Provision of Fishing Activity Data for the DTI Strategic Environmental Assessment No. 6

CEFAS Contract report
C2490/01

FINAL

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This document was produced as part of the UK Department of Trade and Industry's offshore energy Strategic Environmental Assessment programme. The SEA programme is funded and managed by the DTI and coordinated on their behalf by Geotek Ltd and Hartley Anderson Ltd.

C2490/01

ECOSYSTEM EFFECTS TEAM

QUALITY ASSURANCE STATEMENT

TITLE:	Provision of Fishing Activity Data for the DTI Strategic Environmental Assessment No. 6
REPORT REF:	C2490/01
PREPARED BY:	Craig Mills and Paul Eastwood
CONTRACT REF:	C2490
REPORT STATUS:	Final
DATE OF ISSUE:	15 April 2005
PROTECTIVE MARKING:	None
CLIENT:	Hartley Anderson Ltd
DISTRIBUTION:	Hartley Anderson Ltd (1 copy) Geotek Ltd (1 copy)

ISSUED BY:	AUTHORISED:
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Introduction

Strategic Environmental Assessments (SEA) are required to assess the potential environmental impacts of offshore oil and gas licensing rounds, and to promote the sustainable development of Britain's hydrocarbon resources. SEA region 6 covers the Eastern Irish Sea (Figure 1) and this report specifically aims to describe fishing activity in this area. The purpose of this report is to provide spatial and temporal descriptions of major fishing fleet activity in the SEA6 region.

Methods and Results

Aerial surveillance data supplied by the Sea Fisheries Inspectorate (SFI) and the Scottish Fisheries Protection Agency (SFPA) were used to estimate the distribution and relative intensity of fishing effort. The two datasets were provided in different formats and were therefore analysed separately.

Data Preparation

English and Welsh Data

British Fishery Protection flights regularly survey UK territorial waters, flying routes over each quarter of an ICES rectangle approximately once a week throughout the year. Information is collected on vessel activity (fishing or steaming), type of gear used, and the date, time, latitude and longitude of the observations. Overflight coverage is biased towards offshore waters, beyond 6 nm from the shore, as the surveillance programme aims to target the larger vessels operating offshore.

Data used in this study comprised SFI surveillance data for England and Wales waters covering the period 1998 to 2003. Observations were standardised to take account of the variable number of overflights, as not all quarter rectangles were visited on the same number of occasions per month. Observation records were divided by the number of overflights that had taken place in the associated month and quarter rectangle. These data were then aggregated by year, quarter year, fishing gear, and oil and gas block. An index of fishing effort (sightings per unit effort per unit area) was calculated by summing the standardised observations within each oil and gas block and dividing by the area of the block.

The major fleets in the Irish Sea are otter trawlers, beam trawlers, scallop dredgers and potters (Figure 2). Countries of origin for 99% of the vessels sighted in the Irish Sea were Great Britain, Ireland, France and Belgium (Figure 3).

Scottish data

Data for Scottish waters from SFPA covered the period 1996 and 2002. The Scottish fisheries surveillance programme follows a similar methodology to that used by the SFI. Unlike SFI data, observations from patrol vessels were also included in the dataset. However, overflight and patrol vessel effort data were not available. Standardisation of the fishing vessel observations was therefore not possible. SFPA surveillance data were aggregated by ICES quarter rectangles.

Description of fishing effort (England and Wales)

Otter trawlers

The principal source of fishing effort in the Irish Sea derives from otter trawling (Figure 2). UK vessels comprise approximately 70% of the fleet with French and Irish vessels comprising the majority of the remainder. Otter trawlers predominantly target cod, whiting, nephrops and plaice throughout the year. Figure 4 indicates that, in general, fishing effort remained relatively consistent over time. Effort was distributed to the east and west of the Isle of Man and in the southern Irish Sea off the coast of south west Wales. A lesser amount of fishing effort can also be seen in Cardigan Bay. The spatial distribution of otter trawlers showed only marginal seasonal differences (Figure 5).

Beam Trawlers

The three major countries beam trawling in the Irish Sea were Belgium (52%), the UK (32%) and France (12%). Sole was the main target species. The beam trawl fleet were distributed to the south west of the Isle of Man and Liverpool Bay, in Cardigan Bay and off the coast of south west Wales (Figure 6). Effort remained relatively consistent throughout the year with slightly less activity during the autumn (Figure 7). Between 1998 and 2003, there was no noticeable temporal trend in beam trawling effort.

Scallop Dredgers

The vast majority of scallop dredging effort in the Irish Sea derives from UK vessels. Scallop beds between Anglesey and the Isle of Man provide the main focus for activity and are exploited by visiting boats from the Isle of Man, Scotland and south west England. A limited amount of effort also occurs off the south west Wales coast in Cardigan Bay (Figure 8), although the inshore component of this fishery is subject to a seasonal closure between July and December. There is a noticeable decline in effort over the six-year period. On average, effort is slightly higher over the winter months (Figure 9). Measures of effort in this category do not take account of the large number of vessels that take scallops and queen scallops as by-catch in white fish trawls.

Potters

Between 1998 and 2003, < 3% of the vessels sighted in the Irish Sea were potters. Effort was distributed primarily in Cardigan Bay and around Anglesey (Figure 10), and was at slightly higher intensities during the summer and autumn months (Figure 11). In general, the overall number of sighted potters increased slightly between 1998 and 2003.

Description of coastal fishing effort (England and Wales)

As noted above, the SFI overflight surveillance programme primarily targets larger vessels operating in offshore waters outside 6 nm. Whilst trawling and dredging fleets will be well represented by these data, fishing effort for other fleets, primarily netters and inshore potters, will be underestimated. The exact distribution of inshore boats is unknown although vessels generally stay within the 6 nm limit. Pawson *et al* (2002) describes the coastal fisheries within English and Welsh waters. The following represents a summary of the major inshore fisheries in the SEA6 region as described by that report.

Demersal fish

Throughout much of the region otter trawlers land plaice, sole, and rays from spring to autumn, and cod and whiting during winter. Whilst the cod fishery off Whitehaven has declined, the haddock fishery has increased dramatically. Some shrimp beamers periodically switch to flatfish when shrimp are less available. Gill, tangle and trammel nets are used to catch a variety of demersal species throughout the district, and in more recent times a growing number of trawlers have switched to netting. Flatfish continue to provide the mainstay of inshore grounds, along with rays during the warmer months and especially within the Solway Firth. The main target species for the netting fleets are sole, plaice, flounder, rays, turbot and brill. Longlines are used in a few areas to catch cod, rays and spurdog.

Pelagic fish

Bass are taken in gill nets and on handlines from spring through to autumn. Some drift netting for herring occurs in autumn and winter although effort is generally low as only small, local markets are supplied. Mackerel and herring are taken by nets in small quantities, whilst mackerel caught on handlines provide an important resource for the charter angling sector.

Diadromous fish

Fisheries for diadromous species are concentrated in rivers and estuaries, so outside of the SEA6 region.

Shellfish

Lobsters provide the main resource for many fishermen operating in Cardigan bay, and around the Lleyn Peninsula and Anglesey. Pots are typically set between April and November. Brown crabs provide an important resource off the Lleyn Peninsula where under 10 m boats set pots out to 6 nm from the coast. Crawfish are caught in tangle nets in a few rocky areas, as are spider crabs in the south of Cardigan bay. Many fishing ports along the Welsh coast support a small number of beach boats potting for crab and lobsters out to 6 nm. Since the late 1980s, potting for prawns in Cardigan Bay has become increasingly popular particularly between autumn and spring when the lobster fishery is at a seasonal low. A shrimp fishery pursued between the Dee and Duddon estuaries runs from April through to December. Between May until August *Nephrops* are taken by otter trawlers from the deep water areas off Whitehaven. A number of other shellfish fisheries operate within close proximity to the shore and so have less relevance to SEA6. These include mussel, Manila clam and oyster cultivation, and cockle harvesting by hand rakes and mechanical dredges. Morecambe Bay and the Solway Firth support important cockle fisheries.

Description of fishing effort (Scottish waters)

Most activity in the Scottish area of the Irish Sea is concentrated within the Firth of Clyde, which is situated just outside of the SEA6 region. Figures 12 to 14 show that the majority of fishing effort is concentrated in the north east in the form of otter and nephrops trawlers targeting nephrops, cod, whiting and plaice. Most effort occurred during late winter and spring. There was little to no activity recorded by the patrols for all other gear types.

Conclusions

Fishing activity is widely distributed throughout the SEA6 region, although the areas most often exploited by mobile demersal gears are comparable from year to year, and are focussed at particular times of the year.

The implications for the fishing industry of further hydrocarbon exploration and development have not been considered in this report, but have already been discussed in detail for SEA2 (Rogers & Stocks, 2001). Many of the generic issues are the same, however, and the offshore hydrocarbons industry they will need to ensure that obstruction to trawling activity caused by pipelines, wellheads and surface installations is minimised. Restrictions on seismic activity in spring are already imposed as a precautionary measure to limit potential adverse effects on fish spawning aggregations, and the localised effects of drilling have been limited by the widespread introduction of water-based and organic-phase drilling fluids. For sensitive habitats such as herring spawning grounds, environmental impact assessment is expected in some areas to avoid impact of drilling.

References

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Rogers, S.I. & Stocks, R. (2001). North Sea Fish and Fisheries. Technical Report produced for the Strategic Environmental Assessment – SEA2. CEFAS technical Report TR_003. http://www.offshore-sea.org.uk/site/scripts/consultation_download_info.php?downloadID=16

Figures

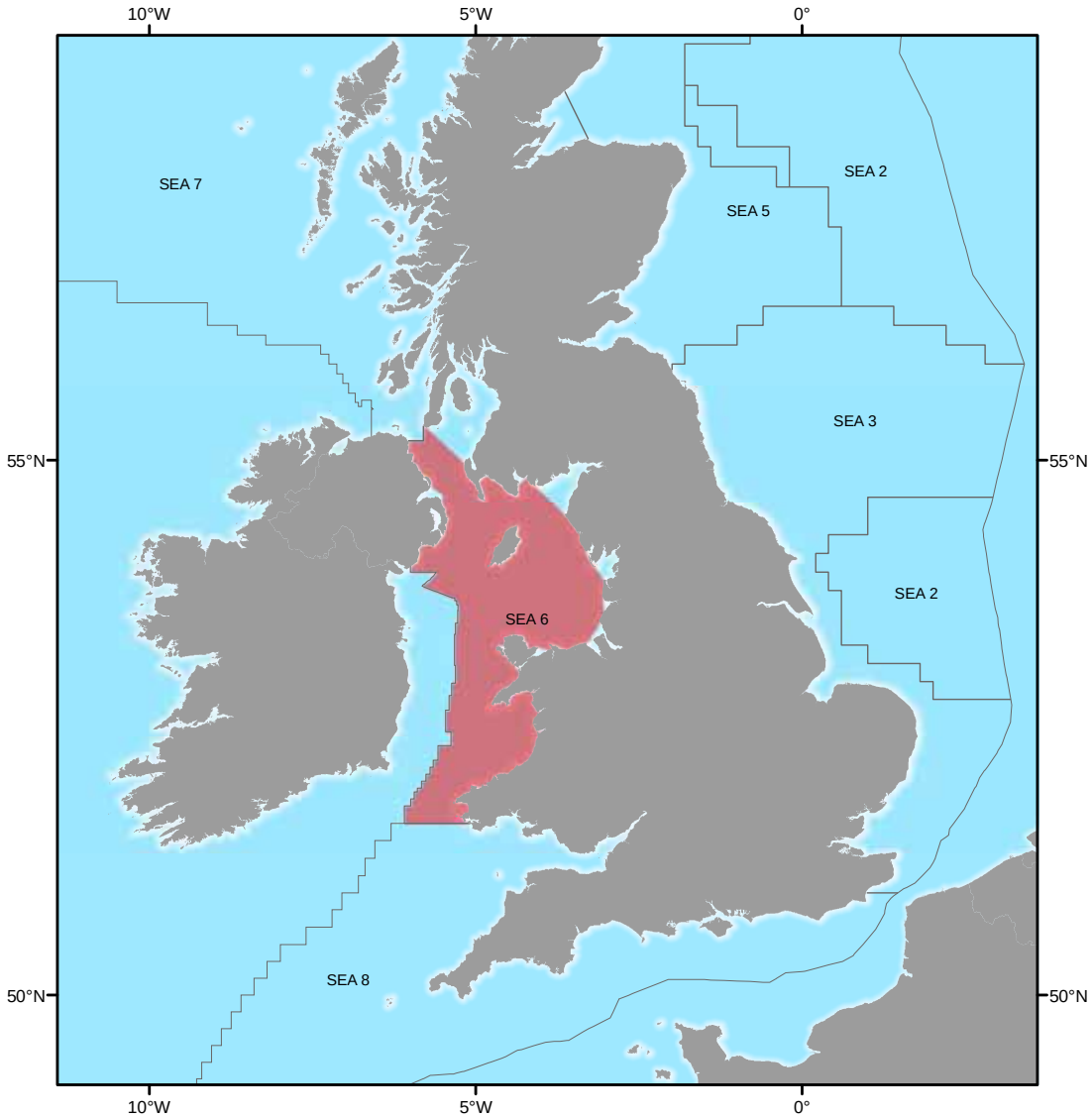


Figure 1. Extent of SEA6.

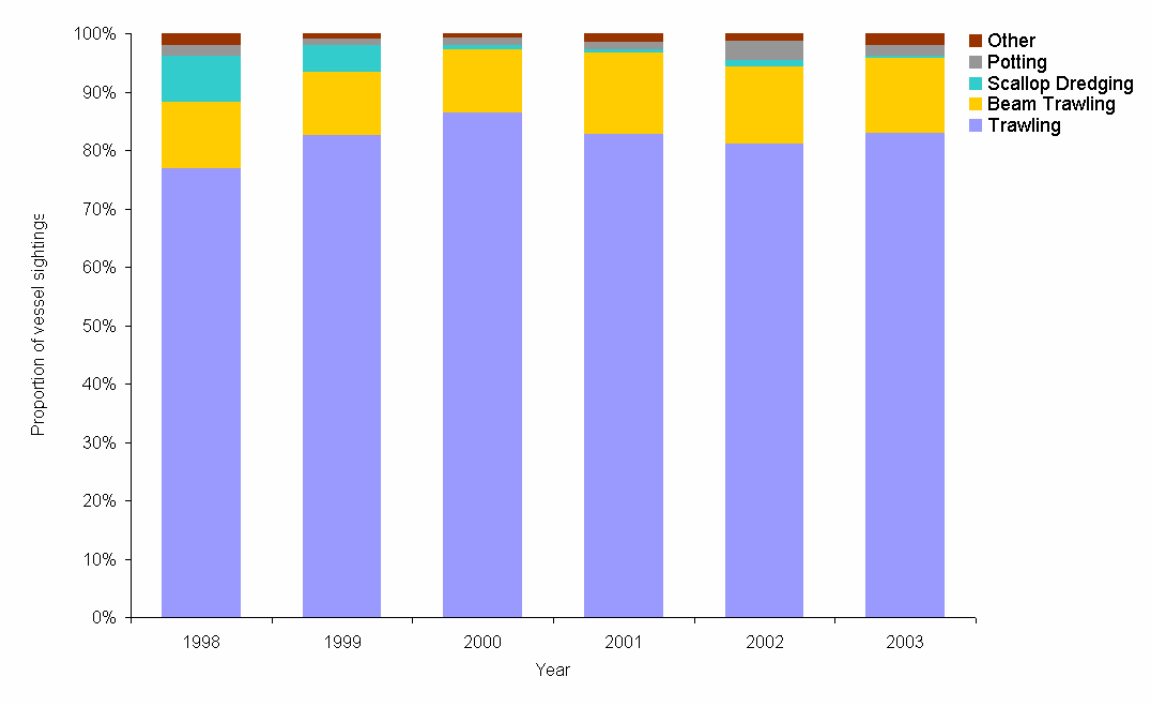
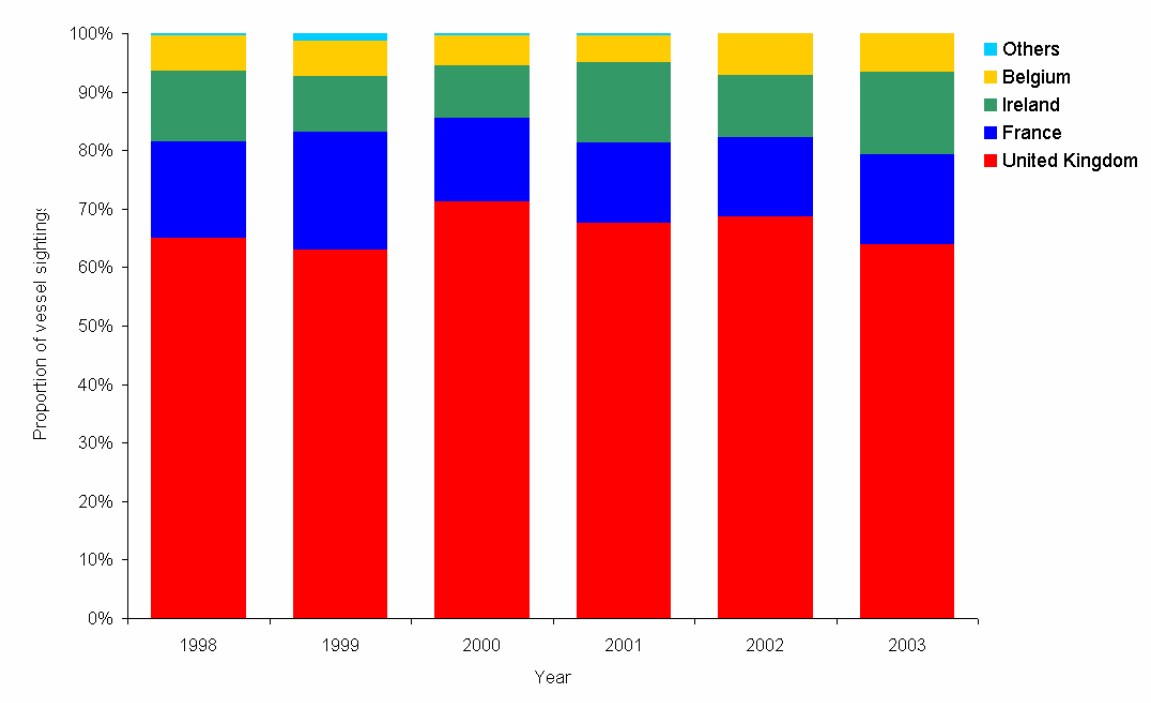


Figure 2. Proportion of standardised overflights by fishing method recorded by British fisheries protection aircraft between 1998 and 2003 for the major fleets in the Irish Sea.



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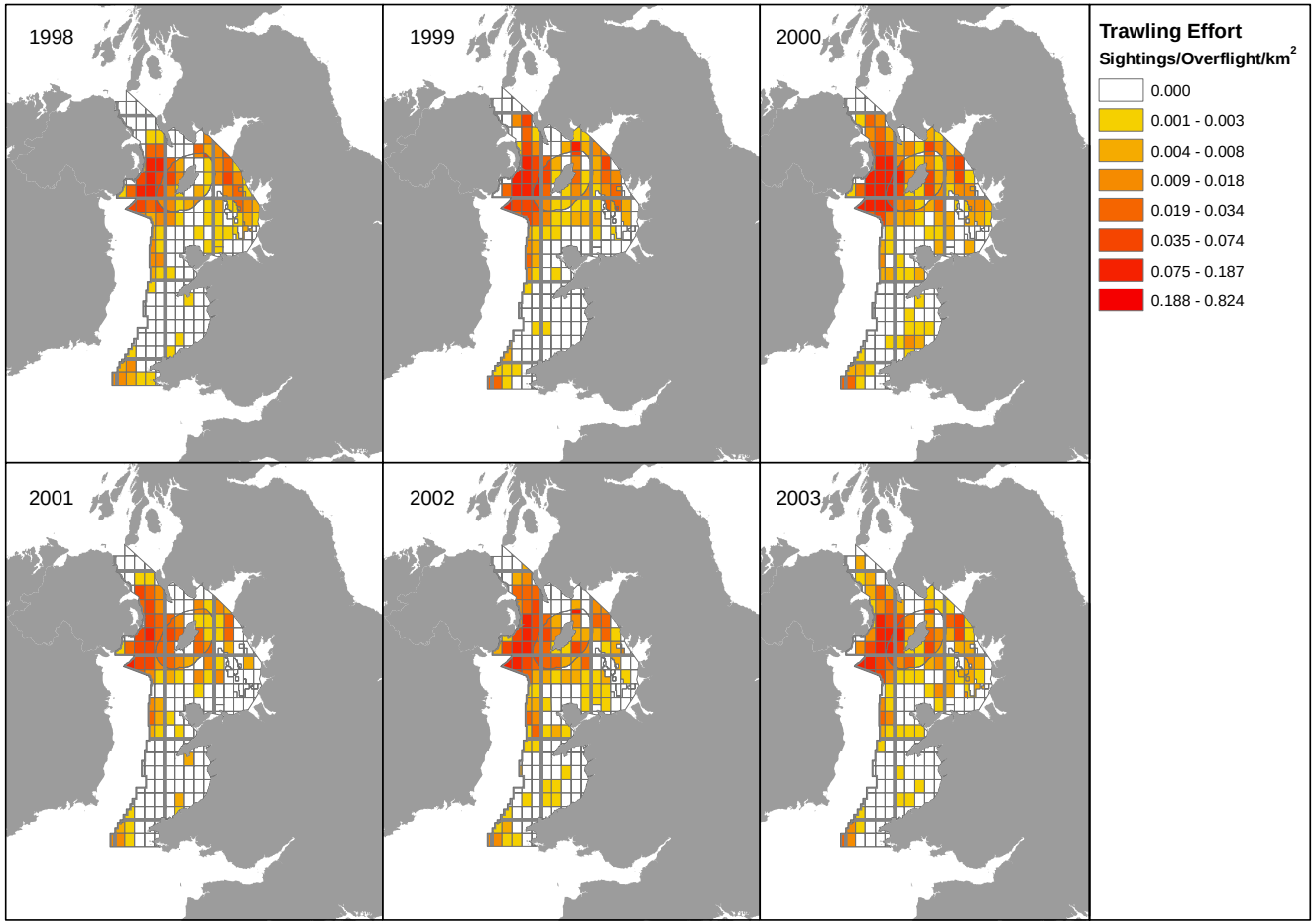

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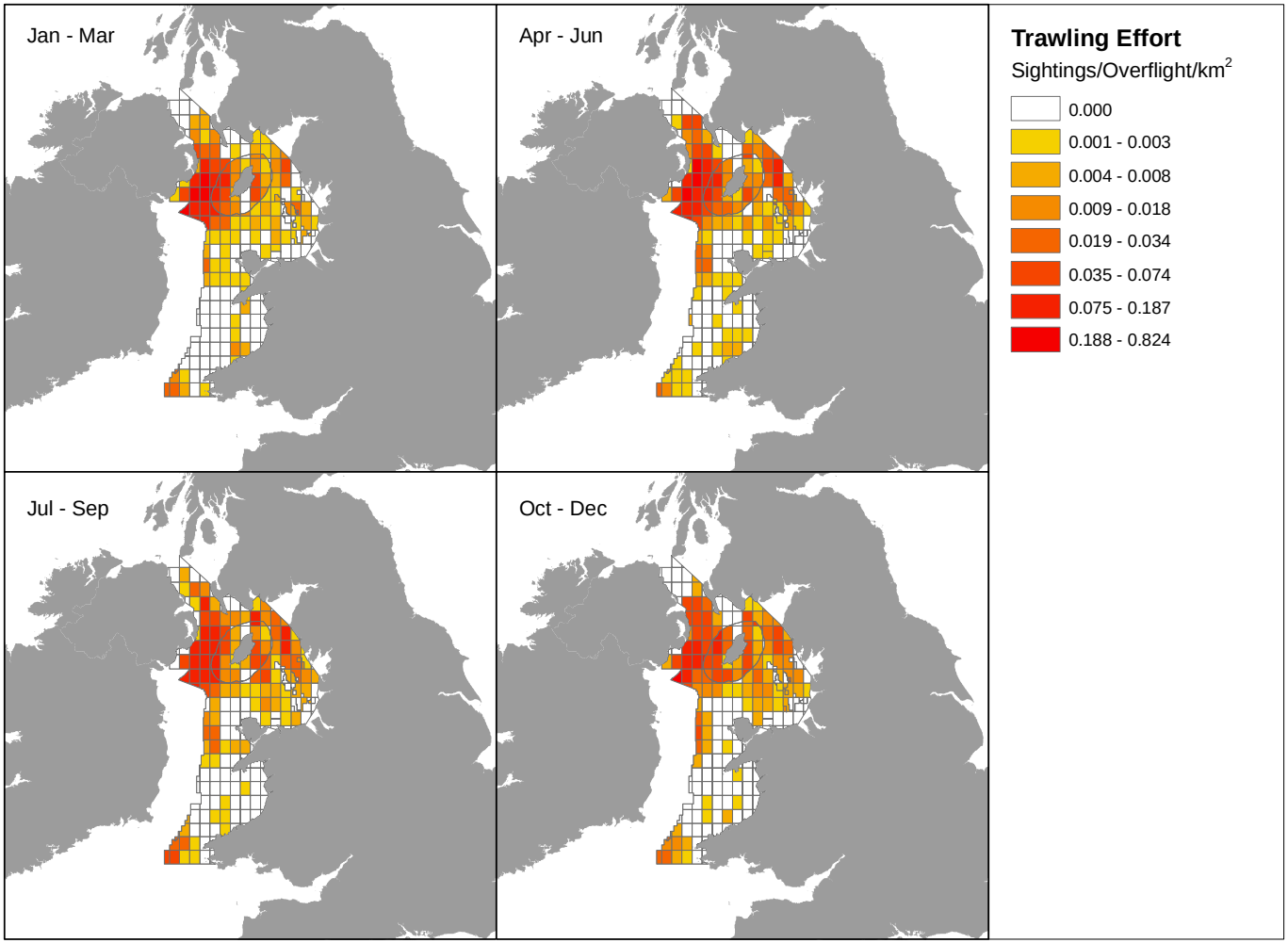


Figure 5. Quarterly distribution of otter trawling within SEA6 between 1998 and 2003 based on SFI overflight surveillance data.

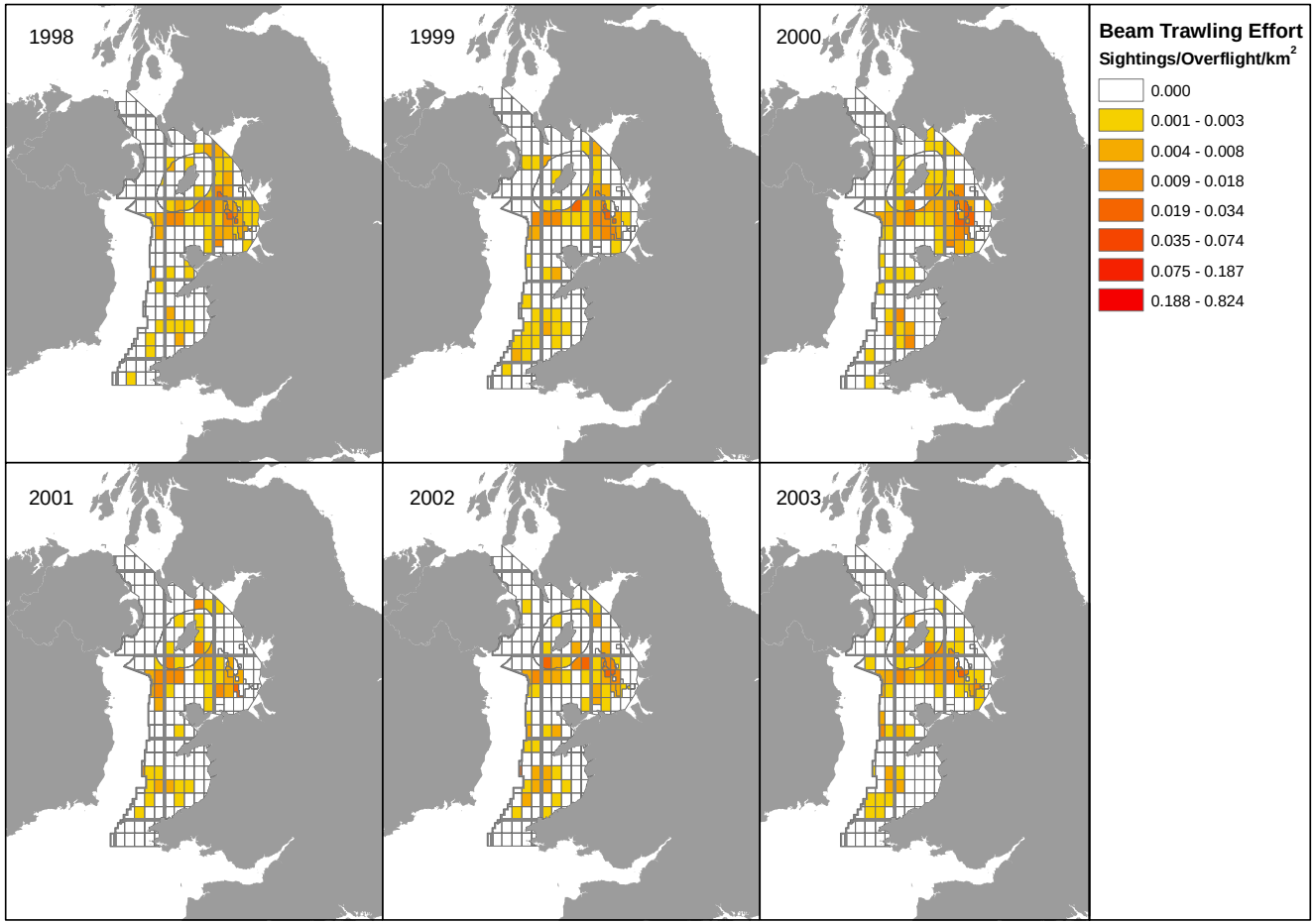


Figure 6. Annual distribution of beam trawling within SEA6 between 1998 and 2003 based on SFI overflight surveillance data.

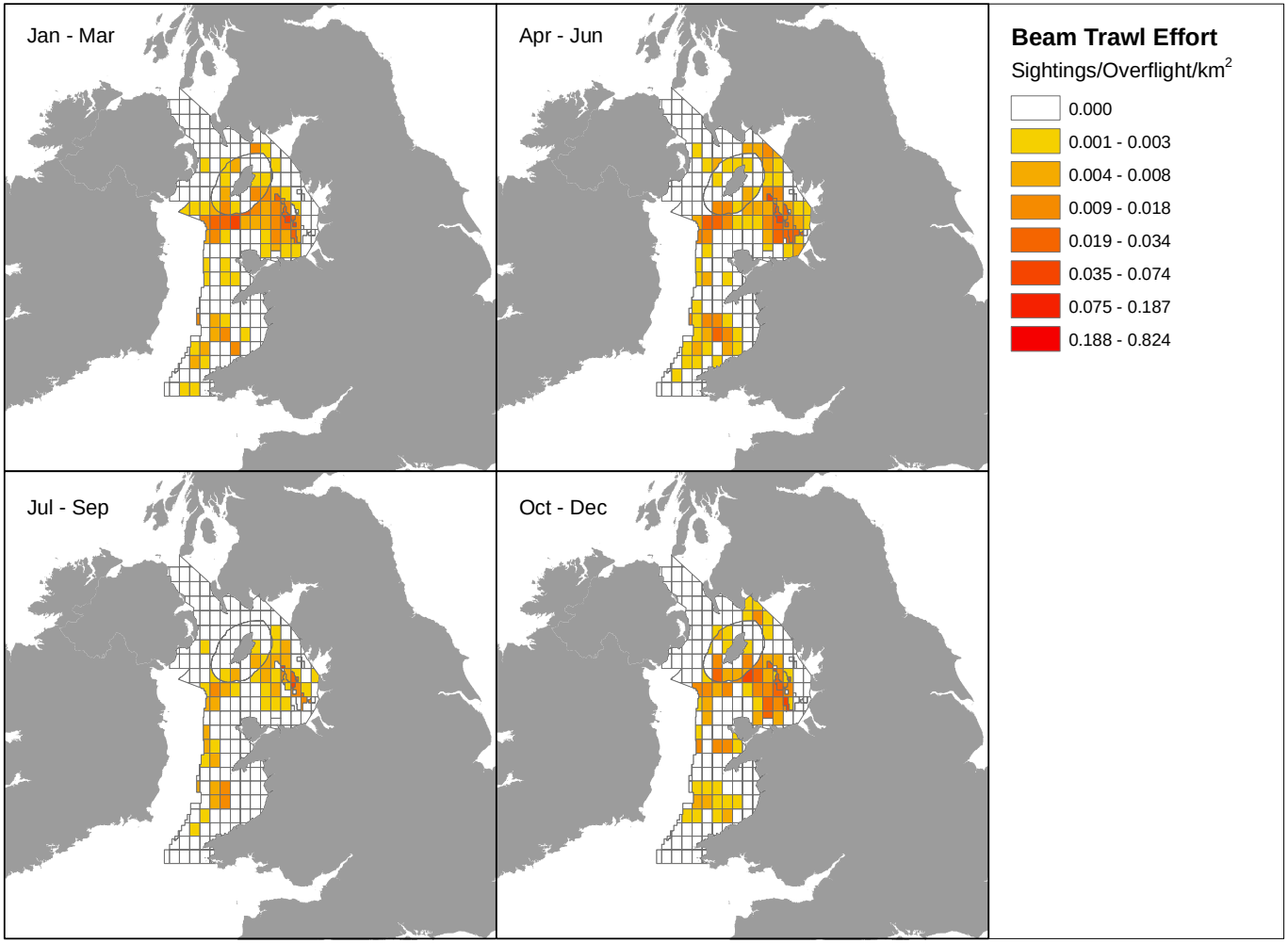
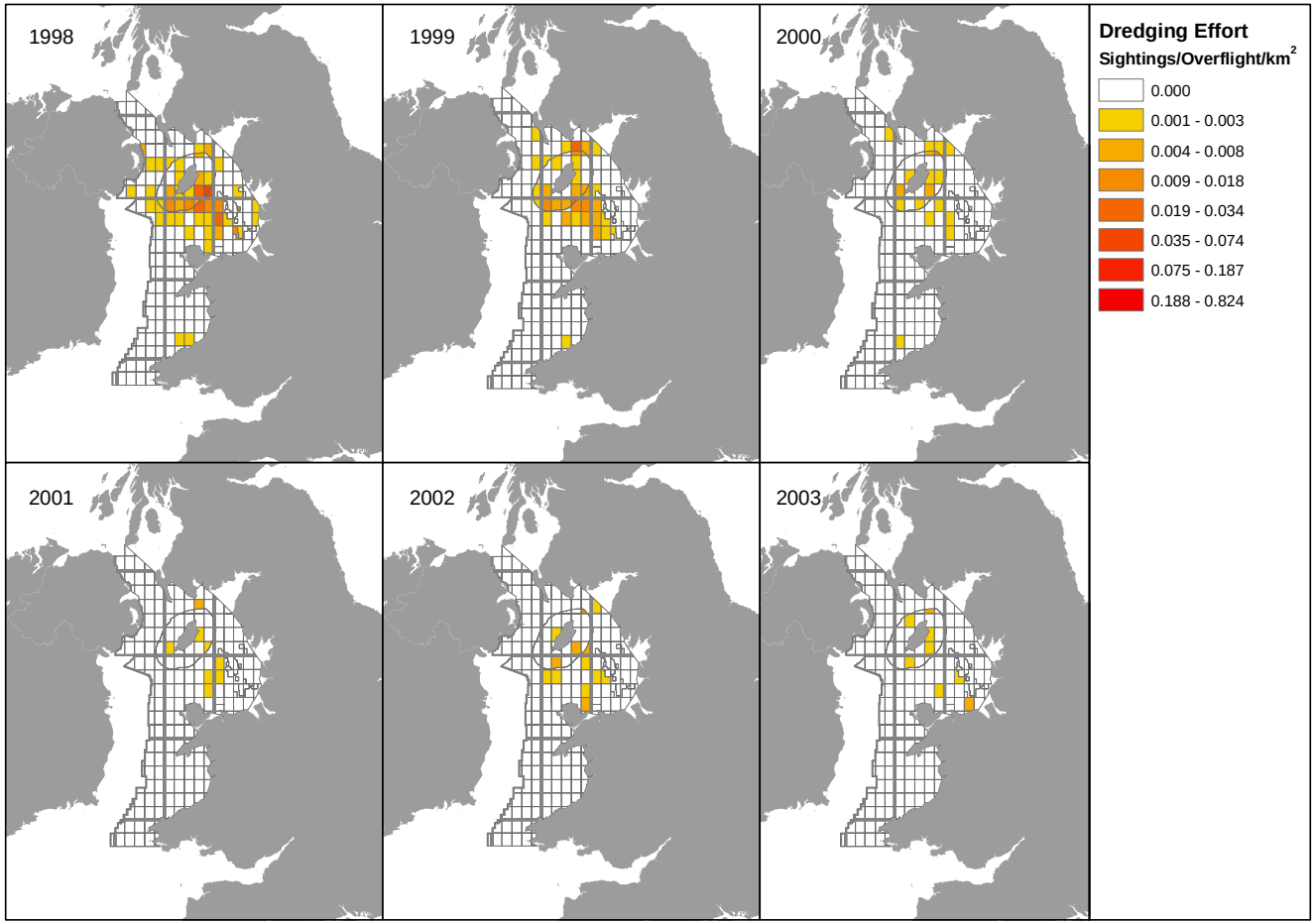


Figure 7. Quarterly distribution of beam trawling within SEA6 between 1998 and 2003 based on SFI overflight surveillance data



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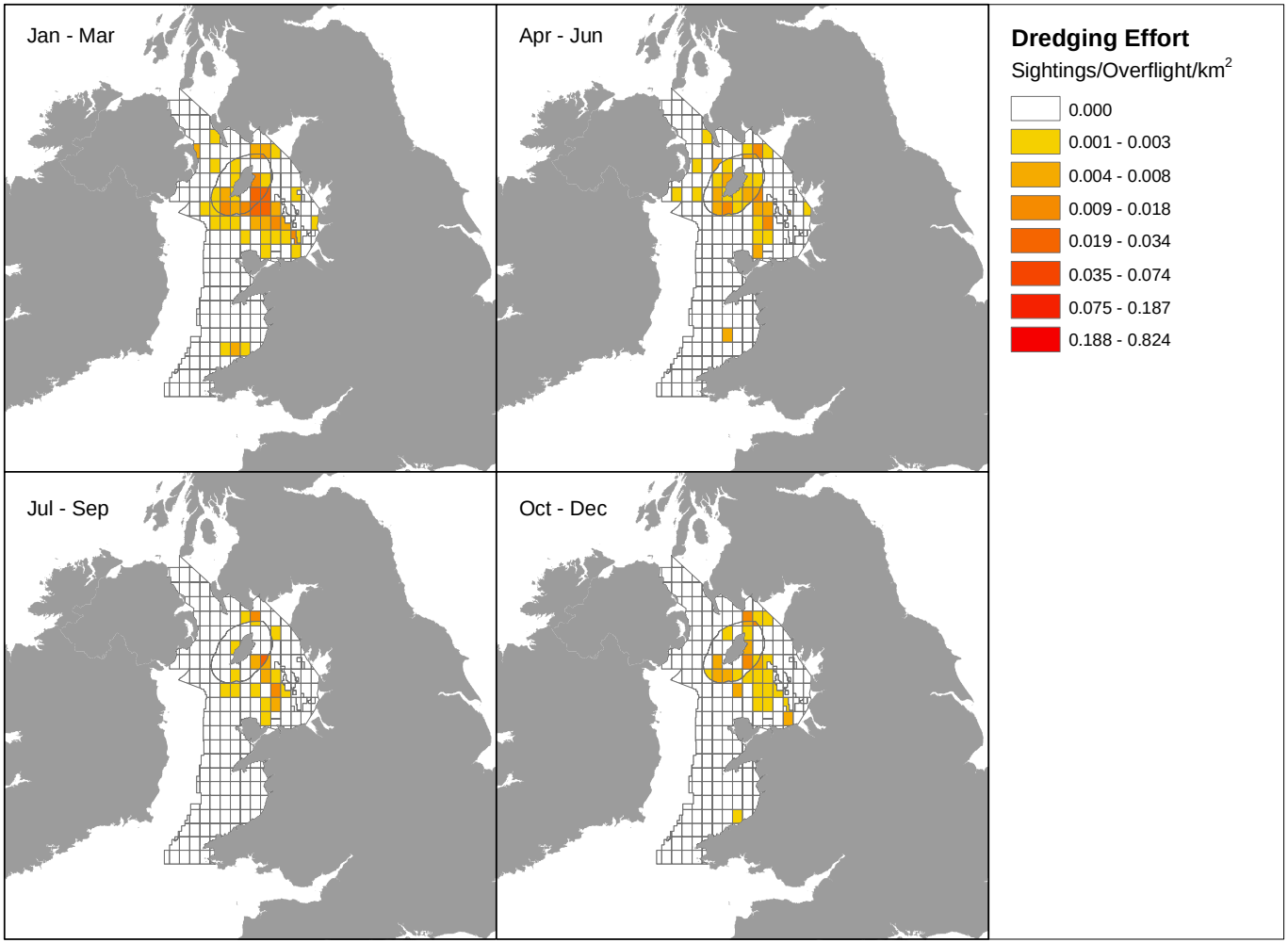


Figure 9. Quarterly distribution of scallop dredging within SEA6 between 1998 and 2003 based on SFI overflight surveillance data.

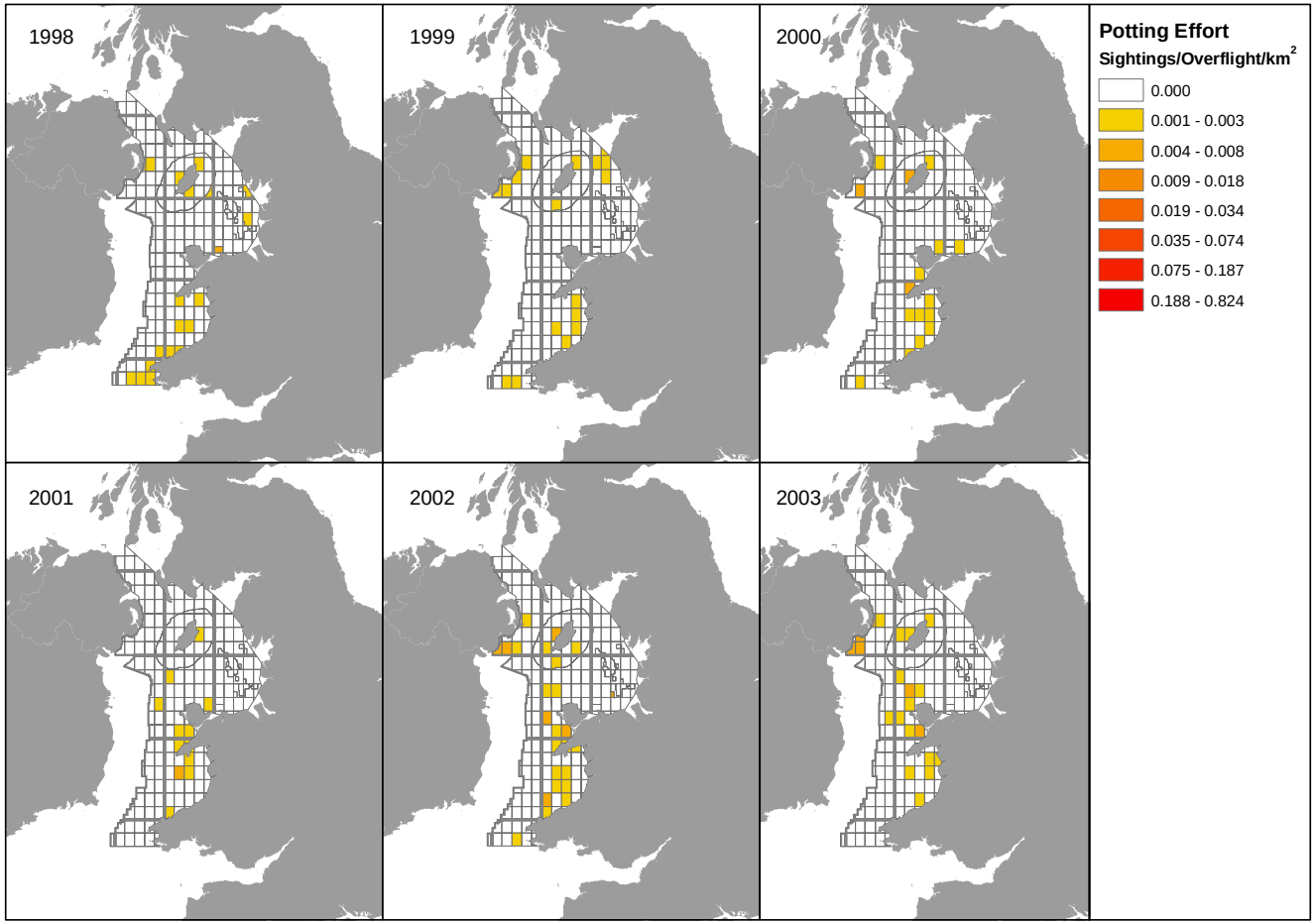
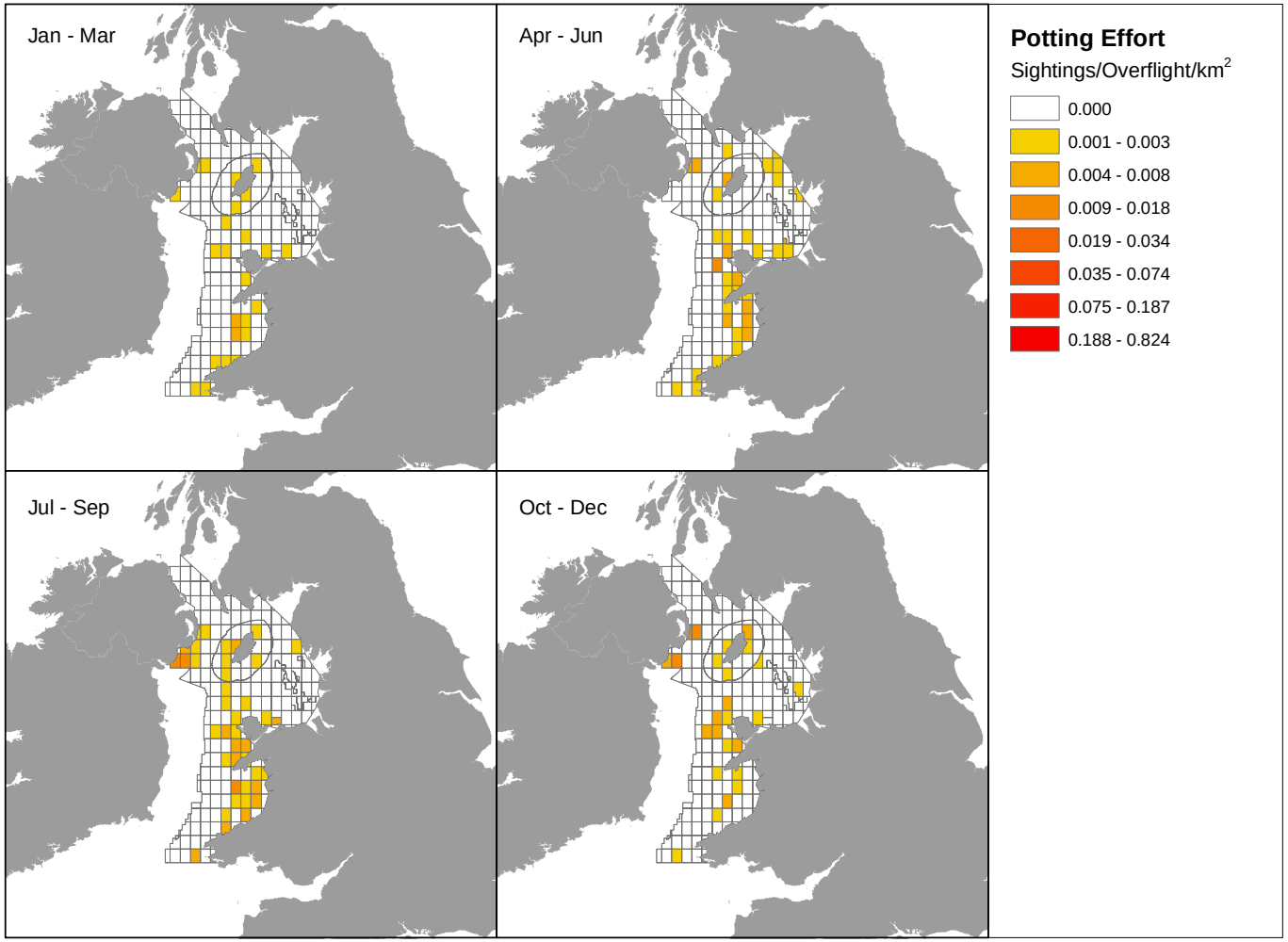


Figure 10. Annual distribution of potting within SEA6 between 1998 and 2003 based on SFI overflight surveillance data.



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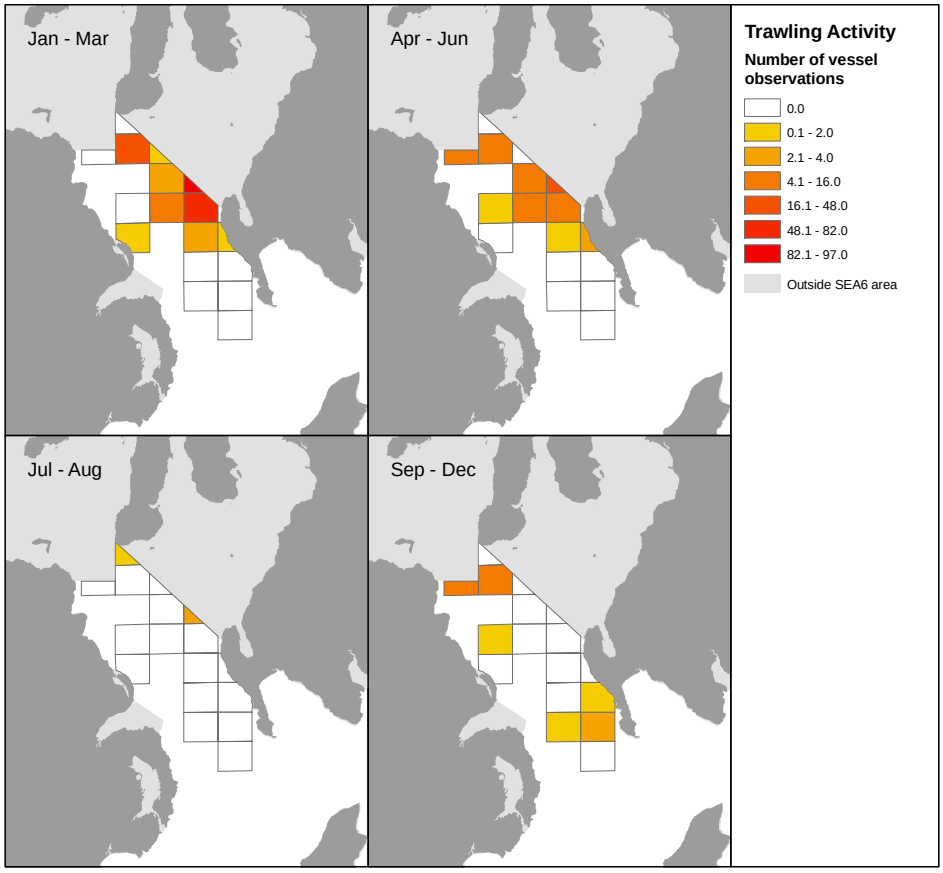

Figure 12. Quarterly distribution of trawling activity within the Scottish waters sector of SEA6 between 1998 and 2003 based on SFPA overflight and patrol vessel surveillance data.

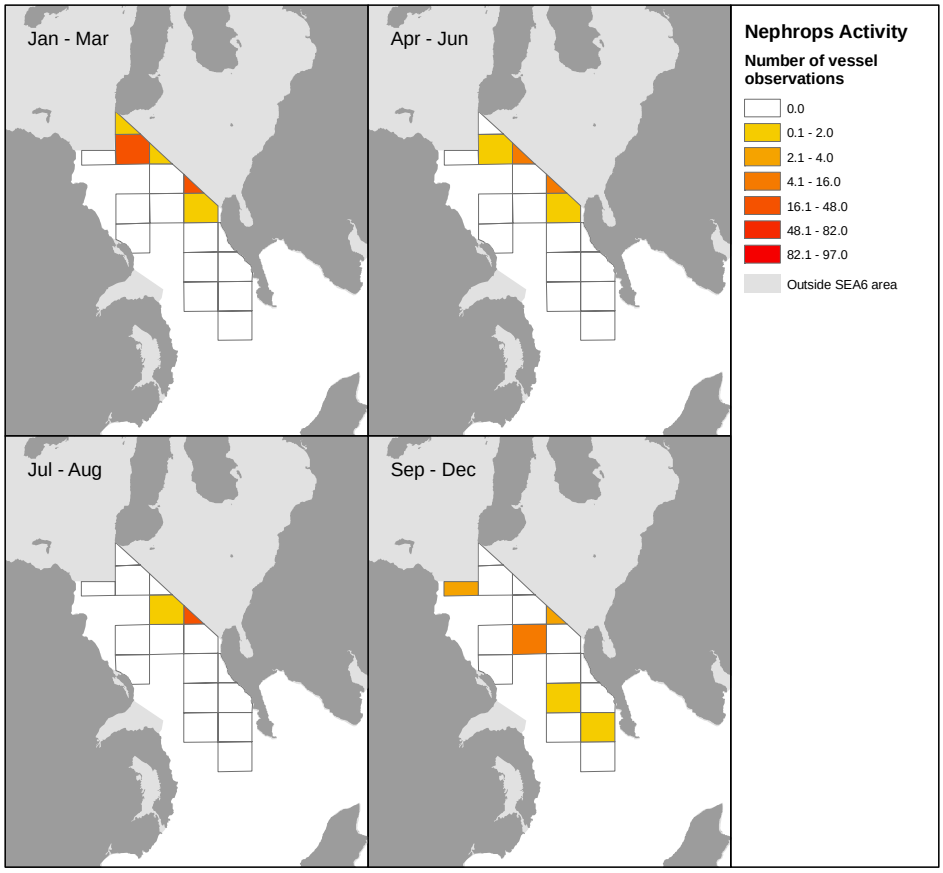

Figure 13. Quarterly distribution of nephrops trawling activity within the Scottish waters sector of SEA6 between 1998 and 2003 based on SFPA overflight and patrol vessel surveillance data.

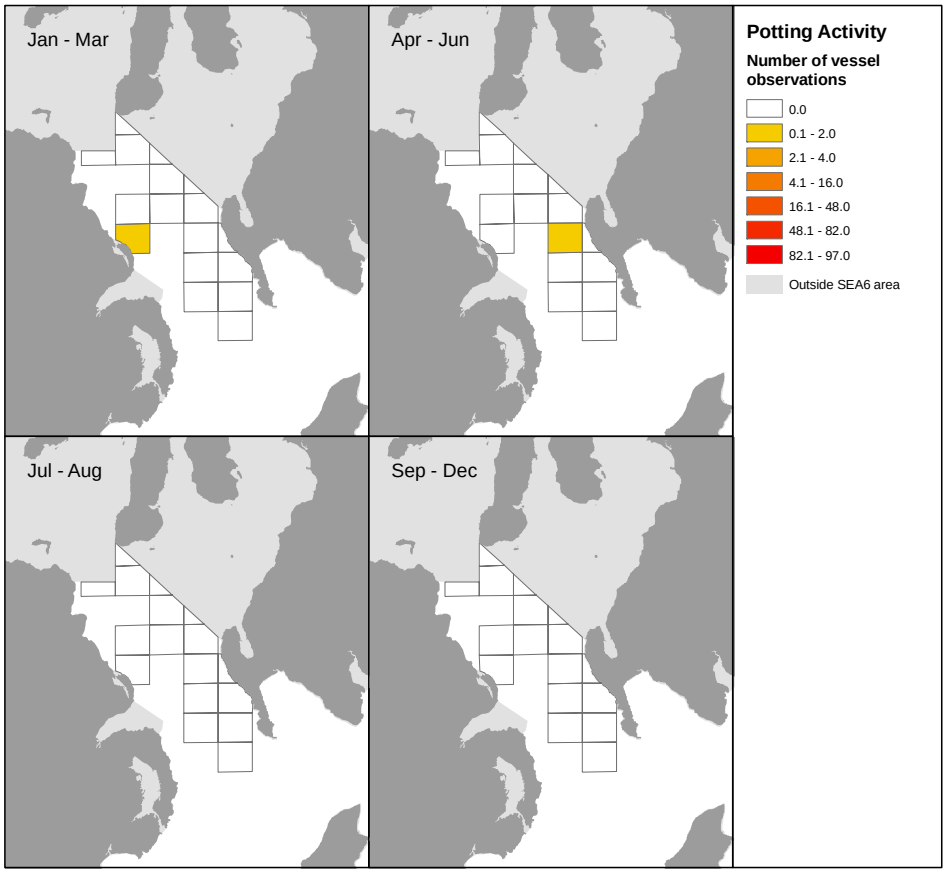

Figure 14. Quarterly distribution of potting activity within the Scottish waters sector of SEA6 between 1998 and 2003 based on SFPA overflight and patrol vessel surveillance data.