



There's No Place Like Home? No Support for Natal Homing in Bog Turtles

By Caroline Chiu, Purva Vaidya, and Suzanne Macey

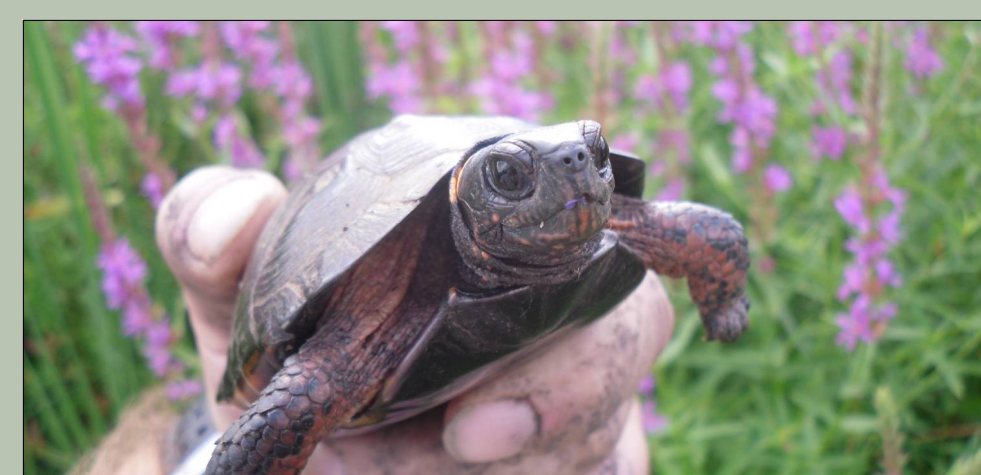


Abstract

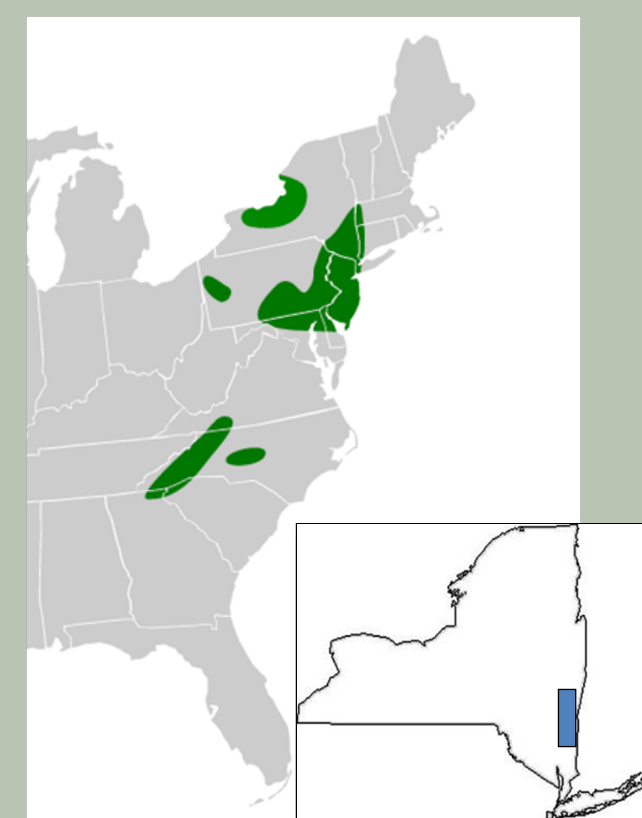
The critically endangered bog turtle, *Glyptemys muhlenbergii*, is threatened primarily because of the loss of suitable habitat. Thus far, researchers and wildlife managers know little about the nest site habitat selection of bog turtles. Our study is the first attempt to find genetic support for whether or not bog turtles at two New York State populations exhibit natal homing (*i.e.* the behavior of a female returning to nest in the area from which she hatched). Natal homing is suggested if more closely related females nest closer to one another. To address the question of natal homing in bog turtles, we compared genetic relatedness and nest site distances between females within each population using microsatellite DNA and GPS coordinates. Our analysis shows no correlation between comparative nest distance and relatedness within a population. Therefore, our results suggest that bog turtles do not exhibit natal homing. Since females are not returning to their natal nesting area, the creation of new nesting areas within a site may be beneficial in contributing to the conservation of the species.

Introduction

Background: Bog turtles are freshwater turtles considered to be critically endangered (IUCN 2011). The main threats to the species are habitat loss, habitat degradation, and the illegal pet trade.



Habitat: Bog turtles are native to specific wetland habitats in the eastern United States. Their nesting habitat is characterized by areas with an open canopy and low vegetation. Unfortunately, this type of habitat is becoming increasingly rare, especially with the encroachment of tall-growing invasive plant species.



Natal Homing: When females return to lay eggs at the nesting area where they hatched (Carr and Carr 1972).



Our Objective: To determine if bog turtles display natal homing.

We used microsatellite DNA and GPS coordinates of nests to relate genetic relatedness to distances between nests.

If bog turtles do not display natal homing, then the creation of new nesting habitat areas could be a viable conservation tool.

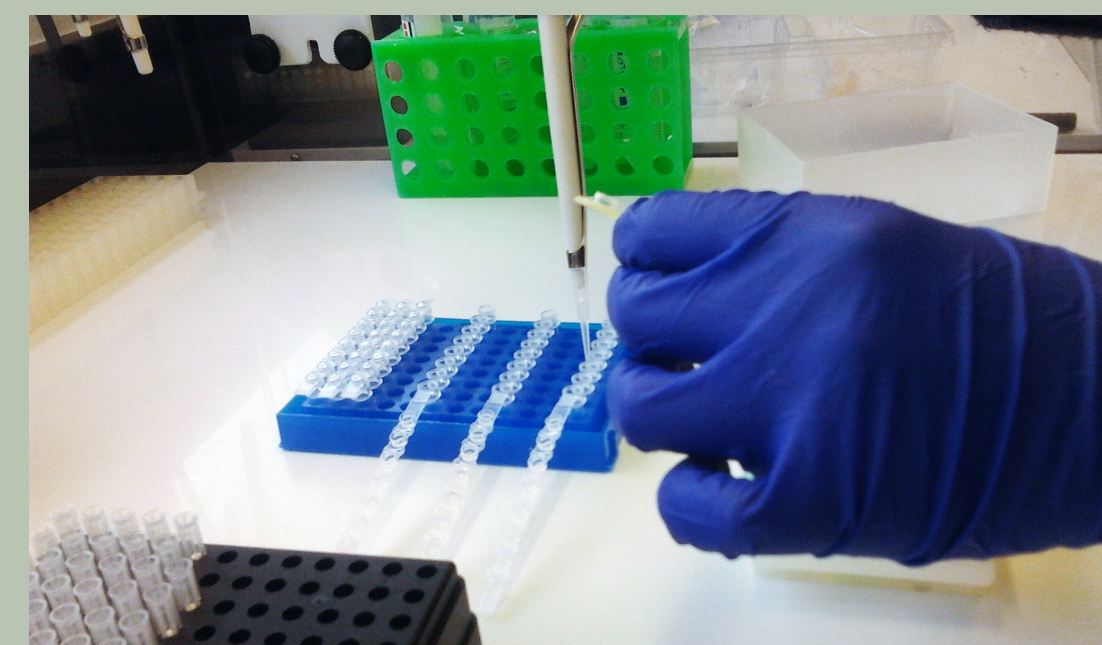


Methods

Collection



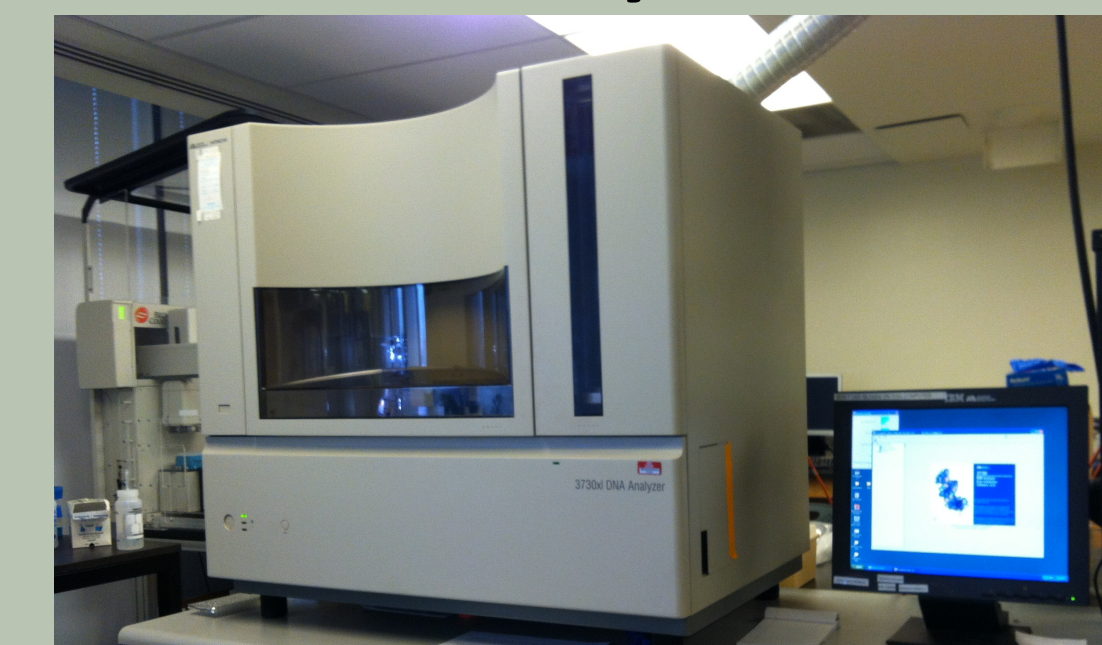
PCR



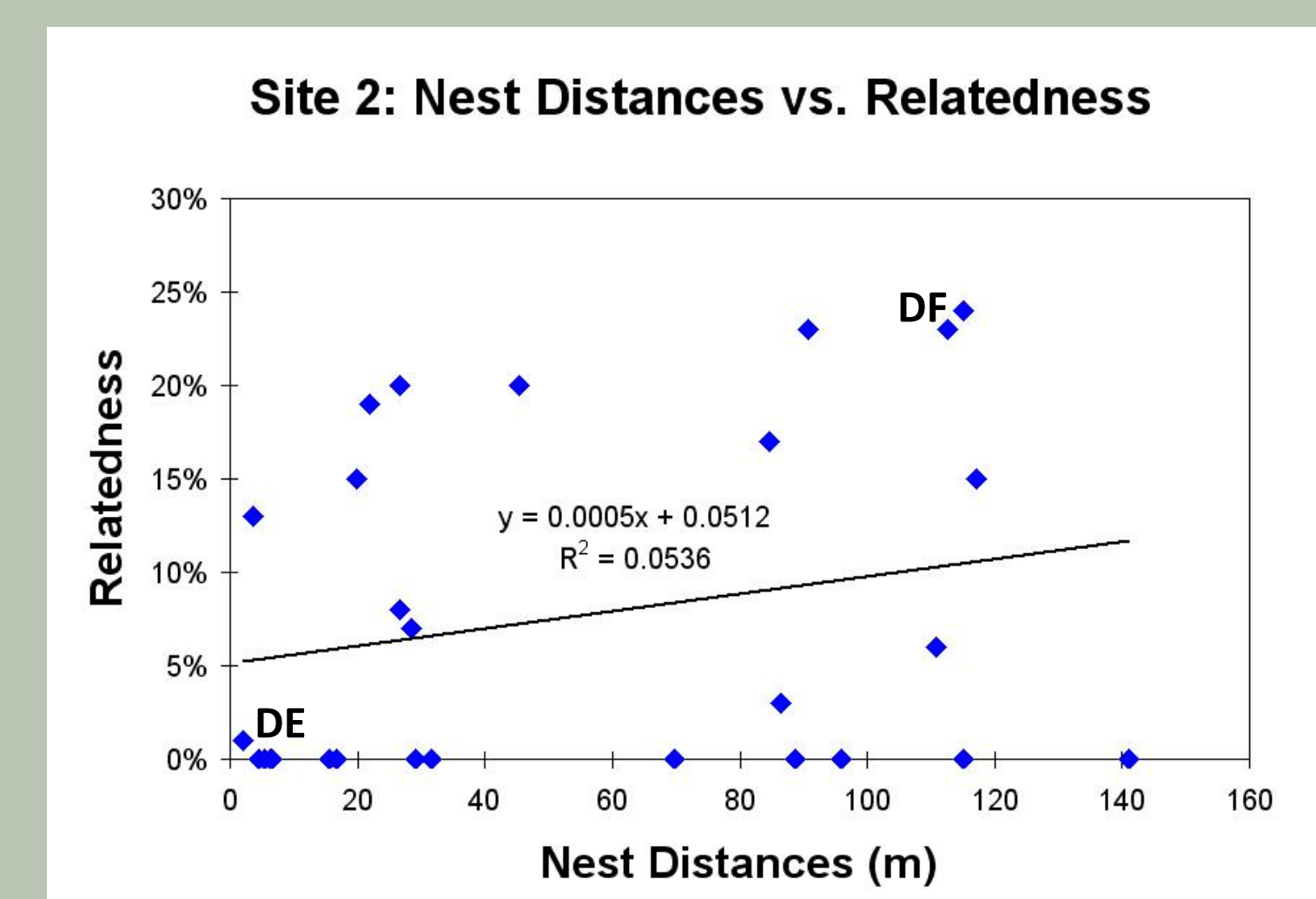
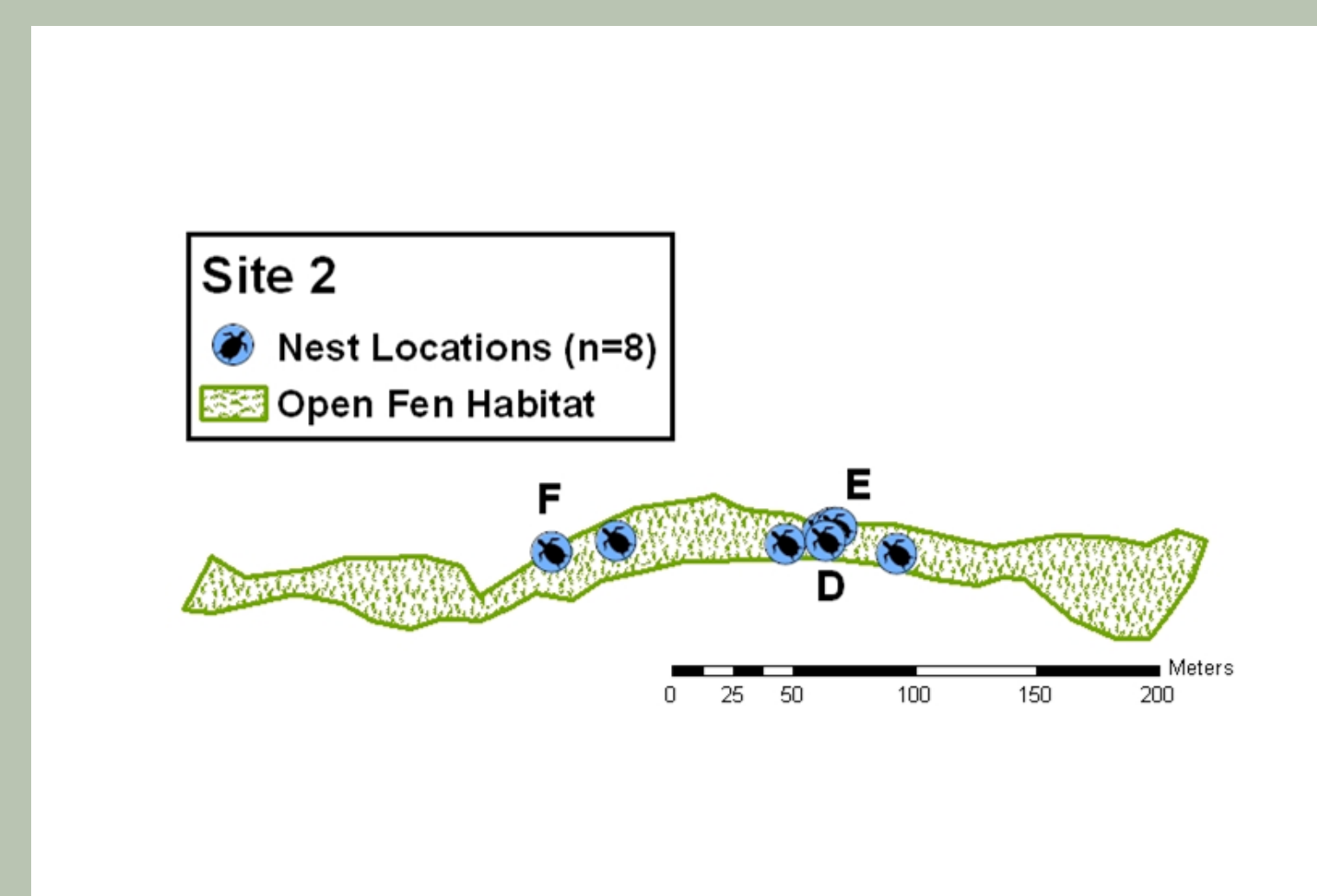
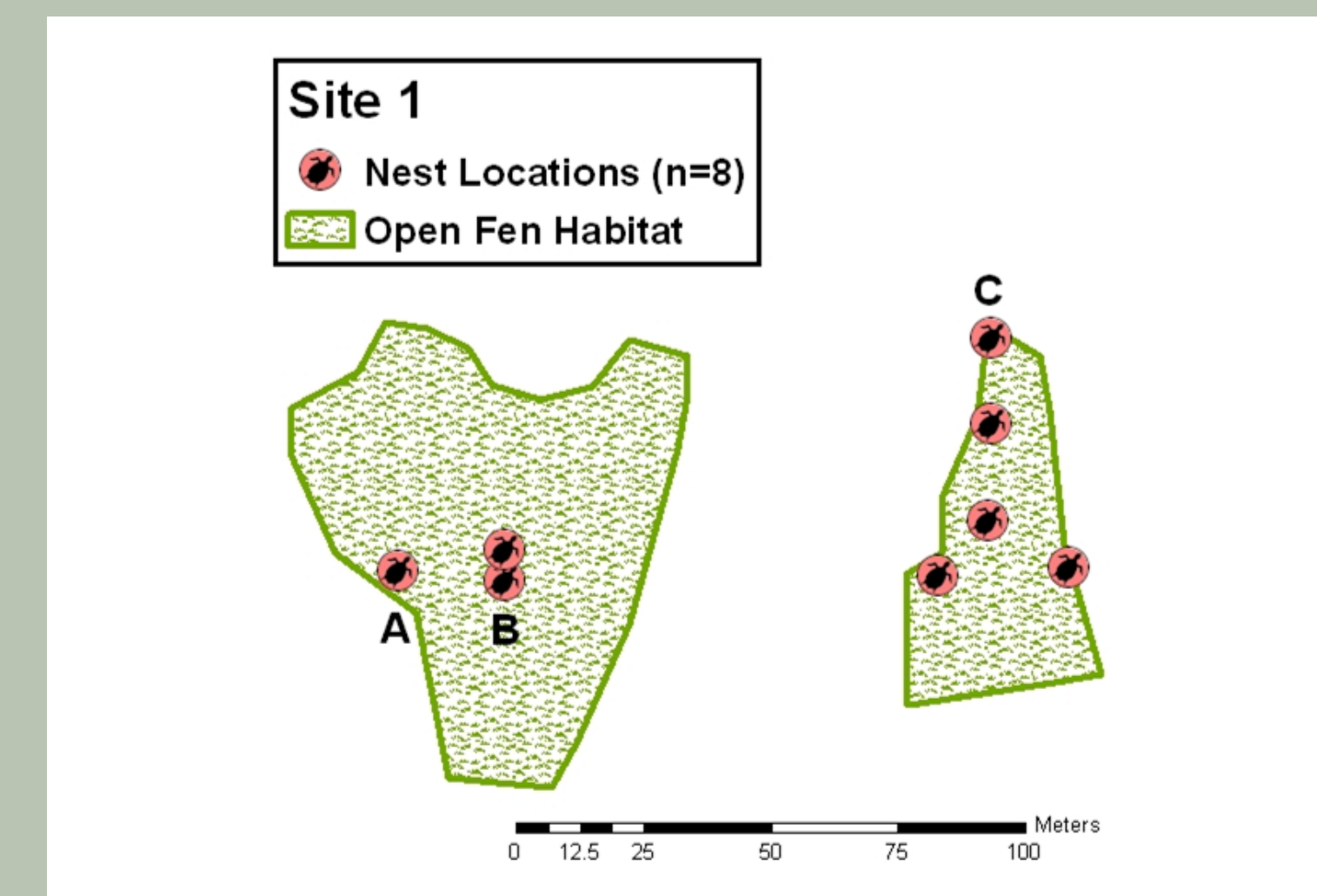
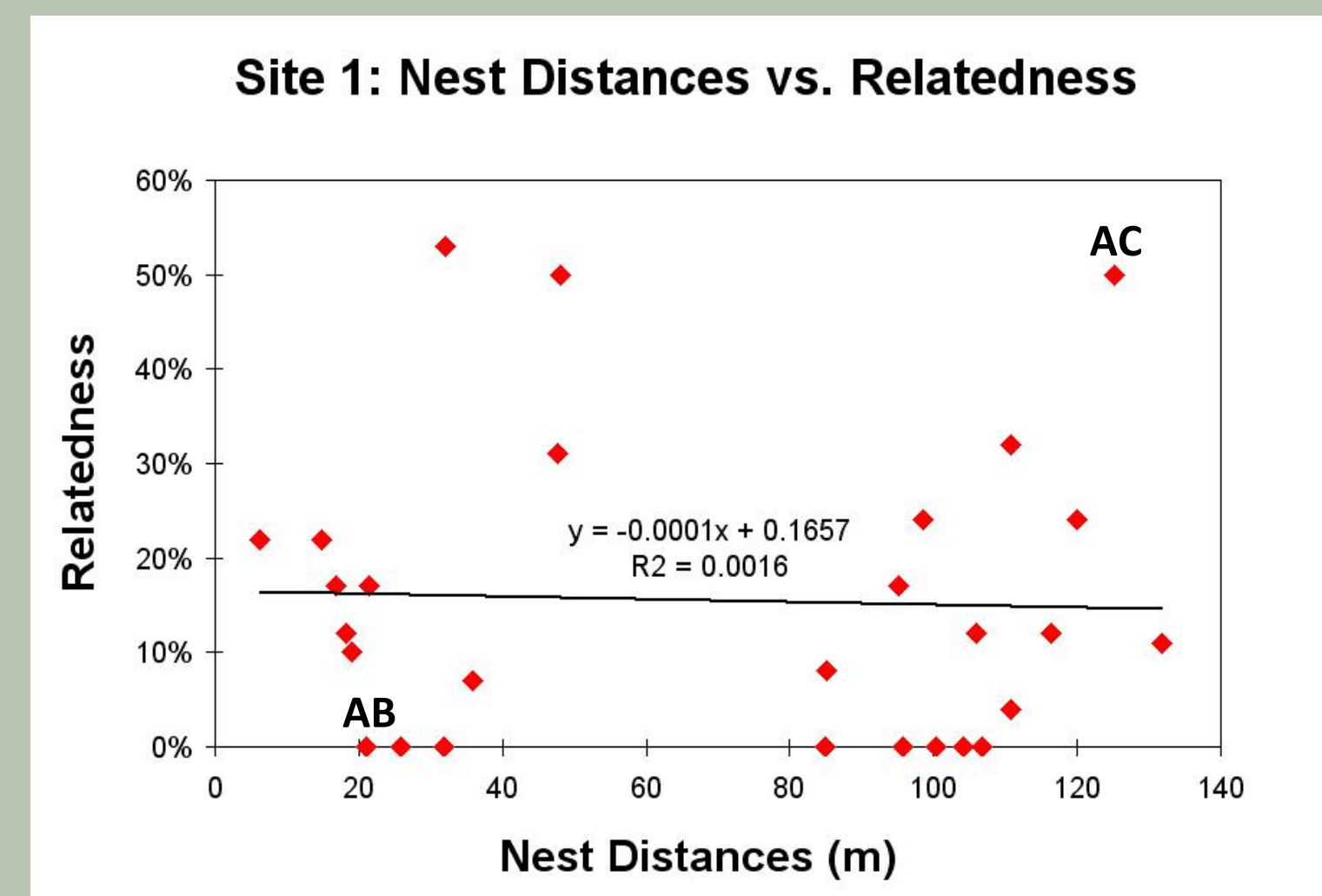
Extraction



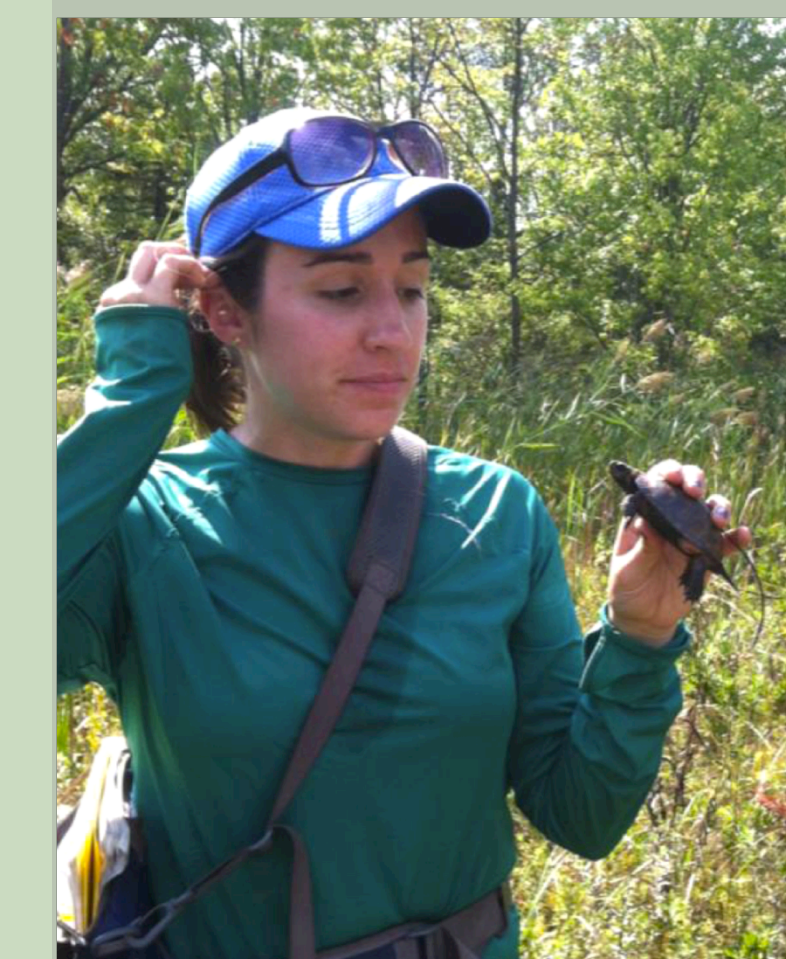
Analysis



Results



Discussion



Why did we do a genetic study?

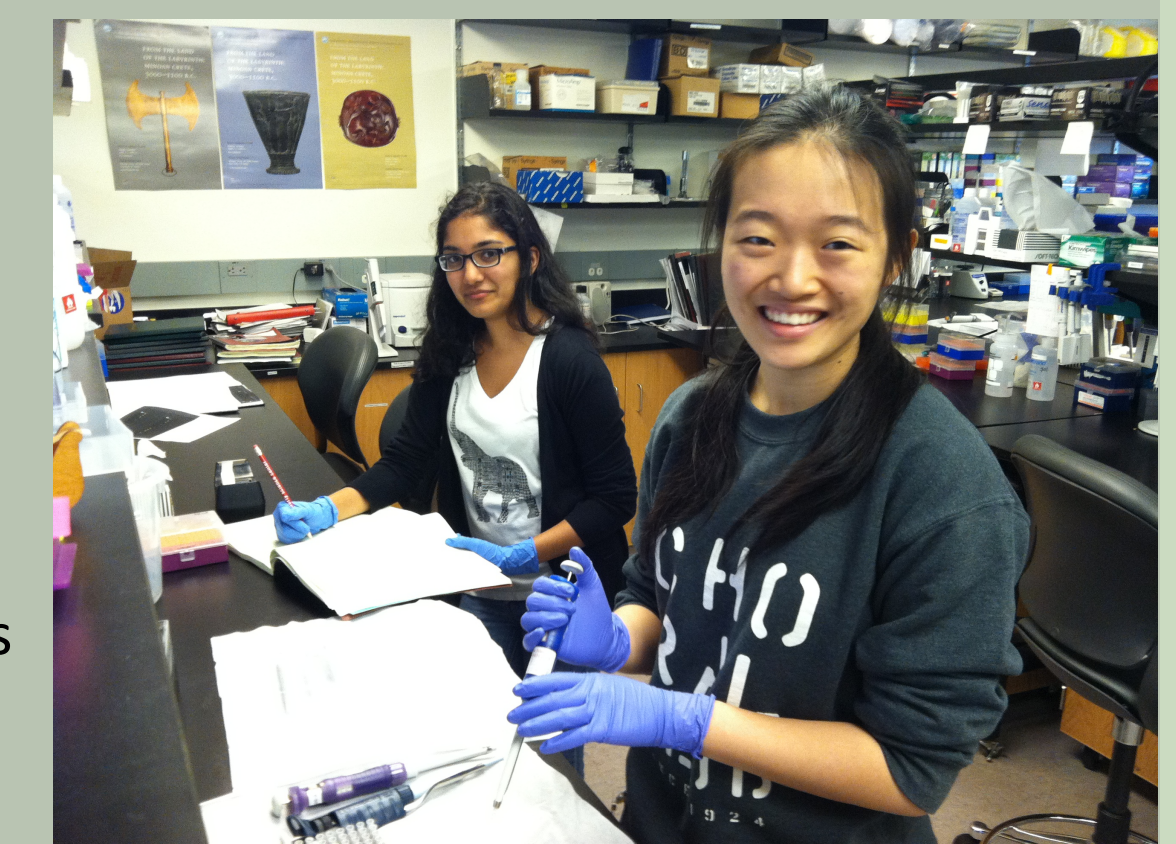
- Because of delayed female sexual maturity (~10 yrs) (Whitlock 2002), long term studies tracking hatchlings to adult nesting females are neither cost effective nor practical.
- Studies on other turtle species have shown genetic analysis as an effective method of determining natal homing (Freedberg 2005).

What are our results? What do they mean?

- There is no correlation between genetic relatedness and distances between nest sites.
- This suggests that bog turtles do not exhibit natal homing.

What's next?

- We have begun examining samples from three additional populations as well as more samples from Sites 1 and 2.
- We recommend the creation of new nesting areas for bog turtles to replace those lost due to habitat degradation.



References

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