Bycatches in Artisanal Fisheries in Developing Countries: Challenges and Approaches to Solutions

Hall, M., Andraka, S., Rendon, L., Pacheco, L. and T. Mituhasi.
• Bycatches are not among the major problems for artisanal and small scale fishers (fuel costs, intermediaries, local depletion, lack of opportunities for the young, ...... )

• But they are a serious problem for those interested in conservation and sustainability.
• Nesting beaches, haul-out areas, rookeries, reproductive aggregations, foraging areas result in a high density of individuals of vulnerable species, spawners, etc. that encounter a high density of fishing gear in the coastal zone.

• Developing successful mitigation programs in these conditions is a challenge, and we’ll try to share some of our experiences.
Figure 1. Global map of exclusive economic zones (green) and high seas (blue) oceanic areas.

http://www.plosbiology.org/article/info:doi/10.1371/journal.pbio.1001826
Bycatch in small-scale tuna fisheries
A global study

Robert Gillett
FAO Consultant
The Republic of Fiji


Conservation challenges for small-scale fisheries:
Bycatch and habitat impacts of traps and gillnets
Geoffrey G. Shester *, Fiorenza Micheli
Hopkins Marine Studies of Stanford University, 1200 Ocean View Blvd, Pacific Grove, CA 93950-9024, USA

Strand Monitoring and Anthropological Surveys Provide Insight into Marine Turtle Bycatch in Small-Scale Fisheries of the Eastern Mediterranean
Author(s): Robin T. E. Snape, Damla Beton, Annette C. Broderick, Burak A. Çiçek, Wayne J. Fuller, Özge Özden, and Brendan J. Godley

Journal of Applied Ecology

Small-scale fisheries of Peru: a major sink for marine turtles in the Pacific
Joanna Alfaro-Shigueto1,2, Jeffrey C. Mangel1,2, Francisco Bernedo2, Peter H. Dutton3, Jeffrey A. Seminoff and Brendan J. Godley1.
1Marine Turtle Research Group, Centre for Ecology and Conservation, University of Exeter, Cornwall Campus, Penryn, Cornwall, TR10 9EZ, UK; 2Pro Delphina, Octavio Bernal 572-5, Lima 11, Peru; and 3NOAA-National Marine Fisheries Service, Southwest Fisheries Science Center, 8604 La Jolla Shores Drive, La Jolla, CA 92037, USA
Options for solving problem

INTERNATIONAL TOP-DOWN APPROACH

• e.g. U.N. Moratorium of all longlining, gillnetting, trawling that causes sea turtle bycatch

NATIONAL TOP-DOWN APPROACH

• Strict regulations in all countries mandating gear and operational changes
SOLUTION must be adopted on its own merits, hopefully benefit fishers in some way.

SOLUTION must not rely on heavy enforcement, expensive gear or technology

CREATIVE,
REGIONAL,
BOTTOM-UP APPROACH
Incentives: find or build

• To get bycatch mitigation process going you need an incentive.

• **Artisanal fisheries**
  
  – **Subsistence**
  
  – **Domestic consumption**
    
    Can domestic consumers be motivated?
    
    Can you produce motivated markets? (e.g. tourists, small export markets, etc.)
  
  – **Export markets:**
    
    “Sensitive” markets -- Consumers motivated
    
    “Less sensitive” markets -- Consumers less concerned
Options for solving problem

REGIONAL BOTTOM-UP APPROACH

• Find or develop an incentive
• Propose a sensible alternative that would reduce bycatch.
• Develop an experimental program with the fishing community in their boats
• If possible implement an observer program.
• Engage the fishing communities

Most likely to succeed
Options for solving problem

Hook exchanges

Observer program

Training of fishermen in the use of instruments and procedures to release hooked or entangled turtles

Workshops for fishermen
The Regional Program to reduce incidental mortality of sea turtles
Get to know the fishing community

- Individual operations, cooperatives
- Leadership
- Organizations
- Economic situation
- Social interactions
- Community structure
Why exchange hooks?

- Catch rates similar or better
- Higher quality of catch – exports, price
- Hooks last very long – savings
- Protects crews from injuries
- Protects future of activity
- Keeps markets open, ecolabels
PREMISES

- Nobody wants to kill sea turtles or drive them to extinction
- Nobody wants to put fishers out of work

A clear and simple “non-aggression treaty”
<table>
<thead>
<tr>
<th>Country</th>
<th>Observed trips</th>
<th>Number vessels</th>
<th>Hook sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico</td>
<td>64</td>
<td>63</td>
<td>5,630</td>
</tr>
<tr>
<td>Guatemala</td>
<td>796</td>
<td>87</td>
<td>647,894</td>
</tr>
<tr>
<td>El Salvador</td>
<td>84</td>
<td>20</td>
<td>619,35</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>45</td>
<td>13</td>
<td>360,50</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>252</td>
<td>83</td>
<td>1,109,559</td>
</tr>
<tr>
<td>Panama</td>
<td>114</td>
<td>22</td>
<td>924,663</td>
</tr>
<tr>
<td>Colombia</td>
<td>231</td>
<td>27</td>
<td>215,342</td>
</tr>
<tr>
<td>Ecuador</td>
<td>550</td>
<td>210</td>
<td>513,461</td>
</tr>
<tr>
<td>Peru</td>
<td>159</td>
<td>53</td>
<td>458,589</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>2,295</strong></td>
<td><strong>578</strong></td>
<td><strong>3,973,123</strong></td>
</tr>
</tbody>
</table>
Types of longline gear from eastern Pacific fleets

Fisheries for TBS (Tuna, billfishes, sharks)

Leader

Branch Line

Main line

Float line

Float

Number hooks 250-2000

by Takahisa Mituhasi
Economic incentives for change

• **Adoption also needs incentives**

  – Eliminate import taxes on mitigation instruments (circle hooks, dehookers, etc.) [Nicaragua, Ecuador, etc.]
  – Facilitate customs procedures. Increase availability.
  – Subsidies for initial replacement of hooks (NGOs, governments, local)
  – Bulk purchases by cooperatives
Solve practical problems
show the fishers good practices and explain why
Identify a minimum set of equipment or simplest gear modifications:

Cheap, easily available, sturdy, practical to store and use, allowed to evolve.

Training: certification programs, observers, workshops.
Frequent contacts.
No over-selling or false promises.
Receive feedback and listen to their ideas.
Work with them on adapting the solutions.
ECUADOR: MORE THAN 140 WORKSHOPS
MORE: THAN 4000 PARTICIPANTS

SRP-ASOEXPEBLA-FENACOPEC

Nr. Workshops
Nr. Attendance

WWF - CIAT – NOAA - WPRFMC - OFCF

Nr: 131  Attendees 4,567
How can we facilitate and channel the action of the creative people in the fishing communities towards the solution of the problems?

How can we optimize the use of resources to reach the fishing communities more effectively?

How can we help strengthen the fishers organizations to take a more active role in mitigation and management?
## Fishers Organizations by province

<table>
<thead>
<tr>
<th></th>
<th>Esmeraldas</th>
<th>Manabí</th>
<th>Guayas</th>
<th>El Oro</th>
<th>Galápagos</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cooperatives</strong></td>
<td>43</td>
<td>16</td>
<td>28</td>
<td>12</td>
<td>4</td>
<td>103</td>
</tr>
<tr>
<td><strong>Pre-cooperatives</strong></td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td><strong>Associations</strong></td>
<td>20</td>
<td>2</td>
<td>7</td>
<td>16</td>
<td>1</td>
<td>46</td>
</tr>
<tr>
<td><strong>Pre-associations</strong></td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Provincial federations</strong></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>National federation</strong></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>7</td>
</tr>
</tbody>
</table>

-Fuente FENACOPEC, (Marzo, 2002)

**High % of fishers are INDEPENDENT**

**Difficult to reach**