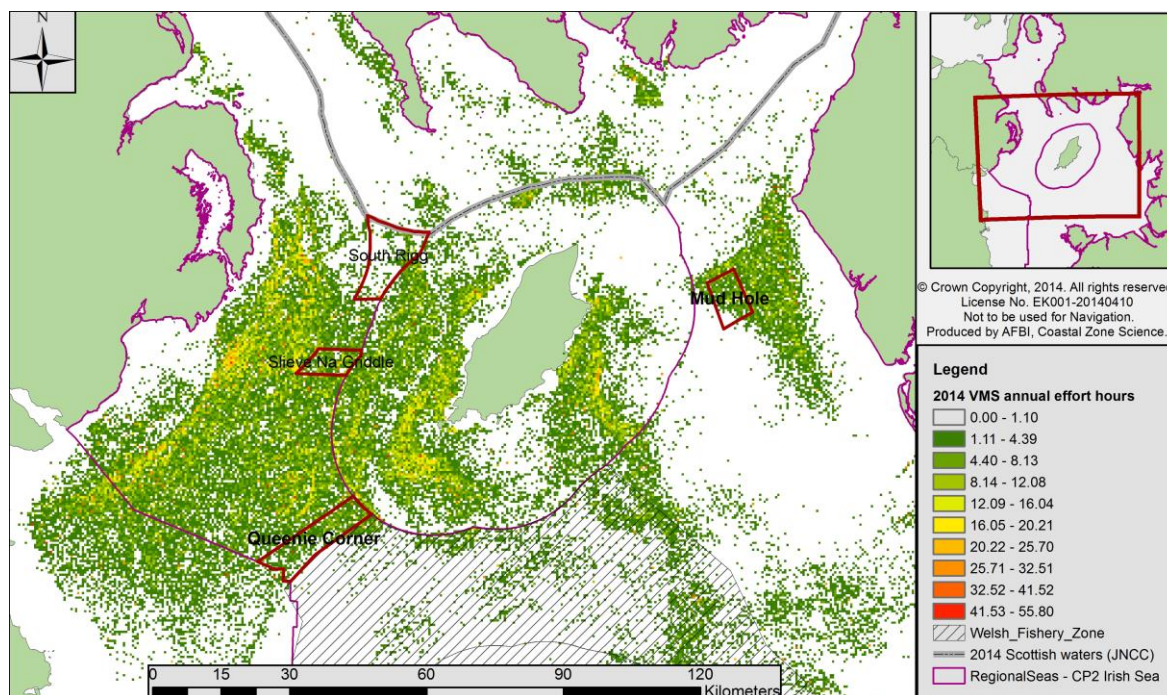


# THE VALUE OF PROPOSED & ALTERNATIVE IRISH SEA MCZs TO THE NORTHERN IRISH FISHING INDUSTRY



© AFBI, 2015



Report to:

Seafish Northern Ireland Advisory Committee (SNIAC)



Funded by

**FEBRUARY 2016**

NI OFFICE:  
18 GORSE ROAD  
UPPERLANDS  
MAGHERA  
BT46 5XH

TELEPHONE: +44 (0) 2825 820928  
[rod@consult-poseidon.com](mailto:rod@consult-poseidon.com)  
<http://www.consult-poseidon.com>

## TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY .....</b>	<b>1</b>
<b>1 INTRODUCTION .....</b>	<b>5</b>
1.1 REPORT BACKGROUND .....	5
1.2 OBJECTIVE .....	6
<b>2 APPROACH .....</b>	<b>7</b>
2.1 APPROACH.....	7
2.2 SCOPE .....	7
2.3 METHODOLOGY .....	7
2.3.1 <i>Fishing effort</i> .....	7
2.3.2 <i>Landings and sales data</i> .....	8
2.3.3 <i>Costs and earnings data</i> .....	8
2.3.4 <i>Socio-economic consequences</i> .....	9
2.4 ASSUMPTIONS .....	9
<b>3 ESTIMATED CATCH VALUE PER MCZ .....</b>	<b>10</b>
3.1 SEASONALITY .....	10
3.2 RATIO OF TAILED AND WHOLE PRAWNS .....	11
3.3 PRICE DATA .....	12
3.4 LANDINGS PER ICES RECTANGLE .....	13
3.5 VALUE OF LANDINGS FROM MCZS .....	13
3.6 DISPLACEMENT .....	14
<b>4 IMPACT ON FLEET PERFORMANCE.....</b>	<b>15</b>
<b>5 SOCIO-ECONOMIC IMPACTS.....</b>	<b>16</b>
5.1 JOBS IN FISHING .....	16
5.2 CO-DEPENDENCE OF FLEET AND SCAMPI PROCESSORS.....	16
5.3 COMMUNITY IMPACTS .....	17
<b>6 CONCLUSIONS .....</b>	<b>19</b>
6.1 FISHING INTENSITY.....	19
6.2 VALUE PER MCZ.....	19
6.3 FLEET PERFORMANCE.....	19
6.4 SOCIO-ECONOMIC IMPACTS.....	20
6.5 SUMMARY.....	20
<b>REFERENCES .....</b>	<b>21</b>
<b>APPENDIX A: NI FLEET FISHING EFFORT IN MCZ AREAS (SOURCE: AFBI).....</b>	<b>22</b>
<b>APPENDIX B: LANDED VALUES PER ICES RECTANGLE (SOURCE: DARD).....</b>	<b>23</b>

## Tables

TABLE 1 RATIO OF WHOLE PRAWNS TO TAILS IN ICES RECTANGLES CONTAINING MCZs.....	11
TABLE 2 COMPARISON OF AVERAGE AND BUYER PRICE DATA .....	12
TABLE 3 PROPORTION OF FISHING HOURS AND VALUE OF NI <i>NEPHROPS</i> FLEET LANDINGS IN RMCZs AND THE ALTERNATIVE SITE* .....	14
TABLE 4 NUMBER OF FISHERMEN BY NI PORT 2013, 2014 (A) .....	16
TABLE 5 CONSUMPTION OF WHOLE PRAWN & TAILS BY NI PROCESSORS.....	17
TABLE 6 FISHING EMPLOYMENT AS A PROPORTION OF LOCAL EMPLOYMENT .....	17
TABLE 7 NUMBER AND PROPORTION OF FISHING HOURS IN EACH MCZ AS % OF TOTAL FISHING HOURS.....	22
TABLE 8 NUMBER OF FISHING HOURS PER ICES SUB-RECTANGLE CONTAINING MCZs .....	22
TABLE 9 VALUE OF NI FLEET LANDINGS FROM KEY IRISH SEA ICES RECTANGLES .....	23

## Figures

FIGURE 1 RECOMMENDED IRISH SEA MARINE CONSERVATION ZONES (RMCZs) & ALTERNATIVE SITE* .....	6
FIGURE 2 SEASONALITY OF <i>NEPHROPS</i> LANDINGS (TONNES) BY THE NI FLEET BY ICES RECTANGLE .....	10
FIGURE 3 RATIO OF TAILS (LWE) TO WHOLE PRAWNS IN LANDINGS FROM ICES RECTANGLES CONTAINING MCZs .....	11
FIGURE 4 WHOLE AND TAILED NI PRAWN PRICES 2006-2014 .....	13
FIGURE 5 AVERAGE ANNUAL OPERATING PROFIT PER VESSEL IN THE IRISH SEA <i>NEPHROPS</i> FLEET .....	15

## Acknowledgements:

This report has been prepared for SNIAC by Rod Cappell of Poseidon who greatly appreciates the support provided by project manager Dr Lynn Gilmore (Seafish), AFBI, DARD and the Northern Ireland fishing industry in providing both the quantitative data and the qualitative information presented in this report.

## Citation:

Cappell, R., "The value of proposed Irish Sea Marine Conservation Zones to the Northern Irish fishing industry" Poseidon Report to the Seafish Northern Ireland Advisory Committee. February 2016.

## EXECUTIVE SUMMARY

---

This report is by Poseidon Aquatic Resource Management Ltd at the request of the Seafish Northern Ireland Advisory Committee (SNIAC) and was funded by Seafish. The Northern Ireland Department for Agriculture and Rural Development (DARD) provided landings data and the Agri-Food and Biosciences Institute (AFBI) analysed VMS data to determine fishing effort.

The report builds on earlier analysis (Poseidon, 2012<sup>1</sup>) that estimated the value to the NI fishing fleet of proposed Irish Sea Marine Conservation Zones (hereafter called rMCZs) that were recommended to the UK Environment Minister by the Irish Sea Conservation Zone project. In November 2013 the UK government designated 27 MCZs in a first tranche and in 2015 consulted on a second tranche of 23 MCZs was designated in January 2016. Consultation on a third tranche of rMCZs, including the Irish Sea rMCZs of particular concern to the Northern Ireland fishing industry (Slieve Na Griddle, Mud Hole and South Rigg), is planned for 2017.

Defra has identified that these three rMCZs require further consideration, stating the following for each: “This site is located within an important fishing ground and designation could have a significant impact on the fishing sector, particularly in Northern Ireland. The fishing sector is in the process of developing alternative site proposals for protecting subtidal mud habitats in this region. We will consider all available options in the third tranche (Defra, 2015)”.

During 2015 the Northern Ireland industry worked with DARD and AFBI to identify alternative sites. The process resulted in two sites for consideration as alternative MCZs; Queenie Corner and a revised West of Walney area (AFBI, 2015<sup>2</sup>).

Current management proposals include the closure of MCZs to ‘benthic fisheries’, implying a ban on the use of bottom-trawled gear. For the Northern Ireland fleet this directly affects the prawn fleet, amounting to some 120 vessels (84% of the NI fleet over 10m).

AFBI analysed VMS data from 2006 to 2014 and provided a summary of annual fishing effort by the NI *Nephrops* fleet within four potential MCZ sites: Mud Hole, Slieve Na Griddle, South Rigg and the alternative site proposed, Queenie Corner.

This report uses the AFBI analysis, DARD landings data and NI seafood industry price data to compare the value to the NI fleet of these sites remaining under consideration and explores the implications for the fishing sector in Northern Ireland.

### Value of landings from MCZ areas

VMS data was used to estimate fishing effort by the NI *Nephrops* fleet in the rMCZ and this was then applied to landed value from the ICES rectangles containing the rMCZs in order to estimate value. An additional detail is the proportion of whole prawns per landing and the size of prawns. These product features are particularly significant for the deep-water grounds of South Rigg and Slieve Na Griddle, which are renowned for their large prawns that are landed whole. The 2012 report calculated that the average value from the Irish Sea rMCZs equated to around 15% of Irish Sea landings by the Northern Irish trawl fleet; this amount of revenue was higher than the fleet’s average profit level (Poseidon, 2012).

The primary objective of this research is to compare the fisheries value of the 3 rMCZs that remain under consideration and the alternative site identified. Estimations of landings values by the NI *Nephrops* fleet from these four areas are presented in the table below.

---

<sup>1</sup> [http://www.seafish.org/media/Publications/Poseidon\\_NI\\_MCZ\\_valuation\\_final\\_report\\_August\\_2012\\_2\\_.pdf](http://www.seafish.org/media/Publications/Poseidon_NI_MCZ_valuation_final_report_August_2012_2_.pdf)

<sup>2</sup> [http://www.seafish.org/media/publications/Seafish\\_2015\\_Alternative\\_MCZs\\_in\\_Irish\\_Seafinal.pdf](http://www.seafish.org/media/publications/Seafish_2015_Alternative_MCZs_in_Irish_Seafinal.pdf)

**Table A Proportion of total fishing hours and value of NI prawn fleet landings in rMCZs & alternative site\*.**

year	Mud Hole			Queenie Corner			Slieve Na Griddle			South Rigg		
	% of hours	landed	value	% of hours	landed	value	% of hours	landed	value	% of hours	landed	value
2006	2.5%	£155,986		0.8%	£43,594		1.2%	£149,505		2.7%	£359,062	
2007	2.0%	£89,686		1.1%	£79,587		1.2%	£180,563		2.5%	£359,789	
2008	1.1%	£25,116		0.5%	£95,115		1.3%	£212,343		1.9%	£302,200	
2009	1.0%	£9,973		1.0%	£24,007		1.5%	£200,705		2.8%	£391,468	
2010	1.3%	£1,895		0.8%	£8,857		1.2%	£153,298		2.2%	£275,996	
2011	0.8%	£2,346		0.6%	£9,455		1.1%	£184,312		1.2%	£202,822	
2012	0.7%	£10,459		1.0%	£54,536		1.2%	£207,210		1.0%	£172,209	
2013	0.7%	£9,499		1.6%	£68,397		1.4%	£260,572		0.9%	£164,864	
2014	0.7%	£7,890		1.4%	£58,947		1.0%	£158,607		0.8%	£136,854	
nine year average	1.2%	£15,872		1.0%	£138,055		1.2%	£189,679		1.8%	£262,807	
per km <sup>2</sup>		£596.04			£939.15			£233.54			£793.91	

Source: Poseidon analysis of AFBI & DARD data \*excludes pelagic & other shellfish

The most valuable rMCZ for the NI fleet remains South Rigg (MCZ6), partly due to its large size. However, on a value per square kilometre basis, Slieve Na Griddle shows the highest landings value per km<sup>2</sup>.

Queenie Corner, the alternative site proposed by industry exhibits the lowest landings value per km<sup>2</sup>, but it does still contain significant Nephrops catches. Due to the size of Queenie Corner (147km<sup>2</sup>), it accounts for a larger average landings value than Mud Hole, which is half the size (72.6km<sup>2</sup>).

The nine years of data used in this analysis (2006-2014) illustrates the inter-annual variability of NI prawn fleet effort as it moves between key grounds: fishing effort in South Rigg has reduced in recent years, while activity in Slieve Na Griddle has remained more stable.

It is also important to note the differing ratios of tailed prawns to whole prawns from the different ICES rectangles containing the rMCZs. In all areas more tails are landed compared to whole prawns, but Queenie Corner shows the highest ratio, i.e. more tails are landed compared to whole prawns in this area than in the others. Therefore, although Queenie Corner is a productive fishing ground, less value is gained from fishing here compared to the other areas considered.

2006-2014 Area	Average Ratio tails to whole
Mud Hole rectangle 37E6	2.99
Queenie Corner rectangle 36E4	4.44
Slieve Na Griddle rectangle 37E4	3.90
South Rigg rectangles 37E4 & E5	3.66

A final consideration is the relative distance from the homeports of the NI prawn fleet. Queenie Corner and Mud Hole are further away for the majority of vessels targeting these grounds (from Kilkeel and Portavogie) and as such more fuel is used to operate at these grounds compared to Slieve Na Griddle and South Rigg. Consequently the profitability of fishing Queenie Corner and Mud Hole is impacted by higher operating costs compared to Slieve Na Griddle and South Rigg.

## Impact on Fleet Performance

The overall value of landings attributable to the MCZ areas is substantial and is significant when compared to fleet finances at a vessel level. Seafish data from the cost and earnings survey shows that the average profit of *Nephrops* trawlers in the Irish Sea is highly variable year on year. Across the eight years where data are available, for trawlers with engines under 250kw profit as a % of total income averaged 16% and for vessels with engines over 250kw it was 14%.

The years since the 2010 economic crisis show better profitability as average prices increased, but 2013 shows a marked decrease in average price per tonne. For the larger vessels this, along with increased fuel costs, contributed to a significant decline in net profit to just £10,800 per vessel (4.6% of total income). This marginal profitability was in part achieved with an increase in non-fishing income (guard duty etc.).

## Displacement

The 2012 report highlighted the potential for fleet displacement and associated consequences. The impacts of area closures on the fleet and target resources were further explored in the FISHRAMP project along with the cumulative impacts resulting from inshore MPAs and marine renewable developments (Poseidon, 2015). A recent study found a reduction of fishing activity by the NI *Nephrops* fleet at the Walney Offshore Wind Farm following its construction (Gray *et al*, 2016)

Current fishing patterns reflect the need to disperse effort across grounds throughout the year. Displacement from MCZ areas will cause additional pressure on the existing grounds that do remain open. Forcing vessels off the deep-water grounds such as South Rigg and Slieve na Griddle will mean vessels fish inshore grounds harder. This is likely to result in lower catch per unit effort and may prove unsustainable in the longer term.

NI skippers have indicated that closing the rMCZ areas of Mud Hole and West of Walney, in addition to existing management and development constraints, would make fishing on eastern Irish Sea grounds non-viable. This effort would probably therefore be displaced to existing grounds in the western Irish Sea or the Clyde.

The western Irish Sea grounds would be further limited should South Rigg (rMCZ6) and Slieve Na Griddle (rMCZ7) be closed. For the smaller vessels with a restricted range, there are few alternative grounds available, and none that provide the good quality large prawns found on these grounds. This group would be expected to experience the greatest impact from MCZ closures.

## Socio-economic Impacts

The *Nephrops* fleet represents the great majority of jobs in the NI catching sector. It is based at the three main NI fishing ports where fishing accounts for 47% of employment in Portavogie, 20% in Ardglass and 15% in Kilkeel. Community dependence on fishing is higher still when upstream and downstream industries, such as vessel services and processing, are taken into account and that dependency has increased as a result of the economic downturn.

The number of Northern Ireland fish processing units has decreased significantly from 27 in 2008 to 16 in 2014. However, jobs in processing have only shown a slight decline from 593 in 2008 to 562 Full Time Equivalents (FTE) in 2014 (Seafish, 2014), illustrating consolidation of the NI processing sector. Supply chains are highly dependent on these local processors as buyers with a high level of co-dependence between the NI fleet and NI processors. If supply from the local fleet reduced, processors would have to source a greater proportion of raw material from elsewhere. The strategic benefit of being located at the Northern Ireland ports would be diminished. As the main market is on the UK mainland, companies would weigh up the pros and cons of continued operation in Northern Ireland. If more landings were to the UK mainland, relocation or (for the

larger companies) further consolidation to mainland premises is more likely. If the NI processors closed, the vessels would land less of their catch into Northern Ireland's ports and instead land more of their catch to the remaining processors in South West Scotland and Cumbria, creating a cycle of decline in Northern Ireland's fishing ports.

As the NI processing industry retains nearly all NI landings, the impacts on the UK economy from any reduction to NI fleet landings can be expected to predominantly occur in Northern Ireland.

The Northern Ireland economy has been slow to recover from the economic downturn compared to other regions of the UK with Northern Ireland's GVA per head of population now only 77% of the UK average (2013 data). This gap has widened since 2007 when it sat at 84% of the UK average (ONS, 2015) and highlights the importance of Northern Ireland's indigenous industries such as fishing, which makes a substantial contribution to the economy of the Down ports.

## **Conclusion**

This analysis confirms that Queenie Corner (identified as a potential alternative site following AFBI habitat analysis and industry consultation in 2015) is a less valuable ground for the *Nephrops* fleet than the three rMCZs previously considered. It also shows that it is a productive ground that is fished by the NI *Nephrops* fleet.

It appears a preferable alternative site compared to the three rMCZs of Slieve Na Griddle, Mud Hole and South Rigg, but closure to fishing will still result in some displacement as the catch from this site would be sought elsewhere.

# 1 INTRODUCTION

---

## 1.1 REPORT BACKGROUND

This report by Poseidon Aquatic Resource Management Ltd explores the economic importance to the Northern Ireland fishing industry of the proposed Marine Conservation Zones (MCZs) in the Irish Sea. It updates earlier analysis (Poseidon, 2012) in estimating the value to the NI fishing fleet of Irish Sea Marine Conservation Zones (hereafter called rMCZs) that were recommended to the UK Environment Minister by the Irish Sea Conservation Zone project.

Current management proposals include the closure of MCZs to ‘benthic fisheries’, implying a ban on the use of bottom-trawled gear. For the Northern Ireland fleet these proposals affect the whole prawn fleet, which exclusively targets *Nephrops norvegicus*, amounting to 120 vessels (84% of the over 10m fleet).

The Northern Ireland fishing industry expressed serious concern for the future viability of the industry should current MCZ proposals for the Irish Sea be implemented. The consensus amongst the industry is that closure of these rMCZs to fishing would result in major negative impacts, representing a disproportionately large impact on the Northern Irish industry when compared to the impacts on the fishing industry within the other devolved administrations. The 2012 report estimated that between 2007 and 2010 the average value of Northern Ireland fleet landings of all species from these rMCZs amounted to £1.2 million (Poseidon, 2012).

In November 2013 the UK government designated 27 MCZs in a first tranche and in 2015 consulted on a second tranche of 23 MCZs was designated in January 2016. Consultation on a third tranche of rMCZs, including the Irish Sea rMCZs of particular concern to the Northern Ireland fishing industry, is planned for 2017.

Defra has identified that the three rMCZs (Slieve Na Griddle, Mud Hole and South Rigg) require further consideration, stating the following for each: “This site is located within an important fishing ground and designation could have a significant impact on the fishing sector, particularly in Northern Ireland. The fishing sector is in the process of developing alternative site proposals for protecting subtidal mud habitats in this region. We will consider all available options in the third tranche (Defra, 2015)”.

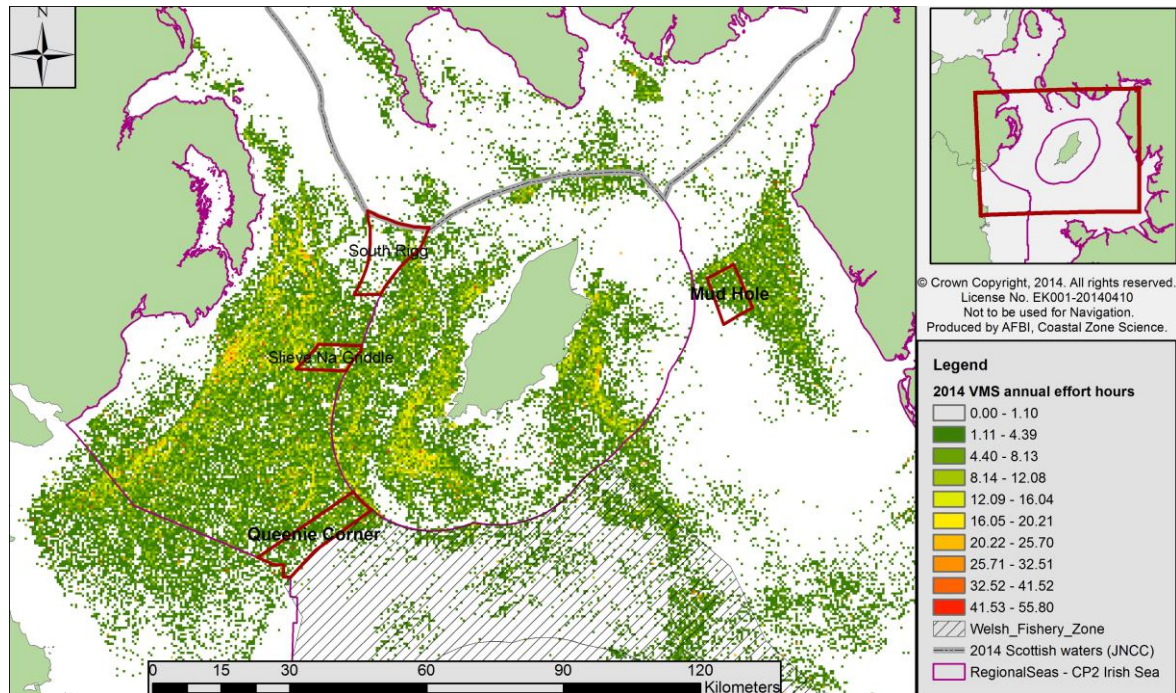
During 2015 the Northern Ireland industry worked with DARD and AFBI to identify sites that could provide alternative MCZs. The criteria was that these sites should contain the deepwater mud habitat Defra intends to protect, but be of less economic significance for the Northern Ireland fishing fleet compared to the rMCZs. The process resulted in two sites for consideration as alternative MCZs; Queenie Corner and a revised West of Walney area. However, developments elsewhere have affected the consideration of these two sites:

- The West of Walney rMCZ was designated by Defra, with effect from January 2016. This means it is already included in the UK’s MCZ network makes consideration of a revised boundary unlikely at this time.
- The original Queenie Corner boundary overlapped with a proposed Welsh Fisheries Zone (and therefore is not to be considered as part of the UK MCZ process). A revised boundary for Queenie Corner removing this overlap (cutting the area from 279km<sup>2</sup> to 147km<sup>2</sup>) is the area considered as the Queenie Corner site.

This report provides estimated values of landings by the NI fishing fleet in the three rMCZs (Slieve Na Griddle, Mud Hole and South Rigg) that are the subject of further consideration by Defra and identified as significant by the NI industry, along with the alternative site proposed, Queenie Corner. The report goes on to consider potential implications of area closure for the fishing sector in Northern Ireland.



**Figure 1 Recommended Irish Sea Marine Conservation Zones (rMCZs) & alternative site\***



source: AFBI, 2015<sup>3</sup>

- MCZ 6 South Rigg is located within ICES rectangles 37E4 and 37E5.
- MCZ7 Slieve Na Griddle is within ICES rectangle 37E4
- MCZ1 Mud Hole is within ICES rectangle 37E6
- Alternative MCZ Queenie Corner is within ICES rectangle 36E4

\*The revised Queenie Corner boundary is the red outlined area SW of the Isle of Man.

## 1.2 OBJECTIVE

The objective of this work is to illustrate the comparative values to the Northern Ireland fishing industry of the MCZ areas proposed, including the alternative site identified, Queenie Corner.

This study also details the socio-economic importance of the fishing industry to Northern Ireland's fisheries sector and fishing communities.

Fleet revenues vary year on year due to various factors affecting the fleet's fishing opportunities & market prices. It is therefore important to compare the proportions of fleet revenue, not just the values.

The report does not explore the numerous other issues and constraints on fishing opportunities that were highlighted during consultation with the industry and reported in the earlier report (Poseidon, 2012). These wider issues are important to take into account when considering the cumulative impacts on the NI fleet.

<sup>3</sup> [http://www.seafish.org/media/publications/Seafish\\_2015\\_Alternative\\_MCZs\\_in\\_Irish\\_Seafinal.pdf](http://www.seafish.org/media/publications/Seafish_2015_Alternative_MCZs_in_Irish_Seafinal.pdf)

## 2 APPROACH

---

### 2.1 APPROACH

To estimate, as accurately as possible, the value to the Northern Ireland fleet of specific proposed MCZ areas through:

- a. Fishing effort data** & information mapped against the rMCZs to establish the proportion of effort associated with these areas;
- b. Landings and sales data** to establish the comparative value of landings from the MCZs;
- c. Cost and earnings data** to determine how far the revenue attributable to the MCZs contributes to fleet economic performance.
- d. Socio-economic context** to explore the potential consequences of any loss of revenue.

### 2.2 SCOPE

The scope of this assessment is limited to:

- The Northern Ireland trawl fleet (*Nephrops* is the main target species, but whitefish and other species make up important additional components). The impact on Northern Ireland's other fleet segments (scallop dredge, pelagic and potting fleets) and vessels from other regions and countries that fish in the MCZs are not included<sup>4</sup>.
- The value of catch associated with rMCZs 6 (South Rigg) & 7 (Slieve na Griddle) between the Northern Irish coast and the Isle of Man; rMCZs 1 (Mud Hole) in the Eastern Irish Sea off Whitehaven); and the alternative site proposed, Queenie Corner. The value of the other Irish Sea rMCZs on this fleet is not analysed, but the cumulative effects of the additional displacement from these other areas should be noted.
- Effort data from the years 2006 to 2014. This enables a nine-year average and short-term trends to be established, but it should be noted that this period includes the global economic downturn, which severely impacted the export-orientated trade in *Nephrops*. Effort limitations (days at sea) have also been in place for the entire period as part of the cod recovery plan for the Irish Sea. Price analysis (section 4.3) shows the expected upturn in value of the *Nephrops* grounds with a substantial price increase from 2011.

### 2.3 METHODOLOGY

#### 2.3.1 Fishing effort

AFBI used VMS data for each year 2006-2014 to establish fishing intensity per rMCZ and per ICES rectangle. The analytical method used differs slightly to that used as the basis for the 2012 report as methodologies have advanced in recent years. The analysis follows the guidelines laid out in ICES Working Group for Spatial Fishery Data.

AFBI calculated fishing speed using the positional data and time stamps of the VMS pings. This provides a more accurate indication of vessel speed, which is taken as being 0.5 – 4.0 knots. The vessels used are Northern Irish vessels in the *Nephrops* fleet. The fishing effort is summed as a function of the time the ping represents, improving accuracy. A more complete description of the methodology used is provided in AFBI, 2015.

---

<sup>4</sup> The pelagic fleet and potting activity should not be affected by management proposals, while scallop dredging activity is not generally associated with the deepwater mud habitat that is the focus of the rMCZs.

The activity per rMCZ and ICES area was then summed for all areas containing an rMCZ site to give a comparative level of activity in each rMCZ.

VMS has been required on vessels over 15m throughout the period being considered, but has only been a requirement for all over 12m vessels since 2012. Therefore, industry consultation was used to establish fishing patterns for the 12-15m vessels in the period prior to VMS data being available, i.e. day boats operating no further than 20 nautical miles from port. This identified that the Portavogie, Ardglass and Kilkeel under 15m fleet is limited to the trawl grounds associated with rMCZ 6 and rMCZ 7. Based on this consultation, an assumption is made that the location of fishing activity of the under 15m vessels in the Western Irish Sea is the same as that established for the over 15m fleet.

### **2.3.2 Landings and sales data**

Landings data were provided by DARD for the years 2006-2014 by species, vessel category (under 15m and over 15m), home port and ICES rectangle.

The value of landings per MCZ is calculated by applying the estimated fishing intensity per MCZ as a proportion of total estimated activity in the ICES rectangle to the value of catch per ICES rectangle. Where an MCZ spans more than one ICES rectangle, the fishing intensity for each ICES rectangle is calculated separately before being summed. For each MCZ being considered the following is calculated:

Value of catch within MCZ = total value per ICES rectangle multiplied by the % effort per ICES rectangle in MCZ

The above provides a better resolution to the data usually used, but still works on the assumption that the value of catch is consistent and is a function of fishing effort, i.e. catch per unit effort is constant. In reality this is not the case, but a precise catch value per area is impossible to establish across a fleet with the currently available data and this provides the best estimate possible.

For the great majority of Northern Ireland's fleet, *Nephrops* is the main target species and has amounted to between 33% and 45% of total landed value from the three ICES rectangles containing MCZs 1, 2, 6 and 7. The catch from these rMCZs, particularly from the deeper water grounds of 6 & 7, are known to be of a generally larger size and a better quality. This has major implications for the value of the catch, suggesting that applying an average price to these areas would underestimate their true value. By using prices specific to catches from the area (averaged for the year), some differences in size and quality can be taken into account.

Data from sales agents is used to determine the proportion of whole prawns landed from these areas as compared to other areas. The ratio of whole to tailed *Nephrops* is then used to apply the relevant prices and determine the value of *Nephrops* attributable to these MCZ areas.

### **2.3.3 Costs and earnings data**

The Seafish economic survey of the UK fleet provides evidence of the economic performance of the key segments of the Northern Ireland fleet.

The profitability per fleet segment is presented and the impact of loss of revenue from the MCZ areas is discussed, recognising that fishing activity is likely to be displaced.

#### **2.3.4 Socio-economic consequences**

The number employed across the fleet is estimated and the implications of the proposals for fleet employment are discussed. For any fleet impact, there are also inevitable knock-on effects for upstream (suppliers) and downstream (buyers) businesses. These all contribute to indirect impacts on the wider communities associated with those businesses.

The full socio-economic consequences of the proposals are difficult to determine as the true extent to which the fleet can source alternative fishing opportunities and the impact on overall profitability is not known. However, the dependence of NI processors on local landings and the consequences of reduced landings is presented along with indicators of local community dependence on the fishing industry.

### **2.4 ASSUMPTIONS**

AFBI (2015) describes the assumptions used in the estimation of fishing hours from VMS data.

It is not possible to establish the precise value of landings specific to the rMCZs. Logsheets for the over 10m fleet report the weight of landings on the basis of ICES rectangles. These are comparatively large sea areas that do not give sufficient detail for the rMCZs. Therefore some level of assumption must be made to establish the value of landings attributable to these areas. The approach described above uses best available information on fishing effort and value of *Nephrops*, but inevitably assumptions are used to link the two as described below.

The value of landings reported in official statistics is also based on average prices. The price data used in this report are from Northern Ireland fish sales agents and purchases by Northern Irish *Nephrops* processors.

For the under 15m fleet without VMS data, it is assumed that the geographical limitations of the vessels, as established through consultation, limits all fishing effort by this day-boat fleet to the prawn grounds between home ports and the Isle of Man.

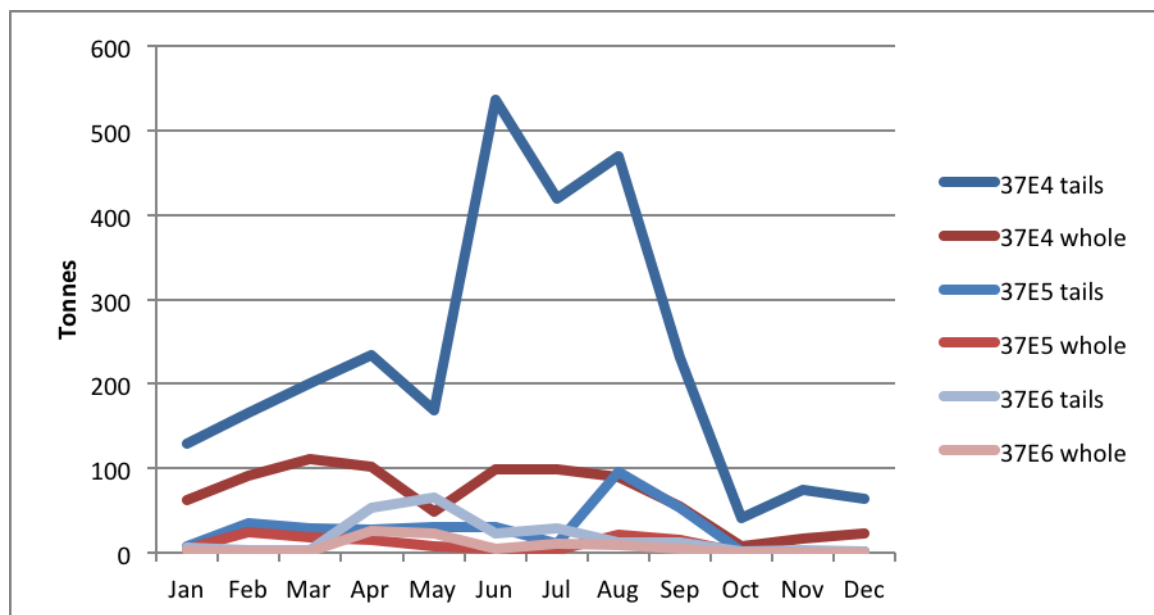
### 3 ESTIMATED CATCH VALUE PER MCZ

DARD provided Poseidon with total landings values per species per ICES rectangle, per month for the years 2006-2014. When these are applied to the fishing activity data provided by AFBI (see Appendix A), a value per MCZ can be established.

A further distinction for the estimated catch value in each area is the proportion of whole prawns per catch, the size of prawns or any differences in quality. These variables are distinguished in the market price as described in section 3.3, which presents the value of landings based on the real prices achieved for whole and tailed prawns.

#### 3.1 SEASONALITY

Figure 2 Seasonality of *Nephrops* landings (tonnes) by the NI fleet by ICES rectangle



Source: DARD

Figure 2 illustrates the seasonality in the landings of tails and whole *Nephrops* in the ICES rectangles that contain the MCZs where the Northern Irish fleet operate. The large summer peak in 37E4 includes the significant summer fishery in the shallow sea area off Dundalk (see fishing intensity maps in Appendix A). However significant fishing on Slieve Na Griddle and in particular on the South Rigg grounds continues. The proportional fishing intensities on the South Rigg in August, September and October are 7.9%, 10.4% and 11.1% respectively compared to the annual average of 6.6% indicating that relatively more fishing effort is occurring in these areas over the peak months.

Of note is the comparatively high proportion of whole *Nephrops* within the first peak in March and April in 37E4 (containing Slieve Na Griddle and part of South Rigg). The importance of the South Rigg and Slieve Na Griddle grounds within these seasonal figures is evident as the AFBI seasonal analysis done in 2012 showed that the level of fishing intensity within the MCZ areas in these months is above the annual average.

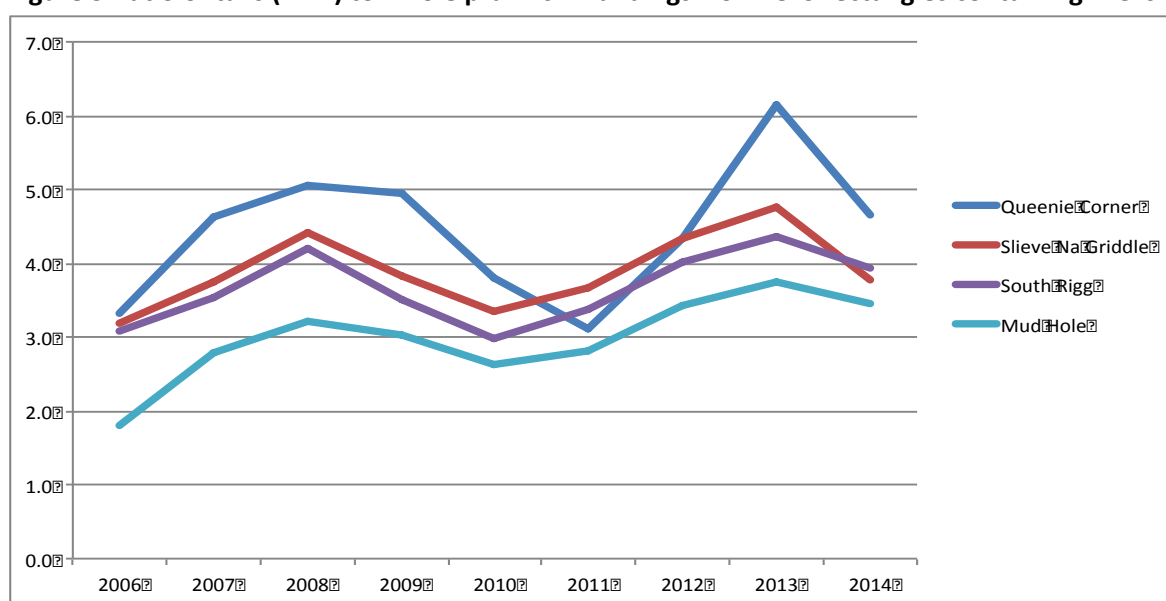
The closure of MCZs to bottom towed gear such as *Nephrops* trawls will be year-round, but the above serves to illustrate that the fleet visits different grounds at different times of the year. Therefore closure of any MCZ, but particularly South Rigg and Slieve Na Griddle, could be expected to directly affect the whole fleet.

### 3.2 RATIO OF TAILED AND WHOLE PRAWNS

*Nephrops* are landed as whole animals and as tails only (depending on size with larger animals being retained whole). When landed as tails the tail portion is retained and the remainder of the animal, discarded. To calculate the live weight equivalent (LWE)<sup>5</sup> of *Nephrops* landed as tails, a 3:1 conversion factor is used, i.e. the landed tail weight is multiplied by 3 to estimate the total weight of whole prawns.

Considering the proportion of whole prawns within the catch and the higher price achieved for whole prawns compared to the LWE price for tails (1/3 of the tails price per kg with the 3:1 conversion factor is used) helps to better reflect the true value of landings from within the MCZs. For most years during 2006-2014 Queenie Corner shows a higher ratio of tails to whole prawns in the catch compared to the MCZs (Figure 3), i.e. 4.44 prawns are landed tailed to every one landed whole. Therefore weight for weight, less value is gained from *Nephrops* catches at Queenie Corner than at the other sites.

**Figure 3 Ratio of tails (LWE) to whole prawns in landings from ICES rectangles containing MCZs**



Source: DARD

**Table 1 Ratio of whole prawns to tails in ICES rectangles containing MCZs**

2006-2014 Area	Average Ratio tails to whole
Mud Hole (rectangle 37E6)	2.99
Queenie Corner (rectangle 36E4)	4.44
Slieve Na Griddle (rectangle 37E4)	3.90
South Rigg (rectangles 37E4 & E5)	3.66

Source: DARD

The ratio of tailed to whole prawns fluctuates year-to-year and has shown an upward trend in this period, reflecting changing market demands and the size availability on the grounds. However the ratios at South Rigg and Slieve Na Griddle do not fluctuate to the same extent, supporting the industry view that these are consistently good fishing grounds for whole prawns.

<sup>5</sup> Defined as the assumed weight of the animal if landed live and whole. For *Nephrops*, a tail is estimated to constitute a third of the whole animal weight and therefore a 3:1 conversion factor is used.

### 3.3 PRICE DATA

Price data from Northern Ireland buyers were compared to the prices derived from DARD data on the volume and value of landings. 2011-12 years show significant differences in the average tail price over the year, but over the 2006-2014 period the difference found in prawn tail prices is only 4p and the difference in tail price is 6p.

In most years the average tail price from the DARD landings data is higher than the buyers data, while the whole prawn price is lower. This may reflect the greater distinction made between the size grades in the buyer data compared to the DARD data.

For the valuation in the following section, the 'real prices' from the buyer are used. The price differences are relatively small as the lower tail price offsets any gains resulting from the higher tail price. Using 'real prices' across the four ICES rectangles containing the MCZs results in a landed value that is £193,000 higher than if average prices are used. The areas with the higher ratio of whole prawns in the catch show a greater difference in the values compared to average prices. Using real prices 37E4 (containing Slieve Na Griddle and part of South Rigg) shows a value that is nearly £300,000 higher than the average prices, while the values for 37E5 and 37E6 are lower than if the average prices are used.

As stated previously, considering absolute values risks misinterpretation as prices fluctuate year on year (see Figure 4). The overall trend for both whole and tail prices is upward. The drop in the whole prawn price in 2009 and 2010 is clearly evident, which resulted from reduced demand from key European markets during the economic crisis.

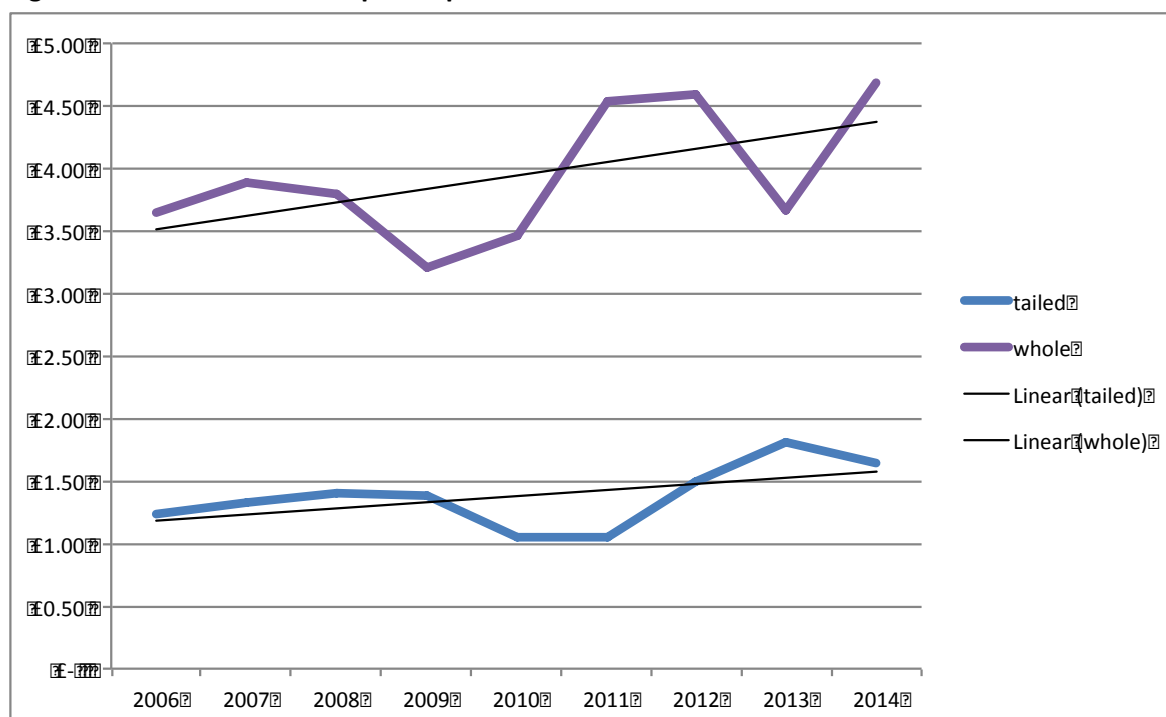
This research therefore focuses on the comparative values of the areas concerned.

**Table 2 Comparison of average and buyer price data**

	Tailed	difference	whole	difference
	prawns	real/average	prawns	real/average
year	LWE/kg	Tailed prawns	kg	Whole prawns
2006	£1.24	-£0.10	£3.65	-£0.09
2007	£1.34	-£0.06	£3.88	£0.01
2008	£1.40	£0.02	£3.79	£0.05
2009	£1.38	£0.33	£3.21	£0.17
2010	£1.05	-£0.00	£3.47	£0.19
2011	£1.06	-£0.45	£4.53	£0.12
2012	£1.50	-£0.32	£4.60	£0.11
2013	£1.82	£0.18	£3.67	-£0.12
2014	£1.64	£0.04	£4.69	£0.08
Average	£1.40	-£0.04	£3.94	£0.06

Source: DARD/NI buyers

**Figure 4 Whole and tailed NI prawn prices 2006-2014**



source: NI buyer data

### 3.4 LANDINGS PER ICES RECTANGLE

Table 9 in Appendix B presents the total landings per ICES rectangle by the Northern Ireland fleet as a whole and *Nephrops* fleet landings over the period 2006- 2014. With very limited whitefish-targeted fisheries in the Irish Sea, landings by the *Nephrops* fleet amounts to the total catch excluding pelagic landings and other shellfish (crab, lobster scallop, etc.).

Landed values show the NI fleet's very high dependence on *Nephrops*, particularly in these Irish Sea areas. Between 2006 and 2014 *Nephrops* fleet landings in the four ICES rectangles containing the rMCZs and alternative site accounted for 77% by value of total NI landings.

When all landings from all areas are considered, *Nephrops* represents (a still highly significant) 44% by value and 24% by volume of total landings by NI registered vessels.

### 3.5 VALUE OF LANDINGS FROM MCZS

Taking effort and landed value into account leads to the estimate of first-hand sales value for the Northern Ireland fleet in the rMCZs and the alternative site as presented in **Table 3**.

In line with the 2012 analysis, the most valuable rMCZ for the NI fleet remains South Rigg (MCZ6) due to its large size and importance as a fishing ground for the NI fleet with an average landed value per annum of £262,807 for the period 2006- 2014. However, on a value per square kilometre basis, Slieve Na Griddle is most important with a value of £3233.54 per km<sup>2</sup>



**Table 3 Proportion of fishing hours and value of NI *Nephrops* fleet landings in rMCZs and the alternative site\***

year	Mud Hole		Queenie Corner		Slieve Na Griddle		South Rigg	
	% of hours	landed value	% of hours	landed value	% of hours	landed value	% of hours	landed value
2006	2.5%	£155,986	0.8%	£143,594	1.2%	£149,505	2.7%	£359,062
2007	2.0%	£189,686	1.1%	£179,587	1.2%	£180,563	2.5%	£359,789
2008	1.1%	£125,116	0.5%	£95,115	1.3%	£212,343	1.9%	£302,200
2009	1.0%	£99,973	1.0%	£124,007	1.5%	£200,705	2.8%	£391,468
2010	1.3%	£101,895	0.8%	£108,857	1.2%	£153,298	2.2%	£275,996
2011	0.8%	£12,346	0.6%	£109,455	1.1%	£184,312	1.2%	£202,822
2012	0.7%	£100,459	1.0%	£154,536	1.2%	£207,210	1.0%	£172,209
2013	0.7%	£9,499	1.6%	£168,397	1.4%	£260,572	0.9%	£164,864
2014	0.7%	£7,890	1.4%	£158,947	1.0%	£158,607	0.8%	£136,854
nine year average	1.2%	£115,872	1.0%	£138,055	1.2%	£189,679	1.8%	£262,807
per km <sup>2</sup>		£596.04		£939.15		£233.54		£793.91

Source: Poseidon analysis of AFBI & DARD data \*excludes pelagic & other shellfish

Queenie Corner, the alternative site proposed by industry exhibits the lowest landings value per km<sup>2</sup> with a value of £939.15 per km<sup>2</sup>, but it does still contain significant *Nephrops* catches with an average landed value per annum of £138,055 for the period 2006- 2014. Due to the size of Queenie Corner (147km<sup>2</sup>), it accounts for a larger average landings value than Mud Hole, which is half the size (72.6km<sup>2</sup>).

The nine years of data used in this analysis (2006-2014) illustrates the inter-annual variability of NI prawn fleet effort as it moves between key grounds: fishing effort in South Rigg has somewhat reduced in recent years, while activity in Slieve Na Griddle has remained more stable.

In summary, the analysis does confirm that Queenie Corner is a less valuable ground for the *Nephrops* fleet than the original rMCZs. It also shows that it is a fishing ground frequented by the *Nephrops* fleet. It appears a preferable alternative site compared to the three rMCZs, but closure to fishing will still result in displacement as the catch from this site is sought elsewhere.

### 3.6 DISPLACEMENT

The closure of MCZ areas to benthic fisheries, which are shown to account for a significant proportion of landed value to the Northern Ireland trawl fleet, is expected to displace fishing effort to other grounds.

Skippers operating in the eastern Irish Sea have indicated that the additional constraints proposed for the MCZ areas would mean that fishing on these grounds would not be viable. This effort would therefore be displaced to western Irish Sea areas or the Clyde.

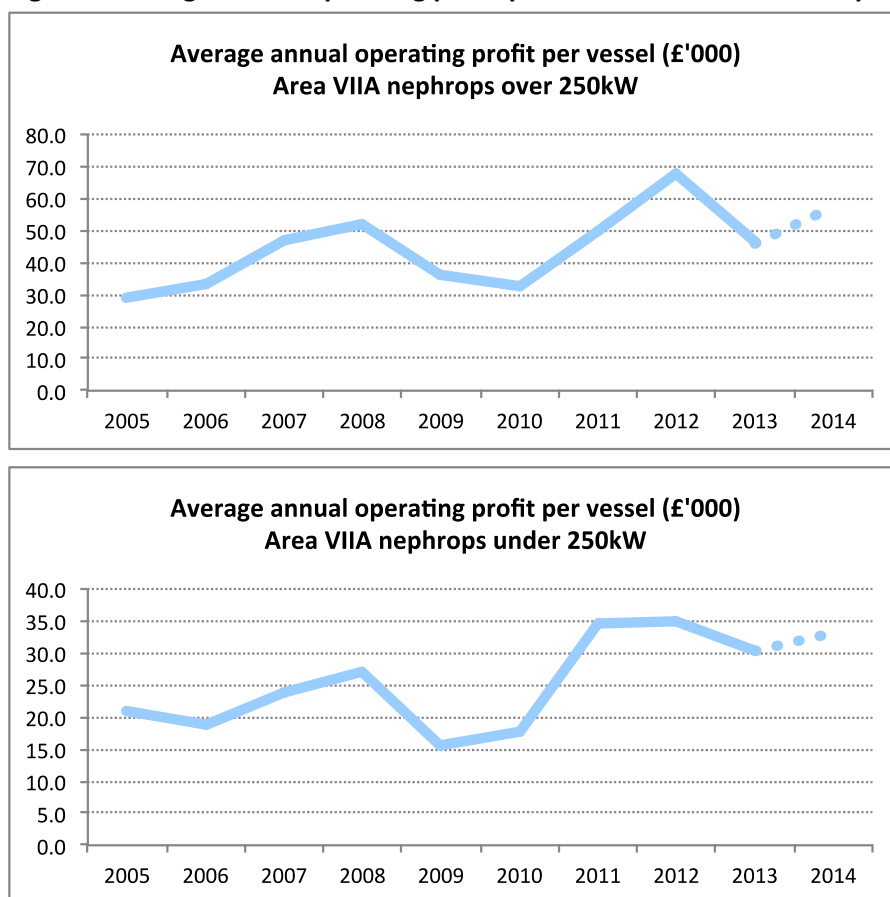
It would be difficult and more costly to replace the lost earnings from the deep-water areas of South Rigg and Slieve Na Griddle. As highlighted above, these areas have a comparatively higher catch value per unit of effort. As vessels are constrained by limits on days at sea and smaller vessels are additionally constrained by fishing range, it cannot be expected that the total amount of revenues lost due to creation of Irish Sea MCZs could be fully replaced by fishing elsewhere. The extent to which revenues could be generated from elsewhere in the short term and in the longer term is difficult to estimate.

The potential displaced activity from these areas (particularly Slieve na Griddle and South Rigg) will result in additional pressure on the grounds that do remain open. The VMS analysis illustrates that the NI fleet is already targeting these areas with the bulk of fishing intensity seen in these near-shore grounds. Fishermen have indicated that the seasonal fishing patterns are dictated by the need to disperse effort across grounds throughout the year. Forcing vessels off the deep-water grounds will result in vessels increasing their fishing effort on inshore grounds, which may result in decreases to the stock size and future TACs. The catch per unit effort associated profitability of those grounds is also likely to decline.

## 4 IMPACT ON FLEET PERFORMANCE

Figure 5 presents the estimated average operating profit of the Area VIIA *Nephrops* trawl segments, derived from Seafish cost and earnings data<sup>6</sup>. Factoring in depreciation and bank interest further reduces fleet profitability. As may be expected, profitability closely reflects the variations in prawn prices (Figure 4). Fleet profitability has improved over the last decade, but significant dips were observed in 2009/10 and again in 2013, when the problem of low prawn prices was compounded by higher fuel prices.

**Figure 5 Average annual operating profit per vessel in the Irish Sea *Nephrops* fleet**



Source: Seafish Fleet Economic Performance Data

While levels of dependence on different grounds differ between the fleet, VMS analysis illustrates that the majority of the fleet fish the various western Irish Sea grounds to some extent. The consequences of displacement and the ability of the fleet to replace any lost earnings from MCZ closures are difficult to quantify. These MCZ grounds are well known by skippers that fish them and moving to lesser-known grounds can be expected to impact on profit. Costs, particularly fuel costs would increase if vessels were forced to fish further afield, such as the Clyde grounds.

The remaining *Nephrops* grounds would inevitably be fished harder (days at sea allowing), which would result in a reduced catch per unit effort (CPUE). For the smaller vessels that have a more restricted range, there are fewer alternative grounds available, and none that provide the good quality large prawns found on the South Rigg and Slieve Na Griddle grounds. This group may be expected to experience the greatest impact from the closure of these grounds.

<sup>6</sup> The full data set is available here: <http://www.seafish.org/research-economics/industry-economics/seafish-fleet-economic-performance-data>

## 5 SOCIO-ECONOMIC IMPACTS

### 5.1 JOBS IN FISHING

The NI trawl fleet represents the vast majority of jobs in the NI catching sector. The average employment per vessel in the NI trawl fleet has remained relatively stable between 2006 and 2014 at 4 full time equivalents (FTE) for single rig and 5 FTE for twin rig (Seafish, 2011 & 2015).

Marine Management Organisation (MMO) figures for 2014 report 645 full time NI fishermen at the 3 main County Down fishing ports of Ardglass, Kilkeel and Portavogie and a further 125 part-time (Table 4). Since 2011/12 coastal fishermen were included in the MMO figures. These are mainly pot fishermen and therefore, while total employment shows an increase, total jobs in the NI trawl fleet is expected to have decreased in line with the slight decrease in vessel numbers.

**Table 4 Number of fishermen by NI port 2013, 2014 (a)**

	Regular		Part-time		Total	
	2013	2014	2013	2014	2013	2014
<b>Northern Ireland</b>						
Ardglass	103	112	8	9	111	121
Kilkeel	331	328	64	71	395	399
North Coast	31	38	27	24	58	62
Portavogie	210	205	40	45	250	250
<b>Total</b>	<b>675</b>	<b>683</b>	<b>139</b>	<b>149</b>	<b>814</b>	<b>832</b>

Source: Fisheries Administrations in the UK

(a) The number of fishermen on >10 m vessels may be underestimated due to the rotational nature of crewing

Source: MMO, 2015

### 5.2 CO-DEPENDENCE OF FLEET AND SCAMPI PROCESSORS

Table 5 below shows the weight of *Nephrops* (in Tonnes) landed by the NI fleet and purchased by local processors. Around 80% of landings (by Live Weight Equivalent or LWE) are tailed (row **a**) with 20% landed as whole prawns.

Local prawn processors purchase nearly all (95-99%) of the tails landed by the fleet (see row **c**). Close to ¾ of whole prawns landed by the fleet are also purchased by these processors (row **d**). These data show local marketing chains are highly dependent on the presence of local processors as buyers; there is a co-dependence between the NI fleet and NI processors.

The number of Northern Ireland fish processing units has decreased significantly from 27 in 2008 to 16 in 2014. However, jobs in processing have only shown a slight decline from 593 in 2008 to 562 Full Time Equivalents (FTE) in 2014 (Seafish, 2014). This illustrates that consolidation has occurred in the sector to the point where just one main scampi processor (Whitby Seafoods) processes tails in Kilkeel. Another processor (Youngs) also buys tails, which are frozen and stored before being transported to the UK mainland factory for processing. There are also a small number of whole prawn processors operating in Northern Ireland.

Prawn processing capacity remains in NI ports to tap into the direct supplies from the local fleet. Whitby Seafoods recently made a £1.3 million investment in a new processing plant, consolidating two older premises and creating an additional 20 permanent jobs with the M.D. stating, “We’re delighted to continue to invest in Kilkeel as we recognise the value of dedicated Northern Irish

prawn fishermen working in this area and the benefit our experienced and skilled staff bring to the business<sup>7</sup>.”

Local landings do not fully support the raw material demands of Northern Ireland’s scampi processors. DARD data from 2010 (Table 5) identified that around 60% of tails comes from the local fleet (row **b**), with additional supplies from Ireland and elsewhere in the UK. Consultation in 2016 indicated that the situation remains broadly similar despite the consolidation seen in the sector.

**Table 5 Consumption of whole prawn & tails by NI processors**

		2009		2010	
<b>a</b>	Tails-live weight of animals (from landing records) in T	5,888	81%	5,553	78%
	Whole prawns (from landing records) in T	1,409	19%	1,570	22%
	total	7,297		7,123	
	Total tails used (from scampi processors) in T	3,029		3,244	
<b>b</b>	Tails sourced in NI in T	1,863	62%	1,829	56%
<b>c</b>	Tails live weight of animals (ie x3) in T	5,589	95%	5,487	99%
<b>d</b>	Whole prawns used by NI industry	1,045	74%	1,070	68%

Source: DARD

With less supply available from the local fleet, processors would have to source a greater proportion from elsewhere. The strategic benefit of being located at the Northern Ireland ports would be diminished. As the main market is on the UK mainland, companies would weigh up the pros and cons of continued operation in Northern Ireland. If more landings were to the UK mainland, relocation or (for the larger companies) further consolidation to mainland premises is more likely.

If the NI processors closed, the vessels would land less of their catch into Northern Ireland’s ports and instead land more of their catch to the remaining processors in South West Scotland and Cumbria, creating a cycle of decline in Northern Ireland’s fishing ports.

### 5.3 COMMUNITY IMPACTS

The prawn fleet is based at the three main NI fishing ports Ardglass, Kilkeel and Portavogie. The number of full time fishermen at these ports in 2009 and 2013 and how this relates to local employment in the towns (ward level) is presented in Table 6. This illustrates the very high level of dependency on fishing employment in these areas. This dependency is higher still when upstream and downstream industries are taken into account, such as employment in vessel services and processing.

**Table 6 Fishing employment as a proportion of local employment**

Port	2009			2013		
	Full time fishermen	Total employment	Fishing as % of total	Full time fishermen	Total employment	Fishing as % of total
Ardglass	98	496	19.7%	103	518	19.9%
Kilkeel	230	2,384	9.6%	331	2,204	15%
Portavogie	187	474	39.5%	210	446	47%

Source: MMO, NISRA

<sup>7</sup> The Skipper (2016) ‘Kilkeel Seafoods cut the ribbon on their new factory’ The Skipper, January 2016.

Table 6 shows that the dependency of these communities on fishing has actually increased between 2009-2013, during the economic downturn. This trend has been seen in other fishing ports<sup>8</sup> such as Castletownbere: “The local fisheries sector has been critical for local employment, as it has absorbed some of the losses seen in other sectors, such as construction. Those fishing part-time in previous years are now remaining within the industry on a full-time basis.” (Cappell, 2010)

The Northern Ireland economy as a whole has been slow to recover from the economic downturn compared to other regions of the UK, showing a 1% contraction in nominal Gross Value Added (GVA)<sup>9</sup> between 2007 and 2012 compared to a UK average of 6% growth in GVA over the same period (ONS, 2015).

Northern Ireland’s GVA per head of population was only 77% of the UK average in 2013 and this gap has widened since 2007 when it sat at 84% of the UK average (ONS, 2015). This further highlights the importance of Northern Ireland’s indigenous industries such as fishing, which make a substantial contribution in these areas.

As the NI processing industry retains nearly all NI landings, the impacts on the UK economy from any reduction to NI fleet landings can be expected to predominantly occur in Northern Ireland.

---

<sup>8</sup> See socio-economic studies on Killybegs and Castletownbere respectively ([http://ec.europa.eu/fisheries/documentation/studies/regional\\_social\\_economic\\_impacts/killybegs\\_en.pdf](http://ec.europa.eu/fisheries/documentation/studies/regional_social_economic_impacts/killybegs_en.pdf) and [http://www.bim.ie/media/bim/content/publications/Economic%20Survey%20to%20Determine%20the%20Importance%20of%20Seafood%20Activity%20for%20Castletownbere%20Region\\_April2012.pdf](http://www.bim.ie/media/bim/content/publications/Economic%20Survey%20to%20Determine%20the%20Importance%20of%20Seafood%20Activity%20for%20Castletownbere%20Region_April2012.pdf) )

<sup>9</sup> GVA is a measure of the value of goods and services produced in the economy.

## 6 CONCLUSIONS

---

### 6.1 FISHING INTENSITY

- The current proposals for Marine Conservation Zones include the closure of areas to benthic fishing. As the proposed areas are *Nephrops* grounds, this directly impacts the entire NI prawn fleet amounting to 120 vessels (82% of the over 10m fleet).
- The MCZs in which the NI fleet fishes are Mud Hole (MCZ1), West of Walney & proposed co-location zone (MCZ2), South Rigg (MCZ6) and Slieve Na Griddle (MCZ7). These account for significant proportions of the fishing effort recorded within the ICES rectangles containing them.
- The nine years of data used in this analysis (2006-2014) illustrates the inter-annual variability of NI prawn fleet effort as it moves between key grounds.
- Fishing effort in South Rigg has somewhat reduced in recent years, while activity in Slieve Na Griddle has remained more stable.

### 6.2 VALUE PER MCZ

- The most valuable rMCZ for the NI fleet remains South Rigg (MCZ6), partly due to its large size.
- Slieve Na Griddle shows the highest landings value per km<sup>2</sup>
- Queenie Corner, the alternative site proposed by industry exhibits the lowest landings value per km<sup>2</sup>, but it does still contain significant *Nephrops* catches and the habitat that Defra wish to conserve through creation of MCZs in the Irish Sea i.e. deep sea mud habitat.
- Due to the size of Queenie Corner (147km<sup>2</sup>), it accounts for a larger average landings value than Mud Hole, which is half the size (72.6km<sup>2</sup>).
- More tails are landed compared to whole prawns in all areas, but Queenie Corner shows the highest ratio, i.e. more tails are landed compared to whole prawns in this area than in the others.
- Although Queenie Corner is a productive fishing ground, less value is gained from fishing here compared to the other areas considered.

### 6.3 FLEET PERFORMANCE

- Fleet profitability closely reflects the variations in prawn prices and has generally improved over the last decade.
- Significant dips were observed in 2009/10 and again in 2013, when the problem of low prawn prices was compounded by higher fuel prices.
- A loss of revenue does not always result in a proportionate decrease in profitability, but the loss of higher value prawns from the deep-water areas may have a proportionally greater impact on overall profitability.
- The consequences of displacement and the ability of the fleet to replace these lost earnings are difficult to predict and to quantify. Costs may well increase as vessels would be forced to fish further afield, increasing fuel costs and reducing profitability.
- The remaining grounds would experience higher fishing effort than before the restrictions (days at sea allowing), which would result in a reduced catch per unit effort (CPUE) and so further reducing profitability.

- For the smaller vessels that have a more restricted range, there are fewer alternative grounds available, and none that provide the good quality large prawns found on the South Rigg and Slieve Na Griddle grounds. This group would therefore experience the greatest impact from current proposals.

#### 6.4 SOCIO-ECONOMIC IMPACTS

- The *Nephrops* fleet based at the three main NI fishing ports represents the great majority of jobs in the NI catching sector.
- Fishing accounts for 47% of employment in Portavogie, 20% in Ardglass and 15% in Kilkeel.
- Community dependence on fishing is even higher when upstream and downstream industries, such as vessel services and processing, are taken into account and that dependency has increased as a result of the economic downturn.
- The number of Northern Ireland fish processing units has decreased significantly from 27 in 2008 to 16 in 2014. However, jobs in processing have only shown a slight decline from 593 in 2008 to 562 FTE in 2014 (Seafish, 2014), illustrating consolidation of the NI processing sector.
- Supply chains are highly dependent on these local processors as buyers; there is a co-dependence between the NI fleet and NI processors.
- If the NI processors closed, the vessels would land less of their catch into Northern Ireland's ports and instead land more of their catch to the remaining processors in South West Scotland and Cumbria, creating a cycle of decline in Northern Ireland's fishing ports.
- As the NI processing industry retains nearly all NI landings, the impacts on the UK economy from any reduction to NI fleet landings can be expected to predominantly occur in Northern Ireland.
- The Northern Ireland economy has been slow to recover from the economic downturn compared to other regions of the UK; between 2007 and 2012 nominal GVA contracted by 1% compared to 6% growth for the UK as a whole.
- Northern Ireland's GVA per head of population was only 77% of the UK average in 2013. This gap has widened since 2007 when it sat at 84% of the UK average (ONS, 2015).
- Northern Ireland's fishing industry makes a substantial contribution to the economy of the Down ports.

#### 6.5 SUMMARY

- This analysis confirms that Queenie Corner (identified as a potential alternative site following AFBI habitat analysis and industry consultation in 2015) is a less valuable ground for the *Nephrops* fleet than the three rMCZs previously considered. It also shows that it is a productive ground that is fished by the NI *Nephrops* fleet.
- It appears a preferable alternative site compared to the three rMCZs of Slieve Na Griddle, Mud Hole and South Rigg, but closure to fishing will still result in some displacement as the catch from this site would be sought elsewhere.

## REFERENCES

---

**AFBI (2015)** Alternative Marine Conservation Zones in Irish Sea mud habitat: potential for fisheries displacement and an assessment of habitat condition and potential management scenarios. Clements, A. and Rooney, L. AFBI report to Seafish June, 2015.

**Cappell (2010)** Casteltownbere: An Economic Survey to Determine the Level of Seafood Activity and Establish its Economic Importance for the Region. Poseidon report to BIM, Ireland.

**DARD (2015)** Volume and value of Northern Ireland fleet landings 2006-2014

**Defra (2015)** South Rigg Candidate Marine Conservation Zone not proposed for designation in the second tranche January 2015 Consultation on Sites Proposed for Designation in the Second Tranche of Marine Conservation Zones. South Rigg report Available at: [https://consult.defra.gov.uk/marine/tranche2mczs/supporting\\_documents/South%20Rigg%20cMCZ%20site%20summary.pdf](https://consult.defra.gov.uk/marine/tranche2mczs/supporting_documents/South%20Rigg%20cMCZ%20site%20summary.pdf)

**Gray et al (2016)** Gray, M., Stromberg, P-L., Rodmell, D. 2016. 'Changes to fishing practices around the UK as a result of the development of offshore windfarms – Phase 1.' The Crown Estate, 121 pages. ISBN: 978-1-906410-64-3

**Irish Sea MCZ Project (2011)** Identification of Fisheries Value Estimates for each pMCZ

**JNCC (2010)** Establishing fisheries management measures to protect Marine Conservation Zones, November 2010. JNCC, Defra, Natural England

**MMO (2015)** UK Seafisheries Statistics for 2014

**NISRA (2015)** Labour market report: Employment Ward level. Northern Ireland Statistics and Research Agency.

**ONS (2010)** Regional, sub-regional and local GVA 2010. Office for National Statistics

**Poseidon (2012)** Cappell, R., Nimmo, F. Rooney, L. "The value of Irish Sea Marine Conservation Zones to the Northern Irish fishing industry" Poseidon Report to the Seafish Northern Ireland Advisory Committee. Available at: [http://www.seafish.org/media/Publications/Poseidon\\_NI\\_MCZ\\_valuation\\_final\\_report\\_August\\_2012\\_2.pdf](http://www.seafish.org/media/Publications/Poseidon_NI_MCZ_valuation_final_report_August_2012_2.pdf)

**Poseidon (2015)** Fisheries Resource Access Mapping Project (FishRAMP): Economic Analysis and literature review. Poseidon report to SNIAC. Available at: [http://www.seafish.org/media/1417509/fishramp\\_economic\\_analysis\\_and\\_literature\\_review\\_2015.pdf](http://www.seafish.org/media/1417509/fishramp_economic_analysis_and_literature_review_2015.pdf)

**Seafish (2006)** The Economic impacts of the UK Sea fishing and fish processing sectors: An input-output analysis

**Seafish (2014)** UK Seafood Processing Industry Report.

**Seafish (2007-2015)** Annual Economic survey of the UK fishing fleet

**Tingley, D (2009)** Northern Ireland Fleet Futures Analysis (2008-2013 update) June 2009



## APPENDIX A: NI FLEET FISHING EFFORT IN MCZ AREAS (SOURCE: AFBI)

**Table 7 Number and proportion of fishing hours in each MCZ as % of total fishing hours**

year	Mud Hole	% of fishing hours	% of time in '37E6	Queenie Cori	% of fishing hours	% of time in '36E4	Slieve Na Gri	% of fishing hours	% of time in '37E4	South Rigg	% of fishing hours	% of time in '37E4	'37E5
2006	3207	2.5%	15.8%	1070	0.8%	2.9%	1543	1.2%	2.7%	3394	2.7%	5.1%	
2007	3114	2.0%	12.5%	1714	1.1%	3.9%	1960	1.2%	2.8%	3864	2.5%	4.6%	
2008	1166	1.1%	12.1%	575	0.5%	1.6%	1393	1.3%	2.8%	2019	1.9%	3.4%	
2009	1545	1.0%	11.9%	1613	1.0%	3.0%	2233	1.5%	3.3%	4378	2.8%	5.4%	
2010	1918	1.3%	16.5%	1185	0.8%	2.5%	1714	1.2%	2.5%	3099	2.2%	3.9%	
2011	1064	0.8%	11.8%	841	0.6%	1.8%	1576	1.1%	2.3%	1748	1.2%	2.2%	
2012	723	0.7%	13.4%	1102	1.0%	2.9%	1281	1.2%	2.4%	1036	1.0%	1.7%	
2013	646	0.7%	10.7%	1512	1.6%	4.0%	1327	1.4%	3.4%	878	0.9%	1.9%	
2014	944	0.7%	9.5%	1838	1.4%	3.6%	1291	1.0%	2.3%	1097	0.8%	1.7%	

**Table 8 Number of fishing hours per ICES sub-rectangle containing MCZs**

Sum of fishing	2006	2007	2008	2009	2010	2011	2012	2013	2014
'36E4	6,481	3,846	5,311	4,027	7,375	45,744	38,325	7,656	51,104
'37E4	6,221	9,851	9,615	8,449	8,866	67,256	2,809	8,579	56,823
'37E5	0,417	4,351	0,174	2,445	0,670	1,636	8,024	7,149	6,333
'37E6	0,330	4,876	9,603	2,930	1,603	8,993	5,386	6,042	9,904

## APPENDIX B: LANDED VALUES PER ICES RECTANGLE (SOURCE: DARD)

**Table 9 Value of NI fleet landings from key Irish Sea ICES rectangles**

Value of total landings from ICES rectangles

ICES rectangle	2006	2007	2008	2009	2010	2011	2012	2013	2014
'36E4	£ 1,105,080	£ 1,763,540	£ 1,018,911	£ 1,128,532	£ 1,338,685	£ 1,041,207	£ 1,700,992	£ 1,490,511	£ 1,637,674
'37E4	£ 1,504,648	£ 1,874,500	£ 1,893,086	£ 1,538,435	£ 1,648,369	£ 1,110,815	£ 1,074,205	£ 1,574,347	£ 1,409,520
'37E5	£ 1,591,702	£ 1,050,340	£ 1,444,870	£ 1,297,582	£ 1,516,902	£ 1,406,920	£ 1,501,649	£ 1,932,726	£ 1,951,715
'37E6	£ 188,307	£ 162,169	£ 104,865	£ 117,453	£ 180,575	£ 167,949	£ 160,523	£ 193,734	£ 104,236

Value of NI Nephrops fleet landings from ICES rectangles

ICES rectangle	2006	2007	2008	2009	2010	2011	2012	2013	2014
'36E4	£ 1,895,733	£ 1,594,035	£ 1,841,030	£ 1,153,593	£ 1,351,964	£ 1,953,515	£ 1,374,387	£ 1,193,877	£ 1,419,373
% of total landings	96%	96%	97%	101%	100%	99%	94%	93%	95%
'37E4	£ 1,447,378	£ 1,434,942	£ 1,563,115	£ 1,152,295	£ 1,159,294	£ 1,865,536	£ 1,542,201	£ 1,575,429	£ 1,981,050
% of total landings	84%	82%	85%	82%	81%	78%	79%	79%	74%
'37E5	£ 1,602,465	£ 1,405,366	£ 1,385,979	£ 1,081,014	£ 1,224,149	£ 1,288,381	£ 1,569,772	£ 1,011,021	£ 1,897,853
% of total landings	62%	69%	57%	47%	37%	38%	35%	26%	30%
'37E6	£ 120,841	£ 131,249	£ 156,414	£ 128,332	£ 118,096	£ 177,040	£ 149,150	£ 190,123	£ 115,617
% of total landings	83%	81%	82%	89%	89%	88%	85%	74%	88%

\* *Nephrops* fleet landings exclude pelagic species & shellfish other than *Nephrops*