Growing juveniles may eat as much as they want every day. As the animal approaches adult size, the amount is limited to a daily portion the size of the shell, so the animal does not get fat. Serve the food on a flat stone or a tray so the animal does not swallow substrate.

Sprinkle a phosphorus-free calcium supplement over the food at least twice a week, more often for juveniles and for females during the egg-laying season, and leave a cuttlebone available at all times as a source of calcium and for wearing down the beak. The species easily becomes overweight, so a large enclosure that provides exercise is just as important as the right amount of food. Commercial pellets can be used for variety, but not as the staple.

Read more: Calcium, vitamins and supplements

BEHAVIOUR AND HANDLING

Tortoises seldom like being picked up, and the species is best for observing. Many can learn to enjoy a gentle scratch on the shell and to take food from the fingers. If the animal has to be lifted, take it from below with the palm under the belly and hold it with two hands around the shell, so that both body and legs are supported. A fall can cause serious injuries. Wash your hands before and after.

The animals are solitary and do perfectly well alone. Several animals require at least 1 m^2 of extra floor space per animal. Never keep several males together, because they fight, and a male and a female together produce eggs. The males pursue the females relentlessly, so females must be able to get away. The species digs a lot, also under the edge of the enclosure, so the wall must extend into the ground.

Breeding

SEXUAL MATURITY AND SEXING

Males are smaller and have a longer tail and claws than females. The male's vent sits further out on the tail than the female's. The animals are considered sexually mature at around 10 years of age, but growth and maturation depend on feeding and climate. Wait to breed until the female is fully grown and in good health.

MATING

Mating follows hibernation, in spring. The male circles the female, stops in front of her head and bobs his head rapidly, while he may bite her forelegs and ram her. During mating itself the male emits loud clucking or piping sounds.

Put the male with the female in a large area with many hides, and keep watch so the female can get away. Separate the animals if the male is too rough. A lack of hibernation can impair fertility.

EGG-LAYING AND CLUTCHES

The female lays 2-6 eggs in May or June and can lay up to three more clutches in the same season. She digs a nest in the sand or loose soil and covers the eggs. Give her a sunny, dry area with deep, loose soil where she can dig.

INCUBATION

Move the eggs carefully, without turning them, to an incubator with slightly moist vermiculite or perlite. At a stable temperature of 30-31 °C the eggs hatch after 60-75 days. In the wild it takes 80-110 days, and some hatchlings stay in the nest over winter and only emerge the following spring.

Read more: Incubating eggs

REARING THE YOUNG

The hatchlings have a shell length of 3 cm at hatching. Keep them in a small, dry enclosure with a humid hide, UVB and a basking spot, and bathe them in lukewarm water twice a week. Feed them every day: soft leaves and herbs in the amount they will eat. Growth is slow. Healthy juveniles can hibernate for a shorter period than adults, typically 8-12 weeks, but should first be examined by a vet.

Health and common mistakes

The typical problems are caused by incorrect conditions, not by the species itself:

- Shell rot and respiratory infections with a constantly damp substrate and cold, damp weather. Keep the animal dry, and provide dry, warm places to rest.
- Pyramiding (raised, thickened scutes) with air that is too dry, too much protein and too little UVB and calcium.
- Metabolic bone disease with a lack of UVB, vitamin D3 and calcium: soft shell, weak limbs and growth defects.
- Obesity and overly rapid growth when too much food, and food too rich in protein, is given.
- Overgrown beak and claws when there are no hard, coarse items to gnaw on.
- Internal parasites, which the vet checks with a faecal sample for new animals and before hibernation.

A healthy animal has clear eyes, a dry nose, a firm shell and a good appetite. Hibernation requires a healthy animal in good weight: sick, emaciated or newly acquired animals must not be hibernated, because illness progresses while the animal sleeps. Skipping hibernation is only an emergency solution, because a lack of hibernation over many years can cause appetite and kidney problems.

Before hibernation the animal fasts at above 13 °C so the gut is emptied: 2 weeks for animals under 1 kg and 3 weeks for animals of 1-1.5 kg. During the fast it is bathed 3-4 times a week so it drinks. Weight-to-length tables developed for Mediterranean tortoises do not suit this species and must not be used to assess it. Hibernation is kept at 4-6 °C for 8-16 weeks, in an insulated box in a frost-free, dark place or in a refrigerator without a freezer used only for the tortoise. Use two thermometers, and move the animal at once if the temperature approaches 2.5 °C. Weigh the animal every week or every other week: if it loses more than about 1 % of its weight in a month, or has urinated, it must be woken. Afterwards it should go into a lukewarm bath and under a heat lamp and begin eating within a week.

Read more: Common diseases and signs of illness

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/testudo-horsfieldii