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Summary:	The Case Study investigated a multiple-use zoning approach to management of marine activities at a regional sea scale to inform the development of marine spatial planning. The zoning scheme derived is based on only existing statutory regulatory measures and jurisdictions for the wide variety of use occurring in the Irish Sea. Default or <i>de facto</i> zones are identified, ie General Use Zone (sub-zones of Minimal Management and Targeted Management), Conservation Priority Zone, Exclusion Zone (sub-zones of Limited Exclusion and Significant Exclusion), and Protected Zone. The first of these occupies the majority of the area examined and the last about 0.005%. To test the utility of the zoning scheme, it was used to assess the current level of different protection in place based on, amongst other things, maps of modelled marine landscapes and a selection of nationally important marine habitats. This

	revealed, for example, that only two of the five landscapes are represented in areas where conservation is the priority and that of these only 0.02% ('Photic reefs') and 0.09% ('Aphotic reefs') lie within the Protected Zone. It was concluded that the existing legal mechanisms on which the proposed zoning scheme is based do not provide adequate protection to important nature conservation features.
Reference/citation:	Boyes <i>et al.</i> 2005. Multiple-use Zoning in UK and Manx Waters of the Irish Sea: interpretation of current legislation through the use of GIS-based zoning approaches. Report to Scottish Natural Heritage, English Nature and Countryside Council for Wales. Boyes, S., Elliott, M., Thomson, S., Atkins, S. & Gilliland, P. (in press) A proposed multiple-use zoning scheme for the Irish Sea: an interpretation of current legislation through the use of GIS-based zoning approaches and effectiveness for the protection of nature conservation interests. (submitted to <i>Marine Policy</i>).
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Multiple Use Zoning in UK and Manx Waters of the Irish Sea: An Interpretation of Current Legislation and a Proposed GIS-based Zoning Scheme

Report to Scottish Natural Heritage, English Nature and Countryside Council for Wales

Institute of Estuarine and Coastal Studies
University of Hull

2 April, 2008

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Scottish Natural Heritage, English
Nature & Countryside Council for
Wales

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Manx Waters of the Irish Sea: An
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Scheme

2 April, 2008

Reference No: YBB087-F-2005

For and on behalf of the Institute of Estuarine and Coastal Studies
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Executive Summary

This report provides an overview of a multiple use zoning approach based on existing legally permitted and permissible mechanisms to inform spatial planning and management of activities at a regional sea scale. It presents both visually and descriptively the extent to which the existing planning and governance framework is able to meet the increasing pressure of activity and development within the marine environment. Various non-statutory management measures are used within the Irish Sea such as informal management agreements, codes of practice and recommendations; however, the analysis in the present study was limited to statutory regulatory measures and jurisdictions governing sectoral activities. Furthermore, only those activities occurring below the low water mark were included, thus excluding local authority byelaws made for regulating activities in intertidal areas.

The Irish Sea supports various users and uses which compete for space; these include aggregate extraction, archaeology, dredging and dredge disposal, military activities, nature conservation, oil and gas exploration, ports and harbours, recreation, sea fisheries, shipping, submarine cables and pipelines and windfarm developments. The national legislative controls and local byelaws which regulate these activities within the Irish Sea are examined in the present report and their spatial data relating to permits and consents, where available, have been mapped spatially in a Geographic Information System (GIS).

After taking account of models provided by previously developed zoning schemes and the regulatory measures identified by activities within the Irish Sea, a multiple use zoning scheme with potential application to the Irish Sea Regional Sea has been developed. By applying the zoning approach at the regional sea level, the present study has been able to produce default or *de facto* zones that show a series of multiple use, exclusive use and partial use activity zones. The application of current legislation and regulation together with the constraints on activities suggests that four main zone types can be identified. Each zone provides an increasing level of environmental protection and also an increasing level of active management. The proposed zones, progressing from the least to highest protection, are:

- General Use Zone (GUZ) - in which there are sub-zones of Minimal Management (MM) and Targeted Management (TM),
- Conservation Priority Zone (CPZ),
- Exclusion Zone (EZ) - in which there are sub-zones of Limited Exclusion (LE) and Significant Exclusion (SE), and
- Protected Zone (PZ).

Zone 1A Minimal Management Zone (MM) of the General Use Zone (GUZ) in principle defines the activities already permitted by international legislation or which could legally occur within this zone, subject to legally permitted consents and licences issued by the relevant authorities and if the proposals are found to be technically feasible and environmentally sustainable. In total, 80% of the Irish Sea study area currently unlicensed for regulated activities makes up Zone 1A. For example, shipping and fishing activities which are not spatially controlled by legislation currently occur within this zone although these activities are controlled under MARPOL and EU fisheries legislation respectively.

Zone 1B Targeted Management Zone (TM) of the General Use Zone (GUZ) defines the areas of Zone 1A where an authorisation, licence, permit, order or

consent has been granted for an activity or development under the relevant legislation controlling that activity. Activities occurring in this zone take place subject to the provisions of regional, national and international regulations and are under management and/or enforcement provisions by the relevant authorities. These activities are likely to constrain further developments. Zone 1B currently occupies only 6% of the Irish Sea regional sea area.

Zone 2 Conservation Priority Zone (CPZ) incorporates all areas designated for their conservation value including MNRs, SSSIs/ASSIs, SACs and SPAs. The CPZ is superimposed on the GUZ because activities are not automatically restricted but generally subject to greater control, assessment and monitoring. An activity can be legally sanctioned if developers can show that proposals will have no significant detrimental effect on the conservation status of the site.

In effect, conservation requirements drive decisions about developments and activities which are permitted within the CPZ and this zone can exist only on actual designated sites. Since the *Natura* site series is at present incomplete both within 12 nautical miles and beyond to 200nm (pending implementation of the Offshore Marine Conservation (Natural Habitats &c.) Regulations applying the Habitats Directive out to 200nm), it should be expected that the zone will be increased as further sites are identified and designated. Once the site series is defined to the satisfaction of the European Commission then the zone will be complete with regard to *Natura* sites. However, if new UK or EU legislation for an ecologically coherent network of Marine Protected Areas (MPAs), or other protection measures for biodiversity are enacted, then the zone would be extended accordingly. The loss of sites for any reason could result in the removal of parts of the CPZ in some areas.

The CPZ currently covers 13% of the Irish Sea study area representing the total area designated for nature conservation measures. Activities managed by formal/statutory powers and controls also occur within this zone although this figure does not represent the actual coverage of legislated activities within this zone.

Zone 3 Exclusion Zone (EZ) is divided into two sub-sectors. **Zone 3A Limited Exclusion (LE)** incorporates activities which a) place a temporal exclusion zone affecting other activities using the same sea space, or b) confer temporal exclusion rights on itself on conservation grounds. Examples of a) include MOD danger areas where other activities are only restricted during MOD activities; 'Areas to be Avoided' by ships exclude this activity on safety and conservation grounds although other activities can still use the area; and 250m no-dredge zones around pipelines excluding aggregate dredging. Examples of b) include fisheries protection areas where legislation defines areas seasonally or permanently closed to a specific fishery. This affords protection to the target species although it does not restrict other activities from occurring within this area.

The LE Zone (3A) currently covers 67% of the total Irish Sea area but overlies other zones and it identifies mostly fishery areas where temporal and spatial restrictions on activities apply. Although effectively prohibiting the activity from taking place within a specified timeframe and spatial extent, this does not preclude other activities from using the sea space. Examples of developments in this zone include pipelines and cables, fishing and military activities. Following the SEA of Round 2 windfarm developments, the DTI established a non-statutory exclusion zone around the coastline of England and Wales to manage the development of the industry. This exclusion zone varies within an 8 to 13km distance from the coastline. Although this exclusion zone applied to the Round 2 developments, further licensing rounds for

offshore windfarms (and other renewable energy developments) will be subject to SEA and the exclusion zone may not necessarily be carried forward to these.

Zone 3B Significant Exclusion (SE) is a *de facto* sub-zone containing legally permitted activities which require an exclusion zone around them on health and safety grounds to prevent collisions and provide protection to the development. The delimited zonation includes both the activity and the safety area. Examples include the 500m safety zones around activities such as oil and gas platforms and wind turbines. Hence as more development takes place at sea, this zone will increase in size. The zone would be reduced if developments are completed, abandoned or decommissioned. Currently this zone only covers 1% of the regional sea area and although other activities are excluded from Zone 3B, the degree to which this zone contributes to the protection of the marine environment varies, depending on the type of activity. For example, the activity licensed could itself have an impact of greater or lesser significance, e.g. oil and gas developments.

Zone 4 Protected Zone (PZ) includes protected historical areas where irreparable damage could occur if activities are permitted. Therefore virtually all activities are prohibited at all times with only very limited exceptions usually for research purposes and even these will require a permit. Areas under the *Protection of Wrecks Act 1973* and *Control of Military Remains Act 1986* are included within this zone. Only 0.005% (2km²) of the UK Irish Sea waters lie within the PZ. Under current legislation, this zone would only increase in size if further military remains, wrecks or other marine archaeological artefacts were designated under relevant legislation.

In order to test the robustness of the scheme developed, several scenarios were developed and assessed against the *de facto* zonation methodology. It was tested against the Irish Sea Pilot Project's collated data on the presence of marine landscapes, a selection of nationally important marine features (habitats and species) and areas of known high intensity bird use areas. It was concluded that the existing legal mechanisms on which the proposed zoning scheme is based do not provide adequate protection to important nature conservation features within the Irish Sea. For example, even those features lying within the Conservation Priority Zone 2 cannot be given the full protection needed to restrict the damage from new developments or existing activities. The Protected Zone (Zone 4) currently protects only 2km² of the Irish Sea and, unless the criteria for its designation are broadened, then the Conservation Priority Zone (Zone 2) provides the next best protection.

This study has demonstrated that it is feasible to create a multiple use *a posteriori* zoning scheme for the Irish Sea by summarising and mapping the existing area-based legislation and regulations which control activities in the regional sea, and the level of environmental protection they provide. It has devised default or *de facto* zones that show a series of multiple use, exclusive use and partial use activity zones by applying a zoning approach at the regional sea scale. In particular, the study has shown that the presently defined regulatory and statutory sectoral measures can be summarised within a relevant zonation scheme. In particular, the study has emphasised that nature protection sites can still be regarded as being within multiple-use zones whereas sectoral activity control areas are included in other zones.

Although this scheme identifies four proposed zones, this is primarily a description of what occurs within the area. It is not what might be regarded as a true zoning scheme in which preferred zones for management, protection and differing levels or types of use are identified *a priori* based on a clear set of objectives. As a tool to give effect to marine spatial planning, these would need to include economic,

environmental and social objectives and would also seek to minimise or avoid conflict between different uses and between a range of uses and environmental features. At present such an approach is not possible given the sectoral licensing system in place for coastal seas. However, the *a posteriori* zoning scheme does provide a 'benchmark', an analysis of the present position, against which to judge the degree to which objectives are already being delivered and to develop an *a priori* zoning scheme.

The current *ad hoc* sectoral and *a posteriori* approach to spatial planning, as indicated here, has been in existence for many years and accommodates the existing developments. This prevents a coherent spatial planning policy being implemented. At present, the exploitation of the UK marine environment is in a 'pioneer' phase where new developments are occupying space and are licensed essentially on an *ad hoc* and 'first-come-first-served' basis. Although Strategic Environmental Assessment could help to address such concerns, e.g. based on experience with the oil and gas sector and developments with wind and mineral extraction, in general, UK marine space is currently being allocated and occupied without any strategic or spatial planning to decide upon priorities for sea area use. Such planning requires an assessment of the most suitable locations for current or future developments by taking account of other potential uses and users and some guidance on location or allocation of space. This implies the need for some form of zoning.

This study has graphically demonstrated the proliferation of activities currently occurring in the Irish Sea and the need for a comprehensive spatial planning system. However, the proposed approach confirms the sectoral basis of regulation in the Irish Sea and thus the constraints provided by that basis. Furthermore, the proposed zoning scheme demonstrates that there are relatively limited mechanisms available through the current regulatory systems that can be used to implement any form of marine spatial planning policy. The analysis confirms that there is some limited spatial management in the Irish Sea, albeit on an *ad hoc* basis, but it also highlights that there is little *de facto* spatial planning.

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Table of Contents

EXECUTIVE SUMMARY	2
TABLE OF CONTENTS	6
1. INTRODUCTION AND BACKGROUND	8
1.1 Aim, Objectives and Methodology	8
1.1.1 Collation and Mapping of Relevant Information	9
1.1.2 Deriving and Characterising a Zoning Scheme	9
1.1.3 Testing and Applying the Zoning Scheme	9
1.2 Study Area	9
1.3 Background to Zoning.....	10
2. COLLATING AND MAPPING LEGAL MEASURES.....	11
2.1 Methods	12
2.1 Aggregate Extraction	12
2.2 Archaeology	13
2.3 Dredging & Dredged Material Disposal	14
2.4 Military Activities	15
2.5 Nature Conservation.....	16
2.6 Oil & Gas	19
2.7 Ports & Harbours	20
2.8 Recreation	23
2.9 Sea Fisheries.....	23
2.10 Shipping.....	25
2.11 Submarine Pipelines & Cables	26
2.12 Windfarms.....	28
2.13 GIS.....	30
3. ZONING.....	32
3.1 Deriving the Zoning Scheme	32
3.2 Characterisation and Description of the Zones.....	35
4. TESTING THE ZONING SCHEME AGAINST IRISH SEA DATA	40
4.1 Marine Landscapes	41
4.1.1 Results and Analysis.....	42
4.2 Nationally Important Marine Features.....	43
4.2.1 Results and Analysis.....	43
4.3 Seabird Hotspots	44
4.3.1 Results and Analysis.....	44
5. DISCUSSION AND CONCLUSIONS.....	45
5.1 The Features of the Proposed Zoning Scheme and Lessons Learned	45
5.2 Developing the Scheme.....	46
5.3 Application - Testing the Effectiveness of the Zoning Scheme.....	47
5.4 Relevance to Marine Spatial Planning.....	48

5.5 Final Comments and Conclusions	49
REFERENCES	50
FIGURES.....	52
APPENDIX 1	55

1. Introduction and Background

The Irish Sea Pilot (Vincent *et al*, 2004) and the Review of Marine Nature Conservation report (Defra, 2004) both emphasised the need to undertake further research into the potential benefits of developing a marine spatial planning system (MSP) for UK waters. They recommended that the data and information collated by the Irish Sea Pilot provided a strong basis for trials of possible MSP approaches. Reviews of legislation, regulations and enforcement relevant to marine nature conservation for the Irish Sea were undertaken for the Pilot (Boyes *et al*, 2003). They were aimed at assessing the extent to which any new management mechanisms for conservation could be delivered through existing regulatory structures, and to inform the Pilot's recommendations in relation to potential improvements in existing systems.

The Irish Sea is an intensively used area, with the majority of activities currently taking place in UK coastal waters represented within this Regional Sea. The management arrangements, legal provisions and jurisdiction of various authorities are also complex. Therefore, as well as building on the work of the Irish Sea Pilot, the Irish Sea provides a good case-study to consider new, perhaps more integrated approaches to the management challenges faced by those taking decisions in the marine environment. Such a potentially valuable approach is to use the zoning of sea areas for types and management, and to use these to contribute to improved governance of the marine environment.

1.1 Aim, Objectives and Methodology

The aim of this study is to derive and test the application of a multiple use zoning approach based on existing legal mechanisms to inform spatial planning and management of activities at a regional sea scale. Such an exercise will also inform the current debate on zoning and spatial planning. It aims to present both visually and descriptively the extent to which the existing planning and governance framework is able to meet the increasing pressure of activity and development within the marine environment.

Various non-statutory management measures are used within the Irish Sea such as informal management agreements, codes of practice and recommendations; however, the analysis in the present study was limited to statutory regulatory measures and jurisdictions governing sectoral activities. Furthermore, this study only includes those activities occurring below the low water mark, and therefore excludes local authority byelaws made for regulating activities in intertidal areas.

The project attempts to capture the activities that already occur within the Irish Sea area. Thus, although attempts have been made to denote zones within the Irish Sea, it is an *a posteriori* zoning scheme, and does not form an objective-based comprehensive multiple use zoning scheme for the Irish Sea. The latter would require a more proactive policy-led approach in which *a priori* zones are created as a means of protecting features of nature conservation importance whilst allowing for other legitimate uses. It is not the intention of the present project to propose policies for the zones that indicate where future developments may or may not be encouraged, only government is able to balance overall economic, social and environmental priorities.

There were several objectives towards this aim and the work was structured sequentially around these:

1.1.1 Collation and Mapping of Relevant Information

The main UK legislation and regulations relevant to marine activities and nature conservation currently in force in the Irish Sea were identified and summarised. The results are set out in section 2. Relevant byelaws in force in the UK waters of the Irish Sea relating to human activities were included. The jurisdictional areas and details of these measures, where they have a spatial element, were then mapped in a Geographic Information System (GIS). GIS provides a powerful tool for the visualisation and analysis of spatial datasets and for the integration of a wide variety of different data formats. The GIS allows spatial data to be visualised and analysed, and overlaid with a range of data types. The various data formats were converted into a common data format and common coordinate system allowing all of the layers to be visualised in relation to one another. All output files are stored as MapInfo and ArcView files on the accompanying CD Rom.

1.1.2 Deriving and Characterising a Zoning Scheme

Once mapped, the measures were reviewed and assessed by the research team in discussion with the nominated officers of the partner bodies (SNH, CCW and EN). A zoning map of the Irish Sea was proposed which defined zones where types of multiple use, exclusive use or partial use policies apply. The scheme presented in this report in section 3 provides a proposal for discussion and may be modified and developed by future work or in the light of new information.

1.1.3 Testing and Applying the Zoning Scheme

The proposed zoning scheme was tested against the Irish Sea Pilot's collated data on protected areas, marine landscapes and features (habitats and species) of national importance. In turn, this assessed where interactions and potential conflicts may arise and the extent to which existing measures can provide protection for natural heritage interests. This assessment, described in section 4, attempts to show spatially whether (for example) a network of marine protected areas could be set up within the zones identified and whether the zones provide an adequate framework for planning and governance at a regional sea scale. The testing also attempts to highlight where natural heritage and conservation interests are unable, through existing mechanisms, to receive the protection that they require, or if they may be subject to damage from new developments or activities.

1.2 Study Area

For the purpose of this project, the Irish Sea Pilot boundaries for the Irish Sea were maintained although the study excluded Irish waters or legislation. Thus, the Regional Sea is bounded in the north by a line from the low water mark between the Mull of Kintyre in Scotland to Fair Head in Northern Ireland. The south boundary is defined by a line from Linney Head in Wales out to the median line between Ireland and the UK and the study area is the UK waters to the Irish, Northern Ireland boundary at Carlingford Lough. It therefore includes the administrative jurisdictions of England, Wales, Scotland, Northern Ireland and the Isle of Man. The legislation of England, Wales, Scotland, Northern Ireland (as reviewed by Boyes *et al*, 2003) and the Isle of Man (as reviewed by Dryden *et al*, 2003) are included within this project.

1.3 Background to Zoning

A number of multiple use zoning schemes are in use in various parts of the world to prioritise ecological assets of a site and the management activities. This management tool has been used to bring a more strategic planning regime into marine decision-making. These zoning schemes have helped to harmonise the mechanisms for the conservation of habitats and species and for sustainable human use by proactively identifying both areas of importance or sensitivity for natural or cultural heritage, and areas of likely interest to particular sectors, to minimise conflict between them. They can guide where activities and developments can be permitted to occur and the level of intensity that can be accommodated in defined areas. The zoning scheme will thus result in an integrated representation of current management controls (Gubbay & Laffoley, 1996). The most mature example is probably the Great Barrier Reef Marine Park (GBRMP) Zoning Scheme in Australia. The GBRMP uses 8 zones to provide a scale of protection and conservation action; these range from a general use zone, where general stewardship principles with few other restrictions apply, to a no-take, no access 'preservation' zone (Table 1).

Schemes have also been proposed within the UK to conceptualise existing regimes at sites. In 1996, English Nature undertook a first analysis of existing '*de facto*' multiple use zoning schemes for small coastal areas at Flamborough Head, Falmouth Bay and the Severn Estuaries (Gubbay, 1996). The six zones proposed by Gubbay (1996) are listed in Table 1. Studies have also been conducted at Lundy MNR and Skomer MNR and Table 1 shows examples of proposed zoning schemes. The latter include zones for restricted access, sanctuaries, those for protecting key habitats, general managed use and special purpose. Zoning has often been used as a tool to address safety or amenity issues and thus it can be an effective tool to minimise conflicts in areas where different activities are competing on a spatial or temporal basis. Zones can operate across geographical areas (such as specific areas of water) or temporally for instance by controlling activities at certain times of the year.

In the last two decades, a network of coastal and estuarine protected areas have been identified and designated in the UK under the Habitats and Species Directive (SACs) and Wild Birds Directive (SPAs). Although these sites are almost exclusively coastal and are focused on shallow water habitats (<50m), they may provide a foundation upon which to build a network of nationally important areas in the Irish Sea (Roberts *et al*, 2003). For the purposes of this study the extent of existing SACs/SPAs and MNR's have been used to identify the location of important natural resources that are priorities for protection. However, the country conservation agencies may require to identify the location of conservation resources more accurately than this, especially in Wales where the SACs cover large areas.

The current study considers the methods and efficacy of zoning not through the development of a zoning scheme to express policy and new objectives, but through attempting to integrate the net result of existing, largely sectoral measures into *de facto* a single zoning scheme. In doing so, it is hoped that this work will complement and inform a much broader exercise soon to be undertaken (summer 2005) on behalf of Defra which will develop and test the concept of Marine Spatial Planning in the Irish Sea.

Table 1 Examples of Zoning Schemes Worldwide

	Example	Zoning Scheme	
Existing Zoning Schemes	Great Barrier Reef Marine Park, Australia (Day, 2002)	1. General use zone 2. Habitat protection zone 3. Scientific research zone 4. Conservation park zone 5. Buffer zone	5. Buffer zone 6. National park zone 7. Preservation zone
	Monterey Bay National Marine Sanctuary, USA (Brown, 2001)	1. National Marine Sanctuary Zone 2. Jade Collection Zones 3. Dredge Material Disposal Zones 4. Restricted Overflight 5. Motorized Personal Watercraft Zones 6. Military Zones 7. Shark Attraction Prohibited Zone 8. Vessel Traffic Zones 9. No Harvest Zones 10. Limited Harvest Zones 11. Recreational Zone 12. Wildlife Enhancement and Protection Zone 13. Water Quality Protection	
Proposed Zoning Schemes	Lundy & Skomer MNRs, UK (English Nature, 1994)	1. General use zone 2. Recreation zone 3. Refuge zone	4. Sanctuary zone 5. Archaeology protection
	Solent Region, UK (Gubbay & Laffoley, 1996)	1. General Use Zone 2. Recreation Zone 3. Harbour Zone	4. Refuge Zone 5. Sanctuary Zone 6. Protected Zone
	Flamborough Head, Severn Estuary & Falmouth Bay, UK (Gubbay, 1996)	1. All activities subject to the provisions of regulations and Codes of Practice 2. Recreation zone 3. Restrictions apply to zone to minimise obstructions to port activities 4. Reduced disturbance to seabed 5. Most commercial fisheries prohibited 6. Most activities prohibited	

2. Collating and Mapping Legal Measures

The Irish Sea supports various users and uses which compete for space; these include: shipping, aggregate extraction or disposal, military use areas, offshore oil and gas exploration, cables and pipelines, windfarms, nature reserves and other marine and coastal protected areas for fisheries and conservation purposes. This section examines the national legislative controls and local byelaws which regulate activities within the Irish Sea Regional Area. Spatial data relating to permits and

consents, where available, were mapped using GIS. Appendix 1 provides a graphical summary of the application of powers and jurisdictions out to 200nm.

2.1 Methods

Byelaws and statutory instruments relevant to activities within the Irish Sea were collated and examined to identify where and/or when activities are prohibited or limited in some way at certain locations. Much of this information had already been collected for the original Irish Sea Pilot although further data were sourced from local authorities, Port and Harbour Authorities, the UK environment agencies (EA, SEPA, EHS(NI)) and the Sea Fisheries Committees. For most licensed offshore activities, their locations were obtained from the licensing / regulatory authorities or the operators of existing activities. Information was collected on the following activities:

- Aggregate Extraction
- Archaeology
- Dredging & Dredged-material Disposal
- Military activities
- Nature Conservation
- Oil & Gas
- Ports & Harbours
- Recreation - Local Authority Byelaws
- Sea Fisheries
- Shipping
- Submarine Cables & Pipelines
- Windfarms

2.1 Aggregate Extraction

LEGISLATION:

- Government View Procedure (GVP) – Applications for the extraction of marine minerals are currently operating under the non-statutory Interim Government View Procedures pending introduction of the Statutory Procedures. Applications are made to the Crown Estate by operators – applications will include an Environmental Statement which is based on an Environmental Impact Assessment and significant consultation with stakeholders on the proposals. The relevant Secretary of State is consulted and gives a “*Government View*” on the proposals, and on any restrictions and limitations which should be applied; given a favourable Government View, the Crown Estate issues licences in accordance with the Government View as well as commercial contractual arrangements.
- *Environmental Impact Assessment and Habitats (Extraction of Minerals by Marine Dredging) Regulations* – it is hoped these will come into force in 2005. These new Statutory Regulations will apply to England, Wales and Northern Ireland. Scotland will introduce its own regulations to govern extraction of marine minerals. These regulations will require the submission of dredging applications for which permission will be determined on environmental grounds. A detailed environmental statement will therefore need to accompany each application, which also must take account of transfrontier effects where necessary. Any potential cumulative effects from developments in the surrounding area will also be considered under the new regulations.
- *Coast Protection Act 1949* (CPA) - Section 34 Licence for construction under or over the seashore lying below the level of MHWS. A licence can be granted for mineral extraction, with responsibility for enforcing the licences lying with the coast protection authority.

- *Minerals Act 1986* – vests the properties of all minerals existing in a natural condition in the Isle of Man to the Department of Trade and Investment. As the coverage of this act extend to the territorial waters, the Department of Transport would also have to be consulted with consideration from the Territorial Sea Committee.

ADMINISTRATION

- Crown Estate – owns the seabed out to the 12 mile UK territorial limit and has ownership rights to all minerals across the rest of the UK part of the European Continental Shelf; it monitors tonnage removal and compliance with licence conditions.
- The current procedure for the consent of marine aggregate extraction is administered by the Office of the Deputy Prime Minister (ODPM) in England, DoE(NI) in Northern Ireland, the Welsh Assembly Government (WAG) and the Scottish Executive.
- Defra - particular responsibility for overseeing and monitoring the effects of dredging.
- Department for Trade and Industry (Isle of Man) - grants licences for the exploration and exploitation of minerals within Manx territorial waters, with consultation with the Department of Transport and the Territorial Seas Committee.

LOCATION

There are currently only 4 licensed aggregate extraction sites within the Irish Sea Pilot Sea Area (Figure 1).

2.2 Archaeology

LEGISLATION

- *Protection of Wrecks Act 1973* - section 1 is designed to protect wrecks which are of historic, archaeological or artistic importance. Diving is prohibited on wrecks protected under this legislation and there is an exclusion zone around the designated site of between 100 to 500m. Under section 2 of the Protection of Wrecks Act, vessels are designated as being dangerous by virtue of their contents and so there is a strict no entry policy; this is in the interest of safety of both divers and members of the public.
- *Wreck and Salvage (Ships & Aircraft) Act 1979* – protection of wrecks within Manx territorial waters; this prohibits tampering, damaging, removing, diving and salvaging activities.

ADMINISTRATION

- Department for Culture, Media & Sport – under section 1 of the Protection of Wrecks Act 1973.
- DfT through Maritime & Coastguard Agency – under section 2 of the Protection of Wrecks Act which is administered through the Receiver of Wrecks.

- English Heritage, CADW, Historic Scotland and Environment and Heritage Services (NI) have responsibilities for maritime archaeology within their respective territorial waters.
- Department of Transport, Isle of Man – Receiver of Wreck under the *Wreck and Salvage (Ships & Aircraft) Act 1979*. Harbour Board charged with responsibility of diving to remove or excavate objects from within restricted wrecks.

LOCATIONS

There are currently 7 protected wreck sites within the Irish Sea Pilot study area. These are listed below and shown on Figure 2.

Protection of Wrecks Act 1973 – section 1

- Royal Yacht Mary - Skerries, Wales
- Pwll Fanog Wreck - Menai Straits, Wales
- Tal-y-bont wreck - Cardigan Bay, Wales
- Resurgam - Denbeighshire, Wales

Protection of Wrecks Act 1973 – section 2

- SS Castilian - East Platters, Wales

Milford Haven byelaw

- Sunderland Flying Boat - Milford Haven, Wales

Wreck and Salvage (Ship and Aircraft) Act 1979

- HMS Racehorse - off Castletown, Isle of Man

2.3 Dredging & Dredged Material Disposal

LEGISLATION:

- *Food and Environment Protection Act 1985* - control is achieved through a strict licensing system under FEPA. FEPA provides the necessary statutory means to meet the UK's obligations under both the OSPAR and London Convention. The majority of disposal applications under FEPA relate to regular dredging activity within long established ports, at which considerable experience has been accumulated by both the regulatory agencies and the port authorities. This information includes sediment quality characteristics of the areas involved and the impacts of dredging and disposal on the surrounding marine environment.
- *Water Pollution Act 1993* – controls the disposal of material on the seabed in Manx territorial waters – similar provisions to FEPA in the UK.
- *Coast Protection Act 1949 (CPA)* - In locations where dredging is not specifically authorised under a local harbour act, dredging and dredging disposal has to be approved by the Department for Transport under the CPA. Section 34 of the CPA provides for the restriction and removal of works detrimental to navigation. The purpose of the control under section 34 of the Act is primarily to ensure that works do not endanger navigation.

ADMINISTRATION

- A harbour authority (or other party) is likely to require a CPA consent from Defra (via the MCEU) both to undertake the dredging and the deposit of the arisings at sea where such activities are outside the provisions of any local harbour powers or where the Secretary of State's consent may also be necessary. Similar consents will be needed from the Scottish Executive or DARD(NI). A licence will

also be required under the Food and Environment Protection Act 1985 from Defra who also act as agents for the Welsh Assembly Government for proposals in Wales (via the MCEU), from the Scottish Executive (Marine Laboratory, Aberdeen) in Scotland or the Environment and Heritage Service DoE(NI) in Northern Ireland.

- Department of Transport, Isle of Man – licences disposal, including that by the Harbours Board with stipulated conditions.

LOCATIONS

There are currently 58 licensed disposal sites within the Irish Sea Pilot area (Figure 3).

2.4 Military Activities

LEGISLATION

- *Military Lands Act 1892 & 1900* – provide powers to exclude access to land owned by the Ministry of Defence for the purposes of military training or national defence, through the making of byelaws. This applies to any land, sea and tidal water that either abuts on defence land or over which firing takes place from defence land to secure the public from danger, but may not adversely affect any right of common access.
- *Land Powers (Defence) Act 1958* – section 7 extended the above regulations to any sea areas not abutting on defence land or subject to firing from such land. Byelaws under this section may now be made in relation to any area of sea, tidal water or shore used for defence purposes, provided that it lies at least partly within the seaward limits of territorial waters
- *Protection of Military Remains Act 1986* - allows the designation of a 'Controlled Site' of any area in UK or international waters which appears to contain a place comprising the remains of both aircraft and ships which appears to have sunk or been stranded while in military service. Less than 200 years must have elapsed since the sinking or stranding. This Act also allows the designation of a 'Protected Place' designating any vessel, whether or not its last resting-place is known, which appears to have sunk or been stranded while in military service. The sinking or stranding must have occurred on or after 4th August 1914 and a buffer zone can be established around the site.

ADMINISTRATION

- Ministry of Defence (MOD) – MOD land and designating military remains. The MOD is consulted as a sea user in relation to offshore developments under the Coastal Protection Act 1949 and the Petroleum Act 1998, although they have no statutory powers offshore.
- Crown Estate – consent for any byelaws made by MOD when the area lies over the foreshore or seabed.

LOCATIONS

There are currently 9 MOD restricted areas within the Irish Sea Pilot study area (Table 2 and Figure 4).

Table 2 MOD restricted areas

Scotland	England	Wales
Coulport	Eskmeals	Ty-Croes
Faslane	Sealand Ranges, English/Welsh border	Castlemartin
Kirkcudbright		Northern Ireland
West Freugh		Ballykinler

There are two sites designated as Controlled Areas under the Protection of Military Remains Act within this study region:

- Firth of Clyde, Scotland
- Caernarfon Bay, Wales

Submarine Exercise Areas are also shown as advisory areas to mariners on Admiralty Charts. These exercise areas are designated for submarines both at depth and on the surface and mariners on passage through these areas have to keep vigilance.

2.5 Nature Conservation

Although there are many designations protecting both habitats and species in the marine environment, this project has focused on four main designations giving protection to the seabed beyond the low water mark. These include Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Marine Nature Reserves (MNRs) in England, Wales, Scotland and Northern Ireland. In addition, although most Sites of Special Scientific Interest and Areas of Scientific Interest (SSSI/ASSI) are designated down to low water, there are some cases along the Welsh coastline (e.g. Dee Estuary) where SSSI's do apply below LW. Therefore these have been included within the mapping. There are no current nature conservation designations extending into Manx territorial waters.

LEGISLATION:

SACs

- The EC Directive on the *Conservation of Natural Habitats and of Wild Fauna and Flora* (the Habitats Directive, 92/43/EEC) applies to the European territory of Member States. Marine Special Areas of Conservation (SACs) can be both intertidal and subtidal areas, and also can apply to land adjacent to the shore where it is used by marine species.
- The UK government has implemented this Directive in Great Britain with *The Conservation (Natural Habitats &c) Regulations 1994* which came into force on 30th October 1994, while in Northern Ireland the regulations were transposed through the *Conservation (Natural Habitats &c) Regulations (Northern Ireland) 1995*. The provisions of the 1994 Regulations have been superceded, to some extent, by the extensive strengthening of the SSSI system under the *Countryside and Rights of Way Act 2000* applicable to England and Wales, the *Nature*

Conservation (Scotland) Act 2004 and ASSIs under *The Environment (Northern Ireland) Order 2002*. European legislation is not relevant within the Isle of Man.

- Although it was originally assumed that the Habitats Directive only applied to marine areas within the 12nm territorial sea limit, the High Court (*Greenpeace vs. UK Government*) ruling in 2000 established that SACs can extend out to the UK Continental Shelf and the waters above it.
- Once a SAC has been established, Regulation 34 provides for the creation of a new legal framework for the management of marine areas proposed for designation. The Government has the power to give directions to require 'specified conservation measures to be included in the management schemes' (regulation 35 (2a)). Once these plans have been established for each SAC, there is a duty placed upon bodies with jurisdiction in the marine environment to use their statutory powers to safeguard the conservation of the sites.

SPAs

- Member States were asked to classify the most suitable territories (both at land and sea) as Special Protection Areas (SPAs) for the conservation of these species under the EC *Directive on the Conservation of Wild Birds* (the Birds Directive, 79/409/EEC). Their conservation is now guided by the provisions of article 6 of the *Habitats Directive*.
- The Wild Birds Directive is enacted in the UK through the *Wildlife and Countryside Act 1981* (as amended by the *Countryside and Rights of Way Act 2000*) and the *Conservation (Natural Habitats, &c) Regulations 1994*, and the *Conservation (Natural Habitats, etc) Regulations (Northern Ireland) 1995*. European legislation is not relevant within the Isle of Man.

MNRs

- In England, Wales and Scotland Marine Nature Reserves (MNR) can be designated under the *Wildlife and Countryside Act 1981* (section 36), in Northern Ireland through the *Wildlife (Northern Ireland) Order 1985* and in the Isle of Man, under Part II section 32 of the *Wildlife Act 1990*.
- A MNR is the equivalent of an NNR within coastal waters and can be designated for any area of land or water from the high water mark to a line three miles from the baseline established for measuring the territorial waters (section 36). However, by order of the Privy Council, MNRs can be designated out to twelve nautical miles. MNRs were designed to be the marine equivalent of NNRs.
- Reserves can be designated in order to conserve marine flora and fauna or geological or physiographical features of special interest, and to provide special opportunities for marine research.
- The impact of an area being designated as a MNR lies in the provision for making byelaws which may protect the reserve from pleasure boats, the killing and disturbance to plants and animals and the deposit of rubbish in the reserve.

ADMINISTRATION

- Country Conservation Agencies out to 12nm – English Nature, Countryside Council for Wales, Scottish Natural Heritage, the Environment and Heritage Service in Northern Ireland and the Department of Agriculture Fisheries and Forestry in the Isle of Man.

- Joint Nature Conservation Committee (JNCC) out to 200nm for UK waters (except for the Isle of Man waters).

Locations:

Within the Irish Sea, there are currently 25 marine SPAs, 11 marine SACs, 2 MNRs and numerous SSSIs/ASSIs (Table 3, Figure 5). Where a site has numerous conservation designations, for example designated a SSSI/ASSI, SPA, SAC and MNR as is the case for Strangford Lough, although there are several conservation designations covering the same area, these often equate to one site for conservation management.

Table 3 Conservation designations in the Irish Sea

SPAs	SACs	MNRs
Ailsa Craig, Scotland	Luce Bay and Sands, Scotland	Skomer, Wales
Loch of Inch and Torrs Warren, Scotland	Drigg Coast, England	Strangford Lough, NI
Ribble & Alt Estuaries, England	Sefton Coast, England	
Duddon Estuary, England	Menai Strait & Colwyn Bay, Wales	SSSIs / ASSIs (*)
Mersey Estuary, England	Llwyn Peninsula and the Sarnau, Wales	Scotland - approx 45 sites
Dee Estuary, English Welsh border	Cardigan Bay, Wales	England – approx 16 sites
Traeth Lafan, Wales	Pembrokeshire Marine, Wales	Wales – approx 70 sites
Dyfi Estuary, Wales	Murlough, NI	Northern Ireland -approx 20 sites
Holy Island Coast, Wales		Isle of Man – 1 site
Aberdaron Coast & Bardsey Island, Wales	Both SPA & SAC	
Castlemartin Coast, Wales	Solway Firth, Scottish English border	AoSP
Grassholm, Wales	Morecambe Bay, England	Ronaldsway, Isle of Man
Mynydd Cilan, Trwyn y Wylfa ac Ynysoedd Sant Tudwal, Wales	Strangford Lough, NI	
Ramsey & St Davids Peninsula, Wales		
Skokholm & Skomer, Wales		
Ynys Feurig, Cemlyn Bay and The Skerries, Wales		
Puffin Island, Wales		
Castlemartin Coast, Wales		
Carlingford Lough, NI		
Swan Island, NI		
Belfast Lough, NI		
Larne Lough, NI		

(*) Although most Sites of Special Scientific Interest and Areas of Scientific Interest (SSSI/ASSI) are designated down to low water, there are some cases along the Welsh coastline (e.g. Dee Estuary) where SSSI's do apply below LW. Therefore they have been included within this review, however since the proposed zoning exercise is based on activities occurring beyond low water, most SSSI/ASSIs will have limited relevance to the exercise and to the zones depicted.

2.6 Oil & Gas

There are many controls governing the activity of oil and gas exploration including Acts and regulations. Key examples are detailed below:

KEY LEGISLATION:

- *Petroleum (Production) (Seaward Areas) Regulations 1988* - relating to the application for petroleum production licences in respect of seaward areas and applications for petroleum exploration licences in respect of seaward areas and landward areas below the low water line. They also apply to certain estuarine and near shore waters.
- *Petroleum Act 1998* - The Secretary of State has powers under sections 21-24 to designate "safety zones" up to 500m around every installation within tidal waters and parts of the sea in or adjacent to the UK, up to the seaward limit of the territorial sea and waters designated under the Continental Shelf Act 1964.
- Under the *Petroleum Act 1998* an authorisation is required for the construction and/or use of a "pipeline" in controlled waters. A pipeline is defined as a pipe or system of pipes "for the conveyance of any thing, together with any apparatus and works associated with such a pipe or system". This includes pipelines used for transporting hydrocarbons, water and chemicals. A "works authorisation" means an authorisation for the works for the construction of a pipeline, or for such works and for the use of the pipeline.
- *Coast Protection Act 1949* - Construction under or over the seashore lying below the level of MHWS. The siting of offshore installations within territorial waters and the UK continental shelf, are controlled under Section 34.
- *Petroleum Act 1986* – property of oil and gas vested in the Manx DTI, giving the Department the rights to grant licences for the exploration and exploitation of these resources within Manx territorial waters.
- *Mineral Workings (Offshore Installations) (Isle of Man) Act 1988* – the Act imposes safety zones around oil and gas installations of 500m. This applies to all installations constructed on the surface to the seabed (including pipelines).
- FEPA – for works not associated with pipelines under the Petroleum Act; it also relates to the use of dispersants. There is also a UK Pollution Control Zone, an area including the UK's internal waters (rivers and canals) and the UK's pollution control zone, defined as 200 miles from the baseline or out to the nearest median line. This is administered by DEFRA in relation to the treatment of spilled oil.

ADMINISTRATION

- Department of Trade and Industry (DTI) - The Oil and Gas Directorate of DTI includes the promotion and regulation of the exploration and development of the UK oil and gas resources in England, Wales, Scotland and Northern Ireland.
- Crown Estate - this owns the seabed out to the limit of territorial waters and the leases required for this area. The Crown Estate will issue a licence for development over its land if development occurs outside the territorial waters.
- DTI – Regulation of oil and gas exploration in the Isle of Man.

- Coast Protection Act 1949 - consents are administered by Defra through the MCEU for England and Wales, and by the Scottish Executive and the Department of Environment for Northern Ireland (DoENI) respectively for Scotland and Northern Ireland on behalf of the DTI.

LOCATIONS:

Within the Irish Sea, there are 20 offshore oil and gas sites currently under licence. These are confined to the Morecambe Bay gas fields and the Liverpool Bay oil and gas fields (Figure 6); there are also wells, associated pipelines, hydrocarbon fields and surface structures.

2.7 Ports & Harbours

LEGISLATION

Most harbours are administered under individual local Acts of Parliament, or under revision or empowerment orders made by the Secretary of State for Transport (under the Harbours Act 1964). Older local Acts often incorporate provisions from the Harbours, Docks and Piers Clauses Act 1847. Other legislation covers marine pollution, pilotage and speed restrictions, ballast discharge, registration of vessels and marine health and safety. These are contained within Statutory Instruments, Harbours Acts, General Directions, Pilotage Directions, Special Directions, Notices to Mariners, Harbour/Port Authority Orders and byelaws made under these Orders.

The main responsibilities of the port and harbour authorities is the maintenance, management and regulation of marine traffic to ensure safety of navigation within its harbour limits, which encompasses the responsibility for maintenance dredging of channels and removing obstructions. Responsibilities also include regulating the activities of other persons at the harbour including, in particular, the movement and berthing of ships in the harbour, the recreational use by means of directions and byelaws, and licensing dredging and the construction of works in the harbour by other persons.

Primary legislation includes:

- *Harbours Act 1964* - The statutory definition of "harbour" for the purposes of the Harbours Act 1964 is very wide. Section 57 of the Act defines it as "any harbour, whether natural or artificial, and any port, haven, estuary, tidal or other river or inland waterway navigated by sea-going ships, and includes a dock, wharf..". The area of water comprising the harbour must be sufficiently enclosed to enable such vessels to ship or unship goods or passengers. The same definition is adopted in other statutes including the Pilotage Act 1987 and the Ports Act 1991. Section 16 allows Harbour Revision Orders to be granted for securing the safety and efficiency of the harbour and these together with Harbour Empowerment Orders can be granted for the improvements, maintenance or management of a harbour (whether natural or artificial) or of a port, haven, estuary, tidal or other river or inland waterway so navigated. Section 48 of the Act imposes environmental duties on harbour authorities when considering any proposal relating to its functions. They should have regard to the conservation of natural beauty of the countryside and of flora, fauna and geological or physiographical features of special interest, to the desirability of preserving for the public any

freedom of access to places of natural beauty and also to maintain the availability to the public of archaeological and historical buildings and sites.

The Amendment of Schedule 2 of the Harbours Act 1964 by the Transport and Works Act 1992 enables harbour authorities to obtain powers for nature conservation purposes through a Harbour Revision Order. Any revisions to impose or confer powers for nature conservation must be consistent with the basic functions of harbour authorities in improving, maintaining or managing the harbour.

The amended Act now exempts operations authorised by harbour orders from the requirement to obtain the consent of the Secretary of State under section 35 of the Coast Protection Act 1949 which provides for the safety of navigation. This also applies to Land Drainage Consents by the Environment Agency in main rivers. Their powers vary widely and many harbour authorities hold powers to control activities within their jurisdiction on both land and water. Byelaws enable the control of many activities from traffic management to establishing zones of recreational water use. These powers are typically broader than those of local authorities but are limited to those provided by statute and can only be used to provide effective harbour management and safety.

- *Transport and Works Act 1992* - Schedule 3 has extended the scope of harbour orders to include recreational as well as commercial harbours and to enable harbour authorities to obtain byelaw-making powers for nature conservation. It also places environmental duties on all harbour authorities.
- *The Pilotage Act 1987* - transfers local responsibility for pilotage from separate pilotage authorities to "competent harbour authorities" which means any harbour authority which has statutory powers in relation to the regulation of shipping movements and the safety of navigation within its harbours (section 1). The authorities have a general duty to consider the need for pilotage services and compulsory pilotage, and to provide such services as they consider necessary (section 2).

ADMINISTRATION

- Department for Transport – maritime policy and legislation overall, including merchant shipping, ports and harbours, are mainly non-devolved matters, therefore controlled by the Department. It is the overarching body for policy development to promote high standards of safety in the shipping industry.
- Department of Transport, Isle of Man – under the Harbours (Isle of Man) Act 1961, harbours and ports legislation is controlled by the Harbours Board.
- Devolved governments: the Scottish Executive, the Welsh Assembly and the Department for Regional Development in Northern Ireland. Each devolved government administers provisions within the Harbours Act and related local legislation as well as policy on and appointments to trust ports, the designating of harbour authorities under the Pilotage Act, and the relevant powers in the Ports Act 1991.
- Port and Harbour Authorities – selected examples from within the Irish Sea Pilot include Milford Haven Port Authority, Mersey Docks and Harbour Company, Associated British Ports, the Environment Agency (Dee), Belfast Harbour Commissioners and the Harbours Division, Isle of Man.

LOCATIONS

Legislation was collated for 25 ports and harbours within the Irish Sea Pilot study area (Table 4, Figure 7).

Table 4 Ports and harbours within the Irish Sea

Scotland	Wales	Isle of Man
Ayr	Dee Estuary, English/Welsh border	Castletown
Troon	Holyhead	Derby Haven
England	Fishguard	Douglas
Barrow	Milford Haven	Laxey
Fleetwood	Pembroke	Peel
Garston	Pwllhelli	Port Erin
Heysham	Northern Ireland	Port St Mary
Liverpool	Belfast	Ramsey
Silloth	Warrenpoint	
	Larne	

Some examples of individual port and harbour legislation:

Ayr	Byelaws by the Ayr Harbour Trustees 1879. ABP The Harbours, Docks and Piers Clauses Act 1847. The Ayr Harbour Act 1855 The Ayr Harbour Amendment Act 1879
Troon	Byelaws and Regulations 1920. The Glasgow and South Western Railway Company.
Heysham	The Heysham Harbour Byelaws 1979
Fleetwood	The Fleetwood Harbour and Docks Byelaws 1982. British Transport Docks Board.
Barrow	Port of Barrow Byelaws 1985. Associated British Ports.
Liverpool	The Mersey Docks and Harbour Act 1992 The Port of Birkenhead Harbour Empowerment Order 1998 The Free Zone (Liverpool) Designation Order 2001
Port of Garston	Byelaws for the Garston Docks of the London & North Western Railway Company 1911
Dee Estuary	Dee Conservancy Act of 1889; Mostyn Docks Harbour Empowerment Order 1988.
Pwllheli	Pwllheli Harbour Byelaws. Dwyfor District Council.
Milford Haven	Milford Haven Port Authority Act 2002
Warrenpoint	Harbours Docks and Piers Clauses Act 1847 The Harbours Act (Northern Ireland) 1970 Harbours (Northern Ireland) Order 2002 Warrenpoint Harbour Authority Order (NI) 2002 Warrenpoint Harbour Authority Byelaws 1998. Milford Haven Harbour Byelaws. Milford Haven Conservancy Board 1984.
Belfast	Harbours (Northern Ireland) Order 2002 Belfast Harbour Order (Northern Ireland) 2002 Harbours (Northern Ireland) Act 1970

Ports (Northern Ireland) Order 1994

All Isle of Man Ports Harbours (Isle of Man) Act 1961

Isle of Man Harbour Commissioners Byelaws 1929

Safe Bathing and Harbour Exclusion Areas 2003. Department of Transport Harbours Division

2.8 Recreation

LEGISLATION

- *Public Health Act 1961* – section 76 allows byelaws to be established for restricting speeds of pleasure boats and for public bathing.
- *Local Government Act (Northern Ireland) 1972* – Section 90 allows for the making of byelaws for seaside pleasure craft and public bathing.
- *Civic Government (Scotland) Act 1982* – allows for byelaws for the shoreline and recreational craft up to 1000m beyond low water.
- *Harbours (Isle of Man) Act 1961* – allows byelaws applied to control activity within harbour areas. This include safe bathing and restrictions on speed of boats.

ADMINISTRATION

- Local authorities in the UK – make byelaws to control activities.
- Harbours Division – control and administer byelaws for the whole of the Isle of Man below high water mark.

LOCATION

Byelaw information below low water was requested from all local authorities within the study area. Speed restriction areas for pleasure boats and banned areas for jet skis can be seen in Figure 8.

2.9 Sea Fisheries

LEGISLATION

- *Sea Fisheries Regulation Act 1966* – section 6 allows Sea Fisheries Committees (SFCs) in England and Wales to impose restrictions on fishing activities within the 0-6nm zone which are designed to ensure responsible and rational use of resources. This is either on the grounds of protecting stocks from the risk of overexploitation and/or collateral damage to essential fish habitats or of preventing conflicts arising from the deployment of incompatible fishing gears on the same fishing ground.
- *Sea Fisheries (Conservation) Act 1967* – grants powers to SFCs in England and Wales to make byelaws out 6nm specifically for the purpose of conserving fish stocks and regulating fishing activities within their Districts. Since the passing of the *Environment Act 1995* these powers have been extended to enable fishery ministers, local sea fisheries committees and the Environment Agency to make

orders or byelaws for marine environmental purposes, though only in connection with fishing activities. Ministerial Orders to restrict fishing on environmental grounds are also made under sections 3, 5 and 15.

- *Sea Fisheries (Shellfish) Act 1967* – this applies through England, Wales and Scotland and enables Several Orders (SOs) and Regulating Orders (ROs) to be granted to protect shellfisheries. SOs are established to restrict the public right to fish an area of the seabed, and to enable the establishment, improvement, cultivation and protection of a shellfish fishery. ROs grant the right, usually to a SFC or local authority, to regulate the exploitation of a shellfishery and allow a wider range of controls to be made to regulate a public fishery.
- *Inshore Fishing (Scotland) Act 1984* – this confers on the appropriate Minister powers to regulate sea fishing in specified areas within the 0-6nm zone through Orders that may prohibit: all fishing for sea fish; fishing for a specified description of sea fish; fishing by a specified method, and fishing from a specified description of fishing boat; it may specify the period during which any prohibition is to apply.
- *Fisheries (Amendment) Act (Northern Ireland) 2001* – this is the most recent Act to make modifications to the *Fisheries Act (Northern Ireland) 1966*. Section 5 of this Act extends the byelaw-making powers of the Fisheries Conservancy Board (FCB) to enable the Board to make byelaws for any aspect relating to the management and protection of fisheries.
- *Inshore Fishing (Prohibition of Fishing and Fishing Methods) Regulations (Northern Ireland) 1993* (as amended) - this prohibits the use of mobile gear.
- *Sea Fisheries Act 1971 & 1991* – this is the governing legislation for the Isle of Man inshore fisheries under which byelaws can be made. This allows the restriction or prohibition of certain methods of fishing, fishing gear, mesh sizes and taking or killing or landing particular species. The Manx government has unilateral jurisdiction within 3nm, but has to have the agreement of the UK government to apply legislation out to the 12nm limit (Isle of Man territorial waters).

ADMINISTRATION

- European Commission – Fishing beyond 12nm to 200nm.
- Defra – Fishing activities out to 12nm.
- DARD(NI) – Regulate inshore fisheries for Northern Ireland.
- SEERAD – Regulate inshore fisheries for Scotland.
- Sea Fisheries Committees – England & Wales, with jurisdiction out to 6nm for the implementation of byelaws and several and regulating orders. They include, for this area, the North Western & North Wales SFC, Cumbria SFC and South Wales SFC and the Environment Agency which is the acting SFC for the Dee Estuary. There is also cross regulation between the SFCs and the EA for seabass nursery areas.
- Environment Agency - administers recreational angling in freshwater and, for migratory salmonids, out to the 6 mile limit at sea which is regulated through licensing and byelaws.

- Department of Agriculture, Fisheries and Forestry (DAFF), Isle of Man – responsibility for establishing byelaws in the Isle of Man out to 3nm (and out to 12nm with the consent of the UK government).

TYPES OF LEGISLATION

Figure 9 shows the spatial distribution of fisheries regulations within the Irish Sea Pilot area. Examples of these measures within the study area include:

EU Fishery Closures

Irish Sea Irish Sea Herring Boxes Irish Sea Cod Box Irish Sea Mackerel Box
Regulating and Several Orders and Byelaws with spatial elements permanently or temporally closing areas to fishing include:

Scotland	The Solway Firth Regulated Fishery (Scotland) Order 2004
England & Wales	The Bass (specified Areas) (Prohibition of Fishing) (Variation) Order 1999 NWNWSFC byelaw 13A - Closure of cockle beds Byelaws 20, 24 to 27.
Wales	SWSFC byelaws 27 to 31
Northern Ireland	The Inshore Fishing (Prohibition of Fishing and Fishing Methods) (Amendment) Regulations (Northern Ireland) 2003 – Strangford Lough
Isle of Man	Sea Fisheries Consolidation (Byelaws) 1984 Sea Fisheries (Scallop Fishing) Byelaws 1999 Sea-Fisheries (Experimental Area) Byelaws 1989 Sea Fisheries (Technical Measures) Byelaws 2000

2.10 Shipping

LEGISLATION

- *Merchant Shipping (Distress Signals and Prevention of Collisions) Regulations* 1996 – this piece of legislation gives force in UK law to the International Regulations for the Prevention of Collisions at Sea 1972, as amended (also known as the Colregs). These regulations specify the conduct of vessels in Traffic Separation Schemes adopted by the IMO. Rule 10(d) states that:

(i) a vessel shall not use an inshore traffic zone when she can safely use the appropriate traffic lane within the adjacent traffic separation scheme. However, vessels of less than 20 metres in length, sailing vessels and vessels engaged in fishing may use the inshore traffic zone.

(ii) Notwithstanding sub-paragraph (d) (i), a vessel may use an inshore traffic zone when en route to or from a port, offshore installation or structure, pilot station or any other place situated within the inshore traffic zone, or to avoid immediate danger.

Rule 10(e) states that a vessel other than a crossing vessel or a vessel joining or leaving a lane shall not normally enter a separation zone or cross a separation line except: in cases of emergency to avoid immediate danger and to engage in fishing within a separation zone.

ADMINISTRATION

- Marine Coastguard Agency (MCA) - the MCA is the Competent Authority for Vessel Traffic Services (VTS) within UK territorial waters. This includes the assessment of the need and type of Coastal VTS within those waters but excluding the areas of jurisdiction of individual Harbour Authorities. The Competent Authority for VTS may also be a VTS Authority in its own right for waters outside the limits of individual Harbour Authorities.
- UK Hydrographic Office – preparation of Admiralty Charts and Notices to Mariners.

LOCATIONS

Within the Irish Sea, there are a small number of legally based spatial measures for shipping activities as listed in Table 5 and shown on Figure 7:

Table 5 Shipping Measures within the Irish Sea

Traffic Separation Schemes (TSS)	Areas to be Avoided	Laden Tankers
<ul style="list-style-type: none"> • Off Smalls, Wales • Holyhead Harbour, Wales 	<ul style="list-style-type: none"> • The Smalls and Grassholm – all vessels laden with oil, gas or noxious liquid substances and all other vessels of over 500GRT should avoid the area. 	<ul style="list-style-type: none"> • The Smalls & Grassholm – laden tankers should avoid the area between The Smalls TSS and The Smalls. Laden tankers over 10000 GRT should not use the channel between Grassholm and Skomer Island unless moving between St Bride's Bay and Milford Haven

2.11 Submarine Pipelines & Cables

LEGISLATION

- *Coast Protection Act 1949 (CPA)* - The laying of cables and pipelines on or under the seabed (or elsewhere in tidal waters) will normally require a consent under the CPA for navigational rights. Where an application is made under the CPA, the Secretary of State's powers extend to the entire length of the cable across the United Kingdom continental shelf by virtue of the CPA's jurisdiction being extended by the Continental Shelf Act 1964, Section 4(1).
- *Transport and Works Act 1992* - An order is required under this Act for the construction and laying of offshore submarine cables.
- *Petroleum Act 1998* – this repealed and replaced the *Petroleum and Submarine Pipelines Act 1975*, with Part III of the 1998 Act relating to submarine pipelines. Under the Petroleum Act 1998 an authorisation is required for the construction and/or use of a "pipeline" in controlled waters. Section 14 states that no person shall execute in, under or over any controlled waters, any works for the construction of a pipeline except in accordance with an authorisation given by the Secretary of State. Controlled waters means the UK territorial sea and any part of the sea on the UK continental shelf (section 14(2)). The permanent placing or

deposition of materials such as gravel, rock, mattresses or protective pipeline covers on the seabed during the construction of a pipeline is governed by the Pipeline Works Authorisation (PWA). Schedule 2 of the authorisation prohibits any further deposition except with the prior written consent of the Secretary of State. For pipelines which do not have a PWA, for example, pipelines constructed prior to the entry into force of the Petroleum and Submarine Pipelines Act 1975, any deposition would require a licence under the Food and Environment Protection Act 1985 (FEPA).

- *FEPA 1985* - A licence under Section 5 is required to deposit pipelines in the sea. However, the installation of subsea cables is exempt from FEPA licensing, provided that the developer has a 'Works Authorisation' under the Petroleum Act 1998. Cable protection activities, such as rock dumping or the deposit of concrete mattresses, are likely to require a FEPA licence unless specifically consented by a Works Authorisation under the Petroleum Act 1998.
- *Telecommunications Act 1984* - for any proposal to install telecommunications cables below the level of Mean High Water Springs (MHWS). The type of consent depends on whether the developer has a licence to operate a telecommunications system within the UK under Part 2 of the Act.
- *Crown Estate Act 1961* - provides for the rights of occupation for the purpose of placing structures on, or passing cables over, the seabed and foreshore in the ownership of the Crown. No dredging will be permitted for a distance of 250m either side of a cable 'No Dredge Zone'. This Act also provides for a 'Dredging Notification Zone' defined as an area 250m to 500m either side of a cable. These notifications operate for six years from 1998 as they are an interim measure pending the creation of the statutory Environment Impact Assessment and Habitats (Extraction of Minerals by Marine Dredging) Regulations. This Act also allows for the establishment of a 'Works Restriction Zone' 250m either side of a cable in water depths up to 55mCD in which no third party works can occur without the consent of the licensee.

Isle of Man

- *Petroleum Act 1986 (Application) Order 2000* – Part III provides restrictions for the construction and use of pipelines in the territorial sea of the Isle of Man without authorisation from the Department of Transport. Other activities can also be controlled around the pipelines (i.e. fishing) to reduce interference.
- *Submarine Cables Act 2003* – Schedule 1 states that consent must be gained from the Department of Transport, Isle of Man before submarine cable can be laid in Manx territorial waters. The Department of Transport can make provisions regarding the manner in which applications should be made and the information to be included. Provisions can be made to reduce interference with navigation, fishing or other activities using the sea or seabed.

ADMINISTRATION

- Coast Protection Act - the consent process for the CPA in England and Wales is managed by the Defra through the MCEU.
- Offshore Renewable Consents Unit (ORCU) – issues FEPA licence for pipelines.

- Marine Division of Defra - a separate application has to be made by the developer to Defra for pipelines which will lie between high and low water marks or across bays, estuaries etc.
- DTI – provides ‘Work Authorisations’ under the Petroleum Act 1998 for offshore submarine pipelines. The DTI also grants licences under the Telecommunications Act 1984.
- Crown Estate – a consent is required for all oil and gas pipelines and telecommunications cables that cross the seabed within 12 nautical miles of the UK coastline. The Crown Estate Commissioners also need to be informed of pipelines and cables transiting or seeking to transit waters that fall within the 200 nautical mile limit as mineral rights, such as marine aggregates, vested in The Crown Estate, or the new renewable offshore energy initiatives (such as wind farms) may be affected.
- Department of Transport and the Department of Trade and Industry, Isle of Man

LOCATIONS

Within the Irish Sea, there are over 25 subsea pipelines and cables currently licensed (Figure 10).

2.12 Windfarms

LEGISLATION:

- *Electricity Act 1989* Section 36 - for offshore wind power generating stations within territorial waters adjacent to England and Wales. The Energy Act 2004 extends the requirement for this consent to the Renewable Energy Zone (REZ). In Scotland, the Electricity Act 1989 (Requirements of Consent for Offshore Generating Stations) (Scotland) Order 2002 is applicable.
- *Transport and Works Act 1992* Order (TWA) - Provides an alternative route to the Electricity Act route above (with FEPA) for obtaining certain statutory rights necessary for the development of an offshore wind farm in territorial waters only. It displaces the need for Electricity Act and Coast Protection Act consents.
- *The Energy Act 2004* introduces a new scheme to enable a safety zone (or zones) to be established around offshore renewable energy installations. In the case of windfarms a safety zone can be established around each turbine within which it will be a criminal offence to enter. The safety zone cannot exceed a distance of 500 metres, measured from the outer edges of the installation around which it is to be established, unless permission is granted by the International Maritime Organisation on a case by case basis. It should be noted that the Department of Transport (DTI) are currently establishing a safety zone scheme. The equivalent legislation in Northern Ireland is the Energy (Northern Ireland) Order 2003 (as amended by the Energy (Amendment) Order (Northern Ireland) 2004).
- *Food and Environment Protection Act 1985* (Part II) (FEPA) – Section 5 relates to the deposition of articles or materials in the sea/tidal waters below MHWS (mean high water springs) around England and Wales including the placement of

- *Coast Protection Act 1949 (CPA)* - Section 34 regulates construction under or over the seashore lying below the level of MHWS. The *Energy Act 2004* states that a CPA consent is not required for projects in English and Welsh territorial waters and the REZ which have a section 36 consent granted after commencement of section 99 of the Energy Act. A CPA consent is not required if the TWA route is followed as navigation matters are dealt with as part of the process.
- Isle of Man
Territorial Sea (Consequential Provisions) Act 1991. The seaward development within the territorial waters requires a lease of easement from the Department of Transport.

Water Pollution Act 1993 – this requires a licence for depositing objects on the seabed under Part II of the Act

ADMINISTRATION

- The Crown Estate owns the seabed out to the limit of territorial waters and so leases are required for this area. The Crown Estate will issue a licence for development over its land if development occurs outside the territorial waters.
- DTI Offshore Renewables Consents Unit (ORCU) – gives consents under the Electricity Act (EA) (section 36) and the Transport and Works Act (TWA).
- Following a strategic environmental assessment of Round 2 developments, the DTI established an exclusion zone around the coastline of England and Wales, preventing the development of offshore windfarms within an 8 to 13km distance from the coastline. This is to reduce visual impact of development and to avoid sensitive, shallow water feeding areas for Common Scoter. However this exclusion zone may not be applicable to further offshore renewable development rounds.
- Defra: Marine Consents and Environment Unit (MCEU) – awards consents under the Electricity Act, Transport and Works Act, Food and Environmental Protection Act 1985 and Coast Protection Act 1949. These are also issued on behalf of the WAG (below).
- Welsh Assembly Government (WAG) – gives orders under the Transport and Works Act 1992 within Welsh territorial waters. FEPA is also devolved but administered by Defra on WAG's behalf.
- Scottish Executive - for consents within Scottish Waters
- Department of Enterprise, Trade and Investment – issues orders under the Energy (Northern Ireland) Order 2003. Department of Environment (NI) issue FEPA licences
- Isle of Man Harbours Division of the Department of Transport – lease for development.

LOCATIONS:

Within the Irish Sea, there are currently seven windfarm sites licensed within Round 1 and three within Round 2 (Table 6, Figure 11).

Table 6 Offshore Windfarm Developments in the Irish Sea

Round 1	Round 2
Barrow	Walney
Rhyll Flats	West Duddon
North Hoyle	Gwynt Y Mor
Solway Firth	
Shell Flats	
Burbo Bank	
Ormonde West	

2.13 GIS

Table 7 lists all the data sets and their use within the GIS. **It is acknowledged that not all current data were included within this study due to their availability within the timeframe of the project.** Figure 12 shows the legally based spatial measures for all the above activities spatially mapped together within the Irish Sea.

Table 7 Data Catalogue – Legislated Uses of the Irish Sea

Title	Format	Source	Data Included & Comments
Aggregate Extraction			
Regulated Areas	GIS	Crown Estate / ISP CD	All spatial data plotted
Archaeology			
Wrecks	Digitised	UK Hydrographic Office website	All spatial data plotted in GIS.
Dredged Material & Disposal			
Disposal Sites	GIS	Defra / ISP CD	All spatial data plotted
Dredged Areas	Coordinates mapped but no associated polygons	MCEU	Information included as point information as too many data to convert to polygons within the study timeframe.
Military Activities			
Controlled Sites	Digitised	Legislation	All controlled military remains plotted with buffer zones
Restricted Areas	Digitised and GIS	ISP CD	All spatial data plotted

Title	Format	Source	Data Included & Comments
Submarine Exercise Areas	Digitised	Admiralty Charts	All spatial data plotted
Nature Conservation			
Protected Areas	GIS	CCW, EN, SNH, EHS, DAFF	Data included: - SACs - SPAs - MNRs - SSSIs / ASSIs - AoSP
Oil & Gas			
Regulated Areas	GIS	UKDEAL	Data included: - UK 20 th Offshore Licensing Areas - Oil and Gas seabed wells - Oil and gas surface platforms - Safety zones around establishments - Oil and gas pipelines with safety zones
Ports & Harbours			
Harbour limits	Digitised and GIS	Admiralty Charts and legislation	Locations and jurisdictions of key ports and harbours together with byelaw information
Recreation			
Regulated Areas	Digitised	Local Authorities & Harbour Authorities	Data included: - Speed restrictions for pleasure craft - Exclusion zones for pleasure craft (motorised)
Angling	-	-	No spatial data available for study
Diving	-	-	No spatial data available for study
Sea Fisheries			
Fishery Closed Areas	GIS	Defra / ISP CD	All spatial data plotted - Irish Sea Herring Boxes - Logan Bay Herring Box - Isle of Man Herring Box - unclear whether Cod Boxes still in operation
Fishery Closed Areas	GIS and some digitised	NWNWSFC byelaws	Data included: - N Llyn Scallop Closed Area - Cardigan Bay Scallop Closed Area - Newbiggin/Aldingham, Morecambe Bay cockle bed closures - Middleton, Morecambe Bay cockle bed closure - Traeth Lafan, Gwynedd cockle bed closure
Regulated Areas	Digitised	NWNWSFC byelaws	Data included: - Fishery Order Areas – seeded mussel beds - Fixed & Drift Net Restrictions in the Northern Menai Straits and Conwy Bay & the Southern Menai Strait and River Llyfni It is recognised that further restrictions are placed on fixed engines, drift nets and mobile nets however these data were unavailable in a digitised format.

Title	Format	Source	Data Included & Comments
Regulated Area	GIS and some digitised	SWSFC byelaws & CEFAS data	Data included: - Skomer MNR - Milford Haven restrictions
Regulated Area	Digitised	Legislation	Bass nursery areas
Regulated Area	GIS	DAFF	Data included: - Herring Fishing - Crab, Crawfish, Lobster licensing within 3nm - Scallop fishing within the 3nm and up to 12nm
Closed Areas	Digitised	DAFF	- Experimental Area
Shipping			
Controlled areas	Digitised	Admiralty Charts	Data included: - Traffic Separation Schemes - Areas to be Avoided - Laden Tankers
Submarine Cables			
Spatial Extent	GIS	UKDEAL	Data included: - Coaxial cables - Fibre Optic cables - Telegraph cables
Windfarms			
Regulated Areas	Digitised and GIS	Crown Estate / Legislation	Data included: - Round 1 and Round 2 sites - Safety zones - DTI Renewable Exclusion Zone (currently policy and only applicable to Round 2 developments).

3. Zoning

3.1 Deriving the Zoning Scheme

Using the models provided by existing zoning schemes and the regulatory measures identified in section 2 above, this study has developed a possible multiple use zoning scheme for the Irish Sea Regional Sea. The main purpose of this scheme is to show that existing legislation and regulation provides implicitly (but not necessarily explicitly) for increasing levels of environmental protection and management controls through the zones.

An initial analysis of the measures identified in section 2 produces some general conclusions or statements about where each use and activity could take place and what potential limitations exist relating to the development of a particular use. These conclusions are then used as a basis for the zoning scheme as follows:

AGGREGATE EXTRACTION

Aggregate extraction must be licensed but could potentially occur in any area of the Irish Sea depending on available reserves, technical and environmental feasibility and potential licensing restrictions. The only areas where this activity would always

be prohibited are where it would have a direct impact on sites designated under the Protection of Wrecks Act 1973.

DREDGING AND DREDGE DISPOSAL

Dredging and dredged-material disposal are licensed activities occurring predominantly within estuaries, ports, harbours and shipping channels. The disposal of this material occurs at designated sites. The only areas in which this activity would always be prohibited are where it would have a direct impact on sites designated under the Protection of Wrecks Act 1973, or around submarine pipelines and cables.

MILITARY ACTIVITIES

Military activities are largely concentrated in defined practice and exercise areas which place some limitations on other users. There are no areas within the Irish Sea where military activities are specifically prohibited, but there are areas (danger areas) which restrict other users and uses of the area at certain times on safety grounds (e.g. unexploded ammunition from bombing practice). Activity within the danger areas is only restricted during MOD activities, and outside these times, other activities are allowed, e.g. certain fishing operations are allowed when live firing is not occurring. However, what can and cannot occur does depend on the site and the military activities for which it is used. Submarine exercise areas exist within the Irish Sea although these do not limit other sea users. The MOD are consulted as a sea user in relation to offshore developments under the Coastal Protection Act 1949 and the Petroleum Act 1998 although they have no statutory powers offshore.

OIL AND GAS

Oil and gas developments must be licensed but could occur in any area of the Irish Sea depending on the available reserves, technical and environmental feasibility and licensing restrictions. Oil and gas installations have a 500m exclusion zone established around them to prevent shipping collisions and prohibit other activities on grounds of safety e.g. fishing. The only areas where this activity would always be prohibited are where it would directly impact on sites designated under the Protection of Wrecks Act 1973.

PORTS AND HARBOURS

Ports and harbours are generally established where there is access via deep-water channels. Ports authorities have powers associated with their harbour jurisdictions where they can control marine pollution, pilotage, speed restrictions, ballast discharge, registration of vessels and marine health and safety. These are contained within Statutory Instruments, Harbours Acts, General Directions, Pilotage Directions, Special Directions, Notices to Mariners, Harbour/Port Authority Orders and byelaws made under these Orders.

RECREATION

Recreation in the marine environment is often managed via voluntary codes. Where byelaws are used they are generally applied above LW to manage access to the sea. Water-based recreation can be restricted through byelaws that enforce exclusion zones around inshore areas (on the grounds of conflicting activities) and offshore areas where other developments may pose safety risks or by limitations on speed. Water-based recreation can also be unsuitable on safety grounds for example within recognised shipping lanes. All types of recreation are excluded from

sites designated under the Protection of Wrecks Act 1973. Only recreation taking place beyond low water was included within this study.

RESEARCH

Scientific research and study within the marine environment is allowed within all zones, although permits may be required in order to work in some areas on safety or heritage grounds. Permits are needed for research which has the potential to interfere with or is specifically looking at the effects of an activity on a designated habitat or species (e.g. a dispensation order is required for the taking of undersized fish on SAC).

SEA FISHING

All commercial fishing activities must comply with existing fisheries legislation whether it is local byelaws, national controls or European legislation. Fishing can occur between shipping traffic separation schemes and in shipping lanes. Fishing legislation generally details where a fishing activity cannot occur and by default allows the activity in all other areas within the district. In most cases, a licence is required by a fisherman to carry out an activity. This tends not to be spatially restrictive but applies quotas to fish taken, licenses on the types of vessel used and regulates fishing methods. Fisheries closed areas are management tools which allows a sea area to be closed to either a certain fishing gear (or vessel size), or for a certain target species. At present there are a number of closed area initiatives in the Irish Sea where fishing is regulated and including both EU and UK controls. Most of these measures involve a closed area for a defined period within the year although still allowing other activities to occur within the sea area. Therefore, most fisheries protection areas fall within Zone 3A (see below), affording partial exclusion on a seasonal or annual basis from access to fish stocks. Fishing is legally restricted within Zone 3B Significant Exclusion Zone and Zone 4 Protected Zone.

SHIPPING

Shipping can occur in most navigable areas within the sea. Controls are placed on shipping in dangerous navigational areas, for example around headlands where traffic separation schemes may be employed. This does not prevent other activities from passing through this area, but restricts fishing to the area separating the shipping channels. Laden tankers are advised not to navigate within sensitive areas. 'Areas to be Avoided' on admiralty charts indicate areas which should be avoided by vessels laden with oil, gas or noxious liquids.

SUBMARINE PIPELINES AND CABLES

Submarine pipelines or cables have a 250m no-dredge area on either side to avoid the removal of aggregate. However, other activities are permitted within the no-dredge areas although mariners are advised (on a non-statutory basis) not to anchor or trawl in the vicinity of pipelines and cables through an issued 'Notice to Mariners'. The laying of submarine pipelines and cables is prohibited only in areas where they will have a direct impact on sites designated under the Protection of Wrecks Act 1973.

WINDFARMS

Windfarm developments must be licensed and can be placed within areas designated under the 'Rounds' of windfarm site lease competitions. Under Round 1, developers were allowed to seek a site anywhere within coastal waters, however under Round 2, Strategic Environmental Assessments (SEAs) were conducted of

three strategic areas (Greater Wash, Thames Estuary and the North West) where developers were limited to these key areas. However, different areas could be proposed for further Rounds, located in sea areas where the depth and wind resources are suitable for renewable development. Once licensed, windfarm developments would by default fall within Zone 1b or Zone 2 (see zoning descriptions below) following the production of an acceptable SEA.

Following the SEA of Round 2 windfarm developments, the DTI established a non-statutory exclusion zone around the coastline of England and Wales to manage the development of the industry. This exclusion zone varies within an 8 to 13km distance from the coastline (as shown in Figure 11). The aim of the exclusion zone is to reduce visual impact of developments and to avoid sensitive, shallow water feeding areas for the Common Scoter. Although this exclusion zone applied to the Round 2 developments, further licensing rounds for offshore windfarms (and other renewable energy developments) will be subject to SEA and the exclusion zone may not necessarily be carried forward to these.

It should be noted that not all windfarm developments have a 500m safety zone, for example the Round 1 developments of North Hoyle and Rhyl Flats. With the exception of these two developments, it is assumed that exclusion zones are in existence for other developments and thus in the present scheme were mapped around other windfarms within the Irish Sea.

3.2 Characterisation and Description of the Zones

By applying the zoning approach at the regional sea level, this study has been able to produce default or *de facto* zones that show a series of multiple use, exclusive use and partial use activity zones. These identify increasing restrictions placed on the types of activities legally permitted within the zones based on increasing protection for conservation and archaeological heritage. This therefore produces an integrated representation of current management controls and what they mean for environmental protection.

The application of current legislation and regulation together with the constraints on activities as described in 3.1 suggests that four main zone types can be identified. Each zone provides an increasing level of environmental protection and also an increasing level of active management. The proposed zones, from the least to highest protection, are:

- General Use Zone (in which there are sub-zones of Minimal Management and Targeted Management),
- Conservation Priority Zone,
- Exclusion Zone (in which there are sub-zones of Limited Exclusion and Significant Exclusion), and
- Protected Zone.

A detailed description of each zone and the types of activities permitted in each are summarised below. Table 8 shows the relative proportions of each zone as applied to the Irish Sea.

1. General Use Zone (GUZ)

Zone 1A. Minimal Management Zone (MM) – In principle, activities are already permitted by international legislation or could legally occur within this zone, subject to legally permitted consents and licences issued by the relevant authorities and if the proposals are found to be technically feasible and environmentally sustainable. In total, 80% of the Irish Sea study area

currently unlicensed for regulated activities makes up Zone 1A. For example, shipping and fishing activities which are not spatially controlled by legislation currently occur within this zone although these activities are controlled under MARPOL and EU fisheries legislation respectively.

Zone 1B. Targeted Management Zone (TM) – This zone defined the areas of Zone 1A where an authorisation, licence, permit, order or consent has been granted for an activity or development under the relevant legislation controlling that activity. Activities occurring in this zone take place subject to the provisions of regional, national and international regulations and are under management and/or enforcement provisions by the relevant authorities. These activities are likely to constrain further developments. Zone 1B currently occupies only 6% of the Irish Sea regional sea area (Table 8).

If an activity or development is proposed within zone 1A and becomes legally permitted i.e. a licence or permit is obtained from the competent authorities, then that consented area would move from Zone 1A to Zone 1B. For example, the UK's commitment to developing renewable energy sources will make further licence blocks available for windfarms in the Irish Sea together with their requirement for additional submarine cables to transfer electricity onshore. Such activities may require the setting of exclusion zones for safety, creating new Zone 3B areas. Hence it is expected that Zone 1A will decrease as increasing marine developments take place. Whether this will lead to increases in Zone 1B or 3B (see below) will depend on factors such as the implementation of safety zones around wind turbines and policy discussion about any further restrictions within the overall footprint of a development.

2. Conservation Priority Zone (CPZ) – This incorporates all areas designated for their conservation value including MNRs, SSSIs/ASSIs, SACs and SPAs. The CPZ is superimposed on the General Use Zone (GUZ) because activities are not automatically restricted but generally subject to greater control, assessment and monitoring. An activity can be legally sanctioned if developers can show that proposals will have no significant detrimental effect on the conservation status of the site.

In effect, conservation requirements drive decisions about developments and activities which are permitted within the CPZ and this zone can only exist on actual designated sites. Since the *Natura* site series is at present incomplete both within 12 nautical miles and beyond to 200 nm (pending implementation of the Offshore Marine Conservation (Natural Habitats &c.) Regulations applying the Habitats Directive out to 200nm), it should be expected that the zone will be increased as further sites are identified and designated. Once the site series is defined to the satisfaction of the European Commission then the zone will be complete with regard to *Natura* sites. However, if new UK or EU legislation for an ecologically coherent network of Marine Protected Areas (MPAs), or other protection measures for biodiversity are enacted, then the zone would be extended accordingly. The loss of sites for any reason could result in the removal of parts of the Conservation Priority Zone in some areas.

The CPZ currently covers 13% of the Irish Sea study area representing the total area designated for nature conservation measures (Table 8). Activities managed by formal/statutory powers and controls also occur within this zone although this figure does not represent the actual coverage of legislated activities within this zone.

3. Exclusion Zone (EZ)

3A. Limited Exclusion (LE) – this sub-zone incorporates activities which a) place a temporal exclusion zone affecting other activities using the same sea space, or b) confer temporal exclusion rights on itself on conservation grounds. Examples of a) include MOD danger areas where other activities are only restricted during MOD activities; ‘Areas to be Avoided’ by ships exclude this activity on safety and conservation grounds although other activities can still use the area; and 250m no dredge zones around pipelines excluding aggregate dredging. Examples of b) include fisheries protection areas where legislation defines areas seasonally or permanently closed to a specific fishery. This affords protection to the target species although it does not restrict other activities from occurring within this area.

The LE Zone (3A) currently covers 67% of the total Irish Sea area but overlies other zones (Table 8) and it identifies mostly fishery areas where temporal and spatial restrictions on activities apply. Although effectively prohibiting the activity from taking place within a specified timeframe and spatial extent, this does not preclude other activities from using the sea space. Examples of developments in this zone include pipelines and cables, fishing and military activities. Following the SEA of Round 2 windfarm developments, the DTI established a non-statutory exclusion zone around the coastline of England and Wales to manage the development of the industry. This exclusion zone varies within an 8 to 13km distance from the coastline (Figure 13 shows this area in the inset box). Although this exclusion zone applied to the Round 2 developments, further licensing rounds for offshore windfarms (and other renewable energy developments) will be subject to SEA and the exclusion zone may not necessarily be carried forward to these.

3B Significant Exclusion (SE) – this *de facto* sub-zone contains legally permitted activities which require an exclusion zone around them on health and safety grounds to prevent collisions and provide protection to the development. The zoning includes both the activity and the safety area. Examples include the 500m safety zones around activities such as oil and gas platforms and wind turbines. Clearly as more development takes place at sea, this zone would increase in size. The zone would be reduced if developments are completed, abandoned or decommissioned. Currently this zone only covers 1% of the regional sea area and although other activities are excluded from Zone 3B, the degree to which this zone contributes to the protection of the marine environment varies, depending on the type of activity. For example, the activity licensed could itself have an impact of greater or lesser significance, e.g. oil and gas developments.

4. Protected Zone (PZ) - This zone includes protected historical areas where irreparable damage could occur if activities are permitted. Therefore virtually all activities are prohibited at all times with only very limited exceptions usually for research purposes and even these will require a permit. Areas under the *Protection of Wrecks Act 1973* and *Control of Military Remains Act 1986* are included within this zone. Only 0.005% (2km²) of the UK Irish Sea waters lie within the Protected Zone. Under current legislation, this zone would only increase in size if further military

remains, wrecks or other marine archaeological artefacts were designated under relevant legislation.

Table 8 Relative proportions of each zone. The Limited Exclusion Zone (3A) has been calculated separately as this zone overlies all the other zones, providing temporal and spatial restrictions on activities.

		Minimal Management	Targeted Management	Conservation Priority	Significant Exclusion	Protected	Limited Exclusion
	Total Area	Zone 1A	Zone 1B	Zone 2	Zone 3B	Zone 4	Zone 3A
Area (km²)	44,591km ²	35,530km ²	2,555km ²	5,818km ²	556km ²	2km ²	30,130km ²
%	100%	80%	6%	13%	1%	0.005%	67%

The zoning table (Table 9) identifies the zones in which each of the activities or uses can take place, with Table 10 showing placement rationale. Colour coding has been used to illustrate the management arrangements and different levels of protection in each zone. Blue represents the zones where any activity could potentially take place subject to legislation; green and orange are zones where increasing levels of restrictions are applied, through to red where all activities are prohibited. This type of colour scheme has been used successfully for previous studies (English Nature, 1994; Gubbay, 1996; Gubbay & Laffoley, 1996).

The proposed multiple use zoning scheme for the Irish Sea is illustrated in map form in Figure 13. This indicates the geographical extent of the zones revealing the patterns of multiple use zoning created by the application here of the existing regulations which permit, confine or prohibit activities in particular geographic areas. As indicated by Table 9, all activities can potentially occur in Zone 1A but, with a progression through the coloured zones, there are increasing levels of legislative control. Therefore activities were mapped in the GIS based on the zone in which they are most legally restricted. It is emphasised that this zoning scheme is an exercise to test ideas for this sea area, and thus should be regarded as a 'work in progress' to inform the debate.

Table 9 Derived management and protection zones and the legally permitted activities occurring in each zone of the Irish Sea.

Activity	Multiple Use Zones			Partial Use	Exclusive Use	
	1. General Use Zone (GUZ)		2. Conservation Priority Zone (CPZ)	3. Exclusion Zone (EZ)		4. Protected Zone (PZ)
	1A. Minimal Management Zone (MM)	1B. Targeted Management Zone (TM)		3A. Limited Exclusion Zone (LE)	3B. Significant Exclusion Zone (SE)	
Aggregate Extraction	✓ (consent required)	✓ (consented areas)	✓ (consented areas)	✗	✗	✗
Dredging	✓ (consent required)	✓ (consented areas)	✓ (consented areas)	✗	✗	✗
- Capital & Maintenance	✓ (consent required)	✓ (consented areas)	✓ (consented areas)	✗	✗	✗
- Disposal	✓ (consent required)	✓ (consented areas)	✓ (consented areas)	✗	✗	✗
Military Activities	✓	✓	✓	✓ ^(a)	✗	✗
Oil & Gas	✓ (consent required)	✓ (consented areas)	✓ (consented areas)	✗	✓ ^(b)	✗
Ports & Harbours	✓	✓	✓	✗	✗	✗
Recreation						
- Angling	✓	✓	✓	✗	✗	✗
- Diving	✓	✓	✓	✗	✗	✗
- Pleasure Boats (Motorised)	✓	Restricted	Restricted	✓ ^(c)	✗	✗
Research & Study	✓	✓	✓	Licence ^(d)	Licence ^(d)	Licence ^(d)
Sea Fisheries						
- Static	✓	✓	✓	✓ ^(e)	✗	✗
- Towed	✓	✓	✓	✓ ^(f)	✗	✗
Shipping						
- General navigation	✓	✓	✓	Limited ^(g)	✗	✗
Submarine Cables & Pipelines	✓ (consent required)	✓ (consented areas)	✓ (consented areas)	✓ ^(h)	✗	✗
Windfarms	✓ (consent required)	✓ (consented areas)	✓ (consented areas)	✗	✓ ⁽ⁱ⁾	✗

Footnotes:

(a) Activity within the danger areas is only restricted during MOD activities, and outside these times, other activities are allowed, e.g. certain fishing operations are allowed when live firing is not occurring.

(b & i) Includes a safety zone around activity.

(c) Excluded areas for jet skis, however this still permits other activities to occur within these areas.

(d) Although no byelaws restrict research in any zone, certain areas may be unsuitable on the grounds of safety

(e & f) Fisheries protected areas incorporate all areas closed for a defined period of time, creating a partial exclusion zone. However this does not exclude other fisheries and other activities occurring within this closed period.

(g) This includes both 'Areas to be avoided' and Laden tankers which are advised not to enter certain areas of sea for navigational difficulties and environmentally sensitive reasons. 'Limited' within the table as this depends on the size of vessel. All vessels should avoid oil and gas establishments and windfarm developments.

(h) Pipeline and cable licences prohibit the activity of dredging occurring 250m either side of the installation. Although excluding this activity, all other activities are permitted including the public right to fish.

Table 10 Activity Placement & Justification of Zone

The list of activities and uses of the Irish Sea marine environment were assessed for the protection and restriction they afford and placed within the zoning scheme proposed for the Irish Sea.

Activity / Use	Zone	Justification	
Historical Wrecks	4. Protected Zone (PZ)	Restricted access, all other activities prohibited	
MOD Controlled sites		Restricted access, all other activities prohibited	
Windfarm Safety Zones	3B. Significant Exclusion Zone (SE)	Restricted access (equivalent to exclusion) zone established for safety reasons by activity. Full exclusion to all other activities within a maximum 500m radius.	
Oil & Gas Wells			
Oil & Gas Surface Structures			
MOD Danger Areas	3A. Limited Exclusion Zone (LE)	Restricted access when MOD activity is occurring. Other activities permitted at other times	
Areas to be Avoided - Shipping		Restricted access to shipping for safety and conservation reasons	
Laden Tankers - Shipping			
Pleasure Boat Exclusion Zones		Restricts access to motorised boats	
Fishery Protected Areas		Seasonal or annual restricts imposed on gear / quota or target species. Does not prevent other activities using the sea area.	
Bass Nursery Areas			
Cables & Pipelines		Excludes dredging activities i.e. for aggregates, 250m either side.	
SACs, SPAs, MNRs, SSSI/ASSIs, AoSP		2. Conservation Priority Zone (CPZ)	By definition, these areas form a series of marine protected areas, currently within 0-12nm
Oil & Gas licensed areas and hydrocarbon fields		1B. Targeted Management Zone (TM)	Licensed areas for this activity
Ship Traffic separation scheme			Designated areas for shipping movements
Submarine Exercise Areas			
Harbour & Port jurisdictions	Defined areas with associated byelaws and other legislation		
Windfarm Developments	Legally permitted Round 1 and 2 sites		
Boat Speed Restrictions	Regulates speeds of recreational craft in inshore waters		
Aggregate Extraction Areas	Licensed activity in defined areas		
Dredged-material Disposal	Licensed activity in defined areas		
Remainder of Irish Sea Pilot Area	1A. Minimal Management Zone (MM)	All other activities can occur in this zone if legally permitted. There is the potential for activities to develop this zone. This zone is already utilised by the activities of shipping, recreation, research and study and fishing.	
	3. Exclusion Zone (EZ)		
	1. General Use Zone (GUZ)		

4. Testing The Zoning Scheme Against Irish Sea Data

Integrating and expressing the current legally-based spatial controls in the Irish Sea as a zoning scheme provides an overall picture of the existing extent of different levels of management and protection against which to consider a number of

scenarios and questions. For example, the proposed zoning map provides an opportunity for the development and trialling of further protection of the marine environment. From this zoning scheme, it is possible to identify where interactions and potential conflicts are likely to arise and the extent to which existing measures provide for avoiding or minimising conflict between activities and between these and natural heritage interests. It also provides a 'benchmark' against which to consider policy development and any planned or 'determined' zoning scheme that might be developed. Here, by way of example, the *de facto* zoning scheme is used to assess the level and adequacy of protection to nature conservation interests within the Irish Sea. The proposed zoning scheme has been tested against:

1. the presence of marine landscapes;
2. the selection of nationally important marine features; and
3. the identification of high intensity bird use areas.

4.1 Marine Landscapes

The marine landscape mapping project is a partnership initiative currently underway within JNCC to provide marine landscape maps for all the UK Sea Area, including all territorial waters within 200nm. The concept originated in Canada and was placed in a UK policy context by the Implementation Framework for Marine Nature Conservation. The marine landscape maps are seen as a necessary step towards building a spatial management framework at regional sea scales, as well as enabling clear priorities to be set in order to develop networks of Marine Protected Areas.

The recent Irish Sea Pilot study to test a regional seas approach to marine conservation management (Vincent *et al.* 2004), investigated the concept of 'marine landscapes' (coastal, seabed and water column) and their ecological relevance (Golding *et al.* 2004). Seabed and coastal marine landscapes were derived by integrating a number of geophysical attributes including bathymetry, sediments, bedforms, maximum near-bed stress and other data. The water column marine landscapes were based on two, model-derived, raster datasets for salinity and stratification (both supplied by Proudman Oceanographic Laboratory). The ecological relevance of the derived landscapes was tested by assessing the correlation with different biological communities, to determine the degree to which a particular landscape can be used as a surrogate for biological communities. In general the seabed landscapes were found to be ecologically valid. Now that the marine landscapes have been identified, consideration will need to be given to their relative value for nature conservation, and their susceptibility to harm from human activities. The three main groups of marine landscapes identified within the Irish Sea are listed in Table 11.

Table 11 Coastal and Seabed Marine Landscapes

Coastal Marine Landscapes	Estuary	Ria
	Saline lagoon (*)	Sea Loch
	Sound	Gas structures
	Photic reefs	Aphotic reefs
Seabed Marine Lands	(Irish) Sea mounds	Fine sediment plain
	Sand/Gravel banks	Sediment wave/megaripple field

	Coastal sediment	Low bed-stress coarse sediment plain
	Shallow-water mud basins	High bed-stress coarse sediment plain
	Deep-water mud basins	Deep-water channel
Water column Landscapes	Mixed and High Salinity	Mixed and Low Salinity
	Stratified and High Salinity	Stratified and Low Salinity

(*) none identified within this Irish Sea study area.

The five most rare landscapes were tested against the proposed zoning scheme: gas structures, photic reefs, aphotic reefs, sea mounds and deep water channels. Their locations are identified on Figure 14. The landscapes were mapped over the multi-use zones in GIS and areas located within each zone of the zoning scheme was calculated. The results are shown in Table 12.

Table 12 Areas of Rare Marine Landscapes within each Irish Sea Zone

Feature & Total Area	Minimal Management	Targeted Management	Conservation Priority	Significant Exclusion	Protected	Limited Exclusion
	Zone 1A	Zone 1B	Zone 2	Zone 3B	Zone 4	Zone 3A
Gas structures (57.5km ²)	57.5km ² 100%					57.5km ² 100%
Photic reefs (257.7km ²)	108.7km ² 42%	7.4km ² 3%	141.6km ² 55%		0.04km ² <0.02%	167.5km ² 65%
Aphotic reefs (954km ²)	723.7km ² 76%	168.8km ² 18%	60.72km ² 6%		0.8km ² <0.09%	584.4km ² 61%
(Irish) Sea mounds (73.8km ²)	73.8km ² 100%					50.8km ² 69%
Deep-water channel (232.8km ²)	229.4km ² 98.5%	3.4km ² 1.5%				20km ² 8.5%

4.1.1 Results and Analysis

Of the five rare landscapes tested, only two small areas of photic and aphotic reef habitats lie within Zone 4, the zone which affords the highest protection against further developments, and none of the five landscapes lie within Zone 3B. Only the two reef landscapes are provided with some additional protection against damaging developments by the Conservation Priority Zone. However, as discussed above, while greater assessment and monitoring may be required on new activities, the CPZ does not automatically restrict developments from going ahead. Zone 1B, where legally permitted activities are currently taking place, hosts both types of reef formation. Activities currently licensed in this zone include shipping lanes, port and harbour activities, dredged-material disposal and oil and gas licence blocks. The deep-water channel landscape is also within this zone, where a dredged-material disposal site is licensed over this landscape feature. All five rare landscapes feature within Zone 1A with all of the Irish Sea mounds and gas structures falling within this

general use zone. Zone 3A has been calculated separately as this zone overlies all other zones, providing temporal and spatial restrictions on activities. Fisheries protected areas provide some restrictions on activities which can occur over the five landscape features, however these are only seasonal measures and do not restrict other activities from occurring in the area. Fishing methods could still potentially damage the landscape feature.

It is emphasised here that this analysis and the accompanying comments do not reflect possible differences in the quality of the feature between locations.

4.2 Nationally Important Marine Features

In order to identify areas within the Irish Sea with high concentrations of nationally important features, selected species and habitats were mapped from records in the JNCC marine database (Lieberknecht *et al.*, 2004). Of the species tested for national importance, the distribution of five habitats and four species within the Irish Sea are shown on Figure 15. In order to determine which of the multiuse zones these nationally important marine features fall into, their locations were mapped in the GIS over the proposed multiuse zoning map and percentages calculated. The results are shown in Table 13.

4.2.1 Results and Analysis

None of the nine features selected above fall within the full Protected Zone of zone 4. Only one record of *Limaria hians* lies within the Full Exclusion Zone of Zone 3B (within an oil rig safety zone), with the remaining thirteen records lying within the General Use Zone of 1A. Many of the inshore species and habitats lie within the Conservation Priority Zone (Zone 2), which affords greater protection against damaging activities, with all of the recorded Bearded Anotrichium falling within this zone. Only one recorded maerl bed habitat falls within Zone 2 (Strangford Lough), with the remaining three habitats located within undesignated areas within the Minimal Management Zone (Zone 1A). Only 1% of the *Sabellaria* reef habitat and *Modiolus* beds recorded within the Irish Sea lie within the Targeted Management Zone of 1B. Again, the majority of the selected habitats and species lie within the unprotected 1A General Use Zone. As before, Zone 3A has been calculated separately as this zone overlies all other zones, providing temporal and spatial restrictions on activities. Fisheries protected areas provide some restrictions on activities which can occur over all eight of the selected habitats and species; however, these are only seasonal measures and do not restrict other activities from occurring in the area.

Table 13 Percentage of Important Marine Features (based on number of records) within the proposed zones for the Irish Sea

Species & Habitats	Minimal Management	Targeted Management	Conservation Priority	Significant Exclusion	Protected	Limited Exclusion
	Zone 1A	Zone 1B	Zone 2	Zone 3B	Zone 4	Zone 3A
<i>Limaria hians</i> beds – File shell beds (14 records)	93% (13)			7% (1)		86% (12)
<i>Lithothamnion corallioides</i> – Maerl beds (4 records)	75% (3)		25% (1)			50% (2)
<i>Modiolus modiolus</i> beds - Horse mussel beds (504 records)	55% (278)	1% (7)	44% (219)			64% (323)
<i>Ostrea edulis</i> beds - Native	27%		73%			77%

oyster beds (30 records)	(8)		(22)			(23)
<i>Sabellaria spinulosa</i> reefs – Ross worm reef (316 records)	59% (187)	1% (3)	40% (126)			81% (256)
<i>Anotrichium barbatum</i> – Bearded Anotrichium (5 records)			100% (5)			100% (5)
<i>Cetorhinus maximus</i> - Basking shark (2 records)	50% (1)		50% (1)			100% (2)
<i>Eunicella verrucosa</i> – Sea fan (64 records)	61% (39)		39% (25)			89% (57)
<i>Palinurus elephas</i> - European spiny lobster (72 records)	60% (43)		40% (29)			92% (66)

4.3 Seabird Hotspots

The Irish Sea Pilot investigated pelagic bird species of national importance and mapped the density of seabirds during the spring months within the Irish Sea area away from the immediate coast, which includes data for the Manx shearwater (*Puffinus puffinus*). Areas with the highest biodiversity index values tend to be concentrated in the Clyde Sea, the western half of the central Irish Sea, St George's Channel and close inshore around Pembrokeshire and off North Wales and Anglesey. As the original data were unavailable for mapping, the top four high bird density areas were plotted in the GIS as 36km² boxes over the proposed zoning scheme (Figure 16). This test provides an indication to the protection afforded to seabirds during this season by the proposed zoning scheme. The results are shown in Table 14.

4.3.1 Results and Analysis

The scenario test shows that the majority of high seabird density areas around the Welsh coastline are located within the existing SAC and SPA network and fall within the Conservation Priority Zone. The highest density area on Figure 16 is located at the mouth of Milford Haven with 70% of this area falling within the CPZ. Only one area of high spring bird density off the coast of Anglesey falls within the Protected Zone although this represents less than 1km². However elsewhere within the Irish Sea, the higher density areas are not protected within the proposed zoning scheme. Again, the Limited Exclusion Zone of 3A has been calculated separately as this zone overlies all other zones. The regulation of fishing activities within this zone would give some added protection to spring seabird hotspots, if these measures were temporally and spatially concurrent with this time of year.

Table 14 Area of Bird Hotspots within the proposed zones for the Irish Sea (based on 36km² boxes)

Densities	Minimal Management	Targeted Management	Conservation Priority	Significant Exclusion	Protected	Limited Exclusion
	Zone 1A	Zone 1B	Zone 2	Zone 3B	Zone 4	Zone 3A
20.0001 – 25.0000 (756km ² total)	515km ² 68%	7km ² 0.9%	169km ² 22%	9km ² 1%	<1km ² 0.1%	574km ² 76%
25.0001 – 30.0000 (108km ² total)	27km ² 25%	25km ² 23%	39km ² 36%	<1km ² 0.9%		86km ² 80%
30.0001 – 35.0000	36km ²					36km ²

(36km ² total)	100%				100%
35.0001 – 40.0000 (36km ² total)			25km ² 70%		18km ² 50%

n.b. some boxes are mapped over land and sea (e.g. 35.0001 – 40.0000) and will therefore not total 36km²

5. Discussion and Conclusions

5.1 The Features of the Proposed Zoning Scheme and Lessons Learned

This study has demonstrated that it is feasible to create a multiple use *a posteriori* zoning scheme for the Irish Sea by summarising and mapping the existing area-based legislation and regulations which control activities in the regional sea, and the level of environmental protection they provide. It has devised default or *de facto* zones that show a series of multiple use, exclusive use and partial use activity zones by applying a zoning approach at the regional sea scale. In particular, the study has shown that the presently defined regulatory and statutory sectoral measures can be summarised within a relevant zonation scheme. In particular, the study has emphasised that nature protection sites can still be regarded as being within multiple-use zones whereas sectoral activity control areas are included in other zones.

The zoning scheme presented here has been developed only from current legislation and regulations and it has not used non-statutory policy measures, voluntary agreements or other initiatives. It is emphasised that these other important mechanisms should be incorporated when carrying out a zoning exercise. Although this scheme identifies four proposed zones (Figure 13), this is primarily a description of what occurs within the area. It is not what might be regarded as a true zoning scheme in which preferred zones for management, protection and differing levels or types of use are identified *a priori* based on a clear set of objectives. As a tool to give effect to marine spatial planning, these would need to include economic, environmental and social objectives and would also seek to minimise or avoid conflict between different uses and between a range of uses and environmental features. At present such an approach is not possible given the sectoral licensing system in place for coastal seas. However, the *a posteriori* zoning scheme does provide a 'benchmark', an analysis of the present position, against which to judge the degree to which objectives are already being delivered and to develop an *a priori* zoning scheme.

Even with increasing protection afforded with a progression from the general use to protected zones and a greater number of activities precluded from the exclusion and protected zones, the conservation enhanced by these zones is limited. Some development activities inadvertently enhance nature conservation, for example by providing the protection of species and habitats through controls on types of activities (trawling) and activities which prohibit other activities within the area, for instance windfarm exclusion areas. However, even within Zone 3B, where other activities are excluded and therefore *de facto* it provides protection for features of nature conservation importance, it is possible that the licensed development itself could be having a considerable negative impact on the nature conservation interests in the area (e.g. oil and gas developments). The only areas providing complete protection fall within Zone 4, but these form very small pockets (i.e. wrecks and military remains), with consequent minimal nature conservation benefit.

5.2 Developing the Scheme

The present project shows that an *a posteriori* approach is possible and that, although the data and information required a large effort to collate, and even so they are still not complete, it was possible to create the zoning scheme for a large semi-enclosed sea area. It was expected that the regulatory data, such as the geographical limits of permitted areas and licensed conditions, and the data relating to areas where well-defined activities take place would be easily accessed. However, given the absence of national databases and, in some cases, the less-than up to date technologies used to store these data, then this part of creating the scheme was time consuming. The GIS approach used here in conjunction with the zoning scheme created will be more straightforward once such data are easily and nationally accessible. It is considered that the scheme developed encompasses all the features of the Irish Sea and is sufficiently robust to be transposed to other sea areas with a similar level of data and information.

The nature of this exercise has dictated the use of an iterative approach to deriving and defining the zoning scheme and so the scheme presented here has evolved through discussion and trialling on available datasets. Because of this, the scheme will be suitable for a wider implementation and extrapolating to other areas. However, given that the present scheme was confined to the sea area below low water, a further refinement will be required to cover the intertidal area and possibly the coastal terrestrial area of influence.

In defining the derived zoning scheme, the study considered the main points of previous prototype zoning schemes in the UK, such as those proposed for the Solent and Falmouth Bay, but it also shows contrasts with those schemes because of the differing nature of the areas under study. The latter were derived for much more localised coastal areas (Gubbay, 1996) and, in comparing such schemes, it became apparent that the most prominent influences which defined these schemes were inshore shellfisheries and recreation. Although an important near-shore and on-shore coastal activity, recreation was considered here to be less significant when considering the Irish Sea region as a whole. In contrast, the fisheries regulations under the EU Common Fisheries Policy are of predominant importance offshore together with other development activities and so have been incorporated into the present scheme.

The progression through the zones identified in this scheme illustrates the increasing restrictions placed on the types and intensity of legally permitted activities and an increasing number and impact of management measures of various types. The proposed scheme shows the extent to which current legal and regulatory mechanisms provide management and protection for conservation and archaeological heritage through a series of defined zones. It is therefore considered that, given the constraints of data availability, the scheme produced here is an integrated representation of current management controls and their implications for environmental protection.

The lessons learned in the present exercise indicate that further refinements and modifications can be made. Firstly, the study has included only those areas where activities have been licensed rather than those where an activity takes place. In general, it has not indicated the spatial intensity of an activity nor the temporal occurrence of the activities. For example, while vessels can in theory move anywhere within the sea area, there are other constraints such as the distances to and from ports and the cost-efficiencies of navigation. Similarly, while fishing is permitted in many areas, the zoning scheme does not at present indicate the level of

activity, such as days at sea, the methods used, some of which will have greater impact on the nature conservation features, or the precise targeting of an area or its stock. Further data are required to give this level of complication and refinement to the scheme. Given the availability of those further data, the scheme could be tested further against scenarios created by the conservation agencies and other users, hence the present scheme provides a benchmark for further development.

Secondly, the study was confined to the UK waters of the Irish Sea and so a moderate amount of effort was required to exclude the Republic of Ireland waters. It would have been little further effort to include those waters and indeed would have made the analysis more complete.

Thirdly, a follow-up stage in the development of a coherent ecosystem-based zoning scheme with maximum benefits for conservation features would be to develop and link conservation objectives to each zone. In deriving a zoning scheme underpinned by conservation objectives, features which qualify as nationally important, rare or threatened should be incorporated within the identification of additional protection areas. For example, in the case of these species or habitats, the conservation aim may be to protect 100% of these features, or require a minimum percentage of the total distribution or 'best examples' to be protected within a coherent network. As shown here, at present the majority of species and habitats lie within the Minimal Management Zone (General Use Zone 1A) with little protection afforded but an *a priori* spatial planning scheme could increase that degree of protection. The linking of the zonation/spatial planning scheme to conservation objectives is also considered below.

5.3 Application - Testing the Effectiveness of the Zoning Scheme

In order to test the robustness of the scheme developed, several scenarios were developed and assessed against the zonation methodology. As a result of the testing exercises undertaken and described in section 4, it is evident that the existing legal mechanisms on which the proposed zoning scheme is based do not provide adequate protection to important nature conservation features (landscapes, habitats and species) within the Irish Sea. For example, even those features lying within the Conservation Priority Zone 2 cannot be given the full protection needed to restrict the damage from new developments or existing activities. The Protected Zone (Zone 4) currently protects only 2km² of the Irish Sea and, unless the criteria for its designation are broadened, then the Conservation Priority Zone (Zone 2) provides the next best protection. Hence the comments above that the scheme requires to be pro active and *a priori* rather than a descriptive, *a posteriori* scheme.

MARINE LANDSCAPES

The current zoning scheme, based on currently legislated activities, indicates that there is currently little specific protection for rare landscapes. Therefore, it is concluded that further measures might be needed for the protection of these features, possibly including protected areas or the extension of zones which can provide adequate levels of protection. The extent and nature of such measures is the subject of on-going discussion.

A network of areas providing protection from damaging activities, which included representation of all marine landscapes types, and in which the conservation requirements of the important features informed decision-making would be a desirable objective. If for example it was decided to establish a network of areas representing all marine landscapes in which the conservation requirements of the

feature informed decision-making, then only 2 of the 5 landscapes are currently represented in the very small protected areas of Zone 4. For example, if the objective were for 20% of each of the landscapes to be included in such areas or a zone then this objective would only be met (actually exceeded) in the case of 'Photic reefs' (55%) but not for 'Aphotic reefs' (6%). Continuing this example, if the objective were to include a proportion of each feature in the protected zone where activities, such as those that cause physical damage or disturbance to the feature, e.g. by trawling, were excluded then only 0.02% of 'Photic' and 0.09% of 'Aphotic' reefs are currently included.

NATIONALLY IMPORTANT MARINE FEATURES

The available data and the proposed zoning scheme indicate that very few of the nationally important habitats and species recorded in the Irish Sea are being given full protection. At present there are no nationally important species or habitats within the Irish Sea currently represented in the protected areas of Zone 4. If, for example, the objective were to represent 20% of the records of each feature in the zone where there is conservation-driven management (CPZ), then this is currently being met with the exception of *Limaria hians* beds. However, although providing some added protection to these important species, this zone does not prohibit development and can only limit potentially damaging activities. Similarly, of the four recorded locations of Maerl, an important and sensitive habitat, only one falls within the CPZ zone with the other three habitat areas falling within the Minimal Management Zone of 1A.

SEABIRD HOTSPOTS

The proposed zoning scheme, again based on currently legislated activities, shows that at present there is little specific protection for 'seabird hotspots'. If a network of protected areas providing protection from development and other damaging activities was to be established, then this might need to incorporate areas of high seabird density within the Irish Sea. If an objective is to include a selection of the highest seabird density areas within protected zones, then currently less than 1km² of the Irish Sea utilised by seabird populations in the spring months is given protection within Zone 4, falling within the 20.0001 – 25.0000 density range. The highest spring density area south of Milford Haven (35.0001 – 40.0000), is protected within the Conservation Priority Zone (Zone 2) although this does not preclude future development. Similarly, it should be noted that the analysis does not address impacts or pressures from outside the zones from sources such as pollution. Even if a highly protected zone was established at the mouth of Milford Haven where the highest densities of seabirds exist in the spring, this would not provide protection against an oil spill event, and in such a highly utilised area by shipping activities, the feasibility of a fully protected zone may be questioned.

Finally, it is expected that any extension of the SPA and SAC series to offshore waters will provide greater protection for seabird colonies within the CPZ. However, while it is difficult to provide a zoning scheme which will cover mobile and wide ranging species, it should be practical to ensure that their main aggregation areas during breeding periods or other life cycle phases are accommodated within zones having appropriate levels of protection.

5.4 Relevance to Marine Spatial Planning

The current *ad hoc* sectoral and *a posteriori* approach to spatial planning, as indicated here, has been in existence for many years and accommodates the existing developments. This prevents a coherent spatial planning policy being

implemented. At present, the exploitation of the UK marine environment is in a 'pioneer' phase where new developments are occupying space and are licensed essentially on an *ad hoc* and 'first-come-first-served' basis. Although Strategic Environmental Assessment could help to address such concerns, e.g. based on experience with the oil and gas sector and developments with wind and mineral extraction, in general, UK marine space is currently being allocated and occupied without any strategic or spatial planning to decide upon priorities for sea area use. Such planning requires an assessment of the most suitable locations for current or future developments by taking account of other potential uses and users and some guidance on location or allocation of space. This implies the need for some form of zoning.

This study has graphically demonstrated the proliferation of activities currently occurring in the Irish Sea and the need for a comprehensive spatial planning system. However, the proposed approach confirms the sectoral basis of regulation in the Irish Sea and thus the constraints provided by that basis. Furthermore, the proposed zoning scheme demonstrates that there are relatively limited mechanisms available through the current regulatory systems that can be used to implement any form of marine spatial planning policy. The analysis confirms that there is some limited spatial management in the Irish Sea, albeit on an *ad hoc* basis, but it also highlights that there is little *de facto* spatial planning.

It was not the intention of the present project and the proposed zoning scheme to be proactive by showing where future developments may or may not receive legal permission to take place. However, by mapping the spatial coverage of the statutory controls, Figure 13 shows where future development may potentially take place and where a developer may apply for a licence. The lack of formal spatial planning in the marine environment is highlighted by the results of this study which show that developments could be proposed in most areas within the study area, except where there are existing developments or within Zone 4. The main existing constraints to further development are present developments with associated exclusions and restrictions already in place rather than a coherent spatial planning policy. For example, licensed activities already in place, such as shipping separation schemes, oil and gas installations and windfarms, will occupy space and therefore effectively limit future developments.

5.5 Final Comments and Conclusions

The proposed zonation scheme and its use against various scenarios have highlighted the fact that such a scheme is possible and desirable but that it has to be linked to the development of objectives for conservation. Such as strategy agrees with the recommendation of the Review of Marine Nature Conservation which highlighted the need for a network with appropriate measures.

Any zoning scheme and marine spatial planning system is required to encompass the *Natura 2000* network which aims to create multiple-use sites for sustainable use while protecting important features throughout EU waters. Despite progress in designating these multiple use sites, the Irish Sea Pilot Project and the present project have shown that they will not deliver a fully coherent network of protected areas which will provide adequate protection for all the important conservation features which have been identified.

The development of zoning has the capacity to effect a proactive approach to the use, management and protection of Marine Protected Areas as shown in the present study for the

Nature 2000 sites. Once there are clear objectives and the conservation requirements of a network, then zoning as an integral part of marine spatial planning will allow such a network to be planned and located in a way that better integrates with other measures and with different sectors of use than has been the case to date.

The study has reinforced the fact that while the *Natura 2000* sites have been chosen for their nature conservation features, this is almost in isolation and that relatively little planning has occurred with respect to the position of these sites within a self-sustaining and ecologically coherent network (Defra, 2004). Hence there is the need for a greater integration of effort between conservation and other activities, an integration which will be dependent upon a comprehensive multiple-use zoning scheme.

Finally, it is emphasised that the development of administrative and legislative mechanisms is required to allow the implementation of a zonation scheme, such as that derived in the present study, within an *a priori* marine spatial planning system.

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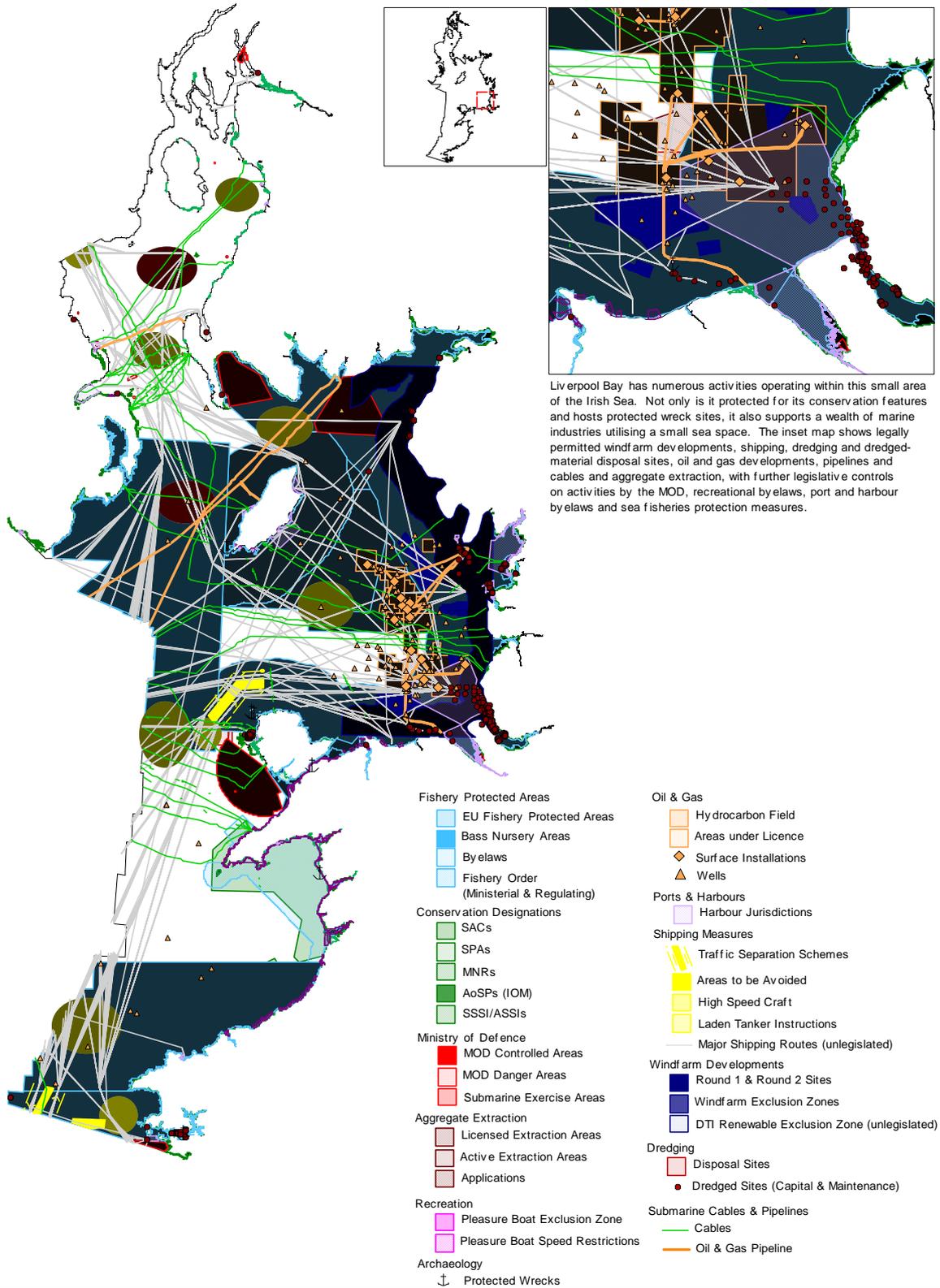
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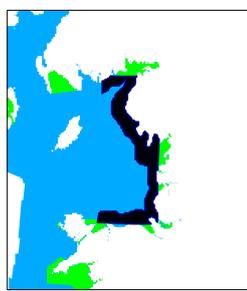
Figures

Legally Permitted Activities within the Irish Sea

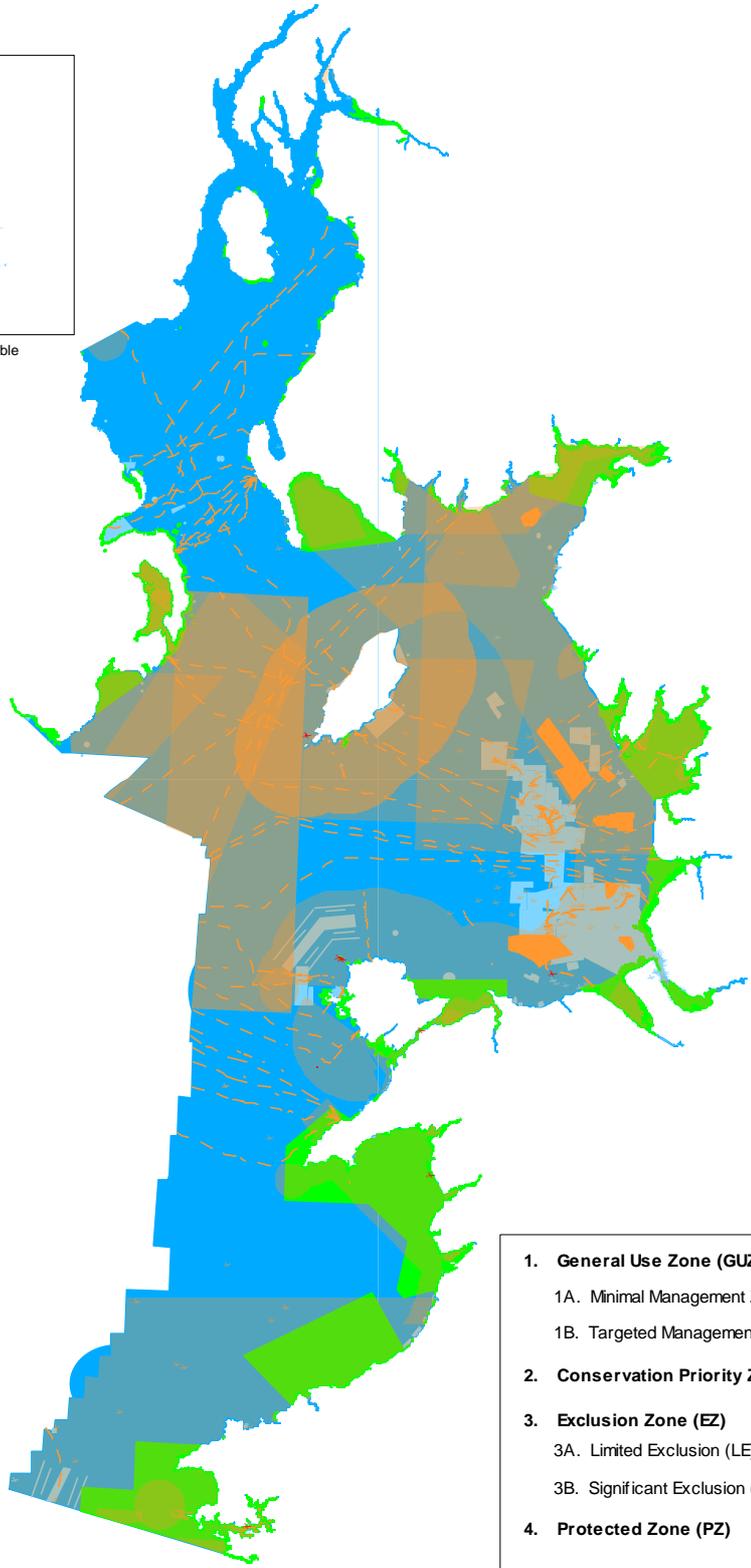


Liverpool Bay has numerous activities operating within this small area of the Irish Sea. Not only is it protected for its conservation features and hosts protected wreck sites, it also supports a wealth of marine industries utilising a small sea space. The inset map shows legally permitted windfarm developments, shipping, dredging and dredged-material disposal sites, oil and gas developments, pipelines and cables and aggregate extraction, with further legislative controls on activities by the MOD, recreational byelaws, port and harbour byelaws and sea fisheries protection measures.

Proposed Multiple Use Zoning Map for the Irish Sea



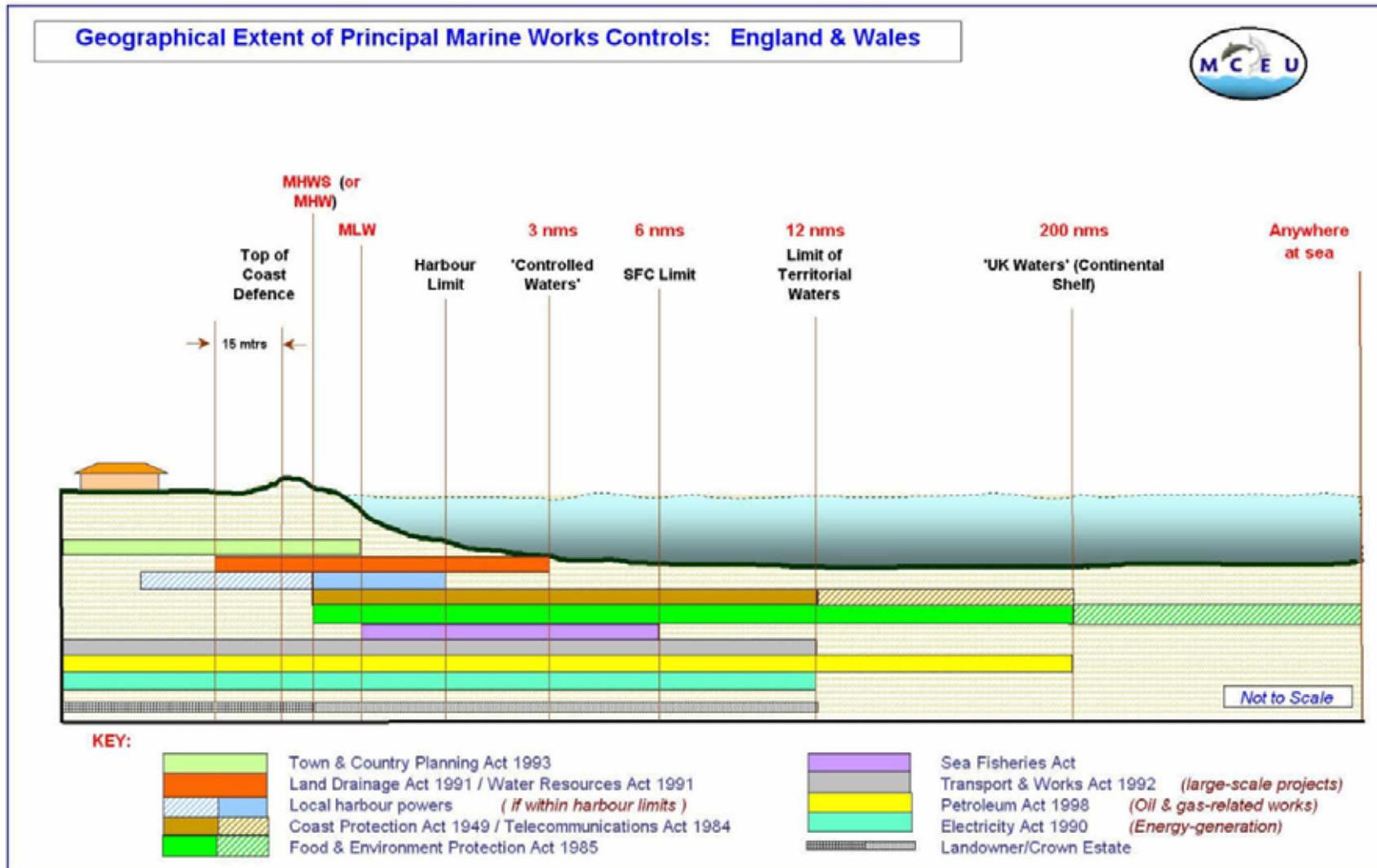
DTI Round 2 Renewable Exclusion Zone



- | | |
|--|--|
| 1. General Use Zone (GUZ) | |
| 1A. Minimal Management Zone (MM) | ■ |
| 1B. Targeted Management Zone (TM) | ■ |
| 2. Conservation Priority Zone (CPZ) | ■ |
| 3. Exclusion Zone (EZ) | |
| 3A. Limited Exclusion (LE) | ■ |
| 3B. Significant Exclusion (SE) | ■ |
| 4. Protected Zone (PZ) | ■ |

 <p>THE UNIVERSITY OF HULL Institute of Estuarine & Coastal Studies (IECS)</p>	<p>Figure 13 Proposed Multiple Use Zoning Map for the Irish Sea</p> <p>Copyright: © IECS, SNH, EN & CCW, 2005 Acknowledgements: Based on data from various sources</p>
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Appendix 1



Appendix 1 Identification of the range of controls which apply to different coastal and marine zones in England and Wales (MCEU, 2003).