

7 MARINE FISH

Summary of previous survey results

Data from 2004 CEFAS surveys indicated that catch rates of 12 species (dab, plaice, sole, solenette, scaldfish, whiting, poor cod, thornback ray, spotted ray, lesser spotted dogfish, tub gurnard and common dragonet) at the station near North Hoyle were greater than those in 2002. Catches of solenette and poor cod reached a record high for the time-series. There was, however, a decline in the catches of grey gurnard, pogge and lesser weever. Catches of the three species of elasmobranch near North Hoyle were all 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.

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 present report (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 and 2005).

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 original reports (Ellis and Parker-Humphreys, 2004 and 2005) and includes data collected from the 2005 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 (Figure 2.1), with one station (Prime station 32) in the vicinity of North Hoyle.

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 elasmobranches 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

Results from regular demersal fish surveys carried out by CEFAS in the Eastern Irish Sea have been summarised by CEFAS. The CEFAS report (Appendix 7.1) updates the previous report and focuses on results of beam trawls carried out at “prime Site 32”, which lies several km to the north east of the North Hoyle Offshore Wind Farm. The surveys are carried out annually in the autumn. The most recent data are from September 2005, which was during the operational period for the wind farm.

Approximately 40 species of marine fish have been recorded around the North Hoyle Wind Farm area during CEFAS beam trawl surveys of the eastern Irish Sea between the years 1988 to 2005. In contrast, more than 80 species have been observed over the whole eastern Irish Sea during these surveys, and 172 fish species are known from the Irish Sea (Ellis *et.al.*, 2002). It must be stressed, however, that these data were from a beam trawl survey and pelagic fish (e.g. herring and sprat), and small-bodied, benthic fish (e.g. sand gobies) will be under-represented.

The most abundant species in the North Hoyle site were flatfish (dab, sole, solenette, plaice and scaldfish), gadoids (whiting and poor cod), lesser weever, common dragonet and grey gurnard. These ten species accounted for >90% of the fish caught (by numbers). In terms of biomass, the dominant species were broadly similar, although large-bodied species such as lesser-spotted dogfish and thornback ray comprised a significant proportion of the fish biomass. The most common elasmobranch species caught were lesser-spotted dogfish, thornback ray and spotted ray, although occasional specimens of blonde ray and nurse hound were recorded.

The 2005 results showed an increase in the relative abundance of both dab (518 ind.hr⁻¹) and scaldfish (387 ind.hr⁻¹), the latter being not only above the long-term mean, but at the highest recorded level in the time series. Catch rates for both these species have also showed a gradual increase in the eastern Irish Sea as a whole. Though the catch rate of plaice continued to decline in 2005, (to 160 ind.hr⁻¹), it was still above the long-term mean catch. Catch rates for solenette (306 ind.hr⁻¹) and sole (46 ind.hr⁻¹) both decreased in 2005, with catch rates lower than the long-term mean. Nevertheless, it should be noted that catch rates for sole at Station 32 have been relatively consistent since 1999, following a period of above-average catches from 1995–1998.

Cod and bib were not observed near the North Hoyle site in 2005, though both of these species have been absent or sporadic at this site since the late 1990's, The catch rate of whiting (12 ind.hr⁻¹) declined in 2005, and was below the long-term mean, though was above the lowest recorded values in the time series. The catch rate of poor cod (2 ind.hr⁻¹) also declined from the series high of 86 ind.hr⁻¹ in 2004, though this species also shows great variation in relative abundance throughout the time series, and therefore spikes of high abundance and subsequent lows are not unusual.

Following the good catches in 2004, the three elasmobranch species studied all declined in 2005, at both the North Hoyle site and in the eastern Irish Sea as a whole. Spotted ray was the only species to remain above the long-term mean, with a CPUE of 10 ind.hr⁻¹. Although the catch of thornback ray declined, the catch rate was within the overall range of the time series. No lesser-spotted dogfish were caught at Station 32 in 2005, although zero catches of this species have occurred in other years (1993–94 and 2000).

Catch rates of both common dragonet and tub gurnard continued to increase in 2005. Whereas the increase in common dragonet (74 ind.hr⁻¹) was still within the long-term range, the catch of tub gurnard (30 ind.hr⁻¹) was at an all time high. Grey gurnard (78 ind.hr⁻¹) also increased to a level above the long-term mean. Catch rates of both pogge (4 ind.hr⁻¹) and lesser weever (114 ind.hr⁻¹) remained low and continue to show a decline in relative abundance over the overall time series. No edible crabs were caught near North Hoyle in 2005.

7.2.3 Conclusions

Data for demersal fish near North Hoyle and in the eastern Irish Sea were analysed from beam trawl catches (1993–2005) sampled during an annual beam trawl survey of the Irish Sea. This gear is a suitable gear to sample flatfish, juvenile gadoids and other demersal fish, though it is less efficient for small-bodied demersal species (e.g. gobies) and pelagic fishes.

Approximately 40 species of demersal fish occur in the vicinity of the North Hoyle site, with about 15 of these abundant.

The distribution and relative abundance (catch per unit effort), and temporal changes in relative abundance were examined for edible crab and 17 species of fish.

Catch rates of fish can be highly variable. Only one species (pogge) had a relatively consistent catch rate over time (1993 to 2003) at Prime station 32 (CV <50%). The catch rates of six other species (dab, plaice, lesser weever, solenette, scaldfish and common dragonet) at Prime station 32 were slightly more variable (CV <85%). The catch rates for the remaining species were all highly variable.

Data from 2005 indicated that although the catch rates of most fishes at the station near North Hoyle decreased slightly from 2004 values, the data were broadly comparable to previous years for most species, and were within the range observed in preceding years. Catch rates of common dragonet and dab increased, and the highest recorded catches in the time series for tub gurnard and scaldfish were observed. Catches of the three species of elasmobranch near North Hoyle all decreased in 2005, with only spotted ray above the long-term average for the sampling station. There was also a continuing decline in the catch rates of pogge and lesser-weever.

7.3 CONSULTATION/CANVASSING OF LOCAL FISHERMEN

7.3.1 Introduction

The North Hoyle Wind Farm is located 4-5 miles offshore from Prestatyn, North Wales, and 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. In that part of the SFC district east of Rhyl coastguard station, i.e. including North Hoyle Wind Farm, only trawlers, set

netters and scallop dredgers not exceeding 13.7 m in length are permitted to fish (SFC Byelaw 9).

For all practical purposes, 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 Wind Farm. 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 and the North Hoyle ground was established as part of the North Hoyle environmental impact assessment (Innogy, 2001). This network has been maintained and expanded in response to the need to monitor commercial and recreational fishing interests around North Hoyle.

ii A targeted list of 37 of these were contacted as part of the North Hoyle FEPA monitoring programme (Appendix 7.2). Officers of appropriate federations and producer organisations were notified of the consultation exercise by e-mail and invited to comment but skippers were spoken with either in person or over the phone. Fleetwood skippers were consulted in person during a port visit on the 8 and 9 June 2006.

iii In all, 31 individual fishermen or fishing organisation representatives contributed to the consultation exercise:

<10 m vessels	– 16	
>10 m vessels	– 6	
Commercial representatives	– 3	
Charter angling	– 6	(1 Rhos-on-Sea plus representative of the 5 Rhyl charter angling skippers)

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 Wind Farm. There are no wrecks within the wind farm boundary and the site is not a destination that the angling charter have made a practice of visiting. Rhos-on-Sea boats very rarely work that far east but Rhyl-based boats regularly work close to (0.5-1 mile) the north-west and southern boundary of the wind farm, but not yet within it.

i. Rhyl skippers report that when working close to the wind-farm, anglers' catches have been good and comprise a wide variety of species (one skipper reported 16 species on one day), including: small cod, whiting, 'skate' (mostly thornback ray up to 12 lb), a variety of dogfish, tope (up to 51 lb), plaice, dab, flounder, turbot, mackerel, black bream and even a 9 lb lobster. These skippers take the view that the wind farm has not had any adverse effect on fish or their fishing.

ii. Similarly, charter-boat skippers from Rhos-on-Sea do not make a habit of fishing around North Hoyle but are aware of the Rhyl skippers' experience and take a comparable optimistic view of future wind farm developments. North Hoyle is beyond the normal working range of Conwy-based charter boats; they are less optimistic about the future and are fearful for the implications of further proposed wind farms.

7.3.3.2 Netting

Under 10 m boats working from Rhos-on-Sea, Rhyl, Prestatyn and the on the Wirral have set

nets each summer across and around the North Hoyle Wind Farm site for many years. The principal target species are rays, particularly thornback (roker). 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 a comparable distance of any turbine.)

During the construction phase and summer of 2004, all the local set-net boats experienced poor fishing in proximity to North Hoyle and explored grounds further afield than had been their previous practice. During the early part of 2005 some of the boats maintained this new pattern as this proved satisfactory fishing while others returned to the previous pattern "working very close" (i.e. 1½-2 miles) to the wind farm. The spring 2005 net-catches around the North Hoyle Wind Farm, both inshore and offshore, were comparable in quantity and composition to catches made before construction work began. Later in the season netting was better to the west than it was near the wind farm.

At the start of the 2005 season only one full-time netter was working the area and began by fishing within 1½-2 miles of the western side of North Hoyle wind-farm site. The skipper described fishing as very steady and he did not feel that the wind farm was having any noticeable adverse effect on his fishing (other than loss of access to the actual wind-farm site) or catch rates. It is too soon to say if this will continue to be the case when he returns to inshore grounds towards the end of the season or if he needs to fish further west as in 2004-5.

A Wirral based skipper has not fished since autumn 2005 as his boat has been ashore for a major refit. Like other net-skippers, he found autumn fishing around North Hoyle very poor and worked further west in the eastern part of the proposed Gwynt y Môr wind-farm site.

In addition to the boats that work offshore (North Hoyle – Hamilton grounds), each spring (May-June) a beach boat sets nets for bass close inshore between Rhyl – Prestatyn – North Hoyle. In 2004, the year that construction was completed and the wind-farm commissioned, this skipper had 'the worst season of my life'. Fortunately, this proved to be a one off. This year (2006) the fishing has been 'pretty well average' compared to many other years but the individual fish have 'probably been above average'. The skipper is satisfied that the wind farm does not appear to affect bass or bass fishing.

7.3.3.3 Trawling

The ground occupied by the North Hoyle Wind Farm 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).

One Birkenhead-based under 10 m beam trawler has fished over the years between the Mersey and the Dee, and occasionally ventured west as far as Rhyl Flats. In autumn 2005 and early 2006 he fished in the vicinity (1-5 miles) of North Hoyle on a small number of occasions but found (sole, plaice) catches were very poor compared to what they have been in pre wind-farm years. He attributes poor catch rates to vibration from the turbines. He has not fished west of the Mersey since wind-farm pile driving began on Burbo bank.

In contrast, a Welsh Dee-based <10 m trawler has continued to fish 2005-6 in the outer Dee Estuary and NW towards North Hoyle (within 1 mile) and has not experienced any noticeable change in fish abundance or catch rates compared to pre wind-farm days. He fishes with an otter trawl and catches mainly small-medium plaice with a mixture of other flatfish including Dover sole. The only change of any significance he has noticed is that he has been catching 'skate' (thornback ray/roker) in the Dee Estuary this year, something he cannot recall ever doing before.

Only two Rhos-on-Sea and one Conwy-based under 10 m boats trawl throughout the year. The Ross skippers believe that trawl catches (sole, plaice) in the vicinity of North Hoyle have been poor compared to pre wind-farm days. One skipper expressed the view that this is due

to the combined effects of turbine vibration and export cable EMF driving fish (sole) away from North Hoyle and into the Dee Estuary. (He offered no firm evidence or why he believes they are now more abundant in the Dee.) The Conwy-based skipper only fished North Hoyle area a few times in the autumn (2005) when he caught mostly small-medium plaice, 'a few sole' and some 'skate' (roker). As he visits the area so rarely, he is unwilling to express a view on whether or not the wind farm has had any effect on fish or fishing.

The larger Fleetwood-based trawlers have fished North Wales grounds, including the vicinity of North Hoyle in past decades but only one beam-trawl skipper has fished within 2 miles of North Hoyle in the past year. As last year, he found that fishing in the area was "dead". He was less inclined than some other skippers to attribute this directly to the presence of the wind farm although, in common with the majority, he is concerned about the loss of access.

Representatives of itinerant vessel organisations were notified of the annual FEPA monitoring exercise and invited to comment. The majority did not respond, probably reflecting the fact that their member's vessels are too large to fish with the SFC boundary and near to North Hoyle. Two organisations that did respond confirmed that their members are unaffected by the North Hoyle Wind Farm.

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. As yet none has fished within or very close to North Hoyle but one itinerant potter skipper asked about restrictions that apply to entering or fishing within a wind farm.

7.3.3.5 Scallop Dredging

The Irish Sea – Liverpool Bay king and queen scallop fishing grounds are to the north west of the North Hoyle Wind Farm. 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 CONCLUSIONS

During the latter stages of the North Hoyle construction phase (spring 2004), and possibly throughout the summer-autumn of 2004 it appears that fish distributions or behaviour were affected in some way that resulted in poor catches for all sectors. Initially, this appeared to continue into 2005 but from spring 2005 the general impression is that netting (for rays) in close proximity to North Hoyle Wind Farm picked up and spring fishing was not significantly different from how it was immediately before construction work began.

In the autumn of 2005 netters found that fishing around North Hoyle grounds was poor and better further to the west. By spring 2006, however, set-net catches were once again comparable to fishing before the wind farm was constructed. In contrast, some trawler skippers report that (flatfish) fishing within ca 5 miles of North Hoyle is no longer as good as it was before the wind farm was constructed. This view, however, is contradicted by other skippers who say they have found no change.

One skipper in particular claims a noticeable decline in Dover sole catch rates and attributes this to an adverse reaction to EMF and, or vibration driving fish away from the wind farm and into the Dee. Whether or not EMF or vibration affect sole behaviour is pure speculation as there are no scientific publications on the matter. It should be noted, however, that trawlers working from the Dee have not noticed any change in flatfish distribution or abundance compared with pre wind-farm conditions. Furthermore, reference to the CEFAS and CMACS

trawl-survey data summarised by PMSS as part of this FEPA monitoring exercise indicate a stable, if not increasing trend in sole catch rates rather than a decline.

Although formal records have not been kept, the angling charter-boat skippers take a keen interest in the range of species taken by their clients as this influences subsequent bookings. Angling in close proximity to the wind-farm site has regularly yielded catches of whiting, cod, gurnard, rays, tope and a variety of dogfish species. They are satisfied that the variety of species and size of fish is sufficient to meet their clients' expectations and ensure further bookings.