



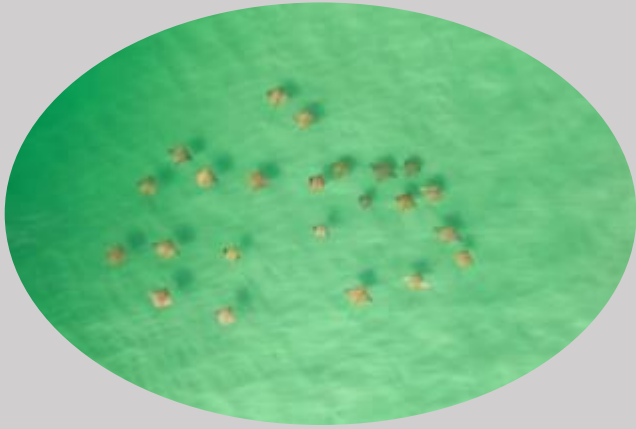
MARINE
MEGAFUNA
FOUNDATION

Species Profile: Giant Manta Ray

Jessica Pate



Order: Myliobatiformes



Cownose Rays



Southern Stingray



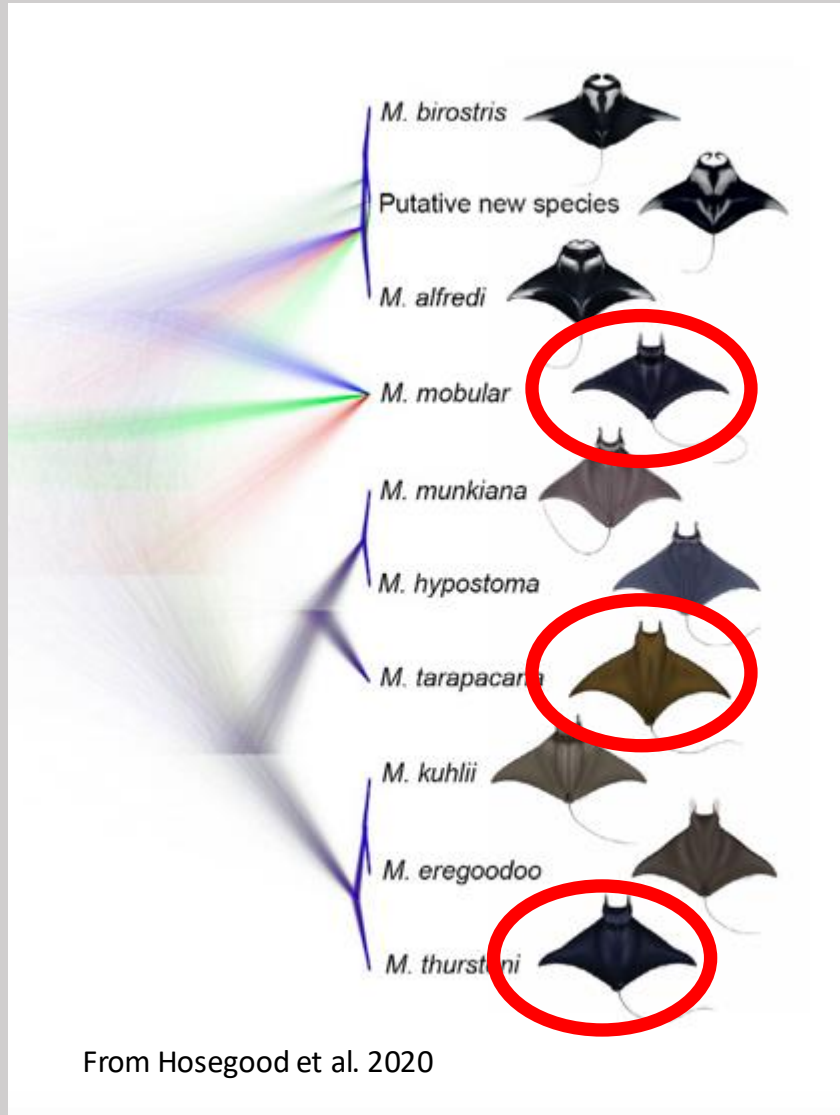
Spotted Eagle Rays



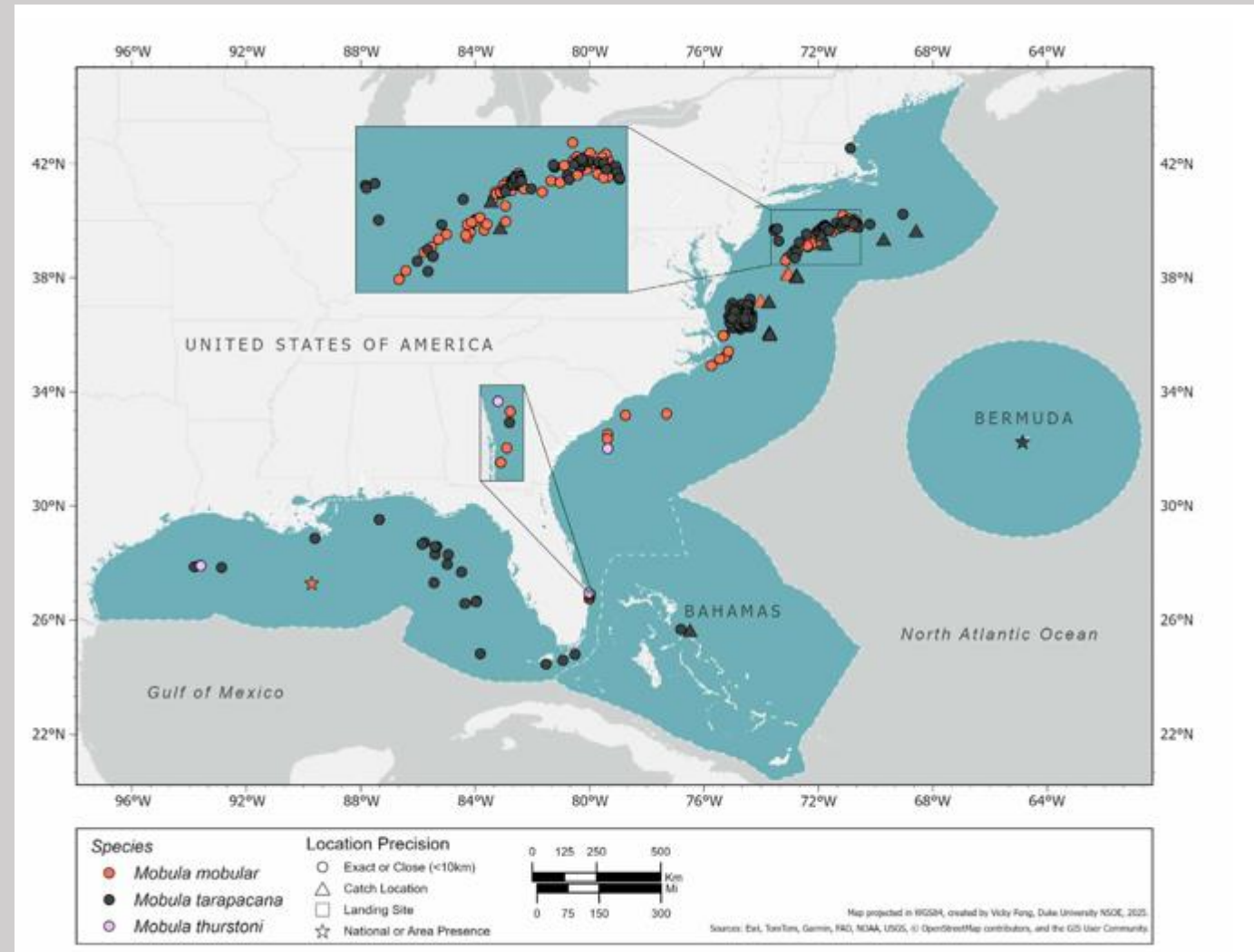
Yellow Stingray

Family: Mobulidae

Genus: Mobula

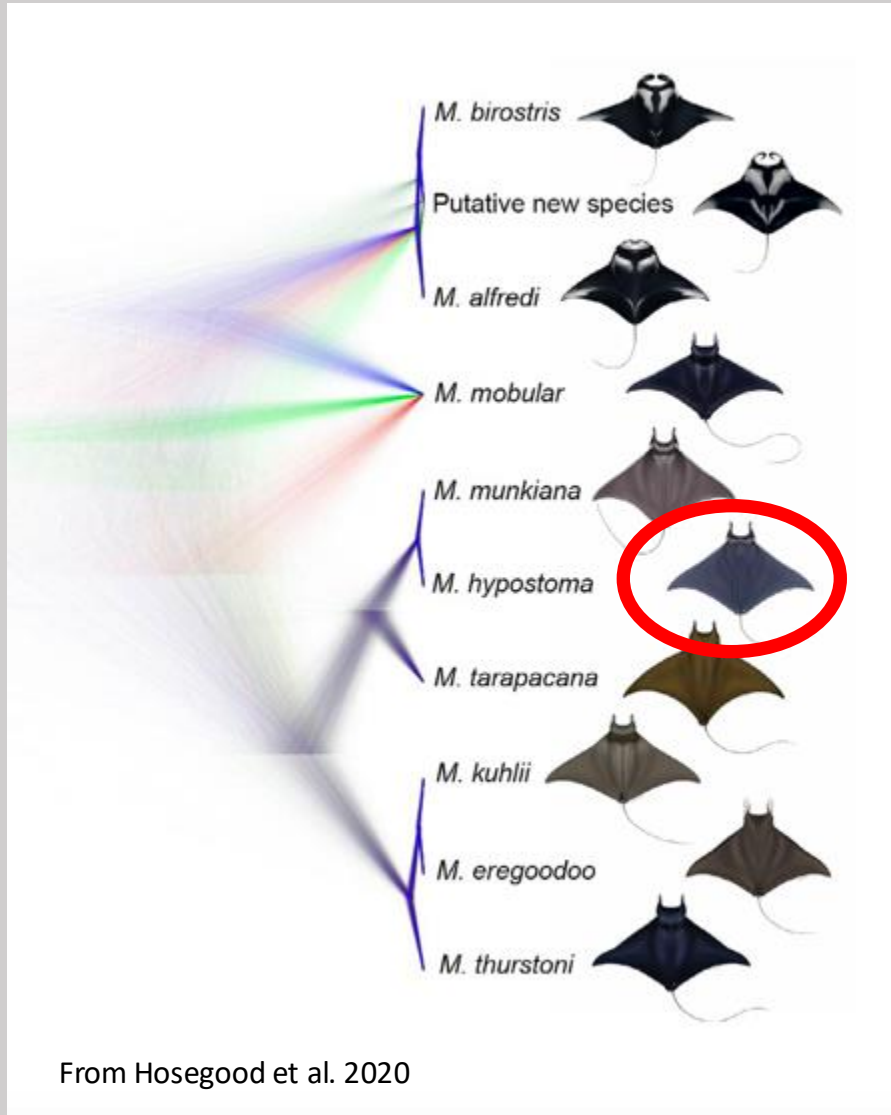


From Hosegood et al. 2020



Family: Mobulidae

Genus: Mobula

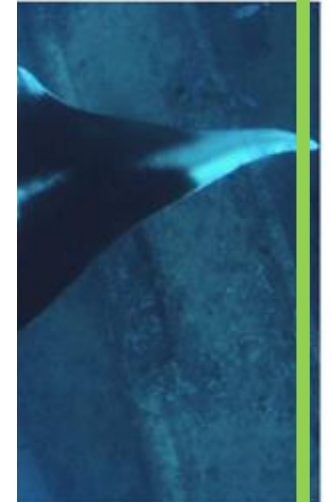
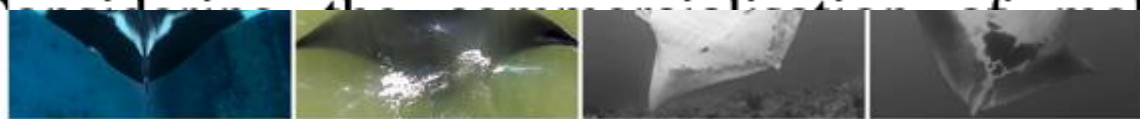


From Hosegood et al. 2020



FIGURE 8 | Updated range of *Mobula hypostoma*. The light blue area reflects the extent of occurrence, the medium blue areas correspond to the confirmed range, and the dark blue area highlights the historic range in Senegal where local extirpation is suspected.

The morphological and colouration details from *M. birostris*, *M. alfredi*, and *M. yarae* sp. nov. can be useful to differentiate these three similar species in the range of regular colouration pattern (Table 7). Some of these characters can be used to identify *M. yarae* sp. nov. in the field; however, individual colour variation may occur (see Fig. 14 for colour discrepancy), and it may overlap the characteristics of the closest congeners. Therefore, care must be taken when identifying manta ray species, especially in the field and from photographs. It is important to note that variation in pigmentation intensity over time, ontogeny, and behaviour in *Mobula yarae* sp. nov. may occur (Ari 2015), especially around the pectoral fins and face.



Genetics of Atlantic Manta Rays

- Unpublished BOEM Study (2025)
 - 20 manta rays sampled off Cape Canaveral, FL
 - 10 were *M. birostris* and 10 were *M. yarae*
 - Problem → used mtDNA (not best for recently evolved species, or possibly hybrids)
 - Problem → Not many photos
- Future → Whole genome sequencing to look at species composition off Florida

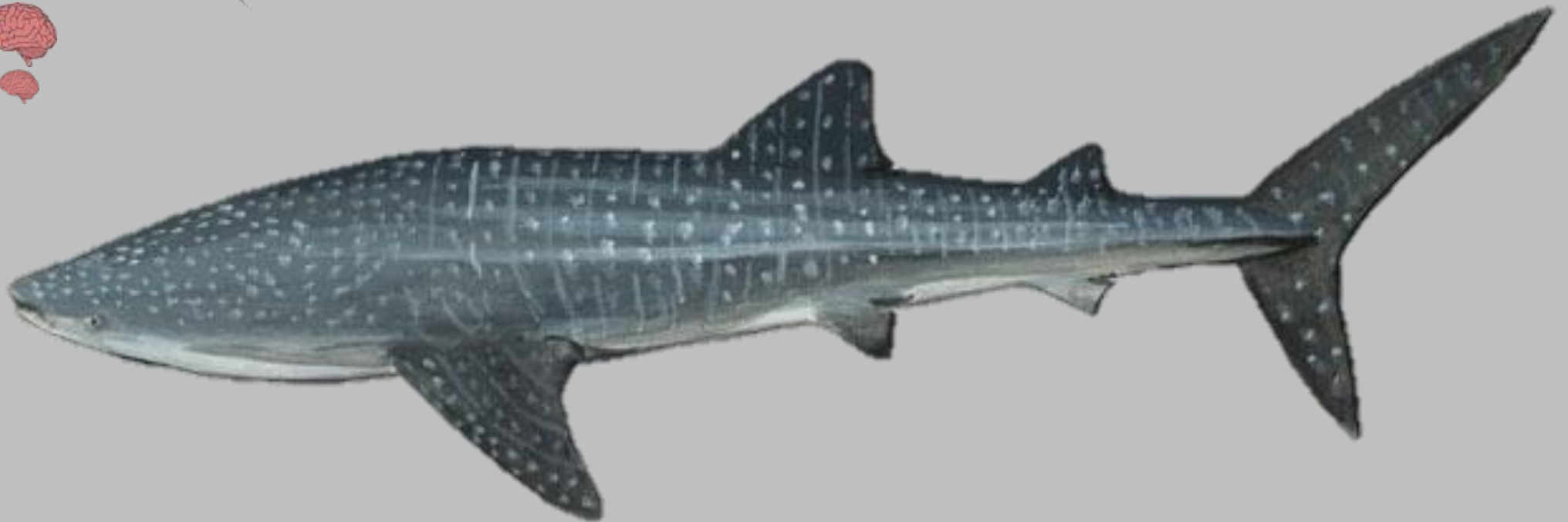


Figure 12. Manta rays whose dorsal coloration is suggestive of *M. yarae* but were genetically identified as *M. birostris*.

Giant Manta Ray

- Large, filter feeding ray
- Maximum disc width of 6.8m (22 ft)
- Born at sizes greater than ~1.9m (6.2ft)
- Slow population growth
 - Late maturity
 - Males: 3.7 m
 - Females: 4.5 m
 - Low fecundity
 - 1 large pup every 2-5 years
 - **Recent research: *M. alfredi* reproductive cycles were every 5.8-8.8 years***



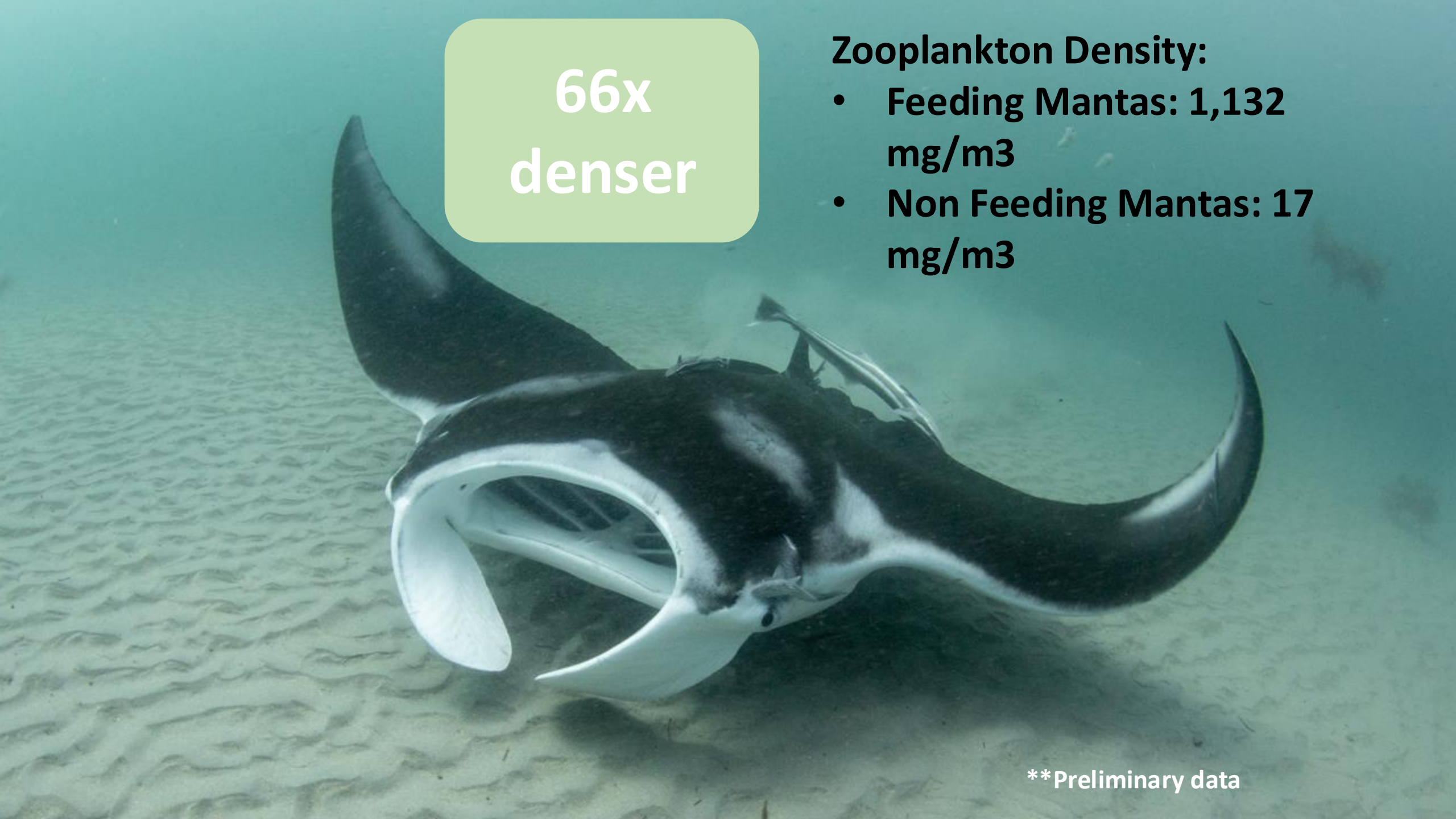










A manta ray is shown swimming over a sandy ocean floor. The ray has a dark upper surface and a lighter, white underbelly. Its large, wing-like pectoral fins are spread out, and its long, curved tail is visible. The water is clear, and the sand on the bottom is visible.

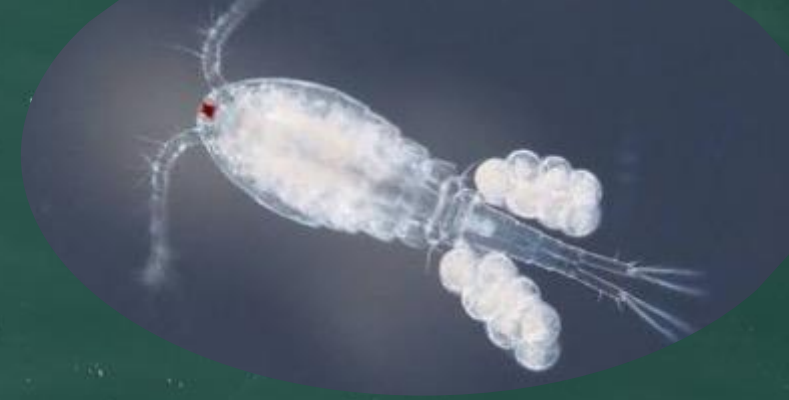
**66x
denser**

Zooplankton Density:

- **Feeding Mantas: 1,132 mg/m³**
- **Non Feeding Mantas: 17 mg/m³**

****Preliminary data**

Most of diet is COPEPODS



Top 3 Copepod Genera

1. *Acartia* spp.

2. *Paracalanus* spp.

3. *Nannocalanus* spp.



Table 4 Summary of the most abundant copepods in each zooplankton sample from central Florida, including percent of total copepods made up by three most abundant species combined

Date	Sample #	% comprised of 3 most abundant copepods	Three most abundant species/genera/life stage
3-18-2022	1	80	<i>Acartia</i> spp. (46%), Copepod nauplii (23%), <i>Euterpina acuntifrons</i> (11%)
3-25-2022	2	58	<i>Labidocera</i> spp. (21%), <i>Euterpina acuntifrons</i> (20%), <i>Corycaeus</i> spp. (17%)
3-26-2022	3	75	<i>Labidocera</i> spp. (27%), <i>Euterpina acuntifrons</i> (20%), <i>Oithona</i> spp. (15%)



★ Central Florida

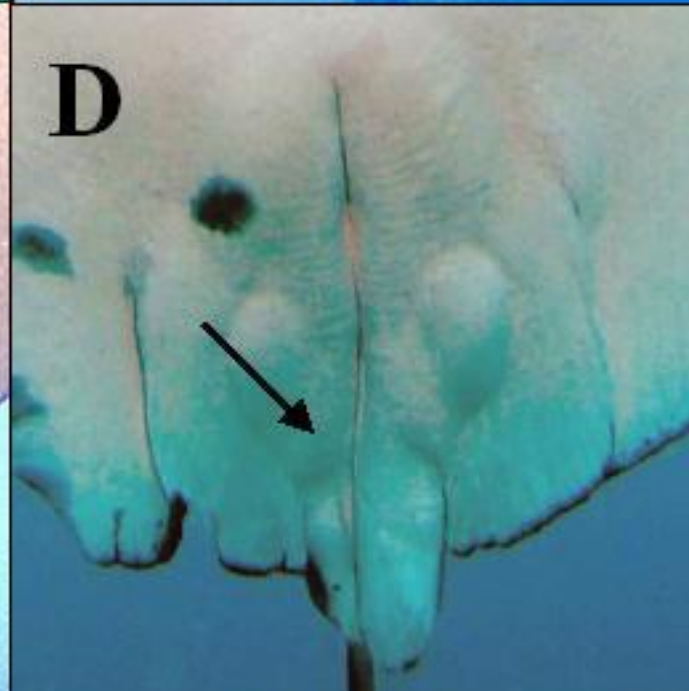
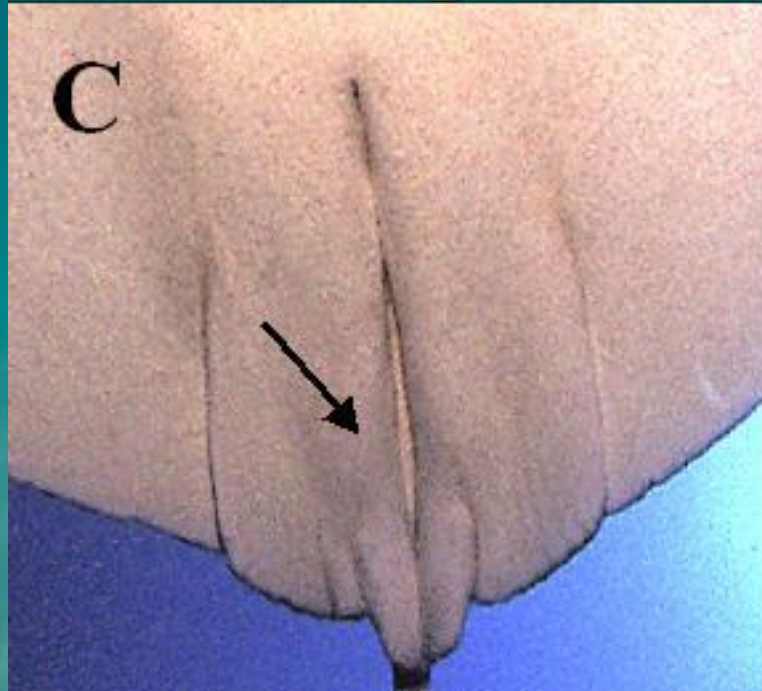
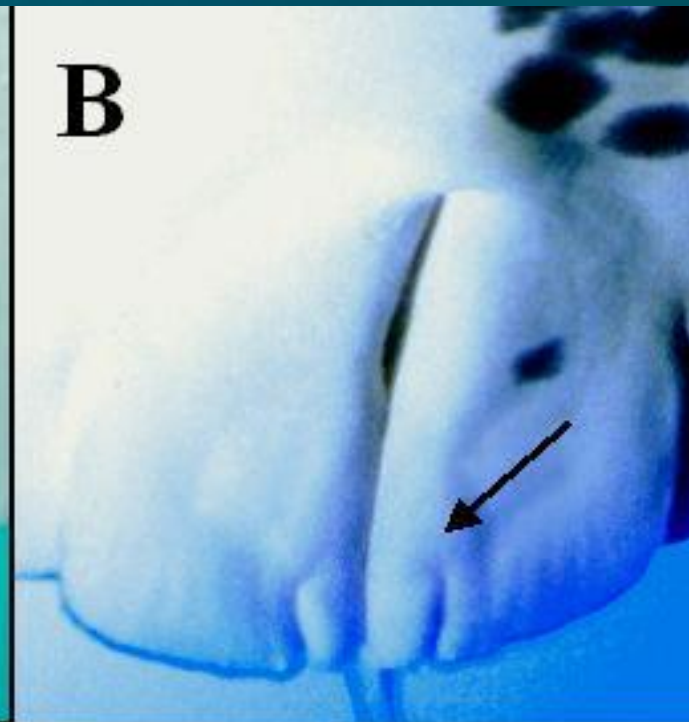
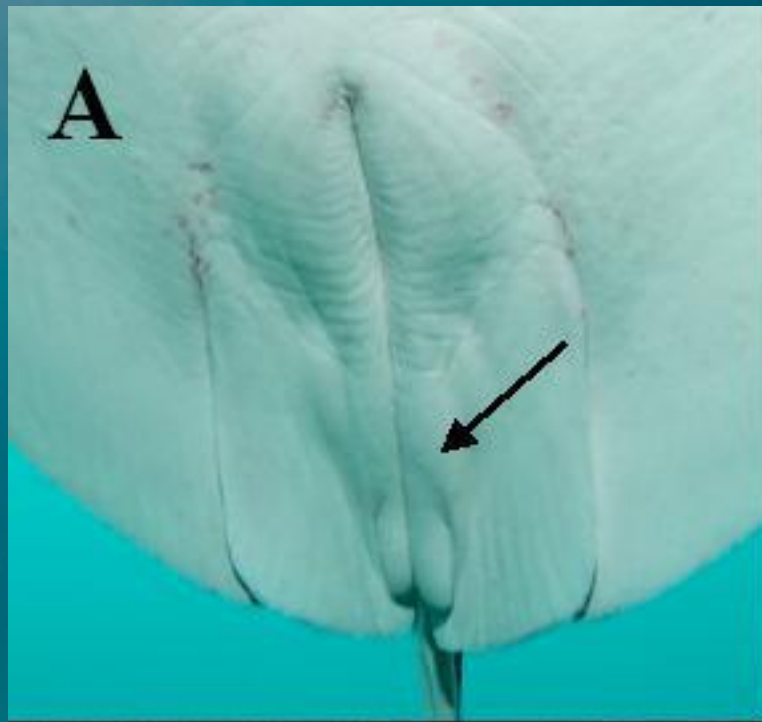
★ South Florida



South Florida

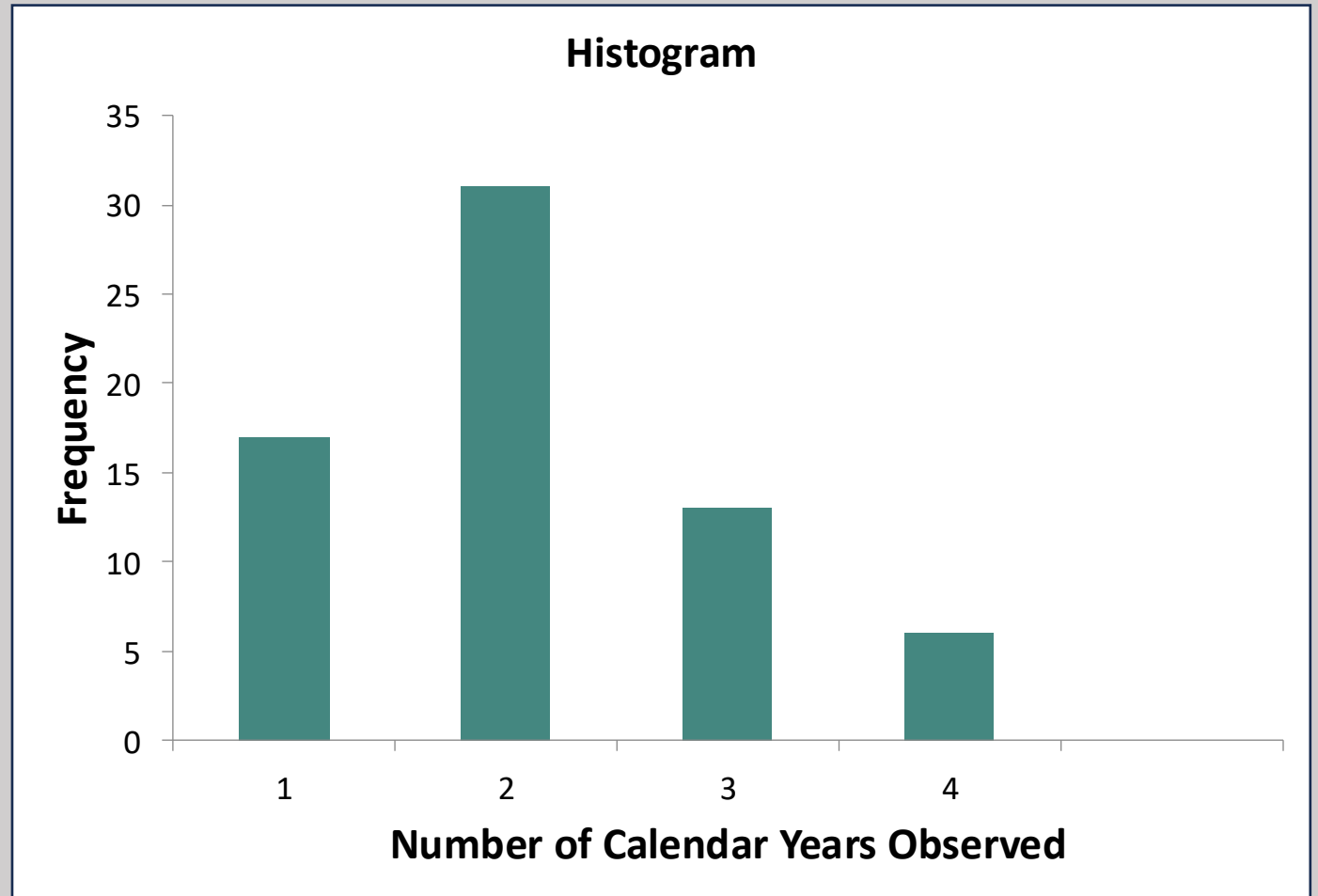
- Nursery habitat for young manta rays
 - 95% of mantas are immature (males)
 - Average Size (disc width)
 - Male: 2.4 m (7.9 ft)
 - Female: 2.5 m (8.2 ft)
 - Minimum size: 2.0 m (6.5 ft)
 - Sex
 - Male 52%, Female 45%, Unknown 3%
 - 251 Individuals identified





South Florida

- 48 % are re-sighted
- 24% are re-sighted in multiple years
- Average re-sightings = 8 (range: 1-63)
- 60-75% of individuals are new each year



South Florida: Threats

- Entanglement in fishing gear
 - 22% of individuals have been entangled
 - 7% have had multiple entanglements

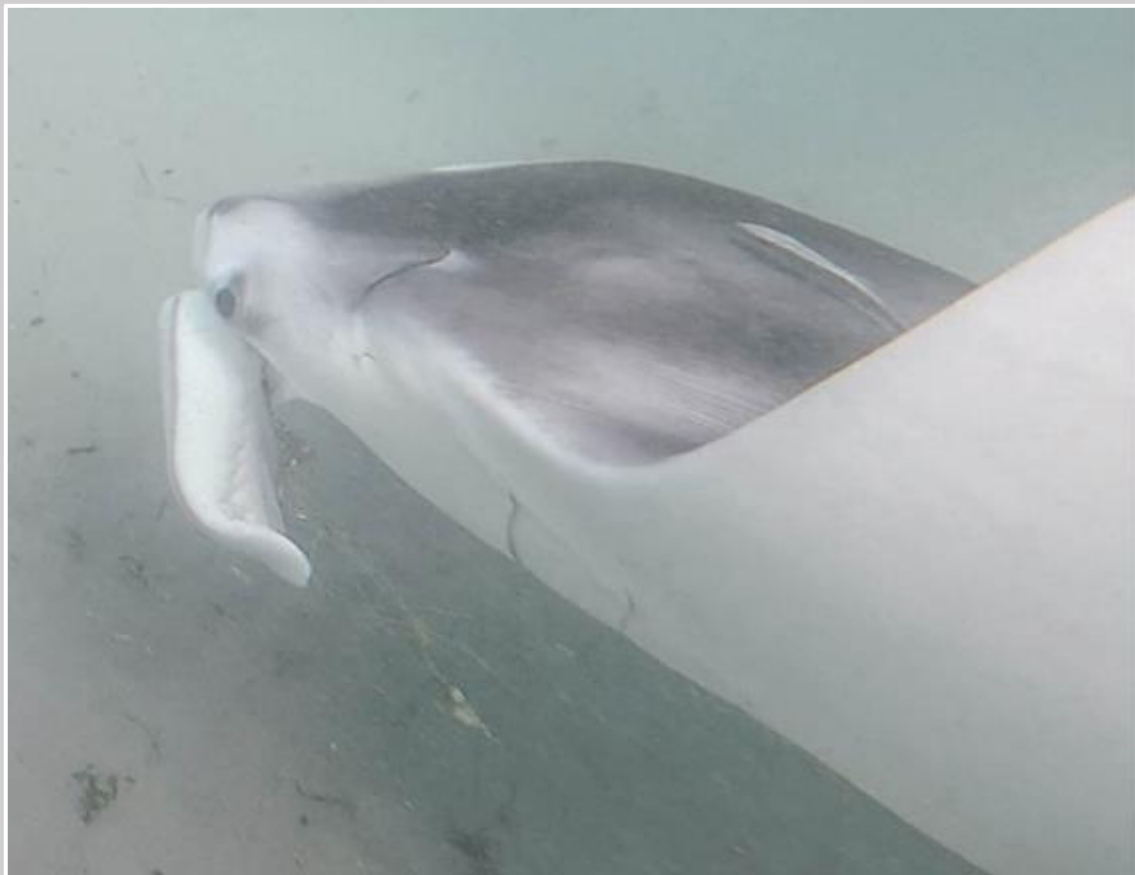




November 2021



October 2022



October 2019



July 2020

South Florida: Threats

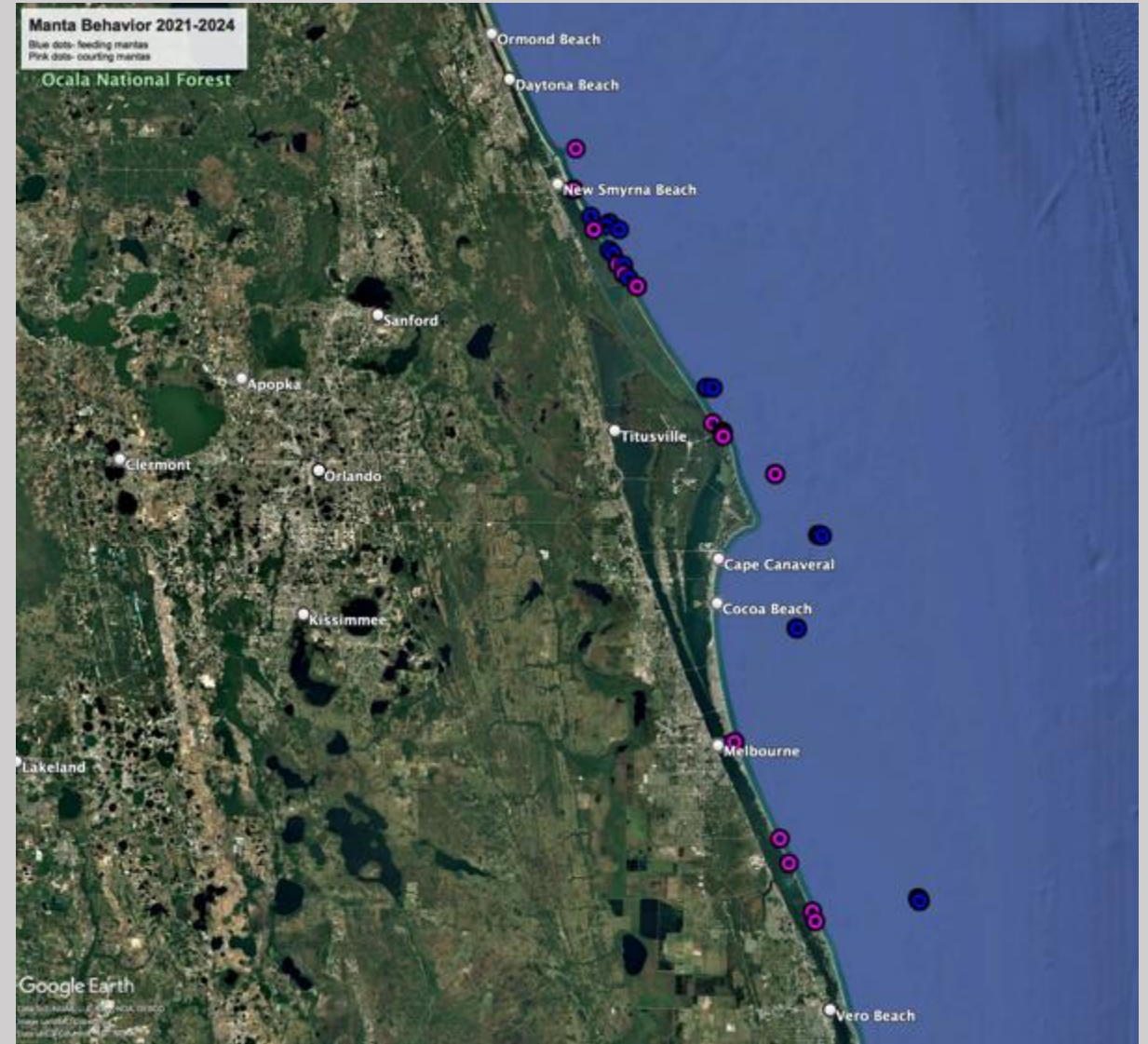
- Vessel Strikes
 - 9 % of individuals seen with propeller scars





Central Florida

- Seasonal aggregation of adult manta rays
- Reproductive and foraging habitat
- Difficult to study
 - Bad in water viz, limited to surface observations
 - Drone limitations



Environ Biol Fish
<https://doi.org/10.1007/s10641-024-01566-7>



Evidence of reproductive and feeding habitat for manta rays off Florida's Atlantic coast

Jessica Pate



Central Florida

- Recreational cobia fishery

LOOKING FOR COBIA? JUST FIND MANTA RAYS

By **Bill Bishop Jr**
THE ORLANDO SENTINEL

Received: 13 September 2023 | Revised: 8 March 2024 | Accepted: 12 March 2024
DOI: 10.1002/aqc.4147

RESEARCH ARTICLE

WILEY

Perceptions regarding the recreational cobia fishery in relation to manta ray conservation

Raquel Braun^{1,2} | Julia Wester^{2,3} | Catherine Macdonald^{1,2} | Jessica H. Pate⁴



<https://www.floridasportsman.com/editorial/cobia-rays/400722>

‘Anyone who has fished for cobia has hooked a manta’[4]

‘It’s gotten a lot worse though. there’s so many boats and so few fish, it seems like everyone’s bombing the same ray you know with the—and that same manta ray that just swam by is gonna see another 50 jigs in his face, you know and that’s just what it became.’[4]



Threats to Mantas

- Entanglement
- Vessel Strike
- Climate Change
- Microplastics



Bycatch

Get them off the deck: Straightforward interventions increase post-release survival rates of manta and devil rays in tuna purse seine fisheries

Joshua D. Stewart^{a,b,*}, Melissa R. Cronin^{b,c,d}, Erick Largacha^e, Nerea Lezama-Ochoa^{f,b,c,g}, Jon Lopez^h, Martin Hallⁱ, Melanie Hutchinson^h, Emma G. Jones^j, Malcolm Francis^k, Maitane Grande^l, Jefferson Murua^l, Vanessa Rojo^m, Salvador J. Jorgensen^{n,o}

- Observed survival rate for *M. birostris* was 50%
- Mean predicted survival probability after 3 min on deck was 83.7 % for *M. birostris*. This decreased to 57.2 % for *M. birostris* after 15 min on deck.



Fig. 1. Example handling and release methods. A) *Mobula mobular* being released by hand. B) *M. thurstoni* being released using a stretcher. C-D) *M. tarapacana* and *M. birostris* being released using cargo nets. Note the satellite tags visible in (A) and (B), indicated by red arrows. Photos courtesy of TUNACONS. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

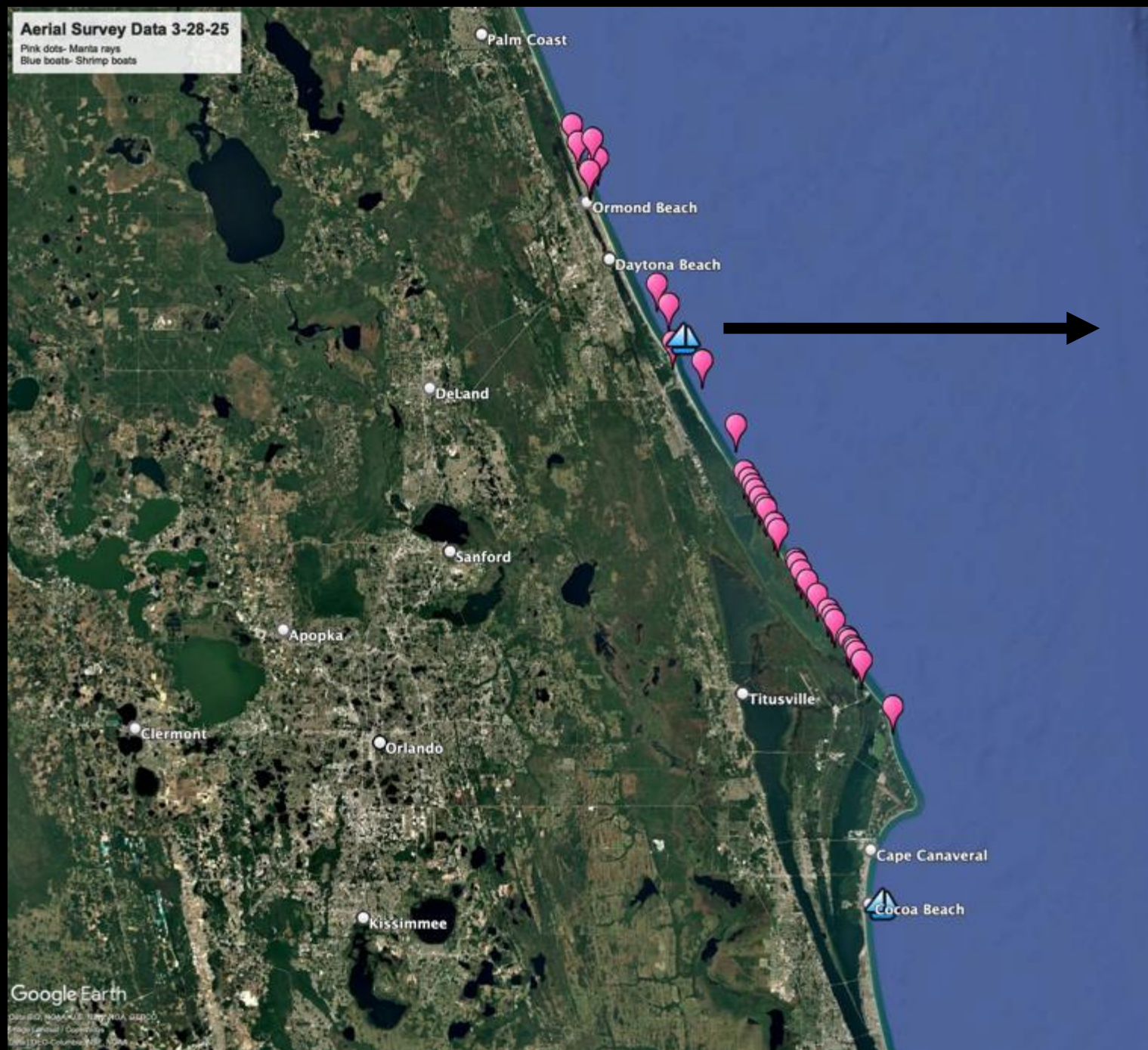


Bycatch in Shrimp Fishery

- Low observer coverage
- 2019-2024
 - 30 Alive; 6 Mortalities; 7 Unknown =Total: 43 (35 GOM; 8 SA)
 - At least 13.9% immediate known mortality rate; possibly as much as 30% if unknowns treated as mortalities
 - Post release mortality unknown

Aerial Survey Data 3-28-25

Pink dots- Manta rays
Blue boats- Shrimp boats



Google Earth

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Global Status of the Giant Manta Ray

IUCN RedList (2020)



ESA Threatened (2018)

Endangered and Threatened Wildlife and Plants; Final Rule To List the Giant Manta Ray as Threatened Under the Endangered Species Act

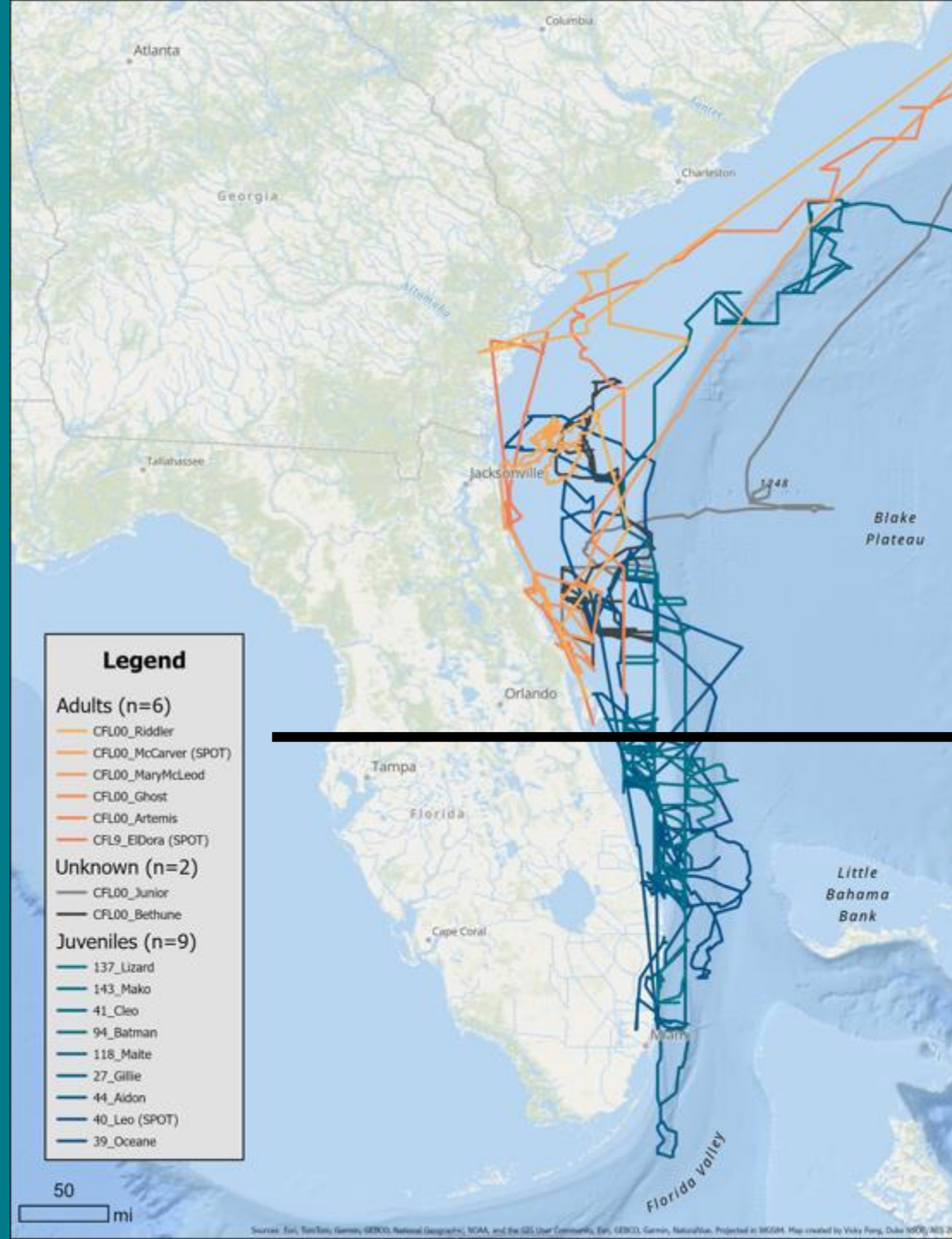
POPULATION TREND



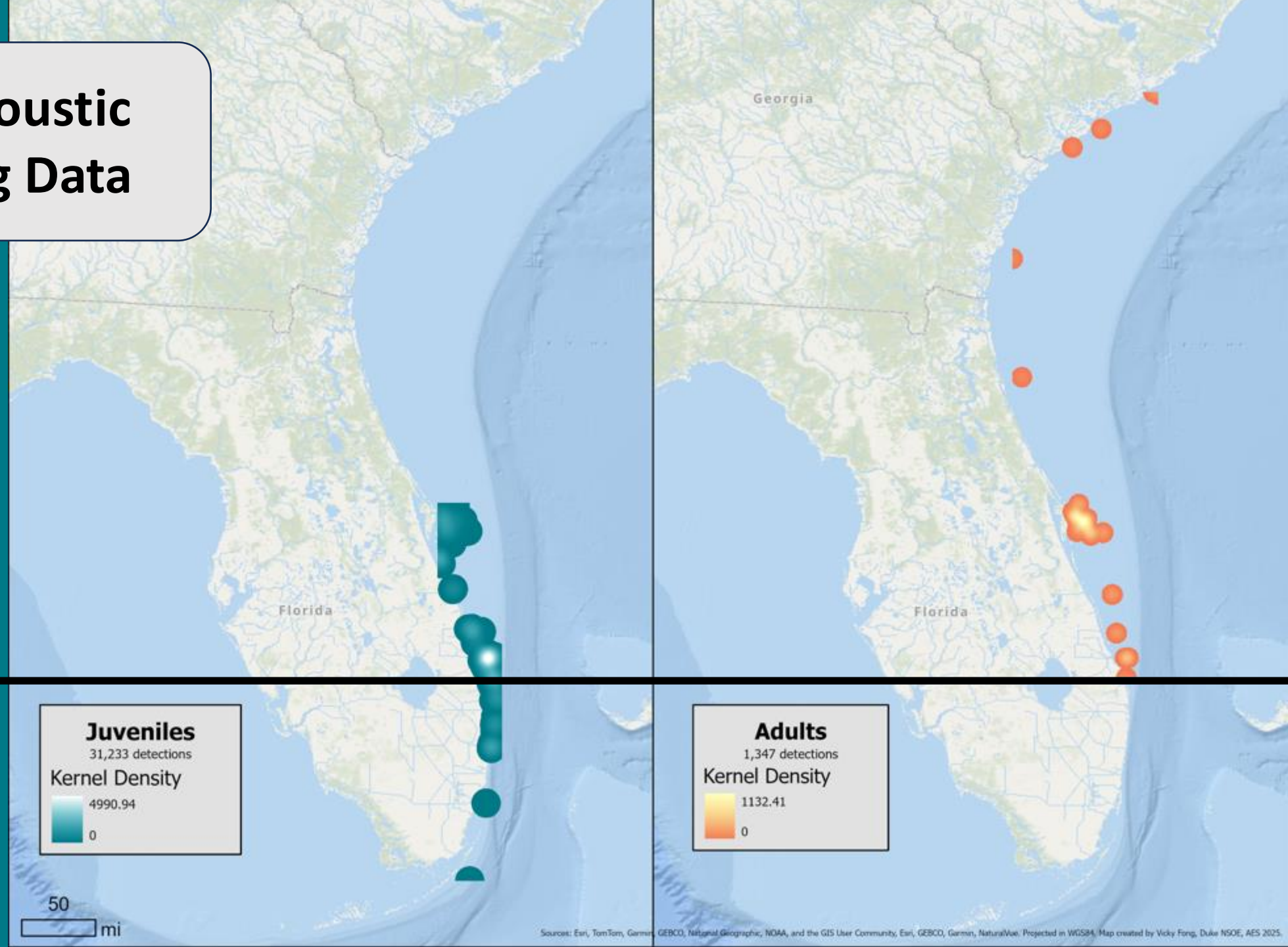
Decreasing

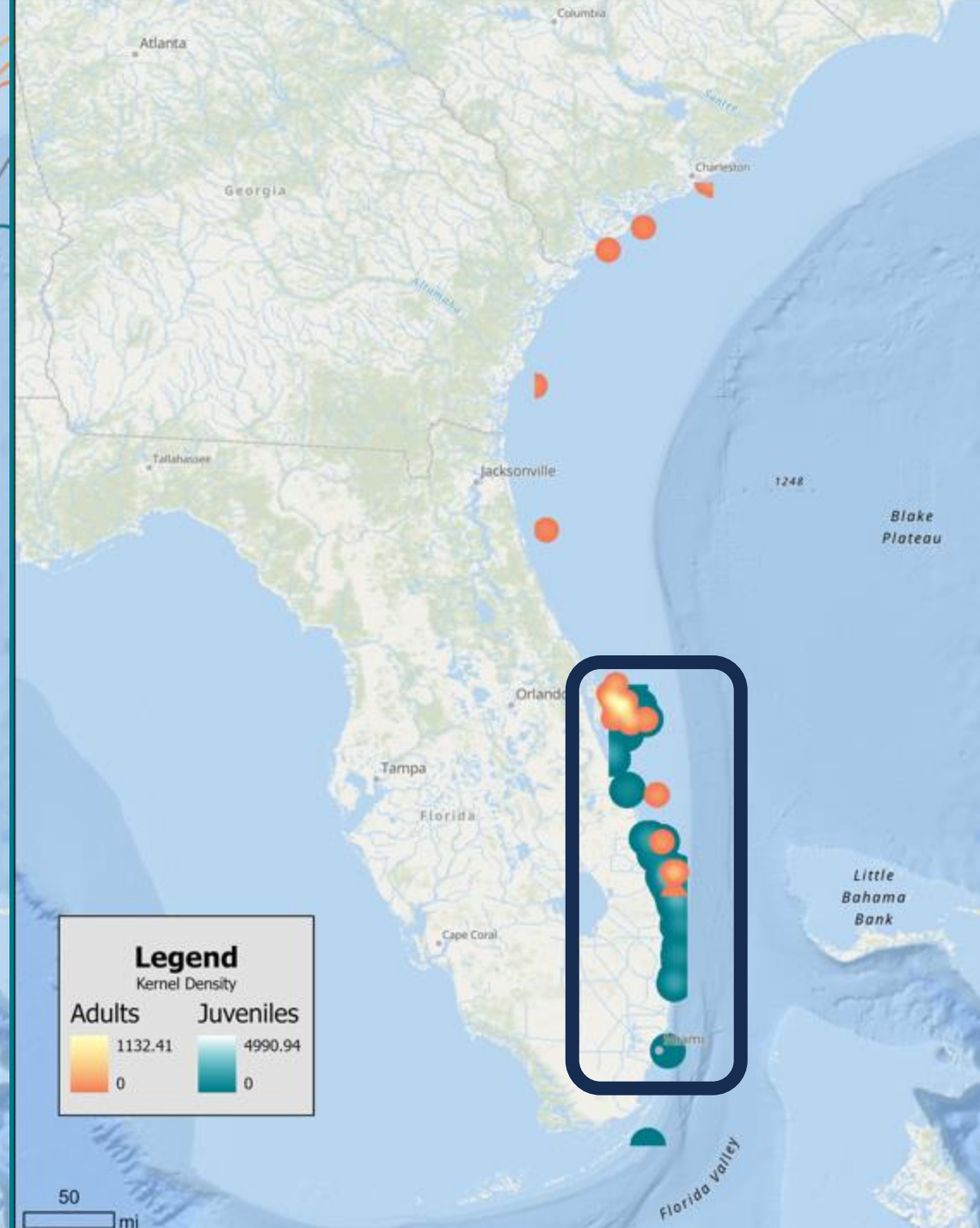
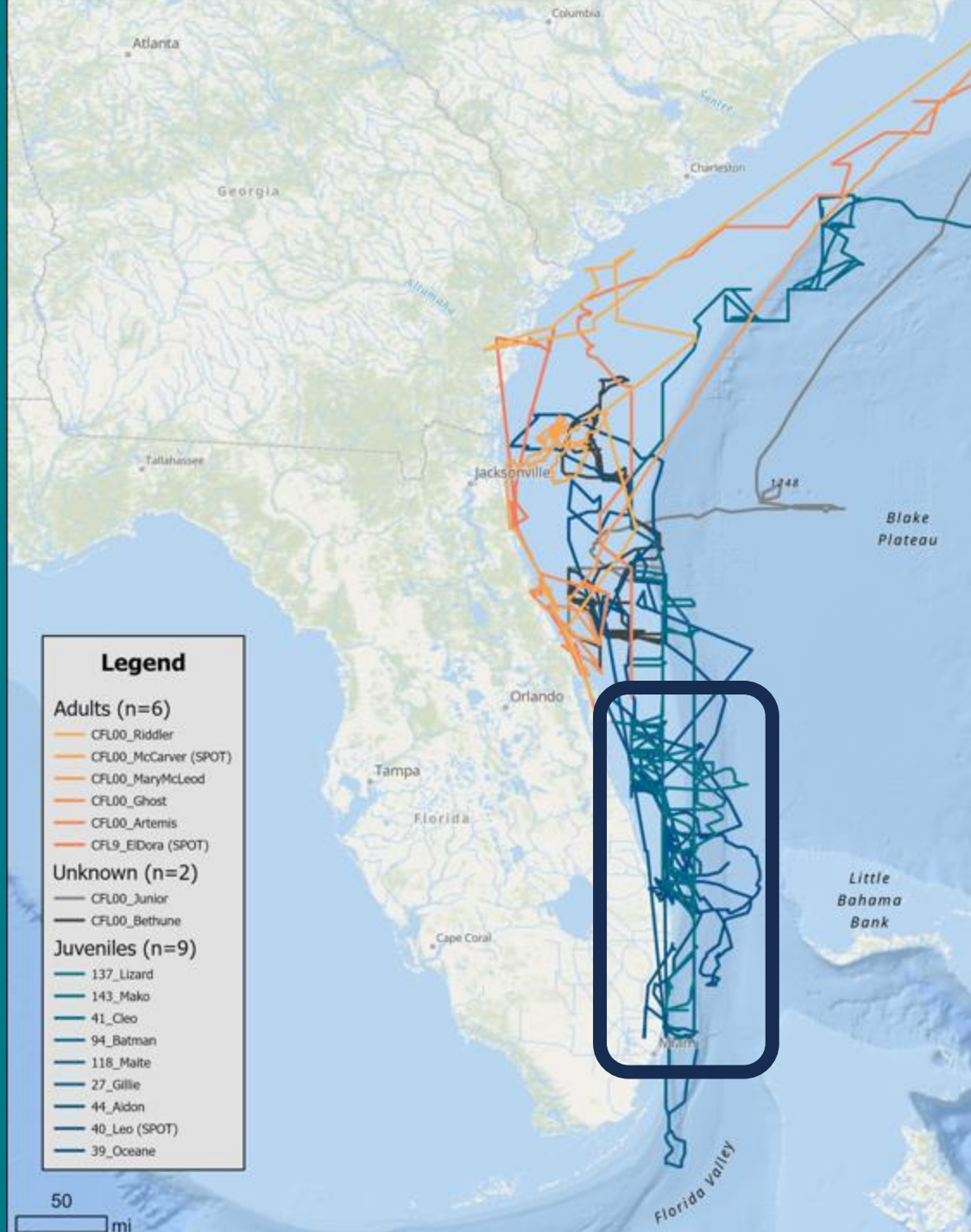
“However, the giant manta ray is likely to become an endangered species within the foreseeable future throughout a significant portion of its range (the Indo-Pacific and eastern Pacific portion).”

Satellite Tag Data



Acoustic Tag Data







<https://marinemegafauna.org/americas/florida-manta-project>



Marine Megafauna Foundation: Americas



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