

URBAN BOX TURTLES ARE EXPOSED TO COLDER BRUMATION TEMPERATURES THAN RURAL BOX TURTLES

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Introduction

How does box-turtle brumation (hibernation) differ in an **urban park** (Forest Park, FP) compared to a **rural intact woodland** (Tyson Research Center, TRC)? Turtles are ectotherms, so they are particularly sensitive to temperature variation and extremes.



(A) Forest Park and (B) Tyson Research Center maps and perimeter.

Hypothesis

Low quality brumation conditions (including those with poor leaf litter) found at FP contribute to greater exposure to temperature extremes than at TRC which leads to a higher mortality rate.

Methods

- We collected the mean minimum shell and surface temperature data for each turtle for each month from 2013-2022

iButton temperature logger

VHF radio tag

PVC pipe with iButton temperature logger at brumation site

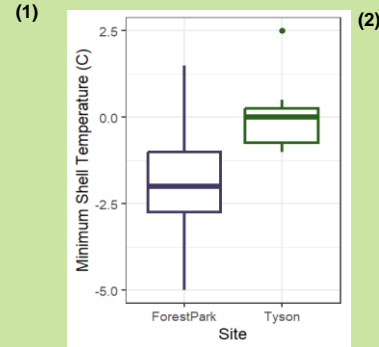


Fig. 1: Average minimum shell temperatures during brumation



Fig. 2: Map of brumation sites in FP

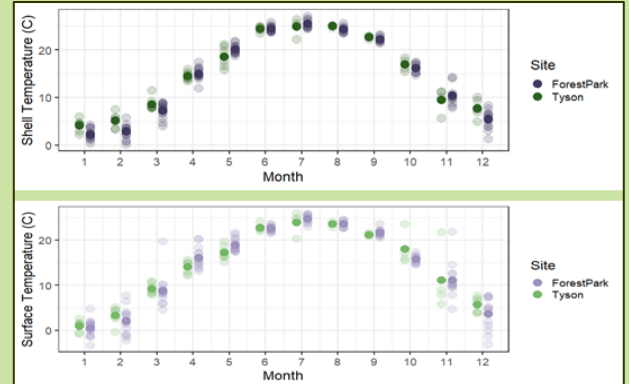


Fig. 3: Mean monthly shell and soil surface temperatures

Results and Conclusion

- Minimum shell temperatures at TRC are higher and less variable than FP.
 - Forest Park turtles are exposed to more extreme cold temperatures, likely because
 - microhabitats for brumation are less suitable (less leaf litter and sites more exposed to weather extremes).
 - **Mortality from “winter kill” is higher in Forest Park turtle than Tyson** - From 2013-19, 14 of 23 turtles at Forest Park died of “winter kill, compared to 4 of 18 turtles at Tyson.
- Conclusion:** Box turtles in Forest Park forest fragments are exposed to colder brumation temperatures than turtles in Tyson’s intact forest which may increase rates of “winter kill”