Cryptic Seabird Mortality on US West Coast Pacific Hake Fishing Vessels

Jason Jannot
Tom Good
Vanessa Tuttle

Photo credit: L. Shiosaka A-SHOP 2016
Problem: Unobserved Strikes
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Deepwater Hake Fishery – South Africa
New Zealand Trawl Fisheries
Argentine Hake Fishery
Alaskan Pollock Fishery – Melvin et al 2011
17 of 22 albatross species are threatened with extinction.

- Migratory Bird Act 1918
- Endangered Species Act 1973
- Magnuson Fishery Conservation and Management Act 1976

Photo by Rob Suryan
Short-tailed Albatross

Short-tailed Albatross population estimate

Short-tailed Albatross Sightings and Non-Lethal Interactions

# individuals
- 3
- 6
- 9
- 12

<table>
<thead>
<tr>
<th>total</th>
<th>south of 36 deg. N. lat.</th>
</tr>
</thead>
<tbody>
<tr>
<td>266</td>
<td>1</td>
</tr>
</tbody>
</table>
At-Sea Hake Fishery
At-Sea Hake Observer Program
Mortality has been documented

<table>
<thead>
<tr>
<th>Annual Mortalities Collected on Vessels</th>
<th>Median</th>
<th>Mean</th>
<th>SD</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>BF Albatross</td>
<td>2</td>
<td>3</td>
<td>3.6</td>
<td>1 - 5</td>
</tr>
<tr>
<td>Other Birds</td>
<td>11</td>
<td>21</td>
<td>22.5</td>
<td>10 - 32</td>
</tr>
</tbody>
</table>

Dead bird on wire

Photo Credit: A-SHOP
Project Goals

1. Quantify extent of cable strike problem
2. Incorporate results into bycatch estimates
3. Develop bycatch mitigation strategies

Photo: N. Kroeger A-SHOP 2016
Data Collection

1. **Current At-sea hake observers**
2. **Methods**
   a) 15 min. observation
   b) Tows: Sunrise-Sunset (no night observations)
3. **Data**
   a) Strikes: Hard vs. Light
   b) Fishing Operations
   c) Seabird Abundance
   d) Mitigation


Photo Credit: A-SHOP 2016
## Observations

<table>
<thead>
<tr>
<th></th>
<th>15 min. observations (#)</th>
<th>Observed tow hours</th>
<th>Fleet tow hours</th>
<th>Observation Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>533</td>
<td>133</td>
<td>4547</td>
<td>0.029</td>
</tr>
<tr>
<td>2017</td>
<td>404</td>
<td>101</td>
<td>3548</td>
<td>0.028</td>
</tr>
<tr>
<td>2018</td>
<td>394</td>
<td>98</td>
<td>4522</td>
<td>0.022</td>
</tr>
<tr>
<td>2019</td>
<td>263</td>
<td>66</td>
<td>3990</td>
<td>0.017</td>
</tr>
</tbody>
</table>
## What Causes Strikes?

<table>
<thead>
<tr>
<th>OPERATIONAL FACTORS</th>
<th>ENVIRONMENTAL FACTORS</th>
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</thead>
<tbody>
<tr>
<td>Offal Plume</td>
<td>Bird Abundance</td>
</tr>
<tr>
<td><strong>Wire Type: Warp, 3rd Wire</strong></td>
<td>Wind Direction Relative to Vessel</td>
</tr>
<tr>
<td>Fish Meal Operation</td>
<td>Beaufort Scale</td>
</tr>
<tr>
<td>Vessel Activity: Set/Haul, Short-Wire, Towing</td>
<td></td>
</tr>
<tr>
<td>Aerial Extent of Wire</td>
<td></td>
</tr>
<tr>
<td>Time Wire is in Plume, Plume Loc.</td>
<td></td>
</tr>
<tr>
<td>Depth of Net, Catch, Tow Duration</td>
<td></td>
</tr>
</tbody>
</table>
# Black-footed Albatross

<table>
<thead>
<tr>
<th></th>
<th>Hard Strikes</th>
<th>Strike Mortality (0.01)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Observed</td>
<td>Estimated</td>
</tr>
<tr>
<td>2016</td>
<td>12</td>
<td>193</td>
</tr>
<tr>
<td>2017</td>
<td>3</td>
<td>145</td>
</tr>
<tr>
<td>2018</td>
<td>1</td>
<td>183</td>
</tr>
<tr>
<td>2019</td>
<td>0</td>
<td>161</td>
</tr>
</tbody>
</table>
Summary

• 10% of strikes Black-footed Albatross
• More birds present when offal plume
• Hard strikes more often when more birds
• Strikes only when offal plume is present
• 3rd Wire more hard strikes than warps
• Bycatch estimates: +2 BF Alba. annually

Photo: Samantha Geyer
A-SHOP 2018
Acknowledgements

• Ed Melvin (retired), WA Sea Grant
• A-SHOP Observers
• Cassandra Donovan, Tom Holland, Jeannine Memoly A-SHOP
• Kayleigh Somers, NWFSC
• Jon McVeigh, NWFSC
Questions ?
At-Sea Hake Observer Program

Photo by A-SHOP observer Jenny Wright