DIAMONDBACK TERRAPIN

By Catherine Love, DVM

Updated 2024

NATURAL HISTORY

Diamondback terrapins (*Malaclemys terrapin*) are a small species of turtle native to the Atlantic and Gulf Coasts of the eastern US. They reside in brackish environments, meaning the water they live in is less salty than saltwater, but more salty than freshwater. Terrapins have unique physiological and behavioral adaptations that allow them to thrive in varying salinities, including the ability to drink fresh rain water films off the top of saltwater sources. There are at least half a dozen subspecies of diamondback terrapins that are recognized, distinguished mainly by their geographical location. Diamondback terrapins are considered vulnerable by the IUCN.

ZOONOSIS

Like other reptiles, terrapins can carry *Salmonella*. Always wash your hands after handling reptiles or items from their enclosure.

SEXING

Females may not reach sexual maturity until 7 years of age, whereas males typically reach sexual maturity a bit earlier. Females are larger than males, though males have a longer, thicker tail. The male's cloaca (vent) will also be further from the shell.

LIFESPAN

25-40 years.

CHARACTERISTICS & BEHAVIOR

In the wild, terrapins typically avoid humans and may be quick to flee if disturbed. In captivity, terrapins are reported to be relatively docile and frequently learn the familiar routines and habits of their keepers. They are typically not aggressive but are known to have particularly strong jaws adapted to crushing mollusk shells, so a potential bite may be painful. Like other semi-aquatic turtles, caring for a diamondback terrapin can be difficult. Setting up and maintaining an aquarium can be a daunting task for a newer keeper, and terrapins have more specialized needs than common freshwater species so they are most suited as pets for intermediate or advanced keepers. Terrapins may become stressed by handling so hands-on interactions should be kept to a minimum. Captive bred individuals are always preferred over wild-caught animals; they tend to be healthier, better adapted to captivity, and do not negatively impact the wild population.

HEALTH

Terrapins can experience calcium and vitamin deficiencies due to poor nutrition or a lack of appropriate supplementation and lighting. This can lead to shell abnormalities, stunted growth, and a poor immune system. Poor water quality is also a common problem in captivity, leading to skin discoloration and irritation, eye problems, and general illness. Any amount of ammonia or nitrITES in the water is abnormal and should be addressed quickly. Terrapins without access to salt water also appear to be less healthy and more prone to illness than those kept in brackish environments. Your terrapin should be examined by your veterinarian every 6-12 months.

ADULT SIZE

Females average 6-9 inches, males average 4-5.5 inches.

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HOUSING

There are a few rules of thumb when looking at tank sizes for aquatic/semi-aquatic turtles. One guideline is 10gal per every inch of shell size. That means a 10 inch turtle would need a 100gal aquarium. Another rule is 6" of aquarium floor space per every inch of shell size. With this guideline, a 10 inch turtle would need 60" of floor space.

Whichever guideline is used should be looked at as a minimum. Bigger is better! Turtles and terrapins produce large amounts of waste, making smaller tanks a risk for ammonia build up. They are also fairly active animals that like having space to swim around. When weather appropriate, outdoor housing in large tubs or ponds are excellent options. Terrapin habitats should be furnished with plants (live or fake) to help them feel more secure. Rocks, logs, and other decor can also be added. For substrate, bare bottom tanks are preferred. If substrate is used, large gravel or pebbles not large enough to swallow can be used. Canister filters are recommended for turtles and terrapins.

Haul out areas are also needed for terrapins. These are above water platforms where turtles can bask. This can be floating logs or platforms, large rocks or cinder blocks, or premade docks. Basking areas should be positioned under heat and UV lamps. The platform needs to be kept above the waterline so the terrapin can fully pull itself out of the water.

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Like other aquatic animals, terrapins need to have their tank cycled before they are added to the enclosure. To understand cycling, one needs to understand the nitrogen cycle. Decaying food, plant matter, waste, or organisms release ammonia in the water, which is extremely toxic to aquatic animals. The way to counteract this is to build up the "good" bacteria. Nitrifying bacteria convert ammonia to nitrites, then nitrites to nitrates, which are much less toxic than ammonia or nitrites. Nitrates are then kept at a reasonable level with water changes +/- live plants. Cycling needs to be done before the animal is added to ensure water parameters are safe for the animal. A 20-30% water change with dechlorinated water should be done every 1-2 weeks after the animal has been added. The filter should never be scrubbed clean, as nitrifying bacteria live here as well. To clean out the filter, tank water can be run through to wash out any debris. Other maintenance should be done based on brand recommendations.

Cycling: The tank should be completely set up prior to adding the animal, then dechlorinated water can be added (dechlorinators can be purchased at pet stores or online). The filter should be turned on, and live nitrifying bacteria should be added. Ammonia

HOUSING (CONT.)

should then be added every day until an ammonia test kit reads 0 ammonia, 0 nitrite, and some nitrates. There are multiple sources of nitrifying bacteria and ammonia. Substrate can be added from an already cycled tank, or fish food, raw fish, or 100% ammonia. Both ammonia and nitrifying bacteria can be purchased from most pet stores or online. Cycling can take weeks to months. Improper cycling is the cause of a disease called "new tank syndrome", where toxic compounds build up in the tank and cause illness.

Cycling is also the reason that full water changes should never be done. If all of the water is removed, all of the "good" bacteria are removed as well.

pH: This is a measure of how acidic or basic the water is. Terrapins appear to do best at a neutral to slightly alkaline pH (7-7.5), though the estuaries they naturally inhabit range from around neutral (7) in lower saline areas to alkaline (8-8.6) in higher saline areas.

Nitrate: This is the end product of the nitrogen cycle. Nitrates should be <40.

KH: This is the carbonate hardness or alkalinity, which measures the water's ability to neutralize an acid. The name carbonate hardness comes from carbonate and bicarbonate, which are the primary components of alkalinity. This is important for stabilizing pH and providing energy for nitrifying bacteria. The KH should be around 100ppm.

GH: This is the general hardness, which measures hard minerals in water (i.e. calcium and magnesium). The GH should be around 100-150ppm.

Salinity: This is the salt level in the water. Terrapins can survive in a wide range of salinities but show reduced growth and increased stress behavior when levels exceed 20ppt for an extended period of time. Optimal growth was noted around 25% seawater, or ~8ppt. Therefore, it may be beneficial to maintain a terrapin's aquarium salinity at 5-15ppt, even though they are capable of surviving in both fresher and saltier environments. Only use aquarium salt, not table salt, to maintain salinity.

Ammonia and nitrites should be 0. Weekly-biweekly water tests should be done to ensure your terrapin's water parameters are within acceptable limits. Water testing kits can be bought at most pet stores or online.

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HEAT

Unlike mammals, reptiles cannot internally regulate their temperature and rely on their environment to heat and cool themselves. Therefore, it is important that we provide captive reptiles with a temperature gradient so they can warm up or cool down as needed. Basking temperatures can be measured with a digital infrared thermometer.

Terrapins need a basking spot of around 90F and water temperatures maintained at 76-78F. All light emitting sources should be turned off at night. Sunlight is made of UV, near IR, mid IR, far IR, and visible light. Flood tungsten-halogen bulbs are the most efficient at producing near IR, which is the most abundant IR in sunlight, and they also produce significant mid IR and some far IR. Far IR is the least abundant in sunlight, but is most often produced in large amounts by sources like ceramic heat emitters, heat pads, and radiant heat panels. Tungsten-halogen bulbs should be the flood type to ensure a wide enough basking site. These heat producing bulbs can be found as reptile specific bulbs or at hardware stores. Avoid hot rocks as these can easily burn reptiles.

LIGHTING

Like all chelonians, terrapins require UVB light to synthesize vitamin D3 in their skin. Vitamin D3 is needed for proper metabolism of calcium and prevention of metabolic bone disease. The ReptiSun T5 5.0 HO, Arcadia T5 12% Desert, or Arcadia T5 6% Forest are all acceptable choices, depending on where you set up your pet's basking spot. Arcadia provides a guide as to where to place your UVB fixture in relation to your chelonian's basking spot. It is important to note that UVB cannot penetrate glass, so natural sunlight through a window will not be sufficient for a chelonian to synthesize vitamin D3. Allowing safe outdoor time is also an excellent source of UVB and visible light.

Sunlight is made of ultraviolet, near infrared (IR), mid IR, far IR, and visible light. It is our job as keepers to provide full spectrum lighting, which means as close to sunlight as possible. Unfortunately there is not one source for all of these components, so we must provide multiple types of lighting. For visible light, LED or halide bulbs should be provided.

UVB is NOT optional for chelonians. Lack of proper UVB can lead to impaired skeletal, muscle, and immune function. Replace UVB bulbs every 6 months, as they can continue to give off light even when not producing UVB. Lights should be turned off at night to maintain normal day/night cycles. For this reason, red or black nightlights should not be used as they can disrupt normal day/night cycles.

Arcadia UVB guide:
https://www.arcadiareptile.com/lighting/guide/

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FEEDING

Terrapins are carnivorous, and only occasionally noted to consume plant matter. In the wild they primarily eat a variety of snails, crabs, clams, and other mollusks and crustaceans. They have also been known to eat carrion, fish, worms, and other invertebrate prey as well. In captivity, variety is key to preventing nutritional deficiency and providing enrichment. As dietary deficiencies are very common in captive turtles, providing nutritionally balanced commercial pellets to turtles of all ages is important for maintaining calcium and vitamin A levels. A cuttlebone should also be provided for added calcium and beak maintenance.

Animals up to 1.5-2 years of age should be fed daily, then feedings can be backed off to every 2-3 days. A good rule of thumb is to only feed as much as the animal can eat within 15 minutes. Terrapins should be fed a mixture of animal proteins (snails, insects, worms, brine shrimp, krill, blood worms, beef heart, mollies, guppies, platies, crustaceans, and mollusks) and commercial turtle pellets. Other carnivore mixes like Repashy Grub Pie or Meat Pie can be offered on occasion to round out the diet.

Even though terrapins live in brackish water, they also require a source of fresh drinking water. Freshwater should always be available in a separate bowl to allow free access.

SOURCES AND FURTHER READING

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