



**AGRI-FOOD
& BIOSCIENCES
INSTITUTE**

Impact assessment –
Fisheries management
proposals for MPAs

Final version

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Executive Summary

This document examines the effort and value of fisheries within Marine Protected Areas (MPAs) around the Northern Ireland coast. It also provides a critique to the proposed management options for the MPAs. Information used for this report has come from AFBI observer trips, Vessel Monitoring System (VMS) data and landings figures. However, there are gaps in our knowledge, most significantly, the lack of information on where the under 12m fleet, which is not required to have VMS, operates. This relates to both vessels fishing static and mobile gear.

1. Skerries and Causeway MPA

There is good observer coverage of static gear within the area, with an average of 49% of vessels targeting the area having been captured by the programme. Of the strings which have been surveyed an average of 83% were on the designated features (76% on reef; 6% on sandbank; 0.78% on seagrass).

VMS analysis of the International Council for the Exploration of the Sea (ICES) rectangle 39E3 showed that an average of 1% of the fishing (of vessels greater than 12m length) is within the MPA boundary. With only a small proportion of vessels targeting 39E3 being less than 12m in length, the majority of mobile fishing within the area is covered by VMS analysis. Mobile gear fishing in the area is primarily for scallops (king and queen), by dredge and trawl. For dredge fishing within the MPA boundary, an average of 36.5% of the activity takes place on the sandbanks and a further 31.8% on the reef. For trawling, 75% of the activity takes place on the sandbanks and 24.4% on the reef feature.

2. Rathlin MPA

With limited observer coverage and no VMS for the pot fishery, assumptions have been made. There has been observer coverage of 100 strings within the Rathlin MCZ boundary. Of these, 98 were on the rocky reef designated feature (eight of which were on the fragile sponge and anthozoan community on subtidal rocky habitat); one of the strings was on the sandbanks feature; one string was within the MPA but not on a protected feature.

VMS analysis of ICES rectangle 39E3 up to 2016 showed that an average of 0.9% of the fishing (of vessels greater than 12m length) is within the MPA boundary. With only a small proportion of vessels targeting 39E3 being less than 12m in length, the majority of mobile fishing within the area is covered by VMS analysis. Mobile gear fishing in the area is primarily for scallops (king and queen), by dredge and trawl. For dredge fishing within the MPA, an average of 13.1% of the activity takes place on the sandbanks and a further 19.8% on the reef. For trawling, whilst no activity takes place on the sandbanks, 39.3% of trawling within the MPA is on the reef feature.

3. Maidens MPA

Data from only two pot fishing observer trips was available for the Maidens. Based on this, the extent of the static fishery within the MPA cannot be determined.

VMS covers approximately 70% of vessels targeting ICES rectangles 38E4 and 39E4, with the remaining vessels being less than 12m in length (based on scallop vessels targeting the area). Only a very low proportion of the effort from the two ICES rectangles is within the MPA boundary (0.1%). For the dredge fishery within the Maidens MPA, an average of 73.85% of the activity takes place on the reef feature. In 2016, the only year when there was bottom trawling within the MPA boundary, it was all on the rocky reef feature.

4. Red Bay MPA

No data is available from either the observer programme or VMS data within the MPA boundary. Therefore the extent of any possible static or mobile gear fishing within the area is unknown.

5. Waterfoot MPA

No data is available from either the observer programme or VMS data within the MPA boundary. Therefore the extent of any possible static or mobile gear fishing within the area is unknown.

6. Outer Belfast Lough MPA

Whilst observer data is unavailable for the MPA, VMS data is available from vessels fishing both static and mobile gear. However, with this VMS representing less than 1% of the static gear effort within ICES rectangle 38E4, it is impossible to determine the actual effort within the MPA.

Annually, an average of 0.9% of mobile gear within ICES rectangle 38E4 is within the Outer Belfast Lough MPA boundary. Dredging is the most prominent mobile gear, followed by trawling and other mobile gears.

7. Strangford Lough MPA – Outer area of Strangford Lough MCZ

This refers to the area of the MPA which is outside of the Special Area of Conservation (SAC) and Special Protection Area (SPA) and therefore is currently without fisheries regulations.

No VMS records are present within this area of the MCZ for vessels using static gear, therefore all vessels targeting the area are under 12m in length. Whilst observer trips have been carried out within the Strangford Lough MCZ Outer area, with the potential effort coming from so many areas it would be impossible to get an estimated value of the fishery in the area with any near certainty.

Within the MPA boundary, dredging had an annual average of 1.6 fishing hours.

8. Murlough MPA

Both observer and VMS data is available for vessels using static gear within the Murlough MPA. Of the string data collected by observers, none of the 43 within the MPA boundary were on the protected sandbank feature. However, VMS for static gear shows a small (3.3%) amount of activity on the sandbank.

Annually, a small proportion of mobile fishing within ICES rectangle 37E4 is within the Murlough MPA boundary (0.03%). An average of 1% of the activity within the MPA took place on the sandbank feature.

9. Carlingford Lough MPA

No data available from either the observer programme or VMS data within the MPA boundary. Therefore the extent of any possible static or mobile gear fishing within the area is unknown.

Assessment of proposed management measures

Dredging is seen as the most environmentally damaging form of fishing. Prohibiting dredging from an area will not only reduce the impact of mobile fishing on designated features but it will also have secondary affects which may, in turn, benefit fishing. Prohibiting dredging would allow the area to recover aiding in the recovery of species such as hydroids and bryozoans, species which are key to the

settlement of juvenile scallops. This in turn could, if the MPA is in a suitable area, provide a high abundance area which seeds fishing grounds outside of the protected area.

Potting is thought of as a relatively benign form of fishing. A study in Lyme Bay showed that low levels of potting had no impact on the seabed environment or target species apart from a potential effect on the Ross coral (Rees et al., 2018). However, if a stock is not being fished sustainably, potting effort should be limited.

Recommendations

Apart from information collected through the AFBI observer programme, there is no spatial data available for the under 12m fleet. With a large proportion of the Northern Ireland fleet falling into this size category, there is a significant amount of data missing. Whilst available data can be used as a proxy, it may not be completely accurate. For example, with regards scallops, smaller vessels can fish in areas which larger vessels cannot. Based on VMS data it may look like an area is not fished but it could be targeted by the smaller vessels. A form of VMS applicable to the inshore fisheries would provide the full picture of fishing effort.

All pot fishing information provided is based on commercial records. However, in parts of Northern Ireland, including areas which are MPAs there can be a significant number of recreational fishing pots. In order to provide an accurate assessment of the fishery it is important to know the total effort. Whilst commercial effort can be determined through monthly returns, at present there is no estimate of recreational fishing. In England this has been addressed by Northumberland Inshore Fisheries and Conservation Association through a pot tagging scheme. All pots that are fished in the area must be tagged with commercial pots being tagged with one colour and recreational pots tagged with another. They work this in with their pot limit so that they provide each commercial fisherman with a fixed number of tags. As part of their monthly returns they must report if any pots (and therefore tags) have been lost before a new tag can be claimed. With the current hobby limit in Northern Ireland being five pots, it could be introduced that each hobby fisherman can apply for five tags. The level of uptake would provide an indication of the level of recreational fishing.

1. Introduction

AFBI have been asked to provide details on inshore fisheries around Marine Protected Areas (MPAs) so that a cost benefit analysis can be included in the consultation on proposed fisheries management measures for MPAs. Table 1 shows the preferred fishing management options as set by DAERA for the nine MPAs:

1. Skerries and Causeway Special Area of Conservation (SAC)
2. Rathlin - Rathlin Island SAC / Special Protection Area (SPA) and Rathlin Marine Conservation Zone (MCZ)
3. Maidens SAC
4. Red Bay SAC
5. Waterfoot MCZ
6. Outer Belfast Lough MCZ
7. Strangford Lough SAC/SPA and MCZ- Outer Strangford Lough MCZ
8. Murlough SAC
9. Carlingford MCZ

This document will examine:

1. The current effort and value of fishing (static and towed gear) for each MPA.
2. Impact of proposed management measures on static and towed gear.
3. Benefits of proposed management measures.
4. Advice on the management proposals.

Table 1: Proposed Fishing Management Options as presented by DAERA

| MPA | Habitat | Proposed Management Option |
|------------------------------|---|---|
| Skerries and Causeway | Reef | Prohibition of dredging and trawling in reef Managed pot fishing, including: <ul style="list-style-type: none"> • Following best practice on biosecurity to prevent the spread of disease and invasive species; • Mandatory vessel monitoring for all vessels operating in the MPA; • Introduction of pot tagging scheme to enable quantification of effort, with different colours for commercial and recreational pots; • Mandatory recording of bycatch and entanglements of protected species; and • Continued use of more selective gear |
| | Sandbank | Prohibition of dredging and trawling in sandbank Managed pot fishing, including: <ul style="list-style-type: none"> • Following best practice on biosecurity to prevent the spread of disease and invasive species; • Mandatory vessel monitoring for all vessels operating in the MPA; • Introduction of pot tagging scheme to enable quantification of effort, with different colours for commercial and recreational pots; • Mandatory recording of bycatch and entanglements of protected species; and • Continued use of more selective gear |
| | Sandbank: seagrass (<i>Zostera marina</i>) beds | Prohibition of dredging and trawling in sub-feature seagrass bed Prohibition of potting in seagrass zone |
| | Caves | Managed pot fishing, including: <ul style="list-style-type: none"> • Following best practice on biosecurity to prevent the spread of disease and invasive species; • Mandatory vessel monitoring for all vessels operating in the MPA; • Introduction of pot tagging scheme to enable quantification of effort, with different colours for commercial and recreational pots; • Mandatory recording of bycatch and entanglements of protected species; and • Continued use of more selective gear |
| | | |
| Rathlin | Reef | Prohibition of dredging and trawling in reef Managed pot fishing, including: <ul style="list-style-type: none"> • Following best practice on biosecurity to prevent the spread of disease and invasive species; • Mandatory vessel monitoring for all vessels operating in the MPA; • Introduction of pot tagging scheme to enable quantification of effort, with different colours for commercial and recreational pots; • Mandatory recording of bycatch and entanglements of protected species; and • Continued use of more selective gear |
| | Reef: fragile sponge and anthozoan | Prohibition of dredging and trawling in fragile sponge and anthozoan community on subtidal rocky outcrops Prohibition of potting in fragile sponge and anthozoan community on subtidal rocky outcrops |

| | | |
|------------------|---|--|
| | community on subtidal rocky outcrops | |
| | Sandbank | <p>Prohibition of dredging and trawling in sandbank</p> <hr/> <p>Managed pot fishing, including:</p> <ul style="list-style-type: none"> • Following best practice on biosecurity to prevent the spread of disease and invasive species; • Mandatory vessel monitoring for all vessels operating in the MPA; • Introduction of pot tagging scheme to enable quantification of effort, with different colours for commercial and recreational pots; • Mandatory recording of bycatch and entanglements of protected species; and • Continued use of more selective gear |
| | Caves | <p>Managed pot fishing, including:</p> <ul style="list-style-type: none"> • Following best practice on biosecurity to prevent the spread of disease and invasive species; • Mandatory vessel monitoring for all vessels operating in the MPA; • Introduction of pot tagging scheme to enable quantification of effort, with different colours for commercial and recreational pots; • Mandatory recording of bycatch and entanglements of protected species; and • Continued use of more selective gear |
| | Deep sea bed | <p>Prohibition of dredging and trawling in Deep Sea bed</p> <hr/> <p>Managed pot fishing, including</p> <ul style="list-style-type: none"> • Following best practice on biosecurity to prevent the spread of disease and invasive species; • Mandatory vessel monitoring for all vessels operating in the MPA; • Introduction of pot tagging scheme to enable quantification of effort, with different colours for commercial and recreational pots; • Mandatory recording of bycatch and entanglements of protected species; and • Continued use of more selective gear introduction of pot tagging scheme and vessel monitoring |
| | Black guillemot habitat | As per Rathlin sandbank and reef management |
| Red Bay | Sandbank: Maerl | <p>Prohibition of dredging and trawling in sub-feature Maerl</p> <p>Prohibition of potting in Maerl zone</p> |
| Waterfoot | Seagrass (<i>Zostera marina</i>) beds | <p>Prohibition of dredging and trawling in seagrass bed (whole MPA)</p> <p>Prohibition of potting in seagrass bed (whole MPA)</p> |
| Maidens | Reef | <p>Prohibition of dredging and trawling in reef</p> <hr/> <p>Managed pot fishing, including:</p> <ul style="list-style-type: none"> • Following best practice on biosecurity to prevent the spread of disease and invasive species; • Mandatory vessel monitoring for all vessels operating in the MPA; • Introduction of pot tagging scheme to enable quantification of effort, with different colours for commercial and recreational pots; • Mandatory recording of bycatch and entanglements of protected species; and |

| | | |
|--|--|--|
| | | <ul style="list-style-type: none"> Continued use of more selective gear |
| | Sandbank: Maerl | Prohibition of dredging and trawling in sub-feature Maerl |
| | | Prohibition of potting in maerl zone |
| Outer Belfast Lough | Ocean Quahog (<i>Arctica islandica</i>) on Subtidal Sands | Prohibition of trawling and dredging on ocean quahog habitat Managed pot fishing, including: <ul style="list-style-type: none"> Following best practice on biosecurity to prevent the spread of disease and invasive species; Mandatory vessel monitoring for all vessels operating in the MPA; Introduction of pot tagging scheme to enable quantification of effort, with different colours for commercial and recreational pots; Mandatory recording of bycatch and entanglements of protected species; and Continued use of more selective gear |
| Outer Strangford Lough ¹ | Priority Marine Features (PMFs) | Extend existing prohibition of demersal mobile gear use in the SAC to include full extent of the MCZ and associated habitats and PMFs in that area. Managed pot fishing, including: <ul style="list-style-type: none"> Following best practice on biosecurity to prevent the spread of disease and invasive species; Mandatory vessel monitoring for all vessels operating in the MPA; Introduction of pot tagging scheme to enable quantification of effort, with different colours for commercial and recreational pots; Mandatory recording of bycatch and entanglements of protected species; and Continued use of more selective gear |
| Murlough | Sandbank | Prohibition of trawling and dredging in sandbank Managed pot fishing, including: <ul style="list-style-type: none"> Following best practice on biosecurity to prevent the spread of disease and invasive species; Mandatory vessel monitoring for all vessels operating in the MPA; Introduction of pot tagging scheme to enable quantification of effort, with different colours for commercial and recreational pots; Mandatory recording of bycatch and entanglements of protected species; and Continued use of more selective gear |
| Carlingford | Sea-pen (<i>Virgularia mirabilis</i>) and <i>Philine aperta</i> in | Prohibition of dredging and trawling in Sea-pen and <i>P. aperta</i> in mud habitat feature Managed pot fishing, including: <ul style="list-style-type: none"> Following best practice on biosecurity to prevent the spread of disease and invasive species; Mandatory vessel monitoring for all vessels operating in the MPA; Introduction of pot tagging scheme to enable quantification of effort, with different colours for commercial and recreational pots; |

¹ Three out of the four broad scale habitats present within the area outside the Strangford Lough SAC, within the MCZ boundary, were identified as gaps in the MPA network assessment in Northern Ireland. These include sublittoral coarse sediment and small areas of moderate and low energy circalittoral rock. Although work to refine the list of pMCZ features is still ongoing, the proposed list will include Priority Marine Features (PMFs) present within these broad scale habitats, such as tide-swept channels and subtidal gullies. Additionally, important blue carbon habitat features such as kelp forests, present in this area, will be included in the revised NI PMF list, currently under development.

| | | |
|---------------|---|--|
| infralittoral | • | Mandatory recording of bycatch and entanglements of protected species; and |
| mud | • | Continued use of more selective gear |

2.0 Static Gear Effort and value of fishery

AFBI carries out fisheries dependent data collection of pot fisheries in Northern Ireland by placing an observer onboard commercial fishing vessels. The scheme has a broad spatial extent, covering inshore areas of VIa and VIIa. The majority (averaging 96%) of vessels fishing pots in Northern Ireland are under 12m in overall length and so are not required to have any form of vessel monitoring system (VMS) onboard. When observers are out, as well as collecting detailed catch and biological information for crab and lobster, they also record the location of fishing using a handheld GPS. This provides an indication of the location of pot fishing. However, there are limitations to this data:

1. AFBI staff are only on a small proportion of the vessels and so there are vessels that we have no indication of where they fish;
2. Whilst there is observer data for most of the Northern Ireland coastline, there are gaps where we been unable to get on a vessel;
3. The positional data collected by observers is for that day. Many boats will move their strings depending on the target species, weather, time of year etc.

As observer data is commercially sensitive, actual string positions are not published.

2.1 Skerries and Causeway MPA

Crab and lobster in Skerries and Causeway are primarily targeted by boats fishing out of Portrush, Portstewart and Portballintrae. This is a seasonal fishery operating between the spring and autumn, with weather being the limit to the fishery. No VMS records are present within the MPA for vessels using static gear, therefore all vessels targeting the area are under 12m in length. In comparison to the level of fishing around the rest of the coast, levels in the area would be considered low.

Annually, there are a maximum of six boats targeting the fishery. Table 2 shows the numbers of vessels fishing out of the three ports. Annually an average of 49% of pot boats in this area are covered by observers and so it is felt there is a good idea of the spatial extent of the fishery.

Table 2: Number of vessels fishing out of Portrush, Portstewart and Portballintrae (DAERA landings figures).

| Year | Number Boats Portrush | Number boats Portstewart | Number Boats Portballintrae | Number observer trips | Number unique vessels |
|------|-----------------------|--------------------------|-----------------------------|-----------------------|-----------------------|
| 2014 | 3 | 2 | 0 | 5 | 2 (40%) |
| 2015 | 2 | 2 | 1 | 4 | 3 (60%) |
| 2016 | 2 | 2 | 0 | 4 | 2 (50%) |
| 2017 | 3 | 3 | 2 | 8 | 6 (75%) |
| 2018 | 4 | 2 | 3 | 3 | 2 (22%) |

Over the five year analysis a total of 239 strings (1880 pots) have been sampled from the harbours of Portrush, Portstewart and Portballintrae. Of these strings, 209 were within the MPA boundary; 189 were on the rocky reef designated feature; ten of the strings were on the sandbanks feature; ten strings were within the MPA but not on a protected feature; 20 strings were outside of the MPA

boundary (Figure 1). An average of less than 1% of gear was reported within the seagrass area. Table 3 shows the estimated value of landings coming from areas where the designated features are present within the MPA

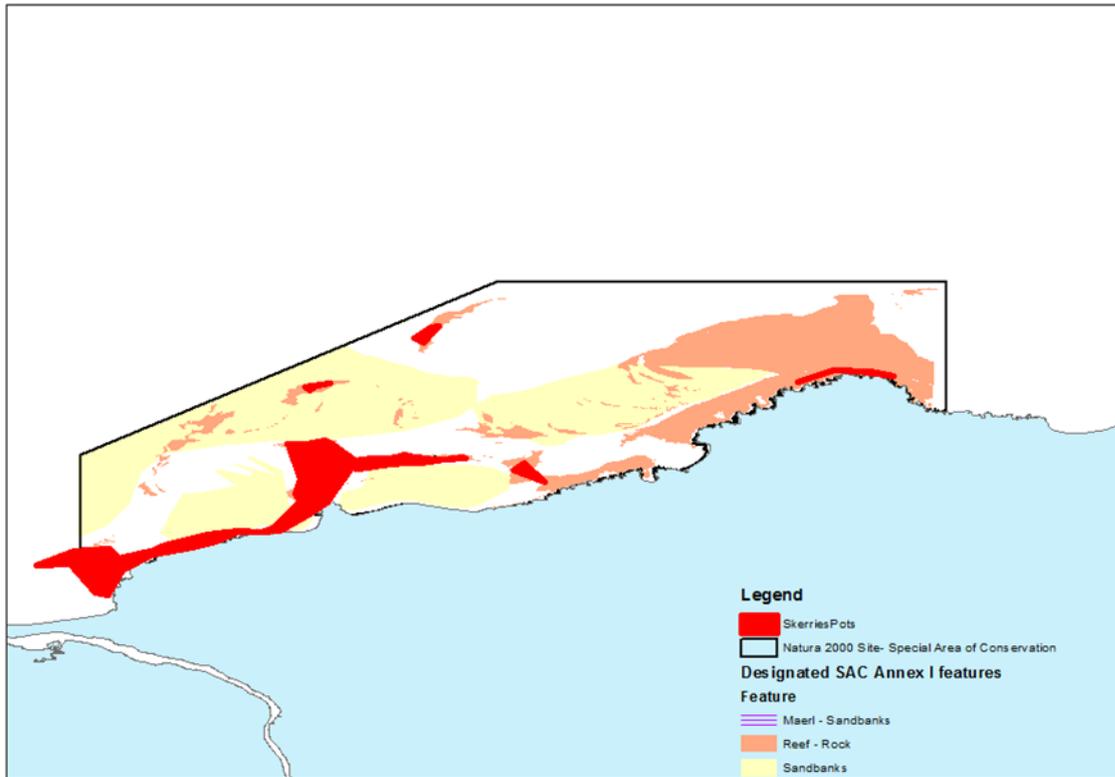


Figure 1: Indicative pot fishing areas (red polygon) within the Skerries and Causeway MPA.

Table 3: Landings from pot fishing reported into Portballintrae, Portrush and Portstewart (DAERA landings figures) and the estimated value of these landings attributed to designated features within the Skerries and Causeway MPA

| Landings | | | Strings sampled | | | | Est. landings | | | |
|----------------|----------------------------|---------------|-----------------|-------------|----------------|----------------|-------------------------|--------------------------|----------------------------------|--------------------------------|
| Year | Tonnes into three harbours | Value £ | Number | % on Reef | % on sand-bank | % on sea-grass | % on designated feature | Tonnes from MPA features | Value £ from designated features | Value £ landings from full MPA |
| 2014 | 6.3 | 26,934 | 68 | 82.4 | 2.9 | 0 | 85.3 | 5.4 | 22,974 | 24,160 |
| 2015 | 10.0 | 50,544 | 19 | 78.9 | 5.3 | 0 | 84.2 | 8.4 | 42,558 | 42,558 |
| 2016 | 15.1 | 52,728 | 29 | 58.6 | 3.4 | 0 | 62.0 | 9.4 | 32,691 | 36,382 |
| 2017 | 12.7 | 61,562 | 86 | 84.5 | 2.3 | 1.2 | 88.0 | 11.2 | 54,175 | 56,575 |
| 2018 | 10.5 | 81,523 | 37 | 75.7 | 5.4 | 2.7 | 83.8 | 8.8 | 68,316 | 72,719 |
| Average | 10.9 | 54,658 | 47.8 | 76.0 | 3.9 | 0.8 | 80.7 | 8.6 | 44,143 | 46,479 |

2.2.1 Rathlin MPA

No VMS records are present within the MPA for vessels using static gear, therefore all vessels targeting the area are under 12m in length. Based on AFBI observer trips, crab and lobster from Rathlin MPA are targeted by boats fishing out of Rathlin Island and Ballycastle. Whilst this is not to say that other boats do not fish in the area, as this is the only information available, this report will base findings on these two ports. Table 4 shows the numbers of vessels fishing out of the two ports. There is low observer coverage of this area and therefore analysis is of the five years between 2010 and 2018 when trips were within the MPA area. Figure 2 shows the indicative fishing pot fishing area within the MPA.

Table 4: Number of vessels fishing out of Rathlin and Ballycastle (DAERA landings figures)

| Year | Number Boats Rathlin | Number boats Ballycastle | Number observer trips | Number unique vessels |
|------|----------------------|--------------------------|-----------------------|-----------------------|
| 2010 | 2 | 5 | 1 | 1(14%) |
| 2011 | 2 | 1 | 1 | 1(33%) |
| 2013 | 2 | 1 | 2 | 1(33%) |
| 2016 | 2 | 3 | 1 | 1(20%) |
| 2017 | 2 | 2 | 1 | 1(25%) |

Over the five year analysis a total of 123 (1,673 pots) strings have been sampled from Rathlin Island and Ballycastle. Of these strings, 96 were within the MPA boundary (Table 5); 94 were on the rocky reef designated feature (eight of which were on the fragile sponge and anthozoan community on subtidal rocky habitat); one of the strings was on the sandbank feature; one string was within the MPA but not on a protected feature; 27 strings were outside of the MPA boundary.

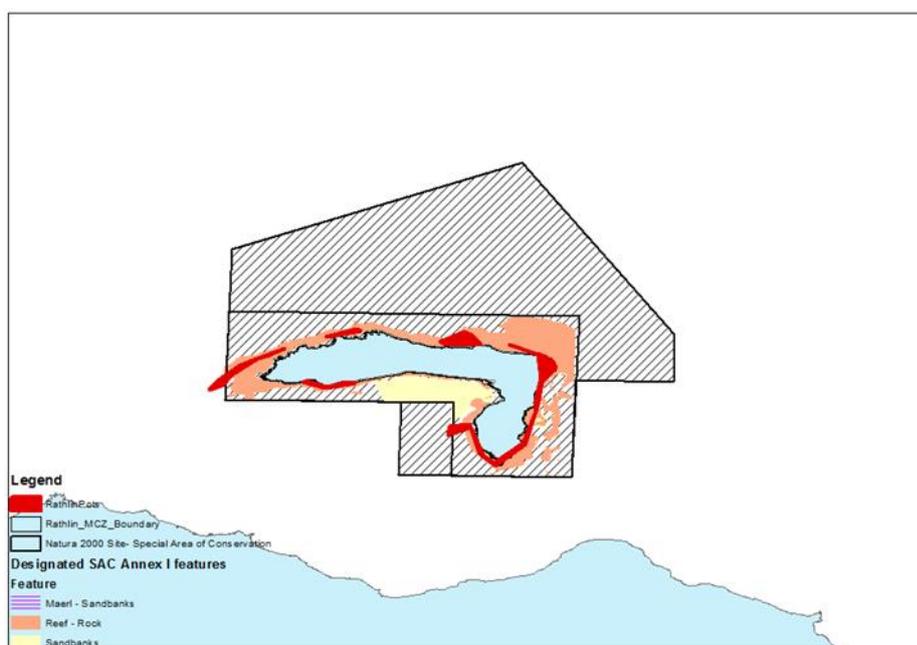


Figure 2: Indicative pot fishing areas (red polygon) within the Rathlin MPA.

Table 5: Landings from pot fishing reported into Rathlin Island and Ballycastle, and the estimated value of these landings attributed to designated features within the Rathlin MPA

| Year | Landings | | Strings sampled | | | | | Est. landings | | | |
|----------------|--------------------------|---------|--------------------|-----------|---------------|---|-------------------------|--------------------------|----------------------------------|---|--------------------------------|
| | Tonnes into two harbours | Value £ | Number | % on Reef | % on sandbank | % on fragile sponge and Anthozoan communities (on reef) | % on designated feature | Tonnes from MPA features | Value £ from designated features | Value £ from fragile sponge and Anthozoan communities (on reef) | Value £ landings from full MPA |
| 2010 | 114.3 | 220,191 | 14 | 37.7 | 7.1 | 0 | 42.8 | 48.9 | 94,242 | 0 | 94,242 |
| 2011 | 20.3 | 52,630 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2013 | 25.9 | 60,148 | 11 +78 single pots | 93.3 | 0 | 9.0 | 93.3 | 24.2 | 56,118 | 5413 | 56,780 |
| 2016 | 29.6 | 69,460 | 8 | 62.5 | 0 | 0 | 62.5 | 18.5 | 43,413 | 0 | 43,413 |
| 2017 | 14.4 | 59,025 | 4 | 25.0 | 0 | 0 | 25.0 | 3.6 | 14,756 | 0 | 14,756 |
| Average | 40.9 | 92,291 | 24 | 43.7 | 1.4 | 1.8 | 44.7 | 19.0 | 41,706 | 1083 | 41,838 |

2.2.2 Rathlin Island Marine Conservation Zone (MCZ)

No observer trips data is available within the Rathlin MCZ. Between 2012 and 2016 there is no VMS data for pot fishing vessels within the MCZ.

2.3 Maidens MPA

No VMS records are present within the MPA for vessels using static gear, therefore all vessels targeting the area are under 12m in length. With only two observer trips carried out in the Maidens area between 2010 and 2018 (Table 6), there is limited evidence as to how many boats fish for crab and lobster in the area. Therefore the effort and value of the fishery cannot be determined.

Table 6: Observer coverage within the Maidens MPA

| Year | Trips | Number Strings | % Strings on rock |
|------|-------|----------------|-------------------|
| 2011 | 1 | 7 | 100 |
| 2018 | 1 | 5 | 100 |

2.4 Red Bay MPA

No observer trips or VMS data is available within the Red Bay MPA.

2.5 Waterfoot MPA

No observer trips or VMS data is available within the Waterfoot MCZ.

2.6 Outer Belfast Lough MPA

No observer trips have been carried out within the Outer Belfast Lough MCZ. However, in 2014- 2016 VMS is present for static gear fishing vessels within 38E4 and within the MPA boundary (Figure 3). This analysis, based on VMS, does not include vessels under 12m in length. Table 7 gives a breakdown of the number of static gear vessels fishing within 38E4. Almost all of these vessels are under 12m and therefore are missed from the analysis. With such a high proportion of vessels missing from the analysis (99%), it is impossible to determine the actual effort within the MPA.

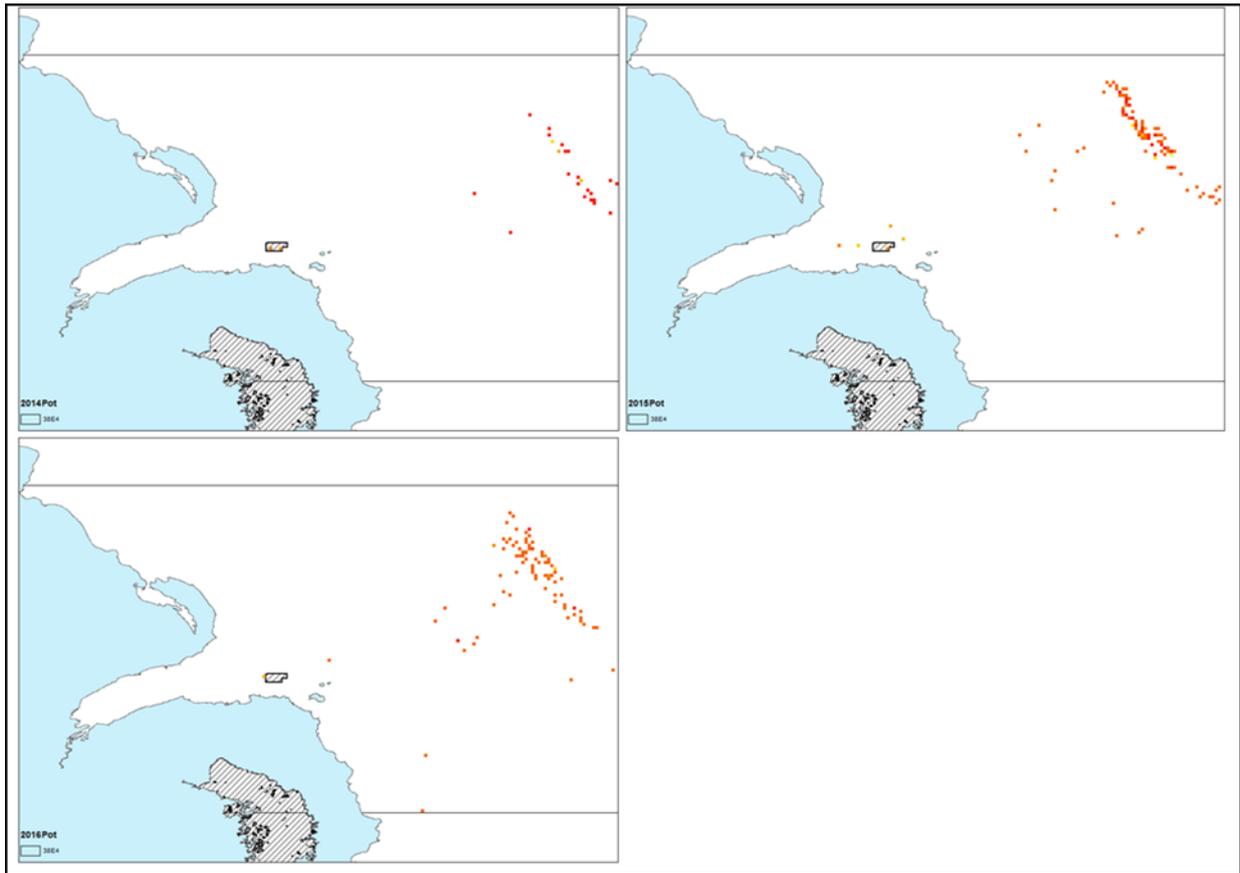


Figure 3: VMS from pot fishing vessels, within 38E4 between 2014 and 2016

Table 7: Number of vessels fishing static gear in ICES rectangle 38E4

| Year | Landings (tonnes) | | | Number vessels | | | | | |
|------|-------------------|---------|-------|----------------|-------------------|------------------|----------------------|---------------|--------------------|
| | Crab | Lobster | Whelk | Fishing crab | crab vessels <12m | Fishing lobsters | Lobster vessels <12m | Fishing whelk | Whelk vessels <12m |
| 2012 | 62.1 | 16.1 | 106.6 | 24 | 24 | 27 | 27 | 4 | 4 |
| 2013 | 54.2 | 14.6 | 63.1 | 24 | 24 | 27 | 27 | 5 | 5 |
| 2014 | 71.5 | 18.1 | 25.9 | 25 | 25 | 25 | 25 | 4 | 4 |
| 2015 | 70.5 | 13.1 | 34.1 | 18 | 18 | 20 | 20 | 2 | 2 |
| 2016 | 70.1 | 9.5 | 73.2 | 20 | 19 | 22 | 21 | 4 | 4 |

2.7 Outer Strangford Lough MCZ

No VMS records are present within this area of the MCZ for vessels using static gear, therefore all vessels targeting the area are under 12m in length. Whilst observer trips have been carried out within the Strangford Lough MCZ Outer area, with the potential effort coming from so many areas it would be impossible to get an estimated value of the fishery in the area with any near certainty.

2.8 Murlough MPA

Crab and lobster in Murlough are primarily targeted by boats fishing out of Newcastle, Ardglass and Annalong. Table 8 shows the numbers of vessels fishing out of the three ports.

Table 8: Number of vessels fishing out of Ardglass, Newcastle and Annalong (DAERA landings figures)

| Year | Number Boats Ardglass | Number boats Newcastle | Number Boats Annalong | Number observer trips | Number unique vessels |
|------|-----------------------|------------------------|-----------------------|-----------------------|-----------------------|
| 2014 | 11 | 1 | 16 | 2 | 2(7.1%) |
| 2015 | 11 | 1 | 13 | 3 | 1(4.0%) |
| 2016 | 12 | 0 | 15 | 1 | 1(3.7%) |
| 2017 | 19 | 0 | 9 | 1 | 1(3.6%) |
| 2018 | 22 | 0 | 15 | 3 | 2(5.4%) |

Over the five year analysis a total of 75 strings (1381 pots), have been sampled from the harbours of Newcastle and Annalong. Of these strings, 43 were within the MPA boundary. None of these strings were on the protected sandbank feature.

VMS records from vessels, which are greater than 12m in length, targeting static gear are also present within the MPA in 2014 (14.1 fishing hours), 2015 (20.0 fishing hours) and 2016 (4.0 fishing hours). The pot fishing VMS (figure 4) shows an average of 3.3% of the activity took place on the sandbank feature. Table 9 shows the estimated value of landings by vessels greater than 12m in length.

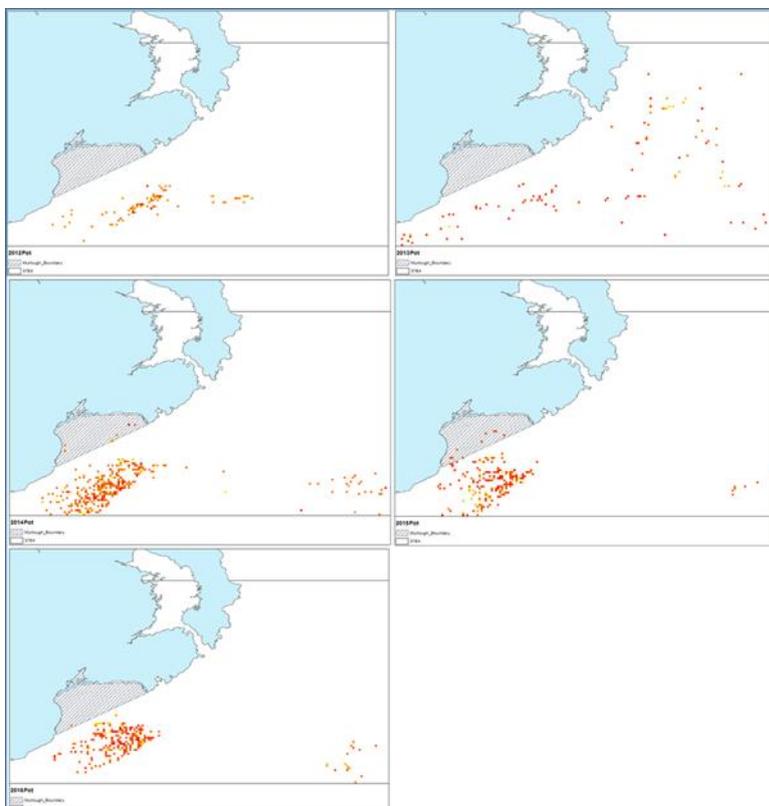


Figure 4: VMS from pot fishing vessels, within 37E4 between 2012 and 2016

Table 9: Estimated pot fishing landings by vessels greater than 12m within the Murlough MPA boundary (* value based on average price used in DAERA landings figures for each year in 37E4).

| Year | Landings (tonnes) | | Landings on sandbank | | Value £ landings from MPA* | Value £ landings from designated features |
|----------------|-------------------|---------|----------------------|---------|----------------------------|---|
| | Crab | Lobster | Crab | Lobster | | |
| 2012 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2013 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2014 | 0.5 | 0.1 | 0.2 | 0.03 | 1973 | 670 |
| 2015 | 0.5 | 0.07 | 0.4 | 0.05 | 1395 | 1053 |
| 2016 | 0.1 | 0 | 0 | 0 | 130 | 0 |
| Average | 0.2 | 0.04 | 0.1 | 0.02 | 700 | 345 |

2.9 Carlingford

No observer trips or VMS data is available within the Carlingford Lough MCZ

3.0 Mobile gear Effort and value of fishery

VMS data for all UK vessels was analysed to examine mobile gear within the protected areas. Whilst this will provide an indication of fishing in the area, it is limited as it only gives information for vessels greater than 12m in overall length. The smaller vessels, which are excluded from VMS, may also stay closer inshore and therefore may have an impact on the inshore MPAs currently being examined. In addition, VMS only produces a ping every two hours, meaning it is possible that fishing within an area may be missed if the tow duration is less than 2 hours.

Analysis is based on the five year period between 2012 and 2016.

3.1 Skerries and Causeway MPA

VMS analysis is based on the proportion of fishing within the MPA boundary in relation to the fishing within ICES rectangle 39E3. Table 10 gives a breakdown of the number of vessels fishing within the ICES rectangle. The majority of the mobile fishing within the rectangle is covered with VMS as only a small minority of vessels, an average of 6.1% for vessels targeting scallops and 9.2% for vessels targeting queenies, are under the 12m limit.

Figure 5 shows the VMS for dredge and trawl vessels between 2012 and 2016 (no other mobile gear VMS was recorded within the area). This activity would primarily be for scallops (king and/or queen). Annually, an average of 1% of the activity within ICES rectangle 39E3 is within the Skerries and Causeway MPA boundary. Of the two forms of fishing, dredging is the more prominent with an average of 44.89 fishing hours. Bottom trawl only took place within the MPA boundary in 2013 and 2014 averaging at 12.01 fishing hours over the two years.

Table 10: Landings figures for scallops and queenies from 39E3 and number of vessels targeting the fishery.

| Year | Landings (tonnes) | | Number vessels | | | |
|------|-------------------|---------|------------------|----------------------|------------------|----------------------|
| | Scallop | Queenie | Fishing scallops | scallop vessels <12m | Fishing queenies | Queenie vessels <12m |
| 2012 | 398.6 | 2271.7 | 30 | 2 | 24 | 1 |
| 2013 | 271.1 | 1079.6 | 20 | 2 | 22 | 0 |
| 2014 | 394.6 | 809.0 | 24 | 1 | 23 | 1 |
| 2015 | 251.2 | 74.0 | 21 | 1 | 4 | 1 |
| 2016 | 136.4 | 104.3 | 21 | 1 | 8 | 1 |

For the dredge fishery within the Skerries and Causeway MPA, an average of 36.5% of the activity takes place on the sandbanks and 31.8% on the reef feature. For the bottom net fishery, for the two years that it occurred within the MPA, an average of 75.0% of the activity takes place on the sandbanks and 24.4% on the reef feature.

In two of the five years analysed, a small value of the king scallop landings (average at 0.37 tonnes over the two years) was taken from the reef feature of the MPA (Table 11). A higher proportion of landings are taken from the sandbank feature with activity on the feature on four of the five years analysed, averaging at 1.89 tonnes.

With regards queen scallops, there were no landings from the rocky reef area. Three of the five years analysed showed landings of queenies from the sandbank feature (averaging at 1.84 tonnes).

Table 11: Landings figure from VMS for within the Skerries and Causeway MPA (* value based on average price used in DAERA landings figures for each year in 39E3).

| Year | Landings (tonnes) | | Landings on rocky reef | | Landings on sandbank | | Value £ landings from designated features | Value £ landings from MPA* |
|----------------|-------------------|----------|------------------------|----------|----------------------|----------|---|----------------------------|
| | Queenies | Scallops | Queenies | Scallops | Queenies | Scallops | | |
| 2012 | 2.9 | 0 | 0 | 0 | 1.8 | 0 | 802 | 1,293 |
| 2013 | 5.5 | 1.6 | 0 | 0 | 3.2 | 0.1 | 1,812 | 5,207 |
| 2014 | 0.9 | 2.5 | 0 | 0.3 | 0.5 | 0.8 | 2,294 | 5,074 |
| 2015 | 0 | 3.0 | 0 | 0 | 0 | 1.1 | 1,831 | 4,995 |
| 2016 | 0 | 8.7 | 0 | 0.5 | 0 | 5.5 | 9,236 | 13,392 |
| Average | 1.9 | 3.2 | 0 | 0.1 | 1.1 | 1.5 | 3,195 | 5,992 |



Figure 5: VMS from (left) dredge vessels and (right) trawl vessels, within 39E3 between 2012 and 2016

3.2 Rathlin SAC and MCZ

As with the Skerries and Causeway, VMS analysis is based on the proportion of fishing within the MPA boundary in relation to the fishing within ICES rectangle 39E3. Table 10 gives a breakdown of the number of vessels fishing within the area. The majority of the mobile fishing within the ICES rectangle is covered with VMS as only a small minority of vessels, an average of 6.1% for vessels targeting scallops and 9.2% for vessels targeting queenies, are under the 12m limit.

Figure 5 shows the VMS for dredge and trawl vessels between 2012 and 2016 (no other mobile gear VMS was recorded within the area). This activity would primarily be for scallops (king and/or queen). Annually, an average of 0.9% of the activity within ICES rectangle 39E3 is within the Rathlin MCZ boundary. Of the two forms of fishing, both of which took place each year between 2012 and 2016, dredging is the more prominent with an average of 28.04 fishing hours whilst bottom trawl averaged at 18.20 fishing hours.

For dredge fishing within the MPA, an average of 13.1% of the activity takes place on the sandbanks and a further 19.8% on the reef. For trawling, whilst no activity takes place on the sandbanks, 39.3% of trawling within the MPA is on the reef feature.

A small value of the king scallop landings (average at 0.07) was taken from the reef feature of the MPA (Table 12a). No scallop landings were taken from the sandbank feature.

With regards queen scallops, a small amount (average of 0.15 tonnes) was taken from the reef feature, with no queenie landings from the sandbank feature.

Within the deep sea area around Rathlin both dredging and trawling took place between 2012 and 2016. Trawling, which took place each year except 2015 had an average of 14.44 fishing hours whilst dredging, which took place each year except 2013, had an average of 4.22 fishing hours within the deep sea area (values shown in Table 12b).

Within the Black Guillemot area around Rathlin both dredging and trawling took place between 2012 and 2016. Trawling, which took place each year had an average of 11.54 fishing hours whilst dredging, which also took place each year, had an average of 23.43 fishing hours within the deep sea area (values shown in Table 12b).

Table 12: Landings figure from VMS for within the Rathlin MPA (* value based on average price used in DAERA landings figures for each year in 39E3).

| Year | Landings (tonnes) | | | Landings on rocky reef | | | Landings on sandbank | | | Value £ landings from designated features | Value £ landings from MPA* |
|----------------|-------------------|----------|----------|------------------------|----------|----------|----------------------|----------|----------|---|----------------------------|
| | Nephrops | Queenies | Scallops | Nephrops | Queenies | Scallops | Nephrops | Queenies | Scallops | | |
| 2012 | 0 | 0.46 | 0.12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 418 |
| 2013 | 0 | 3.23 | 0.32 | 0 | 0.77 | 0 | 0 | 0 | 0 | 401 | 2150 |
| 2014 | 0.05 | 0.79 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 582 |
| 2015 | 0 | 0 | 2.79 | 0 | 0 | 0.35 | 0 | 0 | 0 | 583 | 4646 |
| 2016 | 0 | 0.59 | 1.73 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3153 |
| Average | 0.01 | 1.02 | 0.99 | 0 | 0.15 | 0.07 | 0 | 0 | 0 | 197 | 2190 |

Table 12b: Landings figure from VMS for the deep sea and Black Guillemot areas around Rathlin (* value based on average price used in DAERA landings figures for each year in 39E3).

| Year | Landings from deep sea area | | Landings from Black Guillemot area | | | Value £ landings from deep sea | Value £ landings from black guillemot |
|----------------|-----------------------------|----------|------------------------------------|----------|----------|--------------------------------|---------------------------------------|
| | Nephrops | Queenies | Nephrops | Queenies | Scallops | | |
| 2012 | 0 | 0.46 | 0 | 0.46 | 0.12 | 205 | 418 |
| 2013 | 0 | 2.10 | 0 | 1.36 | 0.32 | 1093 | 1177 |
| 2014 | 0.05 | 1.90 | 0.05 | 0.3 | 0 | 1244 | 290 |
| 2015 | 0 | 0 | 0 | 0 | 2.79 | 0 | 4646 |
| 2016 | 0 | 0.51 | 0 | 0.22 | 1.73 | 423 | 2846 |
| Average | 0.01 | 0.99 | 0.01 | 0.47 | 0.99 | 593 | 1875 |

3.3 Maidens MPA

As the Maidens MPA falls within two ICES rectangles, VMS analysis is based on the proportion of fishing within the MPA boundary in relation to the fishing within ICES rectangles 38E4 and 39E4. Table 13 gives a breakdown of the number of vessels fishing within the area. An average of 30.4% of scallop vessels (scallops are primary target in the area) are under 12m in length and therefore are not recorded through the VMS analysis.

Table 13: Landings figures for scallops from 38E4 and 39E4

| Year | Scallop landings (tonnes) | Number vessels fishing scallops | Number scallop vessels <12m |
|-------------|---------------------------|---------------------------------|-----------------------------|
| 2012 | 449.9 | 51 | 13 |
| 2013 | 601.1 | 67 | 20 |
| 2014 | 718.1 | 75 | 22 |
| 2015 | 646.0 | 80 | 27 |
| 2016 | 699.9 | 69 | 23 |

Figure 6 shows the VMS for all mobile fishing gear within the ICES rectangles between 2012 and 2016. Within the MPA boundary itself there is only VMS recorded for bottom trawl and dredge vessels. Annually, an average of 0.1% of the activity within the two ICES rectangles is within the Maidens MPA boundary. Of the two forms of fishing, dredging, which took place each year within the MPA boundary, had an average of 39.35 fishing hours. Bottom trawling only occurred within the MPA in 2016 with an effort of 2.00 fishing hours.

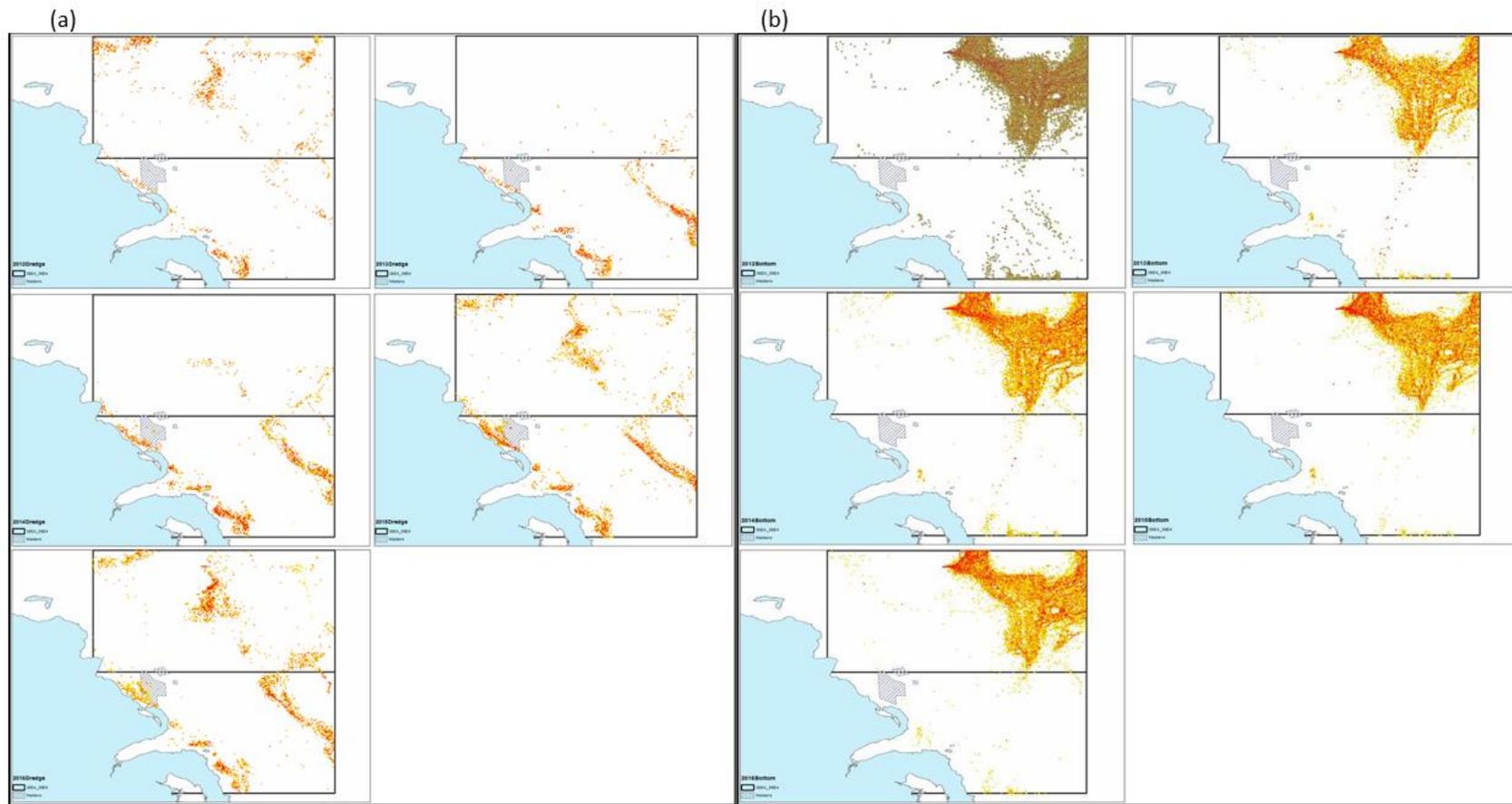
For the dredge fishery within the Maidens MPA, an average of 73.85% of the activity takes place on the reef feature. In 2016, the only year when there was bottom trawling within the MPA boundary, it was all on the rocky reef feature.

In the four years that scallops were landed from within the MPA boundary, an average of 35% of these landings were taken from the rocky reef feature (Table 14). No other landings were recorded from the reef feature.

Within the maerl area of the Maidens, no VMS data was recorded between 2012 and 2016.

Table 14: Landings figures within the Maidens MPA boundary (* value based on average price used in DAERA landings figures for each year in 38E4 and 39E4).

| Year | Landings (tonnes) | | | | Landings on rocky reef | | | | Value £ landings from designated features | Value £ landings from MPA* |
|----------------|-------------------|---------|----------|----------|------------------------|---------|----------|----------|---|----------------------------|
| | Cod | Haddock | Nephrops | Scallops | Cod | Haddock | Nephrops | Scallops | | |
| 2012 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2013 | 0 | 0 | 0 | 0.25 | 0 | 0 | 0 | 0.05 | 87 | 435 |
| 2014 | 0 | 0 | 0 | 6.14 | 0 | 0 | 0 | 0.88 | 1942 | 13550 |
| 2015 | 0 | 0 | 0 | 1.60 | 0 | 0 | 0 | 1.11 | 2373 | 3421 |
| 2016 | 0.005 | 0.053 | 0.050 | 5.19 | 0 | 0 | 0 | 1.90 | 4825 | 13370 |
| Average | 0.001 | 0.011 | 0.010 | 2.64 | 0 | 0 | 0 | 0.79 | 1845 | 6155 |



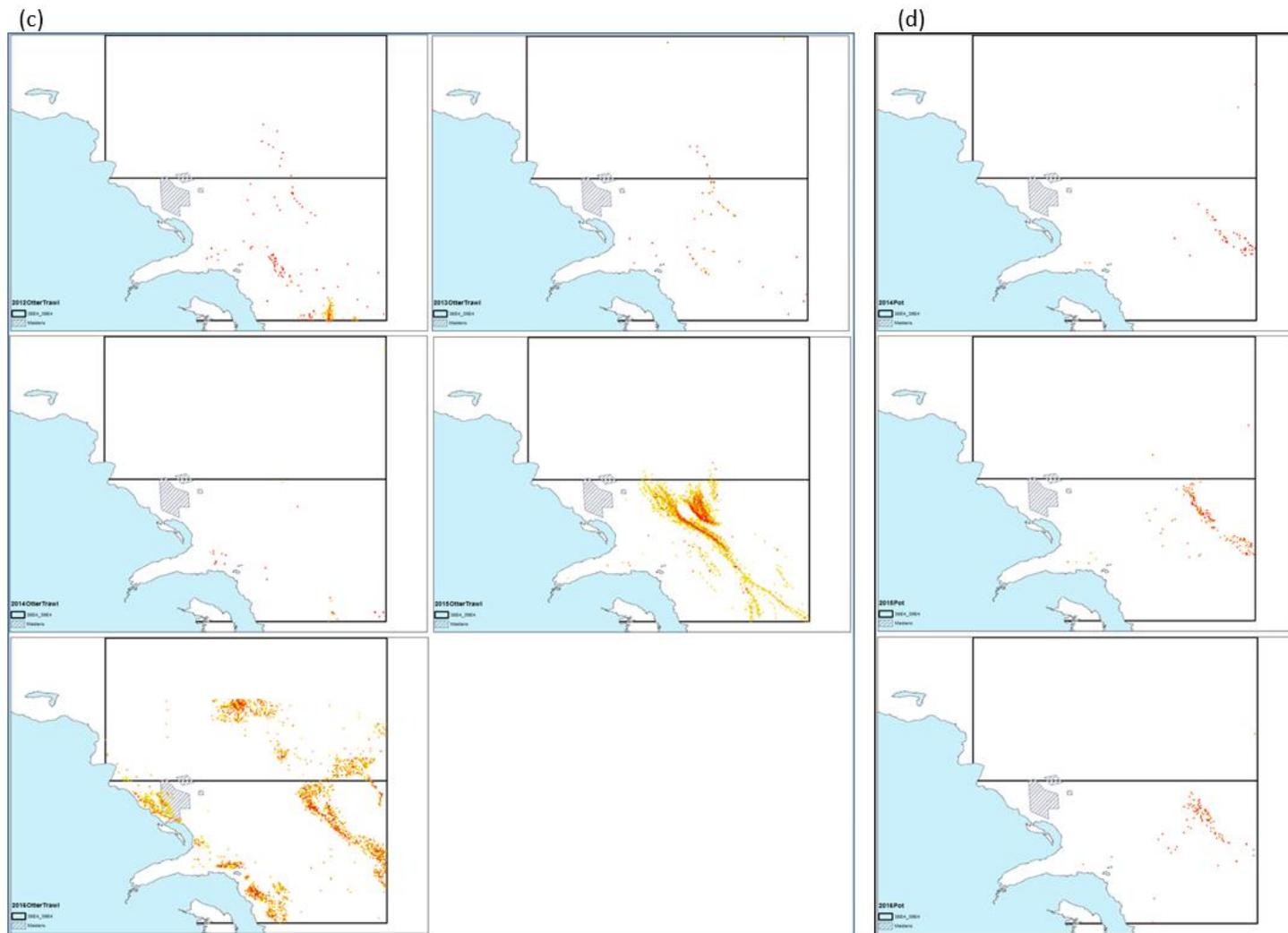


Figure 6: VMS from (a) dredge and (b) trawl and (c) other mobile gear (d) static gear fishing vessels, within 38E4 and 39E4 between 2012 and 2016

3.4 Red Bay MPA

No VMS data was recorded within the MPA between 2012 and 2016. With the limitations of VMS this is not to say that mobile fishing does not occur within the area.

3.5 Waterfoot MPA

No VMS data was recorded within the MPA between 2012 and 2016. With the limitations of VMS this is not to say that mobile fishing does not occur within the area.

3.6 Outer Belfast Lough MPA

VMS analysis for Outer Belfast Lough is based on the proportion of fishing within the MPA boundary in relation to the fishing within ICES rectangle 38E4. Table 15 gives a breakdown of the number of vessels fishing within the area.

Figure 7 shows the VMS for dredge, bottom trawl and other mobile gear vessels between 2012 and 2016. In 2014-2016 VMS is also available for static gear fishing vessels within 38E4 (see section 2.6). In terms of dredging, which is the primary form of mobile gear in the area, approximately two thirds of the effort within the area is covered with VMS, with an average of 35% for vessels targeting scallops, the main landing from the area, under the 12m limit. Annually, an average of 0.9% of the activity within ICES rectangle 38E4 is within the outer Belfast Lough MPA boundary. This represents low effort within the boundary. Of the different types of mobile fishing within the MPA boundary, dredging is the more prominent with an average of 30.1 fishing hours, followed by bottom trawl averaging at 2.3 fishing hours. Other mobile gear (which took place in two of the years) averaged at 4.6 fishing hours.

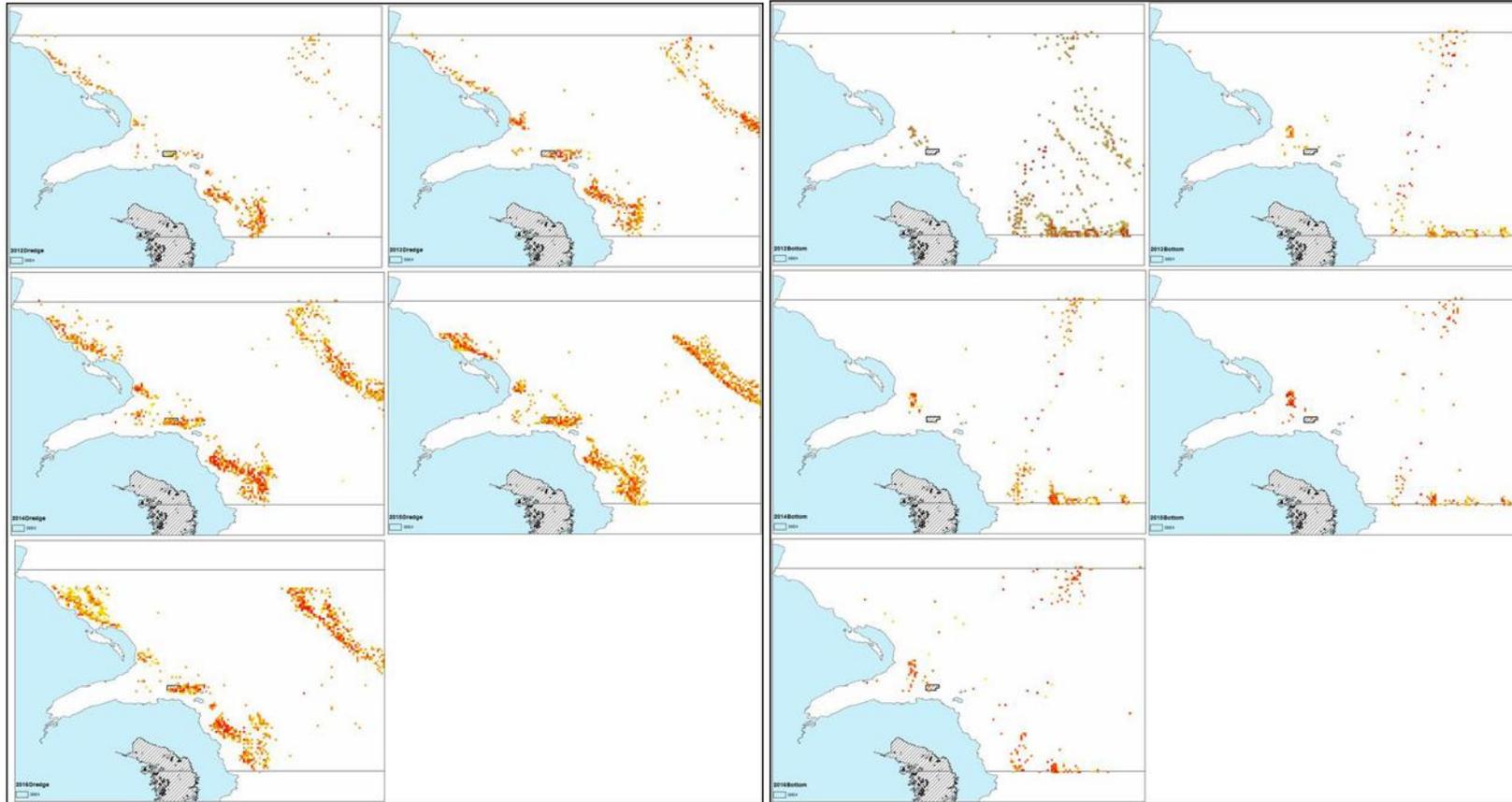
Over the five year period analysed, total landings from mobile gear within the MPA boundary (see pot fishing section for details on static gear VMS) were 7.6 tonnes of scallops, 0.3 tonnes of Nephrops, and 0.02 tonnes of haddock.

Table 15: Landings figures for scallops from 38E4 outside and within the MPA boundary (* value based on average price used in DAERA landings figures for each year in 38E4).

| Year | Scallop Landings (tonnes) | Number vessels fishing scallops | Number scallop vessels <12m | Scallop landings inside MPA (tonnes) | % scallop landings from within MPA | Value £ landings from MPA* |
|----------------|---------------------------|---------------------------------|-----------------------------|--------------------------------------|------------------------------------|----------------------------|
| 2012 | 133.3 | 29 | 10 | 0.6 | 0.5 | 1073 |
| 2013 | 374.5 | 43 | 16 | 0.4 | 0.1 | 697 |
| 2014 | 374.3 | 54 | 17 | 2.0 | 0.5 | 4431 |
| 2015 | 423.8 | 60 | 23 | 2.7 | 0.6 | 5789 |
| 2016 | 402.6 | 54 | 18 | 1.9 | 0.5 | 4864 |
| Average | 341.7 | 48 | 17 | 1.5 | 0.4 | 3371 |

(a)

(b)



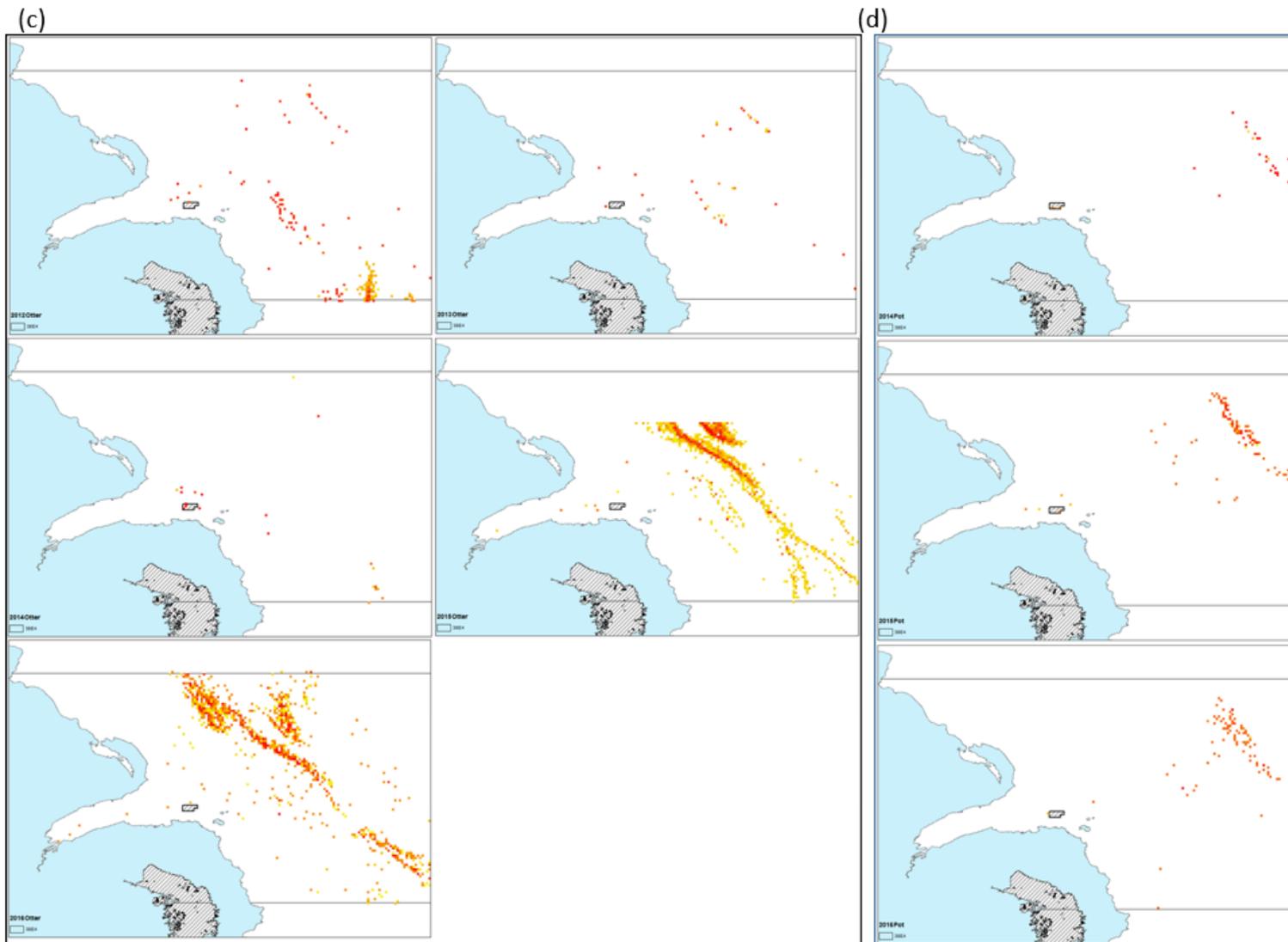


Figure 7: VMS from (a) dredge, (b) trawl, (c) other mobile gear and (d) pot fishing vessels, within 38E4 between 2012 and 2016

3.7 Outer Strangford Lough MCZ

The Outer area of Strangford Lough MCZ falls within ICES rectangle 37E4. VMS analysis is based on the proportion of fishing within the MPA boundary in relation to the fishing within 37E4. Table 16 gives a breakdown of the number of vessels fishing scallops within the area. Figure 8 shows the VMS for all vessels greater than 12m in length within the ICES rectangles between 2012 and 2016.

Table 16: Landings figures for scallops from 37E4

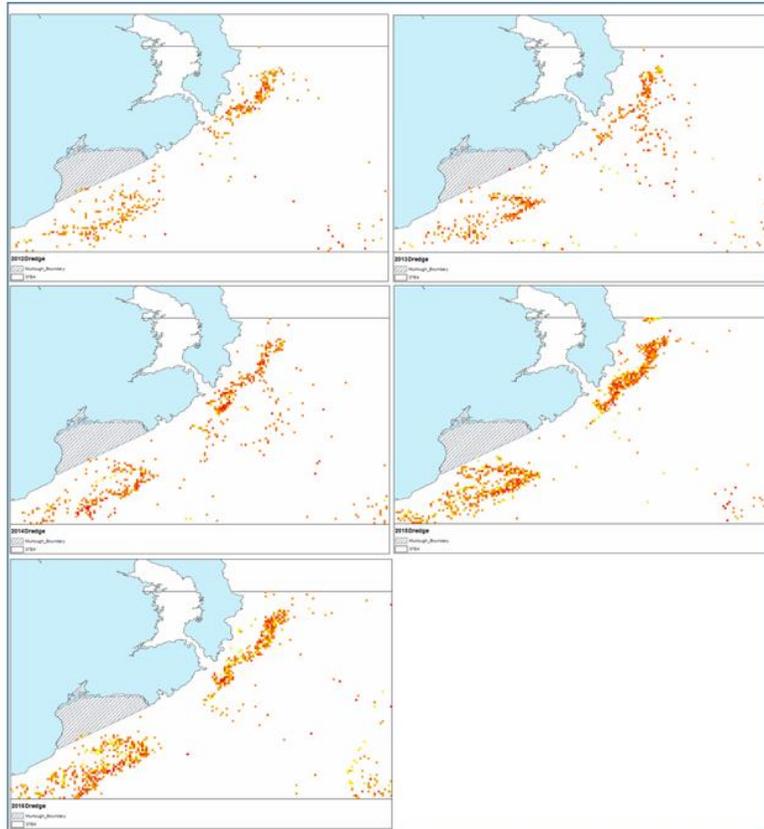
| Year | Scallop landings (tonnes) | Number vessels fishing scallops | Number scallop vessels <12m |
|------|---------------------------|---------------------------------|-----------------------------|
| 2012 | 263.7 | 36 | 16 |
| 2013 | 221.6 | 48 | 19 |
| 2014 | 270.9 | 54 | 24 |
| 2015 | 371.2 | 66 | 31 |
| 2016 | 257.8 | 53 | 23 |

During this time an average of 44% of dredge vessels fishing for scallops within ICES rectangle 37E4 were under 12m in length and therefore are not recorded through the VMS analysis. Within the MPA boundary, dredging, which took place in 2012, 2015 and 2016 within the MPA boundary, had an annual average of 1.6 fishing hours.

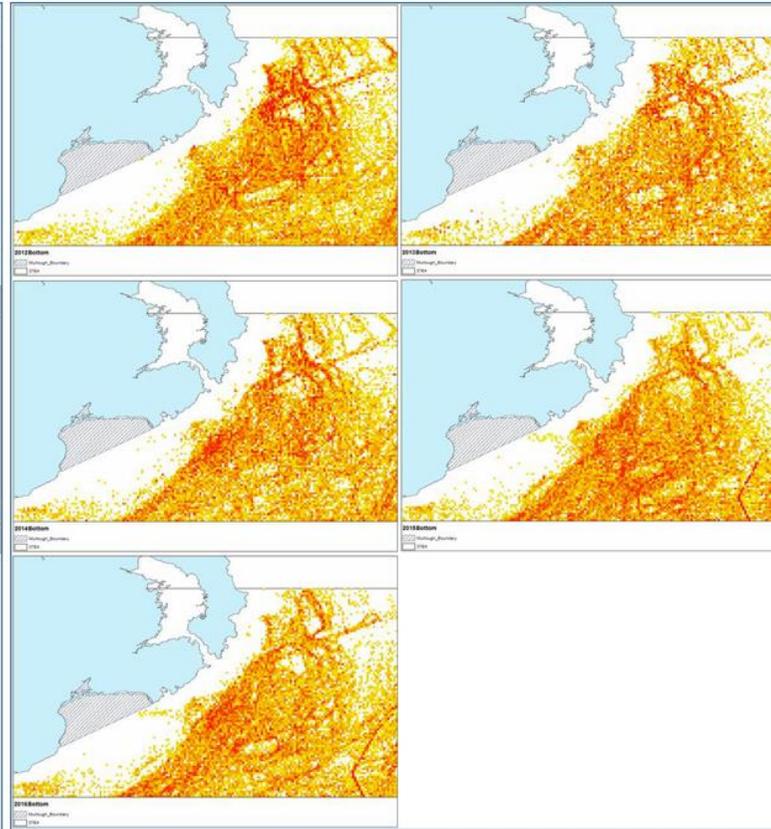
Table 17: Landings figures within the Outer Strangford Lough MCZ boundary (* value based on average price used in DAERA landings figures for each year in 37E4).

| Year | Effort within boundary (fishing hours) | | Landings (tonnes) within proposed boundary | | Value £ landings from proposed boundary |
|----------------|--|--------------|--|----------|---|
| | Dredge | Bottom trawl | Scallops | Nephrops | |
| 2012 | 5.8 | 0 | 0.04 | 0 | 71 |
| 2013 | 0 | 0 | 0 | 0 | 0 |
| 2014 | 0 | 0 | 0.3 | 0 | 622 |
| 2015 | 2.3 | 9.0 | 0.1 | 0.03 | 346 |
| 2016 | 0.02 | 0 | 0 | 0 | 0 |
| Average | 1.6 | 1.8 | 0.1 | 0.006 | 208 |

(a)



(b)



(c)

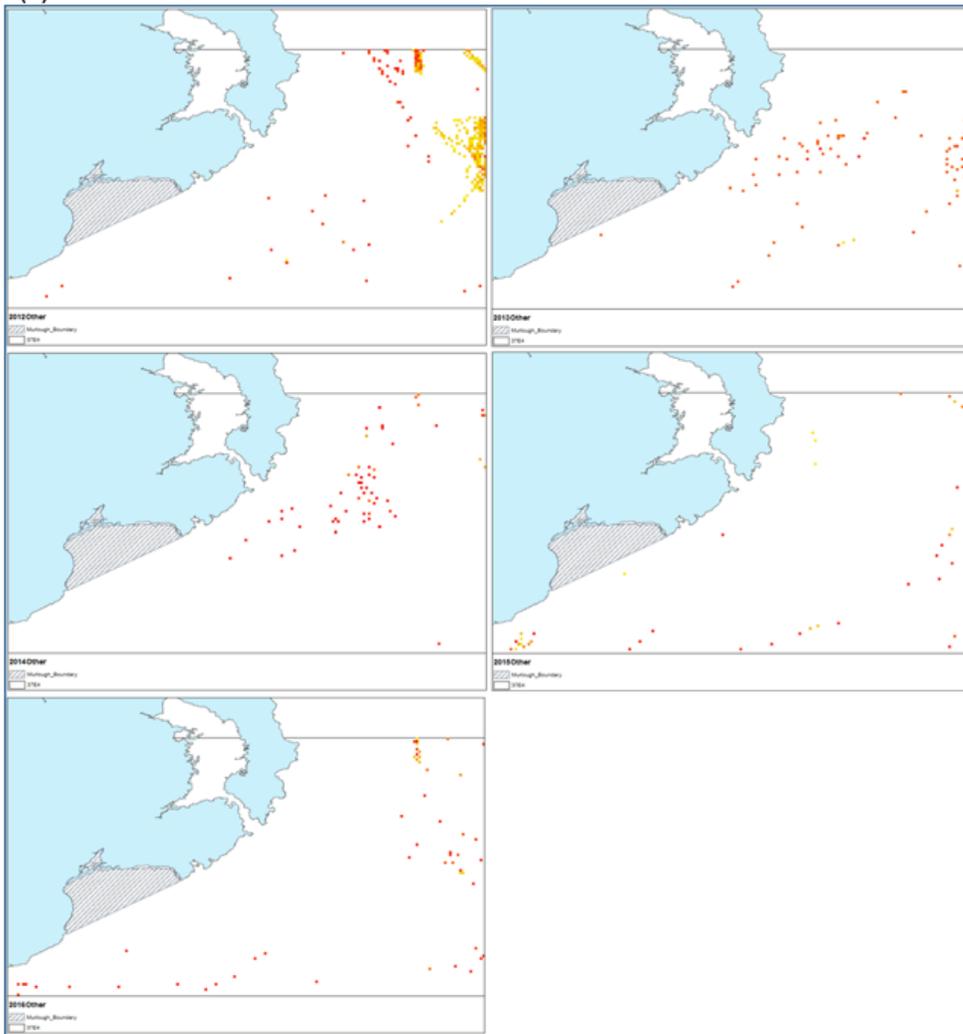


Figure 8: VMS from (a) dredge, (b) trawl and (c) other mobile gear, within 37E4 between 2012 and 2016

3.8 Murlough MPA

The Murlough MPA falls within ICES rectangle 37E4. VMS analysis is based on the proportion of fishing within the MPA boundary in relation to the fishing within 37E4. Table 16 gives a breakdown of the number of vessels fishing within the area. Figure 8 shows the VMS for all vessels greater than 12m in length within the ICES rectangles between 2012 and 2016. VMS data is present from dredge vessels as well as static gear. Annually, an average of 0.03% of the activity within ICES rectangle 37E4 is within the Murlough MPA boundary. During this time an average of 44% of dredge vessels fishing for scallops within ICES rectangle 37E4 were under 12m in length and therefore are not recorded through the VMS analysis. Within the MPA boundary, dredging, which took place each year within the MPA boundary bar 2015, had an average of 6.2 fishing hours.

For the dredge fishery within the Murlough MPA, an average of 1% of the activity took place on the sandbank feature (Table 18).

Table 18: Landings figures within the Murlough MPA boundary (* value based on average price used in DAERA landings figures for each year in 37E4).

| Year | Landings (tonnes) | | Landings on sandbank | | Value £ landings from designated features | Value £ landings from MPA* |
|----------------|-------------------|----------|----------------------|----------|---|----------------------------|
| | Nephrops | Scallops | Nephrops | Scallops | | |
| 2012 | 0.1 | 0.5 | 0 | 0.3 | 532 | 1117 |
| 2013 | 0 | 0.2 | 0 | 0 | 0 | 365 |
| 2014 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2015 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2016 | 0 | 0.8 | 0 | 0.2 | 520 | 2080 |
| Average | 0.02 | 0.3 | 0 | 0.1 | 210 | 712 |

3.9 Carlingford

There is no VMS data recorded for Carlingford Lough.

4.0 Proposed scallop enhancement sites

In 2017, following discussions with the Northern Ireland Scallop Association, AFBI produced a report examining sites around the coast as potential locations for enhancement of scallops (AFBI, 2017). Whilst thirteen sites which had been identified by stakeholders were examined, four sites were highlighted as being most suitable (Figure 9). The report stipulated, that for reseeding to be successful, any site used must be closed to mobile fishing gear.



Figure 9: Sites selected for reseeding taking in to account the characteristics of the sites and feedback from the scallop fishing sector.

4.1 Whitehead

No VMS records are present within the area for vessels using static gear, therefore all vessels targeting the area are under 12m in length. With only two observer trips carried out in the area between 2010 and 2018, there is limited evidence as to how many boats fish for crab and lobster in the area. Therefore the effort and value of the pot fishery cannot be determined.

No VMS data for mobile fishing gear was recorded within the area between 2012 and 2016. With the limitations of VMS, this is not to say that mobile fishing does not occur within the area.

4.2 Drumfad Bay

No VMS records are present within the area for vessels using static gear, therefore all vessels targeting the area are under 12m in length. With only one observer trips carried out in the area between 2010 and 2018, there is limited evidence as to how many boats fish pots in the area. Therefore the effort and value of the pot fishery cannot be determined.

Drumfad is within ICES rectangle 38E4. Figure 7 (section 3.4) shows the VMS for all vessels greater than 12m in length within the ICES rectangles between 2012 and 2016. VMS data is present from dredge vessels within the Drumfad Bay area in 2012, 2014 and 2015 with the landings (Table 19) from the area representing an average of 1.05% of the landings from ICES rectangle 38E4. In these year an average of 35% of dredge vessels fishing for scallops within ICES rectangle 38E4 were under 12m in length and therefore are not recorded through the VMS analysis.

Table 19: Landings figures within the Drumfad boundary (* value based on average price used in DAERA landings figures for each year in 38E4).

| Year | Scallop landings inside Drumfad boundary | % scallop landings from within boundary | Value £ landings from Area* |
|----------------|--|---|-----------------------------|
| 2012 | 0.907 | 1.431 | 1622 |
| 2013 | 0 | 0 | 0 |
| 2014 | 1.656 | 0.923 | 3668 |
| 2015 | 1.689 | 0.801 | 3621 |
| 2016 | 0 | 0 | 0 |
| Average | 0.850 | 0.631 | 1782 |

4.3 Ballyquintin Point

No VMS records are present within the area for vessels using static gear, therefore all vessels targeting the area are under 12m in length. With only one observer trips carried out in the area between 2010 and 2018, there is limited evidence as to how many boats fish pots in the area. Therefore the effort and value of the pot fishery cannot be determined.

Ballyquintin is within ICES rectangle 37E4. Figure 8 (section 3.5) shows the VMS for all vessels greater than 12m in length within the ICES rectangles between 2012 and 2016. VMS data is present from dredge vessels within the Ballyquintin Point area in 2012-2015, representing an average of 0.52% of the effort from ICES rectangle 37E4. In these years an average of 44% of dredge vessels fishing for

scallops within ICES rectangle 37E4 were under 12m in length and therefore are not recorded through the VMS analysis. Whilst VMS data is present, no landings are attributed to this data. Therefore value of the pot fishery cannot be determined.

4.4 Roaring Rock

Roaring Rock is within the Murlough MPA Boundary. There have been no observer trips within the Roaring Rock boundary. VMS records from vessels, which are greater than 12m in length, targeting static gear are present within the area in 2014 (2 fishing hours). Table 20 shows the estimated value of landings by vessels greater than 12m in length.

There is no VMS data for mobile gear recorded within the Roaring Rock boundary.

Table 20: Estimated pot fishing landings by vessels greater than 12m within the Roaring Rock boundary (* value based on average price used in DAERA landings figures for each year in 37E4).

| Year | Landings (tonnes) | | Value £ landings from within boundary* |
|----------------|-------------------|---------|--|
| | Crab | Lobster | |
| 2012 | 0 | 0 | 0 |
| 2013 | 0 | 0 | 0 |
| 2014 | 0.19 | 0.025 | 595 |
| 2015 | 0 | 0 | 0 |
| 2016 | 0 | 0 | 0 |
| Average | 0.04 | 0.005 | 119 |

5.0 Assessment of proposed management measures

5.1 Prohibition of dredging and trawling on protected features

Dredging is seen as one of the most environmentally damaging form of fishing (Bolam, S. et al. 2013). Prohibiting dredging from an area will significantly reduce the impact of mobile fishing. It will also have secondary affects which may, in turn, benefit fishing. Dredged areas tend to have low habitat complexity. Prohibiting dredging will allow the area to recover. This will aid in the recovery of species such as hydroids and bryozoans, species which are key to the settlement of juvenile scallops (in some cases it is believed that is the lack of suitable settlement substrate rather than a lack of juveniles which leads to a reduction in scallop abundance). This in turn could, if the MPA is in a suitable area, provide a high abundance area which seeds fishing grounds outside of the protected area.

5.2 Managed Pot Fishing

Potting is thought of as a relatively benign form of fishing. A study in Lyme Bay showed that low levels of potting had no impact on the seabed environment or target species apart from a potential effect on the Ross coral (Rees et al., 2018). However, if a stock is not being fished sustainably, potting should be limited. Limiting vessel size would not be an appropriate tool in limiting effort as a small vessel can still fish a large number of pots by having a smaller number on a string. A limit to the number of pots would mean the size of the vessel is not relevant. However, the latent capacity would need to be addressed to restrict the number of vessels fishing that area. Calculating the appropriate effort for an area should be based on the carrying capacity for each area. However, this would need to take in to account the total number of pots, both commercial and recreational.

Mandatory recording of bycatch and discards

Currently, in the Isle of Man the Manx Fish Producers Organisation runs a scheme whereby vessels fishing queen scallops must complete a bycatch form. This collects data on catches of quota and non-quota species. Whilst this is in place to address issues raised by the discards ban, it may be a source of information as to the pros and cons of such a scheme.

The practicality of small pot fishing vessels recording all bycatch and discards is questioned. A significant number of these vessels operate with one crew member. To have to record everything would be cumbersome and may increase risks to fishing (whilst they are recording details they are not paying attention to where they are going). Pot fishing is already highly selective with very little bycatch, most of which consists of undersized crab and lobster and species such as starfish and lesser spotted dogfish. To overcome these issues DAERA have proposed mandatory recording of bycatch or discards of NI priority species only, plus entanglement of species under EU protection (Annex IV of the EU Habitats Directive), Wildlife (NI) Order (Schedule 5) and seabirds.

6.0 Recommendations

Apart from information collected through the AFBI observer programme, there is no spatial data available for the under 12m fleet. With a large proportion of the Northern Ireland fleet falling into this category, there is a significant amount of data missing. Whilst available data can be used as a proxy, it may not be completely accurate. For example, with regards scallops, smaller vessels can fish in areas which larger vessels cannot. Based on VMS data it may look like an area is not fished but it could be targeted by the smaller vessels. A form of VMS would provide the full picture of fishing effort.

All pot fishing information provided is based on commercial records. However, in parts of Northern Ireland, including areas which are MPAs there can be a significant number of recreational fishing pots. In order to provide an accurate assessment of the fishery it is important to know the total effort. Whilst commercial effort can be determined through monthly returns, there is no estimate of recreational fishing. In England this has been addressed by Northumberland Inshore Fisheries and Conservation Association (IFCA) through a pot tagging scheme. All pots that are fished in the area must be tagged with commercial pots being tagged with one colour and recreational pots tagged with another. The IFCA work this in with their pot limit so that they provide each commercial fisherman with a fixed number of tags. As part of their monthly returns the fishermen must report if any pots (and therefore tags) have been lost before a new tag can be claimed. With the current hobby limit in Northern Ireland being five pots, it could be introduced that each hobby fisherman can apply for five tags. The level of uptake would provide an indication of the level of recreational fishing.

7.0 References

AFBI (2017) Scallop larval dispersal background study. 90pp

Bolam, S., Kenny, A., Parker, R., Hiddink, J. G. Buhl-Mortensen, L. and Smith, C. (2013). Report on benthic ecosystem processes and the impact of fishing gear. 71pp

Rees, A., Sheehan, E.V. and Attrill, M. (2018) The Lyme Bay experimental potting study: A collaborative programme to assess the ecological effects of increasing potting density in the Lyme Bar Marine Protected Area. A report to the Blue Marine Foundation and Defra, by the Marine Institute at the University of Plymouth.