



## Natural Heritage & Endangered Species Program

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Massachusetts Division of Fisheries & Wildlife

## Northern Diamond-backed Terrapin *Malaclemys terrapin*

State Status: **Threatened**

Federal Status: **None**

**DESCRIPTION:** The Northern Diamond-backed Terrapin is a medium-sized salt marsh turtle. It has a wedge-shaped carapace (top shell), variably colored in ash grays, light browns, greens and blacks. It has concentric ring patterns on the carapace and a pronounced ridged or bumpy mid-line keel. Both sexes have grayish to black skin, spotted with dark green flecks, and light-colored upper and lower jaws. This turtle has very large, paddle-like hind feet that are strongly webbed. Sexual size dimorphism is prominent in this species. Adult females are considerably larger than males ranging from 15-23 cm (6-9 in.) in length, while males are 10-15 cm (4-6 in.). Hatchlings look like adults and are about 2.6 cm (1 in.) long.

**SIMILAR SPECIES:** There are no other brackish water turtle species in Massachusetts. This is the most distinctive turtle in both appearance and its habitat use. It is not likely to be confused with any other turtle species resident within the Commonwealth. Occasionally casual observers may report Northern Diamond-backed Terrapins as “sea turtle” sightings.

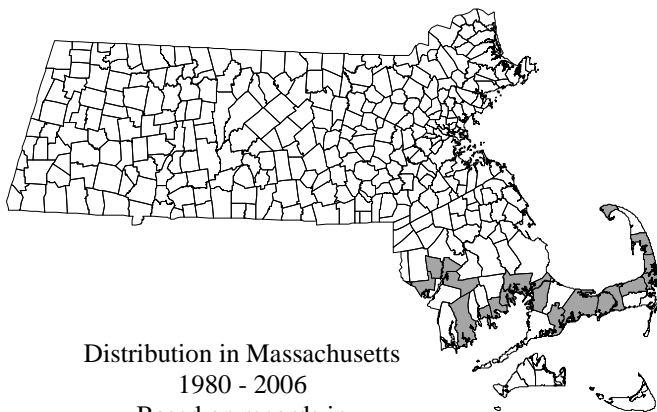


Photo by Bill Byrne, MassWildlife

**HABITAT IN MASSACHUSETTS:** Northern Diamond-backed Terrapins inhabit marshes which border quiet salt or brackish tidal waters. They can also be found in mud flats, shallow bays, coves, and tidal estuaries. Adjacent sandy, dry, open-canopy, upland areas are required for nesting.

**RANGE:** The Northern Diamond-backed Terrapin (*Malaclemys terrapin terrapin*) is found along the Atlantic coast from Massachusetts south to Florida and along the Gulf coast from the Carolinas to Texas.

**LIFE CYCLE & BEHAVIOR:** Northern Diamond-backed Terrapins overwinter in the bottom of estuaries, creeks and salt marsh channels. In late spring, males and females gather to create mating aggregations in small, quiet coves along the coast. Salt marshes are critical wintering, foraging, and nursery areas. Egg-carrying females will make the journey upland and sometimes inland as much as a 0.4 km (1/4 mile) to lay eggs. Except when basking, males spend their time in water; females venture onto land normally twice a year for nesting, once in early June and once in July. Females



Distribution in Massachusetts  
1980 - 2006  
Based on records in  
Natural Heritage Database

*A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan*

## Massachusetts Division of Fisheries & Wildlife

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travel from water's edge to nesting habitat usually at high tide to reach sites above the high water line. Hatchlings and juveniles are thought to hide among the grasses in brackish water marshes.

The Northern Diamond-backed Terrapin is polygamous (each individual may breed with several others) and mates in the water. Females are capable of retaining viable spermatozoa for up to 4 years without subsequent matings. Females become sexually mature at 8 to 10 years of age (males mature earlier) and are known to live to 40, but this is likely to be an underestimation of longevity. A single female may lay 1-3 nests per year. The female digs a nest about 10-20 cm (4-8 in.) deep and then deposits a clutch of approximately 12 eggs. Most females exhibit nest site fidelity, where they return to the same nesting location year after year.

On Cape Cod, Northern Diamond-backed Terrapins have been observed nesting during both day and night and on both vegetated and unvegetated uplands; in contrast, southern populations have reported nesting only during the day and only on vegetated dunes. Eggs laid in unvegetated areas, although more susceptible to wind erosion, receive more heat, thereby decreasing incubation time. Northern Diamond-backed Terrapins have temperature-dependent sex determination; eggs will develop into males if temperatures are below 28° C (82° F). At temperatures above 30°C (86°F), females will develop. At temperatures ranging from 28-30 °C (82-86°F), there will be a mixture of males and females.

Incubation of eggs in Massachusetts lasts between 59 and 116 days depending on temperature. It may take from 2 to 11 days after the eggs hatch for the young turtles to emerge and start the hazardous trip from the nest to the water. Part of this time may be spent rotating towards the sun in what is thought to be an orientation behavior. When the climate is unseasonably cold, some hatchlings may overwinter in their nests waiting until the following May to erupt from the sand.

Northern Diamond-backed Terrapins feed on crabs, mollusks, crustaceans, insects, fish, and carrion. They forage in the water.

**THREATS:** Northern Diamond-backed Terrapin population declines have been documented in many areas with a number of factors contributing to these declines. This species was nearly wiped out by gourmet

consumption around the turn of the 20<sup>th</sup> century. Today, the harvest of Northern Diamond-backed Terrapins is illegal in Massachusetts. However, other human activities continue to threaten this species.

Reduction of salt marsh habitat and alteration of water composition due to ditching, dredging and channelization, loss of sandy nesting habitats, and destruction of dune areas continue to contribute to the decline of the Northern Diamond-backed Terrapin in Massachusetts. "Armoring" and sea-walling coasts thwart Northern Diamond-backed Terrapin access to upland nesting areas. Sea level rise and climate change are also potential threats to terrapins and their salt marsh habitat.

One of the Northern Diamond-backed Terrapin's healthiest populations in Massachusetts is located on Cape Cod. Today, this area is also heavily used for recreational activities. Human activity may disrupt nesting turtles and hatchlings. Off-road vehicles increase the chances of disturbing, injuring or killing nesting females, crushing nests, and killing migrating hatchlings. When interrupted, females will abort nesting attempts which may have taken hours.

Additional causes of mortality are pollution and roads, as well as predation of eggs and hatchlings by predators whose unnaturally high populations are encouraged by high human densities. As air breathers, Northern Diamond-backed Terrapins get trapped and drown in improperly discarded "ghost" netting, as well as by-catch in estuarine crab traps. Nesting females often must cross roads to get to appropriate nesting habitat.

#### **MANAGEMENT RECOMMENDATIONS:**

Northern Diamond-backed Terrapin habitat needs to be targeted for protection and management. NHESP records can be used to assess and prioritize areas based on the extent, quality, and juxtaposition of habitats and their predicted ability to support self-sustaining populations of Northern Diamond-backed Terrapins. Given limited conservation funds, alternatives to outright purchase of conservation land for nesting habitat is an important component to the conservation strategy. These can include Conservation Restrictions (CRs) and Agricultural Preservation Restrictions (APRs). Another method of protecting large blocks of land is allowing the building of small or clustered roadside developments in

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conjunction with protecting large areas of unimpacted land.

Habitat management and restoration guidelines should be developed and implemented in order to create and/or maintain consistent access to nesting habitat at key sites. This is most practical on state-owned conservation lands (i.e., DFW, DCR). However, educational materials should be made available to guide private land-owners on the best management practices for Northern Diamond-backed Terrapin habitat.

Alternative wildlife corridor structures should be considered at strategic sites on existing roads. In particular, appropriate wildlife corridor structures should be considered for bridge and culvert upgrade and road-widening projects within Northern Diamond-backed Terrapin habitat. Efforts should be made to inform Mass Highways of key locations where these measures would be most effective for turtle conservation.

Educational materials need to be developed and distributed to the general public in reference to the detrimental effects of keeping native Northern Diamond-backed Terrapins as pets, which is illegal in Massachusetts. Of equal concern is the release of pet store turtles (which could spread disease), leaving cats and dogs outdoors unattended (particularly during the nesting season), mowing of fields and shrubby areas, feeding suburban wildlife (which increases the numbers of natural predators to turtles), and driving ATVs in nesting areas from June-October. People can be encouraged, when safe to do so, to help Northern Diamond-backed Terrapins cross roads (always in the direction the animal was heading); however, turtles should never be transported to “better” locations. They will naturally want to return to their original habitat and likely need to traverse roads to do so.

Increased law enforcement is needed to protect our wild turtles, particularly during the nesting season when poaching is most frequent and ATV use is common and most damaging.

Northern Diamond-backed Terrapins are an extremely elusive, non-migratory species. They can be easily extirpated by the unintended consequences of human activities before they are even identified as being present. Coastal residents are often surprised to learn their abutting estuary hosts a Northern Diamond-backed Terrapin population.

**Active Period**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

**REFERENCES:**

Brennessel, B. 2007. The Northern Diamond-backed Terrapin Habitat, Management and Conservation. Wheaton College, Norton, MA.  
 Lewis, D. 2002. Diamond-backed Terrapin Summary for Outer Cape Cod. Report to NHESP. Westborough, MA.

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