Benthic and Fish Monitoring at a UK Offshore Wind Farm

ASSESSING DIRECT AND INDIRECT EFFECTS ON WILDLIFE AND THEIR HABITATS

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- Benthos
- Fish and Shellfish
- Birds
- Marine Mammals
- Data analysed to provide robust assessment of the impacts of marine life

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Survey Methods & Analysis

Benthic Monitoring
- 0.1m² Day / Hamon Grab targeting benthic invertebrate communities
- Inter-array cables
- Onshore office & maintenance facility
- Offshore sub-station
- Onshore sub-station
- 60 turbines
- Inter-array cables
- Onshore office & maintenance facility
- Offshore sub-station
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Non-migratory Fish
- Drop Down Video (DDV)
- Novel technique - investigate epifaunal communities
- Hi definition camera dropped 2D tops total of 8 survey sites. One off survey
- Monitored the presence of the following species: lesser spotted dogfish, spiny dogfish, british spiny dogfish, thornback ray, blond ray, and racoon dogfish.

Electro-sensitive Fish
- 2m Scientific beam trawl (21mm mesh) targeting electro-sensitive fish
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- Monthly baseline survey (1 year) (31 sampling stations)
- Daily trawls for the first three months of construction, then reduced to quarterly through to three years of operation (31 sampling stations)

Results – Benthic
- Typical shallow sublittoral sand bank communities - Nephys & Bathyporeia dominated, low abundance and diversity.
- Significant variation in community structure found between all construction periods.
- Biggest changes occurred between baseline and pre-construction, in the absence of any offshore wind farm construction activity.

Results – Non-migratory Fish
- Catch dominated by brown shrimp and juvenile plaice, dab and whiting typical of marine estuarine environment.
- Significant change in species assemblage with catch numbers found.
- Decline in overall numbers occurred between baseline and construction, however, catches largely recovered during the operational years.
- Largest change was between baseline and construction year 1, when very little construction took place.
- Changes in catch rates more likely to have been affected by the changes in shifting sand banks affecting trawl efficiency and fluctuations in species assemblages.

Results – Electro-sensitive Fish
- Three species of elasmobranch found on the survey:
- Lesser spotted dogfish (Scyliorhinus canicula)
- Thornback ray (Raja clavata)
- Blonde ray (Raja batis)
- No significant difference detected between survey periods.

Results – Electro-sensitive Fish
- Elasmobranch abundance was low along the cable route throughout the survey with only 43 individuals recorded in 80 trawl surveys.
- More common on the west side of the Solway (away from the cable).
- Increase in dogfish responsible for increase in overall electro-sensitive fish.
- Anecdotally, fishermen are reporting large increases in dogfish over much of the eastern Irish Sea.

Analitical Methods
- Null hypothesis (95% - there is no difference in benthos (benthic community) / non-migratory fish / electro-sensitive fish) composition across different year / construction period / season / area.
- Uniplicate - (species richness, no of individuals, Margalef’s indices, Pielou index, Shannon-Wiener, Simpson’s index)

Conclusions

This work spanning 12 years has demonstrated the effectiveness of monitoring and new analysis techniques. The study has demonstrated the importance of good management of environmental monitoring compliance and the potential saving to operational costs of good management (through the reduction in monitoring requirements and use of novel techniques (DDV)).

The study has demonstrated the effectiveness of monitoring and new analysis techniques. The study has demonstrated the importance of good management of environmental monitoring compliance and the potential saving to operational costs of good management (through the reduction in monitoring requirements and use of novel techniques (DDV)). For benthos, fish and Shellfish communities the analyses undertaken revealed that although significant differences were found between construction periods (i.e. baseline, pre-construction, construction and post-construction) these could not be attributed to the wind farm but rather to the natural variability common in marine communities.

References


