Short-lived species (squid) science and management in the Falkland Islands
2800 Inhabitants
2800 Inhabitants

British Overseas Territory
2800 Inhabitants
British Overseas Territory
Self-sufficient economy
Traditionally agriculture
Self-sufficient economy
Self-sufficient economy

Tourism

Oil

Self-sufficient economy
<table>
<thead>
<tr>
<th>Sector</th>
<th>2008E Constant</th>
<th>2009E Constant</th>
<th>2010F Constant</th>
<th>% Growth '09 to '10</th>
<th>2010E Pct Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>1,522,600</td>
<td>1,584,504</td>
<td>1,694,003</td>
<td>6.9%</td>
<td>1.6%</td>
</tr>
<tr>
<td>Fishing (all private sector)</td>
<td>60,897,391</td>
<td>49,900,401</td>
<td>53,956,391</td>
<td>8.1%</td>
<td>52.5%</td>
</tr>
<tr>
<td>Mining, Quarrying &amp; Manufacturing</td>
<td>2,133,027</td>
<td>2,149,131</td>
<td>2,190,861</td>
<td>1.9%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Utilities</td>
<td>844,201</td>
<td>850,707</td>
<td>925,041</td>
<td>8.7%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Construction</td>
<td>6,532,021</td>
<td>6,643,884</td>
<td>6,772,891</td>
<td>1.9%</td>
<td>6.6%</td>
</tr>
<tr>
<td>Hospitality &amp; Transport</td>
<td>8,081,316</td>
<td>8,222,366</td>
<td>7,863,136</td>
<td>-4.4%</td>
<td>7.7%</td>
</tr>
<tr>
<td>Government (incl. Health &amp; Education)</td>
<td>12,348,766</td>
<td>12,983,694</td>
<td>14,378,452</td>
<td>10.7%</td>
<td>14.0%</td>
</tr>
<tr>
<td>Housing &amp; Other Services</td>
<td>3,145,160</td>
<td>3,208,084</td>
<td>3,270,377</td>
<td>1.9%</td>
<td>3.2%</td>
</tr>
<tr>
<td>Communication, Finance, Business Svcs, Real Estate, etc.</td>
<td>11,857,270</td>
<td>12,026,736</td>
<td>11,676,443</td>
<td>-2.9%</td>
<td>11.4%</td>
</tr>
<tr>
<td><strong>TOTAL GDP</strong></td>
<td>107,361,751</td>
<td>97,569,506</td>
<td>102,727,596</td>
<td>5.3%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Non-Fishery GDP</td>
<td>46,464,360</td>
<td>44,965,772</td>
<td>48,771,205</td>
<td>8.5%</td>
<td>47.5%</td>
</tr>
</tbody>
</table>
Fishery Licence fees:

2009
- LOL 57%
- FIN 36%
- ILL 7%
£10.85 million

2011
- LOL 32%
- FIN 19%
- ILL 49%
£19.95 million
The Loligo fleet:

- 16 factory trawlers
- GRT: 950 to 2849 tonnes
- registered: Stanley, FI
- home port: Vigo, Spain
The Loligo fleet: Process

- VMS by FIFD begins.
- In-person briefing
- Review instruction booklet
- Catch reports: E-mail daily during season.
- Electronic log-book
Data exchange: Some issues

• Overlap with commercial records-keeping

• Occasional language barrier

• Communication problems
  - No e-mail access
  - Positioning errors

A. Blake, 2007
Who are FIFCA?

Est. 2007. 14 Member companies, 100 % Falkland Islands owned and registered.
FIFCA - ITQ system

- 25-year term ITQs
- Companies instrumental in implementing long-term commitments
- All 14 FIFCA companies hold ITQ; 7 in the Loligo fishery
FIFCA - facts

- 11 fisheries in Falklands waters
- High sustainability rating
- Avg. $200 million+ in sales value
- c. 22% of world catch of Loligo
- 46% of total EU imports of Loligo
The Loligo Product:
SOUTH Atlantic Squid and Igeldo Fisheries Director Cheryl Roberts, has received the Superior Taste Award for Marfrío’s Patagonian squid caught in the Falkland Islands.

The award was presented on April 23 at the XXI edition of Seafood Fair in Brussels.

In their second year of entering for the awards, one of the most prestigious internationally, explained Mrs Roberts, Patagonian squid has managed to improve its rating and move from one star to two stars.

Marfrío Chief Executive Officer Pedro Otaegui, was chosen to receive the award for floured squid, produced by Marfrío from Patagonian squid, and in its first time entering also achieved the distinction of two stars. The breaded squid strips, (also awarded in 2012) paella and squid ring were raised by one Superior Taste star.

Mrs Roberts said Marfrío was once again the premier Galician and Spanish frozen fish company honoured by the International Taste and Quality Institute, whose taste recognition is the only one granted by opinion leaders, such as Michelin starred chefs and sommeliers.

She added: “This distinction helps to strengthen the loyalty of their customers, who a few months ago and for the second consecutive year, have put their trust in the breaded squid strips, floured squid and delicious battered seafood rings, rewarding them with the seal Taste of the Year 2013 Award, which reflects the high quality standard of all the company’s products.

“With this professional recognition Marfrío gives added value to their products and sets them apart from their main competitors in an increasingly globalized market.”

At this year’s fair Marfrío introduced for the first time their new breaded Swordfish snacks. This is viewed as a top quality product presented in a handy format that allows the consumer to prepare easy, healthy and tasty dishes in less than 10 minutes. It will soon become part of Marfrío’s main product range. As in previous years, there were also samples of their main product range.
Loligo - Doryteuthis gahi
Loligo - Doryteuthis gahi
Loligo - *Doryteuthis gahi*

- ‘Domestic’ fishery stock.
- Assessment & monitoring entirely in Falklands zone.
Data from the Loligo fleet:

- Catch
- Effort
- Position
- Loligo size distributions
- Ancillary data
Data from the Loligo fleet:

- Catch
- Effort
- Position
- Loligo size distributions
- Ancillary data

vessel / day trawl / daily
Data requirements: the nature of squid.

- Short life cycle (Loligo: 1 year)
- Weak biomass-recruitment relationship
- Large biomass fluctuations year-to-year

- In-season, real-time, management
- Depletion modelling
Catch over a season time-series.

- Depletion modelling
Catch over a season time-series.

- Depletion modelling
Catch over a season time-series.

- Depletion modelling
Catch over a season time-series.

- Depletion modelling
Catch over a season time-series.

- Depletion modelling
Catch over a season time-series.

- Depletion modelling
Catch over a season time-series.

- Depletion modelling

How many Loligo must be in the population to sustain this catch rate?
Catch over a season time-series.

• Depletion modelling

How many Loligo must be in the population to sustain this catch rate?

How many are left?
Catch over a season time-series.

- Depletion modelling

10,000 tonne biomass Conservation threshold
Data from the Loligo fleet:

- **Catch** → Kg of production total
- **Effort** → Per day; other targets?
- **Position** → North / South modelled separately
- **Loligo size distributions** → Convert catch weight to numbers for model
$N = 839$
$R^2 = 0.9519$
$\alpha = 0.2031$
$\beta = 2.1656$

avg. Loligo size

no. of Loligo
Data from the Loligo fleet:

- Survey trawls
- Net design
- Tori lines

- Ancillary data
Survey trawls - before each season
Survey trawls - vessel’s experience

adaptive trawls
Net design - bycatch reduction
Net design - bycatch reduction
Net design - proposal by captain

- 110-mm diamond mesh
- 40-mm square mesh
- Length = 2 m (58 square mesh)
- Width = 24 square mesh
- Width = 67 diamond mesh
- Width = 67 diamond mesh
- Width = 24 square mesh
- Width = 67 diamond mesh
Tori lines - seabird protection
Tori lines - seabird protection
Tori lines - vessel innovations
Tori lines - vessel innovations
Management perspective:

• Fixed statutory data requirements
• Flexible initiatives
• Evolving relationship (recent fishery)
• Challenges
• Positive working environment
Industry perspective:

• Importance of data exchange
Industry perspective:

• Importance of data exchange
  
  - Sustainable yields and trends.
  
  - Long-term decision making.
  
  - Keeps political interference at bay.
## Why does it work?

<table>
<thead>
<tr>
<th>Context-Specific</th>
<th>Non context-specific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentrated industry</td>
<td>Strong infrastructure</td>
</tr>
<tr>
<td>Small population</td>
<td>Credible Science</td>
</tr>
<tr>
<td>High Economic Impact</td>
<td>Moderate Management</td>
</tr>
<tr>
<td>Low Social Impact</td>
<td>Supportive NGOs</td>
</tr>
<tr>
<td>Relatively new</td>
<td>Commitment to communication</td>
</tr>
</tbody>
</table>
What more does the industry do?

- Information requests.
- Surveys and charter research cruises.
- Represent the fishery internationally
  - Brussels
  - Boston
  - Vigo
What more does the industry do?

- Collaborate on observer coverage.
- Encourage regional coordination & research.
- Work with fisheries management on a range of issues.
Acknowledgements

• FIFCA Board members

• Fisheries Dept. staff

• Various agencies for photos