

Into the Weeds: A Comparison of Microhabitat Use by Wood and Blanding's Turtles in Northern Michigan

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Figure 1: A Blanding's Turtle (a) and Wood Turtle (b) radio-tracked as part of our study.

Introduction:

- Blanding's Turtles (*Emydoidea blandingii*) and Wood Turtles (*Glyptemys insculpta*) are both species of Special Concern in the state of Michigan and are currently under review for federal listing.
- These species co-occur in certain areas of the northern lower peninsula of Michigan.
- Our lab began a radio telemetry project in 2018 to better understand the distribution and ecology of these turtles in this region.
- These species coexist in close proximity to each other at our research site, and in some cases have been found using the same water bodies. This provides a convenient opportunity to compare habitat use between these species.
- Better understanding how these imperiled turtles use their environment, and how each species differs from the other in doing so, will help inform future management efforts.

Methods:

- Turtles were tracked May – August 2018 and 2019.
- A total of 12 Wood Turtles (7 female, 5 male) and 17 Blanding's Turtles (11 female, 6 male) were included in this analysis.
- Once per week, microhabitat data were collected from the area immediately surrounding each turtle upon location (see Table 1 for variables).
- A Principal Components Analysis (PCA) was used as a preliminary tool to examine data structure and patterns (R Studio)
- Only turtles with at least 9 microhabitat points from 2018 and/or at least 10 microhabitat points from 2019 were included, and individuals with more points were subsampled so that all individuals contributed an equal number of points to the analysis.
- The first and second principal components were subsequently averaged for each turtle and plotted to investigate overlap between species in microhabitat use (see Figure 2).

Preliminary Results:

- The first principal component (PC1) explained 36.08% of variance in the samples, and the strongest loading factors were herb cover within 1m² and cover <1m above turtle (positive; see Table 1)
- PC2 explained 17.36% of variance, and the strongest loading factors were density of woody vegetation >2cm diameter within 1m² and overstory canopy cover (see Table 1).

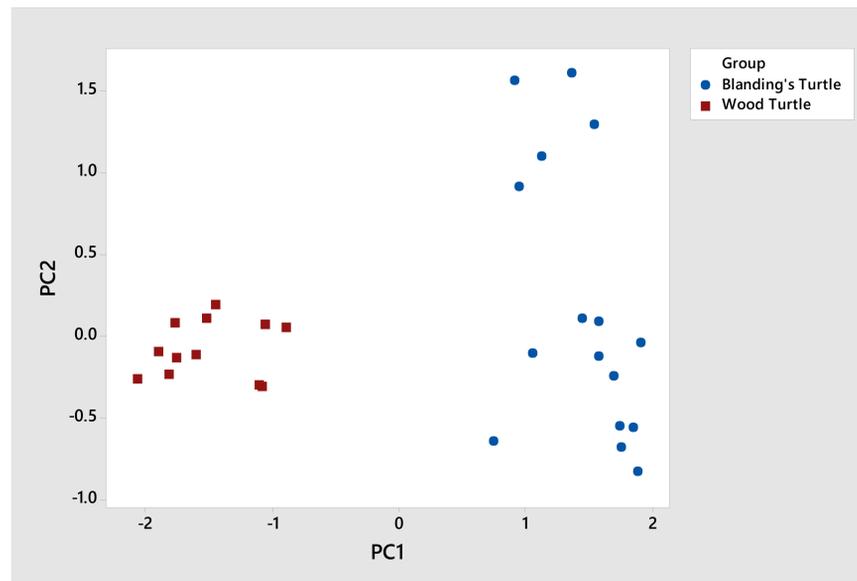


Figure 2: Plot of mean principal component values for each individual. Wood Turtles (red squares) and Blanding's Turtles (blue circles) form separate clusters, suggesting there is little overlap between species in microhabitat use.

| Microhabitat Variable | Loadings | |
|--|----------|--------|
| | PC1 | PC2 |
| Water depth (cm) | 0.326 | -0.073 |
| Distance to water (m) | -0.345 | 0.003 |
| Number of trees within 10m (count) | -0.397 | 0.070 |
| Density of woody vegetation >2cm diameter within 1m ² (count) | -0.013 | 0.710 |
| Small woody vegetation (<2cm diameter) cover 1m ² (%) | 0.331 | 0.102 |
| Herb cover within 1m ² (%) | 0.480 | -0.127 |
| Overstory canopy cover (%) | 0.164 | 0.677 |
| Cover <1m above turtle (%) | 0.500 | -0.04 |

Table 1: Factor loadings for each microhabitat variable in PCA.

Discussion and Future Research:

- Separate clustering of Wood and Blanding's Turtles suggests that there is little overlap in microhabitat use between these species, despite both being semiaquatic turtles that use some of the same water bodies.
- Blanding's Turtles appear to form two distinct clusters on the Mean PC plot, but the cause of this distinction is unclear. Both groups contain both males and females found in a variety of areas. Alternatively, the broader scattering of Blanding's Turtle points may indicate a wider niche breadth in this species.
- Information from PCA and other preliminary tests will be used to select variables in the construction of microhabitat models for both species.

References:

R Core Team (2013). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL <http://www.R-project.org/>.

Acknowledgements:

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Figure 3: A Wood Turtle in typical stream habitat.