



# Population Study of Painted Turtles (*Chrysemys picta*) on Witch Hole Pond and Aunt Betty Pond in Acadia National Park

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## Introduction

Although one of the best studied turtles in the world, only one previous study of Painted Turtles (*Chrysemys picta*) has been conducted on MDI in recent history, occurring from 1991-2002. Painted Turtles naturally occur across the country with 4 subspecies recognized across their range; on MDI, biologists have identified the Eastern and Midland Painted Turtle.

Around the margins of carriage roads near bodies of water, Acadia National Park biologists noticed large numbers of disturbed turtle nests. This project investigates the population structure of the turtles in Witch Hole Pond and Aunt Betty Pond and how the population might have changed in 20 years. Trapping from June to August yielded 129 individuals, of which 23 were identified in a 1990s study. We tagged 7 gravid females, 4 at Witch Hole and 3 at Aunt Betty, with radio transmitters to examine pond use and potential nest site choice. To determine the extent of available natural nesting substrate, we walked the edges of both ponds.



Image 1. Recaptured turtle with transmitter.



Image 2. Recaptured turtle with transmitter removed.



Image 3. Recaptured turtle from 1990s study with notch code.

## Methods

### Trapping:

- Mesh hoop traps set from June 11 - August 28
  - June 11-July 1: 15 trap nights/week
  - July 1-August 28: 10 trap nights/week

### Captured turtles:

- Weighed
- Measured (carapace length, width, height; plastron length)
- Sexed
- Notched (if necessary)

### Telemetry:

- June 11-July 1: Gravid females tagged with BD-2 Holohil radio transmitter
- June 12-August 20: Daily triangulation from 3 points

Performed circumnavigation transects of ponds to locate natural nesting substrate



Image 4. Telemetry in the field.



Image 5. Checking traps and determining reproductive status of captured female.

## Results

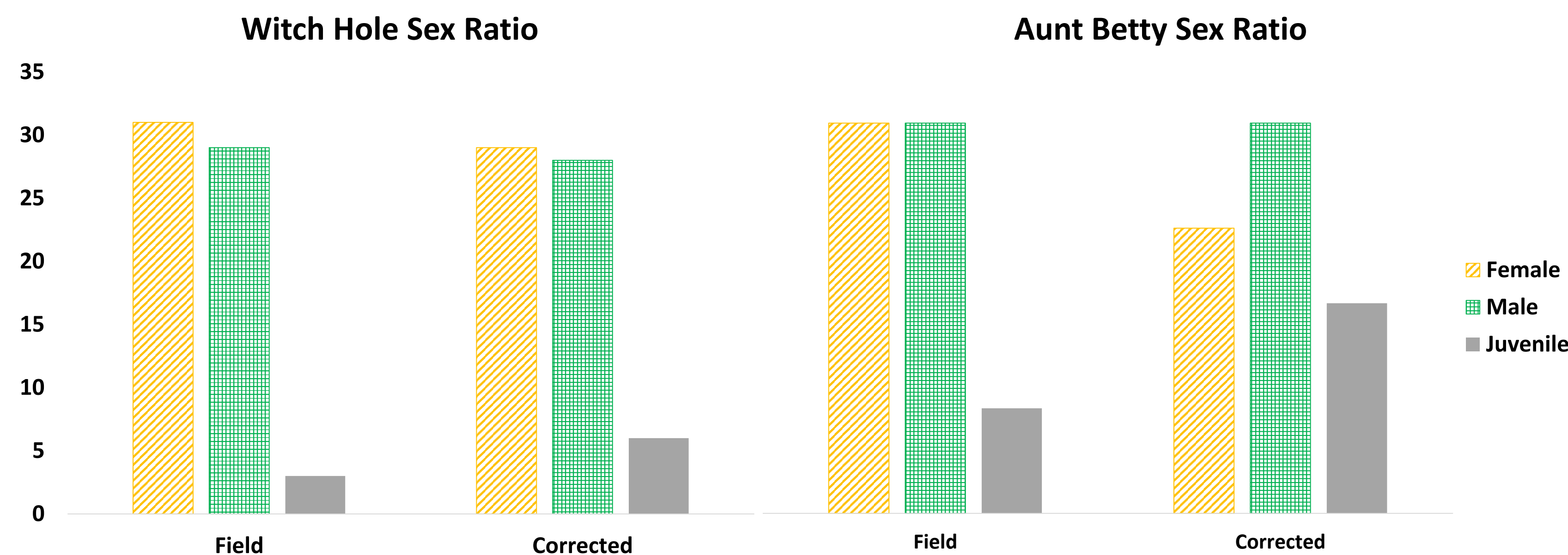


Figure 1. The above graphs show the sex ratios of turtles trapped in each pond. The field values are based on what I could confidently identify in the field using secondary sexual characteristics. Witch Hole's field M/F ratio is 0.93:1.0. Aunt Betty's field M/F ratio is 1.0:1.0. The corrected values take into account Ernst et al.'s (2009) plastron length threshold for sexual maturity in male and female Painted Turtles. Witch Hole's corrected M/F ratio of 0.96:1.0. Aunt Betty's corrected M/F ratio is 1.0:0.73.

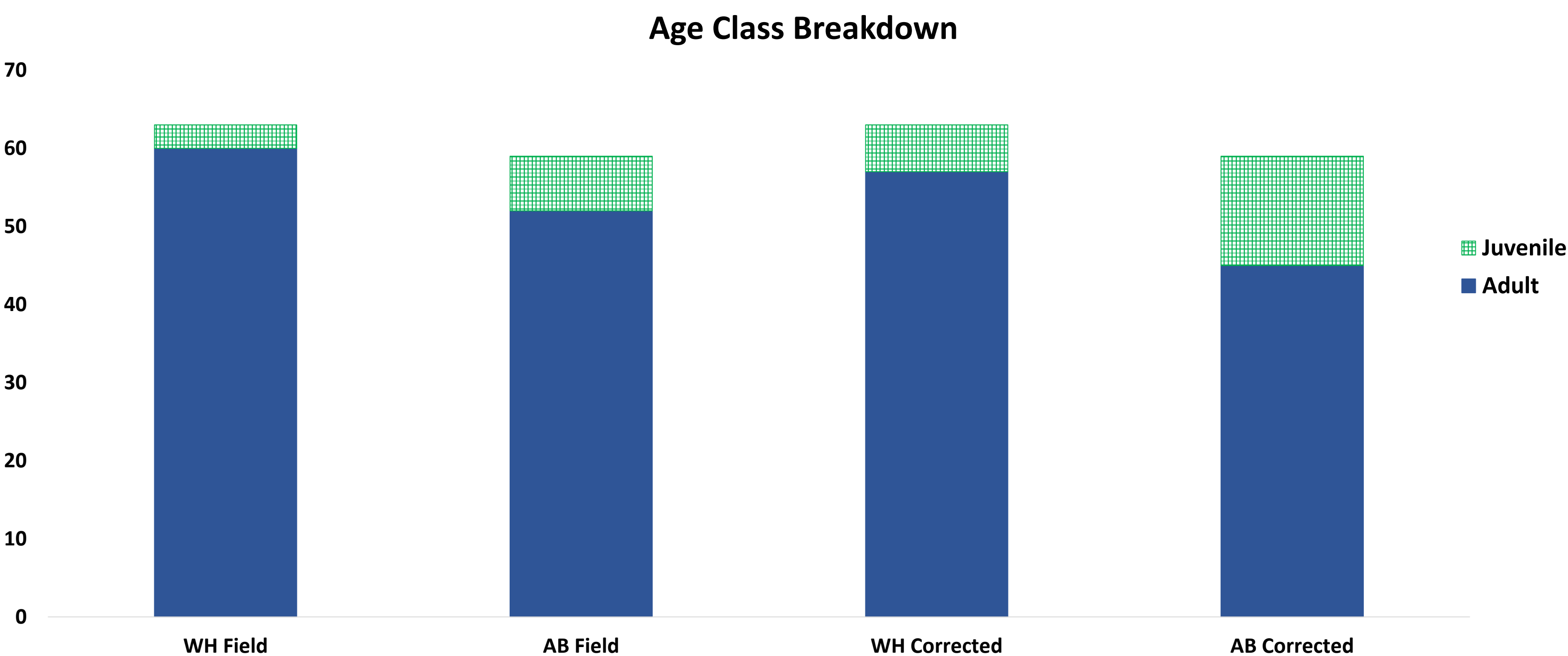


Figure 2. The above graph shows field and corrected adult to juvenile ratios captured at the two ponds. Witch Hole's field A/J ratio is 1.0:0.05. Aunt Betty's field A/J ratio is 1.0:0.13. The corrected values take into account Ernst et al.'s (2009) plastron length threshold for maturity. Witch Hole's corrected A/J ratio is 1.0:0.12. Aunt Betty's corrected A/J ratio is 1.0:0.28.

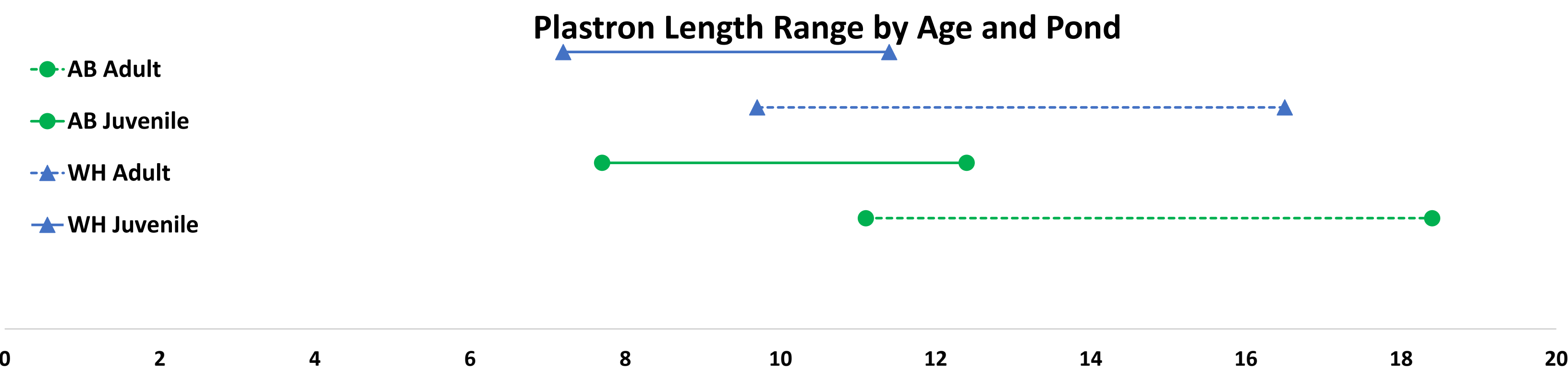


Figure 3. The above graph shows the range of plastron lengths at each pond based on age class.

## Discussion

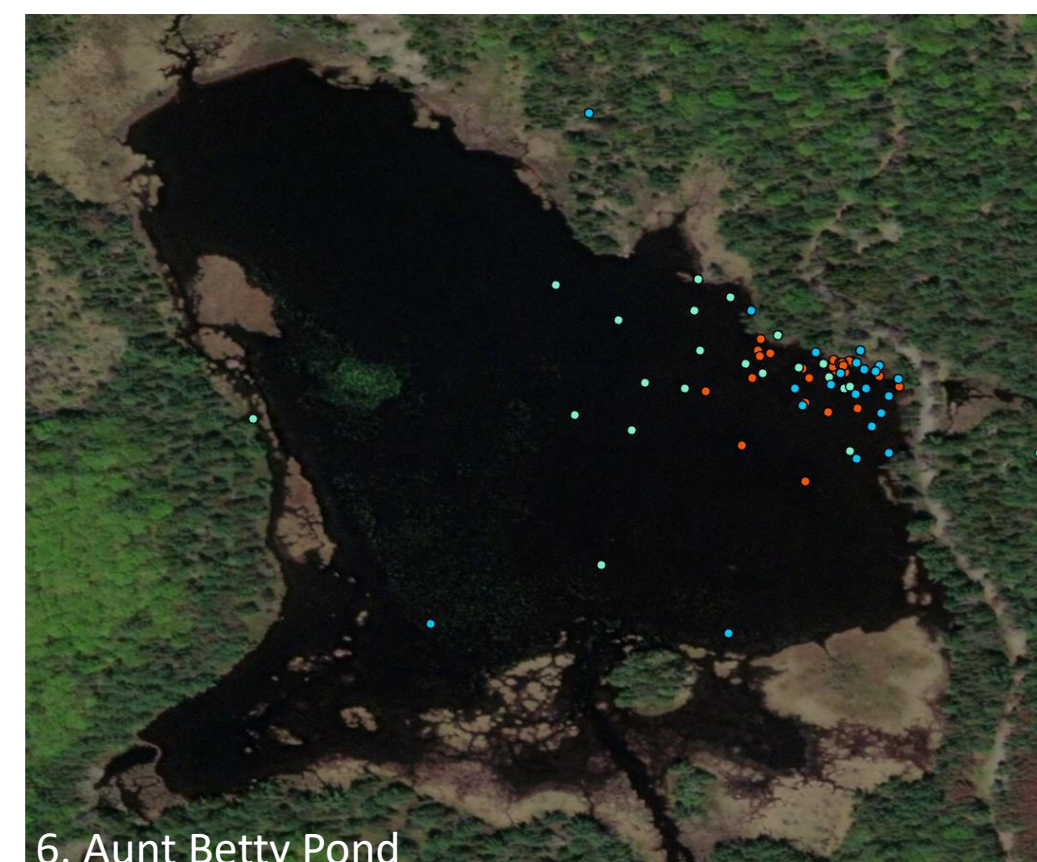
The population structure on these two ponds appears evenly split between males and females, with low numbers of juveniles in both the field and corrected calculations.

The recruitment level appears low; however, turtle populations can persist with low recruitment levels due to their longevity and long reproductive viability.

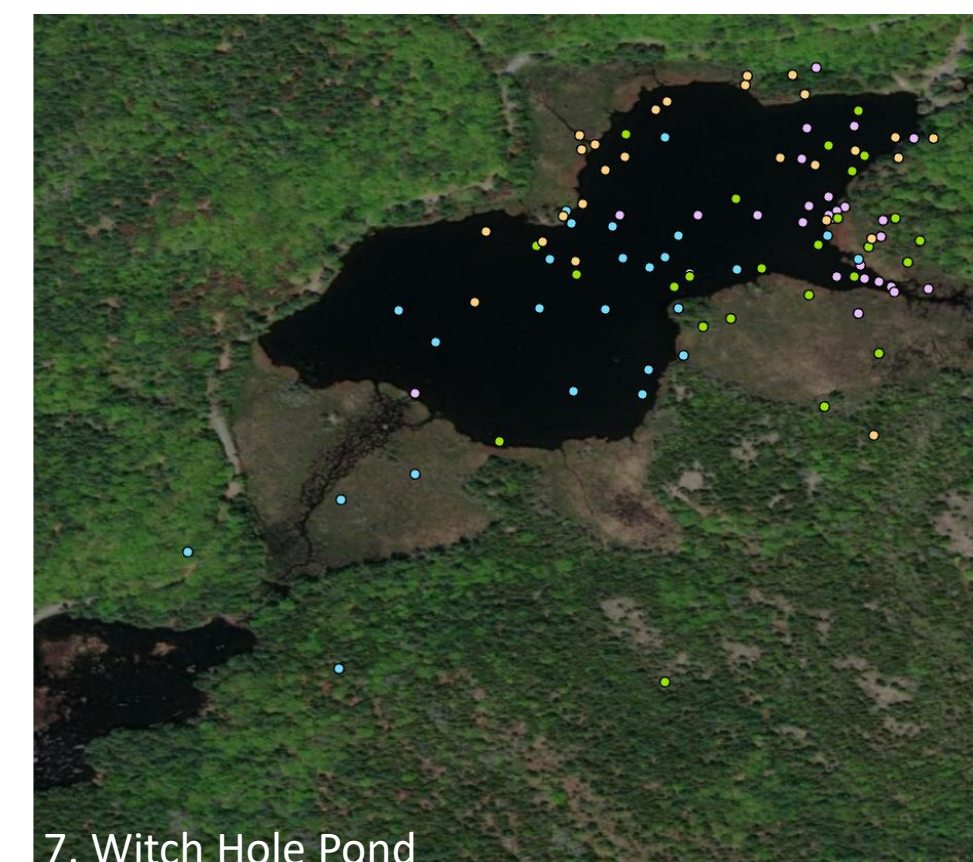
Natural nesting substrate is not readily available to nesting turtles. Walking the perimeter of both ponds showed that natural substrate occurs infrequently in less than 1x1 meter sections, contains ants, or is a large, uphill distance away from the ponds. Turtles that find the carriage road first likely use it in favor of the hard-to-reach, infrequent natural areas. Nests in the natural substrate appeared to be as equally preyed on as those on the carriage road.

## Conclusion

The population is evenly spread, based on sex ratio and recruitment levels; however more analysis is required to determine how this breakdown compares to past years. Natural nesting substrate is not easily accessible or available in abundance. Use of the carriage roads is not necessarily a preference, but it is closer and more available than the natural areas.

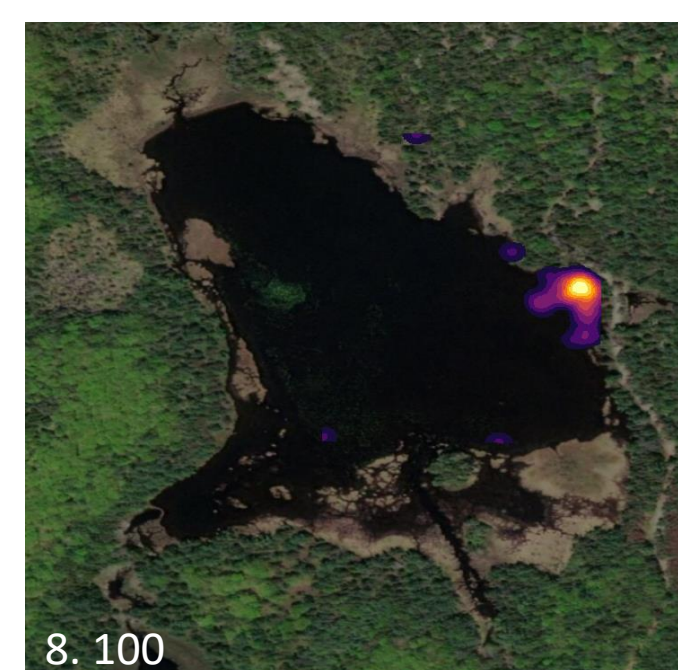


6. Aunt Betty Pond

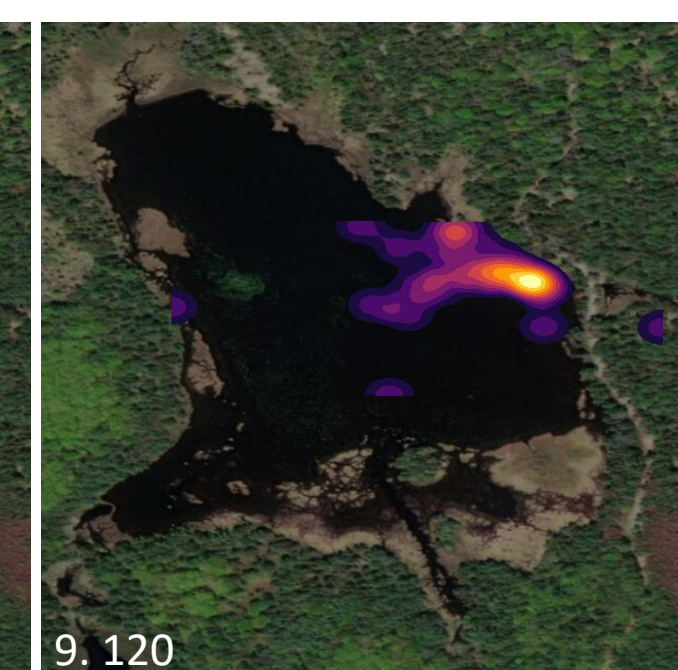


7. Witch Hole Pond

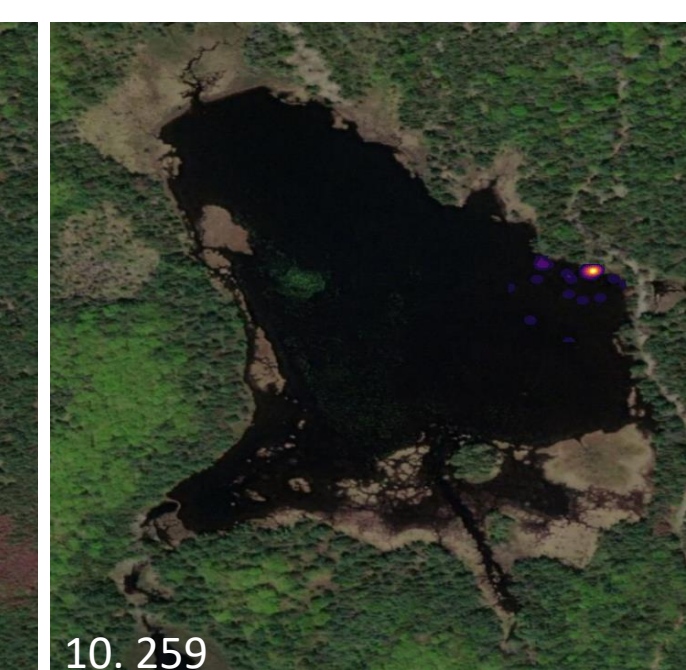
Images 6 and 7. Daily triangulation points for the radio-tagged individuals on each pond. Color indicates individual.



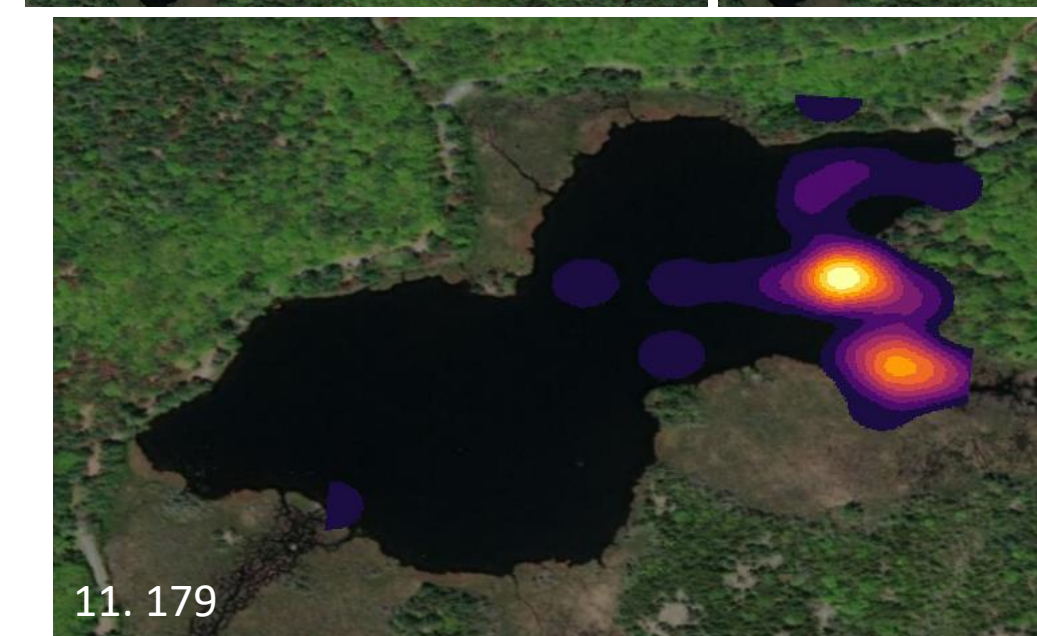
8. 100



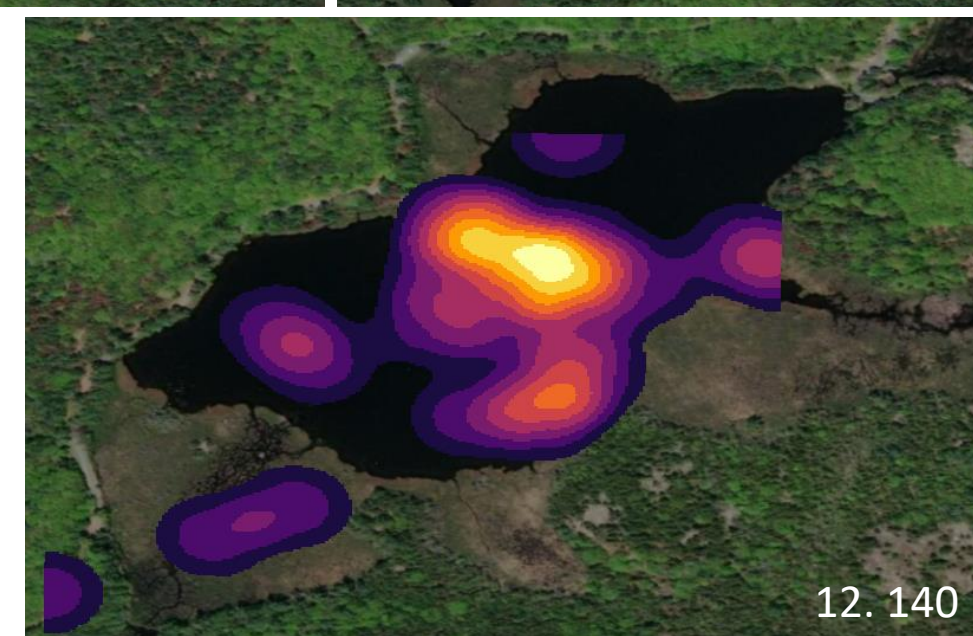
9. 120



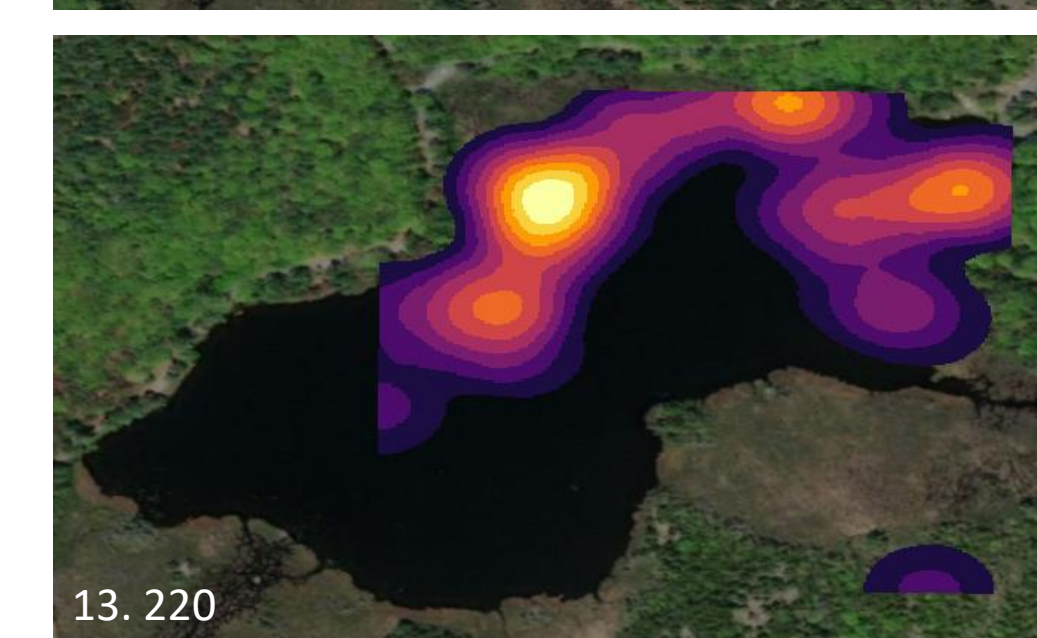
10. 259



11. 179



12. 140



13. 220



14. 280

Images 8-14. Heat maps showing each individual's frequency of occurrence in an area on the pond. 3 digit code on the image indicates the last 3 digits of that individual's transmitter frequency.

## Acknowledgements

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## References

Ernst, Carl H., and Lovich, Jeffery E. 2009. "Painted Turtles." *Turtles of the United States and Canada*. The Johns Hopkins University Press, Baltimore, MD.