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TORTOISES AND TURTLES

Diamondback Terrapin

Malaclemys terrapin

Malaclemys terrapin is a small to medium-sized, diurnal turtle from the coastal marshes and brackish waters of North America. It is the only turtle in its range that lives in brackish water, and it is recognised by the rings on the scutes and the dark-spotted head and legs. The female grows to 23 cm and the male to about 14 cm. The species needs clean, preferably slightly salty water and is best suited to experienced keepers.

Family: Emydidae

KEY FACTS

THE ANIMAL

Adult size	**12-23 cm** total length incl. tail
Weight	**300-1,000 g**
Lifespan	**25-40 years**
Active	**By day**
Lifestyle	**Semi-aquatic**
Habitat	**Wetland**
Difficulty	**Experienced**

CARE

Min. enclosure	**120 × 60 × 65 cm** L × W × H for 1 adult
Temperature, day	**24-28 °C**
Basking spot	**32-35 °C**
Temperature, night	**22-25 °C**
Humidity	**50-80%**
Water	**Aquaterrarium** depth 35-40 cm
Water temperature	**24-27 °C**
UVB	**Essential** Ferguson zone 3
Diet	**Insects, complete diet, vertebrates and worms/snails**
Kept	**Singly or in groups**

BREEDING

Reproduction	**Egg-laying**
Sexually mature	**24-120 months**
Clutch size	**4-22 eggs**
Clutches per year	**1-3**
Incubation	**60-85 days** at 26-30 °C

PROTECTION AND PAPERWORK

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

About the species

Malaclemys terrapin is a sturdily built turtle with a high shell. The carapace is grey, brown or almost black, and each scute has concentric rings or grooves. A keel with small knobs runs along the middle. The skin is grey, brown, yellowish or white with dark spots or wavy lines, and the upper lip is almost always white. No two animals have the same markings. The hind legs are large, and the toes have strong webbing.

All measurements in the text refer to shell length. The difference in size between the sexes is the greatest of any North American turtle: females reach 15-23 cm and weigh about 500 g, the largest up to 1 kg, while males reach 11-14 cm and weigh about 300 g. The female has a broader head and stronger jaws, which are used to crush shellfish. The male has a

longer, thicker tail.

There are seven subspecies, which differ in colour and shell shape, for example *M. t. terrapin* in the north, *M. t. rhizophorarum* in the mangroves of the Florida Keys and *M. t. littoralis* in Texas. Care is the same for all of them.

The species is alert and shy, but gets used to its keeper and learns the times of feeding. It is an animal to observe and not to handle.

Distribution and habitat

Malaclemys terrapin lives along the American east coast from Cape Cod in Massachusetts to the Florida Keys and on along the Gulf coast to Texas. An isolated population lives on Bermuda; it arrived there on its own and was not introduced.

The species is Vulnerable (VU) on the IUCN Red List, because populations are declining across most of its range. The threats are loss of marshes and nesting sites to coastal development, crab traps in which the animals drown, foxes and raccoons that take the eggs, road traffic and the large-scale harvesting for food in earlier times.

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

HABITAT

Malaclemys terrapin lives in tidal coastal areas: marshes with tall grasses, tidal creeks, lagoons, estuaries and, in Florida, mangrove swamps. The animals are adapted to varying salinity and can live in anything from fresh water to full seawater, but adults prefer brackish water. The skin is almost impermeable to salt, and there are salt glands near the eyes. The animals drink fresh rainwater from the surface and from falling raindrops.

The species is not found in the upper reaches of rivers. The animals often stay in the same area all their lives and do not travel far. In the cold season they hibernate in the mud of watercourses and marshes. The female goes up onto sand dunes and into scrub near the coast to lay eggs. The young spend their first years in small creeks and later move to the salt marshes.

Its food is snails, mussels, crabs and other crustaceans, insects, fish and carrion. The animal crushes the shells between strong, grooved jaws.

Care

THE ENCLOSURE

Keep *Malaclemys terrapin* in an aquarium or 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, with the basking area counted as part of the floor area. The water must be at least twice as deep as the shell is wide. The size in the box, 120 × 60 × 65 cm, is the minimum for one adult female of up to 23 cm and gives about 290 litres at 40 cm of water. A male of 12-14 cm manages with 80 × 40 cm, but plan for the size the animal will reach. A group of 4 females and 3 males needs at least 160 × 80 cm, for example in a large, deep tub. The water must be at least 30 cm deep before adults will mate.

The basking spot must be large, stable and easy to climb onto, so that the animal can climb completely out of the water and dry completely, including the plastron. A floating island or a sloping wooden bridge is better than stones, which can slip and trap the animal, and which the animal bangs its shell against when it dives into the water. A female must have a box of damp sand on the land area for egg-laying, even without a male.

The bottom can be bare, which is easiest to keep clean. If a substrate is wanted, fine crushed coral is suitable, while gravel can lodge in the gut. Hides and plants must be firmly fixed.

Powerful filtration is necessary. Use an external canister filter rated for at least twice as much water as the tub holds. Feeding in a separate tub keeps the main tub cleaner, because the species crushes its food and makes a big mess.

Read more: Heat and temperature

TEMPERATURE

The water should be 24-27 °C for adults, about 28 °C for subadults and about 29 °C for newly hatched young. In an outdoor pond the water follows the season. The basking spot should be 32-35 °C, measured at the surface. The air above the water is 24-28 °C during the day and 22-25 °C at night.

Beware of overheating. Both young and adults can die from a basking spot that is too hot or from direct sun without shade and cool water to retreat into. The animal must always be able to get down into the water.

Animals kept indoors at an even temperature all year round should not be given a hibernation period.

Read more: Brumation and the seasons

HUMIDITY AND WATER

Air humidity is not decisive; 50-80 % is sufficient. What is decisive is the purity of the water. If the water is the slightest bit dirty, the animal gets skin problems and shell rot. The first sign is a red ring around the eyes or white patches on the skin; without treatment it can kill the animal in a few days.

Change a quarter to a third of the water every week, and remove food remains immediately.

Read more: Humidity, misting and ventilation

WATER AND WATER QUALITY

The species lives in brackish water in the wild, and salinity is the most important choice in its care. Brackish water keeps the skin and shell healthy. Wild-caught adults must live in brackish water for life: specific gravity 1.012-1.014, measured with a hydrometer. Newly caught animals start at 1.017-1.019 for the first three months. Use marine salt for aquariums, not table salt, and mix the salt in a separate container before a water change. Evaporated water is replaced with fresh water, because the salt stays in the tank.

An animal in brackish water needs fresh drinking water once a week: put it in a small tub of fresh water for about 15 minutes. Captive-bred young can grow up in fresh water, and captive-bred adults that have grown up in fresh water can stay in it if the water is kept very clean. Watch for shell rot. Never switch suddenly between brackish water and fresh water: lower the salinity by 0.002 every other week down to 1.008 before the animal goes into fresh water.

Check ammonia and nitrite every week; both must be 0. All electrical equipment near the water must be behind a residual current device (RCD).

Read more: Buying animals: captive-bred, wild-caught and transport

LIGHTING AND UVB

UVB is necessary for the bones, and the animal must have access to both UVA and UVB. The Ferguson zone has not been documented for the species; zone 3 is borrowed from *Graptemys pseudogeographica* and *Trachemys scripta*. Mercury vapour lamps provide both heat and UVB in one place; follow the manufacturer's instructions for the distance to the basking spot. UVB output falls over time, so measure the UV index once a month, and replace the bulb when it falls.

Glass and plastic block UVB. The light must be on for 12 hours a day. Direct sun outdoors once a week for 30-60 minutes is good for the animal, but only with shade and cool water to retreat into.

Read more: Lighting and UVB

FEEDING

Malaclemys terrapin is a carnivore and eats in the water. In the wild it takes snails, mussels, crabs, fish and insects. In captivity the food must be varied: small fish, shrimp, krill, mussels, snails, scallops, salmon and smelt as well as pellets for carnivorous aquatic turtles. One kind of food alone does not meet the need.

Young are fed every day, subadults every other day and adults two to three times a week. Give only what the animal can eat in 5 minutes, and remove the remains. Crushed coral on the bottom is a good source of calcium and also wears the beak down.

Read more: Calcium, vitamins and supplements

BEHAVIOUR AND HANDLING

Malaclemys terrapin is alert and gets used to its keeper, but is easily stressed. It flees in the water when disturbed and can injure itself on hard objects. It rarely bites. If the animal must be lifted, take it from the side with both hands, and keep your hand away from the head. Wash your hands before and after.

The species is social and likes to bask together, often on top of each other. It can be kept singly or in a group of animals of the same size, when the tub is big enough. In a tub that is too small the animals become aggressive.

Breeding

SEXUAL MATURITY AND SEXING

Males become sexually mature after 2-3 years and at about 11 cm; females after 6-7 years and, in the northern populations, after 8-10 years. The female has a broader head and is far larger, and the male has a longer, thicker tail.

MATING

Mating takes place early in spring. The female can mate with several males and store sperm for several years, so clutches can have several fathers. Keep the male and female together in a large tub with at least 30 cm of water, and separate them if the male is too persistent.

EGG-LAYING AND CLUTCHES

The female lays 4-22 eggs per clutch, 6-11 on average and most in the north. Egg-laying takes place in June and July, in Florida from the end of April, in dunes and sandy scrub near the sea. Up to three clutches a year is normal, and in captivity up to five clutches are possible. The female digs a nest of 10-20 cm in the sand. Give her a box of damp sand on the land area, deep enough for a nest of that size.

INCUBATION

Incubation takes 60-85 days and depends on soil temperature and nest depth. Sex is determined by temperature during incubation. The incubation temperature has not been documented for the species; 26-30 °C is an estimate borrowed from related species. The eggs are moved carefully, without being turned, to an incubator with a damp, but not wet, substrate.

Read more: Incubating eggs

REARING THE YOUNG

Newly hatched young are 3-4 cm. They need warm water at about 29 °C, shallow water, a basking spot, UVB and hides. If they are to grow up in fresh water, the water must be very clean, and shell rot must be monitored. The young are fed every day with small pieces of fish, shrimp, worms and pellets and are kept separated by size.

Health and common mistakes

The species is sensitive to water quality, and most problems are caused by husbandry.

- Shell rot and skin infection: red rings around the eyes, white patches on the skin and grey patches on the shell in unclean water or in fresh water for wild-caught animals. Requires a vet.
- Lack of UVB or calcium: soft, deformed bones and shell.
- Swallowed gravel from the bottom can cause constipation.
- Injuries from slipping stones at the basking spot.
- A basking spot that is too hot or direct sun without shade causes overheating.

All reptiles can be symptom-free carriers of *Salmonella*. Wash your hands after contact with animals, water and equipment. See a vet with reptile experience if the animal does not eat, has swollen eyes, an open mouth or floats lopsided.

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.