Review of the Spanish FAD Management Plan: implementation, evolution and recommendations

M. Soto, A. Justel-Rubio and J. López
1. Introduction

EU/SPAIN FAD MANAGEMENT PLAN

2008
WCPFC
Spanish PS
CMM 2008-01

2010
MAGRAMA
IEO
Spanish PS

2011
MAGRAMA
IEO
Spanish PS

2012
MAGRAMA
IEO
Spanish PS

2013
MAGRAMA
IEO
AZTI
Spanish PS

2016
COUNTRIES
Submit FAD data at aggregated level to IOTC

IOTC 10-02 Res

First format

First format

New format

IOTC 13-08 Res

Resolution 13/08 Procedures on a fish aggregating devices (FADs) management plan, including more detailed specification of catch reporting from FAD sets, and the development of improved FAD designs to reduce the incidence of entanglement of non-target species.

(p.47) The IOTC Scientific Committee will analyse the information, when available, and provide scientific advice on additional FAD management options for consideration by the Commission in 2016, including recommendations on the use of biodegradable materials in new and improved FADs and the phasing out of FAD designs that do not prevent the entanglement of sharks, marine turtles and other species. When assessing the impact of FADs on the dynamic and distribution of targeted fish stocks and associated species and on the ecosystem, the IOTC Scientific Committee will, where relevant, use all available data on abandoned FADs (i.e. FADs without a beacon).
### 2. Material and Methods

**CURRENT FORMAT: INVENTORY**

<table>
<thead>
<tr>
<th>FAD</th>
<th>FAD Dimensions</th>
<th>Rabo/Tail</th>
<th>Identification associated buoy</th>
<th>Type of associated buoy</th>
<th>Withdrawal or loss of FAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification</td>
<td>Description</td>
<td>Material</td>
<td>Width (m)</td>
<td>Length (m)</td>
<td>Height (cm)</td>
</tr>
<tr>
<td>Bamboo</td>
<td>PVC / Plastic</td>
<td>Metal</td>
<td>Floats, corks, buoys, containers ...</td>
<td>Piece of netting</td>
<td>Anti-fouling netting</td>
</tr>
<tr>
<td>Nylon</td>
<td>Piece of netting</td>
<td>Tail-like</td>
<td>Mesh material</td>
<td>Ropes</td>
<td>Palm leaves</td>
</tr>
<tr>
<td>GPS type SHERPE (ball)</td>
<td>Satellite + echo sounder</td>
<td>Satellite without echo sounder</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description**

- Raft of nets and reeds
- Raft (metal, PVC or plastic structure)
- Object with no mesh: Any kind of raft or rack with no covering
- Natural (tree trunk, rope, pallet, grasses)
### Activity Register

**Vessel**
- Date
- Time
- FAD id.
- Buoy id.

<table>
<thead>
<tr>
<th>Vessel</th>
<th>Registration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity</th>
<th>Position</th>
<th>Estimation of school (ton)</th>
<th>Estimate of accidental bycatch</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lat</td>
<td>Long</td>
<td>Group</td>
</tr>
<tr>
<td></td>
<td>Degree/Min</td>
<td>Degree/Min</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity</th>
<th>Groups</th>
<th>Bycatch</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Turtles</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>Billfish, marlins</td>
<td>W</td>
</tr>
<tr>
<td></td>
<td>Swordfish</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frigate tuna</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Small tunas</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Whale shark</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marine mammals</td>
<td></td>
</tr>
</tbody>
</table>

**Observations**

May 15-05 2016, La Jolla, US
<table>
<thead>
<tr>
<th>Activity</th>
<th>Number of records</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity</td>
<td>58,154</td>
</tr>
<tr>
<td>Object design and characteristics</td>
<td>121,144</td>
</tr>
<tr>
<td>Buoy identification</td>
<td>120,798</td>
</tr>
</tbody>
</table>

**INVENTORY AND ACTIVITY on FADs**
**Indian Ocean 2013-2014**

22 PS Spanish vessels
(15 purse seine and 7 supply)
3. Results

**GENERAL AND ACTIVITY FIELDS**

- **Buoy ID**
  - No universal identifiers unless manufacturer code is used
- **Duplicate records**
  - Same activity data submitted twice
- **FAD ID**
  - No universal identifiers, no agreed marking system
- **FAD deployment**
  - Inconsistent chronology
- **Change of buoy**
  - Need to record both former and replacement buoy codes
- **Estimation of bycatch**
  - Data entry inconsistencies (alive>all caught, N/P, bycatch on non-set)
  - Divide Sharks in FAL/OCS/SPN/Others
3. Results

INVENTORY FIELDS

• FAD description
  – Same FAD with different design descriptions

• FAD materials
  – Materials do not match FAD description

• FAD dimensions
  – Large values outside reasonable ranges

• FAD appendages dimensions

• FAD appendages materials

• Buoy description
  – Same buoy with different type descriptions
### 3. Results

#### SUMMARY/RECOMMENDATIONS (General and Activity)

<table>
<thead>
<tr>
<th>Buoy code</th>
<th>General - Duplicates</th>
<th>FAD ID</th>
<th>Activity-deployment*</th>
<th>Activity- Change of buoy</th>
<th>Bycatch estimation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number records analyzed</td>
<td>42972</td>
<td>58154</td>
<td>121144</td>
<td>--</td>
<td>3049</td>
</tr>
<tr>
<td>Number records with errors/incongruences</td>
<td>10029</td>
<td>728</td>
<td>101515</td>
<td>--</td>
<td>2921</td>
</tr>
<tr>
<td>Number records with errors/incongruences that could be prevented</td>
<td>7013</td>
<td>728</td>
<td>?</td>
<td>--</td>
<td>2921</td>
</tr>
<tr>
<td>% Records with errors/ incongruences</td>
<td>23%</td>
<td>1%</td>
<td>84%</td>
<td>--</td>
<td>96%</td>
</tr>
<tr>
<td>% records with errors/incongruences that could be prevented</td>
<td>16%</td>
<td>1%</td>
<td>?</td>
<td>--</td>
<td>96%</td>
</tr>
</tbody>
</table>

**Recommendation**

- Length > 6 char
- User cannot enter data already submitted
- Use 1st buoy manufacturer ID or another unique ID. FAD marking.
- Add extra dropdown option "Deployment + set"
- Clearer guidance to fill out form
- No need to identify "external" FADs/buoys
- Add column for old buoy when activity = change of buoy
- Released alive must be greater than total caught
- No decimal values if "Number" - Bycatch only if act = "set"

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*Difficult to quantify records with incongruences related to deployments/ other activities*
### 3. Results

#### SUMMARY/RECOMMENDATIONS (Inventory)

<table>
<thead>
<tr>
<th>INVENTORY</th>
<th>FAD description</th>
<th>FAD materials</th>
<th>FAD dimensions - width</th>
<th>FAD dimensions - length</th>
<th>FAD dimensions - height</th>
<th>FAD append. Dimensions</th>
<th>FAD append. Materials</th>
<th>Buoy type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number records analyzed</td>
<td>45776</td>
<td>149381</td>
<td>121144</td>
<td>121144</td>
<td>121144</td>
<td>--</td>
<td>--</td>
<td>120798</td>
</tr>
<tr>
<td>Number records with errors/incongruences</td>
<td>6383</td>
<td>34709</td>
<td>206</td>
<td>826</td>
<td>108565</td>
<td>--</td>
<td>--</td>
<td>773</td>
</tr>
<tr>
<td>Number records with errors/incongruences that could be prevented</td>
<td>6383</td>
<td>34709</td>
<td>206</td>
<td>826</td>
<td>108565</td>
<td>--</td>
<td>--</td>
<td>773</td>
</tr>
<tr>
<td>% Records with errors/ incongruences</td>
<td>14%</td>
<td>23%</td>
<td>0.2%</td>
<td>1%</td>
<td>90%</td>
<td>--</td>
<td>--</td>
<td>1%</td>
</tr>
<tr>
<td>% records with errors/incongruences that could be prevented</td>
<td>14%</td>
<td>23%</td>
<td>0.2%</td>
<td>1%</td>
<td>90%</td>
<td>--</td>
<td>--</td>
<td>1%</td>
</tr>
</tbody>
</table>

**Recommendation**

- **Warning message if user tries to enter different FAD type for a FAD code already registered**
- **User cannot enter FAD materials that do not match the FAD description**
- **Do not accept values > 3m**
- **Do not accept values > 3m**
- **Do not accept values > 1m**
- **Apply reasonable range restrictions**
- **User cannot enter different buoy type for a buoy code already registered**
3. Results

SUMMARY/RECOMMENDATIONS (Inventory)

- Buoy code
- General - Duplicates
- FAD ID
- Activity - Change of buoy
- Bycatch estimation
- FAD description
- FAD materials
- FAD dimensions - width
- FAD dimensions - length
- FAD dimensions - height
- Buoy type

- % records with no errors/incongruences
- % records with errors/incongruences that could be prevented
- % records with errors/incongruences not easily prevented
4. Discussion

1. Excel template modifications
   Prevention of data input errors

2. FAD and buoy ID codes
   Need for harmonization and technical agreements

3. Clear guidance for completing Excel template
   Visual guidance drafted by scientists to facilitate filling template

4. Consolidated Access Database
   For better data exchange/ cross-check and analysis

5. Cross-check with CE logbooks and observer data at set level
THANK YOU