

Note

Record longevity of a Spotted Turtle (*Clemmys guttata*)

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Abstract

Turtles are known for their longevity, but the maximum life span for many species remains unknown. Spotted Turtle (*Clemmys guttata*) can live for more than 30 years in the wild, but typical or maximum longevity has not been confirmed. As part of a long-term mark–recapture project in Ottawa, Ontario, near the species' northern limit, an adult female was captured on 27 April 2017. It had first been marked on 11 June 1983, when it was an adult with 17 growth rings on its plastron. Based on the number of growth rings at first capture, and the intervening time, this turtle is a minimum of 51 years old, setting a longevity record for the species. Ten individuals in this population were at least 30 years old when last captured, including a male at least 41 years old. Few of these turtles have grown measurably since being marked in 1983, and it is likely that these minimum ages are underestimates of actual ages.

Key words: Spotted Turtle; *Clemmys guttata*; longevity

Turtles are widely known for their longevity and many species can live for decades in the wild (Gibbons 1987; Ernst and Lovich 2009). Lifespans greater than 50 or 60 years have been confirmed for Wood Turtles (*Glyptemys insculpta*; Brown *et al.* 2015) and Blanding's Turtles (*Emydoidea blandingii*; Congdon *et al.* 2001). Anecdotal observations of turtles with dates carved into their shells suggest that Blanding's Turtles can live more than 75 years (Brecke and Moriarty 1989) and Eastern Box Turtles (*Terrapene carolina*) more than 100 years (Ernst and Lovich 2009), assuming such dates are reliable. An understanding of typical adult longevity is important for calculating life history tables and determining effective conservation strategies for populations. Unfortunately, documenting the precise longevity of such long-lived animals is difficult because determination of ages for multiple individuals from a population requires a long-term mark–recapture study of known-age individuals, while most research studies are relatively short-term.

Spotted Turtle (*Clemmys guttata*) is a small turtle with a maximum recorded carapace length of only 14.25 cm (Ernst and Lovich 2009). The species is restricted to eastern North America from southern Ontario to northern Florida, where it makes use of a variety of shallow wetlands. Habitat loss remains a significant threat across its range (COSEWIC 2014), and Spotted Turtle is considered endangered in Canada (SARA Registry 2018) as well as globally (van Dijk 2011). Individuals can live for more than 30 years in the wild (Seburn 2003; Ernst and Lovich 2009), but few details have been published on longevity in this species in the wild. The estimated maximum longevity is 65 years for males and 110 years for females (Litzgus 2006).

A population of Spotted Turtles occurs in a 2500-ha sphagnum bog owned by the National Capital Commission in Ottawa, Ontario, Canada, near the species' northern range limit (Cook *et al.* 1980). This population was first studied during a mark–recapture project in 1983 (Chippindale 1984). Captured turtles were marked by notching the marginal scutes with a file to assign unique identification codes (Cagle 1939). This work was continued in 1999 (Seburn 2003), and sporadic monitoring of the population has continued. Notches in the shells of Spotted Turtles marked in 1983 remain clear and unambiguous.

On 27 April 2017 during a survey of the bog, I captured an adult female Spotted Turtle that had been first caught and notched as an adult on 11 June 1983 (Chippindale 1984). In 1983, the turtle's plastron was 9.7 cm long and had 17 growth rings. In 2017, 34 years later, its plastron was still 9.7 cm long and had a minimum of 17 faint growth rings. This turtle was presumably an adult in 1983 based on the number of growth rings and the fact that it did not grow in the subsequent 34 years; growth rates for adults are extremely low (e.g., Seburn 2003). Given the number of growth rings in 1983 and the number of intervening years, this turtle was a minimum of 51 years old in 2017. To the best of my knowledge, this is the oldest published age for a Spotted Turtle.

Counts of growth rings are known to underestimate the age of many species of turtles (Wilson *et al.* 2003) including adult Spotted Turtles (Litzgus and Brooks 1998). Adult Spotted Turtles in the study population grew by less than 1 mm and increased the number of growth rings by only 1.1, on average, from 1983 to 1999 (Seburn 2003). Given this lack of growth and addition

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of growth rings, there is no reason to think the turtle was only 17 years old when first marked, meaning this turtle could be considerably older than 51 years.

Other individuals in this population first marked in 1983 demonstrate longevity in excess of 30 years. An adult male first marked when it had 15 growth rings was last caught in 2009, making it a minimum of 41 years old at that time. An adult female first marked when it had 12 growth rings was last caught in 2008, making it at least 37 years old at that point. Both of these turtles could still be alive, as the recapture rate at this site is very low, given the low survey intensity. For example, the adult female caught in 2017 had not previously been captured since 2007. In total, 10 Spotted Turtles first marked in 1983 were at least 30 years old at last capture. This study provides additional evidence that Spotted Turtles are long lived and suggests that conservation efforts should focus on reducing mortality rates of adults.

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