Natural England Research Report NERR038

European Marine Site Risk Review

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Natural England

Published on 22 November 2010

ISSN 1754-1956

Project details

A summary of the findings covered by this report, as well as Natural England's views on this research, can be found within Natural England Research Information Note RIN038 – European Marine Site Risk Review.

This report should be cited as:

COYLE, M.D. & WIGGINS, S.M. 2010. European Marine Site Risk Review. *Natural England Research Reports, Number 038*.

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Summary

- European marine sites (EMS) are marine areas which are designated as Special Areas of Conservation (SACs) under the Habitats Directive and Special Protection Areas (SPAs) designated under the Wild Birds Directive.
- Responsibilities in relation to the assessment, reporting and management of EMS are clearly contained within the Habitats Regulations. Natural England has a responsibility in England for setting conservation objectives and advising relevant authorities on operations which may cause deterioration to the site's interest features, or disturbance of species for which the site has been designated. This information is contained within statutory advice packages.
- Further to information contained within these advice packages, Defra commissioned Natural England to undertake a strategic review of risks from all ongoing activities within European marine sites, in order to identify and prioritise action required to ensure site features are maintained or restored to favourable condition. Activities ranged from commercial (for example, fishing, dredging, aggregate extraction, land based effluents etc) to recreational (for example, bait digging, angling, walking etc). The purpose of this report is to provide Defra with evidence of where appropriate steps may need to be taken to avoid deterioration of natural habitats and species, as well as significant disturbance of the species for which the sites had been designated.
- The methodology was designed to make informed, well-documented judgements on risk in a systematic manner across the site series. The process ensured that Natural England regional staff and relevant (management) authorities[1] could identify and score activities in a simplified way in order to help prioritise any required action. This is the first national audit of risks to EMS which Natural England or its predecessor bodies have undertaken.
- Activities were scored as those which could pose a high, medium, low, or no risk to EMS features. Activities which could pose a high risk are those which have been prioritised by Natural England as potentially requiring additional management measures to avoid deterioration and disturbance in line with the obligations under Article 6(2) of the Habitats Directive. Activities which could pose a medium or low risk are considered to have existing management systems in place and/or they have less potential to pose harm to site features.
- The main findings of this risk assessment were as follows:
  - There are a large number of ongoing activities which have potential to pose a risk to EMS, but the vast majority do not cause a high level of risk to site features.
  - The level of the risk relates to an activity's potential to damage the site, the frequency or intensity of the activity, and the extent to which management controls are in place. From reviewing 957 site-based activities in England, only 18 (2%) were identified which could pose a high risk to sites, and therefore may require additional measures to mitigate the risk.
  - Most activities (66%) were recorded as posing a low risk suggesting that either the activity had a low harm potential, was not taking place, or was well managed.
  - The level of certainty in scoring varied between assessments, according to the evidence available.

[1] Relevant authorities have functions in relation to land or waters within or adjacent to a European marine site.

- Natural England is continuing to provide advice to Defra and relevant authorities who have responsibilities in identifying, and implementing appropriate management measures for activities. Implementing such measures and subsequently reviewing the efficacy of these will result in a downgrading of the risk score.
- This review constitutes a snapshot in time undertaken throughout 2009 and 2010. It will be important to continue to review risks to EMS to account for changes to activities and hence pressures and threats to the sites.
- This risk assessment process could now be applied to any new marine SACs, SPAs, and Marine Conservation Zones (MCZs) in order to inform relevant authorities responsible for the management of existing and new activities.

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1 Introduction

1.1 European marine sites (EMS) are defined in the Conservation of Habitats and Species Regulations 2010 (Habitats Regulations). They are marine areas:

- Designated as Special Areas of Conservation (SACs) under the Habitats Directive.
- Designated or submitted to the Commission to be designated as sites of Community Importance (SCI) under the Habitats Directive.
- Special Protection Areas (SPAs) designated under the Wild Birds Directive.

1.2 "Marine areas" are habitats in the inshore region[2] which are submerged at mean high water spring tide. Features of interest may include nearshore features such as coastal lagoons, and intertidal mudflats, as well as subtidal sandbanks and reefs.

1.3 During the time of this project (pre-August 2010) there were 45 EMS[3] in England which contain 28 SACs and 40 SPAs[4] (see Figure 1). Responsibilities in relation to the assessment, reporting and management of EMS are clearly contained within the Habitats Regulations. Natural England has a responsibility in England for setting conservation objectives and advising relevant authorities on operations which may cause deterioration to the site's interest features, or disturbance of species for which the site has been designated. This information is contained within advice packages (known as "Regulation 35[5] packages").

1.4 Competent and relevant authorities must exercise their functions so as to secure compliance with the Habitats Directive. This would include undertaking appropriate assessments for "plans or projects" which would have a likely significant effect on site features. Such assessments would identify mitigation (for example, through licensing conditions) to ensure that activities would not have an adverse effect on site integrity. In addition, relevant authorities may choose to establish a site "Management Scheme" which sets the framework under which their functions are to be exercised to secure compliance with the requirements of the Directive in relation to that site. Management schemes are informed by Regulation 35 packages and aim to outline conservation measures which correspond to the ecological requirements of the site. They also facilitate collaborative working between relevant authorities. Management schemes are voluntary. Of the 45 EMS in England, there are 18 published management schemes (JNCC 2010).

1.5 The earliest Regulation 35 packages were published in 2000. These were not intended to provide detailed information on risk from specific activities. Moreover, management schemes do not exist for every EMS. Defra therefore commissioned Natural England to undertake a strategic review of risks from all ongoing activities within existing EMS in order to identify future management required to ensure sites are in favourable condition.

1.6 This review had 2 main objectives:

- To develop a comprehensive understanding of the level and range of risks arising from all ongoing activities in EMS, and identify the extent to which they are managed or controlled.

[2] This is the area of the sea 12 nautical miles adjacent to the shore.

[3] This risk assessment did not cover the new marine SACs designated in English territorial waters announced in August 2010.

[4] An EMS can have a number of overlapping SACs and SPAs.

[5] Published as "Regulation 33 packages" under the Conservation (Natural Habitats, &c.) Regulations 1994. The relevant legislation has now been updated and revised in The Conservation of Habitats and Species Regulations 2010.

- To specifically identify those EMS which are most at risk from activities and where appropriate steps may need to be taken to avoid deterioration of natural habitats and the habitats of species as well as significant disturbance of the species for which the sites had been designated.

1.7 The results and conclusions from this review could also inform:

- Water Framework Directive (WFD) river basin management planning.
- Revisions to Regulation 35 package advice, and (Regulation 36) management plans.
- Natural England advice on new marine SPAs and SACs.
- Future Natural England advice in relation to Marine Conservation Zones (MCZs) designated through the Marine and Coastal Access Act 2009.

1.8 This report presents the final results, analysis and conclusions of the EMS risk review project.

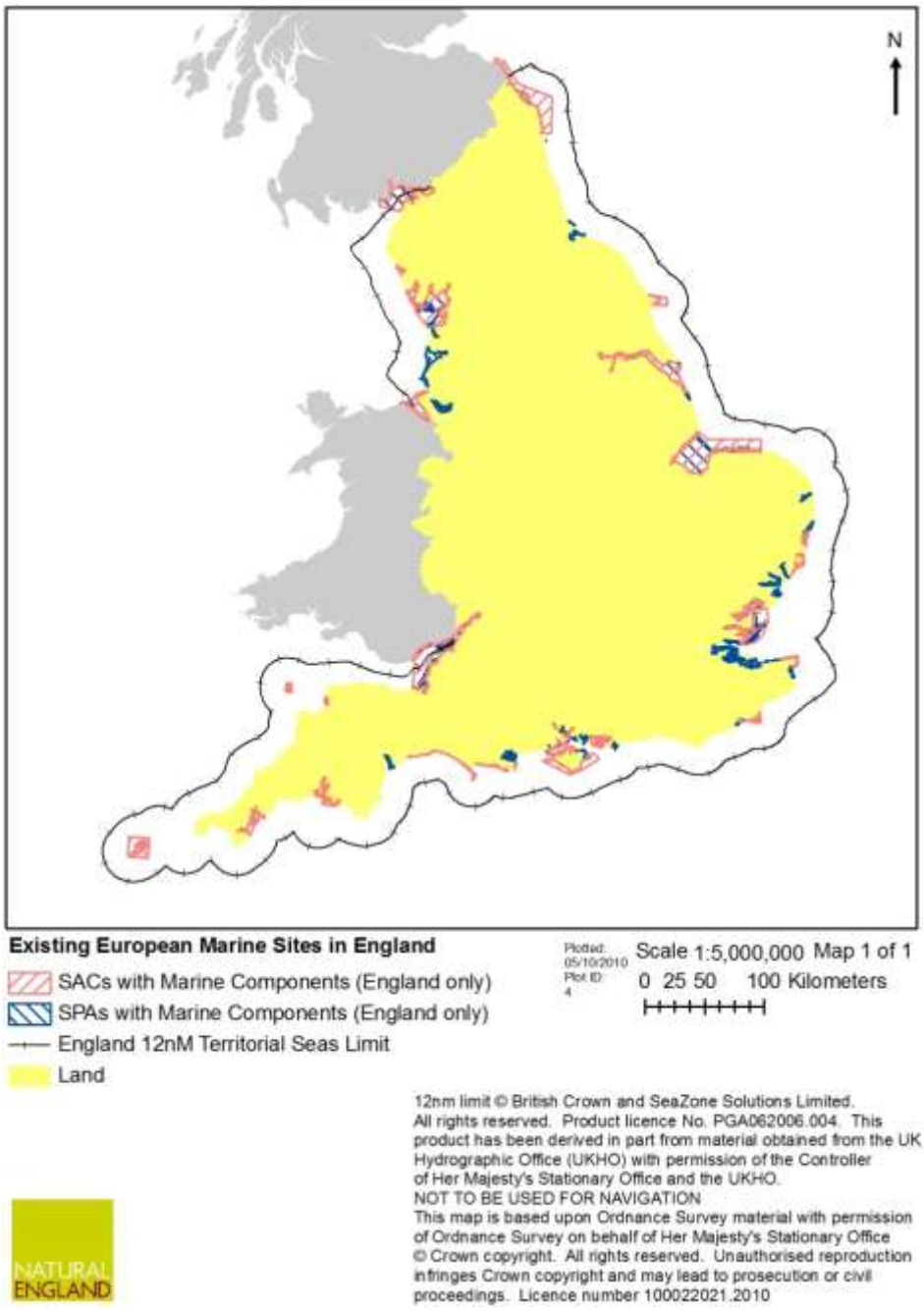

Figure 1 EMS in England (pre-August 2010)

Risk assessment methodology

1.9 Risk assessment is not an exact science, and does not always result in absolute answers. This methodology was designed to make informed, well-documented judgements on risk in a systematic manner across the site series, and to draw out common threads and trends. The process ensured that Natural England's regional staff and relevant authorities could identify the highest risks, which could be set within a national context.

1.10 Natural England's EMS risk review project consisted of 3 separate pieces of work. Two preliminary assessments were undertaken to inform the more detailed final risk assessments. These work areas (a-c) are described in Figure 2 below.

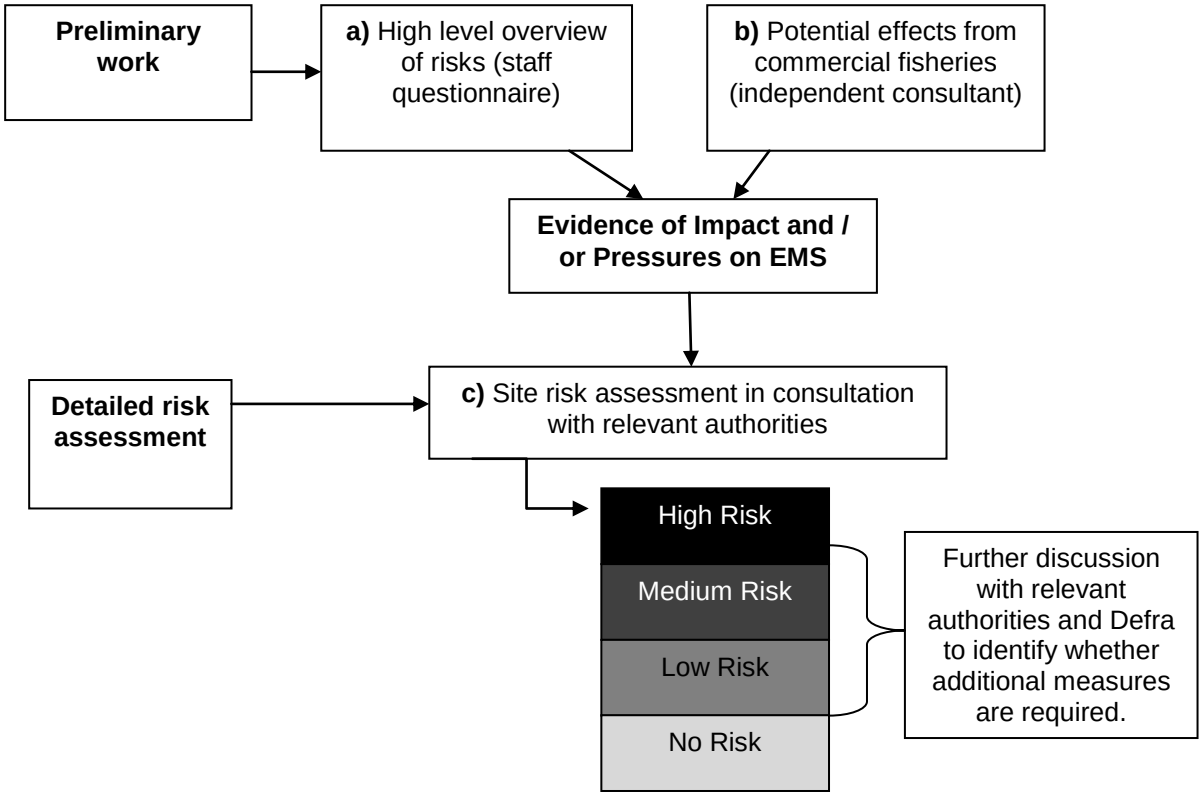

Figure 2 Natural England's EMS Risk Review Process

Preliminary high level overview of risk (a)

1.11 The objective of this work was to understand:

- the breadth of activities which could pose a risk on EMS features; and
- the most commonly occurring activities believed to pose a risk; and
- the management in place to control risk; and
- the evidence base; and
- resultant perceived condition of the features affected.

1.12 The initial purpose of this work was to inform our advice to the Environment Agency with regards to identifying programmes of measures for protected areas under the Water Framework Directive (WFD) river basin management planning process. A structured questionnaire (see Fig 3, Annex 1) was completed by Natural England marine advisers responsible for each EMS, between January to June 2008.

Preliminary review of potential effects from commercial fisheries (b)

1.13 The objective of this work was to further understand the risks posed by commercial fisheries on EMS. Natural England commissioned a review by the Coastal Fisheries Conservation & Management Consultancy to assess how fishing methods or activities had the potential to impact on EMS. For each of the EMS around England, a preliminary judgement of the risk of significant effect from 28 fishing methods or activities was assessed against each designated feature. The potential risk was taken as the extent to which there might be a fishing gear related impact, given the sensitivity of the habitat or species. The potential for risk was scored as high, medium, low, and no known effect.

1.14 This fisheries assessment was a hazard assessment, not an assessment of specific impacts on sites. It considers the intrinsic harmfulness of activities, without a detailed assessment of likelihood or duration of exposure (locations and intensity of actual fishing activity). This assessment represents a “worst case" scenario. Natural England marine advisors were given the opportunity to review the draft assessments and update it with additional local evidence.

1.15 In addition, new evidence on the extent to which the non-native species Pacific Oyster (*Crassostrea gigas)* is now breeding and spreading in UK waters (Syvret 2008) was incorporated. Identification of these potential hot spots helped ensure that Natural England staff further reviewed any potential risk from aquaculture activities in these areas.

Detailed final site risk assessments (c)

1.16 The objective of this work was to build on the preliminary assessments, and look in more detail at the risks in each site. Site risk assessments were recorded in a standardised way (see Table B, Appendix 1). Relevant authorities were consulted with the aim of agreeing a final risk score and identifying areas where additional management measures may be required. Activities were scored as those which could pose a high, medium, low or no risk to EMS features. Final scores were based upon three essential factors:

- HARM POTENTIAL (hazard) – A combination of intrinsic harmfulness of the activity, sensitivity of the designated EMS feature, and area of feature which could be affected.
- LIKELIHOOD OF ACTIVITY (exposure) – Current or potential future level of activity.

A combination of harm potential and likelihood of activity provided an **initial risk score.**

- MANAGEMENT (mitigation) – The extent to which controls are in place to eliminate or reduce risks.

A combination of initial risk score and management provided a **final risk score.**

1.17 Activities which could pose a high risk are those which have been prioritised by Natural England as potentially requiring additional management measures to avoid deterioration and disturbance in line with the obligations under Article 6(2) of the Habitats Directive. Activities which could pose as a medium or low risk are considered to have existing management systems in place and/or they have less potential to pose harm to site features. Where available, factual evidence was used to inform the process, in liaison with relevant authorities. A lack of full scientific certainty required best available information to be used with expert judgement to determine final risk, albeit at lower confidence.

1.18 Detailed assessments were not sought for those activities which were already being tackled through national programmes, as it was considered that management, and consultation with relevant authorities was already in place. Examples of issues tackled nationally include water quality and coastal squeeze. These are being dealt with by the Environment Agency through the Review of Consents (ROC) and Flood Risk Management (FRM) programmes respectively.

1.19 In addition, some activities are being addressed through parallel work to protect Sites of Special Scientific Interest (SSSIs). Management measures are required when activities are identified as resulting in a deleterious effect on SSSI features. These may often overlap and be relevant to EMS features, especially on intertidal habitat. These actions are designed to achieve target condition for SSSIs (either favourable condition or unfavourable recovering).

Scope of the activities and risks assessed

1.20 This review covers ongoing activities within or adjacent to EMS. It does not directly cover:

- Wider scale ecosystem effects (for example, climate change). Although this can link to some issues highlighted such as coastal squeeze and non-native species.
- Future development pressures, both on a small scale (for example, moorings) or a larger scale (for example, renewable energy projects, coastal developments). Both of which could pose risks to sites, but planning for these is subject to formal appropriate assessment which will mitigate against the risk.
- Oil or chemical spills at sea. This is evidently a continued risk to EMS, with a number of incidents taking place each year. National contingency procedures are in place to ensure that any such spill can be cleaned up with the least environmental damage being caused.

Results from EMS Risk Assessments

1.21 A significant amount of information on risk to sites was received and collated. Tables which summarise the risk assessment results for each EMS are presented in Appendix 2:

- Table C is a summary of results from the preliminary high level overview.
- Table D is a summary of results from the preliminary review of commercial fisheries.
- Table E is a summary of results from the final risk assessment for each EMS.

1.22 A short outline of the main findings is below.

Results from preliminary work

1.23 NB: Results from this preliminary work provided an initial indication of the potential risk to site features and allowed a prioritisation of the final risk assessments which followed. Results from these final risk assessments are presented in paragraphs 1.30-1.35.

Preliminary high level overview

1.24 Results were collated for 39 of the 45 EMS in England (the remaining 6 were EMS containing only coastal features underpinned and managed through SSSI mechanisms). The most common risks recorded related to coastal squeeze, pollution, and commercial fishing.

1.25 Other activities and threats which were highlighted as posing potential risks included recreation, disturbance (to birds), bait digging, introduction and spread of non-native species and capital/maintenance dredging. 6 EMS (15% of total) reviewed did not have any potential risks to site integrity identified.

1.26 There were 8 sites in which evidence suggested that activities had an ecological impact on features. Another 12 sites had evidence that suggested activities / pressures were significant and had potential to cause features to be impacted.

Preliminary review of potential effects from commercial fisheries

1.27 The initial assessment undertaken by consultants indicated that 33 EMS were potentially subject to pressures from commercial fishing, and all had potential to be at medium or high risk of a significant effect.

1.28 Further assessment of this work by Natural England staff, and incorporation of the Syvret (2008) report indicated that 17 EMS were identified where commercial fishing theoretically had the potential to pose a high risk to site features, and assessments of these would be prioritised in the more detailed risk assessments. There were no regional patterns occurring, with fishing believed to pose some level of risk in most sites containing sub-tidal features.

1.29 Of the types of activities considered, fishing with towed gear was identified as posing the highest risk to EMS. In particular, beam trawling, scallop dredging and cockle suction dredging.

Final risk assessment

1.30 A more detailed assessment was undertaken on the 45 EMS in England in liaison with relevant authorities.

1.31 The results have been separated into activities which could pose a high, medium, low or no risk to EMS features. The results were also separated into broad activities for further analysis, including commercial fishing; recreation; pollution; water resources; coastal defence; military; commercial vessels; illegal development; and other. "Other" risks included the spread of non-natives, and land management risks. The results show the number of high, medium, low, and no risk at the individual site; regional; and activity level.

1.32 In total 957 site-based activities were assessed. Of these, there were 18 activities on sites which could pose a high risk to EMS features. 276 were of medium risk, 633 were of low risk and 30 posed no risk at all. See Figure 3.

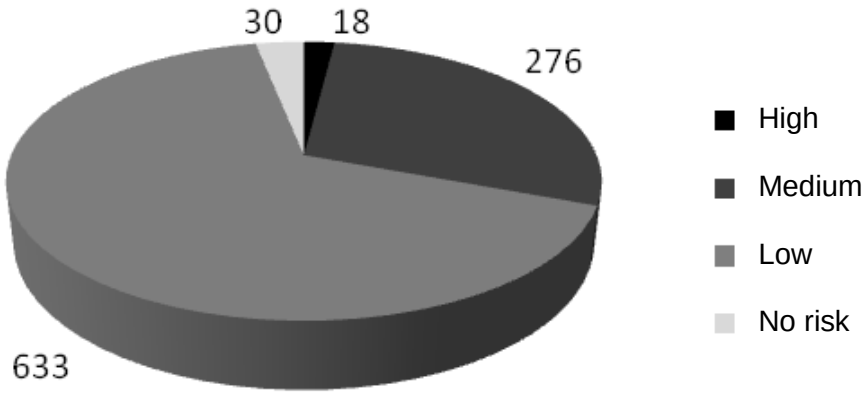

Figure 3 Breakdown of risks from ongoing activities reviewed in EMS

1.33 There were 9 commercial fisheries related activities identified that could pose a high risks to sites. This only accounted for 2% of fishing activities assessed. There were 8 recreation related activities[6] identified which could pose a high risk to sites. Table 1 below summarises all the risks by activity category in the EMS in England.

[6] Bait collection can be categorised as both a commercial or recreational activity. Site assessments determined which category the main risk was associated with.

Table 1 Total risks by activity in EMS in England

Categories	Total high	%	Total medium	%	Total low	%	Total no risk	%	Total activities assessed
Commercial Fishing	9	2	81	21	275	70	26	7	391
Recreation	8	4	66	35	112	59	3	2	189
Pollution	0	0	43	31	95	69	0	0	138
Water resources	0	0	0	0	8	100	0	0	8
Other	1	1	31	40	46	59	0	0	78
Coastal defence	0	0	16	46	19	54	0	0	35
Military	0	0	3	60	2	40	0	0	5
Commercial vessels	0	0	36	33	73	66	1	1	110
Illegal development	0	0	0	0	3	100	0	0	3
Total risks	**18**	**2**	**276**	**29**	**633**	**66**	**30**	**3**	**957**

1.34 The regions with the highest number of high risks were the South West (6), East of England (4) and South East (4). Proportionately the East of England has the greatest percentage of high risks (6%). The Solent and Poole Harbour EMS had the highest number of high risks activities (3).

1.35 The level of confidence associated with the final risk score varies depending on the available evidence to support the assessments. In some cases, there is high confidence associated with both the score of “high” and the subsequent actions required to reduce the risk. In other cases, there is less certainty on both the final score and the specific action that should be taken. Table 2 identifies and groups activities that could pose a high risk at sites. The nature and justification of the judgements have been clearly summarised.

Identification of measures to address high risk activities

1.36 The main aim of this review was to identify those EMS which are most at risk from activities and to identify where appropriate steps may need to be taken to further protect the site features. Natural England is continuing to provide advice to Defra and relevant authorities who have the responsibility in identifying, and implementing appropriate measures for activities. Although the final outcome of the development of these measures is not within the scope of this report, Table 2 provides an indication of how these risks are being managed. Implementing such measures and subsequently reviewing their efficacy will result in a downgrading of the risk score.

Table 2 Summary of activities identified as posing the highest risk to EMS features and indication of planned action to reduce the risk

EMS	Feature at risk	Activity	Further context and summary of measures being developed to mitigate the risk
Flamborough	SPA birds	Fixed (salmon and seatrout) nets in Filey Bay causing bycatch of SPA bird features	An independent report and further monitoring has been carried out since this risk was highlighted. This indicated that if the level of seabirds being caught was to continue it may result in significant disturbance and deterioration of the seabird population at Flamborough Head and Bempton Cliffs, in particular razorbills (*Alga torda*). However, there is a lack of consistent and comparable monitoring data of bird populations in the area to confidently assess these impacts, so a precautionary approach is required. The Environment Agency has implemented a new byelaw and code of practice for nets-men at this location to minimise the potential for bird losses.
Note: The SPA features are not within the Flamborough EMS as they nest on cliffs. However, the risk is incorporated into this assessment as the mode of harm, and subsequent management options relate to the adjacent marine waters.			
Humber	SAC - River lamprey	Eel net fisheries causing by-catch	Since the 2009 Marine and Coastal Access Act, the protection of lamprey comes under Environment Agency jurisdiction. The Environment Agency will develop an authorisation scheme for lamprey fishing. Associated mandatory catch reporting will support other monitoring to better assess the status of lamprey stocks and the impact of the fishery.
Poole Harbour	SPA birds (supporting habitat)	Illegal unlicensed fishing activity (especially for Manila clams) posing risk of disturbance, removal of prey, and habitat modification	Byelaws are in place to help manage this risk, and continued policing effort is required to catch and prosecute fishermen acting illegally. Measures are being developed to both gain a better understanding of watercraft usage in the harbour (which will help to monitor the levels and location of illegal fishing) and to implement a multi-agency agreed plan for enforcement of illegal fishing.

Table continued...

EMS	Feature at risk	Activity	Further context and summary of measures being developed to mitigate the risk
Poole Harbour	SPA birds (supporting habitat)	Bait digging and dragging posing risk of disturbance, removal of prey, and habitat modification	Further research is being undertaken to understand the extent of this activity within the harbour. This will include the development of a map to show where activities are known to take place. Other measures identified and in place include; improved communications to the general public; the completion of a local bye-law being progressed by the Borough of Poole; and examination of further regulatory control through the Marine and Coastal Access Act and creation of IFCAs (Inshore Fisheries and Conservation Authorities).
The Wash	SPA birds (supporting habitat) SAC – Intertidal mudflats and sandflats	Cockle fishery posing risk of disturbance, removal of prey, and habitat modification	Natural England is working with the fishery tenant to agree a voluntary management agreement. The aim is for any measures to be consistent with sustainable fishery measures agreed in remainder of The Wash EMS with the Eastern Sea Fisheries Joint Committee.
Isle of Scilly	SAC – reef and sandbanks	Scallop dredging posing risk of physical damage	A byelaw is in place to protect the features. Local fishermen comply, but not visiting fishermen. The Isle of Scilly Sea Fisheries Committee has undertaken prosecutions for illegal activities and will work with Defra and the Marine Management Organisation (MMO) to ensure sufficient resources are available to enforce the legislation.
Isle of Scilly	SAC – common and grey seals	Fisherman proposing to shoot seals within the SAC which may threaten the sustainability of the local seal population	The MMO is in discussions with Natural England and others on identifying the most appropriate measure for protecting Grey seal (*Halichoerus grypus*) and Common seal (*Phoca vitulina*) within the site boundary.
Solent	SPA birds (supporting habitat)	Bait digging posing risk of disturbance, removal of prey, and habitat modification	Activity hot spots are being identified and will inform further discussion on whether an existing statutory nature conservation order should be amended to protect sites with intense bait digging.
Solent	SPA birds (supporting habitat)	Clam dredging on eel grass beds posing risk of physical damage	A voluntary agreement not to dredge on specific areas of seagrass beds was established in October 2009. Further discussions are taking place between Natural England, the Sea Fishery Committee, and the MMO to agree the most appropriate short term and long term measures to protect the site.

EMS	Feature at risk	Activity	Further context and summary of measures being developed to mitigate the risk
			Table continued...
Generic across a number of sites; including Teesmouth and Cleveland Coast, Exe estuary, Pagham Harbour, Benacre to Easton Bavents, Minsmere to Walberswick, Deben estuary, the Solent and the Alde-Ore estuary	SPA birds and SAC habitats	Recreational activities	Activities could pose a high risk of disturbance to SPA bird features affecting a number of sites throughout England. There is a lower confidence associated with scoring risk for recreational disturbance, due to the complexity in determining the extent to which mobile species (such as birds) are disturbed. Additional site specific information is being collected to improve understanding of the nature of the risk, and in some instances, clear management actions are being identified and implemented. The nature of disturbance and its impact will be different on each site and therefore management actions required will be tailored to each site.

1.37 In addition to activities which could pose a high risk to EMS outlined in Table 2, there are some other important issues which, although identified as a medium risk, are relevant to a large number of EMS, and either require a better understanding of the nature of the risk, or continued and effective implementation of action plans already underway to reduce the risk. These activities are detailed below:

- **Spread of non-native species** is an emerging widespread issue potentially posing a risk to a number of sites. There is a lower confidence associated with scoring risk for spread of non-native species, reflecting the level of evidence quantifying distribution available. For example, there are often datasets to identify presence of a species rather than establishment or spread. Although some comprehensive baseline surveys have been undertaken there is also considerable uncertainty in identifying suitable management responses. Further work is required to develop the site level evidence base and to develop closer links with the GB invasive non-native species strategy. In addition, Natural England and Defra are working with the shellfish industry to identify appropriate measures to reduce the risk of spread of Pacific Oysters (*Crassostrea gigas*).
- **Eutrophication** is the over enrichment of water by nutrients, which stimulates an excessive growth of algae which can adversely affect the diversity of the biological system, and the quality of the water. In EMS, this is mostly manifested in macroalgal mats impacting on SAC (intertidal mudflats and sandflats) and SPA features. Examples of sites impacted include the Solent, Teesmouth, Poole Harbour, Chesil and Fleet lagoon.
  There are national management programmes in place to address this risk. Effluent discharges containing high levels of nutrients have been reviewed and addressed through the Environment Agency Review of Consents programme. Mechanisms to address diffuse sources of nutrients are being applied to varying degrees through catchment sensitive farming (CSF), designation of Nitrate Vulnerable Zones (NVZs) or site specific partnerships. Continued monitoring and review of these actions will be undertaken through implementation of the Water Framework Directive.
- **Coastal Squeeze** occurs when coastal habitats such as intertidal mudflats or saltmarsh become caught between sea defences and rising sea levels. Examples of sites impacted

include the Humber, Deben, Alde-Ore, Minsmere-walberswick, Hamford Water, Benfleet and Southend Marshes, Essex Estuary, Solent, and the Thames Estuary.

- The national management response to this risk is linked to the Natural England's SSSI "remedies" programme, as SAC and SPA intertidal habitats are underpinned by SSSIs. Natural England is working closely with the Environment Agency through this programme and is identifying areas of low-lying coast where "hard" sea defences can either be removed or realigned landward to allow more intertidal zone to develop. A series of increasingly large "managed realignments" have been completed, with more at the planning stage. Realignment of coastal flood defences is also becoming an integral part of many shoreline management plans (SMPs) currently being developed. Continued monitoring and review of these actions is required to determine the effectiveness of these measures.

Ongoing monitoring and research

1.38 This assessment has indicated that the levels of evidence to support judgements of risk from activities to EMS is variable. For activities which have been subjected to appropriate assessments or to national management initiatives (for example, coastal squeeze and water quality) there is stronger evidence on impacts. However, for some activities that are informal, unregulated, and subject to limited surveillance, there is often less evidence available to make judgements. Natural England continues to work with partners to better understand the nature of risks posed by various activities, and the mechanisms and potential risk reduction options available. For example, several studies are underway across English EMS to review the risks and impacts to site features from recreational disturbance. These studies will improve on the evidence base to support future risk assessments and management strategies.

1.39 Natural England is using the results of this risk review to inform the development of a new multi-year risk based marine monitoring and survey programme. The monitoring programme is undertaken to inform judgements on the condition of interest features, and whether conservation measures established to protect the sites are effective.

EMS management schemes

1.40 As highlighted above, relevant authorities can establish voluntary management schemes. The role of these schemes is vital in helping to achieve conservation objectives. This risk review will be made available to management groups, which are encouraged to actively and continually review current actions and to be proactive in taking measures to reduce risks wherever possible.

Future work

1.41 Natural England will continue to work with Defra and relevant authorities on plans to address the risks which are deemed a priority. These plans will contain a "report card" summarising results from all activities reviewed, which can inform any revision or updating of action plans associated with current EMS management schemes.

1.42 Natural England has also undertaken a detailed review of feature condition on EMS which will be published in early 2011.

1.43 Natural England will continue to work closely with the Environment Agency in order to ensure that risk assessments for transitional and coastal water bodies under the WFD, are informed by this work on EMS. The WFD risk assessments carried out so far have also highlighted similar pressures and impacts to the ones identified in this report.

Conclusions

1.44 Natural England has carried out its first national audit of risks to EMS and will continue to gather information related to risk from human activities on EMS. A consistent, systematic approach to assessing risk has enabled the highest risk activities to be identified, and appropriate measures to reduce risk have been taken forward as a priority.

1.45 Of all the activities reviewed, the vast majority do not cause a high level of risk to site features. Natural England will continue to advise Defra and relevant authorities who are developing and implementing plans setting out recommended actions to address activities which could pose a high risk. We will continue to work with relevant authorities through the EMS management scheme process, to provide advice on operations which may cause damage to site features.

1.46 This review constitutes a snapshot in time undertaken throughout 2009 and 2010. It will be important to continue to review risks to EMS to account for changes to activities and hence pressures and threats to sites.

1.47 The risk assessment process could now be applied to the proposed new marine SACs, SPAs, and the Marine Conservation Zones (MCZs) in order to inform appropriate management of existing and new activities.

2 References

JNCC. 2010. URL: **www.jncc.gov.uk/page-4215** [Accessed November 2010]. Management of the UK's European Marine Sites (EMS).

Syvret, M., Fitzgerald, A. & Hoareyvret, P. 2008. Development of a Pacific Oyster Protocol, Technical report.

Appendix 1 Risk Questionnaires

Table A Questionnaire for preliminary high level overview on activities posing a risk to European marine sites

Site	Feature (within 1nm of coast)	Is Feature: a) Considered unfavourable and known to be impacted? (for example, ecological evidence from monitoring) b) Considered unfavourable due to concerns about pressure/risks? (for example, evidence of pressure/risk) c) Considered at risk, but uncertain about condition	Reason for feature being unfavourable or at risk	Link with objectives set in Reg 35 or CSM	Activity causing impact / concern	Is management in place / action being taken to achieve objective?

Key:

a	Feature considered to be impacted
b	Feature considered possibly unfavourable due pressures
c	Feature considered at risk, but uncertain about condition

Table B Questionnaire for more detailed recording of site risk assessment

			Harm potential		Likelihood of activity	Management	Final risk score	Future action required
Activity	Feature(s) potentially affected	Sensitivity	Area affected	Harm potential (hazard)	Current level of activity or potential for activity to start	Score as High (for example, Byelaw in place to fully protect N2K features and clearly enforced/complied with), Medium (for example, Appropriate assessment in place, but no management action underway, or Low (no management in place).		
								
		High, Medium, Low or None based on Reg 35 advice or estimated	High = <70% Medium 30 - 70% Low <30% None 0%	sensitivity x potential area affected				

Note: Guidance issued to EMS staff on use of questionnaire and to ensure consistency with decision making.

Appendix 2 Summarised Results from EMS Risk Assessment

Table C Preliminary high level overview on activities posing a risk to European marine sites

EMS	Feature(s)	Grade	Reason	Activity
North East				
Berwickshire and NN Coast	Mud and sandflats	C	Water quality	Pollution
	Reefs	C	Physical damage	Commercial fishing
Teesmouth and Cleveland Coast	SPA birds	A	Water Quality - Eutrophication	Pollution
Yorkshire and Humber				
Flamborough Head	Reefs	B	Physical damage	Commercial fishing
	Reefs	C	Physical damage / extraction of species	Commercial fishing
	Reefs	C	Smothering	Dredge disposal
Humber Estuary	Estuary, sea / river lamprey	A	Water Quality - DO	Pollution / other
	Mud and sandflats, saltmarsh, SPA birds	A	Coastal squeeze	Coastal management
	Mudflats and sandflats	A	Physical damage	Recreation
	River lamprey	A	Extraction of species	Fishing / water extraction
	Sea lamprey	C	Extraction of species	Fishing / water extraction
	Saltmarsh	C	Other impact	Inapp land use
	Saltmarsh	A	Physical damage	Recreation
	SPA birds	B	Disturbance	Recreation
	SPA birds	A	other impact	Inapp manag
East Midlands				
Wash & N Norfolk Coast	Lagoon	B	Physical damage	Pollution
	Reef, Mud and sandflats	C	Physical damage	Commercial fishing
	Saltmarsh, mud and sandflats	C	Coastal squeeze	Coastal management
	Mud and sandflats, subtidal sandbanks	C	Physical damage – water resources	Water abstractions

Table continued...

EMS	Feature(s)	Grade	Reason	Activity
East of England				
Stour and Orwell estuaries	SPA birds	B	Declining bird numbers	Unknown / cumulative
Deben Estuary	SPA birds	B	Coastal squeeze	Coastal management
Alde-Ore estuary	Estuary and SPA birds	B	Coastal squeeze	Coastal management
Minsmere-walberswick	SPA birds	B	Coastal squeeze	Coastal management
Hamford Water SPA	SPA Birds	A	Coastal squeeze	Coastal management
Benfleet and Southend Marshes	SPA birds	B	Coastal squeeze	Coastal management
Essex Estuaries	Estuaries, mud and sandflats, saltmarsh, SPA birds	A	Coastal squeeze	Coastal management
Breydon Water	SPA Birds	C	Disturbance	Recreation, Industry
	SPA Birds	C	Water Quality - nutrients	Pollution (Diffuse)
South East				
Dungeness SAC	Annual vegetation of drift lines, Perennial vegetation of stony banks	A	Physical damage	Coastal management
	Perennial vegetation of stony banks	A	Physical damage - water resources	Water Abstraction
NB Proposed extension of Dungeness to Pett Level SPA	*Mud and sandflats and SPA birds*	*B*		Recreation
Chesil & the Fleet	Lagoon	A	Water Quality - Eutrophication	Pollution
	SPA birds	C	Loss of habitat	Commercial fishing
South Wight Maritime	Reef	B/C	Physical damage / extraction of species	Commercial fishing
	Reef	B/C	Water Quality - toxic	Pollution
	Reef	C	Alien species	Unknown

Table continued...

EMS	Feature(s)	Grade	Reason	Activity
Solent Maritime	Mud and sandflats	C	Loss of habitat	Maintenance dredging
	SPA birds	A	Declining bird numbers	bait digging and recreation
	Mud and sandflats	B	Physical damage	bait digging
	Mud and sandflats	B	Water Quality – toxic / thermal / nutrients	Pollution
	Mud and sandflats	C	Physical damage	Capital dredging
	Mud and sandflats, saltmarsh	A	Coastal squeeze	Coastal management
	Mud and sandflats	C	Physical damage	Shipping
	Mud and sandflats, subtidal sandbanks	C	Alien species	Commercial fishing / unknown
	Mud and sandflats, subtidal sandflats	C	Physical damage	Commercial fishing
	Mud and sandflats	B	Physical damage	Maintenance dredging
	Birds	C	Disturbance	Wildfowling
Swale and Medway Estuaries	Birds	C	Disturbance	Unknown
Thames Estuary	Saltmarsh	A	Coastal Squeeze	Coastal management
North East Kent	Reef	C	Alien species	Spread of alien species
Pagham Harbour	SPA birds	C	Disturbance	Recreation
South West				
Fal and Helford*	Mud and sandflats, subtidal sandbanks and reefs	B	Physical damage	Commercial fisheries and shipping
	Mud and sandflats, subtidal sandbanks, reefs, inlets and bays	B	Physical damage	Recreation
	Mud and sandflats, subtidal sandbanks, reefs, inlets and bays	B	Water Quality – nutrients/toxics	Pollution

Table continued...

EMS	Feature(s)	Grade	Reason	Activity
Exe Estuary	SPA birds	B	Disturbance	Commercial fishing, recreation
	SPA birds	B	Coastal squeeze	Coastal management
	SPA birds	C	Water quality - eutrophication	Pollution
Lundy	Sandbanks	C	Physical damage	Commercial fishing
	Reefs	C	Decrease in species	Unknown / cumulative
Plymouth Sound and Estuaries	Mud and sandflats	C	Coastal squeeze	Coastal management
	Estuaries, inlets and bays	C	Water quality toxic/nutrients	Pollution
	Subtidal sandbanks, Estuaries	C	Physical damage	Recreation
	Subtidal sandbanks	C	Physical damage	Capital and maintenance dredging
	Cetaceans	C	Disturbance	Noise
	Reefs	C	Alien species	Unknown
Poole Harbour	SPA birds	B	Water Quality – Eutrophication/toxic	Pollution
	SPA birds	C	Physical damage	Commercial fishing, bait digging
Isle of Scilly	Reefs, subtidal Sandbanks	B	Physical damage	Commercial fishing
	Reefs, subtidal Sandbanks	B	Water Quality - sewage	Pollution
Severn Estuary	Saltmarsh	B	Coastal squeeze	Coastal management
North West				
Ribble & Alt Estuaries	SPA birds	C	Loss of Habitat	Aggregate extraction
Dee Estuary	Mud and sandflats	B	Extraction of species	Commercial fishing
Duddon Estuary	Dunes	C	Physical damage	Recreation
	SPA birds	C	Disturbance	Unknown / cumulative

Table continued...

EMS	Feature(s)	Grade	Reason	Activity
Morecambe Bay	Saltmarsh, dunes	C	Physical damage	Recreation
	SPA birds	C	Disturbance	Recreation
	SPA birds	C	Loss of habitat	Development
Solway Firth	SPA birds	C	Disturbance	Recreation

EMS where **no risks** from activities were identified :

Drigg Coast, Tweed Estuary, Benacre to East Bavents, Northumbria Coast, Mersey Estuary, Great Yarmouth North Denes

* Taken from the pilot assessment for completeness

Results from a questionnaire completed in 2008 by Natural England marine advisers with responsibilities for EMS.

Key:

A Feature known to be impacted
B Feature considered possibly unfavourable due pressures
C Feature considered at risk, but less certainty about condition

Table D Summary of preliminary review of potential effects from commercial fisheries: Activities potentially posing a high risk of significant effect

EMS	Designation	Commercial fishery method having the potential to posing a high risk
North East		
Berwickshire and NN Coast	SAC	Beam Trawling Rock hopper Trawling Scallop Dredging
Yorkshire and Humber		
Flamborough Head	SPA	Other static gear (salmon netting)
East Midlands		
Wash & N Norfolk Coast	SAC	Lobster Trawling Cockle suction dredging Oyster Trestles (Non-native pacific oyster) *
	SPA	Cockle suction dredging
East of England		
Alde-Ore	SAC and SPA	Oyster Trestles (Non-native pacific oysters)*
Essex Estuaries	SAC	Oyster Trestles (Non-native pacific oysters)
Benfleet and Southend marshes	SPA	Cockle suction dredging
South East		
Thames Estuary and Marshes	SPA	Cockle suction dredging
North East Kent	SAC	Beam Trawling Rock hopper Trawling Oyster Trestles (Non-native pacific oysters)*
Solent Maritime	SAC and SPA	Clam Dredging Oyster Trestles (Non-native pacific oysters)*
South Wight Maritime	SAC	Beam Trawling Rock hopper Trawling
South West		
Poole Harbour	SPA	Beam Trawling Cockle suction dredging Oyster Trestles (Non-native pacific oysters)*
Exe Estuary	SPA	Oyster Trestles (Non-native pacific oysters)*

Table continued...

EMS	Designation	Commercial fishery method having the potential to posing a high risk
Isles of Scilly	SAC	Scallop Dredging
Plymouth Sound and Estuaries	SAC and SPA	Oyster Trestles (Non-native pacific oysters)*
Fal and Helford	SAC	Light Otter Trawling Scallop Dredging Oyster cultivation (Non-native pacific oysters)
Severn Estuary	SAC	Rock-hopper trawling
North West		
Morecambe Bay	SAC and SPA	Oyster Trestles (Non-native pacific oysters)*

Results are summarised from initial analysis undertaken by an independent consultant on commercial fisheries. This was subsequently reviewed and updated by Natural England marine advisers for EMS and National specialists.

***** These activities were incorporated into the preliminary fisheries assessment following a review on the potential risk from spread of Pacific Oysters (Syvret 2008). Areas were highlighted to ensure that NE staff further review through the more detailed assessments.

Table E Summarised final risk assessment results for each EMS

European Marine Site	Activities assessed	High	Medium	Low	Total assessed (includes those scored as no risk)
Berwickshire and NN Coast	Commercial fishing Pollution Recreation	0	6	15	21
Coquet Island	Commercial fishing Other Recreation	0	4	1	5
Tweed Estuary	Commercial fishing Pollution	0	1	10	11
Teesmouth and Cleveland	Commercial fishing Pollution Coastal defence Recreation	1	7	11	20
Northumbria Coast	Recreation	0	0	1	1
Total North East		**1**	**18**	**38**	**58**
Flamborough Head	Commercial fishing Pollution Commercial vessels Recreation	1	4	17	22
Humber Estuary	Commercial fishing Pollution Commercial vessels Recreation Coastal defence	1	10	12	23
Total Yorkshire & Humber		**2**	**14**	**29**	**45**
The Wash & North Norfolk Coast	Commercial fishing Pollution Commercial vessels Recreation Other Military Water resources	1	19	35	56
Total East Midlands		**1**	**19**	**35**	**56**
Essex Estuaries	Coastal defence Commercial fishing	0	3	1	4
Stour and Orwell Estuaries	Coastal defence Commercial fishing Commercial vessels Recreation Water resources	0	2	20	22

Table continued...

European Marine Site	Activities assessed	High	Medium	Low	Total assessed (includes those scored as no risk)
Alde-Ore Estuary	Coastal defence Commercial fishing Recreation Water resources	1	1	12	14
Deben Estuary	Coastal defence Recreation Water resources	1	1	1	3
Minsmere to Walberswick	Coastal defence Recreation Water resources	1	2	4	7
Benacre to Easton (Bavents (SPA) Lagoons (SAC)	Commercial fishing Recreation	1	1	1	3
Benfleet and Southend Marshes	Commercial fishing Coastal defence Recreation Pollution	0	3	1	4
Breydon Water	Coastal defence Recreation Water resources	0	1	0	1
Hamford Water	Commercial fishing Coastal defence Recreation Pollution	0	3	2	5
Great Yarmouth and North Denes	Coastal defence Recreation	0	0	2	2
North Norfolk Coast	Coastal defence	0	0	1	1
Total East of England		**4**	**17**	**45**	**66**
Thames Estuary	Commercial fishing Coastal defence Recreation Pollution Commercial vessels Other	0	1	9	12
Swale and Medway	Commercial fishing Commercial vessels Coastal defence Recreation Pollution Other	0	2	12	16

Table continued

European Marine Site	Activities assessed	High	Medium	Low	Total assessed (includes those scored as no risk)
North East Kent	Commercial fishing Commercial vessels Coastal defence Recreation Pollution Other	0	8	32	40
Pagham Harbour	Coastal defence Recreation Pollution Other	1	3	6	10
South Wight	Commercial fishing Commercial vessels Coastal defence Recreation Pollution Water resources Other	0	16	19	36
Solent and Isle of Wight lagoons	Coastal defence Pollution Recreation	0	3	5	8
Solent	Commercial fishing Commercial vessels Coastal defence Recreation Pollution Water resources Military Other	3	19	31	54
Dungerness	Coastal defence Military Recreation	0	3	1	4
Total South East		**4**	**55**	**115**	**180**
Chesil and The Fleet	Commercial fishing Commercial vessels Recreation Pollution Other	0	7	15	27

Table continued...

European Marine Site	Activities assessed	High	Medium	Low	Total assessed (includes those scored as no risk)
Exe Estuary	Commercial fishing Commercial vessels Recreation Pollution Other	1	14	27	42
Fal and Helford	Commercial fishing Commercial vessels Recreation Pollution Other	0	18	27	50
Isle of Scilly	Commercial fishing Commercial vessels Recreation Pollution Other	2	11	14	29
Lundy	Commercial fishing Commercial vessels Recreation Pollution Other	0	11	8	19
Plymouth Sound	Commercial fishing Commercial vessels Recreation Pollution Other	0	23	25	48
Poole Harbour	Commercial fishing Commercial vessels Recreation Pollution Coastal defence Other	3	20	29	59
Severn Estuary	Commercial fishing Recreation	0	21	15	36
Isle of Portland		0	0	0	0
Sidmouth to West Bay		0	0	0	0
Braunton Burrows	Coastal defence		0	1	1
Total South West		**6**	**125**	**161**	**311**

Table continued...

European Marine Site	Activities assessed	High	Medium	Low	Total assessed (includes those scored as no risk)
Dee Estuary	Commercial fishing Commercial vessels Recreation Pollution Water resources Coastal defence Other	0	0	43	43
Mersey Estuary	Commercial fishing Commercial vessels Recreation Pollution Other	0	6	31	37
Mersey narrows	Commercial fishing Commercial vessels Recreation Pollution Other	0	6	35	41
Morecambe Bay and Duddon	Commercial fishing Commercial vessels Coastal defence Recreation Pollution Other	0	11	28	40
Ribble Estuary	Commercial fishing Commercial vessels Recreation Pollution Other	0	4	37	41
Solway	Commercial fishing Commercial vessels Recreation Pollution Other	0	1	20	23
Drigg	Commercial fishing Recreation Pollution Other	0	0	16	16
Total North West		**0**	**28**	**210**	**241**

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