Department of Energy & Climate Change

UK Offshore Energy Strategic Environmental Assessment

OESEA3

Post Consultation Report

July 2016

Any enquiries regarding this publication should be sent to us at oep@decc.gsi.gvo.uk.

Contents

1 Introduction

1.1 Document purpose

The Department of Energy and Climate Change (DECC) prepared an Environmental Report as part of its Offshore Energy Strategic Environmental Assessment (SEA) programme, hereafter referred to as OESEA3. OESEA3 assessed a draft plan/programme to hold further offshore leasing/licensing for renewable energy, oil & gas, hydrocarbon gas and carbon dioxide storage and associated infrastructure. Public consultation on the Environmental Report was undertaken over a period of eight weeks between 3rd March and 29th April 2016.

This report presents a summary[1] of the issues raised and other comments on the Environmental Report received during the public consultation period. Where appropriate, responses to comments are given to provide factual and technical clarifications. The report also includes responses to comments on policy, regulatory and other controls, and future plans where these are relevant. It is not intended to publish a revised version of the Environmental Report. However, where relevant the Environmental Report should be read in light of the further clarifications provided by DECC in this Post Consultation Report.

There are many considerations which DECC will take into account in making a decision on the draft plan/programme; the Environmental Report and the comments received during consultation are important inputs to this process. The Government decision will be accompanied by a post adoption statement, describing *inter alia* how environmental considerations have been integrated into the plan or programme and how the Environmental Report and opinions expressed in response to the consultation has been taken into account in line with the requirements of the SEA Regulations.

1.2 Background

Previous SEAs undertaken as part of this programme included the OESEA in January 2009 and OESEA2 in February 2011, which built on a series of earlier regional scale SEAs undertaken by DECC and its forerunner departments since 1999. OESEA considered the environmental implications of a draft plan/programme to enable: further seaward rounds of oil and gas licensing, including gas storage in UK waters; and further rounds of offshore wind farm leasing in the UK Renewable Energy Zone (now Exclusive Economic Zone) and the territorial waters of England and Wales to a depth of 60m. During 2010, DECC undertook an exercise to update and extend the scope of the OESEA Environmental Report and issued OESEA2 for consultation on further licensing/leasing for offshore energy including oil and gas, gas storage including carbon capture and storage (CCS) and marine renewables (wind, wave and tidal technologies). The indicative time horizon (i.e. period of currency) for OESEA2 was 5 years from publication. During this period, as with previous SEAs, DECC has maintained an active SEA research programme; identifying information gaps (some of which were outlined in the recommendations of previous SEA Environmental Reports), commissioning new research where appropriate, and promoting its wider dissemination through a series of research seminars, and maintaining an active SEA Steering Group.

[1] For reference, in addition to the summarised comments in this report, full copies of the comments are available on the SEA pages of the gov.uk website.

OESEA3 is being conducted in accordance with the *Environmental Assessment of Plans and Programmes Regulations 2004* (the SEA Regulations), which apply to any relevant plan or programme which relates either solely to the whole or any part of England, or to England and any other part of the United Kingdom (UK).

OESEA3 is intended to:

- Consider the environmental implications of DECC's draft plan/programme to enable further licensing/leasing for offshore energy (oil and gas, hydrocarbon gas storage, carbon dioxide storage and marine renewables including wind, wave, tidal stream and tidal range). This includes consideration of the implications of alternatives to the draft plan/programme and consideration of potential interactions with other users of the sea
- Inform the UK Government's decision on the draft plan/programme
- Provide routes for public and stakeholder participation in the process

The main parts of the draft plan/programme are:

Renewable Energy:

1. Wave – future leasing in the relevant parts of the UK Exclusive Economic Zone and the territorial waters of England and Wales. The Scottish Renewable Energy Zone and Scottish and Northern Irish waters within the 12 nautical mile territorial sea limit are not included. In view of the relatively early stage of technological development, a target generation capacity is not set in the draft plan/programme.

2. Tidal stream – future leasing in the relevant parts of the UK Exclusive Economic Zone and the territorial and internal waters of England and Wales. The Scottish Renewable Energy Zone and Scottish and Northern Irish waters within the 12 nautical mile territorial sea limit are not included. In view of the relatively early stage of technological development, a target generation capacity is not set in the draft plan/programme. Similarly, a minimum average tidal current velocity threshold is not proposed.

3. Tidal range – future leasing in the internal and territorial waters of England and Wales. It is considered unlikely that there will be tidal range developments outside of territorial waters.

4. Offshore wind – to enable further offshore wind farm leasing in the relevant parts of the UK Exclusive Economic Zone and the territorial waters of England and Wales. The technologies covered will include turbines of up to 15MW capacity and tethered (i.e. floating) turbines in waters up to 200m. The Scottish Renewable Energy Zone and the territorial waters of Scotland and Northern Ireland are not included in this part of the draft plan/programme.

Oil & Gas:

5. Exploration and production – further Seaward Rounds of oil and gas licensing of the UK territorial sea and UK Continental Shelf (UKCS).

6. Hydrocarbon gas importation and storage – further licensing/leasing for unloading and underground storage of hydrocarbon gas in UK waters (territorial waters and the relevant parts of the UK Exclusive Economic Zone), including hydrocarbon gas storage in other

geological formations/structures such as constructed salt caverns, and the offshore unloading of hydrocarbon gas.

Carbon Dioxide:

7. Carbon dioxide (CO_2) transportation and storage – further licensing/leasing for underground storage of carbon dioxide gas in UK waters (the UK Exclusive Economic Zone and relevant territorial waters, excluding the territorial waters of Scotland). Includes CO_2 storage in geological formations/structures including depleted reservoirs (and for enhanced oil recovery), aquifers and constructed salt caverns.

OESEA3 is expected to have a 5 year period of currency. Several of the technologies covered in the draft plan/programme remain to be deployed at a commercial scale, and are likely to undergo rapid development and change during the currency of the SEA, in order to assist in achieving medium to long-term targets in relation to UK greenhouse gas emissions. The currency of OESEA3 will be periodically reviewed by DECC (as the competent authority) in the context of new information on technologies, effects, or plan/programme status.

1.3 Offshore Energy SEA consultation process

The Environmental Report was available to view or freely download on the SEA pages of the gov.uk website[2]. Copies of the Environmental Report could also be ordered[3], if preferred, via the website, by email or by mail. An email alert was sent to all registered users on the SEA website mailing list and other stakeholders were variously alerted by email including through the Communications and Management for Sustainability emailing advertising service. Notices were inserted in 28 national and regional newspapers to inform the wider public of the SEA consultation. Copies of the Environmental Report were sent to statutory consultation bodies and authorities in the UK and to neighbouring states, and a poster advertising the SEA and a CD of the report was sent to all coastal libraries in the UK (note facilities to use CDs were not always available but the report could be viewed online).

Five copies of the Environmental Report were mailed out in response to requests from stakeholders and the public. Statistics for the number of times the Environmental Report, including its appendices were downloaded from the SEA website, and the number of unique views of the website during the consultation period, are summarised in Figure 1 and Figure 2 below. The values are indicative, as for example, search engine page crawlers can add extra traffic to a website.

[2] Various Technical Reports and copies of Reports from earlier DECC SEAs are also available from the gov.uk website.

[3] Copies of the Environmental Report were provided free of charge.

Figure 1: Number of page views[4] and cumulative page views during the consultation period

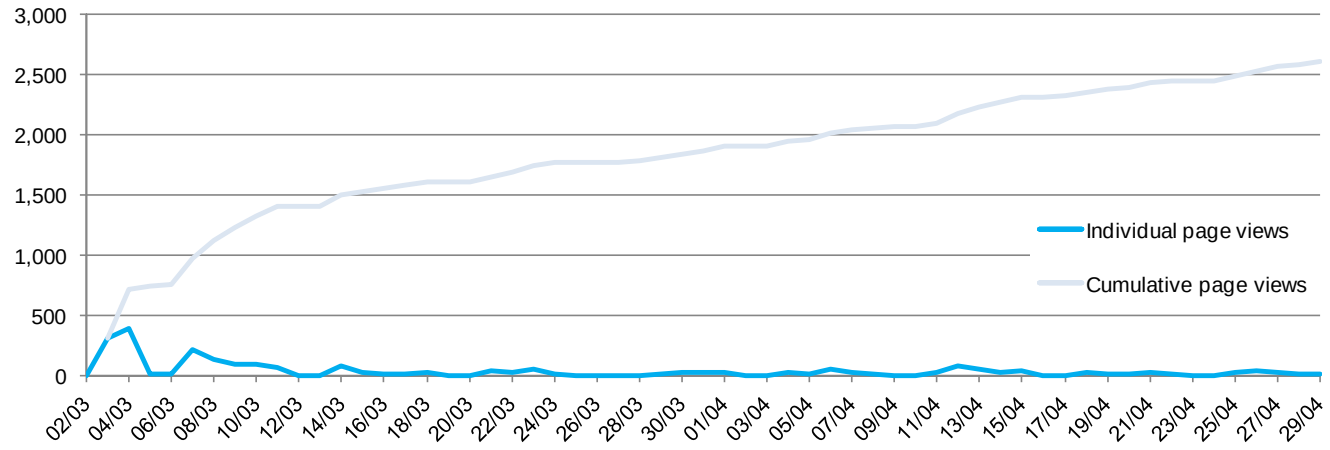
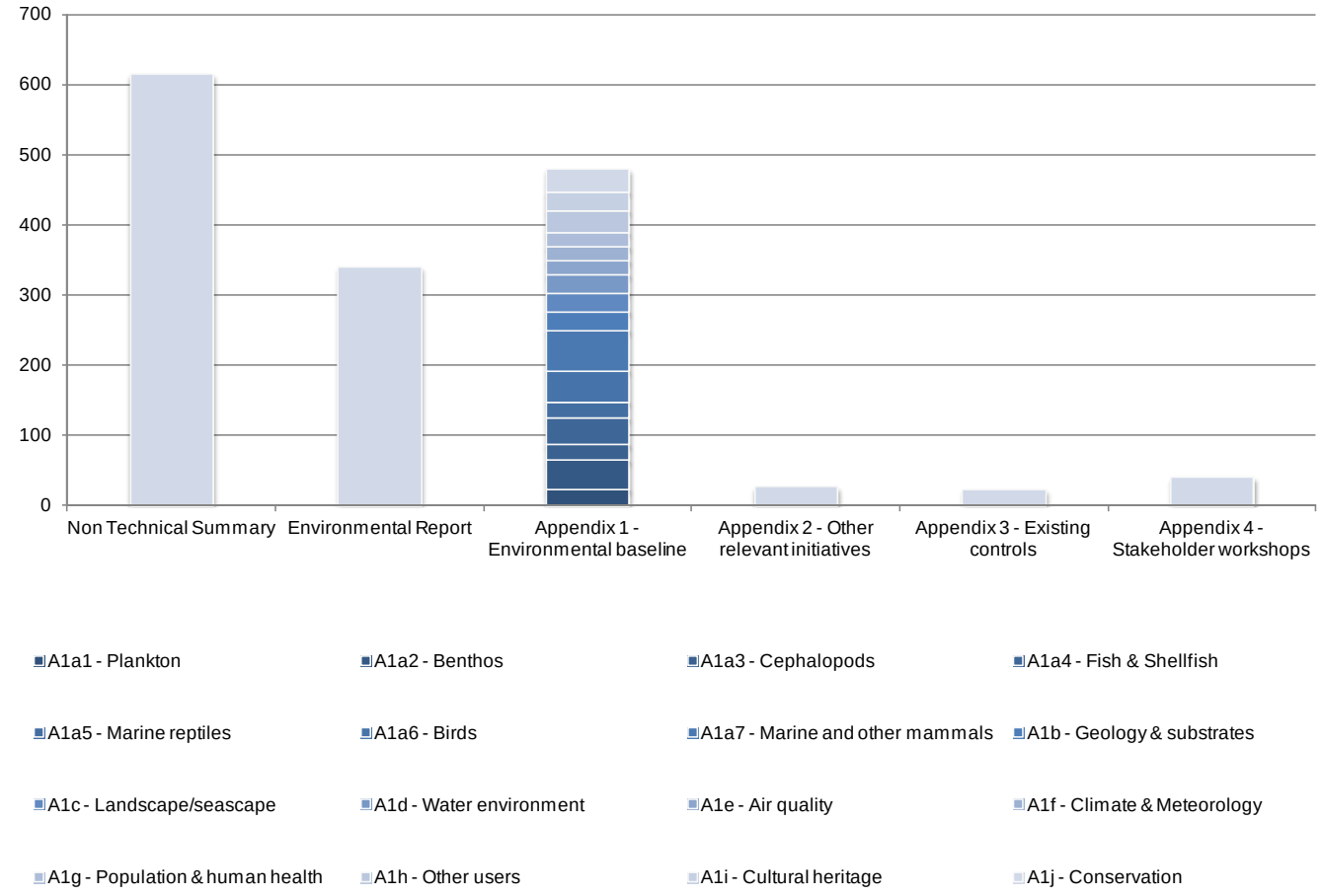


Figure 2: Downloads of the Environmental Report and its appendices during the consultation period



[4] Visits made to: https://www.gov.uk/government/consultations/uk-offshore-energy-strategic-environmental-assessment-3-oesea3

2 Summary of consultation feedback

2.1 Consultation input

Comments on the consultation of the Environmental Report were received by e-mail or as hard copy through correspondence to DECC. A total of 22 organisations and individuals responded to the consultation, and are listed below:

- Joint Nature Conservation Committee (JNCC), also representing a joint response from Natural England (NE), Natural Resources Wales (NRW) and Natural Environment Division, Northern Ireland Environment Agency (DOENI) – abbreviated to SNCBs. Note that there are also separate comments from NRW and SNH.
- Natural Resources Wales (NRW)
- Scottish Natural Heritage (SNH)
- Marine Scotland
- Marine Management Organisation (MMO)
- Scottish Environment Protection Agency (SEPA)
- The Crown Estate (TCE)
- Historic England (HE)
- Cadw (Welsh Government historic environment service)
- Historic Environment Scotland (HES)
- Whale and Dolphin Conservation (WDC)
- RenewableUK (RUK)
- Energy UK (EUK)
- Tidal Lagoon Power (TLP)
- Vattenfall
- DONG
- EDF Energy (EDF)
- Scottish Power Renewables (SPR)
- Alan Neale
- Isle of Man Government
- Ministère de l'environnement (French authorities)
- Norwegian Ministry of Climate and Environment

For ease of reader access, the comments have been summarised and grouped in Section 2.2 (by topic), together with appropriate clarifications and responses which are given in italicised text following each comment. Where the comments cover the same issue they have been combined to avoid duplication. The full text of the comments are available on the SEA pages of the gov.uk website[5].

Respondent category	Number of respondents
UK public bodies	10
Foreign government bodies	3
Trade organisations and businesses	7
Environmental non-governmental organisations	1
Individuals	1
Total	22

Due to the volume and diversity of stakeholder responses received, they have been categorised on several levels, broadly relating to the section of the Environmental Report to which they refer. The following categories are used, which are further subdivided in Section 2:

- SEA scope, process and quality of the Environmental Report
- Assessment process and findings
- Consideration of alternatives
- Recommendations and monitoring
- Environmental baseline
- Other issues raised/comments

2.1.1 Overview of key themes in consultation feedback

A number of high level themes were present in the feedback which are summarised below and discussed in greater detail in Section 2.2:

- General satisfaction with the scope, approach and level of detail, and that the SEA is up to date.
- General acceptance that the resource areas identified for each technology were appropriate and could be used to help inform areas of interest at a high level, but that this should be used in combination with marine plans.
- Several respondents were concerned that the overall spatial consideration suggests definitive exclusion for certain technologies or that this was taking a marine planning role. As indicated in the full text of that section in the SEA, the spatial analysis was initially undertaken for OESEA and OESEA2 in advance of marine spatial planning in the UK to indicate relative levels of constraint for certain technologies covered by the draft plan/programme. Regional marine plans have still not been adopted for the

[5] https://www.gov.uk/government/consultations/uk-offshore-energy-strategic-environmental-assessment-3-oesea3

majority of UK seas and so this exercise was repeated for OESEA3 to help indicate levels of constraint in UK seas covered by the draft plan. The limitations of the method were clearly stated, in addition to the requirement for project level assessment. However, in the context of other similar work it provided a first order indication of areas of most/least constraint based on a range of, primarily, other user issues. It is understood that the remaining marine plans are due for completion and adoption during the life of OESEA3.

- Connected with the above exercise, there was a concern that the SEA suggested wind development should not take place in territorial waters. Given the numerous, often overlapping designations to protect scenic, geological, ecological and cultural features, and designations or use for recreational, shellfishery, fishery, navigational, commercial and other activities, recommendation 3 indicated that some developments may not be compatible with a nearshore location. It also acknowledged that environmental sensitivity of coastal areas is not uniform, but that the intensity of designations and uses typically declines further offshore away from the coast. There is therefore the potential for greater stakeholder interaction and consenting risk for development in these areas, but the SEA did not definitively exclude any area of potential resource.
- Some feedback indicated that lessons should be learned in the SEA from consent refusal, specifically in relation to Navitus Bay. The implication being that since Round 3 and the SEA process had taken place, there was high expectation that the project would receive consent. It should be noted that wind farm leasing Rounds and the SEA process, though connected, are separate, and OESEA and OESEA2 did not assess specific Round 3 zones but rather considered the relevant waters/areas of prime resource. Previous OESEA recommendations indicated that nearshore sites carry a greater consenting risk, reflecting the multiple uses and designations.
- A number of respondents did not think the SEA adequately reflected the potential contribution of renewables, particularly offshore wind, to emissions reductions and also the objectives of the draft plan/programme. The contribution of offshore wind to wider renewables deployment and energy generation is recognised in the SEA, including that, "*In view of the maturity of the technologies covered by this draft plan/programme, it is likely that offshore wind will make the largest contribution to a reduction in the overall UK energy supply carbon intensity.*"
- The SEA research programme will maintain awareness of the outputs of other research initiatives, including the Offshore Renewables Joint Industry Programme (ORJIP), in order to maximise synergies and reduce potential for duplicating effort. The SEA steering group includes a range of Government, non-Government and industry bodies and will continue to be involved in identifying and reviewing suitable research projects. Additionally, in response to comments on the dissemination and peer-review of such work, a list has been published on the SEA pages of the gov.uk website listing recent publications from SEA research, and updates to progress on SEA research topics is ongoing.
- Regarding the alternatives set out in the Environmental Report, some respondents agreed with the recommended alternative, which was to restrict the areas offered for

leasing and licensing, temporally or spatially. However, others (particularly industry) were concerned about the potential for spatial or temporal restrictions.

- In relation to the Recommendations made in the Environmental Report, it was generally accepted that site-specific assessment would be required to properly inform project specific proposals, particularly tidal range. Many of the objectives of Recommendation 1 are being addressed through the marine planning process.
- A number of editorial comments and suggestions for additional literature were made by respondents. Whilst these do not materially alter the outcome of the SEA, these comments are welcome and have been collated for input to any future publications. A few respondents indicated that the report structure and length did not make it easy to review. The report structure was chosen to reduce the potential for repetition, and the length reflects the work undertaken to characterise the baseline and summarise current understanding on potential effects/interactions which underpins the assessment. An overview of the assessment was also provided in a Non-Technical Summary (NTS).

2.2 Consultation issues with DECC responses and clarifications

2.2.1 SEA scope, process and quality of the Environmental Report

#	Group	Comment/response
1.1	TCE	A number of maps do not reflect recent changes (March 2016) to the offshore wind portfolio. Showing former wind zones which are no longer present in maps of existing wind farm activity is not appropriate. Recommend that the emphasis of discussion is on the wind portfolio as a whole rather than focussing on rounds of development and that reference to extensions to existing leases is made for the entire portfolio, not focussing on Round 2.
		DECC are aware of the changes to the offshore wind portfolio which were announced following the start of the OESEA3 consultation, and will reflect this revision in any future work. Former wind zones have been shown in some maps to provide historical context only, and to reflect those changes in the status of these areas since OESEA2. In relation to the potential for wind farm extension, Table 2.2 reflects this possibility in each relevant Regional Sea, without specific reference to any former wind leasing round.
1.2		Agree with the resource potential of mean tidal range >5m and water depths <25m. However, note some areas close to the coast appear to be excluded. Welcome clarification on whether this reflects underlying data availability rather than where projects could theoretically be developed.
		The apparent gaps in coastal resource reflect the landward limits of the underlying data.
1.3		Welcome the flexibility afforded wave and tidal current technologies for the sectors to evolve and deploy new technology within the currency of this SEA.
		Noted.
1.4		Agree with the resource areas outlined in the prospectivity and overall spatial considerations chapters, but recommended that these are not used to place restrictions on the location of wave and tidal current development as there may be some interest sites outside these areas. We further note that the marine planning process is helping to identify likely future opportunities for development based on resources availability and other constraints on development.

#	Group	Comment/response
		The SEA has used maps to illustrate the spatial extent of those resource areas considered as the most prospective, and where available, has been informed by work undertaken for marine planning (e.g. as presented in the MMO strategic scoping report). It is recognised that there may be some opportunistic, small scale and demonstrator projects which might not fit directly within these prime resource areas, and the SEA does not preclude such development.
1.5		Highlight that in addition to Scotland and Northern Ireland, other areas which are within relevant waters (e.g. the south-west and Wales) have the potential to deliver array scale tidal current projects in the currency of this SEA.
		Noted. The prospectivity of these areas for tidal stream and other aspects of the draft plan/programme have been considered in the SEA (e.g. refer to Table 2.2).
1.6		Text was provided clarifying the situation regarding wave and tidal leasing activity to date.
		Noted.
1.7	SEPA	Content with the adequacy and accuracy of the Environmental Report but disappointed to note that the observation made [in scoping] with regard to Underground Coal Gasification (UCG) does not appear to have been addressed. This may become a more pressing issue in future rounds as planned activity in this area increases around the UK coast. It will also be important to understand any interrelated or cumulative effects from interaction with the activity assessed by OESEA3 and/or any future rounds.
		As noted in the scoping response, DECC are not the licensing authority for underground coal gasification, responsibility for which rests with the Coal Authority, and so direct consideration of this activity cannot be made in the SEA. It is understood that a number of licences have been granted in areas of the UK which relate to UCG, some of which are nearshore or estuarine. However, to date there are no firm project proposals. The location of these existing licences is such that there is potential for them to be developed from shore rather than being proposed as entirely offshore developments. It is further noted that in the context of Scottish waters, the Scottish Government have placed a moratorium on this technology, with an independent examination taking place on the potential issues related to UCG. The potential for cumulative effects from such technologies and plan activities, and any relevant output of the examination, will be kept under review.
1.8	SNH	Consider the Environmental Report to be comprehensive, detailed and thorough, as well as being based as far as is possible on the latest information and guidance. Unfortunately, the structure of the report does not allow for easy discrimination of sections applicable to Scotland or to the oil and gas sectors alone which, given its length, makes its review somewhat challenging.
		Noted. The source of effect-based structure of the document was chosen based on what was regarded to ensure least repetition in order to provide for a more concise document, with each section then dealing with aspects of the draft plan/programme individually.
1.9		It may be more useful in future iterations to rely on references and/or web links to reduce the amount of information that needs to be provided in the Report, to reduce length and focus on the areas of interest/concern. One option might be to limit the text covering each receptor interest to that of the environmental issues, in turn focussing on the key issue and recommendations that developers would need to consider, and linking this to the SEA research programme.
		Whilst we acknowledge the value of such summary information, which is provided in the NTS, given the work undertaken to both characterise the baseline and on potential interactions/effects of the technologies covered by the draft plan/programme, as in previous SEAs, it was felt that syntheses and presentation of much of this information was of benefit both to the reader, and subsequent users of the document.
1.10		Nature conservation MPAs are based on a suite of Priority Marine Features that have been identified in recent years by SNH, JNCC and Marine Scotland, to help deliver Scottish Government's marine conservation commitments. These appear not to have been recognised in the Environmental Report or Benthic annex.
		These are referenced in Appendix 1j, Conservation.

#	Group	Comment/response
1.11		Consultation has begun on a possible SAC for Harbour Porpoise in the Inner Hebrides and Minches. This will need to be factored into any final recommendations made regarding oil and gas/CCS development proposals made in this and adjacent areas.
		It should be noted that the pSAC is located within Scottish internal waters and that the Scottish Government will be responsible for oil and gas activities in such areas in due course, and they similarly have responsibility for CCS activities within their territorial waters. DECC are aware of the consultation, and the potential interaction between oil and gas licensing in reserved areas in close proximity to Scottish waters and the proposed sites, and will reflect it in subsequent assessment stages.
1.12		It is not immediately clear how the criteria set out in Table 3.1 have been applied.
		SEA objectives provide an indication of the intended outcome of the SEA for each topic, also outlining the desired trajectory of change where applicable. The objectives have also been used to analyse the relative merits of the alternatives listed in the Environmental Report, as set out in Section 5.17.
1.13	HE	Helpful to see reference to National Policy Statements (e.g. EN-3) that capture the concept that subject to satisfactory conclusion of archaeological mitigation it is possible to identify a positive impact (i.e. knowledge gain). However, effective delivery post-consent and realisation of DCO conditions directed at cultural heritage is essential.
		Noted. The SEA has identified such positive effects at the strategic level, however it should be noted that as the SEA does not confer any level of consent for developments, the delivery of such benefits as part of DCO conditions is something which must be dealt with at the project specific level.
1.14		In Table 3.1 particular attention is given to the visual resource. It is important to add that the approach adopted through the Historic Seascape Characterisation programme is to identify a perception of historic character. It is therefore through any subsequent SEA exercise to determine objectively how the identified character, spatially defined, might change independently of whether it is "visible" or not.
		Whilst the non-visual aspects of seascape are not directly referenced in Table 3.1, this is referred to in Appendix 1c Landscape and Seascape. Moreover, the definition of landscape given in the European Landscape Convention, which can equally be applied to seascape, references perception, and the contribution of the SEA to the Convention is indicated in the objectives.
1.15	HES	Welcome that our comments on the proposed scope of the assessment have been taken into account in the preparation of the assessment.
		Noted.
1.16	SPR, RenewableUK, Energy UK	Welcome the objective of the plan, however note that the scale and rate of deployment proposed is ambitious and the UK offshore industry will require regulatory certainty alongside rapid technology development if we are to meet these ambitions within the timeframe of the draft plan/programme.
		Noted, however, in terms of scale and rate of deployment, no particular target capacity has been set for any technology.
1.17		We support the identification of key resource areas for offshore wind based on the assessment of technical constraints such as wind speed and water depth. As set out in the OESEA document, grid availability is also a significant factor in the preferred location of offshore wind developments. The OESEA makes a number of assumptions with regard to the potential deployment of offshore wind turbine foundations types. Whilst the assumptions seem reasonable at this point in time we would urge against the limitation of development outwith proposed key resource areas based on technical constraints and current or expected technology availability.
		It should be noted that the resource area map for offshore wind (Figure 2.8) identifies that the overall wind resource applies to all relevant waters covered by the draft plan/programme. The SEA does not preclude the possibility of technical innovation, but it was informed by what is regarded to be the most likely fixed and tethered foundation designs to be deployed in the currency of the SEA (approximately 5 years).

#	Group	Comment/response
1.18	EDF, Energy UK	Welcome the inclusion of spatial scale maps identifying the most appropriate zones for development for particular technologies. These maps, combined with the useful regional environmental information, may be used to appropriately inform a developer's siting decisions and their application to develop in an area.
		Noted.
1.19	Vattenfall	Unlike OESEA2, the implications of a draft plan or programme for further leasing rounds for offshore energy have not been considered. The Government is strategically committed to offshore wind, supporting up to three Contracts for Difference (CfD) auctions by 2020 and outlining a cost reduction trajectory to 2025. The Committee on Climate Change sets out a clear and significant role for offshore wind in achieving least cost decarbonisation in its advice to Government on setting the Fifth Carbon Budget. Although there is significant uncertainty regarding future rounds of offshore wind development, the SEA process should clearly consider the broader UK energy landscape, particularly for renewables, and support these strategic objectives.
		OESEA3 has considered the implications of further leasing for offshore energy, and recognises the strategic importance of marine renewables in contributing to Government targets relating to emissions reductions and renewables deployment (e.g. please refer to Sections 2.2 and 5.12).
1.20		Norfolk Vanguard and Norfolk Boreas are likely to be constructed from 2020 onwards and this should be included within the text and relevant figure (Figure 2.10). These are within areas which have significant oil and gas infrastructure and which are subject to ongoing licensing rounds. Vattenfall has initiated discussions with owners regarding decommissioning timescales for existing assets, however improved clarity from DECC on future rounds and related compensation arrangements is urgently required.
		Noted. In addition to OESEA3, interactions between offshore activities are also being considered through the marine planning process, with the East Inshore and Offshore Marine Plans being most relevant in this case. Compensation measures or any project specific agreements are outside of the scope of the SEA, but note that existing DECC guidance is available on the procedures relating to compensation arrangements.
1.21		The UK Government played a leading role in reaching the historic Paris Agreement in 2015 and has subsequently committed to enshrining the Paris goal of net zero emissions into UK law. This should be recognized within the Report as this commitment will play a significant role in driving development in UK waters in the next 5 years.
		The Paris Agreement is noted in the Environmental Report (e.g. Section 2.2, Section 5 (which includes the recommendations from the CCC on the implications of the Agreement for the fifth carbon budget) and Appendix 2). The objectives of the SEA are firmly set within this policy context.
1.22	NRW	NRW places great importance on engaging with the SEA process and welcomes the structured and open way in which participation has been managed and commends DECC on the comprehensive and rigorous approach it has adopted in carrying out this assessment. NRW considers that the report has demonstrated that a robust and comprehensive strategic assessment of environmental issues has been undertaken and that this will help to reduce environmental and consenting risks associated with plan implementation.
		Noted. DECC values the contributions made by the steering group and others in providing constructive input to the SEA process.
1.23	NRW/SNCB	Other offshore energy planners and developers rarely refer to the information gathered by the SEA. We would encourage measures to facilitate better access to information collated within the SEA to ensure it is readily available to those producing lower tier assessments. Acknowledge that there is a wealth of useful information on the SEA website, however much of the information might usefully be presented in a form that can be used more readily (e.g. by subdividing regionally, by activity or by receptor). Also suggest that the SEA can learn from the ongoing streamlining processes within The Crown Estate for their aggregates and wave and tidal plan-level assessments.
		Noted. Please refer to 1.8 and 1.9 above. The reports by The Crown Estate are being reviewed.

#	Group	Comment/response
1.24	Marine Scotland	In light of new legislation devolving further powers to the Scottish Parliament, we would wish to note the following: • DECC oil and gas and CCS consents should respect the Scottish National Marine Plan and any Sectoral Plans/Leasing Rounds undertaken in fulfilment of the role as future Scottish manager of the Crown Estate • DECC consents for these activities should ensure environmental sustainability and minimisation of potential Scottish Government liabilities (e.g. under Environmental Liability Directive).
		Noted. DECC will take account of any provisions made under the Scotland Act 2016, where applicable. However, note that leases from The Crown Estate are only relevant to carbon/gas storage sites and a limited range of oil and gas activities (e.g. pipelines within territorial waters). DECC would also like to clarify that liabilities relating to oil and gas activity on the UKCS are jointly and severally the responsibility of the companies that comprise the relevant licensee.
1.25	EDF, Energy UK	The perception of developers is that sites identified as suitable for development following application of the Government's own principles and documents outlined in the development process have a high likelihood of receiving planning permission. However, this is not necessarily the case and we believe the SEA process must learn from recent practical experiences in offshore energy consenting.
		It should be noted that wind farm leasing Rounds and the SEA process, though connected, are separate, and OESEA and OESEA2 did not assess specific Round 3 zones, the areas for which were identified by The Crown Estate. Instead, those SEAs considered the whole Renewable Energy Zone. Previous SEAs made recommendations based on the sensitivities of certain locations, particularly within territorial waters, for which consenting risk was higher.
1.26		To ensure that developers can rely on the OESEA we believe that the background references and data needs to be scientifically sound and peer reviewed. The decision makers in the planning process need to be confident in the tools provided.
		Most of the references cited in the SEA are published in peer-reviewed journals, and those involved in commissioned research as part of the SEA programme are actively encouraged to submit their work to such journals. Authors of SEA published work have also been involved in a series of research seminars attended by a range of stakeholders at which aspects of the work are presented and discussed. A list of publications associated with SEA research is available on the SEA pages of the gov.uk website (and will be periodically updated). The SEA and its research output are undertaken at the strategic level, and whilst this may inform the next stage of development it does not replace the need for site specific information gathering. Both applicants and decision makers must rely on findings based on site and project specific data collection and assessment.
1.27	EDF	[There is] particular experience with the Navitus Bay offshore wind project where a site was identified using the Offshore Wind Licensing Round 3 process and previous OESEA2 as a suitable development site. At significant cost, it was taken through the planning process for it to then be rejected on an issue that was considered as manageable in both the Offshore Wind Licensing Round 3 process and previous OESEA2. There are lessons to be learned from such rejections of apparently suitable development sites.

#	Group	Comment/response
		Noted, as indicated above, the previous OESEAs, and OESEA3, consider the potential technical resource areas for wind and other technologies within the remit of each aspect of the draft plan/programme. The SEA makes no specific recommendation on particular sites or identifies particular areas or zones for preferred development, but instead indicates that certain locations may be less suitable or carry greater risk due to a number of constraints, whether these are environmental or in relation to other users of the sea. Sections including those on the overall spatial consideration and seascape consider the implications of the conclusions relating to the decision on Navitus Bay. Due to the high level nature of the SEA, a balance has been sought to take account of this decision whilst also not making conclusions which would unduly restrict potential areas for future development. This is the basis of OESEA3 recommendation 3. Furthermore, regional scale considerations and policy relating to activity in UK seas is being augmented by the Marine Planning process, which may provide further locational guidance in the future.
1.28	RenewableUK	The report is useful in informing decisions, but the entire offshore renewables development process would benefit if it was applied to a more specifically defined plan/programme.
		Noted. Please refer to Section 2.4 for an overview of the draft plan/programme covered by OESEA3. Several of the technologies covered in the draft plan/programme (e.g. wave and tidal) remain to be deployed at a commercial scale, and whilst offshore wind is relatively mature innovations and cost reduction in, for example tethered turbines, indicates further advancement in this technology is likely during the currency of OESEA3. The draft plan/programme seeks to enable future leasing rounds for these technologies and the SEA highlights potential environmental sensitivities, spatial restrictions and other issues such as data gaps in its recommendations. The draft plan/programme does not therefore want to potentially curtail technical innovation or opportunistic development which could advance these energy sources by being prescriptive.
1.29	DONG	Concerned about the limited consultation period given the volume of material to review. On that basis, whilst DONG Energy support the conclusion for future licensing and leasing rounds, we do not agree that the OESEA can be a robust evidence base on which to restrict future rounds spatially or temporarily without further review and discussion of the recommendations made.
		Noted. The approach to consultation on the Environmental Report was set out in the Scoping Report in July-August 2015, available at: *https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/450431/OESEA3_Scoping_Document.pdf.* *The majority of the responses to the scoping report supported the proposed approach (refer to: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/481146/OESEA3_scoping_compilation.pdf). The OESEA3 consultation process was designed to be in keeping with the updated Cabinet Office guidance on Consultation Principles (available at https://www.gov.uk/government/publications/consultation-principles-guidance) for engaging stakeholders.* *DECC welcome continued engagement with industry representatives, for example through the SEA steering group, so that their concerns can be considered.*
1.30		There appears to be a number of areas in the main body of the environmental report where the contribution that offshore wind energy will make towards the objectives of the plan/programme is not as strongly highlighted as it could be. In parts, the OESEA report appears to suggest that the impacts from offshore wind may preclude it from wide areas of the sea, often with very limited information to support such statements.

#	Group	Comment/response
		A key objective of the SEA is to consider the potential contribution of the draft plan/programme to achieving carbon emissions reductions, renewables deployment targets and security of energy supply. The contribution of offshore wind to wider renewables deployment and energy generation is recognised in Section 5.12, including that, "In view of the maturity of the technologies covered by this draft plan/programme, it is likely that offshore wind will make the largest contribution to a reduction in the overall UK energy supply carbon intensity." Whilst the SEA has indicated a range of sensitivities specific to all aspects of the draft plan/programme, and where these can be spatially defined these have been mapped and discussed, no recommendation has been made to preclude offshore wind development from any area.
1.31		Believe that the very broad nature of the plan/programme considered in the SEA report will make it very difficult to justify how it meets the main objectives, "to enhance the UK economy, contribute to the achievement of carbon emission reductions and security of energy supply but without compromising biodiversity and ecosystem function, the interests of nature and heritage conservation, human health, or material assets and other users".
		The full range of SEA objectives are covered in Table 3.1 of the Environmental Report. The broad nature of the draft plan/programme maintains flexibility in the potential for areas to be used by the range of technologies covered. The economic benefits both in terms of direct employment and also in the longer term, by contributing to abating the worst effects of climate change, are referred to in the SEA.
1.32		Urge commitment from DECC to provide the certainty needed to underpin long term investment in this strategically important sector is not undermined by a lack of recognition of the contribution that offshore wind sector will make to meeting UK energy policy goals.
		Noted, please refer to response to 1.30 above.
1.33		The report identifies tethered turbines as an option for deeper water locations however, it is not clear where the basis for this comes from. Some future proofing with the offshore wind energy industry would be a useful next step to understanding whether this is likely to be a commercially viable option in the next five years at least. Fixed foundations are a proven technology; DONG Energy would like to be sure that this option is considered fully, subject to a full assessment of hard constraints, before there is a default movement to the use of tethered turbines in depths of 60-200m. It should also be noted that shallower water sites remain more economical and therefore provide the opportunity to reduce cost of electricity as well as offering a much more certain contribution to the move to decarbonisation.
		The potential resource areas for fixed and tethered foundations were subject to scoping, discussed within the SEA steering group and also at stakeholder meetings in early 2016. These areas were also informed by other exercises by The Crown Estate, Energy Technologies Institute and information relating to marine planning in England. DECC recognises the emergent nature of tethered turbines, but does not wish to preclude the potential for commercial scale deployment during the currency of the SEA. No recommendation or preference for any particular foundation type is made in the SEA.
1.34	WDC	Despite many years of the SEA process, most of the UK's seas are still seen as open house for any developments with little sign of the SEA process changing anything in the licensing processes.
		The SEA has placed spatial restriction on certain areas for oil and gas licensing in the past, and continues to do so for e.g. through its recommendation to withhold blocks from licensing to the west of 14˚W and those waters beyond the shelf break (>200m) in the Southwest Approaches. Additionally, the information contained in the SEA (including summaries of research undertaken through the SEA programme) are key inputs to information provided as part of each licensing round to enhance applicant awareness of environmental sensitivities.

#	Group	Comment/response
1.35		With the steering group, stakeholder events, responses to scoping and to final reports it is very unclear how, or even if, our concerns are being considered. We have been raising many of the issues outlined [in our response], and others including that lack of action in filling identified data gaps, for the life of the SEA process, but have had no real feedback nor seen these concerns addressed. Many of these concerns, such as data gaps, have been identified in the series of SEAs but with little or no attempt to address them.
		DECC values the contribution made by the SEA steering group and by interested parties through stakeholder events and consultation. *The recommendations made in previous SEAs have in the past been systematically reviewed to understand their status in view of research outputs (including those of the SEA research programme, see below), and multiple marine initiatives which have, or are, through regulation and policy, making a contribution to fulfilling these. These have been discussed at steering group meetings in relation to past SEAs. A compilation of recommendations covering the OESEA programme since 2009 is in preparation, along with an indication of progress on whether these have been fulfilled, are ongoing, or have been superseded.* *On the specific issue of data gaps, the SEA research programme has identified and commissioned work to contribute to filling these through the life of each SEA. These are discussed and prioritised with the SEA steering group and others (e.g. for collaborative purposes and to avoid duplication of effort), and in the context of maintaining awareness of other research programmes. There have been numerous projects addressing information gaps in respect of marine mammals funded through the DECC SEA programme (see response 1.26 above).*
1.36	Isle of Man Government	The IoM Government has recently announced the appointment of the British Geological Survey as technical advisors for the exploration of hydrocarbon deposits within The Isle of Man Territorial Seas. The IoM Government is also pursuing its own offshore wind programme with potential development is a site providing a capacity of up to 800MW, in an area close to the territorial boundary with the UK. It is envisaged that cumulative impacts and transboundary assessments of this site will formulate key areas of assessment for the developer and constitute important considerations as part of the consenting process itself.
		Noted.
1.37	MMO	All of our scoping comments have been taken on board within the SEA and therefore we have no further comments to make at this stage.
		Noted.

2.2.2 Assessment process and findings

#	Group	Comment/response
		General comments
2.1	TCE	The OESEA3 could have described more thoroughly the potential benefits of carbon transport and storage and natural gas storage including decarbonisation of industrial processes and supporting a flexible and baseload capacity for the power sector.
		Noted. The benefits of carbon dioxide transport and storage in relation to decarbonisation are considered in Section 5.12.
2.2		Note that reference to the CCS commercialisation projects, Peterhead (Goldeneye) and Yorkshire & Humber (Endurance) have been removed. These projects have agreements with TCE and hold licences from OGA, and it would be helpful to reference these when describing activity. Reference should also be made to the Teesside Collective project and Caledonia project from Grangemouth to more comprehensively reflect the likely activity within the lifetime of the SEA.

#	Group	Comment/response
		In view of the present uncertainty surrounding these developments, they were not referenced in the introductory sections of the SEA, but are recognised in Appendix 1h. Reference to the Teesside Collective and Caledonia project are noted, and whilst the onshore elements of these will not be covered by CCS aspects of the draft plan/programme, it is understood that they may rely on associated offshore development, or modification to existing offshore infrastructure.
2.3		Note that existing leased gas storage sites have not been included in figures in the Environmental Report, or discussed in the description of existing activity. In framing prospectivity of the sector, it would be helpful to show what activity has taken place to date.
		Existing gas storage leases are shown in Figure A1h.16 and are discussed in Appendix 1h, and also elsewhere in individual sections such as 5.11 and 5.12. The lack of a map showing these or related description in the prospectivity section is noted.
2.4	EDF	The OESEA could act as a useful tool to help developers assess and identify potential opportunities in areas where sources of renewable energy are most harnessable. However, the OESEA must also be used in combination with marine plans and where applicable the site identification process for the respective licensing round for offshore wind/technology.
		The SEA has been drafted in its wider legislative and policy context (as summarised in Appendices 2 and 3), however, for most UK seas regional scale marine planning is underway but plans and their policies are yet to be adopted. The SEA recognises the future role of marine planning, and that the timescale for completion of the remaining marine plans in UK waters is such that they should be adopted during the currency of OESEA3.
2.5	SPR, Energy UK, RenewableUK	Support the recognition within the OESEA3 that more detailed consideration of mitigation measures should be undertaken on a project-specific basis. This is welcome as mitigation is highly site specific and dependent on site conditions and other technical constraints so it would be inappropriate to set out prescriptive mitigation requirements in a strategic document such as the OESEA3.
		Noted.
2.6	SPR, RenewableUK, Energy UK	We welcome recognition in the draft plan that "*the adoption of the draft plan/programme will bring positive benefits in terms of an increased proportion of low carbon energy in the UK energy mix, greater security of energy supply and increased employment and tax revenues*".
		Noted.
2.7	SNCBs	The document references the Northern Ireland resource, whilst stating it does not form part of the SEA as it was subject to a previous SEA; we consider this a rational approach. However, this approach is potentially confused by continued references to Northern Ireland resource and projects throughout the document.
		Noted, however examples of certain technologies such as tidal stream are discussed with reference to Northern Ireland and Scotland due to experience at sites within these administrations which can usefully inform the SEA.
2.8	DONG	There are a number of instances in the report that information discussing the impacts of offshore wind farm development need further consideration or discussion with relevant regulatory and industry stakeholders before the OESEA is taken into account in any future leasing or licensing rounds [further details given in comments below].
		Please refer to responses to individual comments made below.
2.9	SNH	Generally we endorse the conclusions drawn in the Assessment section 5, regarding the most significant potential impacts (in so far as they relate to Scotland), and what might constitute appropriate mitigation.
		Noted.
2.10	HES	As the assessment notes, in order to meet the environmental objectives much weight is on preparatory survey which should aid both in the protection of cultural heritage resources and the identification of previously unrecorded sites. We are therefore content to agree with the findings of the assessment.
		Noted.

#	Group	Comment/response
2.11	TLP	OESEA3 acknowledges that the UK Government is presently reviewing its energy policy. In this context, and given the announcement of an independent UK Government review into tidal lagoons, OESEA3 recommendations must remain open minded in relation to tidal lagoons (particularly in terms of proposed temporal and spatial restrictions). OESEA3 refers to the fact that there is presently no planning policy for tidal lagoons; it should also acknowledge that this is likely to change very soon (and it would itself be subject to a SEA process).
		DECC are aware of the content of EN-3, including reference to, "...the need for either a revision to this NPS or a separate NPS to provide the primary basis for decision-making on such [tidal range] schemes", and therefore that additional policy may emerge. DECC will await the outcome of the independent review of tidal range, and the recommendations of OESEA3, including for example Recommendation 12, are regarded to be sufficiently open to take account of this review. DECC would also expect that any new policy would consider relevant outcomes of OESEA3.
2.12		The OESEA3 report states that because of the UK's long maritime history and the growing use of offshore areas by other users, not all areas of technical resource may be available at any given time. This may well be the general case, but for tidal lagoons in particular, detailed site specific examination is required in order to determine this and to determine the extent that tidal lagoons can co-locate with other users, and facilitate other uses of marine areas to positive effect.
		This statement made in the SEA applies to all activities, and is given in the introduction to the prospectivity section to indicate that despite the presence of a technical resource, there are potential constraints. The recommendations (e.g. recommendation 1 and 12), emphasise the importance of exploring co-location and the site specific requirements of tidal range. It should be noted that these recommendations are made in advance of the adoption of regional marine plans for most UK waters.
2.13		There is a lack of distinction between tidal barrages and tidal lagoons despite the potentially considerable difference in significance of effects. As a result, many of the statements in relation to tidal range are too generic to be useful, and some are misleading. Consideration needs to be given to how to avoid such statements misleading those that will consider this assessment to inform leasing and consenting decisions. With reference to the bibliography, the Severn Tidal Study by DECC (various references from 2008 to 2010) seems to be the dominant source of information that informed the assessment. That study compared a number of options in specific locations, indicating varying environmental effects according to location (and scale), and the analysis in that study applies only to the options considered, which are not representative of other lagoon proposals of varying sizes and locations. We note that the diversity in type and location of tidal lagoons is reflected in recommendation 12.
		Unlike the Severn Tidal Power Feasibility Study, the draft plan/programme assessed in OESEA3 is at a high level and without project specific details. In recognition of the outputs of the feasibility study, and reflecting the fact that there may be significant differences in the potential effect of different tidal range technologies, the SEA built on this previous work and also made recommendations covering the conclusion that site specific assessments are required, and that information gaps also remain. The statements referred to as misleading or incorrect above, and which are also listed in the full set of comments by TLP, have been individually responded to elsewhere in this document.
2.14		Although the OESEA3 report provides a list of potential effects, it does not sufficiently consider the significant positive impacts, such as flood and coastal protection, jobs, economic regeneration, and environmental enhancement opportunities.
		Whilst flood and coastal protection roles (specifically of tidal lagoons) can be highlighted here, it should be noted that such roles need to be considered alongside their compatibility with other multiple and interlinked priorities, including shoreline management plans, the maintenance of Natura 2000 site integrity, targets relating to the Water Framework Directive, and other externalities such as sea-level change. It is recognised that the SEA can highlight these interactions and the potential positive role of appropriate development (for example please refer to Section 5.17.7). However we would stress that this issue is best dealt with at the development specific level.

#	Group	Comment/response
2.15		Co-location of uses with tidal lagoons is a benefit we have demonstrated at Tidal Lagoon Swansea Bay. We are actively investigating options for future lagoons, ...the potential [for which] will vary by location and size of tidal lagoon and further supports the need for site specific assessments to inform leasing and licensing decisions. The multi-function nature of tidal lagoons has particular relevance for the "population and human health" objective and should have been considered. Tidal lagoons have considerable potential for providing strategic flood and coastal protection, which is directly relevant to the objective on resilience to climate change. This should have been considered.
		Noted, please refer to response to 2.14.
2.16	Vattenfall	Any mitigation measures should be proportionate and their effectiveness understood. Where there are gaps in industry knowledge in relation to these impacts and appropriate mitigation, strategic studies should be enabled both through Government and industry initiatives and through a more strategic approach to monitoring within the licensing process.
		Noted, the SEA research programme continues to identify information gaps and prioritises projects with input from the SEA steering group.
2.17		The Committee on Climate Change clearly outlines a central role for renewables, in particular offshore wind, in delivering least cost decarbonisation for the UK to 2030 and beyond. Future leasing and licensing rounds must provide a supportive framework for offshore wind and other renewables to achieve these objectives.
		Noted, Section 5.12 provides an overview of the potential contribution of renewables, including offshore wind, to decarbonisation goals.
2.18	SPR, RenewableUK, Energy UK	We are supportive of alignment of the OESEA and Marine Planning system and ask that reference is also made to the National Policy Statements which set out the policy need for the deployment of offshore wind energy in English and Welsh waters.
		Noted, reference is made to the National Policy Statements for energy in a number of locations throughout the Environmental Report, including Section 2.3 Marine management context, and are discussed as context to the wider SEA in Appendix 2 Other relevant initiatives.
2.19		In addition to the UK's renewable energy and decarbonisation targets, we would ask that recognition is given to cost reduction targets for the offshore wind industry and the downward trajectory of the Levelised Cost of Energy (LCoE) expected to take place, and required by Government.
		A consideration of levelised costs in relation to offshore wind, including the UK Government target of £100/MWh by 2020, is discussed in relation to the overall spatial consideration in Section 5.15 in the context of a range of other influences on the potential deployment of this technology.
2.20		The OESEA recognises the possibility of new designations under the Birds and Habitats Directive coming forward within potential areas for offshore wind farm development or within areas already leased for offshore wind energy development. In some cases, new designations may require a review of existing consents and this could have significant impacts on project timescales, project viability and ultimately the wider industry and supply chain, particularly within the context of cost reduction targets and competitive allocation rounds. It is therefore critical that the OESEA considers new designations in light of current development portfolios and leases. We would suggest that consideration is given as to how the risk of new designations to developers could be better managed, for example through strategic approaches to assessment which consider the carrying capacity of existing sites.

#	Group	Comment/response
		The SEA reflects the latest information available on broadscale habitats and species of the UKCS, and the location and qualifying features of a range of UK conservation sites (e.g. as covered in Appendix 1j), in addition to habitats and species of conservation interest. Whilst the SEA can raise awareness by reference to information which has, or is, contributing to the identification of new conservation sites (e.g. see Appendix 1a.7 in relation to marine mammals), it can only make reference to specific sites when their boundaries and related information has been made available through consultation (e.g. the Greater Wash dSPA and dSPAs in Scottish waters). DECC are aware that consultation commenced on a number of sites in English, Welsh and Scottish waters following the start of the consultation on OESEA3, and these and any other new Natura 2000 sites where relevant will be considered in any subsequent HRA process.
2.21		We would recommend that guidance for developers on the review of consent process is produced in order to provide industry with a clearer understanding of the approach, process and timing for such a process when new designations are proposed. Statutory Nature Conservation Bodies (SNCBs) should also be encouraged to provide standing advice on pending designations to assist developers of projects within the planning system.
		Noted. Development of such guidance is outside of the remit of the SEA, however the respondent should be aware of the document, Guidance on when new marine Natura 2000 sites should be taken into account in offshore renewable energy consents and licences, which was published in May 2016 and sets out the views of DECC, Marine Scotland, the Marine Management Organisation and Natural Resources Wales Marine Licensing Team.
2.22		The Environmental Report notes that the responsibility for Habitats Regulations Assessment for any future renewable leasing activity rest with The Crown Estate. We support this statement and ask that consideration is given to updating the current HRA for Round 3 in light of OESEA3.
		Noted. A decision on undertaking further HRA is a matter for the relevant Competent Authority.
2.23	Marine Scotland	In relation to the policy context, Marine Scotland welcome the acknowledgement of the role of the National Marine Plan for Scotland and would be keen to have any discussions in the future on any issues which arise in relation to decision-making as regards this Plan and activities outlined in the SEA 3.
		Noted.
2.24		More detail could be provided on protected sites in marine and coastal areas. There is no direct mention of SPAs or SACs, nor of the extensive network of SSSIs in coastal locations.
		Appendix 1j is referenced in a number of locations throughout the Environmental Report, which lists, describes and maps a range of conservation sites including SPAs (Special Protection Areas), SACs (Special Areas of Conservation) and SSSIs (Sites of Special Scientific Interest).
2.25		There could at times be greater linkage between the effects on receptors section and how this relates with the preceding list of effect mechanisms.
		Noted.
2.26		There is little evidence about effects of lagoons on biodiversity, but there is quite a lot in the seascape section about lagoons. This seems imbalanced.
		Noted. The information base for certain interactions with tidal lagoons is still under development, and more detail may be included in future assessments as research and site-specific project-led study continue.
2.27		Individual applications require clarity on effects on individual protected areas - species and habitats - not regional scale impacts. The Report could provide further detail on the applicability of this data in the consenting process and what further information would be required when taking applications forward.
		Noted, the strategic nature of the Environmental Report is such that it may be used to inform developers, however site-specific information will always be required at the project level, which is acknowledged in the report, including in its recommendations.

#	Group	Comment/response
2.28	Vattenfall	Any mitigation and management measures should be effective and proportionate (based on available information). Greater clarity on what activities are being undertaken and when, will enable developers to undertake more comprehensive cumulative and in-combination assessments.
		Noted. Information on existing and potential projects in relevant areas covered by OESEA3 is provided in Appendix 1h, and offshore wind project phasing as it was understood at the time of publication, is discussed in Section 2.7.4 of the Environmental Report. The scale and timing of individual projects or activities may not be fixed, and whilst the SEA has tried to reflect a range of other user interests and the existing/likely location of activities related to aspects of the draft plan/programme, these must be reconsidered at the project level.
Noise		
2.29	SNH	The focus of [the summary of findings and recommendations] section is, rightly, on the impacts of underwater noise on marine mammals, however, we believe there is a need to consider and, if possible, evaluate the potential effects of underwater noise on diving seabirds. This issue arose last year when relatively near-shore seismic exploration surveys were planned for the east coast of the UK during the seabird breeding season, with potential to impact upon the qualifying species of seabird SPAs.
		Noted; the effects of underwater noise on seabirds are considered in section 5.3.3.3 where the limited evidence available is described.
2.30	WDC	Regarding noise the SEA states that "*the main focus is to ensure compliance with the Habitats directive*" but continues saying that the JNCC seismic guidelines are "*primarily relevant to the prevention of injury*" with no further mitigation proposed. The Habitats Directive is clear in that all cetaceans are subject to strict protection – this includes not only injury but disturbance.
		Agreed; it is the SEA concern with respect to disturbance that warranted the description and consideration of evidence with respect to behavioural effects.
2.31		Ask why reference to the German approach to limiting noise levels which has encouraged the development of effective mitigation, is not referred to again and does not appear in the mitigation or recommendation sections. We ask why the UK is not considering applying this approach.
		The German approach is described in the noise mitigation section and its importance to technical noise emission reductions are further emphasised in the final paragraph of the conclusion.
2.32		With regard to porpoise the assessment states that offshore piling will result in a level of acute disturbance but that the "*magnitude is small when compared to e.g. bycatch*" – this is not a valid comparison as we would remind you of the requirement for strict protection, whatever the impact, and that there needs to be detailed cumulative assessment of impacts across sectors.
		It should be noted that the statement reproduced above is part of the conclusions reached in the assessment made by the expert group (Tougaard et al. 2016) and reported in the SEA as part of the review of available studies.
2.33		The SEA states that with regard to impacts on porpoise the "*degree of uncertainty remains uncomfortably high*" but then goes on to conclude overall, regarding noise generally, that "*current mitigation measures are deemed sufficient in reducing risk of injury to negligible levels*". This simply cannot be justified from the evidence given. No real mitigation is proposed and once again no proper conclusion is given to disturbance, strict protection and potential cumulative impacts across sectors.
		It should be noted that the first statement refers to extrapolations from individual changes in behaviour to population effects, while the second is specific to the risk of injury to individual animals. While uncertainty is very high in the first case, current evidence is sufficient to justify the statement with respect to injury. Further consideration of these issues is reflected in Recommendation 9.
2.34		The SEA recognises the importance of minimising underwater noise and emphasises the value of further voluntary measures. The SEA does not explain what the 'voluntary' measures may be, nor how a voluntary approach could lead to compliance with legal requirements. The SEA needs to be much more robust in proposing mitigation and avoidance measures to be embedded into any licensing process.

#	Group	Comment/response
		The SEA acknowledges the importance of minimising underwater noise and supports the effective implementation of appropriate mitigation measures, including any opportunities provided through continued technological developments.
2.35	Vattenfall, DONG	There should be differentiation between the type of seismic survey undertaken by the renewables sector and more penetrative techniques utilized by the oil and gas industry when considering impacts.
		The evidence provided when discussing possible impact of seismic surveys is not limited to the sound generated during large 2D/3D surveys but includes surveys carried out with single airgun sources for example during site surveys.
2.36	Vattenfall	In terms of offshore renewables, and the expected prominent role of offshore wind, there is a particular need to better understand noise impacts on the harbour porpoise. The industry has already invested in this, in the form of the DEPONS project, but there is a need for further work to validate and improve the DEPONS model which should be a focus area of the OESEA strategic programme. It is noted that impacts on harbour porpoise have so far not been specifically covered within the OESEA strategic programme.
		Research in this field is continuing at a fast pace and the role played by industry in supporting this is recognised; the SEA research programme will carefully consider the results from the DEPONS project to identify needs for further work.
2.37	SPR, RenewableUK, Energy UK	Overall, agree with the conclusion within the SEA that with regards to underwater noise "*current mitigation measures are sufficient in reducing the risk of injury to negligible levels*..." However we do recognise that there is a lack of detailed empirical evidence of the impacts of underwater noise on the marine environment and that this is an area of ongoing research.
		Noted.
2.38		We welcome recognition that several modelling frameworks are being developed to assess population level impacts of acoustic disturbance on marine mammals. These models are based on the best available science and will enable population level assessments to be undertaken in order to understand the impacts of planned activities. However it is important that these models are run using realistic build-out scenarios which take into account other constraints such as supply chain availability, available financing etc, in order to ensure that model outputs are realistic.
		Noted.
2.39		We welcome reference to the Marine Evidence Group report and whilst we are in broad agreement with the recommendations of the report, we would also welcome recognition within the SEA that any modifications to offshore wind installation methods or techniques can be prohibitively expensive to install, bespoke to each site conditions and these measures would only be required where significant impacts to regional populations of marine species are predicted as a result of cumulative installations.
		The requirement for any such modifications will be a function of predicted effect. *Whilst the cost of implementing such measures may be acknowledged here, the SEA is primarily focussed on considering potential impacts on the environment and other users of the sea, and available mitigation measures.*
2.40		We welcome the development of the Noise Registry as part of the UK Government's implications of the MSFD. We hope this will make a positive contribution to our understanding of baseline anthropogenic noise in the marine environment.
		Noted.

#	Group	Comment/response
2.41	DONG	Despite noting that operational noise from wind farms is negligible, highlighting that there is no evidence to suggest noise from operational wind farms leads to injury or disturbance, it is still listed in the table summarising sources of potential significant effect as a potential minor negative impact. Post construction monitoring data, collected at operational offshore wind farm sites to date, has illustrated that there is no evidence of significant impacts to fish and shellfish species[6]. Marine mammals have been recorded foraging in areas of wind farms and this is directly referenced in this section noting evidence that suggests that harbour porpoises and harbour seals routinely enter wind farms and in some cases show attraction and behaviours consistent with foraging.
		The assessment includes consideration of chronic low-level increase in underwater noise over potentially large areas; the evidence base on potential longer term effects is very limited.
2.42		The report acknowledges that, "*MMOs and PAM are not always effective (e.g. at night, during low visibility, higher sea state or for species that do not vocalise regularly or cannot be easily recognised)*", however it only appears to consider technical noise emission reductions and careful planning in the recommendations in this section. More could be made of ADDs as an acceptable sole mitigation source in some circumstances particularly given that it will assist in enabling piling activities to continue during times of low visibility and in sea states where an MMO vessel would have to return to port. Projects looking at the efficacy of ADDs as a potential sole source of mitigation will report in the next few years and the OESEA report could recognise this.
		Noted. The contribution offered by ADDs to mitigating against injury needs further consideration and the outputs from studies into the efficacy of ADDs when used as the sole mitigation measure will be reviewed as part of the ongoing SEA process.
2.43		The report states that to reduce noise generation from pile-driving, several technical mitigation measures can be successfully applied during piling and alternatively, low-noise foundations can be chosen instead of those based on impact-piling. Greater consideration of the technical constraints limiting foundation options is needed. Foundation selection is specific to the physical conditions within a site (i.e. water depth, ground conditions). Furthermore, the report should highlight that there are technological and cost constraints on options such as vibration piling and drilling to ensure that unfeasible obligations are not placed on offshore wind farm developers in the leasing of future sites.
		The mitigation is provided at a high level to be considered at the development stage. Whilst ground conditions could add another level of technical constraint to the areas considered in the SEA they are often not well understood at the strategic level. It is noted that recent applications typically assess on the basis of potentially using a range of foundation types, allowing for a development level consideration of their relative merits.
2.44		The report states that "*if sufficient protection is offered to the harbour porpoise, it is assumed this would be sufficient for the marine environment as a whole*". This is a highly precautionary approach (as clearly noted in the report) and could restrict future deployment of offshore wind unless a more proportional, risk based approach is taken that allows for constant re-appraisal.
		For clarity, the sentence refers to the relative sensitivity of marine fauna to noise with respect to a strategic level consideration of potential effects. It does not imply that a higher than necessary level of precaution should be applied at the site specific level, in the case where evidence is sufficient to make a more informed assessment.

[6] MMO (2014). Review of environmental data associated with post-consent monitoring of licence conditions of offshore wind farms. MMO Project No: 1031.

#	Group	Comment/response
2.45	SNCBs	We do not agree that if "sufficient protection (from noise) is offered to the harbour porpoise then this would be sufficient for the marine environment as a whole"'. Whilst the harbour porpoise is one of the most widespread marine species in UK waters, and also one of the most sensitive to noise, specific approaches to risk assessment and mitigation might not be equally suited to other marine species. For example, certain types of acoustic deterrent devices have been shown to deter harbour porpoise from danger areas (e.g. loud noise or fishing nets) but no evidence has so far emerged that these work for other cetaceans such as minke whale or dolphin species.
		Noted. The concept is generic with regard to wider noise generating activities; the specific case of ADDs deployment may be an exception.
2.46		We advise that sub-bottom profiler use by the oil and gas industry requires regulatory consent, but currently their use by other industries is not regulated and a system of voluntary notifications is used instead.
		Noted.
2.47		The SEA is consistent with the scientific consensus that underwater noise generated during seismic surveys, impact pile-driving and explosive use has the potential to cause injury to marine species at close range, with marine mammals being particularly sensitive. Such activities may also cause some level of disturbance at greater ranges. The SEA has considered the protection required for European Marine Species under the Habitats Directive and has had regard to the JNCC mitigation guidelines.
		Noted.
2.48		We welcome further efforts by government to publish legacy seismic data as well as to release data from government-led large-scale geophysical surveys of underexplored areas. This should contribute to lowering the need for multiple seismic surveys in the same area by different operators, ultimately helping to reduce underwater noise.
		Noted.
2.49		The SEA rightly highlights the value of field research on marine mammal behaviour during industrial activities in order to increase our limited understanding of the effects of noise disturbance on these species. We welcome the work funded by DECC on the effects of piling on seals in the Wash and call for more offshore research to be undertaken on a wider range of species e.g. harbour porpoise. This is particularly important given that existing evidence comes from the installation of smaller scale wind farms in coastal, shallow water areas and therefore uncertainty remains on how applicable those findings are to assessing the risk from the considerably larger scale developments planned in UK offshore waters.
		Noted.
2.50		The SEA calls for specific research to improve our understanding of the ecology of beaked whales and location of important areas. Given the potential increase in exploration in the deeper waters west of Shetland, an increased understanding is needed also of the distribution patterns and sensitivities of the other cetacean species frequently occurring in the area such as sperm whales and baleen whales.
		Noted.
2.51		The SEA report rightly considers it likely there will be cumulative effects on marine mammals resulting from potential licensing or leasing. It is reasonable to assume that most, if not all, individual projects will not have a significant effect on the large and wide-ranging populations of marine mammals. It is the potential impact resulting from the combined effect of several pressures on a population that could cause declines. Whilst we agree that planning and operational controls can reasonably cover the risk of auditory injury that could result from noise exposure, the risk of disturbance, particularly of the cumulative effects of several disturbances is considerably more difficult to assess and mitigate. The lack of adequate cumulative effects assessments (CEAs) is a major shortcoming of current processes and there is an urgent need to establish ways in which this can be undertaken and to develop the means to manage cumulative effects if needed.
		Noted. As indicated in Section 5.16 of the SEA, DECC are aware of the Cross-Government Cumulative Effects Assessment Working Group, and will maintain awareness of relevant outputs from this and other groups working in the field of cumulative effects.

#	Group	Comment/response
2.52		The report helpfully refers to cumulative effects of projects with those of other human activities (past, present and future). The temporal context of cumulative effects assessments is particularly important when considering long lived species such as marine mammals. CEAs are usually undertaken within a narrow temporal window that assumes that there was no impact before and there will be no impact after. If precise and frequent population abundance and vital rate estimates were available, changes would be detected and new baselines established at the start of every new impact assessment. However cetaceans in particular are notoriously difficult to survey and hence for most populations it is virtually impossible to obtain regular abundance and vital rate trends with any degree of confidence. Impact assessments have therefore to be based on modelling and predictions, which can be informative if undertaken within appropriate temporal windows and with adequate pressure quantification.
		Noted. Further development of models is welcomed but it is also recognised that uncertainty in model predictions will remain high over the life time of this SEA, given the limitations with input data and with transferring individual responses to population level effects.
2.53		We strongly suggest the SEA report should recommend that a cumulative effects framework is developed by UK Regulators so that pressures are recorded and effects modelled and new projects and plans assessed against a background of existing and past pressures. Such a framework would contribute to impact assessments that more appropriately reflect the relevant biological scales. The CEA framework would include the following key elements: • reference populations (UK Management Units for cetaceans (IAMMWG, 2015) which present the spatial units and abundances against which impacts of plans and projects should be assessed in EIA and HRA processes) • a common currency of species abundance (using the outputs of the Joint Cetacean Protocol for example) • population modelling approaches (e.g. Interim Population Consequences of Disturbance(iPCOD) • records of past, existing and reasonably foreseeable future pressures, (e.g. UK Marine Noise Registry).
		Noted, please refer to response to 2.51 above.
2.54		There are at least two legislative drivers for establishing such a framework, the Habitats Directive and the Marine Strategy Framework Directive (MSFD). The strict protection measures in Article 12 of the Habitats Directive (which apply to all cetaceans) prohibits deliberate disturbance, however derogations are allowed in Article 16 under certain conditions. EC Guidance recommends that regulators should monitor the impact of those derogations to ensure that any risk for a species arising unintentionally through the derogations (possibly in combination with other negative factors) is detected. The MSFD outlines 11 high level descriptors of Good Environmental Status. Descriptor 11 relates to underwater noise: "*Introduction of energy, including underwater noise, is at levels that do not adversely affect the marine environment*". The UK approach to implementing the MSFD indicator for impulsive noise aims to address the wider ranging behavioural effects, in particular the cumulative effects of noise on sensitive populations such as marine mammals and fish etc, through consideration of noise levels (where available), and their distribution in space and time.
		Noted. Several key studies relevant to the points made above, including the large amount of work supporting MSFD Descriptor 11 are recent and ongoing; outputs will be carefully reviewed as soon as publicly available to inform the ongoing SEA process, especially with respect to Recommendation 9.

#	Group	Comment/response
2.55		Despite the uncertainty surrounding analyses of the consequences of disturbance to cetacean populations, population trajectory modelling (such as iPCOD and Disturbance Effects on the Harbour Porpoise Population on the North (DEPONS)) and/or habitat loss/carrying capacity approaches (Tougaard *et al.* 2016) have the potential to be useful in exploring different scenarios of pressures and population status and trends and provide an indication of the relative magnitude of impacts. We would like to add comment on the conclusions of the Habitats and Wild Birds Directives Marine Evidence Group (MEG) report (Tougaard *et al.* 2016). This used a habitat loss approach to look at the effects of disturbance on the North Sea harbour porpoise population and concluded that an assumed worst case scenario of two continuous piling operations over a period of several years in areas of high densities would result in a 6.7% decline in the population. The authors considered this would not compromise the long-term health of the population, particularly relative (but not in addition) to other known pressures such as by-catch. The authors highlighted that their conclusions are not unequivocal and that there are critical information gaps. We note that offshore wind installation in UK waters was the only pressure considered in this assessment and, although relative to by-catch, it is predicted to have a much lower effect on the population, there remains uncertainty as to whether the addition of noise disturbance could affect the long term health of the population. It is now likely that there will be more than two nearly continuous piling operations at the same time in the North Sea for the foreseeable future. Whilst each development will aim to have only two installation vessels being used simultaneously, there are plans for the installation of several OWFs in the UK and other countries in the North Sea, well into 2020 and beyond. The MEG report conclusions may therefore be indicative of smaller installation programmes than is likely to occur in reality and need to be considered with great caution.
		Noted.
2.56		The SEA, using the same approach as in the MEG report, attempted to include seismic surveys in a CEA for harbour porpoise and comes up with a similar conclusion regarding the magnitude of effects. Whilst the attempt to undertake a CEA that takes into account more than one pressure is welcomed, the way in which seismic surveys have been incorporated is highly simplistic and it does not incorporate all the past, present and future pressures on the population. For example, the most recent abundance estimate of harbour porpoises in the North Sea is over 10 years old and within this period there have been a series of unaccounted for pressures. Therefore, we consider that more work is needed before any conclusions on the cumulative effects of disturbance on the long-term health of harbour porpoise populations can be taken with any confidence.
		Agreed. The SEA emphasises the high degree of uncertainty with population level assessment of noise effects.
2.57		Given the high uncertainty associated with estimates of cetacean population vital rates and abundances along with uncertainties associated with population effects assessments, and our limited ability to detect even large changes to cetacean population abundance, a precautionary approach to managing disturbance is required. Sections on controls and mitigation are in our view one of the key elements of an SEA and therefore should be much expanded both for marine mammals and other receptors, with evidence presented on the feasibility of alternative technologies for seismic exploration and installation of wind farm turbines as well as the use of noise reduction techniques (e.g. bubble curtains) and their applicability in UK offshore waters. We highlight some important recommendations in the MEG report such as the reduction of the emission of radiated noise through modifications to pile driving.
		Noted. The most recent publicly available reports on mitigation measures for piling are described and the recommendations in the MEG report are also emphasised in the SEA.

#	Group	Comment/response
2.58		The consultation on the SEA report coincided with a consultation on proposed Special Areas of Conservation for harbour porpoise in the North Sea, Irish Sea and west coast of Scotland. Future SEAs should contain any guidance to be provided by SNCBs on both the conservation objectives for harbour porpoise protected sites and on what information is likely to be needed to inform the HRA process.
		Noted. This will be referred to in future work.
2.59		We agree that unexploded ordinance (UXO) need to be considered as part of cumulative assessments for harbour porpoise in the North Sea.
		Noted.
2.60		We advise that the JNCC seismic guidelines are currently being reviewed and a revised version is expected later in 2016.
		Noted. DECC will maintain awareness of the revised guidelines.
2.61		Where key areas of marine mammal sensitivity have been listed we suggest adding the following: • Thames Estuary (grey and harbour seals) • North Norfolk Coast (grey seals)
		While the areas suggested for addition were not listed under 'key areas of marine mammal sensitivity', their importance to harbour and grey seals populations is acknowledged; to inform consideration of the likelihood of impacts at a more local scale, further details on marine mammal sensitivities are provided in Appendix 1a.7.
2.62		The SEA highlights that "*while in many instances the range (from the source of noise where there is an injury risk) will be <500m, this may not be necessarily true for all large 2D/3D seismic surveys, especially with respect to SELcum for high-frequency cetaceans*". We suggest that more noise modelling and field validation should take place to identify those noise sources and their characteristics, and the environmental circumstances that could carry a risk of injury to marine mammals beyond the standard 500m mitigation zone.
		It should be noted that a sound modelling exercise has been commissioned under the current SEA research programme to model underwater sound propagation during geophysical seismic surveys, and predict received sound levels for marine mammals with respect to injury sound level thresholds.
2.63		We note that the magnitude of effect of displacement from piling varies considerably with distance to the noise source, and that this may not necessarily be as a result of declining sound levels from source. There is some recent evidence that suggests cetaceans may react according to their perception of how distant the sound is and not just how loud it is.
		Noted.
2.64	Isle of Man Government	Seismic activity and other marine development in UK waters surrounding the Isle of Man may have an impact on economically important fisheries in Manx waters. In addition to herring spawning sites identified in the report, king scallop dredge and queen scallop trawl fisheries and whelk potting is carried out to the full extent of the Manx territorial seas.
		Noted, and project level assessments would be expected to take account of such considerations where appropriate.
Physical damage/change to features and habitats		
2.65	HE	Additional reference suggested: Firth, A. (2013) Historic Environment Guidance for Wave and Tidal Energy. Published by Fjordr Ltd on behalf of English Heritage, Historic Scotland and Cadw.
		This was referenced in the Environmental Report as, English Heritage (2013). Historic Environment Guidance for Wave and Tidal Energy. 35pp, and the correction is noted.
2.66	Vattenfall	Agree that the potential for significant effects of offshore wind projects on physical disturbance of sediments and sediment contamination is low.
		Noted.
2.67		We agree that current controls for offshore wind developments provide sufficient protection for cultural heritage features.
		Noted.

#	Group	Comment/response
2.68	SPR, Energy UK, RenewableUK	The OESEA concludes that scour effects are generally small in scale and local in extent and unlikely to be of concern, which concurs with experience to date.
		Noted.
2.69	DONG	Ensure the potential impacts of all energy sources are considered proportionately. For example, Table 5.8 summarises sources of effect, pathways and receptors for all energy sources considered by the OESEA however, although offshore wind is specified as a relevant aspect for physical presence of structures in the water column, it does not list oil and gas.
		In Table 5.8, the source of effect, "Physical presence of structures in the water column" is related to the potentially significant effect, "Changes/loss of habitats from major alteration of hydrography or sedimentation (indirect effects on the physical environment)" listed in the table at the start of the section. It is accepted that this linkage is not clear. Based on extensive knowledge of oil and gas activities and their impacts and following discussions with the SEA steering group, it was considered that the scale of potential oil and gas activities would be unlikely to cause a major alteration of hydrography or sedimentation.
2.70		There are references in the document describing monopile and jacket installation as a "*hole being drilled into the bedrock into which the monopile is placed and secured using cement*". This is incorrect and if this assumption is adopted for the purposes of deciding future offshore wind leasing rounds, it could potentially result in sites being selected that are not suitable for either monopiles or jackets. Drilling is a very expensive installation technique both in terms of direct costs and also because it increases foundation installation time. In general, most pile installation takes place without the need for drilling so sites where this can be facilitated should be considered for future leasing rounds.
		Noted and this is reflected on p156, "Monopiles may also be used as foundations for R3 turbines where depths and sediments are suitable. Steel piles are typically hammered to the desired penetration depth. However, in some cases the pile may reach a point of refusal and cannot be driven to the required penetration depth due to difficult ground conditions. In this event it is possible to drill out some or all of the volume of sediment inside the pile to reduce the driving resistance and allow the pile installation to be completed."
2.71	RenewableUK	The OESEA states that the impacts of tidal range may be significant, with the potential loss of large areas of intertidal habitats and salt marshes. We recommend that the OESEA distinguish between tidal lagoons and tidal barrages [for this topic and water environment] as their potential effects may differ. For example, the two-way generation of tidal lagoons means there is a considerable reduction in the changes to exposure of the intertidal areas.
		Please refer to Section 5.4.3.1 where tidal barrages and tidal lagoons are described separately. Similarly, the introduction to the section where barrages and lagoons are described indicates that, "mitigation measures (e.g. two way operation, regular sluicing and fish diversion) may reduce the impact." More detailed information on the potential differences between lagoons and barrages provided in Section 5.5.2.2.
2.72	SNCBs	We suggest that stabilisation material be added to row 2 'Physical damage to biotopes from infrastructure construction, vessel/rig anchoring etc'.
		Noted. The potentially significant effects listed are the result of scoping consultation and feedback from the SEA steering group. Table 5.8 provides a summary of the sources of effect, pathways and receptors associated with rock dumping on cable/infrastructure and rock dumping associated with scour protection is described in Section 5.4.3.1.
2.73		We advise that the sources of significant effect listed [in Table 5.8] neglect a number of potential pressures. Jack-up rigs are used for offshore wind construction as well as oil and gas. Oil and gas infrastructure is not included within the 'physical presence of structures in the water column' pressure. There is also no mention of maintenance and associated issues of the operational phase of all industries.

#	Group	Comment/response
		Offshore wind should have been included in the placement of jack-up rigs (seabed disturbance by spud cans) section of Table 5.8. Potential impacts associated with jack-up barges used in OWF construction are described in Section 5.4.3.1. With respect to physical presence of structures in the water column, see response 2.69 above. Issues associated with operational phases are described throughout the section.
2.74		We advise including more information [in Section 5.4.3] about post consent monitoring of OWFs. There are a number of possible effects arising from energy developments which are best monitored at a regional scale, such as impacts at a population level of collision of mobile species with structures/devices. The SEA has an important role to play in prioritising and filling the evidence gaps.
		Noted. DECC agree about the importance of the SEA process to identify and fill evidence gaps and has commissioned a wide range of research and monitoring studies much of which is relevant at a regional scale – please refer to the OESEA research programme[7]*. Section 5.4 provides relevant information throughout on the results of post consent monitoring with respect to physical damage/change to features and habitats. Post consent monitoring with respect to collision of mobile species is described in Section 5.6.*
2.75		While we recognise that the dispersion modelling for Hornsea One is as described, we advise that drill arisings can persist for a long time, as shown by the chalk arisings at the Lynn and Inner Dowsing wind farm.
		Noted. Monitoring of the Lynn and Inner Dowsing site (as reported in Carroll et al. 2010[8]*) indicated that the majority of the drill arisings were deposited in the form of larger pebbles and cobbles in size, rather than as fines. This led to a larger spoil pile than predicted by models (due to the reduction in dispersed material). A follow up diver survey 4 months after an initial survey of the pile, indicated that the spoil pile had diminished in size (pile height reduced from 3 to 1.2m) through lateral spreading of sediments, and the dispersal and assimilation of the chalk into the natural sediments.*
2.76		The cabling assessment assumes that impacts are confined to the footprint of the cable trench. We advise that, in many cases, this would represent an underestimation as seabed preparation using dredgers is increasingly being undertaken prior to cable installation. This means that the seabed impact is larger than simply the footprint of the trench.
		Noted; although the arguments made with respect to habitat recovery from temporary disturbance apply equally to the wider footprint incurred through pre-excavation.
2.77		We suggest the comments on pennatulid mortality and physical disturbance is revisited considering the evidence provided in Greathead *et al.*2005 and the MarLIN sensitivity table.
		Noted; Pennatulid vulnerability to physical disturbance varies with species; Pennatula phosphorea *and* Virgularia mirabilis *have the ability to retract into the sediment (Mackie 1998, Hughes 1998, Greathead et al. 2005) and to bend away from certain physical abrasions such as by creel pots (Greathead et al. 2005).* Funiculina *is assessed by MARLIN as highly intolerant of physical abrasion and disturbance (Ager 2003, whereas* V. mirabilis *(and by inference,* P. phosphorea*) is of intermediate intolerance (Hill & Wilson 2000). All would be highly intolerant to substratum loss.*
2.78		We advise that habitat loss is not just in shelf depths.
		Noted, however the text referred to in Section 5.4.3.2 (page 173, paragraph 1) specifically relates to pipelay vessels and construction barges, which are typically used at shelf depths.

[7] https://www.gov.uk/guidance/offshore-energy-strategic-environmental-assessment-sea-an-overview-of-the-sea-process#offshore-energy-sea-research-programme

[8] http://www.thecrownestate.co.uk/media/5873/a_further_review_of_sediment_monitoring_data.pdf

#	Group	Comment/response
2.79		In relation to shallow sandbanks (page 179, paragraph 2), we advise that the following sentence is rewritten: "*it is considered extremely unlikely that OWF development would have a significant influence on the physical habitat in either area*." We do not agree with the conclusion of extremely unlikely significant impact. We also note that impact on sandbanks will occur much more on a site-by-site basis.
		Noted. Given the low to moderate sensitivity of the sandbank features in both sites to physical damage (e.g. see advice on operations in the North Norfolk Sandbanks and Saturn Reef SAC), and the potential to minimise impact through appropriate placement of turbines (see controls and mitigation, Section 5.4.4), it is considered unlikely that OWF development would lead to significant physical damage to the sandbank habitat in either area.
2.80		We suggest that the comment on burrow and pennatulid densities on the Fladen Ground sediments showing little cumulative effect of fishing disturbance needs referencing, and could be misleading. Greathead et al. (2011) identify spatially variable distributions of the seapens *Virgularia mirabilis* and *Pennatula phosphorea* and an absence of *Funiculina quadrangularis* in the Fladen fishing ground which is "*exacerbated by the effect of anthropogenic pressures such as fishing*".
		Accepted, and it is noted that Funiculina quadrangularis *has recently been reported from the Fladen Ground by McIlwaine, P (2015). CEND 5/14 Fladen Grounds Survey Cruise Report. JNCC Report, No. 548.*
2.81		Suggest that the use of '*Sabellaria* spp.' and '*Sabellaria spinulosa* and *Sabellaria alveolata*' is standardised.
		Noted.
2.82		We advise that the suggestion that scour protection would be as likely to support *Sabellaria* aggregations as would the surrounding seabed be referenced fully. We also advise that the conclusions noted from Last *et al.* (2011) are revisited for correctness.
		The likelihood of scour protection acting as a substrate for Sabellaria *colonisation relates to Jackson & Hiscock (2008). Last el al. (2011) demonstrated that* Sabellaria spinulosa *is highly tolerant of short term burial in fine sand and it can generate emergence tubes in response to gradual burial; however responses to stress usually carry a physiological burden of energy usage and its redirection from normal metabolic activity.*
2.83		*Sabellaria* is only protected as an Annex I feature where it forms reefs. As such we suggest amending the mention of *Sabellaria* aggregations in this paragraph.
		Noted.
2.84		The suggestion of lack of coastal changes caused by OWFs [in Section 5.4.3.4] should be revisited using more recent data from Round 3 OWFs.
		Text on p184 and Table 5.13 with respect to potential effects are estimated from modelling of Round 3 OWFs.
2.85		We suggest that reference is made to OSPAR Decision 98/3 on the Disposal of Disused Offshore Installations [in Section 5.4.3.5]. We advise that the comment concerning decommissioning conditions is somewhat misleading, as some offshore wind farms are now required to remove all hard rock protection from the seabed, whereas most oil and gas decommissioning projects to date have left rock protection in place.
		Noted. The DECC (2011) guidance referenced in the section is underpinned by OSPAR Decision 98/3.

#	Group	Comment/response
2.86		On numerous occasions through the Environmental Report, it is mentioned that the impact of offshore energy development on benthic habitats is negligible relative to the impact of the demersal fishing industry, as the scale of impact is small (e.g. page 25 and 164). We do not feel this is valid since habitats which are under stress, such as those which are exposed to fishing pressure, may be pushed to a tipping point where new pressures result in a further degradation of condition. In addition the pressures associated with energy development are different in character to those of fishing. For example offshore construction can result in smaller scale, acute, permanent impacts compared to lower intensity, larger scale, recoverable impacts which can sometimes be associated with fishing. Furthermore, Chapman and Tyldesley (2016) show that even small scale effects can prove to be adverse effects.
		In Section 5.4.5, comparisons with the direct physical effects caused by bottom-contacting fishing gears were made in terms of the potential area of seabed affected at a strategic (UKCS/regional) level. It is clear that the estimated area of seabed impacted by for example the planned Round 3 projects (Tables 5.9 and 5.10) is very much smaller than that estimated to be impacted by bottom-contacting fishing gears. DECC agree that the pressures associated with energy development may be different to those associated with fishing and that small scale effects may have significant effects on vulnerable habitats. Section 5.4.6 indicates that "In areas with vulnerable habitats and species such as cold water coral reefs mitigation may be required for physically damaging activities such as rig/vessel anchoring, discharges of drilling wastes and cable, pipeline or umbilical installation (from hydrocarbon, gas storage or renewable energy related activities). Prior to decisions on activity consenting in such areas, developers should provide a detailed assessment and seabed information so that appropriate site specific mitigation can be defined, for example no anchoring and zero discharge. Detailed site surveys should also be evaluated with regard to archaeological sensitivities."
2.87		Suggest that examples of mitigation methods are provided for physical damage in areas of vulnerable habitats and species.
		With respect to mitigation methods, Section 5.4.6 indicates that "Prior to decisions on activity consenting in such areas, developers should provide a detailed assessment and seabed information so that appropriate site specific mitigation can be defined, for example no anchoring and zero discharge. Detailed site surveys should also be evaluated with regard to archaeological sensitivities."
2.88	TLP	Tidal Lagoon Swansea Bay will not be constructed from concrete, but from rock armour which will be similar to existing breakwaters, and therefore will likely replicate natural rocky habitats.
		The text referred to did not identify Tidal Lagoon Swansea Bay specifically. It is understood that construction materials will vary between individual projects.
Consequences of energy removal		
2.89	TLP	With reference to the Tidal Lagoon Swansea Bay numerical modelling, we disagree with the statement, "*although these changes in flow speeds are relatively short in duration and spatial extent they are significant in magnitude and can be expected to have an impact on the sediment patterns of the area*", as it contradicts the Environmental Statement.
		The Tidal Lagoon Swansea Bay Environmental Statement states that "...the operation of the Project will inherently have an impact on flow speeds and directions within Swansea Bay, although these are predominantly constrained to within the Lagoon and in the near-field across the western region of the bay". Although the ES goes on to assess these impacts as neutral to minor adverse, with neutral to moderate impacts on the sediment regime, they remain significant even if it this applies to small areas of the Bay only. This is highlighted in the rest of the paragraph in the SEA from which the statement is taken, which makes it clear that the impacts are very local in nature.
2.90		Disagree with the statement, "*the effects of water impoundment are largely the same but on a more localised scale than those of barrages*". The effects are not the same as lesser effects are predicted for lagoons than barrages.
		The statement highlighted suggests that the nature of the effects are similar between a barrage and a lagoon, relating to changes to residual current speeds, whilst the scale of impacts (both spatial and temporal) are less for a lagoon.

#	Group	Comment/response
2.91		"*the presence of a tidal lagoon within Swansea Bay is seen to significantly alter the residual tidal flows within the Bay […] with resulting impact on sediment dynamics*", implies that the presence of a lagoon has a significant impact on the sediment dynamics, when in fact the Environmental Statement concluded that the impacts on the sediment regime would be localised and largely be of neutral or minor adverse significance.
		The Tidal Lagoon Swansea Bay Environmental Statement states that impacts on the sediment regime will range from neutral to moderate, in localised areas, and whilst it is noted that the sentence could be read as implying significant impact on sediment dynamics, it was written to convey that significant local changes to residual tidal flows would have an impact (significant or other) on sediment dynamics.
Physical presence – ecological implications		
2.92	SNH	It is stated, in relation to interactions of offshore wind farms and marine birds (specifically collision, barrier effects and displacement) that, "*given the controls and mitigation proposed...it is extremely unlikely that a population level effect will take place over the life of this SEA*". We believe that this statement significantly underplays the potential significance of the cumulative collision risk and displacement likely to be sustained by some species (including qualifying species from SPAs in Scotland), as a result of offshore wind farm development linked to this Plan, and in combination with similar development elsewhere, including that in Scotland. Accordingly, we believe that research to understand potential impacts and to assess cumulative effects over wide areas, and mitigation to minimise impacts forecasted, remain a priority for the OESEA programme.
		It is considered that the Environmental Report does not underplay the potential significance of the potential for cumulative effects described. The statement quoted is the conclusion at a strategic level and based on current information and taking into account controls and mitigation measures, while acknowledging that they are formed from limited evidence and with uncertainties. Section 5.16 describes the consideration of potential for cumulative impacts, a conclusion from which states the risks and impacts from potential plans over the life of this SEA (including collision, displacement and barrier) to bird populations at a strategic level is considered unlikely, while acknowledging that it may be potentially significant at a local or regional level. Potential activities and developments covered by the draft plan/programme will require site-specific information gathering and assessment, including potential cumulative (and in-combination) impact assessments, the determination of significant effects and the identification of appropriate mitigation on a project specific basis, to inform the consenting process. Consequently the SEA recommended a precautionary approach to siting facilities in areas known to be of key importance to bird and marine mammal populations unless evidence indicates otherwise and that additional work is required to improve current models on bird response/collision risk. *The SEA programme is committed to supporting ongoing and new research studies in the area of bird behaviour and the potential interaction with aspects of the draft plan/programme, and welcome further suggestions for research through the SEA steering group.*
2.93	Vattenfall	Industry research into avoidance/repulsion effects of electromagnetic fields from wind farm cables has been extensive and largely inconclusive. It is suggested that although a potential impact cannot be ruled out, any effects are expected to be minor and occur within close proximity of the cables therefore resources would be better used on other issues.
		Noted.
2.94	SPR, Energy UK, RenewableUK	We support the conclusion that overall, the displacement, barrier effects and collision are unlikely to have a significant impact on bird populations at a strategic level. However, we recognise that there are some remaining uncertainties with regard to assessment of the potential impacts of offshore wind farm development on avian populations.

#	Group	Comment/response
		As described in Section 5.6.6 of the Environmental Report, considerable uncertainty surrounding the understanding of potential ecological effects is acknowledged and goes on to further acknowledge the conclusions are based on limited (empirical) evidence and the importance of site selection, site specific assessment and monitoring.
2.95	SPR	SPR along with Statkraft and Vattenfall have commissioned a study to identify knowledge gaps and research priorities for seabird species and populations of particular relevance to Southern North Sea wind farm developments. The knowledge review and gap analysis[9] is publically available and the research priorities report is available upon request. As responsible developers, we are also actively contributing to industry initiatives to help address these uncertainties through further research, for example through participation in the Offshore Renewables Joint Industry Programme (ORJIP) and the Disturbance Effects on the Harbour Porpoise Population in the North Sea (DEPONS) project.
		Noted. Every attempt is made to include and use the most relevant and up to date information available to support the baseline description and assessment process. Relevant information identified subsequent to publication of the SEA will be noted for future assessments, and new evidence will be monitored as part of the ongoing SEA process.
2.96	TLP	There is reference to two way operation being proposed to reduce the environmental impacts of tidal range scheme; it should be noted that this is inherent with tidal lagoons.
		Noted.
2.97		Request the sentence, "*tidal lagoons are similar to barrages in construction impact although they do not span the whole channel width*", is clarified in line with CIEEM guidelines on Ecological Impact Assessment (2016), the impacts being similar but effects are certainly not.
		Noted, however this is not implied in the sentence, and potential effects are described later in this section.
2.98		Strongly disagree with the statement, "*tidal lagoons would require considerably more construction materials than a barrage and damage to habitats during construction is likely to be greater and more prolonged*", which is not substantiated by evidence. We believe this statement may be a misrepresentation of conclusions in the Severn Tidal Study, which were specific to the options considered and are not sufficiently representative of other lagoons of diverse size and location (as reflected in recommendation 12).
		The comment that any such impact is specific to an individual project proposal is acknowledged, however, the extract quoted relates to the potential for lagoon walls, and therefore their footprint, to be longer than barrage options.
2.99		There is reference to the post construction impact of a tidal lagoon being similar to that of a barrage, but no reference to the fact that the effects are likely to be less than those predicted for a barrage.
		Noted. In this case the term 'impact' has been used to convey the type of impact, not the magnitude, this will be made more explicit in future assessments.
2.100		Significant effects are unlikely to be caused by tidal lagoon projects at a Regional Sea level to sediments, features and habitats given the zone of influence for these projects. This is evidenced in the Tidal Lagoon Swansea Bay Environmental Statement and in relation to a larger lagoon, please refer to the Tidal Lagoon Cardiff Scoping Report for predicted zone of influence.

9 http://www.macarthurgreen.com/news/254-seabirds-and-offshore-windfarms-evidence-review

#	Group	Comment/response
		Please note that the conclusions do not differentiate tidal lagoons but rather refer to tidal range. It is acknowledged that direct local effects of construction may not be regarded to be at the Regional Sea level, however, the conclusion refers to the nature of most potential effects as localised and temporary in nature, whereas most tidal range schemes involve a long-term and effectively permanent change. Moreover, the potential for far-field effects, particularly from large barrage schemes, is an additional consideration for these developments (alone and cumulatively), and is the basis for this text.
2.101		With regard to the effects of tidal range developments on waterbirds, it is not acknowledged that the predicted impacts associated with tidal lagoons are less than those predicted for a barrage. The studies quoted (Frid *et.al* 2012) only looked at tidal barrage schemes.
		Noted, however, the potential effects of such schemes are highly localised in nature. Moreover, the text referred to makes no mention of predicted effect, but rather methodologies of for assessing the sensitivity of birds to barrier effects/displacement.
2.102		With regard to collisions risk, we note that there is no mention of the Striker approach to turbine collision risk or the Individual Based Modelling work done by Turnpenny Horsfield Associates for the Tidal Lagoon Swansea Bay project.
		Noted. This will be referred to in future work.
2.103		In reference to SPAs that potentially would be vulnerable to tidal range schemes in England and Wales, note that the Carmarthen Bay SPA is a marine SPA that does not comprise any intertidal habitat. It is notified for its population of common scoter and not any birds that use intertidal habitats and, therefore, would not be significantly affected as a result of a tidal range scheme.
		Those bird species at most risk from tidal range schemes are likely to be waterbirds which rely on intertidal habitats for feeding. The extent to which subtidal habitats and associated conservation features may be affected would depend on location, nature and extent of the tidal range development, together with effects on waterbird prey species. Carmarthen Bay SPA has been included at the strategic level due to the size and importance of this designated area in that region. Any proposal brought forward would better assess any potential impact on this specific site.
2.104	SNCBs	We note that there seems to be confusion in the text between non-native species and non-native invasive species. We recommend that this is rectified to prevent confusion.
		Noted.
2.105		We suggest a further reference (Benjamins *et al.* 2014) on the potential for entanglement from mooring lines associated with wave and tidal devices would be useful.
		Noted.
2.106		We note that *Caryophyllia smithii* is not an anemone and reference to that should be amended.
		Agreed, the Devonshire cup-coral is a scleractinian.
2.107		We note that Krone et al. (2013a) is included within the review of scientific literature but that it could cause confusion by bringing in the subject of shipwrecks in the middle of a discussion on wind farms.
		Noted.
2.108		We also note the potential positives of using obsolete offshore structures, but consider that it should also be mentioned that any benefits have to be considered in light of any nature conservation protection of the area.
		Noted.

#	Group	Comment/response
2.109		We question the comment that policy leads in the continued lack of artificial reefs in the North Sea. We expect that this continued lack is related more to OSPAR than UK policy. DECC policy (referenced in the SEA) suggests "*we believe it is generally accepted that the 'ideal' decommissioning programme involves removing the whole of all disused installations and structures... Our guidance, therefore, starts from a general presumption in favour of the whole of all disused installations being removed and subsequently taken back to land for reuse, recycling, incineration with energy recovery or disposal at a licensed site. Exceptions from this general requirement will only be considered where there are very good reasons*."
		The text of the SEA is neutral in terms of whether the present OSPAR/UK default position of complete removal is positive or negative. The juxtaposition of the Gulf of Mexico and UK is only given by way of example, and no inference of which approach is best practice is given.
2.110		We consider that it would be useful to have clear definitions of barrier and displacement at the beginning of section 5.6.3.2. Further clarification is needed that there is evidence of displacement, but the effects on productivity or mortality are difficult to assess, and this is reflected by the limited data.
		Definitions such as: displacement can be due to effective loss of habitat (e.g. feeding areas) and barrier effect could be where an OWF for e.g. creates an obstacle to regular movement (e.g. to and from breeding colonies) could be included. However, when looking at impacts of OWF on birds, very often clear definitions on either or both of these are not provided, possibly due to their interconnection and have been used interchangeably; papers generally address these in terms of the impact of displacement/barrier (i.e. avoidance) and do not separate them out. For example Masden et al. (2009) states: "…avoidance response of birds to turbines. The latter includes displacement from habitat and extension of flights, where wind farms act as barriers to movement", and from recent publications which state: "collectively barrier effects and displacement effects are referred to as macro-avoidance". *In several places acknowledgment is given to species sensitive to displacement and/or barrier which show strong avoidance behaviour (ergo are displaced from an area): e.g. Section 5.6.3.2, divers, common scoter (Furness et al, 2013), gannet, divers and alcids (Krijgsveld 2014) and Section 5.6.5, divers, scoter, fulmar, gannet, little gull, guillemot and razorbill (JNCC 2015). Section 5.6.5 goes on to further acknowledge the challenge to understand the wider implications of these effects (including displacement and barrier) due to a sparse evidence base for quantifying the rate and scale of such effects.*
2.111		We note that the example presented (Paragraph 5, p221) concerning Horns Rev is actually an example of displacement, not a barrier effect. We suggest that further explanation is given what the 'subsequent surveys' were. If this reference is to part of the study by Petersen *et al.* (2004), then we consider this to be slightly misleading as it suggests that food availability change was the reason for the distribution shift. Petersen *et al.* (2004) suggested a number of factors could have resulted in the distribution change.

#	Group	Comment/response
		The opening sentence of this paragraph would benefit from referring to studies on displacement/barrier effect. Studies looked at and included in the assessment do reference displacement, however barrier effect is also attributed to the results; Petersen et al. (2014) which looked at the post construction evaluation of bird abundances and distribution in the Horns Rev 2 OWF area proposed that the reduced described densities found east of the Horns Rev 2 OWF for red throated and black throated diver could potentially be caused by a wind farm related barrier effect; Petersen et al. (2006) also looked at birds avoiding an area in terms of the construction of a wind farm creating a barrier effect. Consequently, attributing studies to being examples of displacement or barrier effects is difficult, particularly when one of the effects of both displacement and barrier is generally manifested by a type of avoidance behaviour. *The Environmental Report did not infer that the observed change in distribution was due to changes in food availability, but that this was a suggested possibility for changes in distribution; it is accepted that additional references could have been included here, for example: Petersen et al. (2004) stated the reason for the change in avoidance for divers, gannet, common scoter and guillemot/razorbill was unknown, with disturbance (effects from the wind turbines themselves and also from the increased human activity) could be possible reasons; while changes in food resources could potentially play a role (but that this parameter was not investigated); in their final report at Nysted and Horns Rev, Petersen et al. (2006) proposed that for common scoter at Horns Rev the different distribution seen pre and post construction did reflect some major change in feeding distribution and was likely the result of large scale changes in food abundance/availability (while acknowledging this species was also subject to habitat loss due to behavioural avoidance).*
2.112		We suggest that the following sentence needs rewording as it currently implies trajectories curved around the [Nysted] wind farm before it was constructed: "*Their flight trajectories passing through the Nysted wind farm area pre- and post-construction showed a curvature around the wind farm.*" Figure 5.24 shows the trajectories from Desholm and Kahlert (2005) which was a study on waterbirds, not just eider. We suggest using the figures from Masden *et al.* (2009) or stating the findings from the Desholm and Kahlert (2005) study.
		Noted, however, the following sentence in the Environmental Report explains there was a pre- and post construction adjustment in trajectory. The text should have reflected that the figure used was from the Desholm and Kahlert (2005) report showing the movement of waterbirds.
2.113		Krijgsveld *et al.* (2014) is the more recent study and updated the findings from Krijgsveld *et al.* (2011) that suggest turbine spacings can affect avoidance behaviour. We would suggest removing the [sentence describing this] as it has now been made redundant with more recent study.
		In the context of obtaining and showing changes in wider understanding, as well as showing the difficulty in determining whether turbine spacing can effectively reduce the number of collisions, it is considered important to include both publications.
2.114		Where reference is made to Cook *et al*. (2014) for recommended total avoidance rates for the basic band model, we suggest including the SNCBs position paper on the BTO Review of Avoidance Rates. We note in particular that the recommended rates differ for kittiwake. In addition to research that has been mentioned (e.g. Cleasby *et al.* 2015), a further report published by BTO (Johnston and Cook 2016) should be referred to. This looks at flight heights from digital aerial survey data and supports the conclusion from Cleasby *et al.* (2015) that flight heights for some species, including but not only northern gannet, may have been underestimated when based on boat survey data.

#	Group	Comment/response
		This section of the Environmental Report highlights the importance of selection of appropriate avoidance rates for use in collision risk models, and how avoidance rates are commonly based on values derived for terrestrial species/onshore wind farms. The SNCBs position paper on the BTO Review provides useful information, and update to the Review. The Environmental Report section describes the process by Cook et al. (2014), the species they focused on and the recommendations they made; the Environmental Report did not seek to make these same recommendations for conducting collision risk assessments. The SNCBs position paper on the BTO Review has been reviewed and will be considered in future assessment. *The report by the BTO (Johnston & Cook 2016) was published in February 2016 and was not included in the assessment. This report provides information on developing a methodology for producing flight height distributions for some species and will be a useful resource for future assessment.*
2.115		We note the comments concerning the urgent need for further data not only on gannets, but on other high-priority species (e.g. gulls), most at risk from collision. It is currently not clear how improvements in collision risk estimates themselves will enable refining of mortality thresholds for long-term population viability. We believe that this is a different question. Refining collision risk estimates will, of course, lead to more accurate estimates of the population level consequences, but the threshold of what is acceptable is not reliant on collision risk estimates. It is also not clear how improvements in collision risk estimates will benefit strategic monitoring; is it just about having more accurate predicted mortality rates (and hence population level impacts) with which to compare observed mortalities from monitoring? In other words, perhaps this is meant the other the way round; that strategic monitoring will give better collision risk estimates?
		Noted, the Environmental Report does not infer that the threshold of what is acceptable is reliant on collision risk estimates, but does convey the interpretation of Cleasby et al. (2015); that present collision assessments are based on models and estimates and a lack of empirical data.
2.116		Estimates of annual bird deaths from collisions with other structures for comparison [to offshore wind farms] should be provided. Suggest there is also a need to make some attempt to compare relative extent/scale of wind farms in the environment in comparison to structures such as power lines, i.e. is the relatively low collision rates from wind farms compared with other structures due to inherent properties of wind farms in comparison to other structures, or is the relatively low collision rate simply because the extent of wind farms in the environment is much lower in comparison.
		The findings from the review carried out by Marques et al. (2014) were described in the Environmental Report, including the finding that fewer deaths were caused by OWF than from other man-made structures. It is difficult for the Environmental Report to prove/disprove or make the suggested comparisons due to a lack of data in the following areas all of which will contribute to the potential level of impact: annual deaths caused by collision with OWF; information on the extent to which scale/spacing/configuration of OWF/turbines may contribute to any impact; between and within species variation on flight height, avoidance rates etc.
2.117		Suggest better distinction between responses to magnetic fields and electric fields, as currently references within the section are mixed. While electric fields may be shielded by a number of technological options, it is more difficult to shield a magnetic field (created by an AC cable) which, in moving seawater, can induce an electric field. This is challenging to measure *in situ.*
		Noted. Section 5.6.2.2 provides an introduction to electromagnetic fields and describes how the fluctuating magnetic field induces the electric field in the environment.
2.118		We suggest that [the first paragraph in the EMF Section 5.6.3.7] needs to be re-worded as survival rate is not "*in contrast to*" a behavioural response relating to aggression. The two should be considered as quite different points. We also suggest that the benthic species discussed by Bochert and Zettler (2004) need to be detailed.

#	Group	Comment/response
		Noted, while it is agreed the survival rate is not "in contrast to" a behavioural response, that was not the intended meaning of the original text.
2.119		We would like to draw your attention to Ball *et al.* (2015) which demonstrated behavioural responses of developing thornback ray embryos to EMF. Specifically it showed that EMF inhibits an important ventilatory mechanism in embryos as early as one third of the way through development. Although embryos habituated to the presence of low frequency AC fields, this likelihood was reduced if the field was presented intermittently, which may be representative of an operational wind farm.
		Noted. The publication will be reviewed, however, it is noted that the ventilatory response relates to predator detection.
2.120		It is stated that the interaction between anthropogenic EMF and marine mammals is not well understood, and that while understanding of how marine mammals experience and use either natural magnetic or electric fields is poor, knowledge relating to anthropogenic sources is even less (Gill *et al.* 2014).
		Noted.
2.121		We suggest making reference to raising turbine height and increasing the height of lower turbine tip to reduce the risk of collision [to birds] as a means of mitigation.
		This is acknowledged as a potential source of mitigation, and that research is ongoing to enhance understand of typical flight heights and behaviour of relevant species to better inform such a consideration.
2.122		We suggest the following sentence be removed unless it can be appropriately referenced: "*It is likely that larger fish are at greater risk from turbines strikes than smaller fish, with large, slow-moving elasmobranchs perhaps the most likely to incur injury*".
		Please refer to Hammar et al. (2015).
2.123		We consider that it would be useful to refer to Masden (2015), which provides an update method of the Band Collision Risk Model (CRM) incorporating uncertainty in input parameters. In particular it might be useful to refer to the sensitivity analysis contained within Appendix 2 of Masden (2015). This highlights the parameters which can have the biggest influence on estimated collision risk. Although avoidance rate is important, it suggests that non-avoidance rate is less important in terms of driving collision risk estimates than perhaps avoidance rates are, and that other parameters are also important such as flight height, speed, bird density, and some wind turbine parameters.
		Welcome the recommendation to reference Masden (2015) and this will be referred to in future work.
2.124		We suggest [the paragraph relating to the Marine Renewables Ornithology Group workshop] needs to clarify that there is evidence that some species are known to be displaced by OWFs, but that the lack of evidence is around the consequences on the effects of displacement.
		Noted, however, this is largely conveyed by the existing text.
2.125		We suggest inclusion of pursuit divers such as guillemot, razorbill, diver species and gannet to this sentence: "*Bird species at most risk from tidal range schemes are likely to be waterbirds which rely on intertidal habitats for feeding which may be significantly impacted by such schemes*".
		Broadly agree. However, the sentence was trying to focus on the group most at risk, by including pursuit divers, this would also include birds affected by disturbance.
2.126		While we agree with the overall impact level suggested [for marine birds from offshore oil and gas, gas storage and carbon dioxide storage], we advise it is pertinent to mention that for some species, the consequences of an oil spill could be very large, resulting in high impact but low likelihood.
		Noted, please refer to Section 5.13.

#	Group	Comment/response
2.127		We advise that the following sentence is rewritten as: "*Although there is a lack of empirical data, there is a general consensus from various studies that those species at highest risk of collision with wind turbines are gulls (e.g. herring, lesser black-backed, greater black-backed, kittiwake) and gannets – with this risk potentially leading to measurable effects on breeding populations, if colonies for these species lie close to offshore wind farms (e.g. Furness & Wanless 2015).*" [and suggest it] be extended to include, "*or if an OWF is sited in an important foraging area or migration corridor*".
		In recent years, studies have looked at tagged birds at breeding colonies to determine movement and in some cases flight height. Movement from breeding colonies are to and from foraging areas if breeding adults are provisioning chicks, so it is inferred, if not specifically stated, that the positioning of OWF close to breeding colonies also includes those sited in foraging areas. Information on defined foraging areas is still lacking, with these being spatially and temporally variable; more information is available for foraging areas close to colonies during the breeding season, but less so outside this period. From these the general consensus is risk can lead to measurable effects if sited adjacent to breeding colonies. *Less is known about migration routes; birds do not use fixed migratory corridors, with migration instead (usually) a broad front. Flight height is important in determining collision risk; it is not yet known if birds, e.g. gannets fly at different heights when breeding compared to migrating, or how height is altered within the vicinity of OWF, or in relation to weather/light conditions. Consequently, within the context of the sentence in question, there is no apparent consensus this risk potentially leads to measurable effects on breeding populations if an OWF is sited in a migration corridor.*
2.128		There appears to be confusion here between sensitivity and vulnerability [in relation to impacts on birds]. Sensitivity is a score for how sensitive a species would be to a pressure, were they to encounter each other (i.e. overlap in space or time). Vulnerability is then sensitivity with respect to exposure. We suggest the use of vulnerability in each of the Regional Seas bullet points instead of sensitivity.
		While the SEA has indicated prospective areas for certain technologies, actual projects involving a range of design concepts could theoretically take place across the relevant seas covered by the SEA. The implication of replacing sensitivity with vulnerability is that a greater level of understanding in relation to where developments would take place should be known, whereas the purpose of these points is to indicate relative sensitivity on the basis of species present, not their relationship with any extant or proposed development. It should also be noted that vulnerability and sensitivity are often not well differentiated in literature which has informed the SEA. The Environmental Report looked to give an indication of a species risk in terms of these publications.
2.129		We question why in Regional Sea 1 kittiwake is not considered moderate sensitivity. They are of reasonable distribution off the east coast, and have been raised as species of possible concern for Scottish OWF and English OWF on the east coast. Given the scope of this report with regards to renewable energy development, it could still be a concern in the southern part of Regional Sea 1 within the context of this SEA and in particular a concern when looking at cumulative impacts assessment.
		Agree. With the information available on kittiwakes, the approach for this species would be to consider it of moderate sensitivity in Regional SEA 1.
2.130		We note that Dogger Bank is within Regional Sea 2 and as such suggest the large aggregations of auks should be considered.
		Noted.

#	Group	Comment/response
2.131		We suggest a justification is provided as to why the relevant Round 2 strategic area, Round 3 zone or equivalent is the default boundary of the Cumulative Impacts Assessment (CIA) study. From a biological point of view, MSFD defined biographical regions might be more appropriate, or even use of the Biologically Defined Meaningful Population Scale if only looking at a UK scale. A true CIA should take account of wider population at risk and impacts that that population is exposed to, and these impacts should not be restricted to one specific type of development e.g. wind farms. We feel that discussions of CIA in the SEA seem to be focused within limited range of activities and that ecologically meaningful CIAs would instead look across industries and activities. In addition, the appropriate scale of the assessment might vary depending on species, season and legislation (HRA or EIA related). For example, to undertake a colony HRA it should only be done on that population within foraging range during the breeding season and include impacts during the non-breeding season at the relevant scale.
		The comments are noted, however, it is not inferred that any cumulative assessment should be spatially restricted to Round 2 or 3 zones – the text referred to relates to information in King et al. (2009) and is quoted as part of a wider section detailing cumulative impact assessment guidelines which have developed in recent years and should therefore not be read in isolation. Given the evidence provided elsewhere in the Environmental Report (for example that in Table 5.20, but also in terms of bird foraging ranges and sensitivity to certain development pressures), it should be clear that such a restriction cannot be applied to cumulatives effects assessment.
2.132		We advise that...the use of potential biological removal (PBR) is not the preferred standard for assessing cumulative mortality of birds. The preferred approach would be to use Population Viability Analysis.
		The text referred to relates to a series of six steps summarised from the Framework for Assessing Ecological and Cumulative Effects (FACE) publications within which it states for birds, "...the standard for assessing the cumulative bird mortality is the PBR". While PVA was not specifically mentioned in this section, the potential unsuitability of using PBR for assessing the effects of wind farms was noted through a footnote against this step.
2.133		We agree with the importance of site identification as a mitigation measure and agree that monitoring and targeted studies are key to successful management, providing the best opportunities to improve the knowledge base. We believe that this is a crucial statement and we suggest it should be highlighted more.
		Noted.
2.134		It is not clear how the conclusion has been reached, "*that it is highly unlikely that the implementation of the draft plan will result in a significant ecological effect from the introduction and spread of non-native species or from interactions with mobile species (collision, barrier effect and displacement) as presented in the evidence*." We feel that the evidence presented does not necessarily support this. We question if this conclusion is based on the assumption that detailed impact assessments for each proposal will be undertaken, and that appropriate decisions made on development siting (including potential refusal of individual consents if siting is not appropriate and mitigation cannot sufficiently reduce the potential impacts), and mitigation put in place. If so, this assumption needs to be made clear. Although the limited evidence is acknowledged, the fact that recent evidence suggests that impacts may be larger than previously thought needs to be highlighted. We refer to our previous comment that the SEA process has an important role to play in gathering evidence at population or strategic levels which individual developers are unable to do in isolation.

#	Group	Comment/response
		The conclusion is based on the potential level of development likely during the life of this SEA and the identified information available. Individual projects require an environmental impact assessment to be carried out as part of that process; a requirement under the relevant Environmental Impact Assessment Regulations and not an assumption made by this SEA. The recent study by Cleasby et al. (2015), which proposes impacts have been underestimated (in terms of gannet mortality and potential impact at a population level), the findings from this study have been acknowledged in terms of advancement understanding of flight behaviour, but further work is being undertaken to increase the information base and the understanding of what the results mean for potential mortality. The findings from the Cleasby et al. (2015) do not support a revision of the overall conclusion presented in the Environmental Report.
2.135	Marine Scotland	While recognising that a large proportion of the bird sensitivities identified are concentrated in coastal waters, it is recommended that at present, the bulk of new offshore wind generation capacity should be sited away from the coast, generally outside 12 nautical miles, based on current available and applicable science. This should be reviewed in light of any related science which comes forward demonstrating otherwise.
		The basis of recommendation 3 is not isolated to bird sensitivities, but reflects the multiple and often overlapping sensitivities in territorial waters and adjacent coasts including areas noted for their scenic, geological, ecological and cultural features, and designations or use for recreational, shellfishery, fishery, navigational, commercial and other activities. DECC are aware of the evolving nature of the evidence base both specifically in relation to the understanding of bird behaviour and how that may be translated into an understanding of the impacts of one or more developments, including by maintaining this as a priority area on the SEA research programme. The recommendations of the SEAs will be kept under review, and progress against these will be tracked. *It is also acknowledged in the SEA that environmental sensitivity of coastal areas is not uniform, but that the intensity of designations and uses typically declines away from the coast. There is therefore the potential for greater stakeholder interaction and consenting risk for development in nearshore areas, but the SEA did not definitively exclude any area of potential resource for renewable technologies.*
2.136	Isle of Man Government	The Manx Basking Shark Watch has highlighted the international importance of the Irish Sea for basking sharks through an active research and tagging programme, which is now an area of international conservation concern, especially as they are listed as an OSPAR threatened/declining species. They may be impacted by physical barriers created by offshore development and by electromagnetic fields. Figure 2.8 [wind resource areas] includes an area to the south of the Isle of Man we have identified as frequented by basking sharks. Also note other migratory fish of concern include salmon, sea trout and other diadromous fish, and migratory mammal species include Risso's dolphin and minke whales, all present in Manx waters. Grey and harbour seals are regularly present in Manx waters and there is a large pupping colony on the Calf of man and other smaller coastal sites.
		The SEA recognises the importance of Manx waters as an area rich in biodiversity; reference to the mentioned migratory marine species of conservation importance has been provided mainly as part of the environmental baseline information and in relevant sections of the environmental assessment.
Physical presence and other users		
2.137	Vattenfall	Offshore wind projects potentially have a key role in securing wider social, economic and environmental benefits for other users of the sea. These issues and the wider circular economy discussion should be considered within the SEA.

#	Group	Comment/response
		There are a number of references in the SEA to the potential benefits of offshore structures (e.g. exclusion of intensive trawl fisheries and reef effects), and also in terms of the transition to a low carbon economy, the economic cost of not acting on climate change. Whilst the SEA has considered a range of socio-economic factors both in the baseline (e.g. see Appendix 1h) and in the assessment (e.g. Section 5.7) as part of its consideration of "material assets", the primary objective of the assessment to consider the potential for environmental effects, which is undertaken in the context of wider UK legislation and policy.
2.138	DONG	The OESEA report identifies safety of navigation as an objective for the SEA in Table 3.1. The report mentions "*areas important for navigation*" but priority areas are not clearly defined in the report. It is not clear whether these have been discussed with navigation stakeholders prior to publication of the OESEA or how industry stakeholders can contribute to this discussion if it is to follow publication of the OESEA. The MCA have not been included in the list of consultation bodies for this report.
		Reference to "areas important for navigation" is made in the NTS, which is written for wider public readership and therefore uses more general language than in other more technical areas of the document. *As part of previous OESEAs, the MCA produced a series of Primary Navigation Routes based on Automatic Identification System (AIS) data, where the siting of Offshore Renewable Energy Installations (OREI) were not recommended, and an additional series of routes where it was regarded that siting could occur with comprehensive assessment. OESEA3 utilised these routes, but also refers to national AIS data produced by MMO as part of the marine planning process and also those routes identified for the East Marine Plans under policy PS2 as sources of updates. Furthermore, work was commissioned to look at historical and recent AIS data, 90th percentile routes for commercial shipping, and offshore wind farms constructed since a technical report produced for OESEA in 2009. It is regarded that, for commercial shipping, major routes are relatively well understood at the strategic level, and that continually improving AIS datasets, augmented by new Vessel Monitoring System (VMS) data for certain fisheries, will improve the understanding of smaller vessel usage for input at a strategic level, but that these will need to be augmented at the development level by a traffic survey, as indicated in MGN543.* *It should also be noted that whilst those bodies/authorities listed in Section 1.4.1 are the statutory bodies to be consulted for this SEA, the consultation was widely publicised using those methods outlined in Section 1.3 of this document.*
2.139		The industry, MCA and other navigational stakeholders continue to work together to better understand and define transparent assessment processes for determining the actual risks associated with layout. MGN543 (formerly MGN371) clearly states that projects can be considered on a project-by-project basis and this will reduce the likelihood of an offshore wind farm having a negative impact on Search and Rescue operations. DONG Energy welcome references to the use of ALARP principles in the assessment and these principles are the focus of ongoing discussions with the MCA.
		DECC are aware of the updated MGN543 that replaces MGN371, published just prior to the consultation on OESEA3 began. As indicated above, the SEA recognises the need for project level assessment.
2.140		Advice from DECC and others indicates that highly particular circumstances (that relate to an increased navigational risk) would be required in order to justify operational 50m Safety Zones. As such, it is not simply a case of offshore wind farm developers', "*making use of the potential to incorporate operational 50m safety zones*".
		For clarity, the purpose of the paragraph as a whole was to indicate that the reasons for any kind of exclusion would be on the basis of risk assessment, but that such zones may be applied for (there being no mandatory exclusion as is the case for certain oil and gas infrastructure), qualified by experience to date which is that few zones in practice have been applied for.

#	Group	Comment/response
2.141		Whilst standard practice for Oil and Gas installations, it is not standard practice for DECC to approve operational phase safety zones around offshore wind farm infrastructure. This is mainly due to objections from the navigational and fishing communities.
		Noted, please refer to response to 2.140 above.
2.142		Section 5.7.2.1 includes a recommendation that offshore wind farm leases include a general prohibition on turbine location within a 1nm buffer of a primary navigation route. MGN 543 states that separation distances, between turbine boundaries and shipping routes, of between 0.5nm and 3.5nm may be 'Tolerable if ALARP'. In addition, references and recommendations relating to the creation of 'clearways' should be reviewed to ensure they are consistent with current MCA policy.
		Noted. The updated guidelines presented in MGN543 are accepted. Whilst this SEA has made this recommendation based on a precautionary higher level of risk at this distance from shipping routes, it is accepted that site-specific assessment is required to ensure the acceptability of any particular location.
2.143		What frequency/density of shipping traffic/type constitutes a 'primary navigation route'. The report references "Primary Navigation Routes 1 (PNR1) with 1nm buffer (derived from MCA 'siting not recommended' areas (draft and unpublished "OREI 1" primary navigation routes) and checked against 2012 MMO AIS annual average data." but further clarity is required.
		Please refer to response to 2.138 above.
2.144		Where impacts on the fishing industry are considered, the report recommends avoiding occupying recognised important fishing grounds in coastal or offshore areas (where this would prevent or significantly impede sustainable fisheries). Table 5.22 identifies important UK fishing grounds for consideration in the report, these (or important fishing grounds generally) are not listed as a "hard or "other" constraints. This is confusing in terms of how important fishing grounds will be incorporated into the consideration of future offshore wind leasing areas.
		Whilst Table 5.22 identifies the general location of a number of important fishing grounds, the text below the table indicates that, "Outside of the areas of high effort and value from a UK context as listed in Table 5.22, many less intensively fished areas exist which are of great local significance. Such areas are particularly sensitive to spatial conflicts; they are typically fished by small vessels operating within a limited range from port, and may serve communities with livelihoods dependent upon those fishing grounds. At a strategic level, it is not feasible to identify all such grounds; small, inshore vessels operate at almost every port throughout the UK and those in remote and rural areas are likely to be most sensitive." In view of the potentially variable (spatial and temporal) nature of fishing effort, and uncertainties with regards to what could be considered boundaries to important grounds, it was not regarded possible to definitively include these in the overall spatial consideration which relies on datasets which are more spatially defined. The outputs from Section 5.15 are regarded to be indicative, and provide a first-order indication of areas of least/most constraint and the limitations of the outputs, in the context of other similar exercises, are provided.
2.145		References to The Crown Estate report (Gray *et al.* 2016) [should be balanced] with the reality of how impacts during construction are mitigated by the offshore wind industry. Fishermen consulted to inform the report claimed to have reduced effort or stopped fishing altogether within the OWFs during the construction period. The report however, did not make it clear that it is standard practice for commercial compensation agreements to be put in place to cover lost earnings caused by displacement during the offshore wind farm construction, i.e. that in all likelihood these same fishermen received financial compensation in return for not fishing within the OWF-sites during the construction periods.
		Noted; the section concentrates on physical interactions rather than potential economic effects and there is a section detailing potential mitigation methods below the quoted text.

#	Group	Comment/response
2.146		Taking into account the sensitivities surrounding compensation (particularly during the operational phase of an offshore wind farm's life cycle) for both the fishing industry and the offshore wind industry. Section 5.7.2.2 of the report states that "*responsibilities of developers where co-location with MCZs is proposed needs to be defined and additional compensation related costs to the fishing industry*." It is often not practical, or necessary, for offshore wind farms operators' to seek to enter into commercial agreements with commercial fishermen that extend into the operational-phase. However, this text appears to suggest that compensation payments might be due during the operational phase. Any references to compensation in the report should cite the FLOWW best practice guidance.
		Noted, it is accepted that reference to the FLOWW best practice guidance could have been made and is therefore highlighted here[10]*.*
2.147	TLP	It is unlikely that the construction of lagoons would significantly alter the nature of emissions from shipping, the reference to emissions in the referenced DECC study is relevant to barrages.
		This is referenced as such in the text of the SEA.
2.148	SNCBs	With reference to Table 5.22, no non-UK vessels operate within 6nm of the coast.
		Noted.
2.149		Inshore Fisheries Groups (IFGs) are now referred to as Regional Inshore Fisheries Groups (RIFGs).
		It is noted that this change was adopted in April 2016, and will be reflected in future publications.
2.150		Note the following corrections, "*The distribution of non-UK vessels is mainly in offshore waters (beyond 12nm), although several foreign fleets (in particular French, Belgian, Irish, German and Dutch) hold historical rights to fish between 6nm and 12nm in specific areas around the coast of England and Wales. Typically, fishing grounds beyond 12nm and in areas with historic access rights are managed as a common resource.*" and "*The 6-12nm zone, however, is an area of typically high fishing effort but is less well understood and depending on access rights many include many foreign vessels (English and Welsh waters only)*."
		Noted.
2.151	Isle of Man Government	Appreciate if acknowledgement is given regarding the importance of shipping navigation routes and established infrastructure in the Irish Sea Zone and would welcome any further information relating to the redistribution of shipping lanes and navigation routes which might affect shipping traffic to and from the Isle of man, including ferry and freight operations.
		The SEA recognises the strategic importance of shipping (for example in Appendix 1h). In order to understand the potential implications of changes in commercial shipping movement from wind farm construction, work was commissioned as part of the first OESEA in 2009 and again for OESEA3 to account for those developments constructed more recently. The resulting changes in shipping, including with reference to the Isle of Man, are given in Table 5.21. The implications of any development on shipping must be considered at the development level (refer to Section 5.7.2.1 of the SEA), and in order to raise awareness of the major routes around the UK these are indicated as being potential development constraints in Section 5.15. The SEA does not propose that any shipping routes are altered, and instead recognises the importance of this sector in Recommendation 5.
2.152		Any significant risk of interference with aviation navigation would be of concern to the Isle of Man Government. The Isle of Man Civil Aviation Administration has published policy guidance on a range of issues associated with wind turbines and their effect on aviation that will need to be considered by aviation stakeholders, wind energy developers and decision makers.

[10] http://www.thecrownestate.co.uk/media/5693/floww-best-practice-guidance-for-offshore-renewables-developments-recommendations-for-fisheries-liaison.pdf

#	Group	Comment/response
		The guidance mentioned provides useful clarifications on the role of the Isle of Man Civil Aviation Administration and the advice they can provide in relation to wind development and is highlighted here for future reference. It is also noted that the guidelines refer to UK CAA CAP764 as best practice, which is referred to in Section 5.7.2.4 of OESEA3, along with an indication (Figure 5.34) of aerodrome consultation zones, including that for the Isle of Man. It is regarded that the wider aviation consideration in this section is equally applicable to the Isle of Man.
Landscape/seascape		
2.153	SNH	There is a fundamental difference of approach between assessment of seascape in England and assessment of coastal character in Scotland which will affect the consideration of in-shore and offshore energy development both at the strategic UK level and in subsequent more detailed tiers of assessment. In Scotland the approach to assessment of coastal character is detailed in the SNH Consultation Draft Guidance on Coastal Character Assessment.
		The draft guidance has been reviewed. While the recent guidance on seascape character assessment being applied in marine plan areas of England differs from the national scale character types defined by Scott et al., such coastal character types were identified as part of a commissioned study undertaken for OESEA in 2009 to complement such national coastal characterisations for Scotland and Wales. DECC recognise the difference in the nature of the national scale assessment presently being undertaken across different marine plan areas, including those of the devolved administrations.
2.154		Agree that mitigation opportunities for offshore development are largely limited to siting and structure design of the development, however we encourage the consideration of design at all levels of assessment. We have recently developed guidance for the offshore wind energy sector in Scotland which we are happy to share this with DECC.
		Noted. DECC would welcome a copy of the guidance when issued.
2.155		Haze and Meteorological conditions are included within the SEA as conditions which might limit visual range and visibility to offshore development. Under EIA, and the associated method of landscape and visual impact assessment (LVIA), consideration of local meteorological conditions is not taken into account in the assessment of effect. LVIA assumes the 'worst case scenario', which is clear bright weather with excellent visibility. To ensure consistency with other tiers of assessment, we feel this section should be reworded to take account of this issue.
		The SEA does not seek to modify any approach taken at the project level (and some do refer to average meteorological conditions), but in the absence of information on the potential location for many elements of the draft plan which could follow, an understanding of the range of visibility is taken to contextualise for the reader the range at which certain technologies could be visible. This follows other strategic level assessment work undertaken in Scotland (e.g. Scott et al. 2005) and Wales (CCW 2008a, b), and is augmented by work commissioned through the SEA to understand, for selected locations, the assessed and actual visual impact of offshore wind developments.
2.156		There is no discussion on how cross-border impacts will be managed at subsequent scales of assessment (e.g. the shared landscape and visual resource of the Solway Firth and potential impacts on the 3 coastal National Scenic Areas (NSAs)).
		The implications of any development in the Solway would need to consider potential effects on all designated landscapes and landscape and seascape generally, irrespective of administrative boundaries, consulting appropriately with all relevant parties including SNH in Scotland.
2.157		The complex and intricate coastline [of Shetland] formed of many firths and voes provides a variety of viewing characters, from open and expansive on exposed headlands, to narrow and framed along the voes, and should be recognised at a more detailed level of assessment.
		Noted.

#	Group	Comment/response
2.158		Agree that the increasing pressure for aquaculture development around Shetland may conflict or generate in-combination cumulative effects with offshore energy developments, particularly in the NSA. This should be taken forward into future assessments at a more detailed level.
		Noted.
2.159		It is stated that oil and gas activity in Grampian and the Highlands is not likely to generate cumulative effects. However, no reference is made to Environmental Report Figure 5.43 (licensed and awarded blocks for exploration/production) and in particular block 11/24 immediately off the Caithness coast, or Block 18/9 off the north coast of Aberdeenshire. Further details are requested, regarding the licensing conditions for blocks 11/24 and 18/9; where potential development within the areas will be assessed, what the focus of assessment will be and the timing for this assessment.
		Sub-blocks 11/24a and 11/24b were licensed in previous seaward licensing rounds, the former containing the Lybster Field which is drilled from land. Block 18/9 was awarded as part of the 28th seaward licensing round, though no firm project plans are known at this stage. Whilst block licences provide exclusivity to licensees, they do not confer any right to undertake activity which must be permitted through a number of consenting and planning processes. Fixed infrastructure, whether nearshore or land-based would be subject to EIA, and any onshore site in Scotland would be subject to the relevant planning and consenting processes. The previous scale of exploration and production in this area is such that cumulative effects are not expected, particularly when considering previous block relinquishments made in this area, and the likely lifetime of currently producing fields.
2.160		Agree that there are likely to be impacts on the perception of wildness and the special qualities of any NSAs and sensitive visual receptors [in Regional Sea 7] and, in particular, from any onshore development of large scale industrial development. Furthermore we agree that cumulative impacts with the ongoing increased pressure for aquaculture are a key consideration requiring further assessment.
		Noted.
2.161		Care should be taken to avoid siting to minimise visibility (Environmental Report pg. 321 bullet point 4) without due consideration of overall coastal character, as visual impacts could just be most from one location to another rather than more holistically considered. SNH guidance: *The siting and design of Aquaculture in the landscape – visual and landscape considerations (Nov 2011),* whilst specific to aquaculture development, is a useful source of information informing both the siting and design of development at a number of levels.
		Noted.
2.162	HE	The text mentions "*Value is also locally variable, with stakeholders having differing views on what may be valued*"; however, inclusion of how historic seascape might be perceived should also be mentioned.
		The work undertaken to date on historic landscape and seascape characterisation is acknowledged, and also other initiatives such as the MMO's seascape characterisations which include historic elements, and also reference to "non visual" elements of seascape.
2.163		Mention is made of Hadrian's Wall World Heritage Site and associated sensitivity in reference to energy infrastructure developments as could occur in the adjacent marine area – the inclusion of such detail is welcomed.
		Noted.
2.164	Vattenfall	The landscape/seascape section of the NTS recommends siting the bulk of OWF generation capacity away from the coast and generally outside 12 nautical miles. This recommendation should be removed from the document with new projects assessed on a site-specific basis.
		Noted, recommendation 3 better reflects the outcome of the SEA, and that, "...all activities and developments covered by the draft plan/programme require site-specific information gathering and stakeholder consultation to inform consenting decisions", whilst also recognising the relative importance of territorial waters and adjacent coasts.

#	Group	Comment/response
2.165	DONG	Appears to suggest that there are very limited opportunities for offshore wind farm development closer to the coast. Statements in section 5.8 include recommending that development is placed as far offshore as possible and height of structures above sea-level is minimised (with fully submerged structures being preferable). The specific recommendations in this section go on to state that potential for development to be refused on the basis of landscape/seascape issues should be considered.
		It is understood that in many cases there may be limited ability to mitigate structure height and form, both due to the type of technology to be deployed, and also the individual characteristics of a site, and hence this aspect of layout and design is qualified with, "where possible". The text relating to refusal on the basis of landscape/seascape issues is, in part, based on the Navitus Bay decision, and is there to raise awareness of similar risks which should be identified early in the process of wind farm zone identification and appraisal. DECC take this opportunity to reference the policy contained in National Policy Statements EN-1 (paragraph 5.9.18) and EN-3 (paragraph 2.6.208), and that decisions relating to landscape and seascape for such projects are consistent with these.
2.166		Whilst it is appreciated that there are areas of the coastline where sensitivity to visual impacts will be high, this section of the report should be balanced with greater consideration of how far from the coast visual effects are likely to occur. As this section does include some discussion of how visual impact is assessed, greater emphasis could be placed on the actual distance over which wind turbines are likely to be visible and how this correlates to water depths.
		Such theoretical visibility, including in relation to meteorological modifiers, is considered in Section 5.8.2. Whilst water depth is not a major consideration of the chapter, the wind resource areas are shown in Figure 5.39, including those areas which are defined as most prospective for fixed (0-60m) and tethered (50-200m) foundations.
2.167		Fixed foundations are technically feasible to a depth of 60m and DONG Energy would recommend that this is considered further in the report. Specifically, tables summarising sensitivity of the Welsh coastline to renewable technologies should be balanced with some assessment of location in terms of distance from that coastline to indicate whether there are areas beyond highly sensitive areas considered to be visible but still within the 0-60m limit for fixed foundations (taking into consideration other constraints). In addition there are other areas discussed as potentially sensitive in the text in this section however they are not further clarified in the same way as the Welsh coastline. Developing this further, and taking into consideration previous comments about distance from the coast and water depths, would be helpful.
		Noted. Please see Figure 5.39, as described above.
Marine discharges		
2.168	Vattenfall	We agree that water column contamination and the associated biological effects of offshore wind projects are not significant issues.
		Noted.
2.169	DONG	Agree with the finding that no significant discharges to the marine environment are predicted to result from future leasing for offshore wind. This section of the OESEA could go further to recognise that any risks from chemicals used during the operational phase are minor. Any chemicals used by the offshore wind industry are selected from the List of Notified Chemicals and the maintenance activities that they are used for are licensed by the Marine Management Organisation. Furthermore, these chemicals are used on a very limited basis. For example, current expectations are that only minor paint works are required every three years (and only to the transition piece) with full painting of the transition piece (above water level) taking place once every ten years. Removal of marine growth is generally carried out using seawater only.
		Section 5.9.3 of the Environmental Report outlines the above points in relation to chemical permitting for offshore wind. Moreover, the minor expected contribution of offshore wind to chemical use and discharge is outlined in Section 5.9.4 and also 5.16.8 of the cumulative effects consideration.

#	Group	Comment/response
		Air quality
2.170	Vattenfall	We agree that offshore wind projects will not give rise to significant effects on regional and local air quality.
		Noted.
		Climatic factors
2.171	Vattenfall, RenewableUK, DONG	The benefits of a transition to a low carbon economy/contribution of renewables are not adequately reflected.
		The potential contribution of marine renewables to the UK's energy mix, and in contributing the achievement of carbon emissions reduction and renewables deployment commitments are made in chapter 5.12. The benefits of such a transition, and the risks of not transitioning, are also detailed (e.g. with reference to the Stern Review and recommendations from the CCC).
		Accidental events
2.172	WDC	There is no overall conclusion on the potential impacts of oil spills. We have raised our concerns on the rather generic nature of many oil spill response plans that are submitted, and the reliance on dispersants rather than containment in previous responses. Given recent evidence on serious impacts on bottlenose dolphins from the US Gulf of Mexico spill we consider much more work is required on this section.
		Section 5.13.6 concludes that the risk of impact is "...highly associated with reservoir fluid type (e.g. heavy oil compared with condensate or gas), distance from sensitive coastal habitats and locations, and prevailing winds and currents. The areas of enhanced risk are therefore west Shetland (Regional Sea 8) and to a lesser extent the northern North Sea (Regional Sea 1). Project-specific risk of major incidents in Regional Seas 2, 3, 4 and 6 are moderated by prospective fluid type (primarily condensate or gas) although oil is also present in the Eastern Irish Sea." The assessment does not place a reliance on dispersants. Section 5.13.6 indicates that "...prevailing weather conditions will rarely facilitate offshore containment and recovery of surface oil...", but that emphasis in oil spill response planning and capability should be on prevention. Section 5.13.3.2 clearly describes the potential effects of accidental releases including those reported following the Gulf of Mexico spill.
2.173	SNCBs	We would like to highlight that in the event of an actual spill, real-time modelling would be carried out using live data (and sensitivity of seabirds would initially be assessed on a monthly and species basis using the Offshore Vulnerability Index (OVI). We advise that the OVI will soon be updated with the Oil Sensitivity Index (OSI) as part of a contract awarded to HiDef by Oil & Gas UK, the results of which are anticipated to be available in spring 2016. Operators will be expected to update their OPEPs and contingency plans to incorporate the results of the update.
		Noted.
2.174		We question whether the increase in shipping activity as a direct result of oil and gas activities should have been assessed, i.e. increase in supply ships, construction vessels, oil tankers and guard vessel transits and activities. It seems as though only accidental events related to exploration and production have been taken into account in the SEA.
		In view of the maturity of UKCS basins and fields, the recent trajectory of oil and gas exploration and production, and the nature of many new developments given extensive fixed infrastructure in place (e.g. subsea tiebacks), any increase in shipping activity is considered to be minor, and would be subject to vessel traffic survey and collision risk assessment both at the exploration level, and any subsequent development phase.
2.175		Section 5.13.3.2 considers effects of releases on seabirds, marine mammals, fish and benthic habitats; however there is no mention of Marine Protected Areas (MPAs). Even though an MPA will be protecting one (or more) of these features, we believe that the SEA should make reference to the fact that if an unexpected pollution event occurs within, or in close proximity to, an MPA, the response plan should take the protected features of the site into account along with the appropriate legislation in place.
		Noted. MPAs, Natura 2000 sites (amongst other things) are highlighted as sensitivities at the licence application stage, and should a licence be granted any subsequent application for a Direction, or submission of an Environmental Statement, will need to cover these aspects.

#	Group	Comment/response
2.176		We suggest it should be considered that the UK holds significant numbers of waders and waterfowl, and that ultimately a spill in an important area could have significant population consequences whether major breeding areas are outside the UK or not.
		Noted.
Overall spatial considerations		
2.177	Alan Neale	The respondent provided background commentary relating to the recommendation in OESEA and OESEA2 that, "*Reflecting the previous OESEA and the relative sensitivity of multiple receptors in coastal waters, it is recommended that the bulk of new offshore wind farm generation capacity should be sited away from the coast, generally outside 12 nautical miles (some 22km). The environmental sensitivity of coastal areas is not uniform, and in certain cases new offshore wind farm projects may be acceptable closer to the coast. Conversely, siting beyond 12nm may be justified for some areas/developments. As with other developments, detailed site-specific information gathering and stakeholder consultation is required before the acceptability of further wind farm projects close to the coast can be assessed*." The response suggests that OESEA3 uses the refusal of consent for the Navitus Bay wind farm to intensify the constraint imposed by the recommendation, which in the past has not suggested that the 12nm buffer was a hard constraint. The respondent also suggests that the refusal of wind farms on the basis of seascape issues connected to World Heritage Sites could set a precedent where others are refused, despite the reason for site designation being unconnected to seascape. This would introduce an arbitrary cap on the amount of new offshore wind farm capacity that could be installed and limit decarbonisation benefits.
		The former Round 3 zone which contained the Navitus Bay proposal was only treated as a hard constraint as part of spatial analysis undertaken to inform a strategic view of areas of potential constraint for offshore wind. The recent refusal of consent for this development, despite the mitigation measures proposed, indicated that it was unlikely an offshore wind development proposal would be put forward at this location again in the near future. This was also viewed in the context of the currency of this SEA (5 years). It should be noted that the analysis undertaken in Section 5.15 is of a strategic nature, is limited in the number, resolution and currency of datasets it can consider, is made in advance of marine spatial plans having been adopted in most UK waters, and does not seek to prejudge any development level consideration – the intent and limitations of the work are indicated in the SEA. *A key role of the SEA is to assist those at the next development stage by raising their awareness of certain sensitivities and possible constraints, which are in part informed by previous development level assessment and consent outcomes. The sensitivities mentioned are highly concentrated within UK territorial waters, and the former recommendation that the bulk of new offshore wind should be sited in offshore waters reflected both this sensitivity and also that technological improvements and cost reduction would contribute to this in the future. The SEA did not seek to imply that proximity to a World Heritage Site would likely result in refusal of consent on the basis of visual issues, and the text quoted largely reflects the wording set out in National Policy Statements for Energy EN-1 and EN-3. Noting the concern raised on constraints placing a cap on decarbonisation, part of the work undertaken for Section 5.15 was to understand potential capacity which could be delivered taking into account various constraints. Successive work undertaken for OESEA, OESEA2 and OESEA3 has suggested that there is "space" for significant deployment of offshore wind in UK waters which could make a substantial contribution to renewables deployment and carbon reduction targets. The reference to work on effects of wind farm proximity and distribution by the respondent are noted.* *It should also be acknowledged that environmental sensitivity of coastal areas is not uniform, but that the intensity of designations and uses typically declines away from the coast. There is therefore the potential for greater stakeholder interaction and consenting risk for development in nearshore areas, but the SEA did not definitively exclude any area of potential resource for renewable technologies.*

#	Group	Comment/response
2.178	TLP	It is crucial that there is no confusion introduced by the articulation of the spatial constraints (e.g. so-called "hard constraints", such as navigation) in the OESEA3 report, and that is clear (in line with recommendation 12) that for tidal lagoons, site specific assessments are required before decisions can be taken on potential leasing and the desirability and acceptability of individual projects are determined. We request that this matter is clarified in order to avoid misinterpretation of the constraints information in the OESEA3 report.
		The objectives and limitations of the methods used to indicate areas of constraint within the section are clearly articulated, and they are not intended to represent any definitive preclusion of development by type or location, but rather as an indication that numerous, and strategically important, activities take place within the key resource areas identified. The work is an extension of that previously undertaken in OESEA and OESEA2 in advance of the adoption of marine spatial plans for most UK waters, and should not be confused with this. *The respondent is correct in their interpretation that site specific assessment is required to inform and assess the feasibility of specific projects, particularly tidal range developments, and that is the basis for recommendation 12 of the SEA.*
2.179		"Hard constraints" areas are defined in the OESEA3 report to be constraints..." which are likely to definitively and consistently exclude development" include navigation routes and aggregates areas. We know from our engagement to date with the relevant stakeholders, and ongoing assessments that potential issues with navigation routes and aggregates areas can be addressed.
		Noted, refer to response to 2.177 and 2.178, and Section 2.1.1 in relation the basis of this exercise.
2.180		Our understanding is that the Welsh Government is updating the Interim Marine Aggregates Dredging Policy for the Bristol Channel and the Severn Estuary in order to inform the Welsh National Marine Plan. Co-location of lagoons with aggregates uses is a matter we are investigating through project development. Co-location uses such as mariculture, fishing and recreation are a benefit demonstrated through the Swansea Bay tidal lagoon project. The potential for co-location will vary by lagoon location and size, further supporting the need for site specific assessments to inform leasing/licensing decisions.
		Noted, also please refer to response to 2.14 and 2.15.
2.181		The OESEA3 report includes Natura 2000 sites as "*other constraints*". However we consider the phrasing used in the report to the misleading. A technical note on Natura 2000 sites as a constraint to development of tidal lagoons was provided.
		It is understood that the presence of a Natura 2000 site does not preclude development, however there are additional assessment requirements associated with these sites, and despite mitigation, not every proposal (alone or in combination) may pass the HRA tests, or meet IROPI (Imperative Reasons of Overriding Public Interest) requirements. These are highlighted here for awareness.
2.182	TCE	The overall spatial considerations section is helpful in understanding strategic level constraints, however we caution against this taking the place of marine planning and site-specific assessment, and therefore welcome the overarching recommendations from OESEA3 that place an emphasis on the need for site-specific assessment and consultation to inform development.
		Noted. The overall spatial consideration is intended as a strategic level indication of areas of least/most likely constraint given the availability of a limited range of spatial datasets. The objectives and also limitations of this and similar works are noted in the relevant chapter, and it is not intended to take the place of marine planning.
2.183		Suggest that in the spatial considerations chapter, that areas where agreements/developments are in existence are treated as hard constraints rather than overlaying them on the remaining resource.
		As indicated in Table 5.35, these areas were treated as hard constraints.

#	Group	Comment/response
2.184		Former Round 3 zones that did not prove technically of economically viable in the past have been included in the area of theoretically available resource, however Navitus Bay has been excluded as a hard constraint. The seabed occupied by this zone will be surrendered in due course. We do not consider it appropriate to treat this area as a hard constraint given its refusal, as this would appear to pre-judge any future possible mitigation of potential impacts. We suggest it would be more appropriate to include it as an "other" constraint, noting the high visual sensitivity and hence increased consenting risk.
		Given the relatively recent refusal of consent for Navitus Bay, despite the mitigation measures proposed, and considering the lifetime of this SEA (expected to be 5 years), it was regarded to be unlikely that another wind development proposal would be put forward at this location in the near-term. Moreover, the exclusivity agreement for this area was yet to be rescinded at the date of publication of OESEA3. The possibility of including this area in "other" constraints is noted.
2.185	SNCBs	There is a need for better consideration of coastal constraints and coastal designated sites including SSSIs for tidal range. Coastal SSSIs and MCZs should be considered for all industries in the consideration of coastal buffers etc. alongside Natura 2000 sites.
		Noted, however many coastal constraints and smaller, coastal conservation sites are best considered at a more local level. This section largely deals with relative socio-economic constraint, and it was chosen to show this in relation to marine conservation sites in relevant waters covered by the SEA. Whilst SSSIs are not mapped here, they are mapped in Appendix 1j.
2.186		We do not agree that it is necessarily appropriate to screen in areas (e.g. Bristol Channel) that are currently not suitable for development but which may become so and to screen out areas (e.g. offshore from a World Heritage Site) which are currently not socially acceptable for visual impact reasons, when it is possible that either social acceptability or national need may change.
		The previous Celtic and Atlantic Array areas were not taken forward on technical and economic grounds and the exclusivity areas for these have been rescinded. Cost reduction, technological change and experience could allow development in these areas in the future, subject to further assessment. The refusal of the Navitus Bay development was made despite assessment and proposals for mitigation, and at the time of publication of OESEA3 its exclusivity area was still in place. The spatial consideration reflects the differences in the decisions relating to these areas.
2.187		Further clarification is needed to explain how a coastal buffer, if not an exclusion zone, is considered a form of mitigation. The inclusion of SSSIs alongside MCZs (Marine Conservation Zones) and Natura 2000 sites would change the outputs and should also be incorporated in the discussion on p424. It would also change the outputs in the various figures in the section particularly for tidal range (Figure 5.72).
		The consideration of a "coastal buffer" is one of a number of considerations contributing to recommendation 3 of the SEA. Note that MCZs and Natura 2000 sites are considered as "other" constraints and are mapped in Figures 5.69-5.72 but do not alter the output of the section, as they cannot be considered to definitively exclude development. Instead they are mapped here along with those areas considered to have lower levels of constraint. As indicated above, whilst SSSIs are not mapped here, they are mapped in Appendix 1j.
2.188		We disagree that it is unlikely that any aspect of the plan will interact with capital dredging operations. Consideration should also be given to maintenance navigation dredging alongside capital dredging; this could be an issue in estuaries with tidal range schemes. Similarly recreation and marine aggregate operations could be affected by tidal range schemes, particularly in estuaries, and have not been included.
		Please note that the section referred to includes a consideration of recreational users, and that marine aggregates are considered elsewhere in Section 5.15 including existing licence and application areas, with reference to wider areas of technical opportunity. It is accepted that capital dredging may be associated with tidal range schemes, and that depending on the site specific nature of any tidal range proposal that this and maintenance dredging could alter. The location and intensity of such changes are uncertain, and therefore difficult to include in the exercise undertaken as part of Section 5.15.

#	Group	Comment/response
Consideration of potential for cumulative impacts		
2.189	WDC	Agree on the need for "*improved and targeted guidance*". We remain concerned that "*previous SEAs have recommended consideration of the establishment of criteria for determining limits of acceptable cumulative impact*" but that these "*have not yet been defined*". Cumulative impact needs to be looked at in a wide cross sectoral approach. This highlights our concern at the SEA process, whereby many recommendations are made in a rather general way but are not followed up on. Meanwhile the licensing process continues as normal. This is not acceptable and the SEA process needs to identify detailed measures that should be implemented before further licensing.
		The SEA recognises the marine management context (Section 2.3) and the range of initiatives such as MSFD and marine spatial planning which are now being implemented. These and the developing understanding of important areas, effects of activities and the efficacy of mitigation measures will amongst other things guide future SEA and project specific assessments.
2.190	SNH	While generally comprehensive in scope, the cumulative effects arising from overlaps that may occur between the various industry interests received relatively little attention. For example it was unclear how much consideration has been given to the Scottish draft Sectoral Plans and the areas being considered in this Plan for other interests, nor how the marine grid commitments will be considered.
		The marine management context of the SEA and draft plan/programme are indicated in Section 2.3, and the sectoral plans in Scotland for wind, wave and tidal energy were considered in the drafting of the report and context to the draft plan/programme (e.g. see Appendix 2). Marine grid connections were not part of the draft plan/programme and consequently not addressed at a strategic level.
2.191	RenewableUK	The OESEA states that the potential for significant adverse effects on other users of the sea and on landscape/seascape can be mitigated to acceptable levels by appropriate site selection, in particular avoidance of areas of prime importance to other industries/users and preferential selection of sites away from the coast. Whilst we broadly agree with some of these mitigations, there is a potential conflict where some areas may be of prime importance for the offshore renewables sector as well. There is no reason why other industries/users should take precedence over offshore renewables, whose role is key in meeting carbon emission reduction commitments.
		Noted, however, the SEA must assess the potential for mitigation for those activities contained in the draft plan/programme. It should also be noted that recommendation 1 of OESEA3 indicates that developments should, "explore opportunities for co-location which could mitigate potential spatial conflicts with existing users." This is consistent with marine policies and plans which have been adopted to date, including those aimed at meeting carbon emission reduction commitments.
2.192	SNCBs	Question why impacts to water quality are not considered in this section, alongside energy removal (5.16.5) and marine discharges (5.16.8). Tidal lagoons, in particular, have the potential to result in impacts to water quality. We advise that water quality should also be considered here, if not, then better cross referenced.
		The cumulative impacts section does not explicitly detail water quality issues, but by way of cross referencing to the assessment sections, issues surrounding water quality are discussed in Sections 5.4, 5.5 and 5.9 and are included as an SEA indicator in Table 3.1. Tidal range schemes induce local and regional changes to water column characteristics such as current speed, turbidity, sediment deposition and water properties (such as temperature and salinity), which have the potential to impact water quality in an area. These changes have the capacity to interact with impacts on water quality from other local and regional activities, such as industrial discharges. Whilst this is accepted, these are best considered at a local level, and in the context of controls on other activities including waste water, and where their interactions with specific WFD and MSFD water body conditions and objectives can be better considered.
2.193		This section and the summary (5.16.12) are very focused on offshore wind and underwater noise.

#	Group	Comment/response
		For some aspects of cumulative effect such as physical presence, landscape/seascape and potentially also noise (notwithstanding deep geological seismic survey), the potential range of interactions and sources of effect is greater for large offshore wind farms than other aspects of the draft plan/programme. The summary covers a range of activities and sources of effect, however, it is noted that the issue of cumulative effects from noise is an area of uncertainty, and one of current relevance.
2.194		The cumulative assessment for offshore wind farms has only considered the southern North Sea. A cumulative assessment for the Irish Sea area would have been beneficial or could have been highlighted as a gap in knowledge in this area.
		The section refers to offshore wind farm project timelines, which for the Irish Sea are presently isolated to the Walney Extension, and therefore significantly limited compared with the number of proposals/consented projects for the southern North Sea, and also the area remaining there for which new projects could be proposed during the timescale of this SEA. The focus of the section referred to was therefore the southern North Sea, but it is accepted that there is the potential for cumulative effects elsewhere.
2.195		While we do not disagree with the definition of cumulative effects [made in Section 5.16.2], we note that it is not applied consistently across the SEA. We suggest the need to look across industries should be made clearer in other sections of the SEA.
		Noted.
2.196		Consider that reference should be made to the possible impacts of cumulative noise on birds i.e. possible displacement from important foraging areas. We acknowledge there is a lack of evidence concerning this, but the potential for impact still exists and should be considered.
		Noted. This area will be kept under review as part of the ongoing SEA programme.
2.197		While the SEA does consider scale of impact to the total area considered by the SEA, it does not consider the incremental loss of soft sediment habitats to hard substrate on a regional sea scale. Of specific concern is that the constraints mapping (Figure 5.64) shows suitable areas for offshore wind development to be concentrated into several clusters or 'sub regions' e.g. Dogger Bank region, Greater Wash, offshore Yorkshire, central Irish Sea etc.
		Please refer to responses to 2.177-2.178 above with regards to the purpose of interpretation of those maps presented in Section 5.15.
2.198		Referenced at the scale of the whole SEA area, the change in seabed type likely to occur through hard substrate deployment will always appear very small. However there is the potential for the small scale changes associated with turbine construction to accumulate and change the character or ecological functioning of a large area if a number of developments take place in close proximity. The change in seabed character of these 'sub regions' could have a larger impact at an SEA level if the area in question is of specific importance, e.g. as a key location in a species' life cycle or as a significant morphological feature such a large sandbank.
		Noted. It is understood that information on actual deployment of hard substrate compared to those worst case estimates made in Environmental Statements will augment knowledge in this area in the future. The SEA makes a specific recommendation that, "...volumes of rock... must be the minimum required..." and that, "Alternative methods of protection/control should be considered to minimise the potential for permanent habitat change."
2.199		We question the validity of the assertion that "*in a UKCS context, the contribution of all other sources of disturbance are minor in comparison to the direct physical effects of fishing, and it can be argued that the positive effect of fisheries exclusion offsets any negative effects of exploration and production and OWF, wave and tidal stream development... however, the spatial extents of both positive and negative effects are probably negligible for most seabed habitats."*

#	Group	Comment/response
		Noted, however an important caveat has been omitted from this sentence in the response, that the corollary of reduced direct impacts from fisheries inside areas used by marine renewables is displacement elsewhere. The statement in its entirety therefore is that physical impacts from activities potentially arising from the draft plan/programme are small in comparison to fisheries impacts.
2.200		We do not consider that the statement that displacement, barrier effects and collisions are all unlikely to be significant to birds at a population level is justified, at least not based on the evidence presented in the SEA and in particular when considering cumulative effects.
		Current available information on potential impacts of oil and gas and renewable activities from collision, displacement and barrier effects generally concludes that there is unlikely to be a significant impact on birds at a population level, with the caveat that at present there is a lack of empirical information. While this conclusion is made at the strategic level and in anticipation of the scale of development likely within the projected 5 year life span of OESEA3, new information emerging on potential effects will be kept under review through the SEA process.
Potential for transboundary effects		
2.201	Vattenfall	The wind industry has established good relationships with advisory organisations in relevant Member States. In general, environmental effects on adjacent territories are considered unlikely to be significant but will continue to be considered on a site specific basis.
		Noted.
2.202	SPR, RenewableUK, Energy UK	The offshore renewable sector has experience of consulting widely on transboundary effects in line with national policy and legislation, and therefore welcome the conclusion within the OESEA that potential transboundary effects of underwater noise, marine discharges, atmospheric emissions, impact mortality on migrating birds and bats, and accidental events are unlikely to be significant.
		Noted.
2.203	SNCBs	For tidal range, particularly on the west coast and in the Irish Sea, we advise that the reduction in tidal energy and changes to hydrodynamics/physical processes could be a trans-boundary effect with Ireland and the Isle of Man.
		Noted. Section 5.5 details the potential scale of far-field effects which could be generated from multiple tidal range or other marine energy devices, which could be transboundary at the scales indicated by the respondent. This is accepted, and any proposal for tidal range developments would be expected to undertake detailed modelling of the implications of their project cumulatively with any other proposals, to allow for a consideration of such far-field effects.
2.204		In addition to transboundary effects impacting migrating birds, they could impact wintering birds, and indeed breeding birds which are part of a wider biogeographic population. This ties in with CIA and the appropriate scale at which to make such assessments. This discussion is inadequate throughout the SEA, and needs further thought and attention.
		The SEA acknowledges (Section 5.6.5) the extent of any potential transboundary impact on birds, fish and marine mammals remains unclear, with assessment relying on currently available frameworks; these frameworks describe the scale at which to make assessments. However, it is considered that the scale of effects in adjacent territories due to activities resulting from the adoption of the draft plan/programme, will be relatively insignificant when compared to UK waters. Potential significant effects on adjacent states are further considered at the project level as part of the consenting process.
2.205	Ministère de l'environnement	The environmental impact assessment of neighbouring countries such as France, is described as "potentially significant", with the consideration of a very low probability as to the materialization of these impacts. It would be pertinent to examine precisely what the real impacts on the environment and the French maritime activities adjacent to the areas that will be subject to planning.

#	Group	Comment/response
		Noted. The potential for significant effects to be generated in adjacent state waters is considered to be unlikely and certainly less than any effect in UK waters. However, a number of areas are highlighted which are regarded to be the most likely source of any such effect. Individual developments arising from further leasing or licensing rounds will be subject to project level assessment, where a greater level of detail will provide for a more precise assessment of potential effects, including those which could be transboundary.
2.206		The environmental impact assessment found in insignificant proportions the probabilities of occurrence of transboundary effects, such as underwater noise, air emissions, increased mortality of birds and marine accidental events. It would be appropriate to know precisely the intensity of cross-border effects on the French maritime space.
		No specific project level plans are known at this stage to inform a specific intensity of transboundary effect, however the nature of legislative and policy controls are such that development level assessment must consider such effects on adjacent states.
2.207		We would like to be informed of the outcome of this project and the consultation related, in particular in order for France to consider this project in the planning of its maritime space.
		Noted. Also refer to response 2.206 above.
2.208	Isle of Man Government	Disappointing to note that no reference is made to the Isle of Man within the transboundary effects section. We feel it is important to acknowledge that the proximity of the island and its territorial waters to those of the UK mean that risk of various transboundary impacts do feasibly exist.
		Noted. It is accepted that the Isle of Man could have been listed separately in addition to the adjacent states mentioned in the transboundary effects section, and therefore that the text of that section equally applies to the Isle of Man and its territorial waters.

2.2.3 Consideration of alternatives

#	Group	Comment/response
3.1	TCE	Support the conclusion of the OESEA3 that alternative 3 to the draft plan/programme is the preferred option, that the area offered for leasing/licensing is restricted spatially, however it is unclear how such restrictions will be defined and applied, and also the relationship with OESEA3, Marine Planning and other processes which guide development location.
		Previous seaward oil and gas licensing rounds have restricted areas available for licensing on the basis of the outcome of the SEA. DECC are cognisant of the content of adopted marine plans, and is involved in providing input to remaining plans. The SEA has reflected the existing regulatory and policy framework of the UK and that these and related initiatives provide a level of activity control, or environmental protection. The SEA has sought to reflect this in the assessment and recommendations unless there are clear areas where issues remain.
3.2	WDC	Welcome the overall conclusion to adopt alternative 3 to the draft plan/programme, however, we are concerned that only the area to the west of the Hebrides is recommended to be withheld from oil and gas licensing for the present. In previous SEAs other areas, including Cardigan Bay, were withheld due to lack of information on key species such a bottlenose dolphin. We are not aware of any new research that fills this data gap.

#	Group	Comment/response
		It is considered that recent publications have significantly improved the information base, allowing a reconsideration of the issue in respect of Cardigan Bay, including: *Baines ME & Evans PGH (2012). Atlas of the marine mammals of Wales. CCW Monitoring Report No. 68. 2nd edition, 139pp.* *Feingold D & Evans PGH (2014a). Bottlenose dolphin and harbour porpoise monitoring in Cardigan Bay and Pen Llŷn a'r Sarnau Special Areas of Conservation 2011 - 2013. NRW Evidence Report Series Report No. 4, 120 pp.* *Feingold D & Evans PGH (2014b). Connectivity of bottlenose dolphins in Welsh waters: North Wales photo-monitoring report, 16pp.* *It should also be noted that Blocks in the deeper parts of the Southwest Approaches, beyond the shelf break in waters >200m deep, have been withheld from oil and gas licensing.*
3.3		Under alternative 3, a detailed assessment of spatial exclusions and key mitigation measures should be presented. We would recommend an approach based on the recommendations of the former Joint Links Oil and Gas Environmental Consortium (JLOGEC) where, instead of a presumption for development across all waters the SEA would designate certain categories of regions, namely that the SEA should identify Sacrosanct, Moratoria and Potential Areas [definitions provided in full response].
		Noted, please refer to responses to 1.34 and 3.2. *It should be noted that the nature of resources is prospective and exploratory, and though it may be expected that future oil and gas development will likely take place in those basins exploited to date, frontier areas may present new opportunities for exploration and production. The SEA has not concluded that development should be precluded in any area for renewable technologies, but has highlighted the range of environmental sensitivities, other uses of the sea, potential sources of effect, and information gaps which remain, and that site-specific assessment will be required. The area to the west of 14˚W west and those waters beyond the shelf break (>200m) in the Southwest Approaches have been withheld from oil and gas licensing.*
3.4	SNH, NRW	Support the conclusion that, "*alternative 3 to the draft plan/programme is the preferred option, with the area restricted spatially through the exclusion of certain areas together with a number of mitigation measures to prevent, reduce and offset significant adverse impacts on the environment and other users of the sea*."
		Noted.
3.5	SPR, RenewableUK, Energy UK	We would support the option to proceed with a leasing and licensing programme for future energy development as this is the only alternative being considered which meets the objectives of the plan in terms of delivering secure energy supplies in line with carbon emission reduction targets. The UK offshore wind industry is at a critical point, balancing the need for rapid deployment and innovation with UK government cost reduction targets. Therefore it is imperative that the industry has a clear line of sight with regard to future leasing opportunities, and financial support, from government to ensure that the industry and supply chain can continue to plan for the future in terms of project development and investment. For these reasons we do not support the option not to offer any areas for leasing or licensing or to restrict areas offered for leasing or licensing, temporally or spatially, as this will not contribute to the UK targets and could place the expansion of the UK's offshore wind industry and associated supply chain in jeopardy.
		Noted, the SEA has not definitively excluded any areas for renewables, however, it draws attention to a number of sensitivities (environmental and socio-economic) which indicate that development will not be suitable in all locations.
3.6	Vattenfall	A leasing and licensing programme is required which recognizes the importance of offshore wind. This could be achieved through Options 2 and 3, assuming restrictions described under Option 3 allow the required expansion of the UK offshore wind industry and its supply chain.

#	Group	Comment/response
		Please refer to response to 3.5 above.
3.7	DONG	To support the further development of offshore wind energy in the UK, the industry will need access to attractive sites, not least to support the current momentum in reducing the cost of energy. Such sites will have the majority of the following characteristics: good ground conditions, strong wind resource, water depth suitable for optimum wind turbine and foundation type combination, access to a grid connection. Some valuable lessons from Round 3 could be incorporated into this process. Development specific assessment comes at a considerable cost to individual developers and if an area offered up for lease turns out to be technically challenging, it can deem a project financially unviable at least in the short term.
		Some aspects of the characteristics mentioned, such as ground conditions, are not well understood at a strategic level, and in all instances and for any aspect of the draft plan/programme requiring infrastructure to be installed, site specific studies will be required. Analogous to offshore wind, carbon capture and storage and oil and gas development may understand the strategic potential and importance of certain formations, but without exploration and appraisal further development cannot be reasonably assessed. It is beyond the remit of the SEA to provide such detailed information.
3.8	SNCBs	Consideration of alternatives, Biodiversity, habitats, flora and fauna: the section and tables do not adequately consider infrastructure and other human uses on the coastal and inshore environment, such as transport infrastructure, ports, marine aggregates, harbour navigation, navigation dredging and disposal, which could be effected by tidal range schemes.
		Cumulative effects are considered in Section 5.17. It is noted that table 5.17.9 should have also indicated potential for interactions between tidal range and other users of the sea, however, the consideration against the guide phrases for these receptors is considered to be accurate for tidal range and other marine renewables.
3.9		DOENI and NRW are encouraged that the OESEA has recognised the potential for impact on marine archaeology arising from all proposed activities covered by the plan and the fact that cultural heritage is now fully considered as part of the planning and installation process. We strongly agree that site-specific surveys should be undertaken before decisions can be taken on potential licensing/leasing of individual projects to prevent any loss to the marine archaeological resource.
		Noted.

2.2.4 Recommendations and monitoring

#	Group	Comment/response
		General comments
4.1	TCE	It would be helpful to have a link between the OESEA3 recommendations and the ongoing SEA research programme, and also how these align with other research initiatives, to ensure consistency and avoid duplication of effort.
		A list of recommendations from former SEAs and their status, including links to SEA and other research, has previously been circulated and is in the process of being updated. This will be made available on the SEA pages of the gov.uk website in due course.
4.2		A number of recommendations imply a level of "regulation creep" and additional burdens some examples of which are provided below. We believe the recommendations should sit firmly within the scope of what can be assessed under existing legislation and regulatory frameworks.
		The SEA reflects the range of other national and international legislation and policies and how they are implemented in the UK (as outlined in Appendix 2 and Appendix 3, and elsewhere throughout the Environmental Report). Individual responses to comments on the recommendations are provided below.

#	Group	Comment/response
4.3	SNH	For transparency, and in order to help ensure delivery of the recommendations, we believe it is important, on implementation of the Plan, that all the recommendations are assigned to owners, with timescales for completion. Without such assignment there is a strong risk that some may not, in practice, be secured. Progress might usefully be tracked by the OESEA Steering Group.
		Many of the SEA recommendations may be fulfilled through a range of initiatives, policies and research, some of which will be from SEA commissioned work and others which will be delivered through mechanisms such as marine spatial planning. The recommendations will be tracked as part of the ongoing SEA progress shared and discussed through the SEA steering group.
4.4		SNH endorse, in particular, a number of the recommendations: 2, 3, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 22, 23, 24 and 25, and make additional comments on some of these (indicated below).
		Noted.
4.5	TLP	The data collection requirements for tidal range projects tend to extend to the regional, and well beyond the site specific level as noted in the OESEA3 report. It is important that research initiatives that focus on tidal lagoons, such as ORJIP, are adequately funded to develop the evidence base. We would urge consideration of support for research initiatives as a recommendation alongside the OESEA3 report. Given that there is a need to evolve the evidence base, a proportionate approach to data requests from statutory consultees for tidal range projects should also be considered as a recommendation.
		The SEA research programme has contributed to filling information gaps of relevance to the draft plan/programme, and maintains awareness of other initiatives such as ORJIP to ensure that effort is not duplicated. DECC will review the output of this programme as part of ongoing work to identify research priorities, along with input from the SEA Steering Group. Whilst the SEA research programme attempts to better understand aspects of the environment and potential interactions and effects of draft plan activities, these are not a replacement for more detailed site specific considerations.
Recommendation 1 It is recommended that leasing/licensing and any subsequent consenting of activities should ensure the minimisation of disruption, economic loss and safety risks to other users of the sea and the UK as a whole. It is recognised that individual projects will be assessed on a case by case basis through the relevant planning process. However, in advance of formal and spatially explicit marine planning for most UK seas, and recognising the overarching policy of the UK Marine Policy Statement, developments (individually or cumulatively) should aim to: • avoid impingement on major commercial navigation routes where this could significantly increase collision risk or lead to appreciably longer transit times; • avoid causing alteration to the ease and safety of navigation in port approaches or reduce the commercial attractiveness of the ports e.g. through increases in vessel insurance premiums; • avoid occupying recognised important fishing grounds in coastal or offshore areas (where this would prevent or significantly impede sustainable fisheries); • avoid potential disruption of existing and potential future aggregate supplies; • avoid interference with civilian aviation operations necessary to ensure aviation safety, efficiency and capacity, including radar systems, unless the impacts can be mitigated, are deemed acceptable, are temporary or can be reversed; • avoid jeopardising national security for example through interference with radar systems or unacceptable impact on training areas unless the impacts can be appropriately mitigated or are deemed acceptable in consultation with MoD; • avoid causing significant detriment to tourism, recreation, amenity and wellbeing as a consequence of deterioration in valued attributes such as landscape, tranquillity, biodiversity and hydrographic features; • explore opportunities for co-location which could mitigate potential spatial conflicts with existing users.		
4.6	TCE	Many of the objectives listed have been or are in the process of being reflected in Marine Plans and therefore there is the potential for duplication of spatial planning policy. We would welcome the clarification of the hierarchy of OESEA3 and other plans/policies. For example, are these recommendations only intended for areas where marine plans are yet to be undertaken/adopted.

#	Group	Comment/response
		The introductory text to this recommendation states that the points are made in advance of formal and spatially explicit marine planning for most UK seas, whilst recognising the overarching policy of the UK Marine Policy Statement (MPS). The points made reflect both the conclusions of the SEA and marine planning policy as it is presently understood.
4.7	NRW/SNCBs	Welsh Government are developing a Welsh National Marine Plan (WNMP). Many of the policies in the plan are aimed at managing interactions between marine industries and should help guide decision makers and users of the marine environment in avoiding conflicts between activities. We recommend that DECC liaise with Welsh Government over the potential interactions between the Offshore Energy Plan and the WNMP and utilise the WNMP once available.
		Like most UK seas, regional level marine planning is underway and at various stages of completion. The SEA reflected the status of the various UK plans, and the content of those which have been adopted, and also the MPS with which marine plans are to be consistent with.
4.8	SNCBs	All marine areas are scheduled to have a marine plan in place by 2021. Recommend that DECC consult and utilise any information as it becomes available.
		Noted.
4.9		The World Heritage Committee reiterated its position in Decision 38 COM 7B:80, that oil and gas exploration and exploitation are incompatible with World Heritage status (WHS) and urge State Parties to exclude WHS properties from petroleum exploration licences. Seascape is a critical element of the setting for the Giant's Causeway and Causeway Coast World Heritage Site. Oil and gas platforms have the potential to significantly impact on this setting with no potential for mitigation at close quarters. In light of recent decisions in relation to impacts on seascape of OWFs, we suggest a limit of the release of sea bed within 12 nautical miles of the WHS in Northern Ireland and ensure any projects are fully assessed for landscape effects after this distance.
		It should be noted that those blocks formerly licensed in quad 125 have been relinquished.
Recommendation 2 As part of the Natura 2000 and linked initiatives, further offshore SACs, SPAs, MCZs and MPAs (and extensions to them) are being identified. Although in line with the UK Marine Policy Statement, existing and future Natura 2000 and MCZ/MPA sites are not intended or treated as strict no-go areas for other activities, competent authorities have a responsibility to secure compliance with the requirements of the Habitats and the Wild Birds Directives. It is recommended that developers are made aware at the licensing/leasing stage that SAC/SPA or MCZ/MPA designation may, subject to the conclusions of any Habitats Regulations or MCZ/MPA Assessment, preclude development or necessitate suitable mitigation measures so as to avoid adverse effects on a designated site or species.		
4.10	NRW/SNCBs	The decision to proceed with designating the proposed new Special Areas of Conservation and Special Protection Areas in Wales has not yet been taken by Welsh Ministers. NRW has launched a consultation on the proposed new sites and this will inform the decision whether or not to designate. The consultation documents provide information which describes the new sites and the reasons for designation.
		Noted. DECC are aware of this consultation and its content, and also those similar consultations in Scotland and England. DECC will consider these in relation to any subsequent HRA process, where relevant.

#	Group	Comment/response
4.11	SNCBs	Believe that the SEA does not negate or influence the need for a project specific HRA to be undertaken by the licensing authority on any aspect of the plan. The report recognises that there are a range of uncertainties associated with potential effects on receptors that cannot be evaluated in detail in relation to a plan at such a high level, but that nevertheless will need to be addressed with further information, assessment and consultation as part of the marine licensing process before any new development can be undertaken. We are pleased, therefore, to see these uncertainties captured in the form of recommendations for further work. We note that at project-level, cumulative assessment with other operational, consented, and proposed developments, will be required. This assessment should include the sources of effects as listed such as noise, introduction and spread of invasive species, behavioural disturbance, collision risks, changes/loss of habitats, trans-boundary effects and contamination in the form of discharges and emissions. These sources of effects on marine habitats and species, the wider environment and risks associated with accidents will require consultation with the relevant authorities in areas adjacent to or impacted by the proposed projects. The Plan is flexible and it is not essential to the implementation of the plan that any or all of aspects of the plan are taken forward to exploration, production or development. The plan thus acknowledges the risk that one or parts of the plan may not be developed due to a project level HRA identifying the possibility of adverse impacts.
		Noted. In relation to the last point made, project level HRA relates to individual site specific assessments once project plans are known, and should not be confused with the draft plan/programme as outlined in Section 1.2. The recommendation seeks to draw attention to the potential consenting risk relating to projects covered under parts of the draft plan/programme (e.g. wind, wave and tidal leasing) where likely significant effects are identified as part of the HRA process.
4.12		Recognise that assessment of potential impact within protected sites is a process best left to the project level HRA, however, we feel that developers may not fully understand the potential implications of proposing development within a protected site. We feel that more comment should be made within the SEA about these potential complications. We would expect developers to gain some understanding of: • conservation objectives, and what an objective of maintain or restore (or the equivalent wording under the Marine and Coastal Access Act) would mean for any proposed development • assessment against conservation objectives and the level of evidence required for such an assessment • potential of using IROPI routes for project level operations.
		Section 3.7.1 of the Environmental Report provides an overview of the responsibilities for strategic level HRA. Additionally, reference is made elsewhere in the Environmental Report to HRA requirements. More detail will be provided in any strategic level HRA to be undertaken associated with future leasing/licensing of draft plan/programme activities.
4.13		We believe that relevant SSSIs and their protected species should be included in Recommendations 2 and 8.
		Noted. Whilst the recommendations specifically relate to Natura 2000 and MCZ/MPA (Marine Protected Areas) sites, the SEA highlights wider conservation sites in Appendix 1j, which any development level assessment will need to have regard. Note that many SSSIs are contained in Natura 2000 sites, and DECC are aware of changes resulting from the Marine and Coastal Access Act 2009 such that SSSI notifications can be made in England and Wales below the Mean Low Water Mark (MLWM) under certain statutory conditions, and that notifications may be removed where they coincide with new MCZs.

#	Group	Comment/response
Recommendation 3 The importance of territorial waters and adjacent coasts is reflected in numerous, often overlapping designations to protect their scenic, geological, ecological and cultural features, and designations or use for recreational, shellfishery, fishery, navigational, commercial and other activities. The environmental sensitivity of coastal areas is not uniform and the intensity of designations and uses typically declines further offshore away from the coast. All activities and developments covered by the draft plan/programme require site-specific information gathering and stakeholder consultation to inform consenting decisions. In addition to marine spatial plan requirements, the particular sensitivity of the coastal zone and must be taken into account during site selection for proposed developments within territorial waters. Some developments may not be compatible with a particular nearshore location.		
4.14	TCE	Welcome the emphasis on site-specific assessment and stakeholder engagement, however the recommendation could be interpreted as implying that siting developments within territorial waters is not considered appropriate.
		As in previous OESEAs, the recommendation seeks to highlight that there is an inherently greater number of sensitivities and therefore development risks in territorial waters and that due regard should be given to this. The recommendation is explicit in stating that some developments, and therefore certainly not all, may not be compatible with a nearshore location.
4.15		Note reference to marine spatial plan requirements and suggest that the recommendation should be "*in line with*" rather than "*in addition to*", as seascape character and sensitivity are key considerations of the planning process as well as in policies contained within the plans. Suggest that this part of the recommendation could be re-phrased as: "*Given the lack of uniformity in coastal area sensitivity around the country, all activities and developments covered by the draft plan/ programme require site specific-information gathering and stakeholder consultation to inform consenting decisions. In line with marine spatial plan requirements and national policy statements, the particular uniqueness or sensitivity of the coastal zone must be taken account of as part of the project-level assessment for a development proposed within territorial waters*".
		The suggested change is noted, however the recommendation does not specifically relate to seascape. The recommendation reflects the conclusion of the SEA in terms of where the majority of sensitivities are located and the potential for conflict with draft plan related activities. In the absence of marine spatial plans (which are a separate process to this SEA) for many UK seas, this recommendation applies to all relevant waters covered by the draft plan/programme, and therefore is "in addition" to these.
4.16	NRW/SNCBs	NRW welcomes the recommendation that the particular sensitivity of the coastal zone must be taken into account when proposing developments in territorial waters. The tidal range component of the plan in particular means that large scale development at the coast is much more likely than has been the case within the timeframe of previous offshore energy plans. This will necessitate careful consideration of a range of receptors that may be impacted by the plan, subsequent lower tier plans and any resulting projects that may have not been considered in detail previously. In particular, shoreline and flood risk management, water quality management and hydrology, bathing waters, fish and shellfishery management are issues that have not typically been considered in detail by previous assessments of offshore energy plans and projects but are a particular concern in relation to tidal range. Impacts on flood risk management and bathing waters, for instance, have not been considered a potential source of effect in the Environmental Report. Whilst this does not affect the overall conclusions of the SEA it does perhaps reflect the fact that greater attention will need to be paid to such issues as the plan is implemented.
		The impacts of any tidal range development on flood risk and bathing waters are highly site specific, and hence the SEA has recommended that this type of development is subject to site specific assessment prior to leasing decisions being made. Whilst not explicitly mentioned in Box 5.1, flood risk and bathing water effects are covered by the effects, "Changes to sedimentation regime and associated physical effects" and "changes in seawater or estuarine salinity, turbidity and temperature from discharges (such as aquifer water and halite dissolution) and impoundment."

#	Group	Comment/response
4.17		Projects resulting from the plan will need to undertake assessments that are novel to those operating further offshore to address the potential consequences of their proposals for flood risk and shoreline management plans (via Flood Consequence Assessments) and demonstrate compatibility with the requirements of the Water Framework Directive (WFD) and River Basin Management Plans (via WFD Compliance Assessments). As a consequence, SEA research may well need to be re-focused to allow consideration of some of the uncertainties associated with these assessments.
		It is recognised that certain developments have the potential to affect coastal environments and flood risk, and that these areas are already subject to a range of policies and legislative processes including those mentioned above. DECC are also aware of the particular issues relating to shoreline management plan policies, flood risk, and the requirement to secure compensatory habitats for Natura 2000 sites, particularly in view of projected sea-level changes. Awareness of research priorities of relevance to the SEA are maintained via the SEA steering group and other routes, and specific priorities can be raised there.
4.18		The evidence provided at a project level to evaluate alternative options and locations is often only based on a very high level analysis. To improve the level of confidence as and when it is concluded that there isn't a less environmentally damaging option, guidance could be developed, particularly for tidal range, on the assessment of alternatives required by the EIA and potentially the HRA and WFD assessments.
		Noted.
4.19	SNCBs, NRW	Recognition of the need to fill evidence gaps associated with coastal topography is welcomed. It is also necessary to consider other key strategic baseline evidence gaps in relation to physical processes that would assist with strategic planning for newer technologies such as tidal range. These would include, for example, better wave data, information about bedform dynamics and longer term records of intertidal morphology.
		Noted.
4.20	EDF, Energy UK	The coastal buffer for offshore wind development, introduced in Round 2... must not become a *de facto* exclusion zone. We accept that development within a buffer zone could require a greater burden of proof and the application of more stringent mitigation measures. However, development in shallower water is a more practical and economical option for developers, as it offers cheaper deployment and connection options. This would mean, for example, that more renewable generation capacity can be deployed and at lower cost to the consumer. It will also mean that the Government's decarbonisation targets could be met at lower cost.
		Noted, the intent of this recommendation in OESEA3 was to highlight the particular sensitivity of coastal waters, it does not imply any notional exclusion for renewables technologies.
Recommendation 4 In view of the above, extensions to existing wind farm lease areas during the currency of the SEA requires careful site-specific evaluation since significant new information on sensitivities and uses of these areas is now available.		
4.21	TCE	It would be helpful to clarify whether the "*significant new information*" referred to means post-consent monitoring and any other data that may have become available since existing wind farms were consented. It would be helpful to note that this expectation to use the latest available information would apply to any new development, regardless of whether it is a proposed extension.
		The recommendation refers to all new information which has become available, irrespective of which source, whilst not discounting appropriate data quality and provenance.

#	Group	Comment/response
Recommendation 5 Important navigation routes were identified as part of the first marine plans in England, primarily in territorial waters. In view of the projected construction of major offshore of wind farms resulting from Round 3 leasing, and that further wind farms may be proposed in these and other areas (for fixed and tethered turbines), it is considered that a wider set of offshore routes be considered and documented. This would help to ensure continuity of efficient and safe shipping traffic between UK national and international ports. Where necessary, important navigation routes could be treated as "Clearways" in the siting and consenting of marine developments. These would require agreement for all waters of the British Isles as well as international coordination for transboundary routes since there are wind farm and other development proposals in the waters of adjacent states.		
4.22	TCE	Would welcome clarification on what is meant by "*clearways*", and how it is envisaged that they would be identified and designated. Suggest such instruments are reserved for where particular vessel routes have been identified as being strategically important following consultation and negotiation between the shipping/navigation and renewables sectors. Vessel movement should be largely unconstrained unless as a result of fixed infrastructure where the siting of such could result in the need for Clearways being protected.
		Clearways have been used in other countries (e.g. Netherlands) to maintain safe navigational routes in areas with multiple offshore developments. They are navigational routes within which further development cannot take place. The marine planning process is presently identifying routes of particular importance (e.g. East Marine Plan Policy PS2 indicates that sea surface infrastructure should not be sited within these routes unless there are exceptional circumstances), and methods of identifying these routes are made therein and in related MMO publications. The recommendation recognises the strategic importance of shipping traffic (e.g. in relation to the proportion of UK freight import/export it handles, please refer to Appendix 1h), but also the need for agreement on any such measures.
Recommendation 7 The offshore wind and marine renewable industry remains relatively young, with appreciable technological development expected in for example, turbine size, rotation speed, foundation structure, spacing and potentially rotational axis. A firm base of information is required to inform risk assessments and adaptive management, and consequently in respect of ecological receptors a precautionary approach to facility siting in areas known to be of key importance to bird and marine mammal populations is recommended unless evidence indicates that impacts can be appropriately mitigated.		
4.23	TCE	This recommendation links to other comments regarding the need to ensure a join-up between the SEA programme and research initiatives aimed at addressing the remaining uncertainties. Also note that whilst appropriate for the emerging wave and tidal sectors, the recommendation does not recognise the progress made in improving evidence for offshore wind.
		Noted. Those recommendations under heading 6.1.3 Improving the marine management information base, reflect the fact that progress has been made in understanding, however they also note that significant gaps remain.
4.24	NRW comments relate to recommendations 7 and 8	Welcome the recognition that a precautionary approach will need to be taken where European Marine sites may be affected by plan activities although this recommendation seems only to be applied to birds and mammals. Precaution may well need to be applied when there are uncertainties about other potential receptors and not necessarily confined to European site features but other receptors such as habitats and species protected under the Biodiversity Action Plan (BAP) and Natural Environment and Rural Communities (NERC) Act Section 74. We agree, however, that precaution is particularly relevant when considering birds and mammals. Diadromous fish should also be carefully considered particularly in the case of tidal range.
		Noted.
4.25		Information gaps remain an issue for consenting both offshore wind and wave and tidal stream technologies which leads to a more precautionary approach (although we would argue that marine renewable technologies are at a much earlier stage of development, and about which there is much more uncertainty than offshore wind). Reliance on precaution can nevertheless be minimized by improving our understanding of potential effects to receptors and NRW welcomes DECC's continued support for research to help understand the effects of these activities.

#	Group	Comment/response
		Noted.
4.26		It may be possible to apply the principles of adaptive management in deploying technologies when uncertainties about impacts remain so that we can learn about their effects. This is particularly relevant to new technologies like wave, tidal stream and tidal range. However, before adopting such an approach it would be necessary to exhaust all possible conventional assessment as part of the Environmental Impact Assessment (EIA) process. It should also be recognized that with larger scale developments like tidal range which are deployed once and which will, in effect be permanent, adaptive measures will need to be demonstrably achievable, to avoid incurring adverse effects that cannot be mitigated at a later date. It may be helpful to develop guidance on adaptive management to ensure that it is applied to newer technologies appropriately.
		Noted, this can be considered in the context of the SEA research programme in relation to information gaps.
Recommendation 8 For areas which contain habitats/species listed in the Habitats Directive Annexes or those for which MCZs and MPAs have been designated, developers should be made aware that a precautionary approach will be taken and some areas may either not be leased/licensed until adequate information is available, or be subject to strict controls on potential activities.		
4.27	TCE	The Crown Estate is not a regulator and therefore we suggest the removal of the term "*leasing*" from the recommendation. It is the statutory planning/consenting/licensing process that determines the appropriateness of development which may affect certain habitats and species.
		Noted, however, the corollary of consent refusal is that a lease is not likely to be issued.
4.28		It would be helpful to clarify whether "*adequate information*" refers to the information and assessment that would arise from a developer's project-specific assessment.
		Areas have previously been withheld from licensing for oil and gas due to an inability to make a satisfactory assessment due to information gaps (e.g. Cardigan Bay). "Adequate information" may therefore either relate to information which assists making a strategic level consideration in the future, or else where appropriate, can inform a development level decision.
4.29	SNH	Note that in Scotland MPAs are not restricted solely to biodiversity interests but may also be designated for historic interests or for research and demonstration purposes.
		Noted. Historic MPAs are acknowledged in Appendix 1i of the SEA, and DECC are aware of the proposed Fair Isle Demonstration & Research MPA.
Recommendation 9 Previous SEAs have recommended consideration of the establishment of criteria in relation to underwater noise for determining limits of acceptable cumulative impact and for subsequent regulation of cumulative impact. The advances made in this respect through the establishment of the indicator on low- and mid-frequency impulsive sounds under the Marine Strategy Framework Directive are recognised. While criteria have not yet been defined, the establishment of the Marine Noise Registry database to collate occurrences of 'noisy activities' represents the necessary precursor. It is recommended that these efforts are prioritised to allow effective consideration of the cumulative impacts of underwater noise.		
4.30	NRW/SNCBs	Tools for assessing cumulative effects of noise on the mortality of marine mammals are not well developed. Whether or not Potential Biological Removal complies with the Habitats Directive is a matter of debate and the role of tools based on other approaches such as ASCOBANS and International Whaling Commission population decline limits for marine mammals is uncertain. Welcome the recommendation that work to develop criteria to determine and regulate the cumulative effects of noise should be prioritised. This is an issue that affects many technologies and as a UK wide issue it might be something that the SEA research programme could address.
		Noted.

#	Group	Comment/response
4.31		Agree that the Marine Noise Register is an important precursor to effective management of noise and are fully supportive of it, also that further work is needed to establish criteria of acceptable impact. However, the limitations to the data that are recorded in the registry should also be recognised. It does not require any reporting of source level or frequency range, will not record other noisy activities e.g. operational turbine noise, high frequency Acoustic Harassment Devices (AHDs) and does not require any kind of forward look to enable planning, all of which would be precursors to effective noise management.
		Noted.
Recommendation 10 Beaked whales are very sensitive to anthropogenic noise (particularly to powerful sonar but potentially also to seismic survey) and their behaviour makes them difficult to observe visually or acoustically as part of implementation of standard seismic survey mitigation procedures. In recognition of this, it is recommended that opportunities to enhance mitigation measures for beaked whales beyond those in the JNCC guidelines for minimising the risk of injury and disturbance to marine mammals from seismic surveys should be considered during deep water seismic survey planning and implemented during operations.		
4.32	SNCBs comments relate to recommendations 10 and 15	We agree with the caution shown in the SEA around current mitigation measures for beaked whales and deep-diving species in areas such as the Rockall Basin and the Faroe-Shetland Channel. A possible increase in oil and gas exploration in areas like these raises conservation concerns given the large abundance and diversity of marine mammals (over 20 species of cetacean) and the presence of deep diving species, such as beaked whales, which may be particularly sensitive to noise. Should further, large scale, exploration take place in these areas, it may be advisable to review current mitigation measures, monitoring efforts, baseline information and the suitability of available environmental risk assessment approaches. For example, as highlighted in the SEA report there is uncertainty about the effectiveness of current mitigation measures for beaked whales. It would be helpful if the SEA report provided examples of measures that could be explored in order to reduce risk to this group of whales.
		An authoritative review of beaked whales in UK waters has been commissioned as part of the supporting information to this SEA; it includes new information on life history, diving behaviour, ecology, noise impacts, approaches to monitoring and options for mitigation. This will be published on the SEA pages of gov.uk website in due course.
Recommendation 12 The nature and uses of the range of estuaries and embayments in which tidal range developments have been and may be proposed vary widely. Similarly there is a wide diversity in the type and location of installations proposed to exploit tidal range. Consequently it is recommended that site specific assessments are undertaken before decisions can be taken on potential leasing and the desirability and acceptability of individual projects, and that successive tidal range proposals should consider the potential for local, regional and wider far-field effects to be generated cumulatively. Such assessments will require a broad subject, spatial and temporal consideration e.g. coastal defence trends and plans, local and regional nutrient flows and siltation patterns, feasibility of compensatory measures for effects on Natura 2000 sites, effects on endangered diadromous fish, and the importance for waterbirds the UK assumes during extreme cold winters.		
4.33	TCE	Do not agree that "*site specific assessments are undertaken before decisions can be taken on potential leasing and the desirability and acceptability of individual projects*" and ask that the statement is rephrased. TCE do not undertake site specific assessment. We expect developers to undertake these as required by the existing statutory planning regime in order to obtain consents, and require developers to obtain all necessary project consents before a lease becomes effective.
		It is understood that TCE do not undertake such assessment. The recommendation reflects the fact that site-specific assessment will be required to inform the consenting process and leasing decisions.

#	Group	Comment/response
4.34		We note that the suggested subject matter of the recommended assessment is not an exhaustive list of the impact/receptor topics that developers will be required to assess for their project proposals as part of the consenting process. As such, the subjects to be assessed should be dictated by the relevant legislation. We also note that the lack of clarity in the recommendation on at what stage of the legislative "hierarchy" such assessments should be undertaken, and by whom, could potentially lead to challenge of land owners' decisions with regard to their role in leasing and awarding rights, whether or not there is a legal basis for such a challenge.
		The topics are given as examples, and moreover fall within the definition of areas that would be considered at the project level (e.g. at the EIA or HRA screening stage). The recommendation reflects the fact that the site and technology-specific nature of tidal range is such that conclusions on these types of development can only be definitively made at the development stage. The recommendation does not imply, nor should it be interpreted as, suggesting any additional work than would be undertaken as part of the statutory process, for example under the Planning Act 2008, and environmental submissions required as part of project consenting.
4.35	SNH	While tidal range development within Scotland falls outwith the scope of this Plan and SEA, such developments off Cumbria, and the southern Solway coastline in particular, could affect sites and features in Scotland.
		The Energy Removal assessment section includes information on the far-field impacts of tidal barrages. Whilst this section does not directly mention impacts in Scottish waters from tidal range developments in English or Welsh waters, it does discuss the significant potential spatial extent of impacts, over 100's of km's in certain cases. As part of project specific assessment, developers will be expected to undertake modelling of potential effects on sediment dynamics and consider the implications of projects on wider UK waters as applicable, irrespective of the administrative boundaries.
4.36	NRW/SNCBs	The plan for offshore energy development is at a very high level which does not allow for very detailed analysis of the issues associated with each of the technologies at specific locations. Tidal range developments, in particular, have the potential to have environmental impacts over large areas and, whilst some risks may be avoided or mitigated by careful siting of individual deployments (or through operation controls), it may not be possible to mitigate or compensate for others. Planning the deployment of these technologies, to ensure that they are deployed in locations that are 'appropriate' and take count of environmental risk, is therefore critical. We agree therefore that more detailed analysis/assessment of tidal range locations (which are mostly now known) is desirable before sites are leased and at an appropriate geographical scale.
		Noted.
4.37		Large scale tidal range developments will raise a number of issues that, in some cases, would be better addressed strategically rather than at the project level. For example, the cumulative and/or in-combination effects of multiple developments in the Severn estuary (and possibly at other locations) and the possible need for measures to compensate for potential adverse effects on European Marine sites have already been identified by the Severn Tidal Power Feasibility Study as significant challenges. Furthermore, the identification of compensation for tidal range development may conflict with existing arrangements for delivering compensation for other schemes such as that required for shoreline management plans. The combined effects of tidal range development and shoreline management planning may also result in increased coastal squeeze that will have implications for important habitats and species including those that are features of European Marine sites. It would be difficult for an individual developer to address these issues effectively. We note the announcement by UK Government of a review into the feasibility of tidal lagoons and we are hopeful that this process will carefully consider the benefits of a coordinated and planned approach to development that is more efficient and effective for industry, regulators and advisors.

#	Group	Comment/response
		As indicated in the response to 2.14, above, the effects (potential negative and positive) of tidal range developments need to be considered in the context of the objectives and requirements of amongst others, shoreline management plans, maintenance of the status of Natura 2000 sites and the water framework directive. Whilst it is agreed that a strategic approach to this consideration would be beneficial in highlighting the issues, firm understanding of the magnitude of impacts, particularly cumulative ones, will rely on having sufficient information both on the proposed nature of projects and the environmental character and interactions (e.g. migratory fish) with specific project designs – this is the basis of recommendation 12. Also refer to response to 2.11 on potential future national policy on tidal range development.
4.38	TLP	Support this recommendation, and on the basis of, "*site specific assessments are undertaken before decisions can be taken on potential leasing and the desirability and acceptability of individual projects, and that successive tidal range proposals should consider the potential for local, regional and wider far-field effects to be generated cumulatively*", there should be no restriction of areas offered to tidal lagoons for leasing and licensing (temporally or spatially).
		The SEA has not specifically indicated that temporal or spatial exclusions for tidal range developments should be proposed at the strategic level, however the leasing/licensing of sites is on the basis of site specific assessment, as indicated in the recommendation, and therefore the appropriateness of a particular development (alone or in combination with others) will need to be considered at that level.
Recommendation 13 The subject of cumulative effects assessment (CEA) is challenging at project, industry and strategic levels, and is frequently raised by stakeholders as an issue. The establishment of a Cross-Government Cumulative Effects Assessment Working Group is welcomed as, is its aim to develop guidance for regulators, advisors and applicants to help increase consistency in application of CEA. At all levels of assessment, guidance on the spectrum of certainty and the point beyond which CEA is considered conjectural would be useful.		
4.39	NRW/SNCBs	NRW welcomes the recognition that further clarity on cumulative effects assessment is needed as this is likely to be a major challenge for future consenting of a number of offshore energy technologies, especially tidal stream and tidal range.
		Noted.
4.40		The SEA makes reference to the roles of risk-based approaches to consenting and adaptive management in minimising and managing environmental risk. These terms are increasingly used within the marine energy sector with little shared understanding or agreement for what they mean in practice. NRW believes that the SEA recommendations could usefully recognise this and consider how they might be developed in a consistent, transparent and proportionate manner for each of the sectors.
		Noted. This is not regarded to be an issue for the SEA recommendations; however it is highlighted here to raise awareness of this issue across sector regulators and developers.
4.41		The amount of site characterisation data necessary to interpret the potential risk of development of the different technologies should be explored, particularly to support assessment of mobile species but also other receptors such as physical processes. It is sometimes the case that conventional approaches to gathering data (e.g. two years mammal and bird data) is insufficiently robust to be of value in the consenting process. A cross-sector review is something the SEA research programme might usefully undertake to inform development of good practice recommendations.
		Any recommendations for research will be considered in the context of wider priorities relating to information gaps, and can also be discussed with the SEA steering group.

#	Group	Comment/response
Recommendation 14 Although there has recently been significant boat based and aerial survey effort in coastal waters, there is a general lack of modern survey data on waterbirds in offshore areas. Adequate data on waterbird distribution and abundance is a prerequisite to effective environmental management of activities, for example, in timing of operations to avoid periods of particular sensitivity. A comprehensive analysis of the European Seabirds at Sea (ESAS) database was undertaken to identify possible marine SPAs but gaps in spatial coverage necessitated the use of interpolation to estimate values for un-surveyed areas. The development of high-precision tracking devices has led to a recent upsurge in bird tracking studies, and for some species several hundreds of individuals have been tracked from numerous colonies around the UK, allowing the marine distribution of some species to be predicted from tracking data. It is recommended that the results of cross-validations of models of marine distribution derived from tracking individual birds with those from at-sea survey are assessed to inform decisions on the nature and location of waterbird distributional research.		
4.42	SNCBs	The report considers some migrating marine birds within the Irish Sea. However there is very little assessment provided on terrestrial bird movements across the Irish Sea, such as waders. There may be migration movements across the Irish Sea that have not been considered as a large number of birds migrate to and from Ireland (particularly during severe weather in the UK). The lack of knowledge on these and other movements could have been recognised as a data gap for future research and monitoring to inform projects.
		Recommendation 14 acknowledges there is a general lack of modern survey data for waterbirds in offshore areas; the SEA here did not restrict this to North Sea offshore areas, but was in reference to all offshore areas around the UK, which would include the Irish Sea.
Recommendation 18 There is a need for enhanced, strategic level understanding of biodiversity and its patterns in UK waters, in particular for the species (e.g. the bivalve *Arctica*) and features (e.g. habitats characterised as seapens and burrowing megafauna communities or burrowed mud) used as the bases for MCZ/MPA identification and designation, to inform considerations of site integrity and the assessment of proposed activities impinging on sites.		
4.43	SNH	We would expect the work outlined [need for enhanced, strategic level understanding of biodiversity and its patterns in UK waters...to inform considerations of site integrity and the assessment of proposed activities] to be informed by existing resources such as FEAST (Feature Activity Sensitivity Tool).
		Noted.
4.44	NRW/SNCBs	We agree that there is a need to enhance our strategic level understanding of biodiversity and its patterns in UK waters to inform considerations of site integrity. The integrity of our MPA network as a whole, as well as on a site by site basis, should also be considered.
		Noted.
Recommendation 19 There is little information available on the interaction of birds, marine mammals and fish with surface and submerged wave and tidal stream and range generation devices. It is recommended that for the deployment of single devices and small arrays, appropriately focussed surveys of animal activity and behaviour should be undertaken to inform commercial scale deployment risk assessments and consenting. A strategic and coordinated approach to such research is recommended since the results will be of wider application; research results should be made publicly available where ever possible.		
4.45	SNH, NRW, TCE	Emphasise to DECC the value of ORJIP Ocean Energy in indicating relative priorities for research relevant to the wave and tidal renewables sectors.
		Noted. *Also, please refer to response to 4.5 above.*
4.46	NRW	The emergence of tidal range in particular has highlighted a number of key gaps in our knowledge of the implications of these developments. We welcome the extension of the scope of ORJIP Ocean Energy to include tidal range. NRW is preparing its response to the ORJIP Ocean Energy Call for Evidence, a summary of which has been provided as an annex. NRW would be happy to discuss any of the above areas with you in formulating the OESEA research programme.

#	Group	Comment/response
		The SEA research programme will maintain awareness of and liaison with ORJIP Ocean Energy. *Also, please refer to response to 4.5 above.*
4.47	SNCBs	We agree and note that it is recommended that for the deployment of single devices and small arrays, appropriately focussed surveys of animal activity and behaviour should be undertaken to inform commercial scale deployment risk assessments and consenting. However, because a method of mitigation is to avoid areas with high bird densities then it may be difficult if densities are so low that it is not possible to do any meaningful monitoring. Monitoring use of single devices or small arrays to test monitoring approaches as a proof of concept for a technology to monitor collision/avoidance, on the other hand, would be feasible. For example, trialling the use of underwater cameras could be considered to test a technology to see whether the clarity and resolution would be enough that we would be able to detect sensitive receptors, if they were there.
		Noted. At present, single devices and single arrays provide the only opportunity to gather site-specific information and should be utilised where possible; obtaining information on animal activity and behaviour in association with these devices, even on a small scale, adds to our overall understanding. This research is likely to trial new technologies, as has been seen in tagging studies for breeding seabirds where different tagging technology has been used and compared.
4.48	Marine Scotland	Agree that appropriate surveys of animal activity and behaviour should be undertaken to inform commercial development [for wave and tidal].
		Noted.
4.49	Vattenfall	Vattenfall participates in ORJIP and hosts the study at Thanet Offshore Wind Farm. The project aims to better understand bird avoidance behaviour within and around wind farms and tests the efficacy of deterrence devices. The OESEA should take steps to understand the ORJIP findings.
		Awareness of other research programmes, their priorities and outputs, is maintained throughout the SEA programme. *Also, please refer to response to 4.5 above.*
Recommendation 20 For some areas there is excellent data on seabed topography and texture from multibeam mapping undertaken under various auspices including by the MCA, BGS and the SEA programme. The NERC Marine Environmental Mapping Programme (MAREMAP) and the scoping study for a UK National Seabed Mapping Programme are noted. However, significant gaps in coverage remain, and continued effort should be focussed on developing comprehensive coverage of the UKCS, prioritising areas of industrial and conservation interest.		
4.50	TCE	TCE has recently been involved in steering work to scope a UK-wide seabed mapping programme which seeks to identify opportunities for greater public and private sector collaboration to increase seabed mapping coverage around the UK. This would be a useful consideration in relation to this recommendation and the ongoing SEA research programme.
		Noted.
4.51	NRW/SNCBs comments relate to recommendations 20 and 21	The research undertaken by the OESEA has been of considerable value in helping to reduce uncertainty, though with limited focus to date on wave and tidal technologies. As the range of marine renewable technologies diversifies NRW would encourage DECC to continue to evolve the research programme as far as stretched budgets allow. Understanding the evidence gaps for tidal range is not well developed although work to identify these is now underway through ORJIP Ocean Energy. It is our view that the marine energy element of the OESEA research programme should be guided by the evidence prioritisation work that ORJIP OE has undertaken for wave and tidal stream developments and will soon undertake for tidal range.
		Please refer to response to 4.5 above.

#	Group	Comment/response
Recommendation 21 The information collected by offshore renewables and oil industry site surveys and studies is valuable in increasing the understanding of UK waters. The initiatives such as the UKOilandGasData, Marine Data Exchange and UKBenthos databases to ensure that such information is archived for potential future use should be continued and actively promoted during the consenting processes. Similarly, there should be encouragement for the analysis of this information to a credible standard and its wider dissemination.		
4.52	TCE	Welcome this reference to existing data resources, and note that the Wave and Tidal Knowledge Network (WTKN) is another source of information that could be promoted.
		Noted.
Recommendation 22 The volumes of rock used for example in cable armouring, foundation scour protection and pipeline protection and upheaval buckling prevention must be the minimum required to provide the necessary protection in order to minimise permanent habitat change and to ensure areas developed as a result of the current draft plan/programme are left fit for other uses after decommissioning. Alternative methods of protection/control should be considered to minimise the potential for permanent habitat change.		
4.53	TCE	Agree with the principle of this recommendation, but note that it should be recognised that for new, early stage projects, rock armouring may be the most appropriate/cost effective/safest method. The regulatory process will ensure that methods and any volumes of armouring proposed are justified.
		Whilst the regulatory process allows for the assessment of the potential effects at a project level, it is the role of the SEA to highlight at a strategic level where it is of stakeholder interest. The volumes presented as potential worst case estimates of rock armouring in developer EIAs has drawn SNCBs attention in recent years, and additionally how this worst case estimate relates to the actual quantities of protection materials used. This recommendation reflects that interest.
Recommendation 24 Whilst it is recognised that most developers in the marine environment have Health, Safety & Environmental management systems in place, it is recommended that companies involved in the planning, undertaking and control of marine activities resulting from the current draft plan/programme operate Environmental Management Systems which are consistent with an international standard.		
4.54	TCE	Recognise that this recommendation aspires to achieve more consistency between sectors and developers, we note that depending on the international standard intended (e.g. compliance with ISO14001) it may not be possible for all developments to meet this recommendation (e.g. some small-scale operators while having some form of EMS may not have the resources to comply). In such cases, this recommendation could be seen as adding a regulatory burden to developers.
		Noted.
Recommendation 25 Site surveys for marine developments can identify unexploded ordnance (UXO), which is either left *in situ* or rendered harmless through attachment and detonation of an explosive charge. Human safety is paramount in such decisions, but the potential to minimise the cumulative effects of the percussive noise on marine mammals should be explored, in particular in relation to conservation sites established or proposed for seals or cetaceans in areas of relatively high UXO occurrence e.g. the southern North Sea.		
4.55	TCE	Note that this recommendation relates to efforts underway to implement the UK's approach to management of underwater noise via the Marine Strategic Framework Directive; it would be helpful to highlight this link post-consultation for alignment purposes.
		Noted.
Monitoring		
4.56	SNH	While aware that the SEA Regulations allow for the inclusion of other monitoring programmes in full or partial delivery of monitoring requirements, we do not believe that any of these, in themselves, will be sufficiently relevant to enable the environmental effects of this Plan to be identified and discriminated. We believe a bespoke programme of monitoring is required to deliver this, in particular for gauging effects of offshore renewables development, and also those linked to cumulative effects from all relevant industries of underwater noise on marine mammals.

#	Group	Comment/response
		The SEA has contributed to monitoring as part of a series of seabed surveys, including most recently those of the Fladen Ground and Mid North Sea High area. In relation to renewables, as part of post-consent monitoring the MMO are responsible for providing a synthesis of information collected as to the impacts of renewables on a range of receptors, however it is acknowledged that further information and synthesis would be useful. There are also possible synergies to be drawn from marine spatial planning and marine plan review periods, and other commitments for example through MSFD which can assist delivering a set of monitoring metrics that can be used for the SEA.
4.57	Vattenfall	The OESEA should ensure/support adequate monitoring of the effects of the plan on populations of those birds and marine mammals of most concern for specific developments (for example, seabirds and harbour porpoise). If this work is not being directly conducted under OESEA, then other relevant institutions should be resourced accordingly.
		The UK Government are committed to monitoring species and habitats across the UKCS to fulfil several requirements including those of the Marine Strategy Framework Directive and of the Habitats and Birds Directives.
4.58	SPR	As part of the RenewableUK Consent and Licensing Group, SPR have been in actively engaged in discussions with Natural England regarding strategic monitoring to address outstanding data gaps. The monitoring activities of this and future SEA's, could make a meaningful contribution to addressing outstanding data gaps and reducing the uncertainty that exists within the marine environment.
		Noted, also please refer to responses to recommendations 14-21.
4.59	SPR, Energy UK, RenewableUK	We are supportive of coordinating ongoing research through the SEA steering group but would ask that this is done in consultation with industry.
		Steering group membership is such that representatives from a range of Government, non-governmental and industry bodies can share their views and have input to the SEA process, including its research programme. DECC value the inputs to this process from industry through the steering group.

2.2.5 Environmental baseline

#	Group	Comment/response
		General comments
5.1	SPR, Energy UK	Welcome the statement within the Environmental Report that "the Southern North Sea contains the bulk of the current UK offshore wind capacity, both in operation and planning. The area remains highly prospective for offshore wind due to its shallow depths and the potential for suitable grid connections. It is possible that further areas may be leased (including by extension) for commercial offshore wind." However, further clarity is required on the baseline for the plan in terms of offshore energy projects in planning, consented and operation and how these have been taken into account within the environmental assessment.
		The location and status of projects, correct at the time of publication, are provided in Appendix 1h, and are also broadly mapped in the main Environmental Report.
5.2	SPR, Energy UK, RenewableUK	Welcome recognition within the OESEA that the baseline for many of species of birds and marine mammals has the potential to change due to other external factors such as climate change. It is therefore important that these changes are considered carefully within strategic and project based assessments, and that activities such as the development of offshore wind farms are not subject to onerous management due to changes in the baseline, particularly where the development may help mitigate this change to the baseline (for example energy generated from offshore renewables can help mitigate the impacts of climate change).
		Noted. Each baseline section of the SEA (refer to Appendix 1a-h) contains sections detailing the likely evolution of the baseline which seeks to inform potential changes e.g. in relation to climate change for each topic. This information is also summarised in Section 4.4 of Environmental Report.

#	Group	Comment/response
5.3	Isle of Man Government	We have published "The Manx Marine Environmental Assessment" which provides a comprehensive source of information on the Manx marine environment with reference to baseline data that you may wish to take account of in future. Note that currently only UK designated sites have been listed and mapped. Suggest that with regard to future considerations of environmental impacts and constraints it would be useful to display those in the Isle of Man and its waters, including the Ramsey Marine Nature Reserve. Note that the whole of the Isle of man and its territorial waters has just been designated as a biosphere reserve and request support in seeking to ensure the future environmental sustainability of the area.
		The above additional information is welcomed and will be referenced as applicable in future work, and awareness is drawn to these sources in this document for consideration in any relevant development.
5.4		Isle of Man holds seabird populations exceeding 1% of the British populations for cormorant, shag, herring gull, great black-backed gull, little tern and black guillemot, and of particular note is the seabird recover project on the Calf of Man and the recovering Manx shearwater colony. Other important resident birds include divers; red-throated, black-throated, great northern and an increasing population of breeding peregrine falcons.
		Noted.
Environmental Baseline Summary: Section 4		
5.5	SNCBs	We advise that the water environment section should make reference to chemical and microbiological contamination by soluble and dispersed discharges including e.g. produced water, saline discharges (aquifer water and halite dissolution), and drilling discharges (from wells and foundation construction) and accidental events - contamination of the water column by dissolved and dispersed materials from oil and chemical spills or gas releases.
		The comments are noted and better signposting to the relevant information could have been made within the section. A review of existing contamination is provided in Appendix A1b.14.3 which includes information such as produced water discharges. Relevant baseline information is also provided in the Marine discharges assessment in Section 5.9.
5.6		We suggest it would be useful as quick reference to have an Annex listing all current SACs/SPAs per region along with any currently proposed. We advise that there are ongoing consultations on proposed Special Areas of Conservation for harbour porpoise in the North Sea, Irish Sea, and west coast of Scotland.
		Please refer to Appendix 1j which lists those sites per Regional Sea. DECC are aware of ongoing consultations relating to both SACs and SPAs in UK waters.
5.7		It is worth noting that there is increasing evidence that the coastline of Northumberland (the southern part of Regional Sea 1) is important for various marine mammal species, in particular the white beaked dolphin.
		Noted.
5.8		Advise that there is now a sizeable breeding colony of grey seals along the North Norfolk coast (in 2015, it recorded more pups than at Donna Nook). Annual reports on seal populations are available from the Special Committee on Seals (SCOS).
		Noted. Appendix 1a.8 provides more detailed information, including a summary of the SCOS data.
5.9		It should be noted that both species of seals [harbour and grey] are also present in the Thames Estuary.
		Noted. Please refer to Appendix 1a.7 where descriptions and plots of marine use are presented.
5.10		The other users section of the evolution of the baseline appears to be very focussed on offshore wind and needs better consideration of displacement, implications and impacts to the environment by the existing activities particularly in the nearshore environment and in estuaries due to tidal range.

#	Group	Comment/response
		Offshore wind is proportionately represented in the section, the primary focus of which is the status and trajectory of other users of the sea. Environmental concerns are dealt with in other sub-sections of the evolution of the baseline.
5.11		We question what standards are referred to when metal concentration is considered unacceptable. We suggest reference is made to barium, which in the form of barite is used as a weighting material to increase the density of drilling muds and thus can be considered an indicator of drilling contamination.
		The section refers to the OSPAR (2010) Quality Status Report which in turn refers to the Coordinated Environmental Monitoring Programme (CEMP) which has a set of agreed assessment criteria. Also, please refer to Section 5.9.2.2 for reference to drilling discharges.
5.12		Suggest utilising papers by Jepson *et al.* (2016) and Murphy *et al.* (2015) that investigated the levels of contaminants (organochlorine pesticides and polychlorinated biphenyls) in various species of marine mammals, concluding that these contaminants are likely to cause population decline or suppress population recovery.
		Noted.
5.13		We question why only shallow sediment and reefs have been referred to as being damaged by bottom fishing practices.
		Please refer to Appendix 1a of the Environmental Report, where more information is provided.
5.14		The sentence "*Safety zones around surface infrastructure will likely locally reduce trawling activities in these areas thereby reducing trawling pressure on benthos*" should be removed, as it is a specific, biased instance of impact in a paragraph concerning high-level description.
		Noted, this interaction is juxtaposed against the potential effects of technologies covered by the draft plan/programme.
5.15		It should be noted that due to the cryptic nature of their preferred habitat along the Welsh and southwest English coastlines (e.g. in caves), there is a national under-reporting of grey seal abundance by SCOS (the Special Committee on Seals). This is an issue that requires further research in the future.
		Noted.
5.16		*Lophelia pertusa* and *Atrina fragilis* are considered here to be some of the most sensitive features in the UK; however no further reference is made to *Atrina fragilis* in the main report or Appendix A1a2.
		It is noted in Section 4.3.1, under Regional Sea 7, that the Small Isles MPA contains the only known aggregation of fan mussels in UK waters. This is noted in Appendix 1j both with reference to the Small Isles MPA and also under wider species conservation lists for the UK.
Landscape/seascape		
5.17	SNH	The UK Context is overly Anglo-centric in the approaches and methodologies outlined and level of detail for each country provided. From this there is the concern that there could be limitations or inconsistencies in approaches required from the next tiers of assessment which are raised in this SEA.
		The information provided primarily relates to a strategic level consideration of information sources and methods of landscape and seascape characterisation.
5.18		There is no mention of the SNH guidance on coastal character assessment.
		It is understood that this guidance is still in draft form, however it is noted here and acknowledged as a source of guidance for development level assessment in Scottish waters, and any final/updated version will be considered in future assessment.
5.19		Introductory descriptions of Scottish coastal character in the Features sections A1c5 to A1c11 are limited in content and scope of description, and inconsistent to relation to level of information provided across these sections. This is a UK wide SEA, which should be highlighting the wide variety and diversity of all its coastlines. It is important that the SEA refers to all coastlines, consistently, so as to feed into future and more detailed tiers of assessment and plans.

#	Group	Comment/response
		The SEA recognises the wide diversity of coastal character types, for example with reference to the work previously undertaken to describe the various seascape units around the UK coast, in part commissioned under the previous OESEA. The SEA also recognises the large body of literature that has developed in recent years to describe the character of landscapes, adjoining coasts and seascapes through multiple initiatives outlined in Section A1c.2, and draws attention to these for consideration, whilst recognising that a reproduction of summaries included for these areas is beyond the scope of the SEA.
5.20		Two additional sources of information are relevant: • Inventory of Historic Gardens and Designed Landscapes – managed by Historic Environment Scotland (HES); • Historic Land use Assessment RCAHMS (now HES) – revised in 2015.
		Noted.
5.21	Cadw	In Wales, there is a Register of landscapes of Outstanding Historic Interest.
		These are noted in Section A1c.3.1.5 of the Environmental Baseline (Appendix 1).
5.22		In addition to landscape, seascapes are also recognised in marine planning.
		Noted. The characterisations undertaken for the East and South Marine Plans are considered in Appendix 1c.
Cultural Heritage		
5.23	Cadw	Wrecks: The enhancement of the Welsh maritime database should be mentioned alongside other enhancement projects in the UK.
		Noted. This will be referred to in future work.
5.24		Bring attention to the Arfordir Project, which was a volunteer-led recorded project around the coast of Wales, concerned with sea-level change.
		Noted. This will be referred to in future work.
5.25		Bring attention to the regional Historic Environment Records (HER) held and maintained by the Welsh Archaeological Trusts, which now have a statutory footing under the Historic Environment (Wales) Act 2016. Available via www.archwilio.org.uk for non commercial use.
		Noted. This will be referred to in future work.
5.26		In Wales, underwater assets, including wrecks, may be scheduled or designated. The Historic Environment (Wales) Bill gained Royal Assent in March 2016 and site designations will need to be amended to take account of the Act.
		The Bill was noted in Appendix 1h but at the time of publication was yet to be enacted. Changes resulting from the implementation of the Act will be noted and referred to in future work.
5.27		Regional Sea 4 requires more emphasis on the River Severn and Gwent Levels, including significant finds such as the Newport Ship, Barlands Farm Boat and Magor Pill. Further consideration should also be given to later prehistoric coastal routes and the importance of the Iron Age in south Wales.
		Noted.
5.28		The report should consider major ports in the region, including Chepstow, which dated from the Norman period and flourished in the 15th-16th century and the Roman port of Caerleon. In light of the global importance of the ports of Cardiff and Swansea in the 19th and 20th century, there is the potential for offshore associated finds in these areas.
		Whilst the chapter did not make specific reference to these areas, it is noted that the long maritime history of the UK makes its waters particularly prospective for finds, including those associated with trade.

2.2.6 Other issues raised/comments

#	Group	Comment/response
6.1	TCE	Discussions have taken place recently between offshore wind developers, regulators and statutory nature conservation bodies on developing a more joined-up, strategic approach to post-consent monitoring. Given the overarching role of the SEA process in facilitating plans for offshore energy development, we believe the SEA research programme should assist in coordinating this.
		DECC are responsible for monitoring the implementation of the draft plan/programme as indicated in Section 6.2, with post-consent monitoring being the responsibility of a number of relevant Competent Authorities depending on their remit (e.g. the MMO). DECC look forward to further engagement on this issue through the SEA steering group, of which TCE are a member.
6.2	SEPA	We would request that a copy of the post-adoption statement be sent to us via the Scottish Government SEA Gateway on publication.
		Noted.
6.3	WDC	The UK needs to develop a surveillance monitoring strategy to comply with Article 11 of the Habitats Directive. Whilst SCANS surveys are an important component of this, local and regional surveys and surveys undertaken throughout the year are required. Funding for such a strategy will need to come from all marine users, including the oil and gas industry. As key data providers and users, the development of a strategy should include NGOs.
		Efforts are underway to develop an integrated monitoring programme for biodiversity with the support of all users (see Defra 2014 Marine Strategy Part Two: UK Marine Monitoring Programmes. Published by the Department for Environment Food and Rural Affairs on behalf of HM Government. July 2014. 86pp. https://www.gov.uk/government/publications/marine-strategy-part-two-uk-marine-monitoring-programmes)
6.4		WDC remains committed to the SEA process but are very concerned that, despite the effort and expense involved, it contributes little to increased environmental protection. We would be happy to meet with DECC to discuss these concerns.
		Successive SEAs have identified data gaps, made recommendations (including on spatial considerations in advance of formal marine planning), has excluded certain areas from oil and gas licensing on the basis of limited evidence on many potentially vulnerable components of the marine environment, and has commissioned a variety of studies to help improve understanding of animal ecology (e.g. seal and bird tagging studies) and potential effects of activities related to former and future leasing/licensing. The SEA programme is run continuously so that further research may be commissioned, which is informed by (amongst others) the SEA recommendations, input from the SEA Steering Group, dialogue with other Government departments, NGOs and those undertaking research as part of other initiatives.
6.5	RenewableUK	Recognise the need for a better understanding on the potential impacts associated with the deployment of wave and tidal stream devices ahead of their commercial deployment, which could be considered under the OESEA research programme.
		Noted. The SEA research programme continues to identify and prioritise further research in this area. Also please refer to recommendation 19.

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