

Introduction

In 2019, scalloped hammerhead sharks (*Sphyrna lewini*) were listed by the IUCN as critically endangered globally and since the 1980s, the Northwest Atlantic/Gulf of Mexico Distinct Population Segment of *S. lewini* has declined by more than 80%.^{1,2} In order to combat the many pressures facing *S. lewini* populations and hopefully reverse declines, efforts should be focused on identifying key habitats and resources used by this species and what can be done to preserve them. One important habitat used by many elasmobranch species, including the scalloped hammerhead, is that of the nursery area.

Shark nursery areas are defined the following characteristics:

- 1) Sharks are more commonly encountered there than other habitats.
- 2) These sharks have a habit of remaining in or returning to the area for extended periods of time.
- 3) The area is utilized repeatedly across years.³

Recent work in our lab has identified the Tolomato River as a nursery area for *S. lewini*.⁴ However, the extent to which the species utilizes this nursery habitat is unknown. Answering the following questions will allow us to better manage this species/population:

- 1) What factors drive *S. lewini* use of/movement within the nursery?
- 2) What are the temporal, home, and core ranges for *S. lewini* in the nursery?
- 3) From where do these sharks leave the nursery and where do they go after?
- 4) How do *S. lewini* share resources of the nursery with other elasmobranch species?

Methods

Active Acoustic Telemetry

- 15 YOY scalloped hammerheads will be caught by rod and reel fishing in the Tolomato River between April and August over a two-year period.
- Shark morphometric data, GPS position, and environmental data will be recorded.
- An Innovasea V9 active acoustic transmitter will be affixed to the dorsal fin and the shark will be released.
- For 6-12 hours, shark bearing/distance and boat GPS coordinates will be recorded at 5-minute intervals. Environmental data will be recorded at 15-minute intervals.

Passive Acoustic Telemetry

- Acoustic receivers will be placed at Pine Island Sound and two potential egress points for the nursery.
- During two consecutive summers, 15 YOY scalloped hammerheads will be tagged with an Innovasea passive acoustic transmitter.
- Every 3 months, receiver data will be downloaded for analysis.

Stable Isotope Analysis

- Sharks will be caught via longline fishing during the annual Northeast Florida shark population survey conducted in the GTM NERR.
- 1-2mL of blood will be drawn from the caudal vein of 10 sharks per species.
- Plasma will be extracted and analyzed for $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ stable isotope signatures using mass spectrophotometry.

MOVEMENT PATTERNS AND HABITAT USE OF YOUNG-OF-THE-YEAR SCALLOPED HAMMERHEAD SHARKS (*SPHYRNA LEWINI*) IN THE TOLOMATO RIVER NURSERY

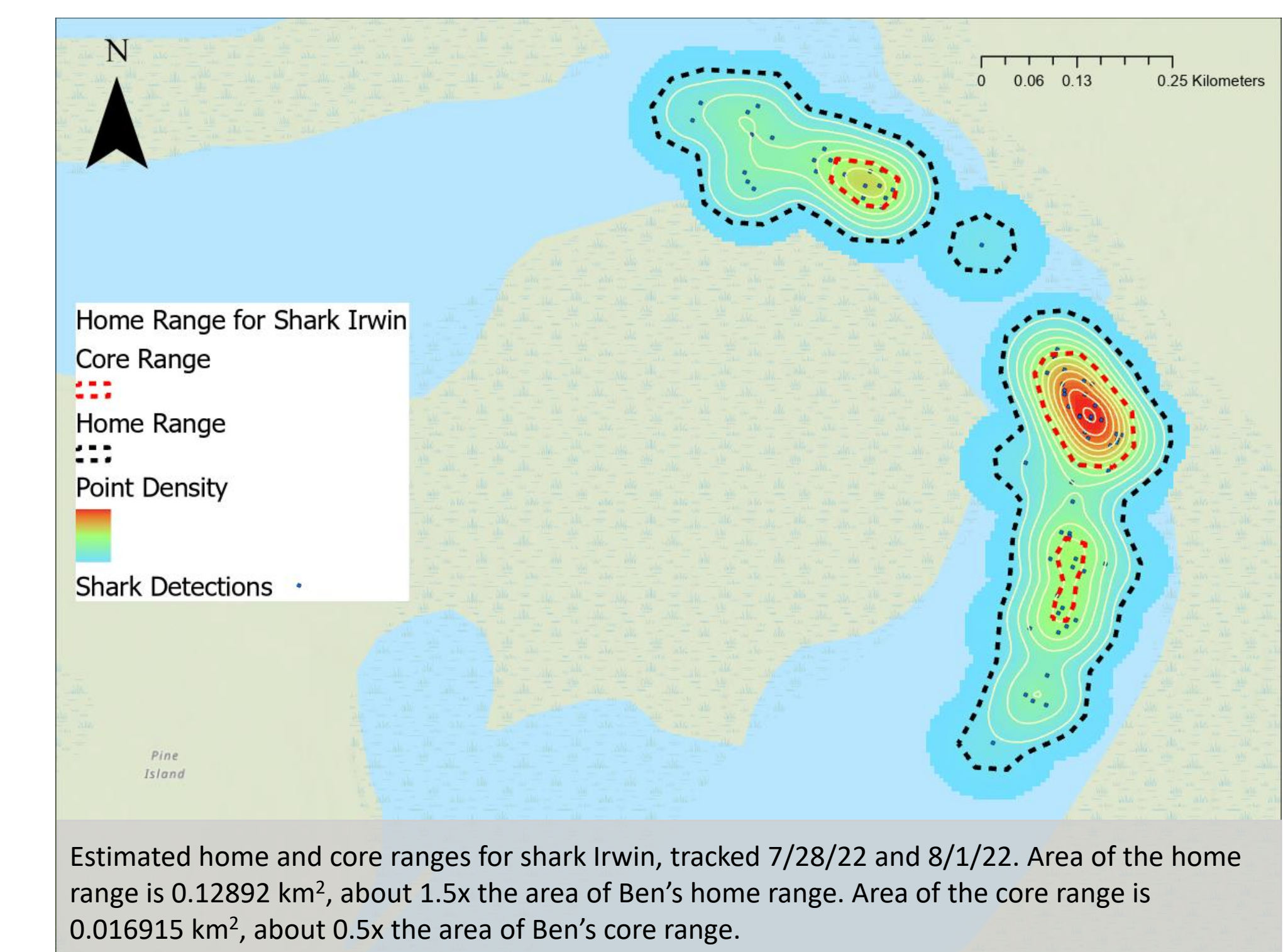
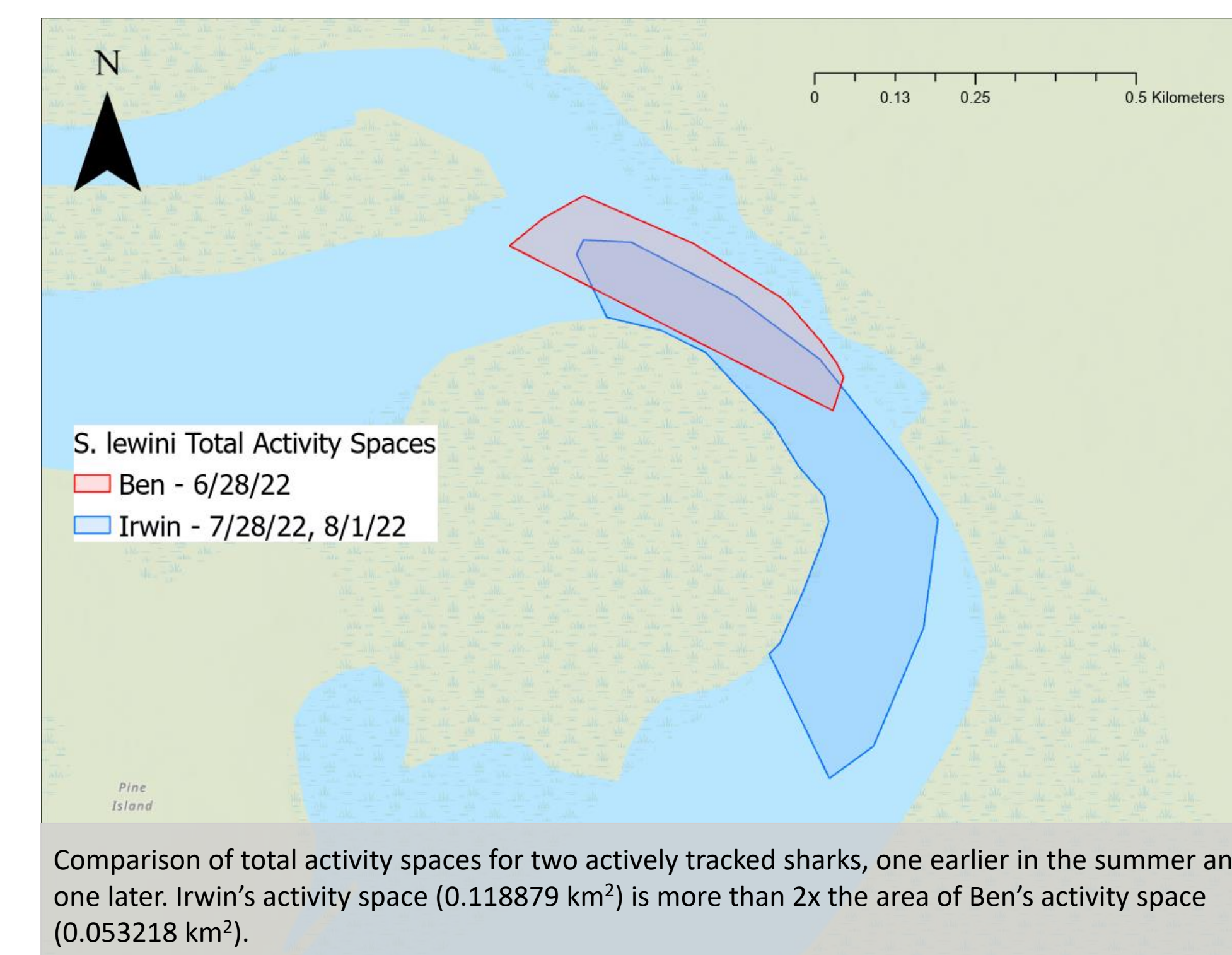
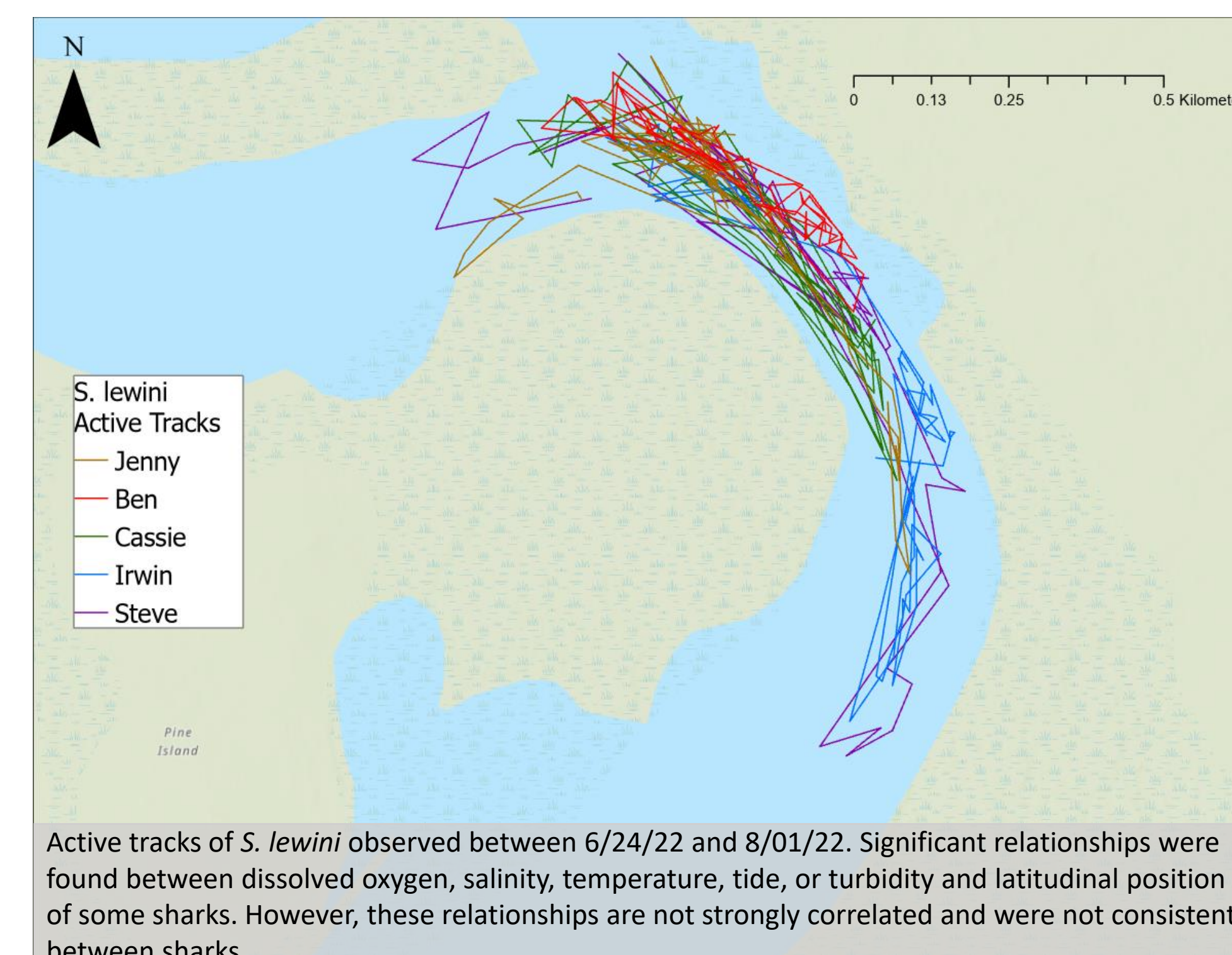
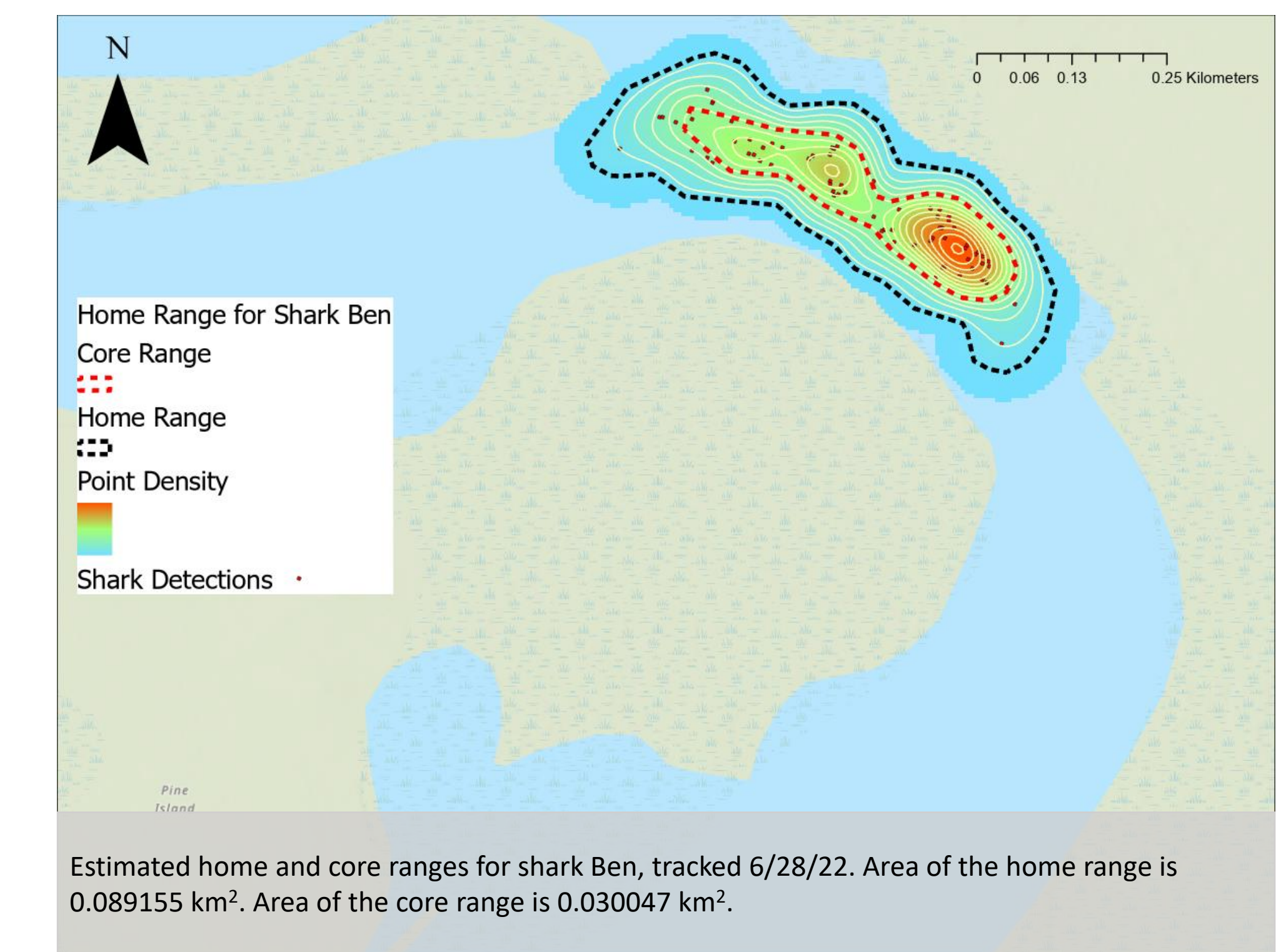
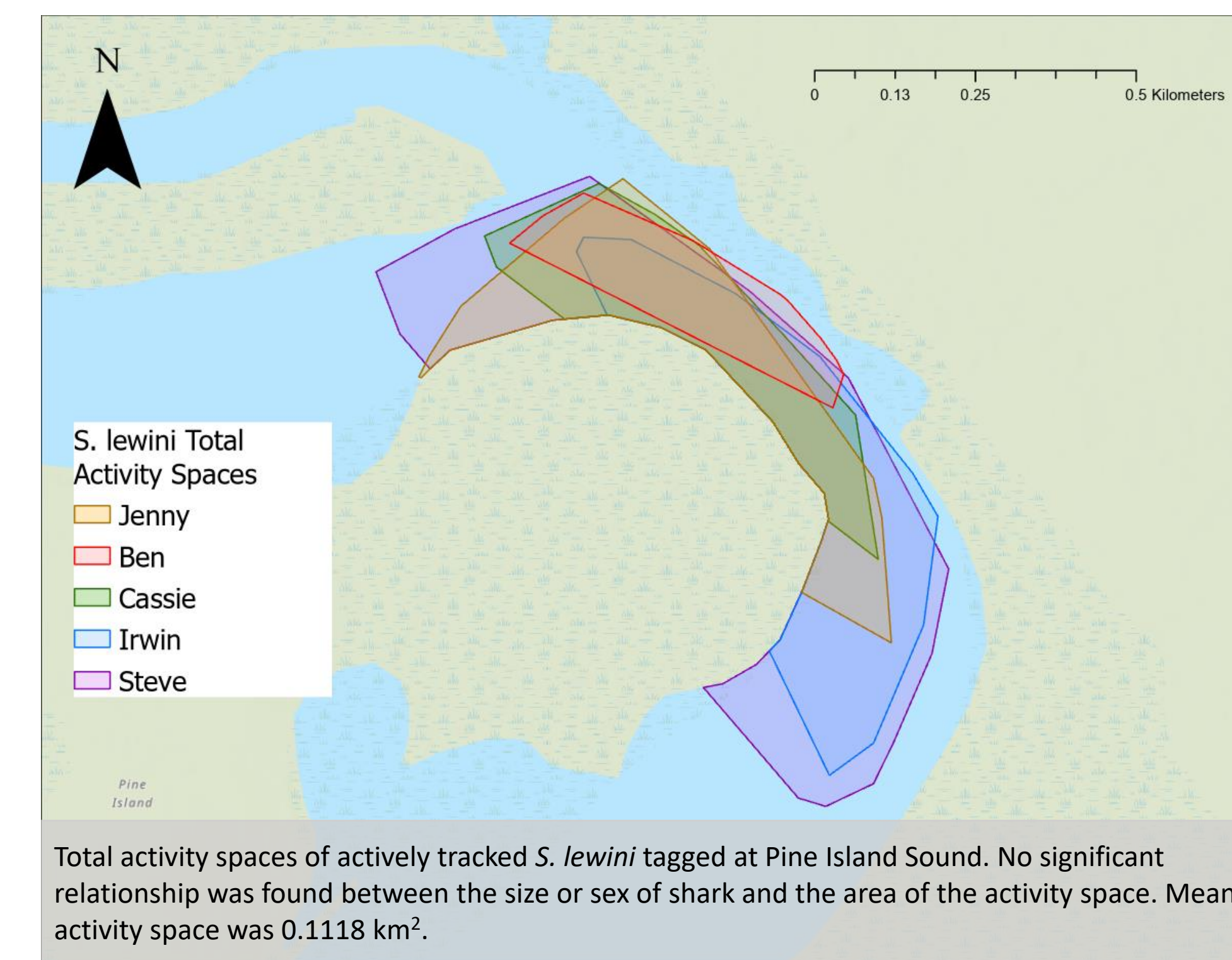
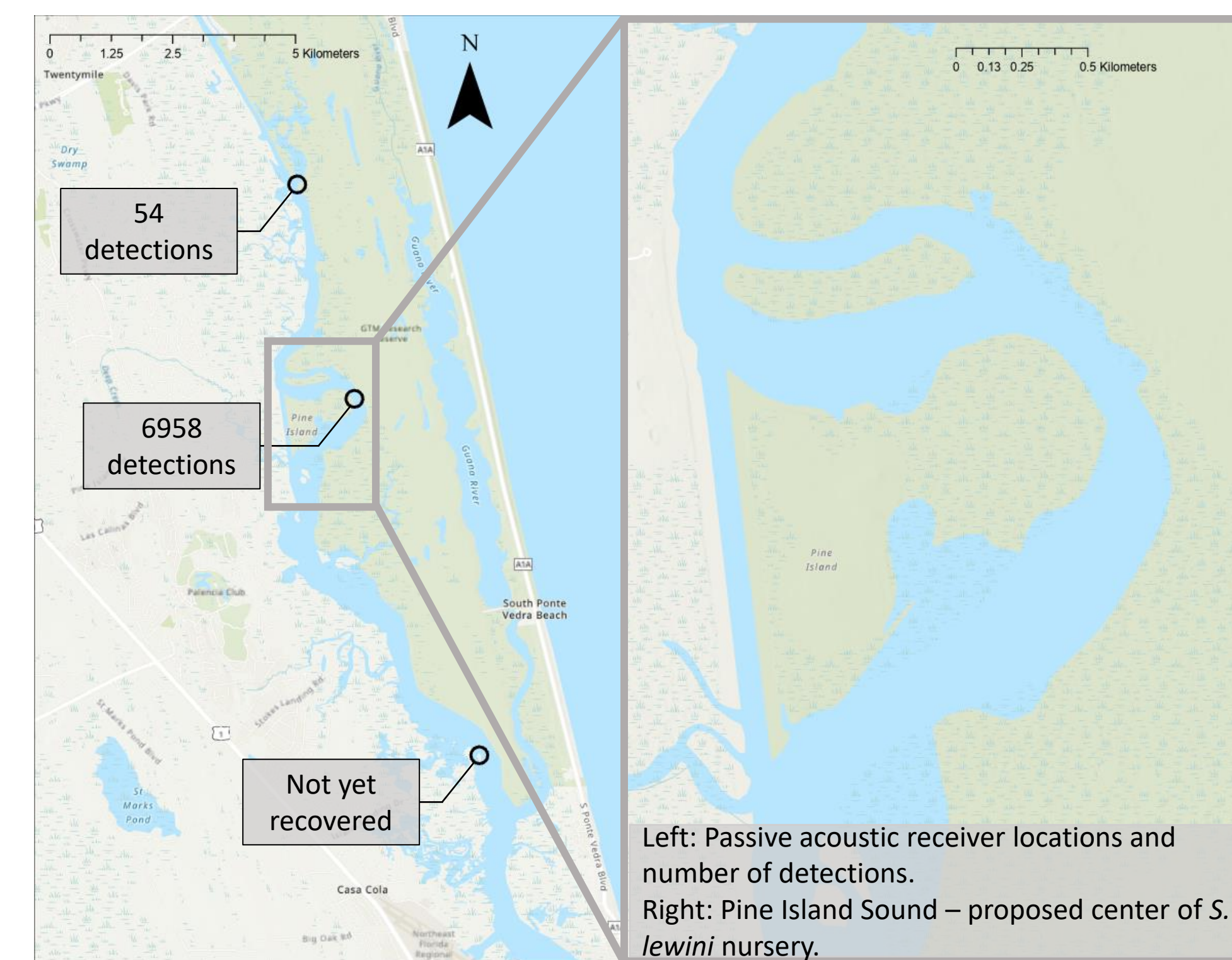
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Results



Discussion

- Pine Island Sound does seem to be the center of the nursery.
 - High residency for sharks tagged at Pine Island.
- Environmental factors do not seem to influence habitat use within the nursery.
 - Are there biological influences?
- Sharks seem to expand their home range throughout the summer but maintain a consistently small core range.
- There is a need to track animals outside of Pine Island Sound.

References

1. Rigby, C. L., et al. "Sphyrna lewini. The IUCN Red List of Threatened Species 2019: e. T39385A2918526." *linea*. [Último acceso: 22 04 2021] (2019).
2. Miller, Margaret H., et al. "Status review report: scalloped hammerhead shark (*Sphyrna lewini*)." (2014).
3. Heupel, Michelle R., John K. Carlson, and Colin A. Simpfendorfer. "Shark nursery areas: concepts, definition, characterization and assumptions." *Marine ecology progress series* 337 (2007): 287-297.
4. Wargat, Bryanna. *Characterization of a scalloped hammerhead (*Sphyrna lewini*) nursery habitat in portions of the Atlantic Intracoastal Waterway*. Diss. UNF Digital Commons, 2021.

Acknowledgements

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