INTRODUCTION

Natural History of the Diamondback Terrapin
- The only obligate estuarine turtle found in North America
- Ranges from Cape Cod, MA to Texas
- Heavily exploited through the early 20th century as a gourmet food item

Current Status
- Believed to be declining throughout much of their range
- Face many anthropogenic threats1,2,3
  - Road mortality, habitat loss, drowning in crab pots
  - The status of the Diamondback Terrapin in South Carolina is unknown4
  - Terrapins are currently a state-regulated species (Chapter 5 Section 50-5-2300) and considered high priority
  - Declines have been documented in the Kiawah River5

Ecology and Reproduction
- Sexually dimorphic1
- Display high site fidelity and small home ranges1,2
- Use different habitat types to complete life cycle4
- Foraging, mating, and nesting
- May form dense aggregations in spring specifically for mating purposes6

OBJECTIVES

1. Estimate the population size and sex ratio of Diamondback Terrapins in Charleston Harbor using MARK analysis of mark-recapture data
2. Compare to population size determined for the Ashley River in 2010
3. Evaluate the efficacy of PIT tagging and marginal scute notching as mark-recapture techniques for terrapins
   ￫ How much PIT tag loss occurs in the wild?
4. Determine if terrapin populations undergo distinct seasonal habitat shifts
   ￫ Assess using capture data and ultrasound
   ￫ Are shifts in habitat use related to reproduction?

METHODS

Capture methods
- Capture via trammel net in conjunction with SCDNR Inshore Fisheries
  ￫ Samples a random set of 12-14 sites throughout the harbor each month
  ￫ Effective for capturing terrapins along shorelines in the harbor
- Capture via modified seine net
  ￫ More effective at sampling terrapins located within tidal creeks

Tagging and morphometrics
- Sex and morphometric data recorded
- 11mm polymer PIT tag inserted into right rear leg
- A unique series of 4 V-shaped notches are filed into each turtle’s marginal scutes

Ultrasound
- Reproductive structures of female terrapins imaged using an Aloka 500 ultrasound equipped with a 5.0 MHz probe

Data Analysis
- Population estimates using program MARK

ACKNOWLEDGEMENTS

I would like to thank my advisor, David Owens, and my committee members, Bill Roumillat, Erin Levesque and Pace Wilbur. Special thanks go to the SCDNR Inshore Fisheries Section, funded through NMFS Project NA08NMF4720514, for summer support and fieldwork. I am also very grateful to my fellow students who volunteered their time for help with fieldwork.

REFERENCES

3. Estep, B. 2005. Seasonal movements and habitat usage can be used to evaluate the status of terrapins in Charleston Harbor and ultimately help to determine if new management measures should be considered.
4. The status of the Diamondback Terrapin, Malaclemys terrapin, is unknown or declining throughout much of its range. Due to the multitude of anthropogenic threats terrapins face, more research is needed to assess population trends. In this mark-recapture study, terrapins will be sampled using both trammel netting and seine netting. Captured individuals will be dual marked using PIT tags and marginal scute notching to evaluate the efficacy of PIT tagging as a viable mark-recapture technique for this species. The use of multiple capture techniques is designed to sample both Charleston Harbor sites and adjacent tidal creeks in order to look at seasonal shifts in habitat use. In addition, female reproductive condition will be assessed using ultrasound and used to explore links between habitat shifts and reproduction. Sex ratios will also be determined to look at potential differential mortality between sexes. Mark-recapture data will be used to generate a population size estimate for Charleston Harbor using MARK software. The Charleston Harbor population size will then be compared to estimates calculated for the Ashley River in 2010 to gain an understanding of patterns throughout the estuary. This information on population size, sex ratios, and habitat usage can be used to evaluate the status of terrapins in Charleston Harbor and ultimately help to determine if new management measures should be considered.

ABSTRACT

Currently the status of the Diamondback Terrapin, Malaclemys terrapin, is unknown or declining throughout much of its range. Due to the multitude of anthropogenic threats terrapins face, more research is needed to assess population trends. In this mark-recapture study, terrapins will be sampled using both trammel netting and seine netting. Captured individuals will be dual marked using PIT tags and marginal scute notching to evaluate the efficacy of PIT tagging as a viable mark-recapture technique for this species. The use of multiple capture techniques is designed to sample both Charleston Harbor sites and adjacent tidal creeks in order to look at seasonal shifts in habitat use. In addition, female reproductive condition will be assessed using ultrasound and used to explore links between habitat shifts and reproduction. Sex ratios will also be determined to look at potential differential mortality between sexes. Mark-recapture data will be used to generate a population size estimate for Charleston Harbor using MARK software. The Charleston Harbor population size will then be compared to estimates calculated for the Ashley River in 2010 to gain an understanding of patterns throughout the estuary. This information on population size, sex ratios, and habitat usage can be used to evaluate the status of terrapins in Charleston Harbor and ultimately help to determine if new management measures should be considered.

PREDICTIONS

- Population size in the Ashley River was estimated to be 3060 with a 95% confidence interval of 1964-4156 in 20108
  ￫ SCDNR incidental capture data predicts a smaller population in Charleston Harbor
- More trammel captures in Spring/early Summer; More seine captures in Fall

- Leave tidal creeks for mating/nesting habitats and return to creeks for foraging/hibernation habitats
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- Leave tidal creeks for mating/nesting habitats and return to creeks for foraging/hibernation habitats

CONCLUSION

Currently the status of the Diamondback Terrapin, Malaclemys terrapin, is unknown or declining throughout much of its range. Due to the multitude of anthropogenic threats terrapins face, more research is needed to assess population trends. In this mark-recapture study, terrapins will be sampled using both trammel netting and seine netting. Captured individuals will be dual marked using PIT tags and marginal scute notching to evaluate the efficacy of PIT tagging as a viable mark-recapture technique for this species. The use of multiple capture techniques is designed to sample both Charleston Harbor sites and adjacent tidal creeks in order to look at seasonal shifts in habitat use. In addition, female reproductive condition will be assessed using ultrasound and used to explore links between habitat shifts and reproduction. Sex ratios will also be determined to look at potential differential mortality between sexes. Mark-recapture data will be used to generate a population size estimate for Charleston Harbor using MARK software. The Charleston Harbor population size will then be compared to estimates calculated for the Ashley River in 2010 to gain an understanding of patterns throughout the estuary. This information on population size, sex ratios, and habitat usage can be used to evaluate the status of terrapins in Charleston Harbor and ultimately help to determine if new management measures should be considered.