You may use the information and images contained in this document for non-commercial, personal, or educational purposes only, provided that you (1) do not modify such information and (2) include proper citation. If material is used for other purposes, you must obtain written permission from the author(s) to use the copyrighted material prior to its use.
Assessment of Habitat and Prey Availability Associated with the Distribution of Texas Diamond-backed Terrapin (*Malaclemys terrapin littoralis*)

Bryan Alleman and Dr. George Guillen
UHCL School of Science and Computer Engineering, Houston 77058
Environmental Institute of Houston

April 9, 2015
Texas Bays and Estuaries Meeting
Life History

Range from Cape Cod, MA to Corpus Christi, TX

Only US turtle species adapted to live in brackish and saltwater (*Spartina alterniflora*) marshes

- Keystone predator - diet consists of snails, clams and mussels, crabs, fish
- Sexually dimorphic:

<table>
<thead>
<tr>
<th>Sex</th>
<th>Carapace Length (mm)</th>
<th>Weight (kg)</th>
<th>Head Width (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>&gt; 200</td>
<td>&gt; 1.5</td>
<td>&gt; 50</td>
</tr>
<tr>
<td>Male</td>
<td>~ 140</td>
<td>~ 0.4</td>
<td>~ 25</td>
</tr>
</tbody>
</table>
Background

Information on habitat preferences across range needed
Most prey availability studies from Atlantic Coast
  • accessibility rather than abundance may be limiting factor in areas of high tidal variability
  • 76-79% of dietary mass Littorina for all size classes (males and females)
  • availability may not be primary driver of terrapin distribution
  • physical habitat important influence on accessibility to prey
  • no Littorina present
Objective

Quantify habitat and available prey of terrapins in Texas, specifically the upper coast

Hypotheses

1. Are there habitat/prey differences between random and terrapin capture locations?
2. Are there temporal (seasonal) differences in habitat/prey at terrapin capture locations?
Study Sites
Methods

- Terrapin were captured by hand during random searches at each site
- Surveys were conducted by walking random transect lines
- Random sample locations along the transect line were chosen by timer set for times of 5-15 minutes while walking transect
- Prey abundance, plant community composition, and physical habitat within 1 m² quadrat
Methods

Prey abundance:
- *Littorina irrorata* counts
- *Uca* spp. burrows counts
- Noted presence of other potential prey

Habitat:
- Species composition
- Vegetation coverage and height

Statistical Analysis:
- Random vs. Capture Locations
- Seasonal at Capture Locations
- Kruskal-Wallis test employed to test for group differences
- Dunn’s Method (*post hoc*)
Common Prey Items

- *Littorina irrorata*
- *Uca spp.*
- *Cerithidea pliculosa*
- *Callinectes sapidus*
Results

Location Differences
Results – Overall Patterns

Quadrats (n = 293)
- Random (n = 78)
- Capture (n = 215)

No significant difference in *S. alterniflora* coverage ($p = 0.372$) or number of *L. irrorata* ($p = 0.571$) between random and capture locations.
Number of Plant Species vs. Location

Total Number of Plant Species, $p = 0.000$
Percent Cover vs. Location

Percent Cover, $p = 0.003$
% *B. maritima* vs. Location

Percent *B. maritima, p = 0.022*
% Salicornia vs. Location

Percent *Salicornia* spp., $p = 0.011$
No. Fiddler Crab burrows vs. Location

Number of *Uca* spp. Burrows

\( p = 0.018 \)
Seasonal Differences at Capture Locations
Smooth Cordgrass vs. Season

Percent *S. alterniflora*, $p = 0.000$

- **Fall**: 100%
- **Spring**: 80%
- **Summer**: 60%
- **Winter**: 40%

Percent cover of Spartina alterniflora varies significantly by season, with the highest percentage in Fall and the lowest in Winter. The difference is statistically significant at $p = 0.000$.
% *Batis maritima* vs. Season

Percent *B. maritima*, p = 0.002

*Season*
- Fall
- Spring
- Summer
- Winter

*Percent Cover Batis maritima*
Percent Salicornia spp. vs. Season

Percent Salicornia spp., $p = 0.000$
No. Fiddler Crab burrows vs. Season

**Number of *Uca* spp. Burrows**

$p = 0.000$
No. *L. irrata* vs. Season

Number of *L. irrata*  
\[ p = 0.000 \]
Conclusions

Prey abundance not correlated with distribution of Texas Diamond-backed Terrapin agrees with previous studies.

Vegetation composition likely affects distribution.

Seasonal changes in vegetation use by terrapin:
- due to thermoregulation?
- predator avoidance?

Seasonal variation in prey numbers confirmed in diet analysis (Uca).
References


Acknowledgements

Environmental Institute of Houston:
- Staff and graduate students contributions in the field
- Equipment and funding

Texas Parks and Wildlife Department:
- Funding
Thank You!

Contact: alleman@uhcl.edu