

Factors affecting spatiotemporal patterns of nest site selection and abundance in diamondback terrapins

Patricia Levasseur¹, Robert Prescott², Mark Faherty², and Chris Sutherland³

¹University of Massachusetts Amherst

²Massachusetts Audubon Society

³University of St Andrews

February 22, 2024

Abstract

Determining what factors influence the distribution and abundance of wildlife populations is crucial for implementing effective conservation and management actions. Yet, for species with dynamic seasonal, sex-, and age-specific spatial ecology, like the diamondback terrapin (*Malaclemys terrapin*; DBT), doing so can be challenging. Moreover, environmental factors that influence the distribution and abundance of DBT in their northernmost range have not been quantitatively characterized. We investigated proximity to nesting habitat as one potential driver of spatiotemporal variation in abundance in a three-step analytical approach. First, we used a scale selection Resource Selection Function (RSF) approach based on NLCD landcover data to identify the scale at which DBT are selecting for (or avoiding) landcover types to nest. Next, we used RSF to predict areas of suitable nesting habitat and created an index of nest suitability (NSI). Finally, analyzing visual count data using a generalized linear mixed model (GLMM), we investigate spatiotemporal drivers of relative abundance, with a specific focus on whether similar factors affect offshore abundance and onshore nest site selection. We found the scale of selection for developed and saltmarsh land use classes to be 500 m and 525 m and coniferous, beach and open water land use classes to be 100 m. Selection was positive for nesting areas proximal to saltmarsh and beach habitat and negative for developed, coniferous and open water. Expected relative abundance was best explained by the interaction between NSI and day of season, where expected relative abundance was greater within high NSI areas during the nesting season (2.30 individuals, CI: 1.29 – 4.10) compared to areas of low NSI (1.99 individuals, CI: 1.27 – 3.13). Our results provide evidence that inferred spatial patterns of suitable nesting habitat explain spatiotemporal patterns of terrapin movement and abundance.

Hosted file

Levasseur_et_al_Terrapin_Patterns.docx available at <https://authorea.com/users/500830/articles/581496-factors-affecting-spatiotemporal-patterns-of-nest-site-selection-and-abundance-in-diamondback-terrapins>