

Eastern Box Turtle

Terrapene carolina carolina

Federal Listing	N/A
State Listing	SC
Global Rank	
State Rank	S1
Regional Status	Very High



Photo by Michael Marchand

Justification (Reason for Concern in NH)

The eastern box turtle is a species of concern in the northeast (NEPARC 2010, Therres 1999). States reporting declines of box turtles have included Connecticut, Delaware, Florida, Illinois, Indiana, Iowa, Maryland, Massachusetts, Missouri, New Jersey, New York, Ohio, Oklahoma, Tennessee, Virginia, West Virginia, and Wisconsin (Nazdrowicz et al. 2008, Stickel 1978, Williams and Parker 1987, Lieberman 1994). Massachusetts and Connecticut consider the eastern box turtle a species of special concern, and in Maine eastern box turtles are listed as endangered (Hunter et al. 1999). Box turtles are a long-lived species with delayed ages of sexual maturity, relatively low fecundity, and dependence on high adult survival. Therefore, they may be extremely vulnerable to increased mortality associated with rapid development in New England. The current and historic status of box turtles in New Hampshire is not known and needs further evaluation.

Distribution

In New England the box turtle's range includes southeastern Maine, southeastern New Hampshire, eastern Massachusetts including Cape Cod and the islands, the Connecticut River region, and much of Rhode Island and Connecticut (Klemens 1993, DeGraaf and Yamasaki 2001). Box turtles do not occur in Vermont (Hunter et al. 1999). In Maine, box turtles have been reported in at least 13 towns (Hunter et al. 1999). However, reports distant from south-coastal Maine were likely released pets. Records in Maine consist largely of single individuals and do not attest to a population (P. deMaynadier, Maine Department of Inland Fisheries and Wildlife, personal communication). In Massachusetts, there are box turtle records in at least 4 towns that border New Hampshire but each of these towns only has one occurrence record (Erb 2011).

In New Hampshire, the distribution and abundance of box turtles is not well known. A specimen was collected in Pelham, Rockingham County historically (Huse 1901) and submitted to the Manchester Institute of Arts and Sciences, but has apparently since been lost (Natural Heritage Rare Species Database 2004). Specimens from Lee were also reported (Huse 1901), suggesting that box turtles occurred in southern New Hampshire historically. Remains of a box turtle were found at a pre-colonial excavation site from Lake Massabesic, New Hampshire (Largy 2003). This report may suggest that a native population of box turtles existed in New Hampshire historically.

Use and trade of box turtles by Native Americans has complicated our understanding of the historic distribution of the species (Adler 1968). Box turtles were occasionally consumed (Dodd 2001), were commonly used as ceremonial objects (Klemens 1993, Dodd 2001), and were transported, often north of the species' current range (Bleakney 1958, Adler 1968). Therefore, it is possible that box turtles were traded to New Hampshire from other locations where box turtles are currently more abundant (e.g., southern New England). Box turtle shells recovered in Ontario, north of the current range, have

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been considered not native (Bleakney 1958). However, Adler (1970) reported that Native Americans (primarily Iroquois) may have been responsible for the elimination of box turtles in western New York and possibly in southern Ontario.

The NHFG Nongame and Endangered Species Program received reports of box turtles from 12 towns between 1992 and 2004. Reports of box turtles from central and northern New Hampshire (Wentworth Location, Eaton, Moultonborough) were most likely the result of released pets. Box turtles were extremely popular in the pet industry (Ernst et al. 1994, Lieberman 1994), and in New Hampshire, it was not illegal to possess Eastern box turtles until 1996.

In 1985, a recently deceased box turtle was reported from Hudson. Habitat surrounding the turtle was described as a dry oak forest with a power line right-of-way and a graminoid marsh (Korpi 1985). Taylor (1993) illustrates 2 additional locations in southeastern New Hampshire on the edge of Rockingham and Strafford Counties, and Dodd (2001) depicts 2 locations on the southern border of Maine and New Hampshire.

From 2006-2014 (Wildlife Action Plan timeframe), the NHFG Nongame and Endangered Species Program received an additional 7 reports with photographs from 7 different towns (Hudson, New Ipswich, Newfields, Pembroke, Westmoreland, Wilton, Windham). Several additional unconfirmed reports were received. The report from Newfields was of two adjacent box turtles. All other reports were of individual box turtles. NHFG was able to acquire and track 3 of these 7 turtles with radiotelemetry. The New Ipswich animal was tracked periodically from June 2012 till October 2014; turtle used a variety of habitats available including forests, fields, and wetlands. Its home range over the two-year monitoring period was relatively large (MCP 38 ha, 94 acres) but travel was not linear during that period (turtle moved back and forth between various habitat areas perhaps indicating some experience at the site). The MCP of this turtle's two-year home range exceeds the averages of other states. In Massachusetts, single-season home ranges averaged 22.6 acres but maximum home ranges were 223-340 acres among 3 different sites (Erb 2011).

The Wilton turtle was found ~7 km from the New Ipswich animal. This animal was tracked for only a short period (June-August 2013) due to transmitter failure. The same animal was incidentally encountered and reported to NHFG crossing a major road 0.6 km from the release location. The Hudson animal was reported to NHFG with photograph during June 2014 and was a gravid female digging a nest chamber in a utility right of way, the first documented evidence of reproduction. NHFG was able to locate the turtle and verify the presence of 5 unlaidd eggs. The turtle was induced and eggs were incubated but none of them successfully developed.

DNA samples were taken from the 3 tracked turtles and sent to Dr. John Placyk (University of Texas, Tyler) for extraction and analysis (methods as in Martin et al. 2013). Initial analyses indicate that the New Ipswich animal may have originated from outside of New England and that the Wilton and Hudson animals were consistent with genetics from box turtle populations in New England.

Individual box turtles have been confirmed from 14 scattered towns (two of which are historic, before 1994), mostly south of the Lakes Region. Despite these widely scattered reports, southern NH in the vicinity of Hudson, Derry, and Windham has the highest number of current and historic reports and is a target area for locating a box turtle population, despite the highly developed nature of the area.

Habitat

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Eastern box turtles are terrestrial generalists that use a variety of habitats including mesic forests, xeric uplands, open woodlands, pastures, old fields, thickets, and powerline clearings (Klemens 1993, Ernst et al. 1994, DeGraaf and Yamasaki 2001, Mitchell 2003). Although considered a terrestrial turtle, box turtles may make extensive use of a variety of wetlands, shallow streams, or muddy seepages (Klemens 1993, Quinlan et al. 2004, Marchand et al. 2004) as relief from high temperatures, concealment from predators (Dodd 2001), and for additional foraging opportunities (Marchand et al. 2004). A diversity of habitats in close proximity is apparently favored (Madden 1975, Klemens 1993), and box turtles may adjust habitat preference depending on season and temperature (Madden 1975, Dodd 2001, Marchand 2004).

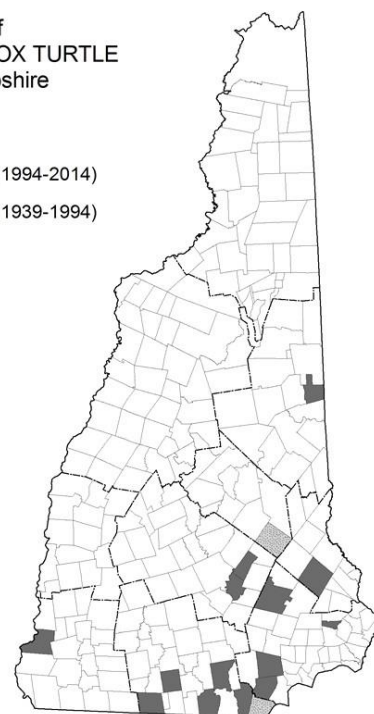
During periods of inactivity, box turtles may bury in litter or rest in brush piles or briar patches (Stickel 1950). Openings in the forest canopy are important for basking individuals (Stickel 1950), and well-drained open canopy areas are required for nesting (Ernst et al. 1994). As temperatures drop in the fall, box turtles dig progressively deeper into soil where they spend the winter. Portions of the carapace are sometimes visible even in northern climates (Dodd 2001).

NH Wildlife Action Plan Habitats

- Appalachian Oak Pine Forest
- Hemlock Hardwood Pine Forest
- Grasslands
- Marsh and Shrub Wetlands
- Shrublands
- Temperate Swamps

Distribution of
EASTERN BOX TURTLE
in New Hampshire

■ Current (1994-2014)
■ Historic (1939-1994)



Distribution Map

Current Species and Habitat Condition in New Hampshire

Not assessed because of insufficient information.

Population Management Status

See 'Distribution' section for discussion of monitoring and genetic assessments.

Appendix A: Reptiles

Regulatory Protection (for explanations, see Appendix I)

- CITES - Convention on International Trade of Endangered Species of Wild Fauna and Flora
- NHFG Rule FIS 803.02. Importation.
- NHFG Rule FIS 804.02. Possession.
- NHFG Rule FIS 811.01 Sale of Reptiles.
- NHFG FIS 1400 Nongame special rules
- Fill and Dredge in Wetlands - NHDES
- Alteration of Terrain Permitting - NHDES

Quality of Habitat

Not assessed because of insufficient information.

Habitat Protection Status

Not assessed because of insufficient information.

Habitat Management Status

No ongoing targeted habitat management.

Threats to this Species or Habitat in NH

Threat rankings were calculated by groups of taxonomic or habitat experts using a multistep process (details in Chapter 4). Each threat was ranked for these factors: Spatial Extent, Severity, Immediacy, Certainty, and Reversibility (ability to address the threat). These combined scores produced one overall threat score. Only threats that received a “medium” or “high” score have accompanying text in this profile. Threats that have a low spatial extent, are unlikely to occur in the next ten years, or there is uncertainty in the data will be ranked lower due to these factors.

Habitat conversion due to development of upland habitat (Threat Rank: Medium)

Box turtles are long-lived and have a late age of maturity similar to several other turtles. As such, additional mortality to adults could adversely affect local populations. Much of southern New Hampshire has relatively high road densities and remaining undeveloped land is often fragmented.

There are no known populations of box turtles in New Hampshire. However, locations where box turtles have been reported in southern New Hampshire typically have major roads nearby. It is unknown to what extent roads and development are impacting box turtles in New Hampshire.

Mortality of individuals from vehicles on roadways (Threat Rank: Medium)

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List of Lower Ranking Threats:

Mortality and species impacts (decreased fitness) from various diseases (ranavirus)

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Mortality from subsidized or introduced predators (egg and hatchling mortality)

Mortality from introduced or subsidized predators

Mortality and degradation from legal and illegal OHRV activity

Mortality of individuals from forestry equipment

Mortality from casual collection of individuals from the wild or moving animals to a different location

Mortality from mowing and agricultural machinery and vehicles

Actions to benefit this Species or Habitat in NH

Conserve priority parcels at documented box turtle populations

Primary Threat Addressed: Habitat conversion due to development of upland habitat

Specific Threat (IUCN Threat Levels): Residential & commercial development

Specific Action: Land and Water Rights Acquisition and Protection

Objective:

Conserve priority parcels at documented box turtle populations

General Strategy:

Following documentation of box turtle populations, NHFG will work with conservation partners (such as land trusts, towns, etc.) to conserve land in priority areas.

Political Location:

Statewide

Watershed Location:

Statewide

Location Description:

Location of populations unknown at this time.

Box turtle monitoring

Objective:

NHFG will survey sites where box turtles have been reported and track individual turtles to evaluate potential of populations.

General Strategy:

Multiple box turtle reports have been confirmed in NH but there are no known populations. Recent reports in southern NH indicate a possible population. NHFG will encourage reporting of any box turtle observations and will target communities and landowners in the vicinity of previous documented reports. NHFG will attempt to capture any box turtles reported in southern New Hampshire and potentially track those individuals via radiotelemetry. Radiotelemetry will indicate habitat use, movement patterns, and potentially lead to additional box turtles. DNA analysis of specimens may reveal potential for individual to represent native population. Multiple turtles from a location will indicate a population and further conservation actions will be developed at that time.

Appendix A: Reptiles

Political Location:

Cheshire County, Hillsborough County,
Merrimack County, Rockingham County

Watershed Location:

Lower CT Watershed, Merrimack Watershed,
Coastal Watershed

References, Data Sources and Authors

Data Sources

Sources of information include unpublished data from the NHFG Department, the Reptile and Amphibian Reporting Program database, NH Natural Heritage Bureau Rare Species database, NH Wildlife Sightings website database, Massachusetts Natural Heritage Element Occurrence Information, and Maine Reptile and Amphibian Atlas (Hunter et al. 1999).

Threat assessments were conducted by a group of NHFG biologists (Michael Marchand, Brendan Clifford, Loren Valliere, Josh Megysey).

Data Quality

The historic and current distribution of box turtles in New Hampshire is not well known. Data has improved during the last 10 years as the result of tracking 3 individual turtles and the associated genetics assessments for these animals.

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2005 Authors:

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