Progress in addressing key research to inform Mobulid ray conservation in the Pacific Ocean

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>3,000 mobulids caught annually by tuna purse seiners in Eastern Pacific

- Poor species identification and catch reporting
- Observed population declines but no stock assessments
- Improving port-release mortality likely to improve status (Griffiths & Lezama-Ochoa, 2021)
Primary barriers to rapid + safe release

- Large, slippery animals sit on deck longer >> leads to crushing and asphyxiation

- Manual release for large animals can lead to eye and lobe damage
Objectives

Study purse seine – mobulid interactions and population structure

Design and test sorting grid for mobulids and evaluate post-release mortality with satellite tags

Train fishers and observers to identify and sample mobulid rays and educate crew on best safe-handling and release practices

Outreach to fishers, scientists and managers
Preliminary results
Objective 1: Purse seine-mobulid interactions

- 29 mobulid captures documented by participating vessels
- Mean size of sets with mobulids = ~ 63 tons
- Four mobulid pairs captured in same set
Preliminary results

Objective 1: Purse seine-mobulid interactions

- 11 samples collected, combined with 61 mobulid samples collected by Ecuadorian fleet in collaboration with IATTC and TUNACONS

- Misidentification of mobulid species likely occurring
  - *M. munkiana* documented outside its coastal distribution

- RAD library and sequencing successful, bioinformatics in progress

- Mobulids will be assigned based on population structure identified by Cronin et al (*in revision*)
Preliminary results
Objective 2: Design and test sorting grids

• Surveys, calls conducted with fishers to inform and adapt grid designs
Preliminary results

Objective 2: Design and test sorting grids

- Sorting grids were constructed for each of the 12 US purse seine vessels
- Design varied based on vessel specifications
• Sorting grids were most common method (n=7) 
  • followed by stretcher (n=4) and manual release (n=4)

• Sorting grids used for larger animals (mean DW = 200 cm) 
  • manual release for smaller animals (mean DW = 162 cm)

• Mean duration of capture using sorting grid (4:07 minutes) was similar to other methods (4:11 minutes)
Preliminary results
Objective 2: Design and test sorting grids

- Tag battery malfunctions and rarity of capture severely limit sample size

<table>
<thead>
<tr>
<th>Species</th>
<th>Release method</th>
<th>Condition on release</th>
<th>Fate</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>M. thurstoni</em></td>
<td>manual</td>
<td>good (“active and energetic”)</td>
<td>mortality</td>
</tr>
<tr>
<td><em>M. thurstoni</em></td>
<td>manual</td>
<td>poor (“sank with little movement”)</td>
<td>mortality</td>
</tr>
<tr>
<td><em>M. mobular</em></td>
<td>stretcher</td>
<td>good</td>
<td>survival</td>
</tr>
</tbody>
</table>
Preliminary results
Objective 3: Fisher training and education

Fisher training in port

Vessels: Cape Breton, Evalina da Rosa, Cape May, Pacific Princess, Sea Encounter, Friesland, Cape Cod, Cape Finisterre, Capt Vicent Gann, Daniela, Cape Elizabeth, Cape Ferrat, Andrea 1
Preliminary results
Objective 3: Fisher training and education

Biologist onboard purse seiner

Fishers sampling

Educational materials
Conclusions

✓ US fleet easily adopted + adapted sorting grids
✓ Grid release time **comparable to manual release**, despite larger animals
✓ **Interaction rate is low**, tagging difficult
✓ **Education and training to all US fleet vessels**, online, onboard and in port
✓ Next: Genetic analyses and continued testing of sorting grid use
Thank you!

Pacific Islands Regional Office

NOAA

American Tunaboat Association

ISSF

International Seafood Sustainability Foundation

AZTI

Member of Basque Research & Technology Alliance