Marine Scotland Science: Commercial fishing interactions with North Sea oil and gas pipelines

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INTRODUCTION

• Overview
  – The benefits of GIS data
    • Scale and context
  – Application of GIS
    • Interaction between demersal trawling and North Sea pipelines
GIS DATA

Legend
- DECC Countries
- DECC Median Line
- SZSO Wrecks
- MSS Shellfish
- MSS Finfish
- MSS Sea Disposal Open
- TCE Aggregates Licence
- TCE Wind Farm
- MSS SACMPAMCZ

<table>
<thead>
<tr>
<th>Category</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>UKCS</td>
<td>874,011 km²</td>
</tr>
<tr>
<td>UK Land</td>
<td>244,579 km²</td>
</tr>
<tr>
<td>UK Wrecks 50m Buffer</td>
<td>27 km²</td>
</tr>
<tr>
<td>Shellfish Licence</td>
<td>24 km²</td>
</tr>
<tr>
<td>Finfish Licence</td>
<td>53 km²</td>
</tr>
<tr>
<td>Sea Disposal Sites</td>
<td>50 km²</td>
</tr>
<tr>
<td>UK Aggregate Extraction</td>
<td>1,149 km²</td>
</tr>
<tr>
<td>UK Offshore Wind</td>
<td>22,850 km²</td>
</tr>
<tr>
<td>Benthic Conservation</td>
<td>186,612 km²</td>
</tr>
</tbody>
</table>

Figure: XX  Version: XX  Scale: 1:10,000,000  Size: A4
Projection: Europe Albers Equal Area Conic
Coordinate System: GCS European 1950
Author: P Hayes
Date: 13/11/2015

marinescotland

science

The Scottish Government
FISHING AND PIPELINES
FISHING AND PIPELINES

• Quantify the demersal fishing activity associated with NS pipelines
• Identify which pipelines are associated with the fishing effort
• Consider how infrastructure is influencing fishing activity
FISHING AND PIPELINES

- UK Vessels >15m
- Location sent every 2 hrs
- 2009-13
- Demersal vessels
- Filtered for speed
- Interpolated into tracks
- Unique ID assigned to tracks for each trip
FISHING AND PIPELINES

- Buffer zone of 200 m
- 35% of demersal trips
- 75% of vessels on at least one trip
FISHING AND PIPELINES

- 0.98% (274) of demersal trips 50% or more of fishing time inside 200 m
- 12.4% of vessels on at least one trip inside 200 m
- Majority of trips for two vessels
## Fishing and Pipelines

The map illustrates the overlap between fishing areas and pipelines at different distances from shore. The table below shows the percentage of overlap at 100 m, 200 m, and 500 m distances:

<table>
<thead>
<tr>
<th>Distance (m)</th>
<th>40%</th>
<th>50%</th>
<th>60%</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 m</td>
<td>0.94%</td>
<td>0.55%</td>
<td>0.28%</td>
</tr>
<tr>
<td>200 m</td>
<td>1.27%</td>
<td>0.98%</td>
<td>0.56%</td>
</tr>
<tr>
<td>500 m</td>
<td>2.31%</td>
<td>1.55%</td>
<td>0.96%</td>
</tr>
</tbody>
</table>

### Legend
- **North Sea Pipeline Infrastructure**
- **Trip 1**: Green
- **Trip 2**: Yellow
- **Trip 3**: Orange
- **Trip 4**: Red
- **DECC Countries**: Beige

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*Source: Marine Scotland Science*
FISHING AND PIPELINES

Average Diameter
- 16.7 in Actively fished
- 12.5 in Coincidental
- 7.5 in No interaction
FISHING AND PIPELINES

Legend
- DECC Countries

60°0'N

0°0'

Figure: XX  Version: XX  Scale: 1:3,500,000  Size: A4
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FISHING AND PIPELINES
SUMMARY

• GIS provides scale and context to identify real issues
• Approx. 1/3 of demersal trips fish within 200 m of a pipe
• Only a small % of trips actively target pipes, typically large diameter pipes
• Fishing effort is not spread evenly across pipes
  – Target species
  – Depth
  – Substrate
• Groundtruthing confirmed active pipeline targeting
LIMITATIONS

• Interpolation is based on Scottish vessels
  – Approx. 80% of UK demersal fleet
  – No non-UK vessels included

• Speed is only a proxy for fishing
  – Non-fishing activities at <5 knots

• Inherent error in track interpolations
  – Need for exact plotter data

• Threshold of 50% of time fishing may exclude some trips

• Conservative approach
DECOMMISSIONING

- Evidence base to assist comparative assessment process
- Consider decommissioning options based on fishing relationship with pipelines
  - Pipelines that benefit or hinder fishing
  - Leave in situ, remove or rock dump
- Contribute to a risk based approach to determine future monitoring frequency
ACKNOWLEDGEMENTS

• MASTS support for the internship
• Improved access to GIS datasets
• Sally, Andronikos and Ruis for their support of a back pocket project
• ICES for accepting our paper