

7 MARINE FISH

Summary of previous survey results

The 2005 CEFAS beam trawl survey report for the Irish Sea examined trends in the relative abundance of the dominant demersal fish species in the eastern Irish Sea region and at the station in the vicinity of the North Hoyle Wind Farm. Approximately 40 species of demersal fish occur in the vicinity of the North Hoyle site, with about 15 of these abundant. Data from 2005 indicated that catches of most of the abundant commercial species declined slightly from 2004, though the catch rates of fishes at the station near North Hoyle were broadly comparable to previous years for most species. The number of pogue captured at the North Hoyle site was again low, but there were increases in catch rates of scaldfish and tub gurnard, with 2005 catches greater than observed previously. Catches of dab, common dragonet and grey gurnard at North Hoyle also increased in 2005, though catch rates of these species were within the range observed during the overall time series. Catches of the three species of elasmobranch all declined near North Hoyle in 2005, with only spotted rays remaining above the long-term average for the sampling station.

7.1 INTRODUCTION

There are two components of the marine fish monitoring for FEPA reporting purposes: analysis of annual CEFAS trawl surveys and consultations with local fishermen through the Fisheries Liaison Officer. Analysis of semi-quantitative fish result (as a by-catch of the epifaunal beam trawl survey) is presented in Section 5. A further statistical analysis of the CEFAS beam trawl data has also been conducted to augment the analysis of potential effects on fish in accordance with Condition 9.7 of the FEPA licence in Section 6.

7.2 CEFAS SURVEYS

It has been suggested that wind farms may have a variety of effects on fish species, including short-term effects during construction and cable-laying, the physical presence of the turbines, changes to the local sedimentary environment (e.g. substrate and topography) and the noise and electromagnetic fields (EMF) associated with the turbines and cables when the wind farm is operational (Anon., 2000; Gill and Taylor, 2001; Danish Institute for Fisheries Research, 2002; CMACS, 2003).

The CEFAS trawl surveys have followed a consistent sampling protocol since 1989 (and at fixed stations since 1993) and provide a useful baseline with which to examine temporal trends in the relative abundance of demersal fish. Relative abundance varies to a high degree naturally; indeed, indices of mean annual Catch Per Unit Effort (CPUE) for many species are likely to have high variance, and so only extreme impacts would indicate significant change, whereas more subtle impacts may be within the natural levels of variation and so remain undetected. However, the examination of temporal trends in the relative abundance of demersal fish in the south eastern Irish Sea should be a useful method for determining whether or not any major changes have occurred on a broader scale.

The purpose of the CEFAS report (reproduced in Appendix 7.1) is to utilise data collected during the Cefas beam trawl survey that is undertaken in the Irish Sea, and to analyse long-

term trends in CPUE for selected fish species, with a view to examining any major changes in the relative abundance of fishes from 2003 onwards. Data are examined at both a regional and site-specific scale. This section provides an overview of the main fish species present in the vicinity of the North Hoyle wind farm and in the eastern Irish Sea as a whole, and examine temporal trends in the relative abundance of selected demersal fish covering an extensive period prior to construction (1993–2002), and both the year of construction (2003) and the operational years (2004 to 2006).

It should be noted, however, that fish populations are naturally variable and will be affected by a variety of natural factors as well as human activities. This report updates the previous reports (Ellis and Parker-Humphreys, 2004, 2005; Parker-Humphreys et al., 2006), (Ellis and Parker-Humphreys, 2004 and 2005) and includes data collected from the 2006 survey.

7.2.1 Survey Methods

The surveys utilised a 4m-beam trawl with chain mat, flip up rope, and a 40mm codend liner to retain small fish. The gear is towed at 4 knots (over the ground) for 30 minutes, covering approximately 2 nautical miles per tow. Fishing is only carried out in daylight, shooting after sunrise and hauling no later than sunset, as the behaviour of some fish species is known to vary diurnally. Selected stations, where large catches of juveniles are made, are sometimes fished for 15 minutes.

Since 1993, a grid of 34 stations has been consistently fished in the eastern Irish Sea, with one station (Prime station 32) in the vicinity of NHOWF.

Catch per Unit Effort (CPUE) data are presented, as number of fish per hour, at prime site 32, at all stations fished, and at all stations where each species was caught, for each of 17 major fish species. These were the flatfish dab, sole, solenette, plaice and scaldfish; the gadoids cod, whiting, bib and poor cod, the elasmobranchs, lesser spotted dogfish, spotted ray and thornback ray, together with dragonet, pogge, lesser weever, tub gurnard and grey gurnard. They were selected either because they were abundant, commercially important, of conservation importance, or considered useful indicators for monitoring change.

7.2.2 Results

The 2007 CEFAS presents data from 2004–2006 indicating that the catch per unit effort of most of the species considered were broadly comparable to previous years and within the long-term range, with some species showing recent increases (e.g. dab and scaldfish), and some species showing a recent decrease (e.g. plaice and sole). Catches of three species of elasmobranch all fluctuated around the long-term mean for the prime station 32 site. Catches of pogge at site 32 have been at record low levels for the period 2004–2006, but appear to mirror the regional trend.

The full CEFAS monitoring reports and subsequent analysis report by CMACS Ltd are reproduced in full in Appendices 7.1 and 7.2, however the conclusions of the CMACS statistical analysis of the last 10 years of CEFAS data is reproduced below.

The fish community at prime station 32 is dominated numerically by flatfish species notably solenette, dab, plaice, scaldfish and sole, plus lesser weever, whilst the lesser spotted dogfish was the top ranked species over the period 1993 – 2007 in terms of biomass. This fish community is widespread in inshore sediments in the eastern Irish seas (Ellis et al, 2000; Ellis et al, 2002; Ellis and Rogers, undated). According to Ellis et al (2000) the demersal faunal assemblage in these areas was dominated (in terms of biomass) by starfish *Asterias rubens*, with plaice, dab and sole being the dominant fish, and the community was assigned to 24 out of the 35 survey sites in the North Eastern Irish sea between Anglesey and Luce Bay. While the fish community at prime site 32 was associated strongly within this community, there appear to be minor differences between site 32 and the wider “typical” *Pleuronectes-Limanda* assemblage, notably the relatively higher importance of dogfish and lesser weever catches at site 32.

Observations using multi-dimensional scaling plots and dendrograms strongly suggest that there have been no significant changes in fish community at site 32 since the development of the NHOWF, whether looking at fish numbers or fish weights per hour, and that the fish community at site 32 was similar to that at a number of other sites off the North Wales Coast/Liverpool Bay area and remained so following development of the NHOWF.

These conclusions are supported by ANOSIM (analysis of similarity), which confirm that there was no statistically significant change in the fish community at site 32, following development of the wind farm. Although there was some suggestion of post-development changes in a wider suite of sites representing the *Pleuronectes-Limanda* assemblage off the North Wales coast, these changes, if real, were negligible in magnitude, particularly in comparison to inter-site variation. They probably represent minor widespread changes in fish communities with time that have no connection with the presence of the wind farm.

7.3 CONSULTATION/CANVASSING OF LOCAL FISHERMEN

7.3.1 Introduction

The NHOWF is wholly within the UK 6 mile coastal fishing limit and the district of the North Wales and North Western Sea Fisheries Committee (NWNW SFC). Only UK-registered fishing vessels are permitted to fish within the 6 mile fishing limit where they are all subject not only to EU and UK fishery legislation but also SFC byelaws.

Vessels of any length fishing with hooks and lines, drift nets or dredging for mussels are permitted to fish anywhere within the NWNW SFC district; length restrictions apply to all other vessels, including trawlers, set netters and scallop dredgers. Only trawlers, set netters and scallop dredgers not exceeding 13.7 m in length are permitted to fish, in the part of the SFC district east of Rhyl coastguard station, which includes North Hoyle Offshore Wind Farm (SFC Byelaw 9).

For all practical purposes, SFC Byelaw 9 limits fishing to vessels that are based in or operate from ports, harbours and landing places around Liverpool Bay. Drift netting has not been practised in the area for many decades and the occasional licensed mussel dredging for seed mussels tends to be close inshore to the west, off Llandulas and Rhos-on-Sea. Itinerant beam

trawlers from, for example, the south west of England or scallop dredgers from Scotland or the Isle of Man are likely to exceed the size limitation and, therefore, will not fish closer than approximately 2 miles north of North Hoyle Offshore Wind Farm (in practice, they fish much further to the north west and beyond the 12 mile fishing limit (NRL, 2005)). Nevertheless, representative organisations of these vessels were notified of the annual FEPA monitoring consultation exercise (see below) and invited to comment if they wished.

7.3.2 Consultation

A network of fishing industry contacts with active interests within Liverpool Bay was established as part of the North Hoyle environmental impact assessment (Innogy, 2001). This network has been maintained and expanded to monitor commercial and recreational fishing interests around North Hoyle and as part of the preparation of an environmental impact assessment for the proposed Gwynt y Môr Offshore Wind Farm (NRL, 2005) and consented Round 1 Rhyl Flats Offshore Wind Farm (www.npower-renewables.com/rhylflats).

The complete Liverpool Bay consultation list comprises almost 100 individuals and representative bodies but only a targeted fraction of the list was contacted as part of the North Hoyle FEPA monitoring programme (Appendix 7.3). Officers of appropriate federations, producer organisations and some skippers were notified of the consultation exercise by letter or e-mail and invited to comment. Skippers known to have an active fishing interest in the area from previous years' consultations were contacted by phone or in person to discuss their past year's experience. These skippers work from the Dee, Prestatyn, Rhyl, Rhos-on-Sea and Conwy.

7.3.3 Effects of North Hoyle Wind Farm on Fishing Activity

7.3.3.1 Angling Charter Boats

Locally-based angling charter boats generally fish in close proximity to the numerous wrecks that are found across Liverpool Bay, including those close to North Hoyle Offshore Wind Farm. There are no wrecks within the wind farm boundary therefore the ground within the site is not a destination that the angling-charter boats have made a historic practice of visiting. Rhos-on-Sea boats very rarely work this far east, but Rhyl-based boats regularly work close to (0.5-1 mile) the north, west and southern boundary of the wind farm. None have yet taken a charter-angling party within the wind-farm boundary although some of the skippers have used a rod and line within the wind farm when providing wind farm stand-by services.

Rhyl skippers report that when working close to the wind farm, anglers' catches have been good and comprise a wide variety of species, including: small cod, whiting, rays, a variety of dogfish including tope, plaice, dab, flounder, turbot, mackerel, black bream, wrasse et.al. With respect to their favoured marks around the north and western side of the wind farm, these skippers take the view that the wind farm has not had any adverse effect on fish or their fishing. One skipper, however, expressed the view that fishing between the shore and the wind farm is not as good as it once was. In particular, he said that tope are no longer caught in this location although they appear to be no less abundant relatively close but east and west of the wind farm. His view is to attribute the lack of fish, but particularly the tope, to adverse

effects of electro-magnetic fields (EMF) associated with the export cables. These views however were not supported by a commercial netter who works inshore of the wind farm (see below).

Charter-boat skippers from Rhos-on-Sea rarely fish as far east as North Hoyle; their current concerns were not focussed on NHOWF.

7.3.3.2 Netting

Under-10 m boats working from Rhos-on-Sea, Prestatyn and the Dee have set nets each summer across and in the vicinity of the NHOWF site for many years. The principal target species are rays, particularly thornback (roker) and (inshore of the wind farm) bass. Construction of the wind farm resulted in loss of access to the wind farm site and, effectively, a zone 1-2 miles wide around the wind farm. (A typical fleet of set-nets operated by local boats is approximately 2000 m long, too long to be worked safely within the wind farm or within c. 2500 m of any turbine.)

Except for this loss of access, over the past year none of the skippers who have worked the area over the past year have reported any adverse effect. Their view was that fishing in the spring-early summer 2007 has proved up to, if not better than, their average expectations for the area. In particular, a skipper who specifically works inshore of North Hoyle during late spring-early summer was surprised by the proposition (see above) that fishing inshore of the wind farm has been poor. Although he could not comment specifically with respect to tope (not a commercial target species) he is satisfied that there is plenty of fish in this area – both commercial target species and their prey, such as sprat and mackerel.

Another skipper who, hitherto, has tended to work to the east and north of North Hoyle, has worked mostly to the north of North Hoyle in the past year as fishing to the east, nearer to the Wirral has been very poor. This he attributes to the pile driving and construction work on the Burbo Bank site.

7.3.3.3 Trawling

The ground occupied by the NHOWF has rarely, if ever, been a popular trawl ground. Trawling has tended to be to the east (particularly between the Dee and Mersey Estuaries), the north, and to the west (Chester Flats and Constable Bank). This has continued to be the case over the past year with no trawlers working within c. 5 miles of North Hoyle. Fishing on the inshore grounds to the west has been up to normal expectations but not to the east (attributed, again, to the Burbo Bank construction work).

The (larger) Fleetwood-based trawlers continue to assert their historic interest in fishing all inshore grounds around Liverpool Bay, including the North Wales coast and North Hoyle, and reiterate the implications for increasing loss of access. Nevertheless, none made any specific reference to North Hoyle during the past year but it is assumed that, as in past years, one (beam trawl) has fished north of North Hoyle in the spring and another (otter trawl) in the autumn. However, as neither has reported any adverse effects it is also assumed that their fishing has been on a par with their expectations.

Representatives of itinerant vessel organisations were notified of the annual FEPA monitoring exercise and invited to comment. None responded, probably reflecting the fact that their member's vessels are too large to fish with the SFC boundary.

7.3.3.4 Potting

Traditionally, Liverpool Bay is not an area associated with potting activity. Potting for crustaceans takes place west of Colwyn Bay and North of Walney Island but not in Liverpool Bay, including North Hoyle. In recent years, however, there have been occasional visits from itinerant over-10 m whelk potters and one or two North Wales under-10 m boats have taken it up. The under-10 m boats have not worked whelk pots in or around North Hoyle and there has been no indication (sighting by the netters etc) of any of the larger itinerant boats working so close inshore.

7.3.3.5 Scallop Dredging

The Irish Sea – Liverpool Bay king and queen scallop fishing grounds are to the north west of the NHOWF (NRL, 2005). Commercially exploited beds do not extend as far into Liverpool Bay as the North Hoyle wind-farm site. Nevertheless, representatives of the scallop industry were notified of the annual FEPA monitoring consultation and invited to comment but none did. It is assumed, therefore, that their members are unaffected by the North Hoyle wind farm.

7.4 FIVE YEAR OVERVIEW

It is now 5 years since work began on construction of the NHOWF (spring 2003) and was fully commissioned (summer 2004). Throughout this period contact has been maintained with representatives of the UK and Irish fishing industry and individual skippers who have an interest fishing within Liverpool Bay (Appendix 7.3). Each year, as part of the annual FEPA monitoring programme, the majority (if not all every year) of these contacts have been invited by letter or e-mail to comment on, or have been spoken with to discuss any effects that the NHOWF may have had on fishing. The extent to which any individual or organisation feels that they may have been affected has varied but on one thing they are all agreed; in common with all offshore wind farms, the NHOWF represents a loss of fishing opportunity, not only through limited access to the site itself but also to a buffer zone around the site they must maintain for safety. (Set netters, for example, set fleets of net typically 2000 m long and must, therefore, work more than 2000 m from the nearest turbine.)

Despite this access issue there appears to have been relatively little adverse effect on fishing activity. Indeed, even during pile driving in 2003, three local boats (two netters and an under-10 m trawler) that hitherto fished each season near the North Hoyle ground, did not notice any significant difference in their catch composition or catch rate compared with earlier years (FEPA Report 2004). This changed the following year (2004), however, when catch rates were poor compared with what was normally expected and two of the locally-based netters moved to grounds further west or further north than they had tended to work previously. Similarly, the inshore, under-10 m trawlers that occasionally worked the area did not work closer than 5 miles as catches were poor. A third netter, who only works inshore of the wind-farm site due to the size of boat had a very poor season with catches well down on average

but could not move elsewhere. In effect, this skipper believed he had lost a season's fishing through wind farm effects.

In 2005, some skippers (both netters and inshore trawlers) maintained the pattern established in 2004 where their catches had proved satisfactory. Others, including the netter working inshore of the wind farm, returned to their established pattern of fishing. In all cases, they reported that fishing was satisfactory with catch composition and catch rates comparing favourably with those preceding wind farm construction. In general, this experience and response to consultation has proved the consistent picture for commercial vessels from 2005, through 2006 and 2007.

A similar pattern of responses to consultation has been gathered from (Rhyl-based) charter-angling boat skippers. If there was any adverse effect on catch composition or catch rates it was highly localised and short lived. For the past three years the Rhyl-based charter boats have been working the wrecks and other marks they have favoured historically around the northern and western boundaries of the wind farm. Like the local commercial boats, they are satisfied that there has been no discernible adverse effects on their business interests.

Inevitably, however, although there is general overall consistency in information gathered during consultations, there are exceptions. One skipper who works a small inshore trawler from Rhos-on-Sea down to Rhyl (but rarely more than a mile or so offshore) is of the belief that there are fewer Dover sole on the ground than there were before the wind farm was commissioned. Although he attributes this decline to the effects of export-cable EMF or turbine vibration on the fish, such claims need to be viewed in the context of a c. 40% fall in Dover sole spawning stock biomass and concomitant fall in catch per unit effort in the Irish Sea 2000-2005 (ACFM Report – ICES, 2006).

Similar concerns have been expressed for EMF driving tope from the area between the wind farm and the foreshore – but not the inshore channels relatively close to the east and west of the wind farm. As an elasmobranch, tope may be sensitive to EMF associated with the export cables and may be deterred from occupying this localised area. Until such times as the COWRIE elasmobranch-EMF study group report, however, this perceived cause and effect must remain a matter of conjecture. Nevertheless, it is possibly fortunate that the effect, if it exists, appears to be fairly specific in its distribution and not one covering the NHOWF area as a whole.

7.5 CONCLUSIONS

Anglers' catches have been good recently and comprise a wide variety of species. With respect to their favoured marks around the north and western side of the wind farm, skippers generally take the view that the wind farm has not had any adverse effect on fish or their fishing.

Except for loss of access, over the past year none of the under 10m netting skippers who have worked the area over the past year have reported any adverse effect. Their view was that fishing in the spring-early summer 2007 has proved up to, if not better than, their average expectations for the area.

The ground occupied by the NHOWF has rarely, if ever, been a popular trawl ground. This continues to be the case. None of the larger Fleetwood trawlers made any specific reference to North Hoyle during the past year through correspondence.

In recent years, there have been occasional visits from itinerant over-10 m whelk potters and one or two North Wales under-10 m boats have taken it up. The under-10 m boats have not worked whelk pots in or around North Hoyle and there has been no indication (sighting by the netters etc) of any of the larger itinerant boats working so close inshore.

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