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EFFECTS OF OFFHORE WIND FARMS (OWFs) ON FISHING ACTIVITY AND LANDINGS

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ABSTRACT

The development of offshore wind farms (OWFs) and other marine renewable energy technologies and the designation of marine protected areas will place pressure on existing economic activities. Marine spatial planning opportunities for habitat enhancement and co-location may also be provided. Spatial fishing effort for two fishing gear categories, mobile and static gear, was analysed for pre and post construction periods at three separate UK OWF sites. Fishermen were also interviewed on their experiences of the effects of OWFs, existing pressures prior to OWF development and perceptions of the best planning scenarios to accommodate OWFs, marine protected areas (MPAs) and economically viable fisheries in each region. Mobile fishing activity displayed the greatest displacement of fishing effort from OWF sites. Fishermen using static gears identified potential benefits to stocks and fisheries if reef material was deployed within OWFs. Benefits from co-location of OWFs and MPAs were raised by fishermen. Mobile gear fishermen identified a benefit if fishing grounds remained open elsewhere. Static gear fishermen identified a benefit from co-location if they retained access but mobile vessels were prohibited.

INTRODUCTION

Marine renewable energy development and the designation of marine protected areas will inevitably restrict space available for fishing and other activities. The co-location of OWFs with marine protected areas (MPAs) may provide a means of limiting the total area closed to fishing activities while augmenting stocks of commercial species. Alternatively OWFs may provide new fishing opportunities to mitigate for area closures through MPAs and disruption to fishing activity during construction activities for OWFs.

OWFs have been present in UK seas since 2003. This provided opportunity to analyse spatial fishing activity and conduct interviews with fishermen operating in OWF development regions, to examine if fishing effort had increased in proximity to OWFs or effort displacement had occurred. Existing statutory surveillance data sources and fishermen's accounts of changes in activity, mapped during face to face interviews were analysed for three OWF development regions in the UK to quantify changes in spatial fishing effort before and after OWF development.

METHODOLOGY

Changes in spatial fishing activity were investigated for three OWF development areas in English and Welsh seas. These were Liverpool Bay in the Eastern Irish Sea, the Greater Wash and the Greater Thames regions, both in the North Sea (Fig 1). Fishing activity data were analysed for available time periods up to five years pre OWF construction and five years post OWF construction. Two forms of statutory data, vessel monitoring system (VMS) data (aggregated for one year) and aerial surveillance data were accessed for the three development regions through the Marine Management Organisation (MMO). Face to face interviews with fishermen in each region also requested fishermen to map fishing grounds and effort pre and post OWF construction. Mapped activity represented a typical year pre and post construction.

Data were then mapped and spatial analyses undertaken within a geographical information system (ARC GIS) utilising the methods of Vanstead and Silva [1]. Data sets were created for mobile fishing practices (including trawling, dredging and mobile netting) and static fishing practices (potting, static nets and angling). Statistical analyses compared effort for each gear category pre and post construction in three distance categories from the first OWF constructed in each region. Effort between pre and post construction periods within the near distance category (within 2km of the OWF), mid (2km to 10km from the OWF) and far distances (10km to 20km from the OWF) were compared using Mann Whitney U tests (MMO surveillance data) and paired t tests (interview mapping data).

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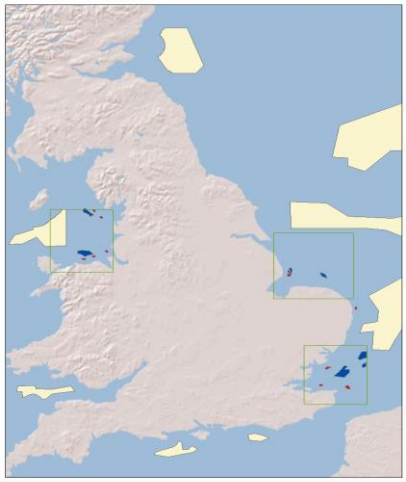

Figure 1 The three study sites (within hollow boxes), clockwise from top left, Liverpool Bay, Greater Wash, Greater Thames.

Interviews also collected fishermen's experiences of effects of OWFs on fishing and fishermen's perceptions on marine planning options to accommodate OWF development, MPA designation and economically viable fishing businesses.

OBSERVATIONS

Mobile fishing practices such as trawling, dredging and mobile netting displayed greater displacement of fishing effort from development sites than static fishing effort (potting, static nets and angling).

Thirty seven interviews with fishermen across the three development regions revealed existing pressures on fishing activity from other marine activities and the fishing activity practised in each region affected the impacts and opportunities created by OWF development. A number of responses from fishermen utilising mobile fishing gears suggested co-location of OWFs and MPAs as beneficial, primarily as a means of reducing the area taken up by MPAs in remaining fishing grounds. Responses of fishermen utilising static fishing gears favoured co-location of OWFs and MPAs if access for static gear fisheries was maintained but mobile fishing activity prohibited. Habitat augmentation using bespoke artificial reef designs within scour protection were raised as beneficial options by static gear fishermen. The study identified a need to ensure detailed surveillance data on fishing activity is provided for research projects to ensure the required evidence can be provided to support mitigation and management decisions.

CONCLUSIONS

- Greater effort displacement was identified for mobile fishing effort.
- Potential benefits if reef habitats were created within OWFs, both to commercially targeted species abundance and resulting catches (identified by static gear fishermen).
- Co-location of OWFs and MPAs was identified by some fishermen to provide a means to reduce loss of grounds overall, but ecological benefits were questioned.
- The level of detail required to fully examine changes in fishing effort was limited by restrictions on data release due to commercial sensitivity issues.
- The study has informed the work within the NERC Marine Renewable Energy Knowledge Exchange funded Fisheries and Renewable Energy Working Group workshops.

ACKNOWLEDGEMENTS

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REFERENCES

[1] Vanstead, K., Silva, T., 2010. *Developing National Inshore Fisheries Data Layers from data collected by the Sea Fisheries Committees and Marine Management Organisation.* Report for Department for Environment, Food and Rural Affairs. MB0106: *Further development of marine pressure data layers and ensuring the socio-economic data and data layers are developed for use in the planning of marine protected area networks*, Report 3. Version: Final. Date: July 2010 CEFAS, Lowestoft UK.