Managing Heritage Impacts

Digital Data and Dogger Bank

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23 April 2015
Project Background

- Dogger Bank
  - Largest Round 3 offshore wind Zone
  - North Sea 8660 km²
  - Forewind (RWE, SSE, Statkraft and Statoil)
  - Royal HaskoningDHV, Wessex Archaeology
Prehistoric Dogger Bank

Wrecks and Aircraft
Impact Assessment…
How Much Work?
..and When?
Shipwreck Investigation, Port of Pori Finland
Reducing Risk at Dogger Bank

- **Zone Appraisal and Planning (ZAP)**
  - early identification of potential impacts to heritage

- **Embedded Mitigation**
  - avoiding significant impacts through project design

- **Staged Assessment**
  - Increased resolution at each stage

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**ZAP**
High level assessment of zone

**EIA**
Project level desk-based assessment and survey

**Post-Consent**
Site-specific fieldwork
- high resolution geophysics?
- ROV and Diver survey?
- geoarchaeology?
High-level ZAP: Wrecks

Image courtesy of Forewind
High-level Zap: Palaeolandsapes

Image courtesy of Forewind
Projects for EIA
Geophysical Data

- Raw data processed by Wessex Archaeology
- Images optimised for archaeological assessment
- Representative sample of:
  - Sidescan Sonar and Multibeam Bathymetry
    = Seabed Features
  - Sub-bottom Profiler
    = Buried features (palaeolandscapes)
  - Magnetometer
    = Ferrous buried/surface material
- Spatial comparison using ESRI ArcGIS
Palaeolandscapes

Dogger Bank Creyke Beck

Dogger Bank Teesside A

Dogger Bank Teesside B

Images courtesy of Wessex Archaeology
Palaeolandszapes

View of the Mackenzie Delta, Northern Canada
Photograph by Sarah Bannon

Images courtesy of Wessex Archaeology
Palaeolandsapes: Data Example

Channel Feature Dogger Bank Teesside A

Images courtesy of Wessex Archaeology
Seabed Features

- In project areas and export cable corridors:
  - United Kingdom Hydrographic Office
    - 99 wrecks and obstructions
  - National Record of the Historic Environment
    - 115 maritime records
  - Historic Environment Record
    - 63 maritime records

- Anomalies in geophysical data
  - corresponded to just 2 of the above
Location: 290918 E, 5990495 N (UTM31N)

Archaeological Importance: High

Geophysical survey dimensions and notes:
Dimensions: 43.1m x 35.9m x 0.6m. Irregular seabed depression with an elongate central mound. Backscatter data shows a series of parallel linear features which make up the remains of the wreck: no actual recognisable vessel structure is visible. No magnetometer data available in this area.

Build Type: Steam Cargo Ship
Construction: Single boiler, compound expansion engine of 192HP, single drive shaft.
Dimensions: 75.77m x 10.39m
Shipyard: Kish, Boocks & Co., Sunderland

Loss Cause: Torpedoed by UC-16 whilst on passage Gothenburg for London 25/17/1918, towed and attempted to beach but was lost close to shore.

Extent of Survival: UKHO record this as being the aft section of the wreck, and that the vessel is very broken up and dispersed. Geophysical data seem to confirm this, as no coherent structure appears to remain. Debris is likely to be partially buried in the area, however, with feature 70001 nearby likely to be associated wreckage.

70000: Multibeam bathymetry (facing north, x10 vertical exaggeration)

70000: Sidescan sonar
**Location**

- 249763 E 6058493 N (UTM31N)

**Area**

- Teesside Cable Route

**Archaeological Importance**

- High

**Geophysical survey dimensions and notes**

- 18.5m x 6.2m x 0.9m. The wreck lies in quite shallow water, recorded at 26m water depth in the nearshore area of the cable corridor. The surrounding seabed is covered in a substantial rocky reef with large cobbles and boulders scattered across the area. In the backscatter geophysical dataset the wreck appears as a discreet large anomaly covered by sands and gravels. The skeleton of the vessel is subtly visible in the geophysical data with some structure of the hull or stern area present and somewhat intact. The wreck is a dark diffuse reflector with a thin and bright shadow visible. This wreck is to some extent visible in the multibeam bathymetry data; however it is not distinguishable as a wreck. There is no supporting magnetometer data available in this location, however according to the wreck records it is of a steel construction and as such will likely be highly magnetic. This is a Live wreck.

**Build**

- Type: Minesweeper - Previously ex-trawler, 275 tons

**Construction**

- Steel

**Dimensions**

- Original dimensions unknown

**Shipyard**

- Smiths Dock Co. Ltd., Middlesbrough 1916

**Loss**

- Cause: Mine in 1917 - This vessel was sunk by a mine from the German submarine UC-50 (Rudolf Seuffer), off Skinningrove, nine people were lost as a result of this sinking.

**Extent of Survival**

- The wreck is in a poor state of preservation according to both geophysical datasets and written accounts. The vessel is recorded as being very broken up and abraded lying on the seabed; it looks to be in a poor state of preservation and is described in the UKHO database as being very decayed and damaged. Divers accounts have noted that this is an armed trawler lying on its port side. The ship's bell was found almost buried on the seabed some 20m off the port side of the vessel.

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70657: Sidescan sonar image of Wreck 70657 18.5m x 6.2m x 0.9m

70657: Multibeam bathymetry image looking North x10 vertical exaggeration
Seabed Features

- 16 new wrecks
- 484 features of potential anthropogenic origin

Unidentified wreck (70502)  
Dogger Bank  
Creyke Beck A

Images courtesy of Wessex Archaeology
Mitigation and next steps?

- Gazetteer mapped against design envelope
- Embedded Mitigation
  - AVOID impacts through design
    - 58 Archaeological Exclusion Zones (100m)
    - Micrositing
  - UNAVOIDABLE impacts through SITE SPECIFIC measures
    - Pre-construction geophysical survey data
    - Pre-construction geotechnical data
    - Targeted geoarchaeological survey
    - Ground truthing (Diver / ROV)
    - Reporting Protocol (The Crown Estate ORPAD)
Questions?

Acknowledgements

Particular thanks to:
Forewind Gareth Lewis, Phil Redstone and Sue Vincent
Wessex Archaeology Paul Baggaley and Jack Russell
Royal HaskoningDHV Robert Staniland