

People, places, and the terrestrial component of core habitats of turtles: nesting by females and hatchling orientation and dispersal from nests. ¹Justin D. Congdon, ²Michael Pappas, and ³Bruce Brecke. ¹Savannah River Ecology Laboratory, Drawer E, Aiken, S.C. 29802 USA; and Institute of Ecology, University of Georgia, Athens, GA., ²Michael's Restaurant, Rochester, MN 55901 USA; and, ³Bruce Brecke, Welch, MN USA.

Nest site selection by females and the abilities of hatchlings to orient and disperse from nests are coevolved. Therefore alteration of nesting areas (particularly rapid changes such as establishment of tree farms and agriculture fields) may impact hatchling recruitment through females and hatchlings. To examine the abilities of hatchlings of four species of freshwater hatchlings (Blanding's, Snapping, Painted, and Map turtles), we constructed a series of circular arenas (diameter = 70 - 90 m) in different areas and situations within natural turtle nesting habitat near the Weaver Bottoms, MN of the Upper Mississippi River. Naive and experienced hatchlings were released in orientation arenas to: 1) test the null hypothesis that the direction of hatchling dispersal from nests is random, 2) test the working geotaxis hypothesis (hatchlings go down hill), 3) compare hatchling dispersal at different locations for relationships to environmental cues (brightness, near and far horizons, and olfaction), and 4) test for learning (encoding) with experienced hatchlings. For all releases and under all conditions, hatchling dispersal was not random, and not consistent with the "go down hill" rule. There was no evidence of olfaction as a mechanism for dispersal patterns of turtles. Hatchling Blanding's and Map turtles oriented toward dark or closed horizons and away from open, illuminated horizons (either open prairie or river). In contrast, hatchling Snapping, Painted turtles oriented toward more intensely illuminated near and open horizons (either open marsh, prairie or river) and away from dark or closed horizons. Comparison of naive and trans-located experienced Blanding's hatchlings dispersal patterns indicated that experienced hatchlings had encoded a "map-like image" (sun-compass??) based on cues from their initial emergence location (i.e., the majority of them retained their "initial direction of dispersal" when transplanted to a new location on the opposite side of the dunes). In combination, our results indicate that the traits of females and hatchlings related to using terrestrial habitats are plastic, but not infallible.