Mobulid rays in the Eastern Pacific:

Post-release mortality and fishery-facilitated research

IATTC Bycatch Working Group
June 4, 2020

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The Manta Trust

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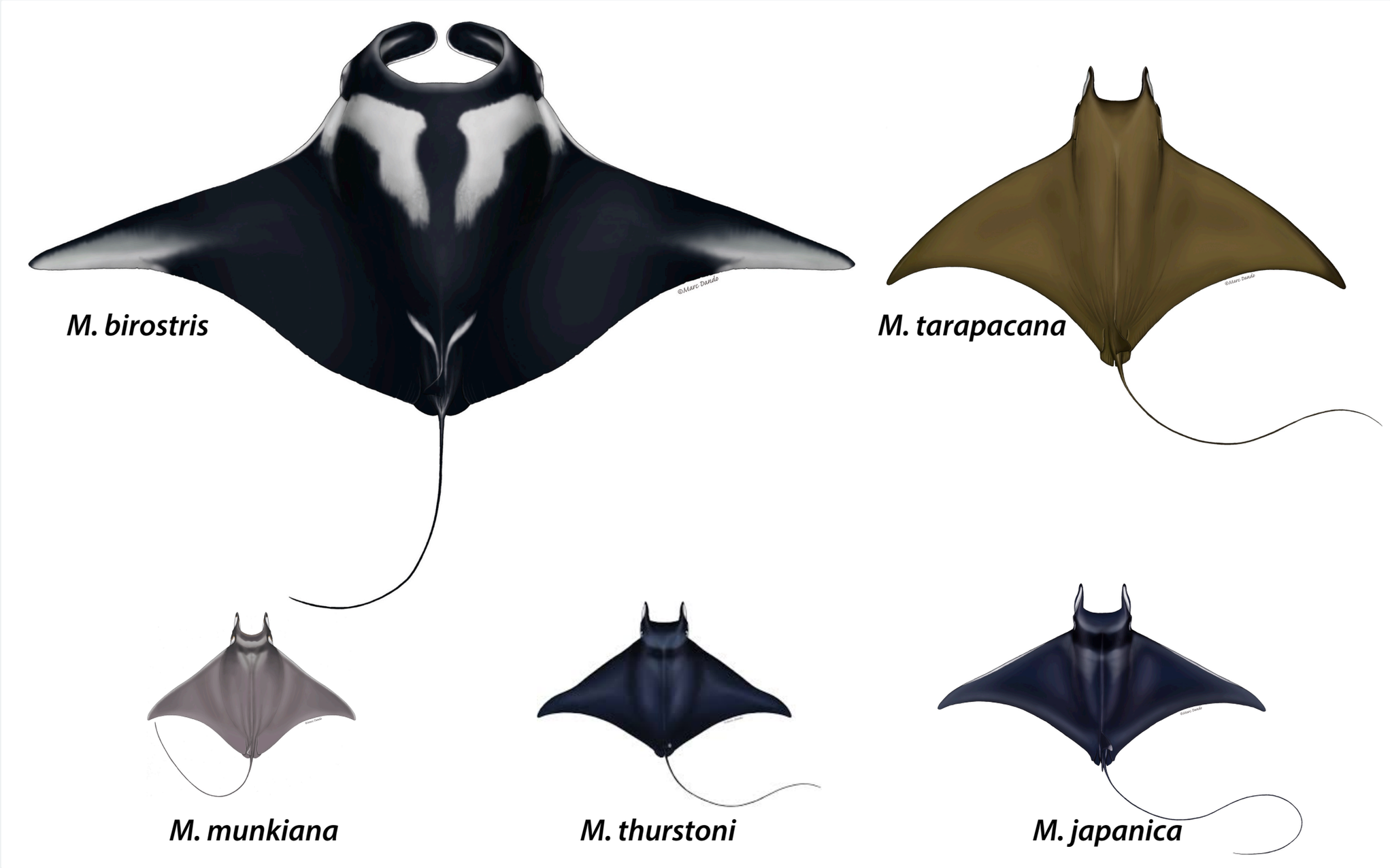
UC Santa Cruz

Mantas and Devil Rays



Illustrations © Marc Dando

Mobulid life history

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  - 40+ years for mantas
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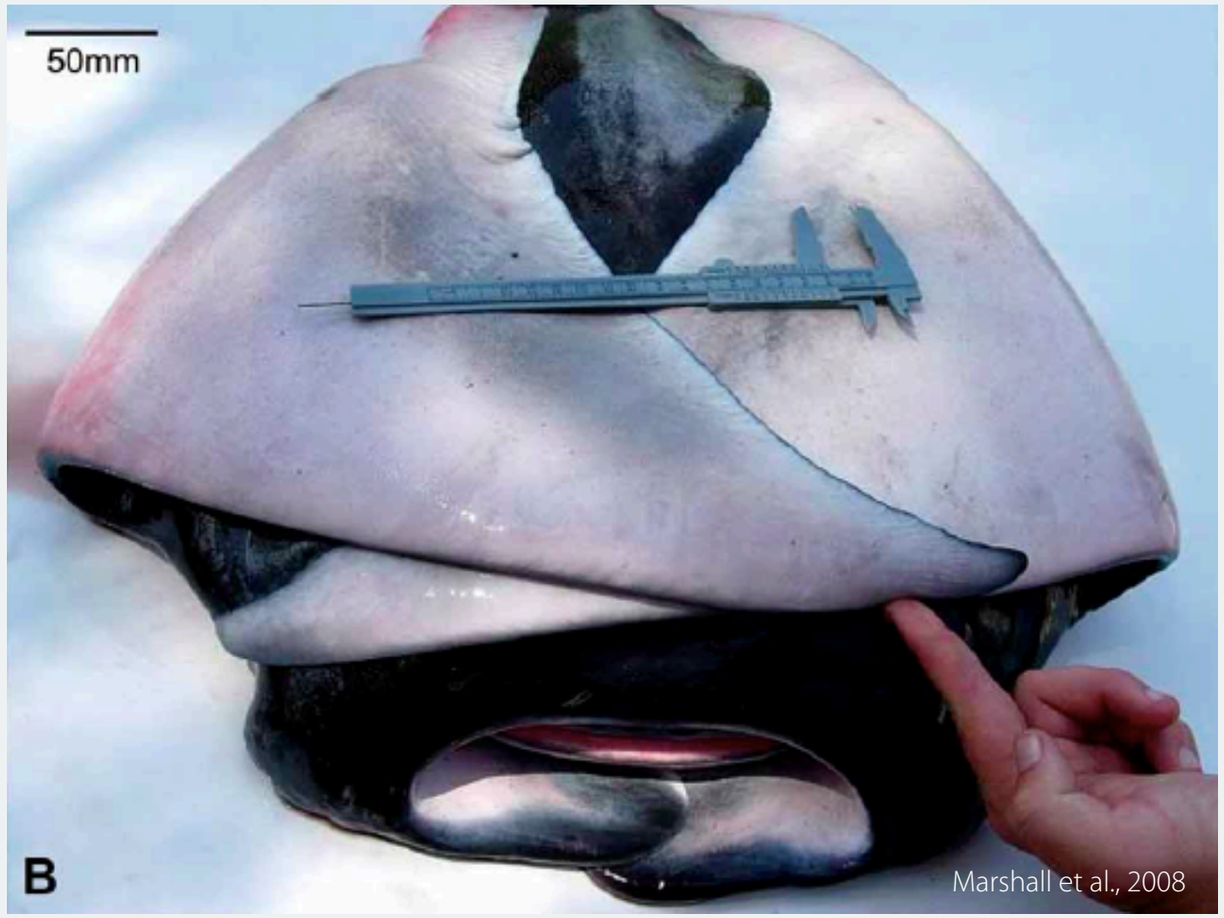

Marshall et al., 2008

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- Late maturity
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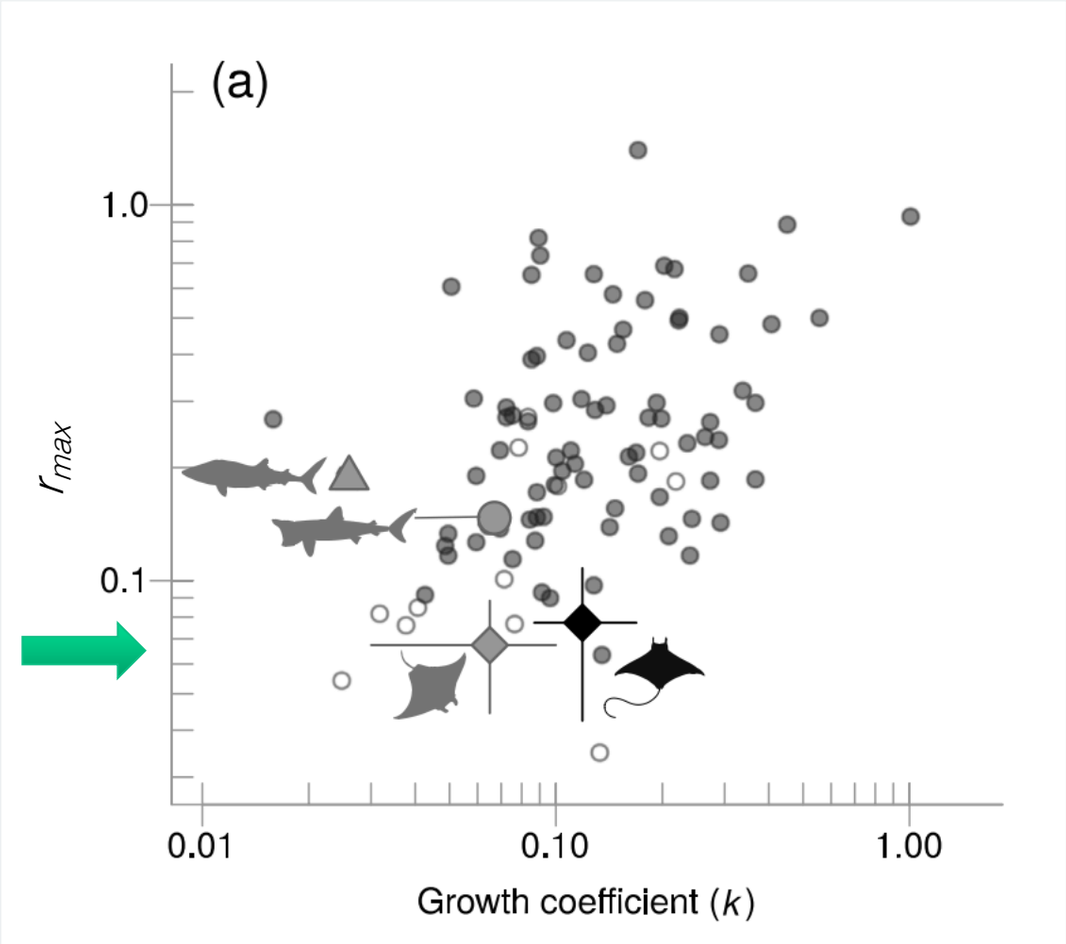
- One of the lowest population growth rates among elasmobranchs



Mobulids & Fisheries

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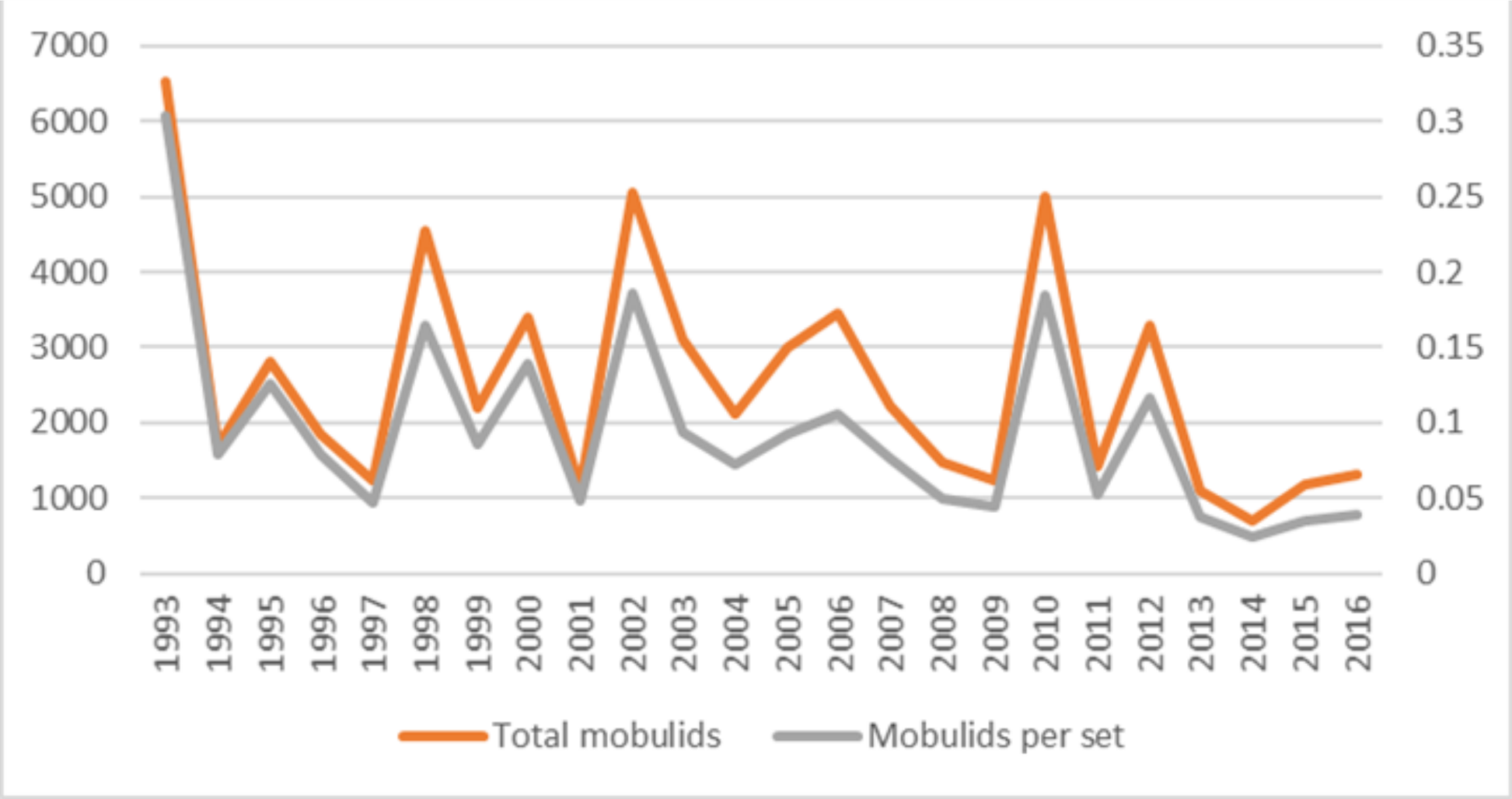
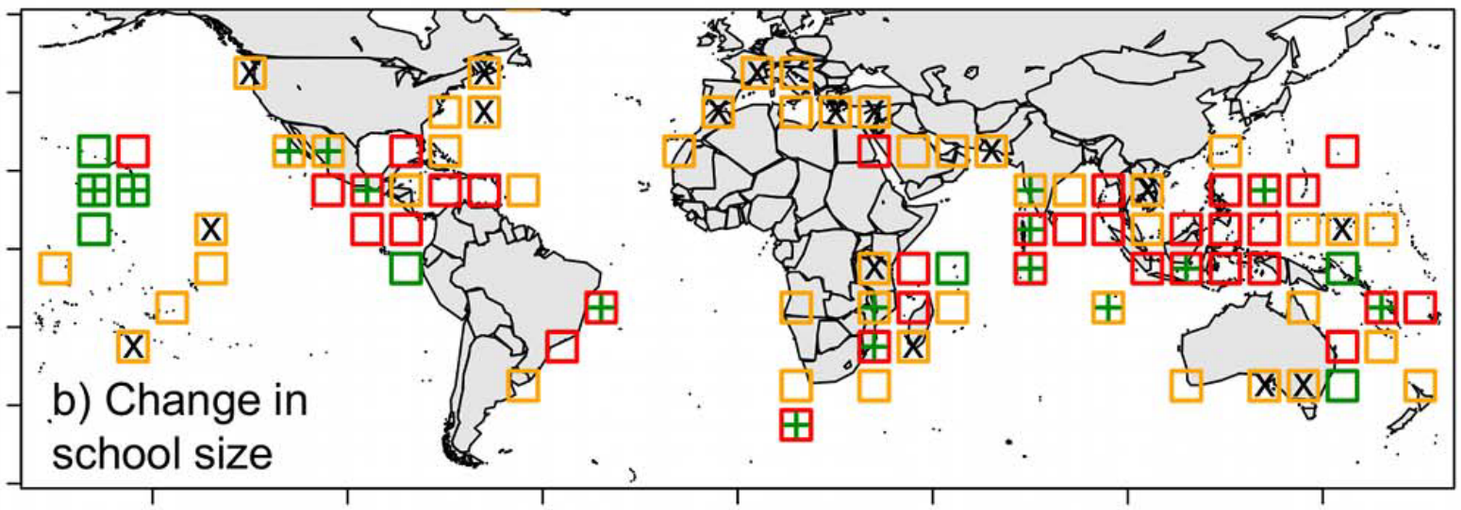
IATTC Purse Seine Fleet:

2,545 mobulids captured / year (mean)

Range: 705 (2014) – 6,531 (1993)

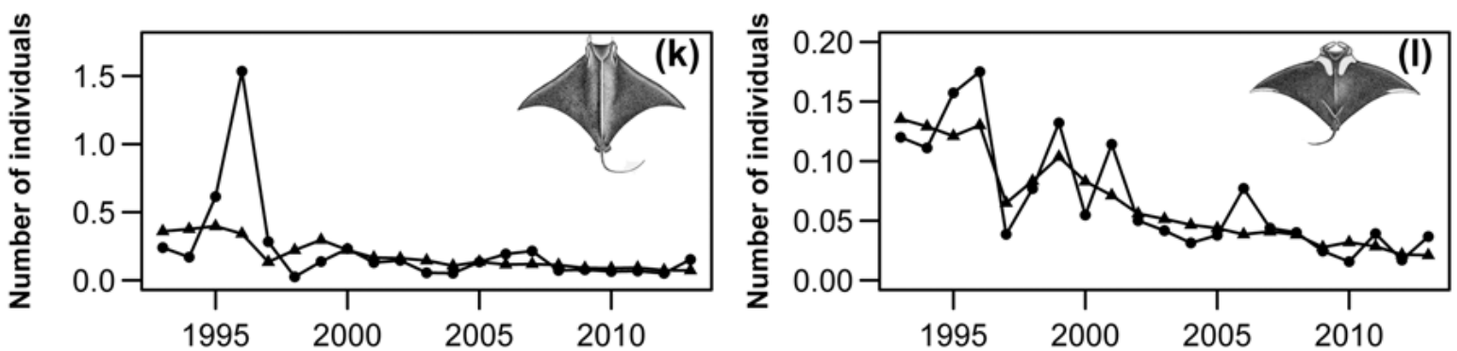


Population Trends



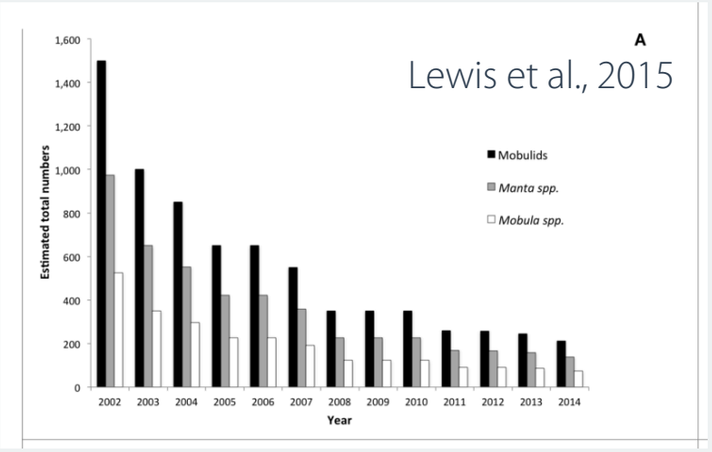
Ward-Paige et al., 2013

Global decline in school size and sighting frequency



White et al., 2015

Declines in manta and mobula sighting frequency (Cocos Isl.)



Lewis et al., 2015

Declines in manta and mobula catch rates (Indonesia)

Bycatch Impacts

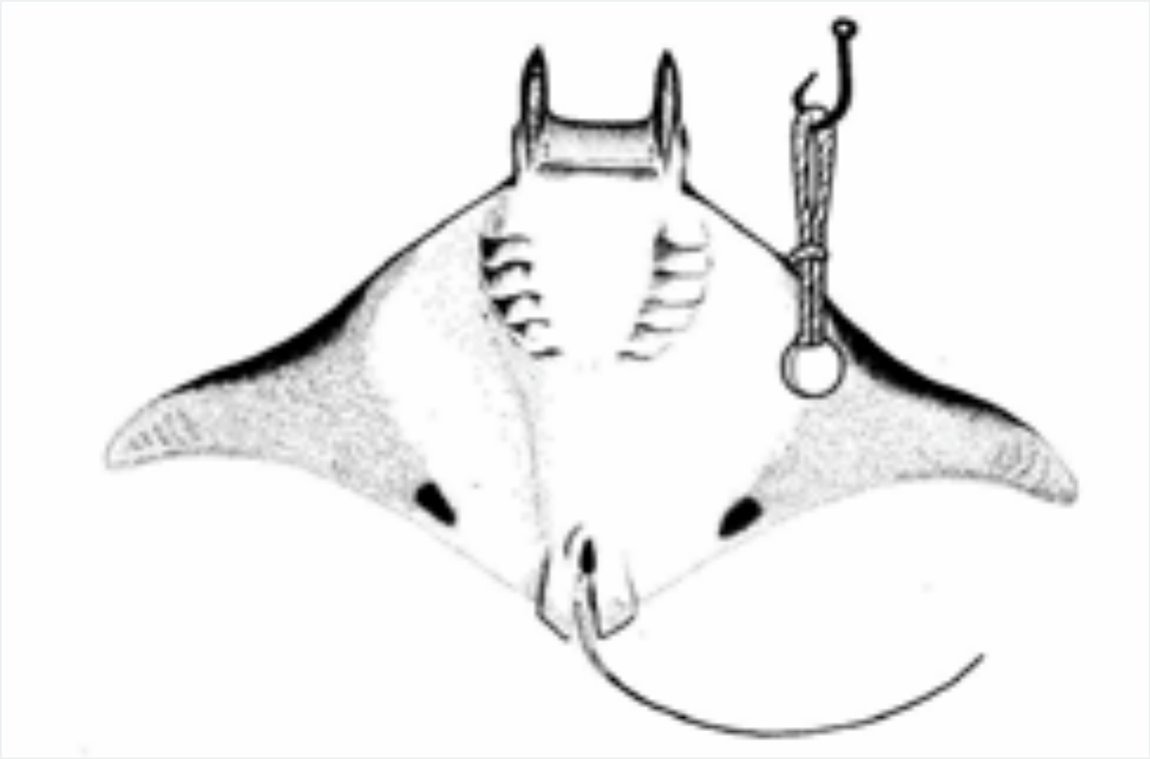
Small Scale Fishery / Gill Net Bycatch

Likely to have 100% Mortality

Purse Seine Fishery Bycatch

Has potential to be lower impact

Manta & Devil Ray Bycatch

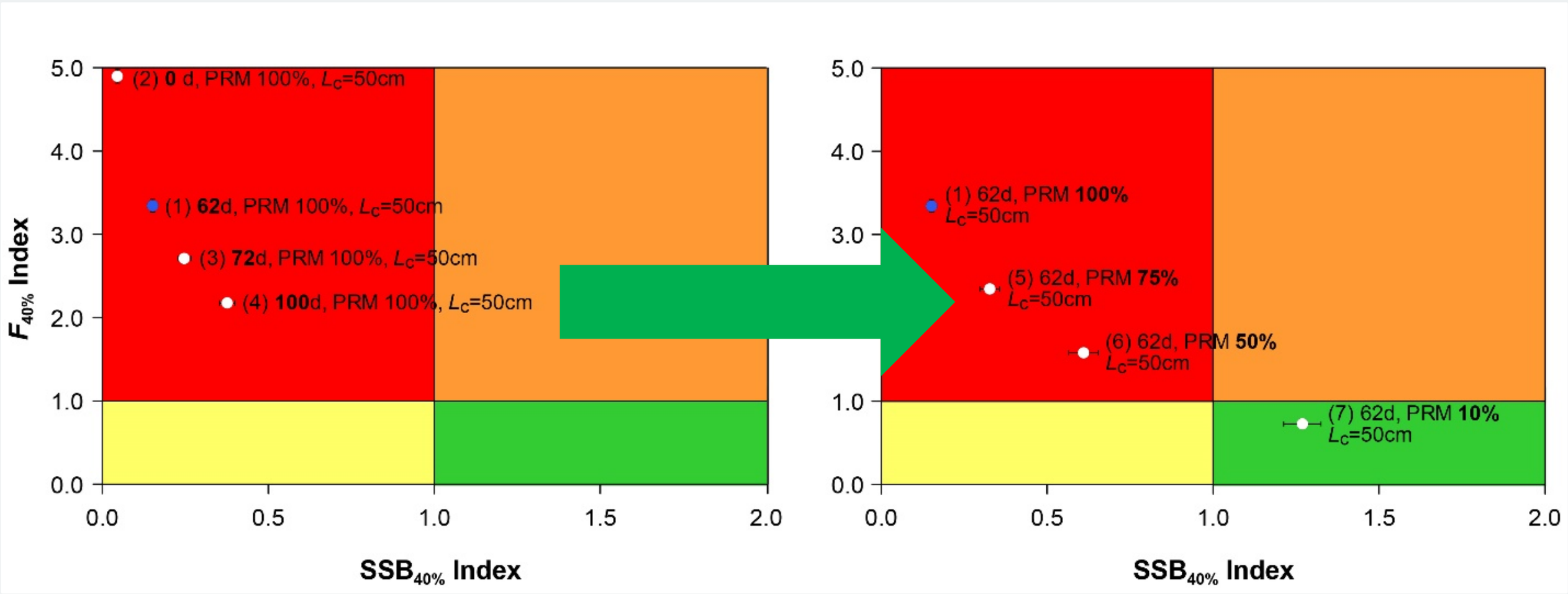


IATTC previously assumed **100% mortality** for mobulids, based on harmful handling & release practices

These practices are now **banned** (as of 2015: Resolution C-15-04)

Recovering Mobulid Populations in the ETP

- IATTC risk assessment determined that reducing post-release mortality was one of the most effective ways of improving the status of mobulid populations in the ETP



Griffiths et al. 2019 BYC-09-01

Project Overview

- Estimate the post-release mortality of mobulid rays released from purse seine vessels.
- Identify handling and release methods that minimize mobulid post-release mortality
- Work with vessel captains and crews to develop new, low-impact release methods and technology
- Use genetic methods & tag data to examine population structure of mobulids within the ETP and improve species identification

Collaborating Partners

Research

- The Manta Trust
- Monterey Bay Aquarium
- UC Santa Cruz
- IATTC

Fishery / Management

- TUNACONS
- PROBECUADOR

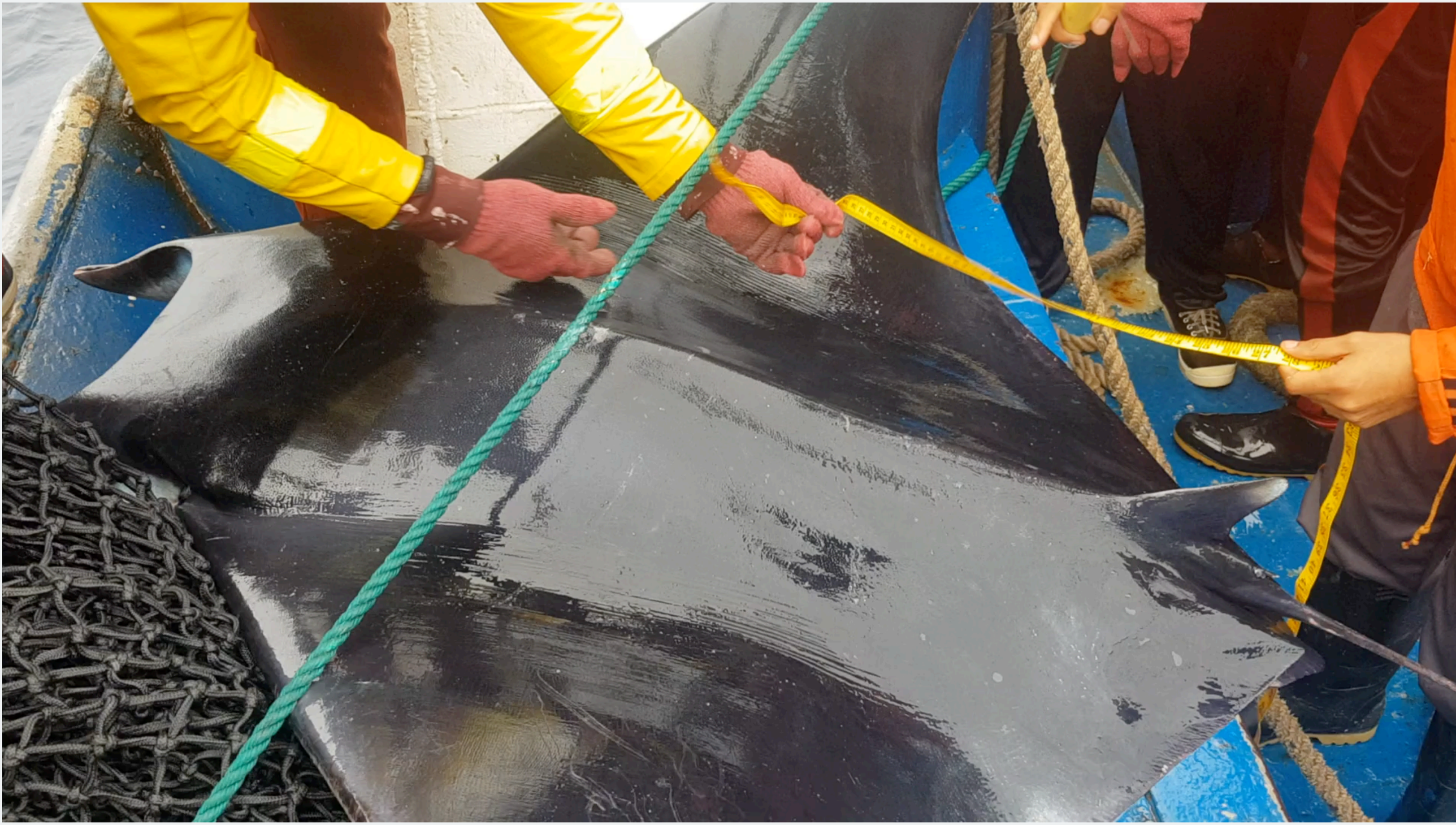
Funding / Support

- Monterey Bay Aquarium
- Save Our Seas Foundation
- International Seafood Sustainability Foundation

Observer Programs

Observer Programs

Data Collection



TUNACONS, used with permission

Handling & Release

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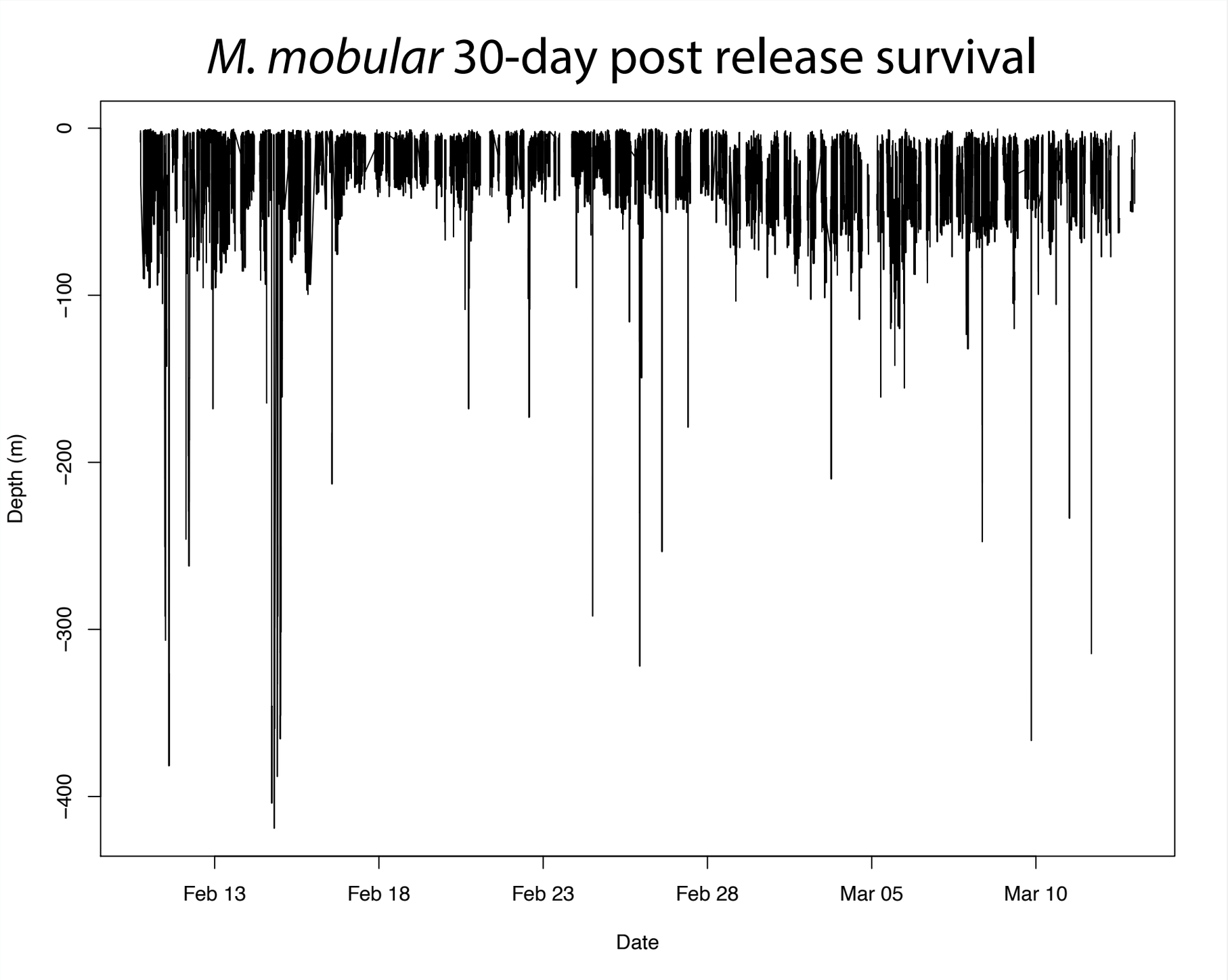
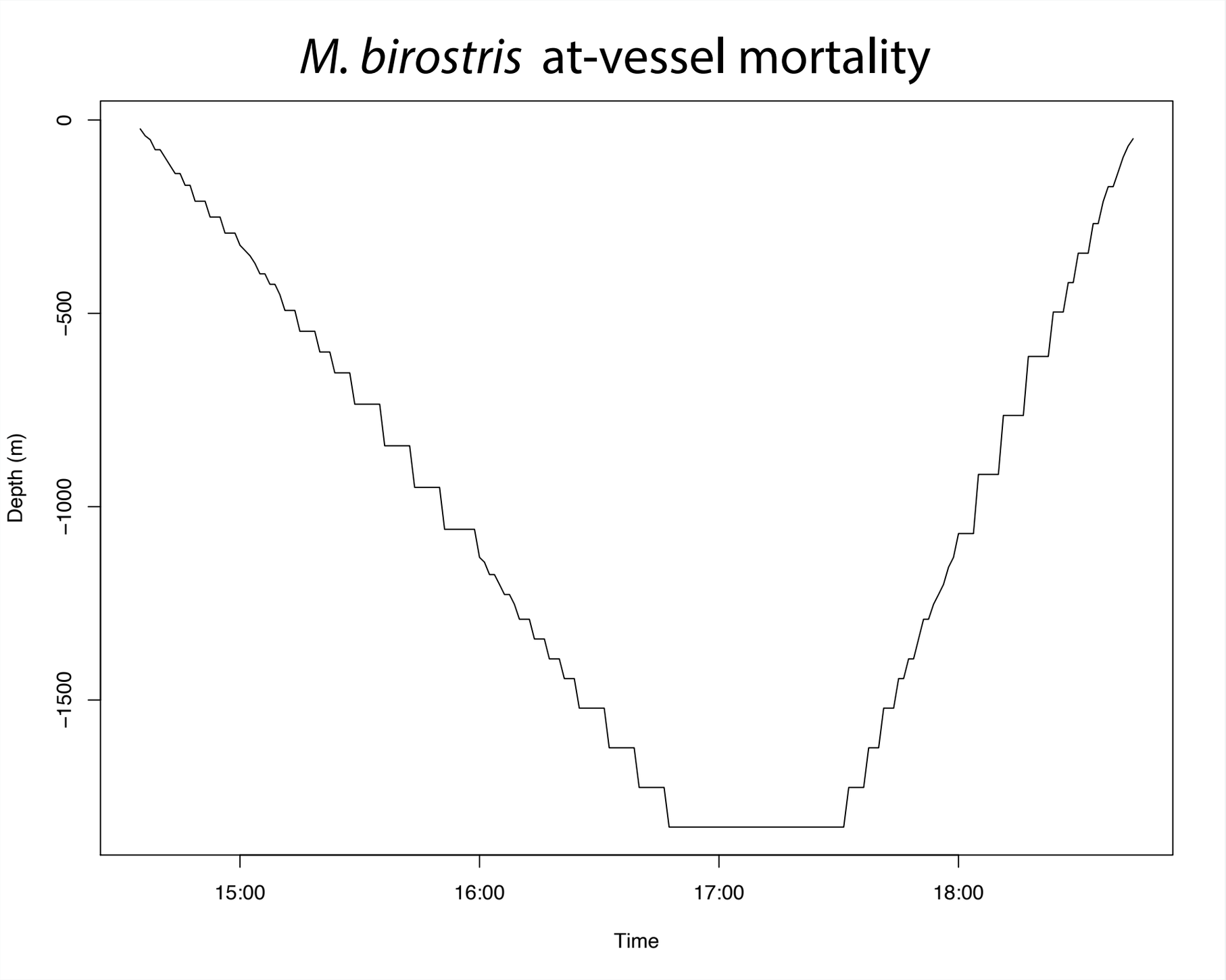
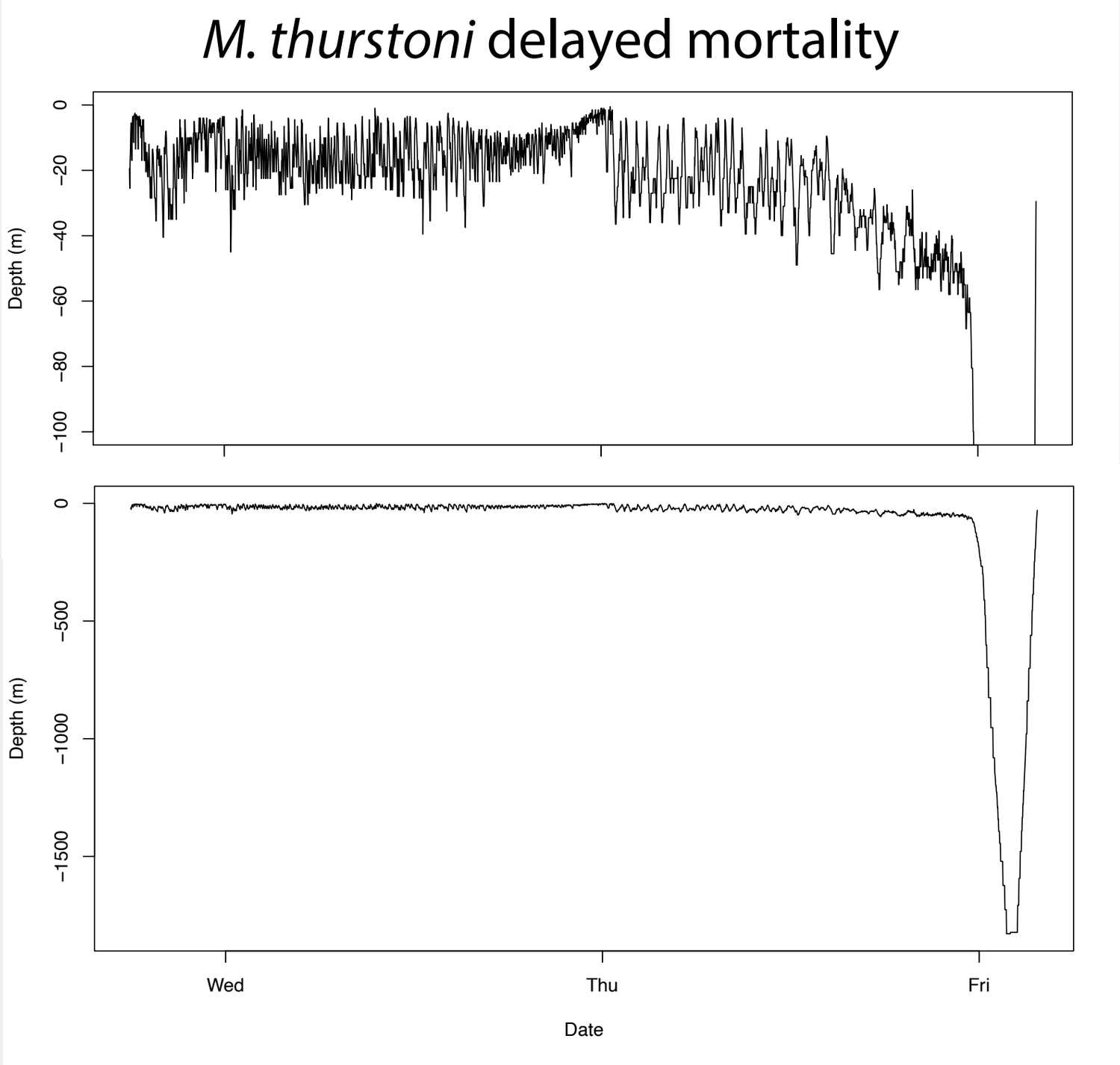
Post release mortality



Post release mortality



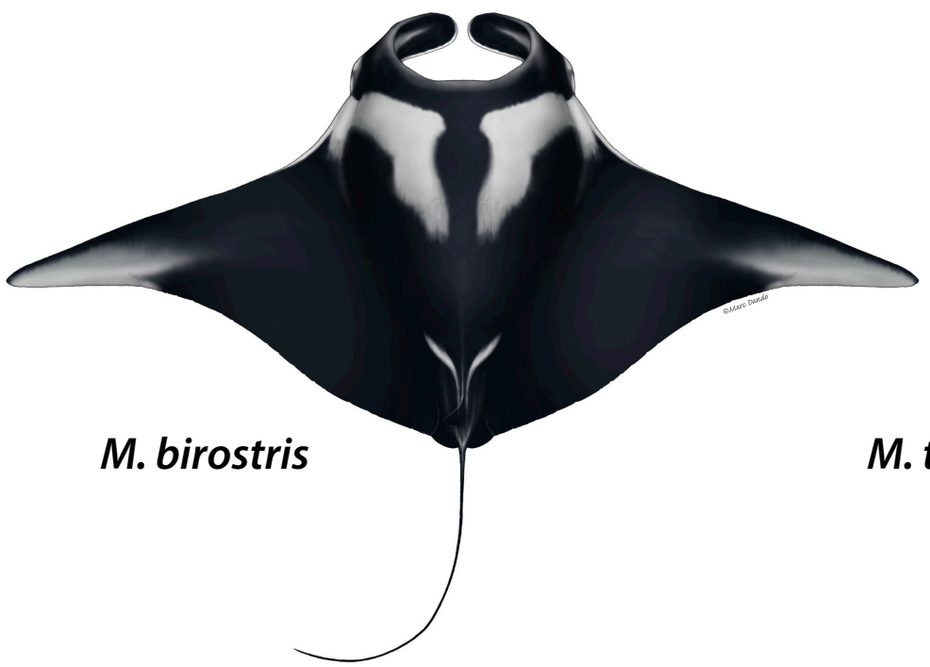
Post release mortality



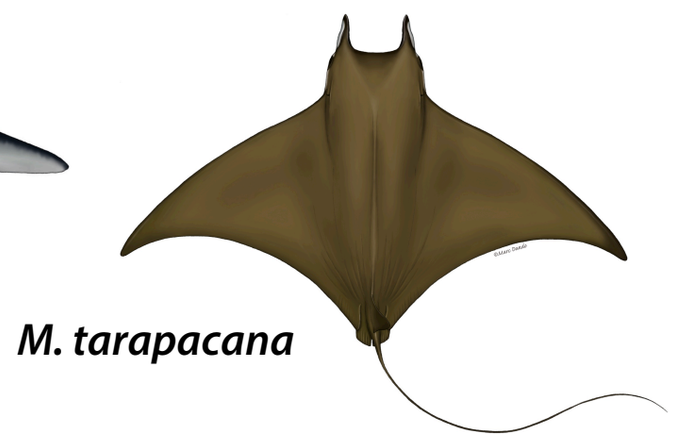
Preliminary Results

- 31 tags deployed since 2018
  - **16** M. mobular
  - **8** M. thurstoni
  - **5** M. tarapacana
  - **2** M. birostris

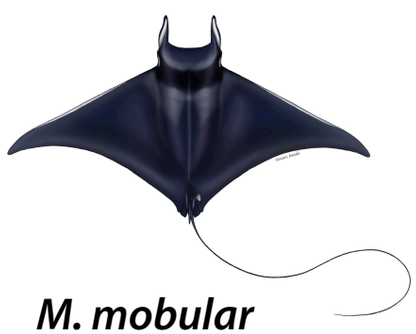
50% Mortality



60% Mortality



8% Mortality



80% Mortality

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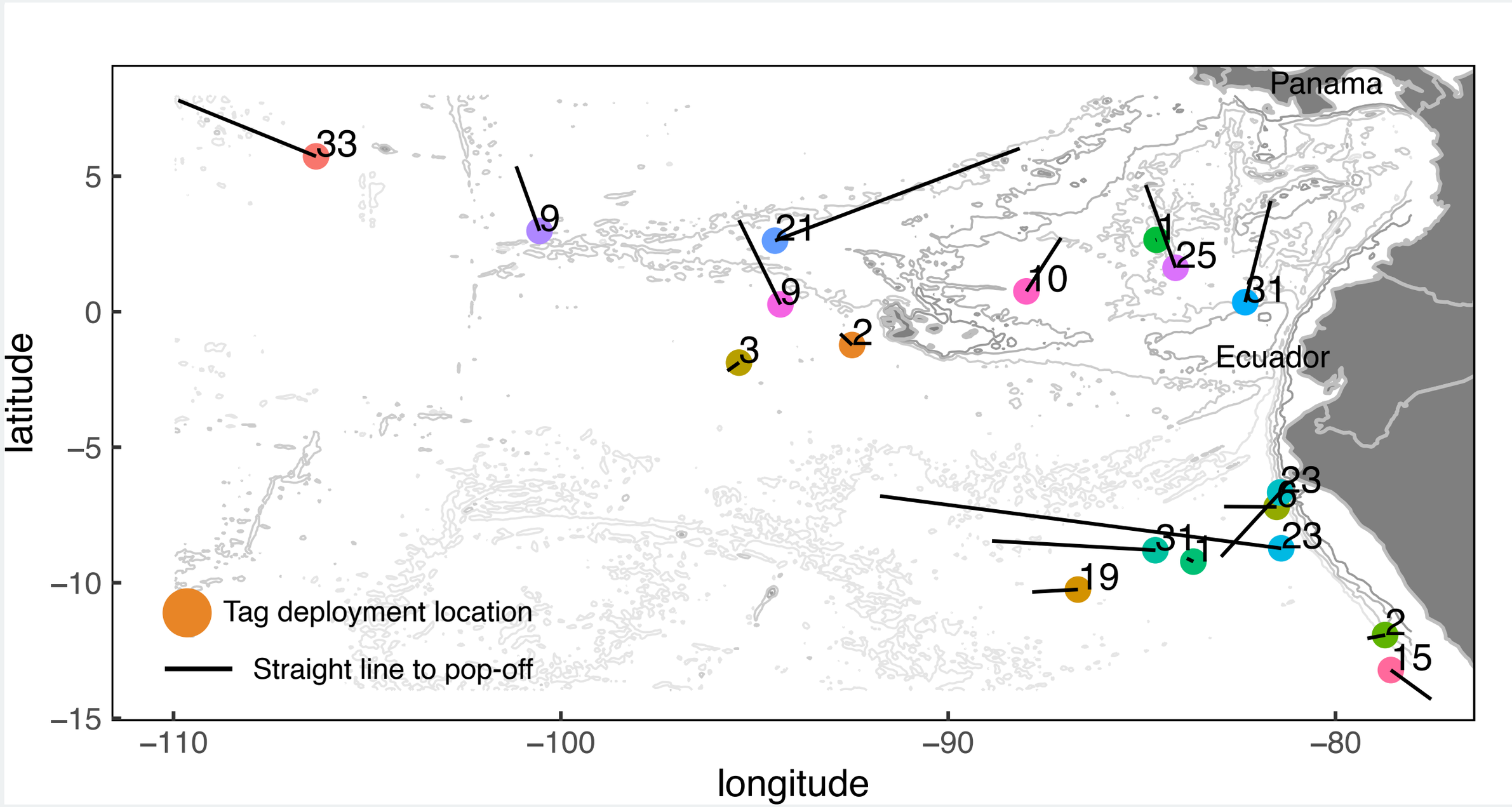
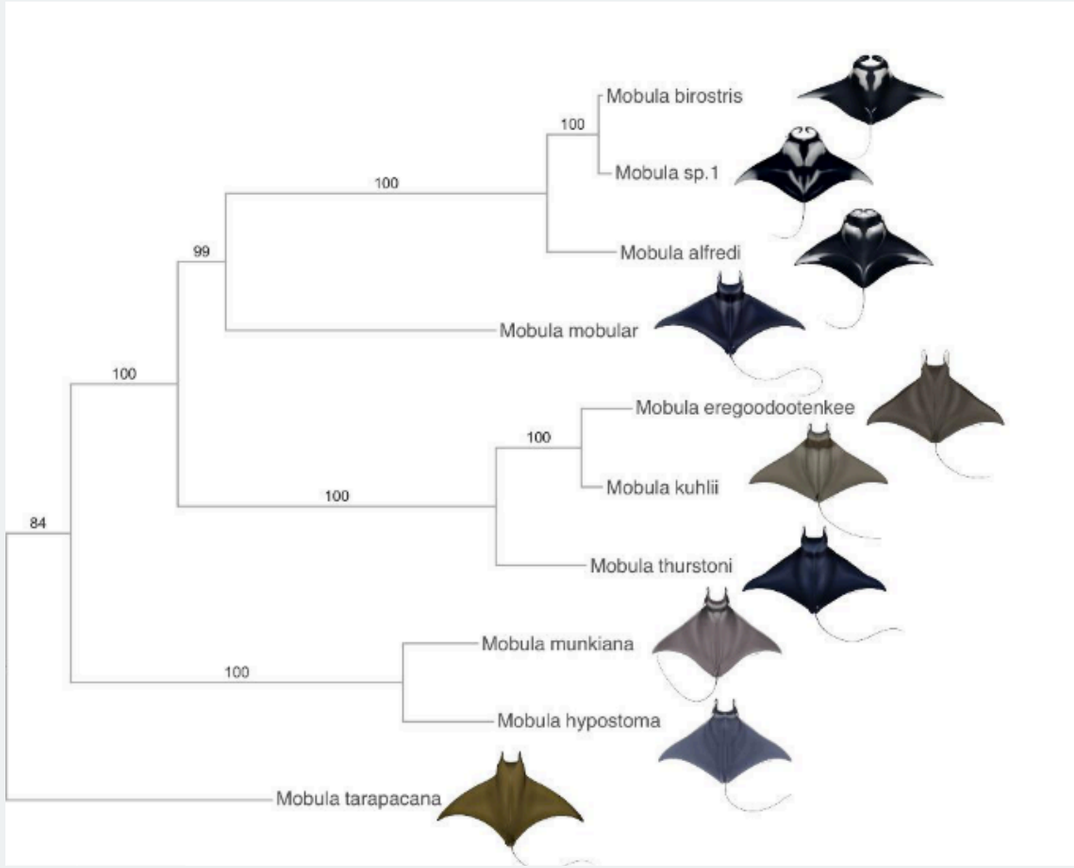


Skipper workshops supported by ISSF

- Developed mobula bycatch survey for skippers, crew, and observers
- Funding to host 2-3 skipper workshops in Manta, Ecuador, 2021
- Skippers collaborate to develop ideas for gear/handling modification, or improve existing one
- 'Winning' design to be developed, tested with PAT tags

Mobula population genetics

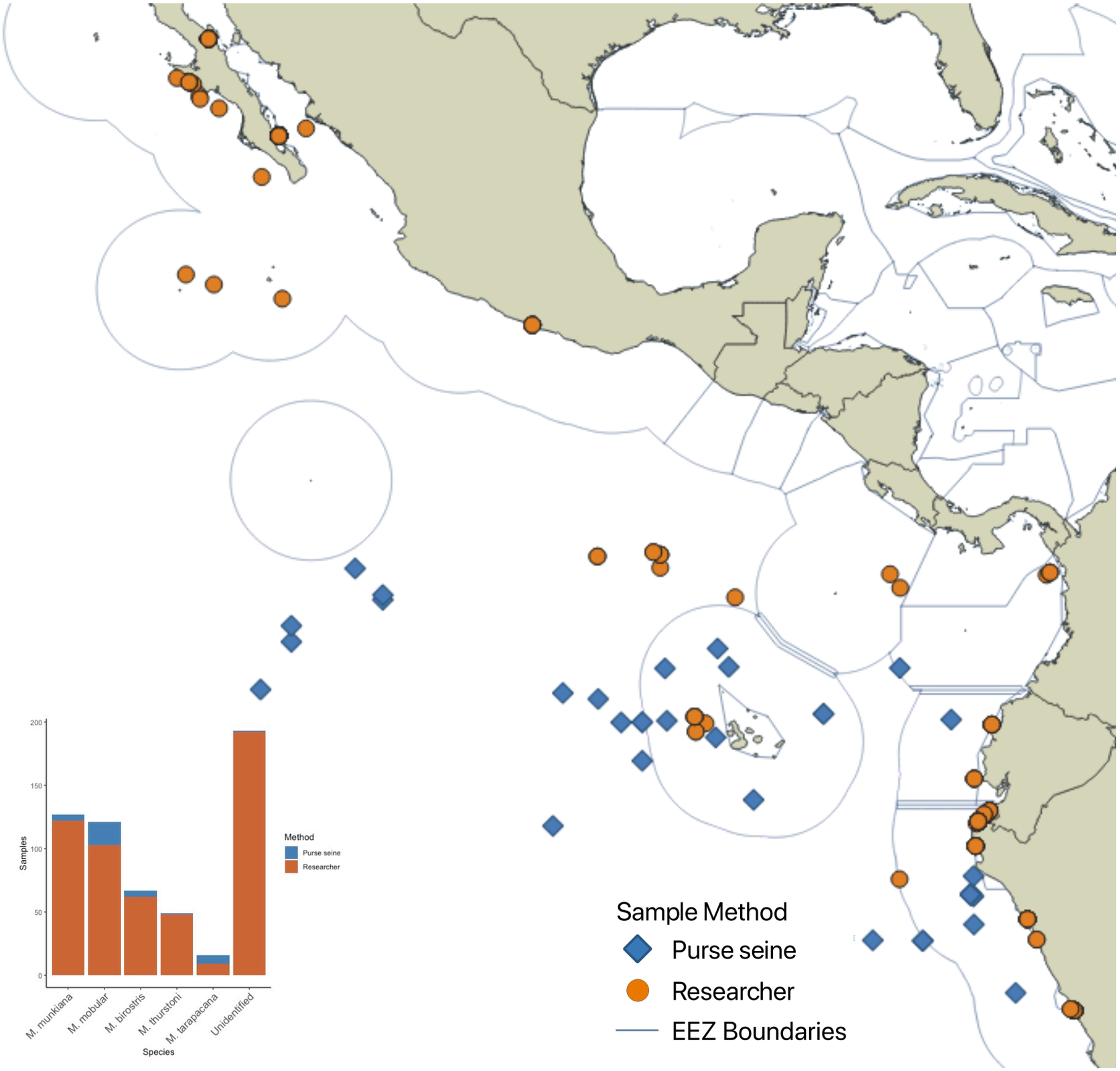
- How accurate are observers' species IDs?
- Is there population structure, or are all populations panmictic?
- Can unique stocks be identified for management?
- What is effective population size?



Hosegood et al., 2018

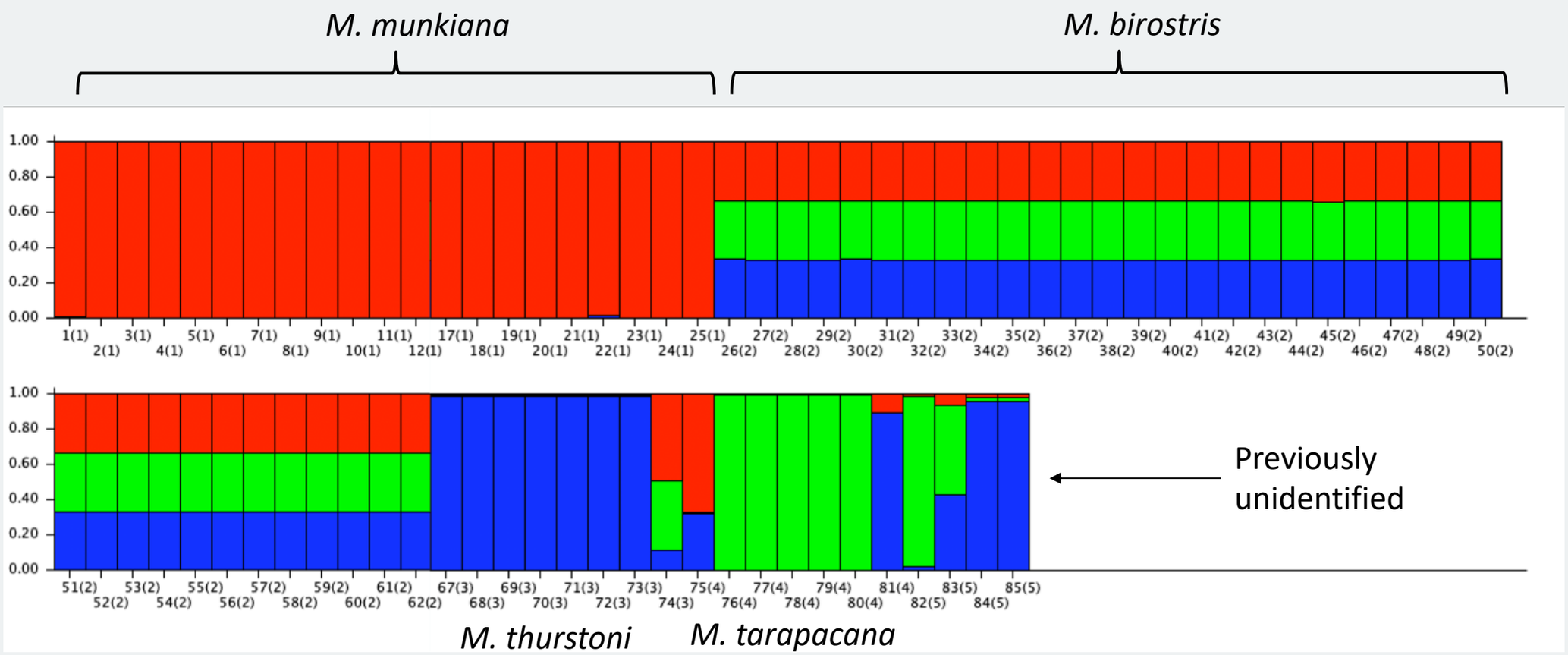
Sample collection by observers

Mobulid samples collected in the ETP



RAD-Sequencing fractional genome method

- High-coverage sampling across fragments of genome
- Effective for species without good genomic “infrastructure”



Thank you

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