

6. THE REGIONAL SEA

Defining boundaries

97. As explained in paragraph 83, it is practical to subdivide the UK and adjacent sea areas into a number of Regional Seas on the basis of biogeography using factors such as water temperature, depth and currents. The work undertaken on this to date has focused on the area of sea covered by UK jurisdiction, but such Regional Seas, being based on ecological characteristics, will cross national boundaries in some areas. Further work needs to be undertaken, in collaboration with other country partners, to complete the identification of Regional Sea boundaries in such cases.
98. The draft framework for marine nature conservation considered that such Regional Seas could *inter alia* form the basis for environmental management action, including spatial planning. The degree to which Regional Seas can be used in this way can be expected to vary. Clearly-defined Regional Seas, such as the Irish Sea, will lend themselves to this approach. In contrast, the Regional Seas identified in Map 8 west of the Hebrides are less amenable to this approach, and, in practice, it may be considered desirable, in some cases, to combine Regional Seas for environmental management purposes. This would be a matter for practical decision by the countries with a jurisdictional interest in the Regional Seas concerned.
99. The Irish Sea was selected as an appropriate Regional Sea for the purposes of the Pilot, partly because it had been relatively well studied in the past. Descriptions of the biology, human impact and management of the Irish Sea were published by the Irish Sea Study Group in 1990, and more recent accounts are contained in Boelens *et al.* (1999), Weighell *et al.* (2000) and in the OSPAR Quality Status Report, Region III (OSPAR Commission, 2000), among a wide range of other publications.

Physical description of the Irish Sea

100. The Irish Sea is one of the smaller Regional Seas, about 58,000 sq km (23,000 sq miles) in area. In character, it has the form of a fairly shallow basin, with depths ranging from 20-100m over considerable areas, but with a deeper channel, exceeding 100m, extending north-south in the western part of the Irish Sea which reaches a maximum depth of 315m in Beauforts Dyke. This deeper channel connects with the Celtic Sea via St George's Channel in the south, and with the Malin Shelf through the North Channel. Water moves into the Irish Sea from the Atlantic Ocean through the St George's and North Channels; the two branches meeting to form a standing wave and weak currents to the south-west of the Isle of Man. Gravelly sediments occur extensively in a broad central belt, often in areas subject to tidal currents. Areas of sandy substrate, often moderately mobile, occur fairly extensively, and sand waves and megaripples occur north of the Isle of Man, in Liverpool Bay, Cardigan Bay and also in St George's Channel. Muddy sediments are present in two large areas in the northern half of the Irish Sea in low energy environments. There are also large areas of exposed till in St George's Channel, and areas of exposed bedrock occur locally in the North Channel and between Anglesey and the Isle of Man (Boelens *et al.*, 1999).
101. Although it differs in detail, the Irish Sea, in terms of depth and substrate type, has much in common with adjacent seas overlying the continental shelf, such as the eastern Celtic Sea, the English Channel and the North Sea. However, the seas to the south and west of Ireland, and west of the Hebrides, are significantly deeper, while those to the north of Scotland are both deeper and colder.

Economy and human population summary of the Irish Sea

102. The total human population residing in coastal localities within 10km of the Irish Sea coastline is estimated to be in the order of 6 million. Marine-related human activities dependent on the Irish Sea contribute to the regional and national economies in a similar manner to that described for the

Wider Sea in paragraph 84. Generally speaking, economic and employment statistics are not compiled in a manner which enables their ready collation at the Irish Sea level. However, a reasonable estimate of the annual economic contribution of the principal marine sectors would be in the order of £6 billion (€9 billion) for the Irish Sea as a whole.

- 103 The Pilot commissioned Posford Haskoning Ltd to collate statistics on the contribution to the regional economy of the principal sectors which are directly dependent on the Irish Sea. This was not a straightforward piece of work as statistics are compiled for different reasons and are rarely available on an Irish Sea basis. Consequently, amalgamation and estimation had to take place. The contractors were able to utilise the methodology and some of the information provided in the major study undertaken by Pugh and Skinner (2002). The results of the work undertaken by Posford Haskoning Ltd (Lindsay and Stocks, 2003) are summarised below.

Tourism and recreation (seaside tourism and sea based recreation)

104. Statistics on tourism and recreation were not available in a form which enabled collation at the Irish Sea scale. Nonetheless, the tourism and leisure sector probably contributes the most of all the marine sectors to the regional economy. Statistics which are available indicate a contribution to the regional economy in the order of £2.5 billion (€3.6 billion) per annum, with between 100,000-200,000 people directly employed in the sector.
105. The value of seaside tourism to Wales in 2001 is estimated at £0.9 billion (€1.3 billion), and resorts along the eastern coasts of the Irish Sea are important for the sector; for example Blackpool attracts 17 million visits a year with an annual expenditure of £545 million. Some 0.54 million tourist trips are made from Northern Ireland to Scotland each year, spending an estimated £114 million and supporting an estimated 3,800 jobs.
106. In Ireland, interest in coastal and marine based activities is growing. In the mid 1990s, over 260,000 overseas visitors participated in water-based activities, representing 29% of the total outdoor market. In 1989, an estimated 15,000 people participated in sailing in Dublin Bay alone. Leisure craft services are growing with an expansion of marine developments around the whole of the Irish Sea. At the last Dublin Boat Show some £30 million was spent.
107. Recreational angling is an increasingly important part of the rural economy. In England and Wales, CEFAS have calculated the commercial catch of bass in 1993 at first sale to be c. £5 million, whereas, during the same period, the recreational fishery generated almost £19 million of expenditure. In Ireland, national legislation has banned most commercial netting of bass and this has resulted in local and long-distance sea angling tourism valued at £17 million per annum.
108. An important factor in maintaining 'seaside' tourism and sea-based recreation is ensuring that the water quality of the sea, particularly in the vicinity of resort beaches and other important recreational areas, is maintained at a high level. Map 9 shows the distribution of EU bathing waters and 'blue flag' beaches around the Irish Sea. Maintaining the supply of sand to holiday beaches is also an important consideration.
109. In its character, the nature of tourism and recreation around the Irish Sea is changing. Numbers of visitors to traditional seaside resorts have declined; with much of this high-volume/low-cost tourism moving abroad. In its place, there has been a growth in the number of people wishing to enjoy a more active holiday experience and being prepared to pay the higher cost involved. Such tourism includes yachting, motor cruising, sailboarding and other watersports, sea angling and diving. Servicing this growing sector represents an opportunity for reinvestment in the tourism and water recreation sector, and a potential transfer of economic activity, both from within the tourism sector and also from other sectors, such as fishing, into this area. Such recreational activities may have local impacts on coastal habitats and wildlife, directly, or through coastal developments, such as marinas.

Oil & gas

110. Oil and gas is among the most important of the Irish Sea marine-related economic activities with a total revenue in 2001 of £1.56 billion (€2.2 billion). Oil and gas production from the Irish Sea is currently all in UK waters, and derived from the north-east Irish Sea. The production is mainly of gas (equivalent to 13.6% of UK gas production, whereas Irish Sea oil contributed 2.77% of UK oil production, in 2001). Map 10 shows the location of the main current oil and gas production sites in the Irish Sea.
111. The number of people directly employed in activities relating to oil and gas production in the Irish Sea is in the order of 700-1000. These include about 350 people employed offshore, and some 450 people employed at the Heysham support base and the Barrow and Point of Ayr gas terminals.
112. Oil and gas production in the Irish Sea is not dependent on the marine environment *per se*, but on the occurrence of these resources from strata overlain by the sea. The resources are exploited as economically and safely as possible, with considerable care taken to avoid harm to those engaged in this and other marine sectors, or to the environment. Exploration and production activities may have local impacts on the seabed and water column. Cetacean densities are low in the Irish Sea and seismic survey work is undertaken to strict guidelines to minimise impact.

Ports & shipping (imports/exports, ferries)

113. About 100Mt of imports and exports passed through Irish Sea ports in 2002. Milford Haven and Liverpool accounted for 34.5Mt and 30.4Mt respectively, Belfast 16Mt (in 1996), Dublin 9Mt (in 1995) and the Manchester Ship Canal ca 8Mt. Port activities at Clydeport yielded a turnover of £41.4 million in 2001.
114. 80% by volume of Ireland's exports and imports pass through its ports and trade is continuing to rise. The UK remains Ireland's most important trading partner, accounting for just over 31% of imports and 21% of exports.
115. Passenger travel across the Irish Sea is also very important, with numbers of sea passengers using the main routes calculated at 6.665 million in 2002. The main ferry routes are shown in Map 11. Figures using the main routes are reported in the Transport Statistics Bulletin, National Statistics Office 2003, and shown below.

Route of travel	Number of passengers (000s)
Fishguard-Rosslare	662
Holyhead-Dublin	1,354
Holyhead-Dun Laoghaire	1,017
Liverpool-Dublin	291
Liverpool-Belfast	137
Liverpool-Douglas	286
Pembroke-Rosslare	287
Stranraer-Belfast	1,296
Cairnryan-Larne	651
Troon-Belfast	332
Heysham-Douglas	252
Total	6,665

116. The ports and shipping sector is a significant employer in the Irish Sea region, with in the order of 10,000-15,000 people directly employed in the sector.

117. The sector utilises the ability of the sea to transport materials and people at relatively low cost. Shipping requires water of sufficient depth and, in shallow areas, this leads to dredging and sediment disposal operations. The economy of sector operations, and human and ship safety, are key considerations. Port development can have significant impacts on coastal habitats and processes, and navigational dredging can have local marine impacts. The possible introduction of non-native species in ballast water or on ships' hulls is a potential problem, and accidental spillages and illegal discharges of oil may have significant, though generally transient, impacts.

Naval defence

118. HM Naval Base Clyde at Faslane is the headquarters of the Royal Navy in Scotland and home to the UK's strategic nuclear deterrent. The management of all submarine and surface ship maintenance, together with the provision of ancillary services, takes place in the area. The Base provides personnel support for 3,000 service personnel, 800 service families and 4,000 civil servants. In total, naval defence around the Irish Sea directly contributes perhaps £1 billion per annum to the regional economy and employs 10-20,000 people. The BAE Systems Marine shipyard at Barrow is engaged in the £3-4 billion contract to construct Astute Class submarines, and its shipyard on the Clyde will be involved in the £5.3 billion contract to construct the Type 45 Destroyer. These contracts are expected to sustain around 10,000 jobs in the shipyards, subcontractors and supply chain. BAE Systems has also been awarded, jointly with the French company Thales, a £2.9 billion contract to build 2 aircraft carriers. The Gorvan and Scotstoun Yards in Glasgow will manufacture sections for assembly at Rosyth Dock yard. This contract is expected to create around 2,000 jobs and safeguard a further 10,000 at UK shipyards. In Ireland, there is a naval base at Haulbowline in County Cork.
119. The construction of naval vessels and the operation of shore bases can have similar impacts to other coastal developments on coastal habitats and processes. Naval operations generating high intensity underwater sounds may impact upon cetacean and other marine species.

Renewable energy

120. The production of electricity from renewable sources based on the Irish Sea is expected to develop substantially over the next 15 years. Five offshore wind farm projects in the Irish Sea have already acquired consent under the UK government's Round 1 licensing. When the Round 1 projects are complete, they will have a combined capacity of about 600MW. In addition, there are six proposed sites on the east coast of Ireland. The 25MW Arklow Bank site is due to begin generating by the end of 2003.
121. It has been estimated that windfarms will occupy an area of 135km² by 2010 and 254km² by 2020 in the eastern Irish Sea, although maximum credible estimates could be double this. The planned development of Liverpool Bay might create between 1,500 and 6,000 jobs during the construction phase, though longer-term employment for the sector is likely to be of a lower order.
122. Although the region has considerable potential for tidal and wave energy generation, none has yet been realised.
123. The dependency of the industry on the marine environment is mainly limited to wind availability (and potentially tides and waves), and benefits from the modest extent (relative to the situation on land) of competing activity uses. Important considerations are the need to operate the windfarms economically, and to ensure operations are conducted as safely as possible avoiding harm to other sea users and to the environment. Offshore windfarms may impact on seabed habitats and processes, some fish species and aggregations of seabirds.

Sea fisheries

124. Fisheries landings in the Irish Sea had a turnover of around £60 million (€86 million) in 2002, and are summarised below.

	Total weight (tonnes)	Value £ million	Value € million
Shellfish	52,500	43.5	62.2
Demersal	11,900	15.8	22.6
Pelagic	3,900	0.6	0.8
Total	68,300	59.5	85.6

125. These fisheries comprise:

- i. Shellfish: the most important commercial species in the Irish Sea is *Nephrops* worth £8.2 million in 2002. 18% of the total UK catch of *Nephrops* was caught in the Irish Sea VIIa area (excludes the Clyde). Mussels (£3.4 million), Scallops (£3.2 million) and Queens (£2.2 million) are other important species;
- ii. Demersal (bottom or near-bottom living fish): these are generally mixed fisheries targeting primarily cod (£1.8 million), dogfish (£1.5 million), skates and rays, soles, haddock, hake, anglerfish, plaice, pollack and conger eels;
- iii. Pelagic (surface or mid water fish): the 3 principal species are herring (£0.3 million), mackerel and horse mackerel.

126. There has been a decline in the number of vessels (11,108 in 1993 to 7,033 in 2002) and employment (19,044 in 1996 to 12,746 in 2002) in the UK fishing industry in recent years, and it is probable that this trend applies also to the Irish Sea. Direct employment in the Irish Sea fishing industry is estimated at 1,000-2,000. The fish processing and preserving industry also contributes to the economy and employment, but no figures are available for the Irish Sea area.

127. The fishing industry depends on good water conditions, the maintenance of good habitat conditions for spawning and as nursery areas, and the maintenance of plankton productivity and of a complex trophic structure. By its very nature and scale, fishing has an impact on target stocks, on non-target stocks of fish and on other species through their incidental catch in fishing gear. It can also affect marine foodwebs. In the Irish Sea, several fish stocks are close to or below safe biological limits and some skate and ray species are threatened. Certain gears, in particular beam trawls and scallop dredges, have impacts on the seabed due to physical disturbance. Such disturbance is widespread in the northern Irish Sea.

Mariculture

128. Mariculture contributed about £13 million (€18.5 million) to the regional economy in 2001, of which mariculture along the Irish coast contributed £6.9 million (€9.9 million). The main species were mussels (£9.2 million), and Pacific oyster (£3.6 million), with small quantities of native oyster, scallops and Manila clams also being produced.

129. The tonnage and total value of shellfish produced in the UK increased by *c.*50% between 1999 and 2000, due mainly to an increase in mussel cultivation, and the situation is likely to be similar in the Irish Sea. Employment in the industry in the Irish Sea is estimated as being in the low hundreds.

130. Mariculture for shellfish requires clean water conditions and the maintenance of natural productivity.

Marine aggregates

131. The economic contribution of the aggregate production in the Irish Sea is small, with a turnover in 2000 of £1.79 million (1.36% of UK production marine aggregates) Within the UK sector of the Irish Sea, there are 4 areas licensed for dredging, in the north-east Irish Sea. The marine aggregate industry in north-west England employs about 50 people. There is a licence application to extract a further 1.2Mt a year from a further area in the north-east Irish Sea. There has been no significant extraction of marine aggregates in Irish waters in recent years, but the demand for marine aggregates is growing as inland sources are depleted. A marine aggregate strategy is likely to be developed in the near future.
132. Employment in the Irish Sea marine aggregate industry is estimated at less than 100.
133. Aggregate extraction is not dependent on the marine environment *per se*, but on the location of aggregate resources. Avoiding aggregate extraction from shallow water areas helps ensure that sediment support to intertidal habitats and to beaches is not reduced. The removal of seabed material involves disturbance of the benthos and alteration of the seabed profile and may impact upon fish spawning areas. Aggregate extraction is currently very limited in the Irish Sea and the total area being dredged is very small.

Conclusions

134. The primary contributors to the national and regional economy are tourism and recreation, oil and gas, ports and shipping and, locally, naval defence. Of these, tourism and recreation is the most dependent on ecosystem services of clean water and beaches, and the maintenance of natural processes including sediment supply to beaches. For the other sectors, the sea is a medium which supports the sector, but the relationships to the ecosystem are primarily those of ensuring the activity is carried out without substantial adverse impacts.
135. The renewable energy sector is small and increasing. It is unlikely to make a major contribution to the regional economy but may provide significant local opportunities for the port and local construction industries.
136. The fisheries sector makes a relatively modest contribution to the economy and employment. The future of the commercial fisheries depends largely upon the safeguarding and recovery of fish and shellfish stocks and their sustainable exploitation. Recreational angling is likely to make an increasingly important and sustainable contribution.
137. Mariculture and marine aggregates make small but increasing contributions to the regional economy and employment.

Discussion

138. As mentioned in Chapter 5, many issues relating to the regulation of human activity are subject to action at the global, EU or national level, and the issue of whether action at a Regional Sea level is also essential requires consideration. The main benefits of such 'regionalisation' could be expected to be the facilitation and development of bilateral and multilateral initiatives between the UK and neighbouring countries aimed at the better and more integrated management of these sea areas. Such an approach would also enable the involvement of regional and local communities when considering the future use and development of the Regional Sea. While such regional engagement and planning will, necessarily, be undertaken within the context of the broad governance systems referred to in Chapter 5, implementation at the Regional Sea scale could prove effective and beneficial.

139. Examples of potential value of such regionalisation include:
- i. the development of regional strategies for the management of the sea to take full account of the dependency of regional and local populations on the Regional Sea. Such strategies are more likely to be capable of paying due regard to regional and local needs than is strategic planning at the national and international level. An example of such a strategy might be the setting of water quality standards and targets at the Regional Sea level (over and above those set by EU legislation); something that could be expected to benefit from bilateral and multilateral agreements between countries;
 - ii. in some instances, the regulation of human activity might better be achieved at the regional level; for example the establishment of a Regional Advisory Committee on fisheries for the Irish Sea under EC Regulation 2371/2002 could be expected to make a significant contribution to the sustainable management of Irish Sea fisheries;
 - iii. the co-ordination of data collection and survey referred to in Recommendation 6 could benefit from the establishment of a data and research forum at the Regional Sea scale as a means of implementing improved national and EU co-ordination and collaboration;
 - iv. for nature conservation purposes, the Regional Sea approach provides a natural and useful classification of medium-scale marine ecosystems within which Special Areas of Conservation under the EC Habitats Directive, and, potentially, marine protected areas under OSPAR Annex V, can be selected as part of the development of an ecologically-coherent network of such areas (i.e. representative examples of the relevant features would be identified on a Regional Sea basis, and these, combined, will form the national site series).
140. Consideration as to whether action at the Regional Sea level would prove beneficial for sectors other than those referred to above (e.g. for shipping, renewable energy, marine aggregates), may merit further attention.

Recommendations

141. The following recommendations are made with respect to Regional Sea matters:

R10 A system of biogeographical Regional Seas should be developed for the north-east Atlantic by the relevant countries in conjunction with the EU and OSPAR. A good starting point would be the system suggested for UK waters.

R11 The biogeographical Regional Seas referred to in R10 should be considered as a basis for strategic planning and management of national and adjacent waters. It may be desirable to combine some biogeographic regional sea areas into larger areas which are administratively better suited for such strategic planning and management.

R12 Consideration should be given to the establishment of fora at the Regional Sea level to improve co-ordination and collaboration in management planning, data collection, survey and research.

R13 The biogeographic Regional Seas can be used to guide the selection of Special Areas of Conservation under the EC Habitats Directive, and the prospective marine protected areas selected under OSPAR Annex V, to ensure the necessary representation of geographical and ecological variation in the development of ecologically-coherent site networks.