



TICKS AND TORTOISES: INVESTIGATING ECTOPARASITE LOADS ON GOPHER TORTOISES AT THE GTM RESEARCH RESERVE

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INTRODUCTION



Gopher tortoises (*Gopherus polyphemus*) have been well-studied in much of their range, but data on tortoises in coastal dune habitats are scant (Lau & Dodd, 2015). Less is published on associations with their chief external parasites, gopher tortoise ticks (*Amblyomma tuberculatum*).

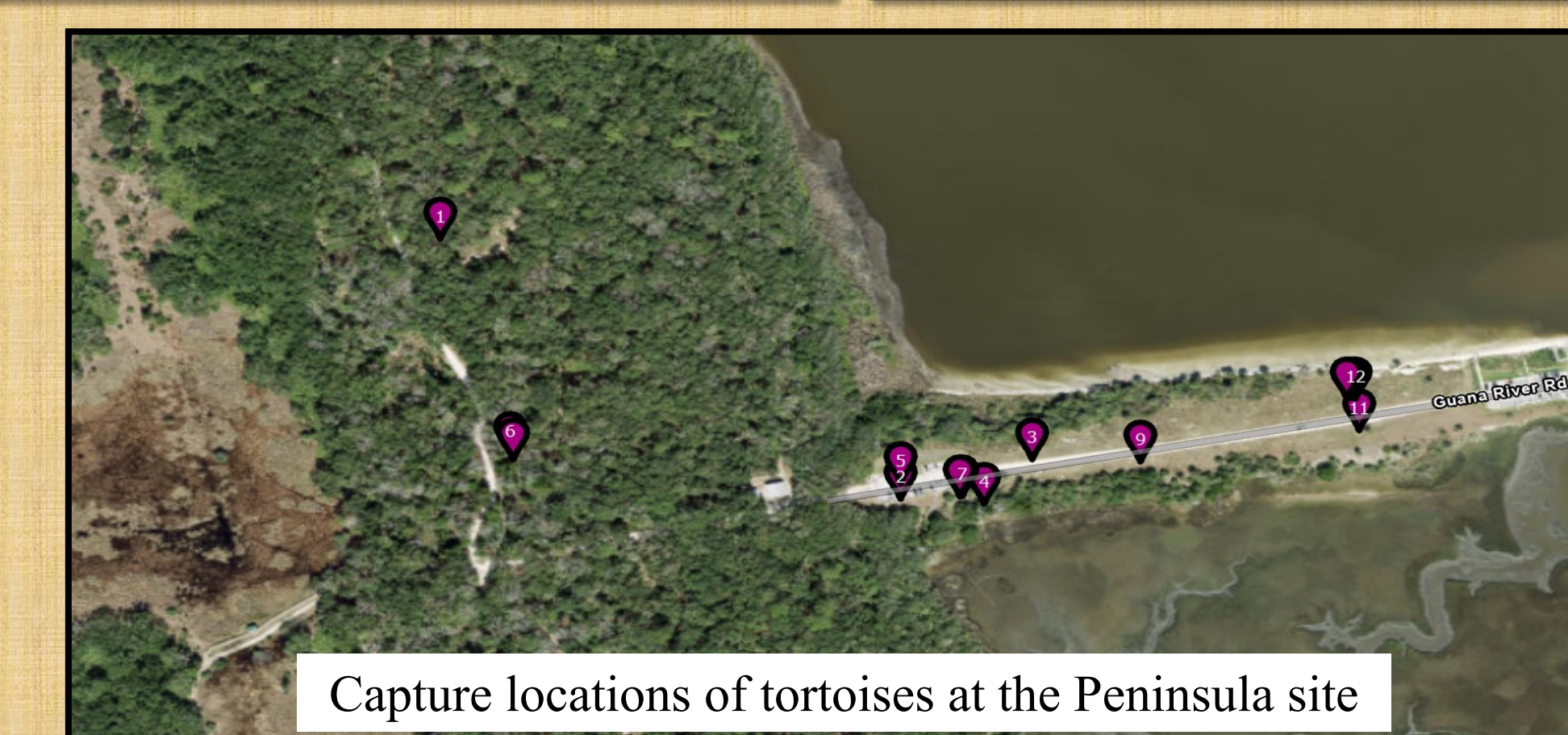
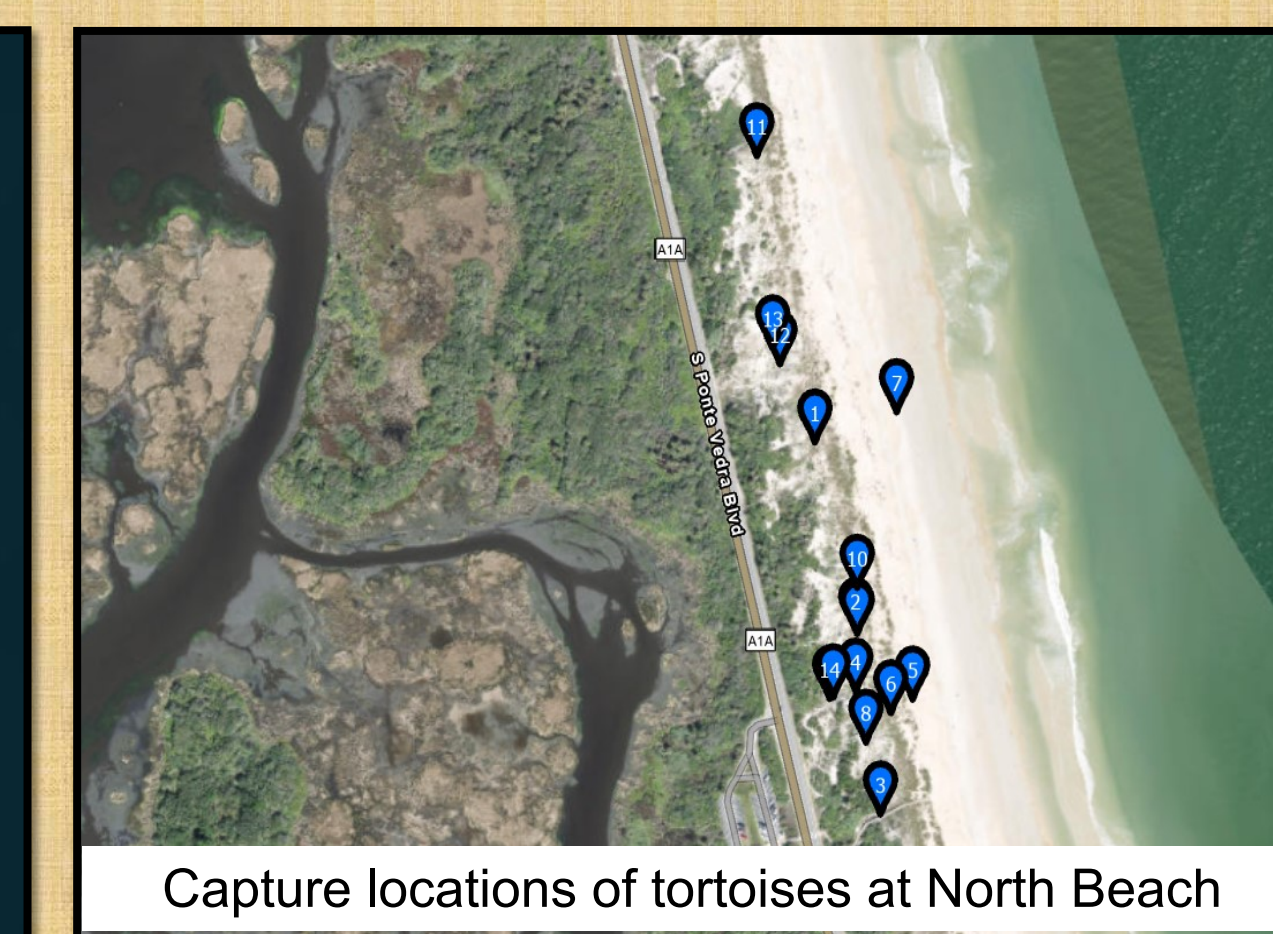
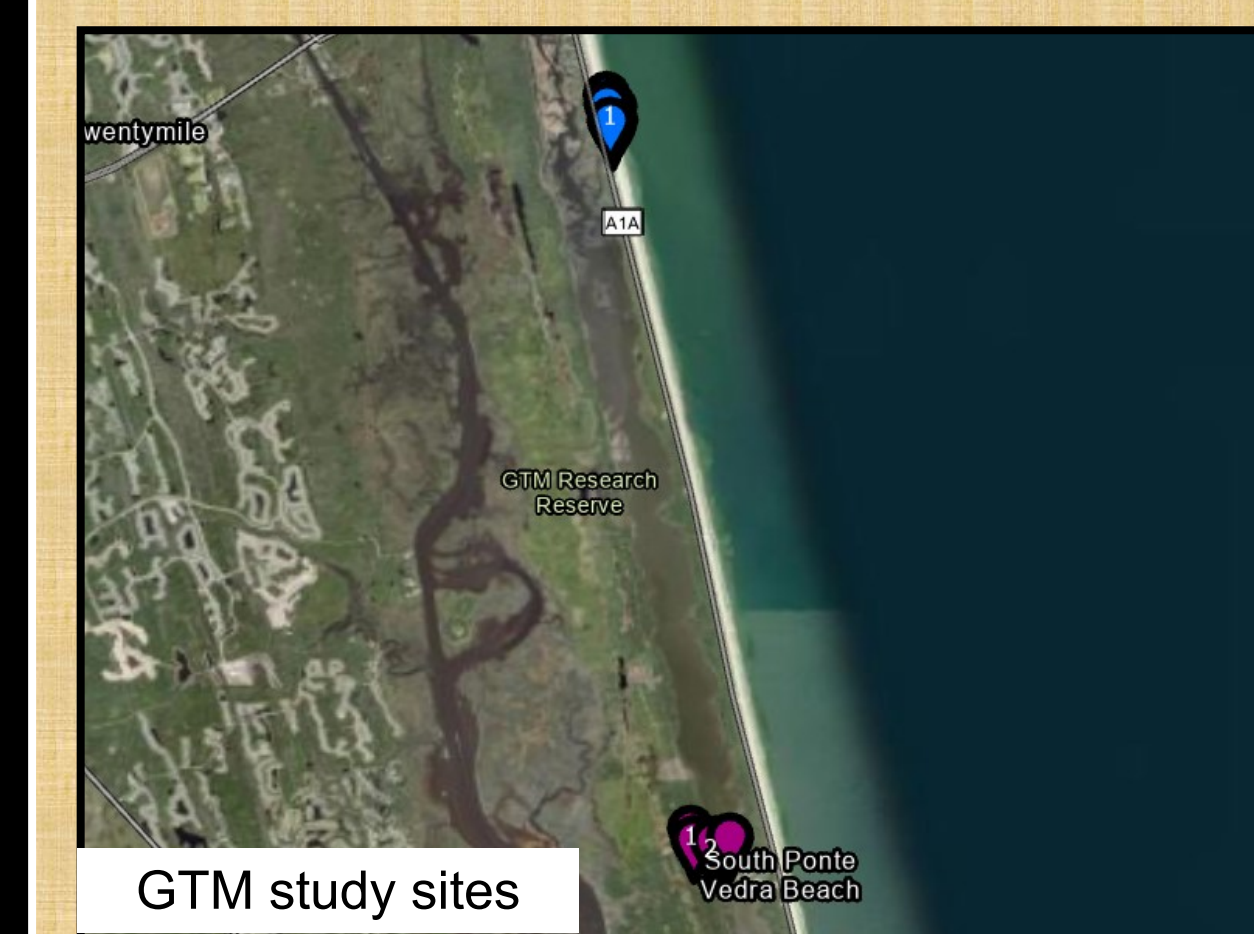


We noted substantial tick loads on the gopher tortoises at our North Beach site and subsequently initiated a research project to investigate external parasites in two populations within the GTM Research Reserve: the coastal dune site at North Beach, and an upland peninsula site in closer proximity to the GTM Visitor Center.

GOPHER TORTOISE



SITE LOCATIONS



METHODS

- We hand-captured tortoises and documented GPS coordinates for distributional mapping
- We collected all captured tortoises' mass (g)
- We used tree calipers for shell morphometrics
- We removed any ticks present with tweezers
- We applied alcohol and betadine to the tick bite
- We inserted Passive Integrated Transponders ("PIT tags" with unique identification numbers)



- We stored all ticks from a given tortoise in 70% ethanol with the tortoise's unique PIT tag number to maintain demographic data with the parasites (Barradas et al., 2019)



- We photographed the dorsal, lateral, and ventral view of each tortoise with their scribed PIT tag ID
- Finally, we released the tortoise back to the spot where we captured it



RESULTS

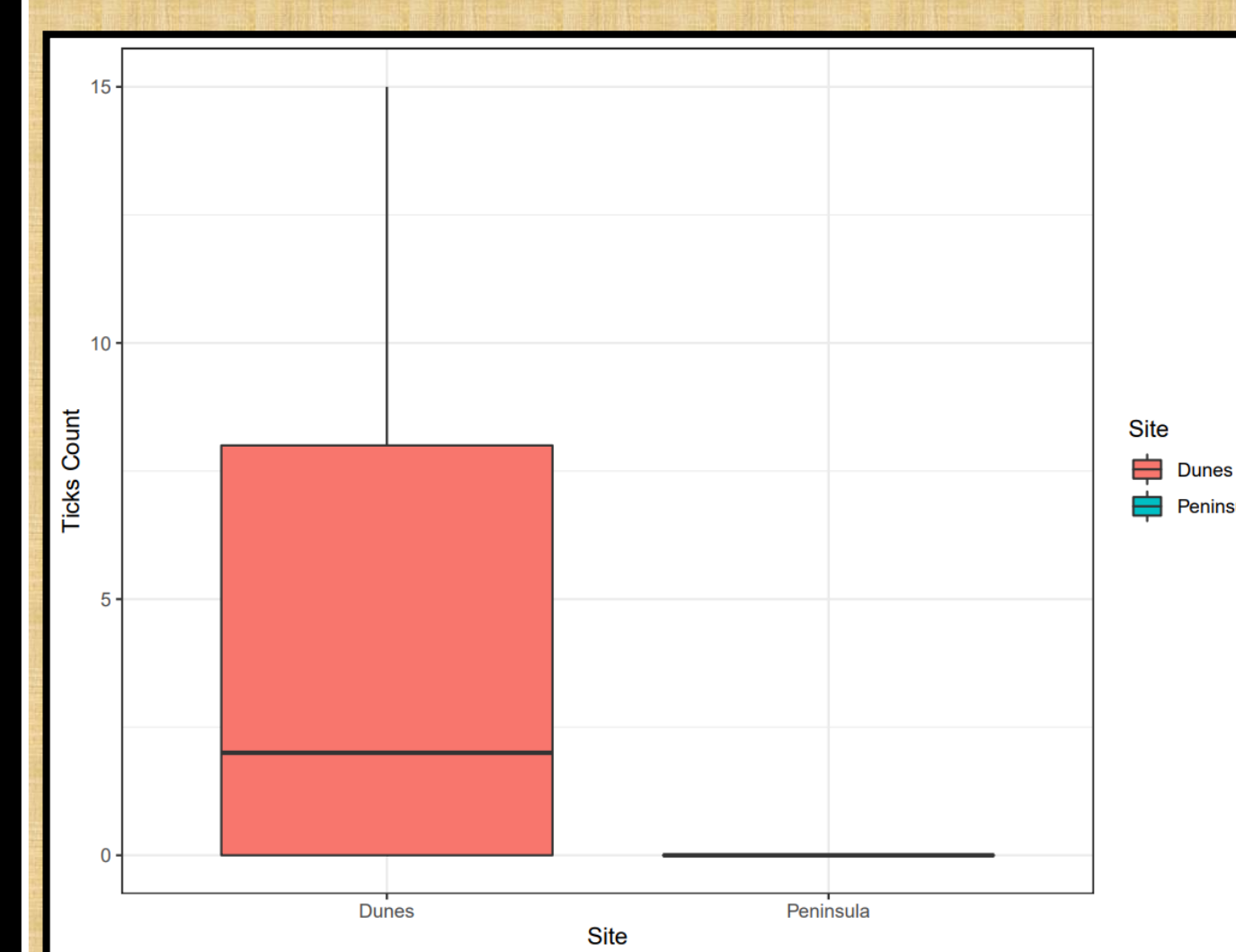


Figure 1: Tick counts between sites. The North Beach tortoises frequently carried gopher tortoise ticks. We observed no ticks on tortoises at the peninsula site.

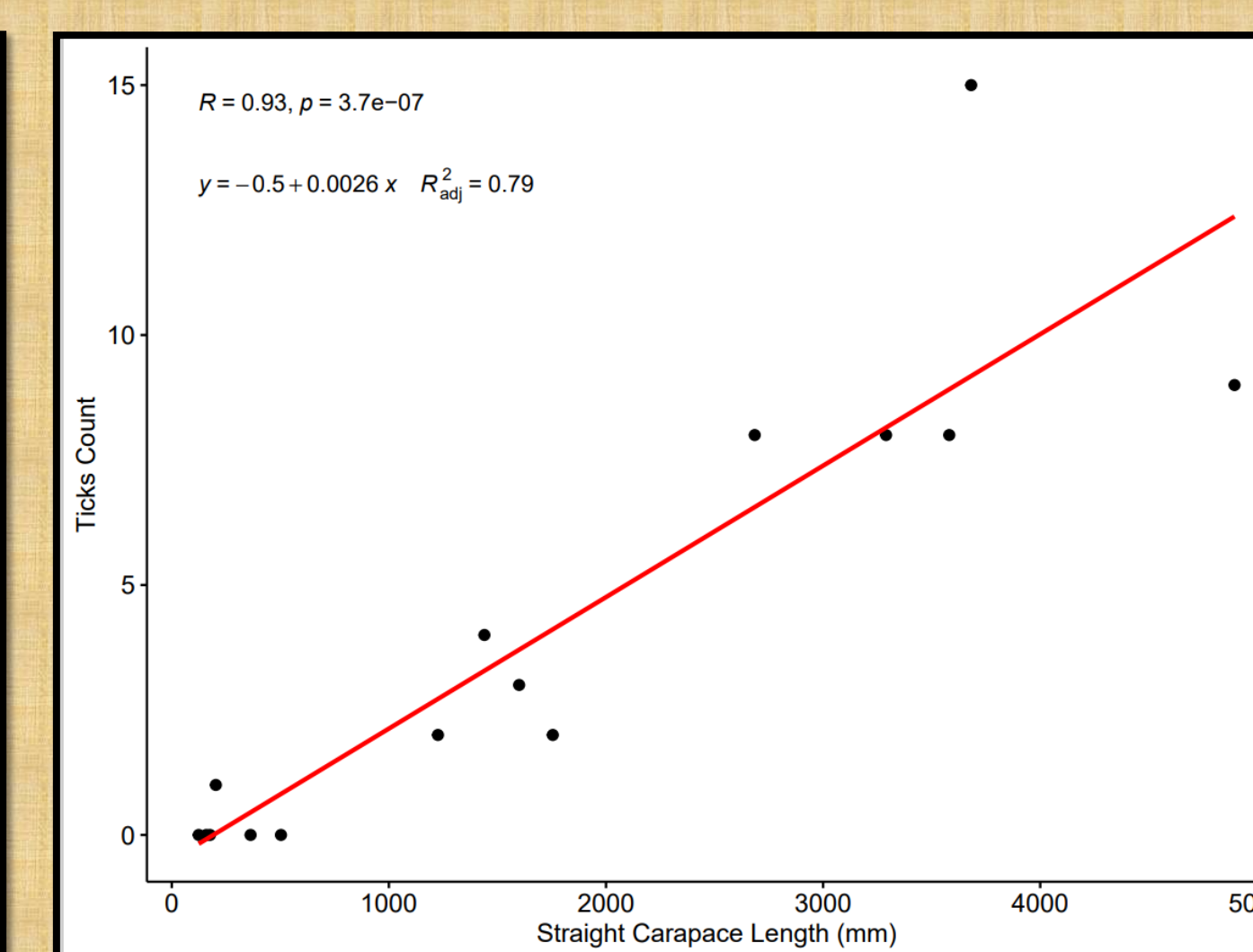


Figure 2: Straight carapace length of hand-captured gopher tortoises strongly correlates with ectoparasite load at our North Beach site.

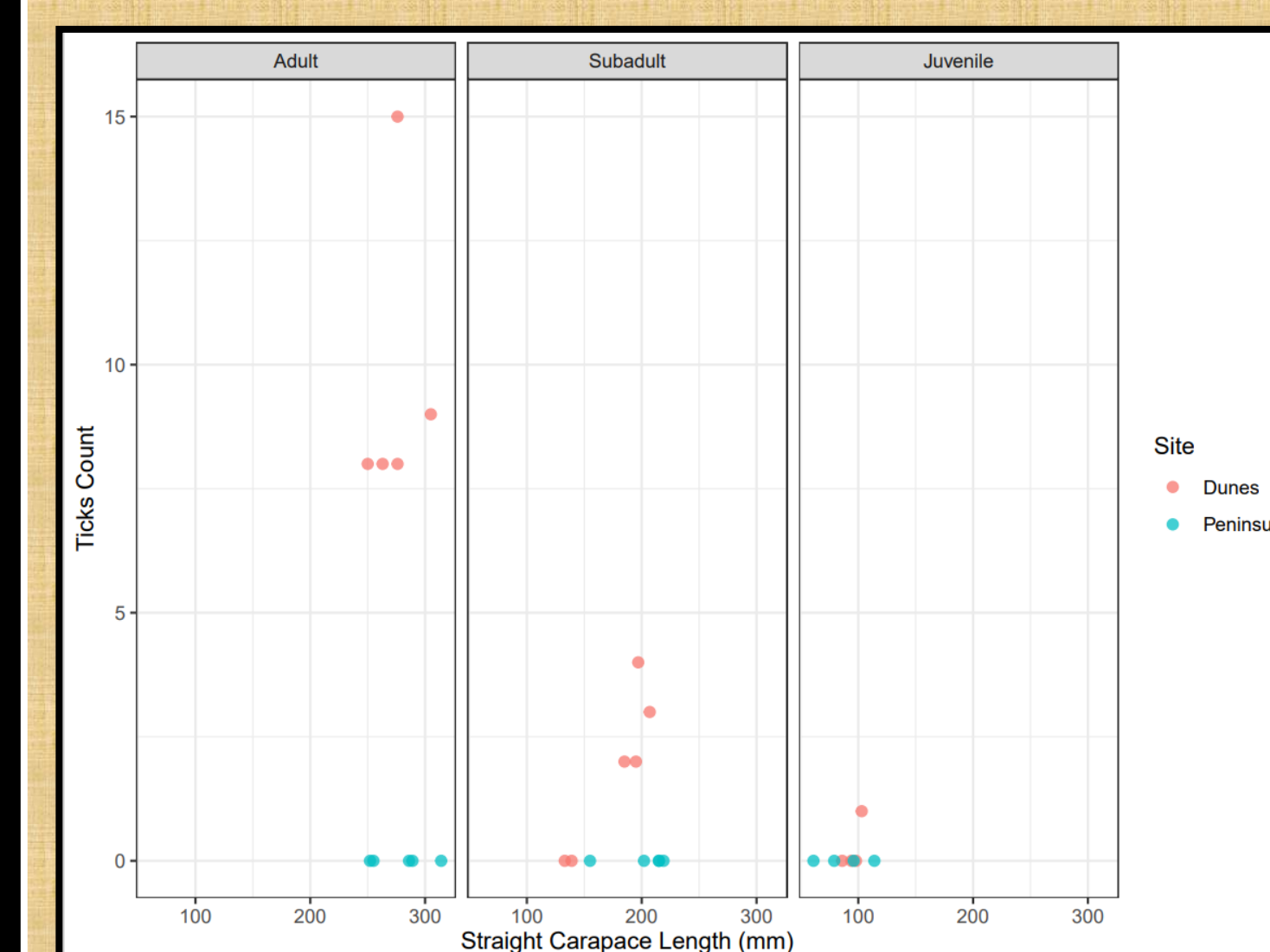


Figure 3: Size class and site-based comparisons of tortoise ectoparasite loads from our primary study sites, comparing straight carapace length to the number of ticks present. There were no ticks on tortoises captured at the peninsula site. Number of ticks per tortoise increased in relation to tortoises' size at the dune site.

DISCUSSION

We hand-captured 30 gopher tortoises in this pilot study. Tortoises sampled from the North Beach dune population (n=15) had a substantial tick load versus those sampled from our upland/peninsula population also (n=15), where none were present. Ennen and Qualls (2011) determined that sand depth and soil type primarily delimit the gopher tortoise tick populations. Our gopher tortoise sites feature multiple sediment types. Further research is needed to examine our site-specific relationships to sand depth and soil type with gopher tortoise tick abundance.

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