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Nesting ecology and offspring recruitment in a long-lived turtle

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Abstract. The role of early life stages (eggs, neonates, and juveniles) for population persistence in long-lived organisms is thought to be minor. However, few long-term data sets are available to test this assumption. Variation in vital rates over space and time and the potential for the success of early life stages to shape adult reproductive behavior evolutionarily suggest that more thorough consideration of these life stages is necessary. In particular, the impact of climatic variation on early life-stage recruitment is not well understood. Furthermore, predation occupies a significant role in theoretical models of population dynamics, but its impact on populations through variable vital rates of early life stages is unknown. Maternal nest-site choice, an important component of nesting ecology, may influence many offspring traits and respond to selection to optimize offspring success. Overall, we have limited information regarding the long-term patterns of natural fluctuations in the nesting ecology and hatchling recruitment of populations of long-lived organisms.

The research site for this ongoing long-term project is on an island in the Mississippi River near Thomson, Illinois, USA. Painted turtles (*Chrysemys picta*) have been studied extensively at this location since 1989 to examine the ecology and potential demographic consequences of nest-site choice and depredation, with the aim of understanding the evolution of maternal nesting behavior and its effects on offspring phenotype. We monitored the site every day of the nesting season each year to record nesting and depredation events. The data presented here include nesting phenology, nest vegetation cover, total number of nesting events, clutch size, depredation, and hatchling survival.

Portions of this data set have been used to address related questions in ecology and evolutionary biology. In particular, climatic variation influences the probability of nest depredation events. Such events are typically nonrandom, primarily occurring adjacent to habitat edges. Because habitat edges may have atypical vegetation composition and vegetation influences nest temperature, such nonrandom depredation could influence offspring recruitment and, hence, population structure. Given the unique scope and accessibility of this data set, researchers and teachers should find it to be a valuable empirical resource for exploring important facets of nesting ecology and hatchling recruitment in a wild population of a long-lived species.

Key words: *demography; early life stages; fluctuating environments; maternal effects; nesting behavior; predation; temperature-dependent sex determination; turtles.*

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