Post-release survival of mobulid rays in purse seine fisheries

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Manta and Devil Rays

Oceanic manta ray
*M. birostris*

Sicklefin devil ray
*M. tarapacana*

Bentfin devil ray
*M. thurstoni*

Spinetail devil ray
*M. mobular*
Large bodied

+ Long lived
+ Low reproductive rate
+ Small population sizes

= Highly susceptible to population declines
Population trends

Global decline in school size and sighting frequency

Declines in sighting frequency (Eastern Pacific, Indian Ocean)

Declines in catch rates (Indian Ocean)
Purse Seines:
>13,000 captured / year (mean)
Former Handling & Release Methods

Assumed post-release mortality: 100%
Reducing PRM is likely most beneficial

(For M. mobular)

Griffiths & Lezama-Ochoa, 2021
Improved Handling & Release Methods

Image courtesy of TUNACONS
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Improved Handling & Release Methods

Images courtesy of TUNACONS
Observer Training
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Tag Deployments

- 53 deployments in ETP 2017-2024
- 16 in NZ (Jones & Francis, NIWA)
- 20 in Atlantic (Hutchinson, ISSF; Murua & Grande, AZTI)

- 41 (32 rpt.) *M. mobular* (74%)
- 32 (19 rpt.) *M. tarapacana* (33%)
- 12 (5 rpt.) *M. thurstoni* (20%)
- 4 (2 rpt.) *M. birostris* (50%)

58* total reporting tags out of 89 deployments

*2 tags with ambiguous fates excluded*
Covariate Effects

Entangled in Bag

Entangled in Bag (Skunked)

Body Size

Brailer #

FAD Set

Male

Release – Cargo Net vs Manual

Release – Stretcher vs Cargo Net

Release – Stretcher vs Manual

Time on Deck

Tons of Catch

Water Temp

M. birostris

M. mobular

M. tarapacana

M. thurstoni
Takeaways

• New handling methods likely a huge improvement
  • Specific method (by hand, stretcher, net) less important*

• Mobulid post-release survivorship can be moderate to high
  • Highly dependent on:
  • **Species**
  • Time on deck
  • Entanglement in bag
Recommendations

• Release mobulids in <5 min, flexibility on method
  • Would lean towards stretchers

• Don’t let them sit in the sack until brailing is complete

• Explore & evaluate options to release directly from net
  • Even under optimal handling, *M. thurstoni* has low survivorship
  • Spotter pilots may be able to notify crew of mobulids in net
Recommendations

• Observers should record release conditions so we can estimate fleet-wide survival probability
  • These estimates aren’t the *realized* mortality rates
  • Actual survival rates are likely much much lower

• *M. mobular* 74%
• *M. tarapacana* 33%
• *M. thurstoni* 20%
• *M. birostris* 50%
Sorting Grids

Murua et al. 2022
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