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Characterization of Prey Availability Between Texas Diamondback Terrapin (*Malaclemys terrapin littoralis*) Capture Sites and Background Wetland Densities

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Introduction

The diamondback terrapin (*Malaclemys terrapin*) is a species of turtle specialized for living in brackish and saltmarsh environments. The Texas diamondback terrapin (*M. t. littoralis*) (Figure 1) is the subspecies found along most of the Texas Gulf Coast. Past studies have been conducted on prey availability and diet of diamondback terrapin, but these studies primarily occurred along the Atlantic Coast. Previous diet studies indicate that terrapin consume various crab and mollusk species (Tucker et al. 1995). There is currently a paucity of data on the diet of this species along the coast of the Gulf of Mexico, and specifically on the Texas Gulf Coast.

Figure 1. A male and female Texas diamondback terrapin captured on South Deer Island.

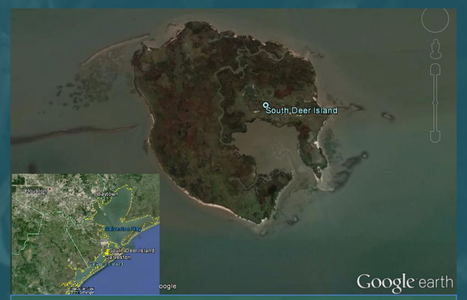

Figure 2. Google Earth image of South Deer island.

Study Area and Methods

South Deer Island is a small island in West Galveston Bay (Figure 2). The island's habitat consists of saltmarsh vegetation (*Spartina alterniflora*, *Batis maritima*, and *Salicornia* spp.) with tidal creeks and interspersed ponds. Terrapin were located and captured during surveys on the island. Field data were collected at each capture site and nearby, randomly selected control sites including: location, time, and vegetation data (species composition; density; height within a $1m^2$- square quadrat) (Figure 3). Potential prey items (*Uca* spp. burrows; *Littorina* snails; etc.) (Figures 4 and 5) were also counted within the $1m^2$ quadrat at these sites. Counting open *Uca* spp. burrows can be used to estimate crab abundance (Warren 1990). These data were analyzed using two-sample T-tests and a frequency distribution graph using the Minitab software package.

Figure 3. Image of quadrat (1m2) used in the field.

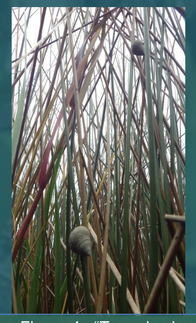

Figure 4. "Terrapin view" of marsh periwinkles (*Littorina irrorata*) on *Spartina alterniflora*.

Figure 5. Image of crab burrows.

Results

We failed to reject the null hypothesis that there was no significant difference in the number of *Littorina* at terrapin capture sites versus random sites (P = 0.256) (Figure 6). However, random locations exhibited significantly (P = 0.004) higher numbers of fiddler crab burrows in comparison to terrapin capture sites (Figure 7). There was no significance in the average width of *Littorina* at capture sites versus random sites (P = 0352). Terrapin were also captured most frequently in areas where *S. alterniflora* was the dominant vegetation, followed by *B. maritima* (Figure 9). Areas dominated with *B. maritima* or *S. alterniflora* were encountered equally in random prey quadrat surveys(Figure 9).

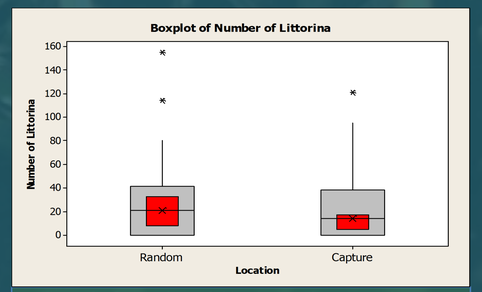

Figure 6. Comparison of *Littorina* numbers at random sites (n = 37, $\bar{x}$ **= 28.9, SD = 34.4)** with terrapin capture sites (n = 97, $\bar{x}$ **= 21.8, SD =** 25.7**)**. Median symbol = x. Red bar depicts the 95% confidence interval for the median.

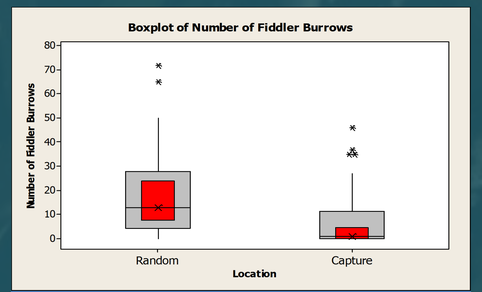

Figure 7. Boxplot comparing crab burrows at random sites (n = 26, $\bar{x}$ **= 19.7, SD = 19.8)** with terrapin capture sites (n = 70, $\bar{x}$ **= 6.8, SD = 10.4)**. Median symbol = x. Red bar depicts the 95% confidence interval for the median.

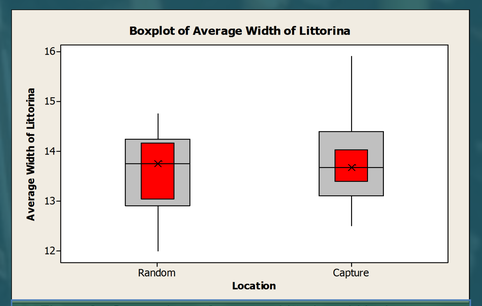

Figure 8. Comparison of average *Littorina* widths between random sites (n = 27, $\bar{x}$ **= 13.6, SD = 0.79)** and terrapin capture sites (n = 62, $\bar{x}$ **= 13.8, SD = 0.78**). Median symbol = x. Red bar depicts the 95% confidence interval for the median.

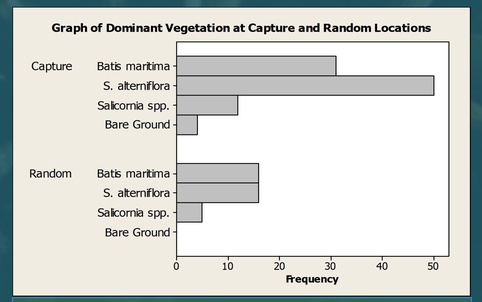

Figure 9. Bar graph depicting dominant vegetation types at terrapin capture (n = 97) and random locations (n = 37).

Discussion and Future Work

These results indicate that the availability of fiddler crabs or marsh periwinkle snails may not have a large effect on Texas diamondback terrapin habitat selection. Also, average width of *L. irrorata* does not seem to have an effect on habitat selection. *Littorina* numbers at capture locations are not different from the random locations. The number of fiddler crab burrows is higher at random locations, although there is some overlap in the distribution of burrow density between random versus terrapin capture sites. However, initial observations during fecal collection indicates that fiddler crabs are taken frequently as prey items throughout the year. It appears as though dominant vegetation type may play a large factor in habitat selection, and likely on prey available to terrapin.

This information will be compared with actual prey consumption, by fecal analysis, in the near future to evaluate potential prey selectivity by terrapin. The effects of the presence of other potential prey items and any prey/ habitat differences between the sexes will be analyzed in the future.

Literature Cited

Tucker, Anton D., Nancy N. Fitzsimmons, and J. Whitfield Gibbons. 1995. Resource Partitioning by the Estuarine Turtle *Malaclemys terrapin*: Trophic, Spatial, and Temporal Foraging Constraints. Herpetologica 51: 167-181.

Warren, J. H. 1990. The Use of Open Burrows to Estimate Abundances of Intertidal Estuarine Crabs. Australian Journal of Ecology 15: 277-280.

For Further Information

Please contact *alleman@uhcl.edu*. More information on this and related projects can be obtained at EIH webpage: www.eih.uhcl.edu

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