



Department of Trade and Industry

**Strategic Environmental Assessment of Parts
of the Central & Southern North Sea
SEA 3**

**SEA 3 Post Public Consultation Report
Including comments on the
Extension to SEA 2**

January 2003

CONTENTS

1	Introduction.....	3
1.1	Background	3
1.2	Overview of the consultation process	3
1.3	Purpose of this document.....	3
2	Habitats-directive.org.....	4
2.1	Introduction	4
2.2	Web hits and pages/document reviewed statistics.....	4
3	Consultation Issues.....	5
3.1	Consultation input received	5
3.2	Consultation issues with DTI responses and clarifications	6
3.3	SEA 2 Extension – Consultation issues.....	15
	Appendix.....	i

1 INTRODUCTION

1.1 Background

Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment (hereafter called the SEA Directive) entered into force on July 21 2001. The United Kingdom, as a Member State, is required to comply with the Directive before 21 July 2004. The Department of Trade and Industry has adopted a proactive attitude towards this Directive and in 1999 commenced the use of Strategic Environmental Assessment (SEA) as a planning tool prior to the 19th Round of offshore licensing. It is planned to use SEA before all future Licensing Rounds for hydrocarbon exploration and production on the UK Continental Shelf (UKCS). In order to prioritise and expedite the process, the UKCS has been sub-divided into eight areas. The 1st SEA (SEA 1) covered parts of the formerly disputed area between UK and Faroese waters (an area which was known as the “White Zone”). The 2nd Strategic Environmental Assessment (SEA 2) completed during 2001, addressed the implications of licensing for oil and gas exploration and production, some unlicensed parts of the offshore North Sea. In 2002 the SEA process focussed on parts of the central and southern North Sea referred to as SEA 3, prior to a 21st Licensing Round. The DTI initiated the SEA 3 process in autumn 2001.

1.2 Overview of the consultation process

Key elements of the SEA 3 consultation were:

- SEA website
- Initial scoping consultation with a range of academics and conservation organisations (focussed on ascertaining seabed survey needs) (autumn 2001)
- Wider stakeholder scoping consultation involving over 230 stakeholders. The scoping exercise was carried out electronically, (through circulation of a scoping pamphlet) (spring 2002)
- Stakeholder dialogue meeting at the draft assessment stage (summer 2002)
- A 3 month public consultation period following publication of the SEA 3 assessment and supporting documents on the website (autumn/winter 2002)
- Post consultation report (early 2003)

In keeping with the Government’s move towards “less paper” where feasible, scoping and subsequent consultation was conducted electronically where appropriate using e-mail and the SEA website.

In addition, the SEA 3 documentation could be requested in hard copy or on CD. The formal public consultation period on SEA 3 commenced on the 14 September 2002 and lasted for 90 days. Responses were received via the website, e-mail and letter. These responses have been summarised in this report and are available in full on the SEA website.

1.3 Purpose of this document

This document summarises the issues and comments received during the 90 day public consultation period following issue of the SEA 3 Consultation Document, and provides factual and technical clarifications together with DTI responses regarding policy, regulatory and other controls, and future plans where appropriate.

The document also contains a summary of feedback received regarding the DTI proposal to make a minor modification to the SEA 2 area to cover an additional 14 blocks immediately adjacent to the

SEA 2 central North Sea area, and then to offer these blocks for licensing in the next Licensing Round.

2 HABITATS-DIRECTIVE.ORG

2.1 Introduction

Visitors to the www.habitats-directive.org website are encouraged to register, to allow news from the site to be mailed to them.

The site is designed to be user friendly and is formatted in a series of sections, each of which is accessible from the navigation bar.

All documents were placed on the site in pdf format for downloading and in addition the Consultation Document was converted for viewing on the web. To aid navigation through a many paged document, the section content list indicated the current viewing location. A search facility was also included.

A comments facility was provided, where users could comment on individual sections within the Consultation Document, on the technical reports, or on the SEA process in general.

In addition to the web based documents the site included an ordering facility for the documents in paper form or CD.

2.2 Web hits and pages/document reviewed statistics

To allow the relative success of the website as a vehicle for public consultation on SEA 3, the number of visits to the site and individual reports and pages accessed was recorded. A summary of these statistics is provided in the series of histograms below.

Figure 1 – Number of views of individual web pages

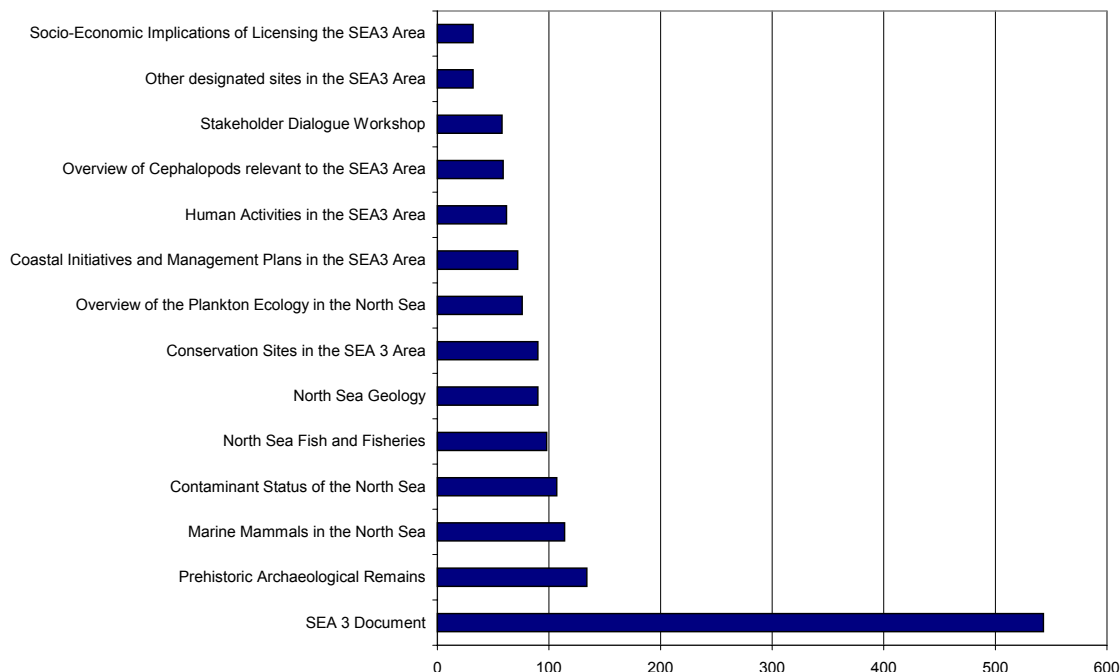
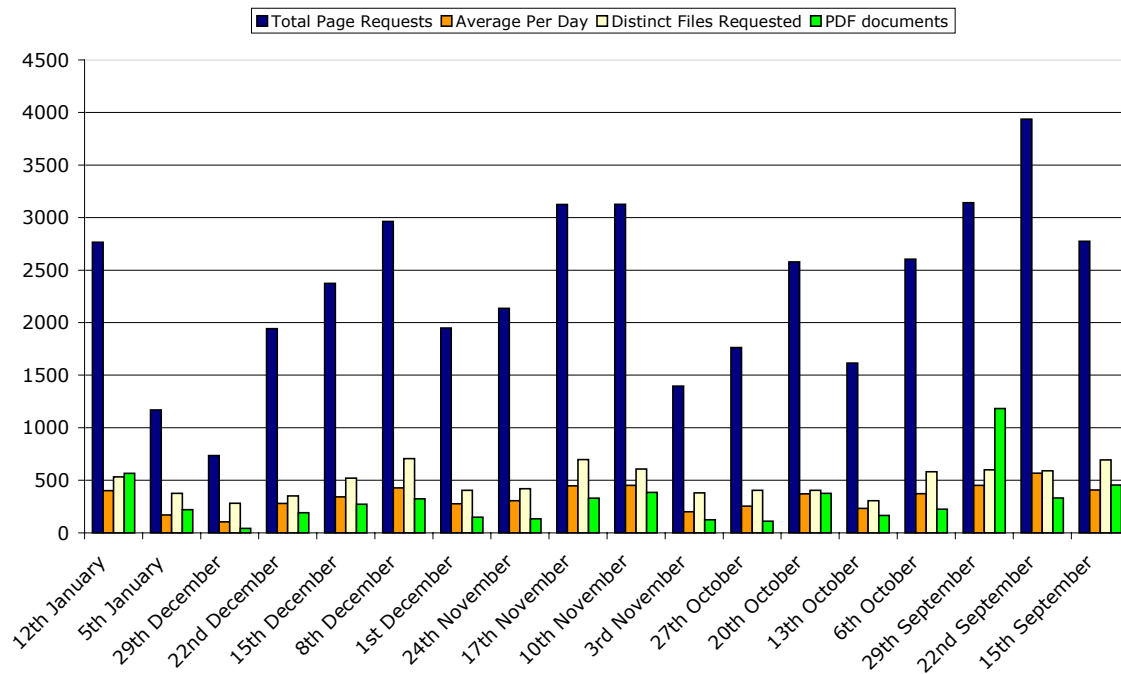


Figure 2 – Number of pages requested during the SEA 3 consultation period and to date



3 CONSULTATION ISSUES

3.1 Consultation input received

Responses were received via the SEA website and as e-mailed or hard copy correspondence to the DTI. Feedback relevant to the SEA 3 public consultation was received from:

- Joint Nature Conservation Committee (JNCC)
- English Nature
- Environment Agency
- Royal Society for the Protection of Birds (RSPB)
- Joint Marine Programme (JMP) - The Wildlife Trusts and Worldwide Fund for Nature (WWF)
- Marine Conservation Society (MCS)
- English Heritage
- Institute of Field Archaeologists (IFA)
- Wessex Archaeology

For ease of reader access, consultee comments have been summarised and grouped in Section 1.2 (by subject or SEA 3 Consultation Document Section), together with clarifications and DTI responses which are given in italicised text following each comment. Where author approval was given, full texts of consultee comments are available on the SEA website.

Feedback relevant to the SEA 2 Extension was received from JNCC and RSPB and is presented in Section 3.3 together with clarifications and DTI responses.

3.2 Consultation issues with DTI responses and clarifications

3.2.1 Comments on the SEA initiative

- a. Positive response to DTI SEA initiative and involvement in steering group (JNCC)
- b. Positive response to DTI SEA initiative (English Nature)
- c. Positive response to DTI SEA initiative (Environment Agency)
- d. Positive response to DTI SEA initiative (RSPB)
- e. Positive response to DTI SEA initiative (English Heritage)
- f. Positive response to DTI SEA initiative (IFA)
- g. Positive response to DTI SEA initiative (Wessex Archaeology)

3.2.2 SEA process

- a. Linked assessments – Recommend linking assessments between different industries. Encourage the DTI to take a lead on such an approach given that two of the current SEA processes fall within its remit i.e. offshore windfarms and oil and gas (English Nature). A collaborative approach is also encouraged by the JMP. *One of the recommendations arising from the SEA 3 (Section 11.3) is that “...the merits of an SEA at a cross sectoral level should be explored. This would support but not replace sectoral SEAs.”*
- b. Scoping pamphlet – The scoping pamphlet was welcomed but did not explain the estimates of the potential development in the SEA 3 area. The pamphlet should also explicitly highlight perceived information gaps (RSPB). *The nature of the scoping pamphlet was to provide a basis for consultation in order to identify questions, concerns, information gaps and potentially useful information sources. The pamphlet noted the limited hydrocarbon prospectivity of the area. Consideration will be given to providing more detail on potential development estimates in the scoping pamphlet for future SEAs.*
- c. Experts workshop – Experts workshop was welcomed but the results from it should be more fully integrated into the SEA report. Proposed licensing scenarios and development alternatives made available to technical authors earlier in order to produce SEA-specific reports and assessments. Suggest that this approach is adopted for SEA 4 (RSPB). *Expert reports are intended to provide one of the basis for the SEA assessment by drawing together the current understanding of topics identified in scoping. The proposed licensing scenarios and development alternatives were presented at the expert workshop which included an evaluation process (see SEA 3 Appendix 2) to identify those environmental interactions which could result in significant effects. The workshop included discussion of the likelihood and severity of effects to identify those to be considered further in the SEA report. Recognising the technical nature of oil and gas activities, mitigation technology advances and the progressive nature of regulation, the DTI view is that consideration of potential effects is best done through a workshop format with the assessment team using workshop outcome in consideration and assessment of the implications of each scenario.*
- d. May be clearer to refer to future Experts Workshops as scoping or initial assessment workshops, as SEA/EIA experts generally interpret the term ‘screening’ to mean the process of determining whether or not an assessment is required (RSPB). *The terminology will be reviewed and agreed with the SEA Steering Group.*

- e. Stakeholder dialogue meeting – Presentations from the dialogue meeting and experts meeting should be available on the website (RSPB). *Presentations will be made available for future SEAs during the period of consultation.*
- f. Standardisation of terminology – Suggest that the level of development likely to result from a licensing round explained in terms of the “predicted level of potential development activity” and the different options proposed for licensing described as “alternatives” (RSPB). *In SEA 3 the terms “estimates of potential activity” and “alternatives” were used.*
- g. Reorganisation of assessment part – If the assessment were reorganised on a receptor rather than impacts basis it would make it more understandable and easier to assess cumulative impacts (RSPB). *Consideration will be given to reorganising future SEA documents on this basis.*
- h. Strategic auditing/monitoring of SEA – As raised at the Stakeholder Dialogue meeting, auditing of previous SEAs would aid the predictions of future SEAs and EIAs (RSPB). *This recommendation from the stakeholder dialogue meeting was discussed and agreed at the last SEA steering group meeting in 2002. In addition, a recommendation regarding post activity reviews was made in SEA 3. (Note: The recently published SEA 2 extension document (<http://www.habitats-directive.org/>) contains a review of SEA 2 activity predictions (Section 3.1.5), comparing the predictions made for SEA 2 with the number of block awards and actual work programmes committed to in the 20th licensing round. The predicted versus firm and contingent levels of drilling activity were found to be in sufficiently close agreement and therefore the conclusions reached in SEA 2 were regarded as still valid.)*
- i. Decision making – Recognition of companies’ track records on exploring and developing renewable sources of energy should be a prime consideration when considering companies for licensing of SEA 3 (JMP). *Prime considerations when considering companies for oil and gas licensing are companies’ technical, financial, environment and safety ability and performance in the context of hydrocarbon exploration and production.*

3.2.3 General comments

- a. Consultation report seems to place greater emphasis on describing the current environment of the study area than presenting an assessment of the likely impacts of the proposed consented activities. In particular, no specific mitigation measures or requirements for monitoring identified (Environment Agency). *“The consideration of effects assumes compliance with all relevant legislation and controls and the application of current standard operational controls and mitigation.” (Appendix 2 of the SEA 3 Consultation Document). In addition, other mitigation measures are also identified within the assessment. The requirement for wide area monitoring was flagged in Section 11 of the SEA 3 Consultation Document. See also response 3.3.2h regarding monitoring of SEA predictions.*
- b. Many of the figures and diagrams were difficult or in some cases impossible to read (RSPB). *For the web documents there is a balance to be struck between file size (ie speed of download) and clarity of figures. This will be reviewed for future SEA documents to ensure legibility of figures and diagrams.*

3.2.4 Issues raised on Non-technical summary

- a. Socio-economic effects –Non-Technical Summary is slightly misleading in its statement on job creation as it fails to mention that the 2007 peak in extra jobs is a brief peak that then falls sharply over the next 3 years (RSPB). *Accepted, more detail on employment projections is provided in Section 10.6.5.*

3.2.5 Issues raised on Section 3 Regulatory Context

- a. Helpful if text explained that the Assessment Criteria used to consider the potential effects of development assumed that standard-practice control procedures were already in place and that any mitigation mentioned were above and beyond standard-practice (RSPB). *Appendix 2 states “The consideration of effects assumes compliance with all relevant legislation and controls and the application of current standard operational controls and mitigation.”. However it is agreed that for clarity this could have been reiterated in the main text.*

3.2.6 Issues raised on Section 4 Activities

- a. Multiple activity scenarios – It is very useful to have the comparison of the predicted level of activity for SEA 2 versus actual SEAs licences and licensed activity to date. Whilst there appears to be close agreement in most cases there are some cases where the actual number of exploration wells is approximately 50% higher than the number estimated. Beneficial to have more than one predicted level of activity for the blocks/areas being licensed along with associated confidence levels. Alternatively adopt a worst-case scenario for the assessment (RSPB).

The following notes included in the comparison of activity predicted in SEA 2 versus licence commitments resulting from the 20th Licensing Round explain the various levels of certainty that an exploration well will be drilled:

- *“A Firm well is a commitment to drill, which is not contingent upon any further evaluation. No waivers will be considered for Firm wells.*
- *A Contingent well is a commitment to drill, contingent upon additional evaluation. These are not firm wells although, the Operator must make a technical case to the DTI for a waiver of the commitment if the Operator no longer feels the drilling of the Contingent well is justified on technical, geological or other grounds.*
- *D/D or a Drill or Drop well is a commitment to drill or relinquish the licence within a specified time frame – again these wells may not be drilled unless geological evaluations prove to be favourable.”*

For future SEA assessments it is proposed to review the limits of confidence of activity estimates (in particular with relation to Drill or Drop wells) to refine the basis for the greatest anticipated activity level. See also response 3.2.2.h.

- b. Potential activity– Section 4.2.3 would be clearer if linked more explicitly to the sections on geology and what that means for the SEA. For instance, the blocks likely to hold hydrocarbon reserves are clustered together and it would be helpful to draw attention to the general location of this cluster. The fact that SEA 3 is only likely to hold gas reserves, with little or no oil has knock on effects on the potential impacts - infrastructure required, potential discharges etc. If all these things are different between oil and gas production, they need to be highlighted (and at the scoping stage). This may not be obvious to stakeholders outside the oil and gas industry. (RSPB). *Section 4.2.2 and Figure 4.2 give summary details of the broad-scale geology of the SEA 3 area as well as the likely prospects for hydrocarbons. Section 4.2.3 then provides forecasts of potential activity in each geological sub-area. Potential impacts of exploration and development described in Chapter 10 take account of the most likely source and nature of the hydrocarbons, and the methods and infrastructure required. A summary of generic oil and gas activities is provided in the supporting document ‘An overview of offshore oil and gas exploration and production activities’ which can be found on the SEA website. The DTI agree that facilitating stakeholder understanding of issues is key and will feed this comment into the improvement process for subsequent SEAs.*

- c. Potential activity - Discrepancy between estimates of well drilling activity in Section 4.2.3, 6-15 wells within 4 years and the 22 wells over 4 years in Section 10.3.8 (RSPB). *Accepted. The Section 4.2.3 figures are correct. This discrepancy is not regarded as altering the conclusions reached in Section 10.3.8.*
- d. Potential activity - Discrepancy between Section 4.2.3 where it is indicated that that any new production would be tied to existing infrastructure and Section 10.6.3 (Section 10.6.2) which indicates that existing infrastructure in the CNS is limited and there is uncertainty about the ability of new finds in this area to be linked up (Environment Agency). *Section 4.2.3 gives the estimated number and type of developments for the SEA 3 area in general. However, as indicated in Section 6.1 of the underpinning socio-economic report (TR_013), much of this development may be restricted to the SNS "...under the Pessimistic Scenario there could be 2 developments via sub-sea completions and 1 via platform whilst for the Optimistic Scenario there may be 4 developments via sub-sea and 2 via platforms."*
- e. Section 4.2.3 – The DTI are currently consulting on the use of a new ‘Promote’ Licence to encourage oil and gas exploration which could increase the estimates of potential activity. Suggest this is considered in the conclusions on estimates of potential activity (JNCC). *The Promote Licence initiative is aimed at harnessing the skills, knowledge and energy of the wider geo-technical community. In addition to the expertise within traditional oil companies, it includes the geoscientists in consultancies and contracting companies together with the technical resources of the wider oil service industry. The DTI believe all of these have the capacity to make a significant contribution to the future success of the UKCS. The Promote Licence concept would provide a period of time during which licensees would be able to work up potential prospects - primarily using existing data - without the usual commitment to undertake substantial seismic or drilling at an early stage. substantial intellectual resources.*

3.2.7 Issues raised on Section 6 Ecology

- a. Section 6.3.5 – Should be noted that in order to maintain the structure and function of a sandbank or sandbank system the actual area considered for designation as Annex I habitat may be greater than the area of sandy sediment in less than 20m water depth (JNCC). *This was noted in Section 7.3.4.1 - "The actual area considered for protection may therefore need to be increased to incorporate complete sandbank flanks, associated sandy habitats and/or channels between banks, to maintain the structure and functions of a sandbank." This would be a consideration for the activity specific consenting process.*
- b. Section 6.3.9 – Suggest that there should be an appraisal of communities associated with the Annex I habitats of reef and sandbanks which are slightly covered by seawater all the time as they are of conservation interest (JNCC). *Noted. The distribution and faunal composition of shallow sandbanks was considered in Section 6.3.5.*
- c. Section 6.3.9 of the SEA covers species and communities of conservation interest, details work to list nationally rare and scarce marine benthic communities but questions their conservation importance (MCS). *Section 6.3.9 states "Species at the limit of their global distribution (e.g. 'southern' or 'northern' species) may be rare within Great Britain's territorial seas but occur more commonly towards the centre of their biogeographic range. Species described here as 'nationally rare' or 'nationally scarce' are therefore not necessarily endangered globally and, although they are of national interest, their conservation importance needs to be carefully considered." It was not the author's intention to question their conservation value.*
- d. Section 6.7 – The SEA notes the age of seabird at sea data, gaps in coverage and the potential for ecological change to have occurred. In light of this, updating the seabird data and filling gaps

should be a priority (RSPB). *Identification of data gaps is a key part of SEA. The SEA is explicit about the information gaps and recommends that they be filled in due course. However, the gaps in coverage are small in scale and evidence from breeding colonies surrounding the North Sea suggest that there have not been major changes in species composition over the last 20 years. A precautionary approach with regard to seabirds is taken in the licensing process with the DTI receiving advice from the JNCC. Similarly, in the consenting of offshore activities, the JNCC is a key consultee and the opportunity for wider advice is provided through the public consultation process for SEAs and Environmental Statements.*

- e. Section 6.5.4 – Does not fully recognise the importance of the study area as a migratory route for salmon. Shad and lampreys are discussed in Section 6.5.6 but the most recent information on distribution has not been included, in some areas especially the south-east, these are more common than the SEA Report acknowledges. The migration of eels receives no mention. Would like to see an assessment of the risks to these fisheries (Environment Agency). *Accepted and these are considered further in the Appendix to this summary report.*
- f. Marine mammals - The SEA notes that there is an information gap regarding the foraging behaviour of seals which should be filled as a priority in order to determine important areas. Where there is good information, important sites for cetaceans and seals should be avoided, in particular the more northern part of the SEA 3 area for cetacean populations (JMP). *The potential effects of licensing on marine mammals were discussed at the Expert Workshop. In view of the limited incremental extent of noise resulting from predicted activity levels, previous activity and oil and gas activities in existing licensed acreage and existing control and mitigation measures, it was considered unlikely that physical damage or significant behavioural disturbance of marine mammals would result from the activity scenarios associated with proposed licensing (Section 10.3.1.8 of SEA). It is recognised that SACs beyond territorial waters may be established for marine mammals and this fact is reflected in the decision making processes which apply to offshore oil and gas activities.*
- g. Block 42 - The perceived interest in this quadrant and its proximity to Flamborough Head, an important seabird area has caused concern. The area is also the site of a nutrient rich frontal system which attracts marine wildlife to feed. Given that there is evidence that frontal systems in the North Sea are changing, it is important to know about the changes to these systems prior to licensing. The JMP recommend that no licensing be considered in Block 42 until more information available. More research is needed on North Sea frontal systems (JMP). *Its assumed that this comment refers to Quadrant 42. Identification of data gaps is a key part of SEA and it was recognised that “Long-term variability and trends in hydrographic characteristics, in relation to natural phenomena and climate change and the implications for North Sea ecology” (Section 11.2 of the SEA document) represented a significant gap. Plankton forms the basis of the North Sea food web and has been monitored for almost 70 years using the CPR. From this data, changes in abundance and long-term trends can be distinguished. To support the SEA process, SAHFOS produced a report which describes the plankton community structure in the North Sea (TR_005 and TR_005_Rev1) and how this has changed over the last few decades. The report suggests that hydro-climatic events have a greater impact on the biota of the North Sea than anthropogenic factors. With regard seabirds, see response 3.2.7d above.*
- h. Cephalopod spawning – The SEA recognises that more research is required on cephalopod spawning areas in the North Sea (JMP) *Noted*
- i. Note should be taken of the work being undertaken as part of the Review of Marine Nature Conservation (RMNC) to develop rationale and criteria for the identification of nationally important marine nature conservation features (MCS). *Noted. The DTI is aware of the ongoing Review of Marine Nature Conservation and will monitor the outcome of the Regional Seas Pilot Scheme.*

3.2.8 Issues raised on Section 7 Coastal and offshore conservation sites

- a. When considering individual block licenses, account should be taken of areas that may be designated as marine SACs under the Habitats Directive. No licenses should therefore be given for sites that support features of interest under the Habitats Directive (MCS). Potential offshore SACs and SPAs within SEA 3 should be excluded from licensing and there should be no licensing in coastal waters close to SACs or SPAs (JMP). *These perspectives are noted. Section 7.3.1 of SEA document states: "The Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001 came into force on 31 May 2001, and regulate UKCS offshore oil and gas activities with respect to the European Council Directive on the conservation of natural habitats and wild fauna and flora (the Habitats Directive), and the European Council Directive on the conservation of wild birds (the Birds Directive). That offshore SACs and SPAs had not yet been designated was recognised during the SEA assessment processes. The designation of SACs and SPAs does not preclude activities in an area – rather it requires that the effects of such activities be thoroughly considered through an appropriate assessment before consent(s) can be granted. The SEA assessments documented in Section 10 considered the potential effects of activities that could follow licensing, including effects on potential statutory conservation sites. Existing offshore activity consenting (e.g. PON14, PON15, Environmental Statements, Oil Spill Contingency Plans) already takes a precautionary approach regarding the implications of potential offshore conservation sites, through the consultation with and involvement of the JNCC and where appropriate the country agencies.*
- b. Section 7.3. No reference made about the potential for national important sites. What concessions are being made in the SEA for marine Natura 2000 sites yet to be designated and how is this being integrated into the decision making process? Opinions of the statutory conservation agencies are to be published in the statement explaining the licensing decision (RSPB). *See response 3.2.8a above. Existing offshore activity consenting (e.g. PON14, PON15, Environmental Statements, Oil Spill Contingency Plans) already takes a precautionary approach regarding the implications of potential offshore conservation sites, through the consultation with and involvement of the JNCC and where appropriate the country agencies.*
- c. Figure 7.1 – Concerned that Figure 7.1 may lead to misunderstandings over which areas are under consideration for the identification of offshore SACs as it does not fully correlate with the information provided within Natura 2000 in UK Offshore Waters, JNCC Report 325, Johnston *et al.* 2002. *suggest that users refer directly to this report (JNCC). Johnston et al. 2002 is referenced in this section.*
- d. The DTI should avoid licensing sites that may crossover with habitats or species identified under OSPAR's MPA programme (MCS). *The identification and implementation of OSPAR MPAs was a consideration during the assessment process (SEA 3 Appendix 2).*
- e. The JNCC interpretation of the Habitats Directive only permits sublittoral sandbanks in less than 20m of water to be considered as SACs. However, this should be extended into deeper water to include the whole sublittoral sandbank habitats. Licensing on this extended sublittoral sandbank habitat should be avoided (MCS). *JNCC Report 325 (Natura 2000 in UK Offshore Waters: Advice to support the implementation of the EC Habitats and Birds Directives in UK offshore waters) states that before a list of possible offshore SAC can be proposed, a number of habitat-specific site identification problems require resolution, one of which is the "determination of the full extent of shallow sandbanks and their associated sandy habitats ...in UK offshore waters." This was reflected in Section 7.3.4.1 of the SEA document (taken from Section 2.3 of JNCC Report 325), "The actual area considered for protection may therefore need to be increased to*

incorporate complete sandbank flanks, associated sandy habitats and/or channels between banks, to maintain the structure and functions of a sandbank.”.

- f. Section 7.3.4.3 – Highlighted the potential for sites to be designated in the future under the Birds Directive. Potential designations can be divided into three key areas – seaward extensions of breeding colony SPAs below low water mark, inshore areas used by birds in non-breeding season and marine feeding areas. As analyses to identify important areas are not yet complete, not possible to say whether SEA 3 blocks will be located close to or within a proposed SPA (JNCC). *This aspect was noted in Section 7.3.4.3 SEA 3.*
- g. Section 7.4.1 - The statement “The locations of most of these wrecks [refers to the large number of ship wrecks in UK coastal and offshore waters] are known.” is incorrect as the current record of shipwreck sites recorded in the sources listed is only a small proportion of the resource (English Heritage, IFA). The lack of data concerning the number and location of aircraft wreck sites should be noted in the list of information gaps in Section 11.2 (IFA). *This is noted.*
- h. Section 7.4.1 - Not the case that marine archaeological sites that are not scheduled monuments are protected by the planning process. Scheduling of shipwreck sites has occurred in one case in Scotland, and although scheduling is applicable to marine sites it has not been implemented for completely submerged non-shipwreck sites as yet (English Heritage). RCHME is now part of English Heritage. *Noted.*
- i. Section 7.5 states that “Given the difficulty in terms of cost and logistics of surveying large areas of the North Sea ...these offshore industries currently offer the best means of finding archaeological sites away from the coast”. English Heritage has recently taken responsibility for maritime archaeology in English coastal waters and claim that whilst the above statement may have been true in the past, it is no longer valid (English Heritage). The above statement should not preclude the inclusion of archaeology within pre-development work as this may reduce costs and complications (IFA). *Section 7.5 provided a summary of the main conclusions of Dr. Flemming’s technical report (TR_014 -sections 7 and 8). Also, section 10.3.3.2 states that “...in the case of oil and gas activities pre-activity assessment and survey can be expected to identify the presence of exceptional [archaeological] features and to thus allow for either further investigation and/or alterations to planned activities.”*
- j. May be advantageous to make reference to documents outlining frameworks relating to development-related archaeology, both terrestrially and as applied at the coast and offshore. Key documents include *Planning Policy Guidance: Archaeology and Planning* [PPG 16] (Dept. of the Environment 1990), and *England’s Coastal Heritage* (EH/RCHME 1996) (Wessex Archaeology). *Noted.*
- k. Section 7.4 of SEA 3 and Sections 5-8 of TR014 – Increasing body of archaeological experience on which to base recommendations to the oil and gas industry regarding site investigations, reporting, mitigation measures etc. which could be fed into the SEA 3 documentation (Wessex Archaeology). *Noted*
- l. Section 7.4 of SEA 3 and Sections 5-8 of TR_014 – Knowledge of previous human use and occupation of the UKCS very limited, and the grounds upon which areas are written off should be kept under review. TR014 may benefit from a consideration of contemporary terrestrial sites from the UK and near-Continent, in particular, work done on nominally ‘terrestrial’ investigations on major estuaries (Wessex Archaeology). As a contribution to discussion of such matters, Wessex Archaeology will shortly be distributing copies of a report for English Heritage and BMAPA, entitled *Palaeolithic and Mesolithic Archaeology on the Sea-bed*. *We look forward to this report for use in subsequent SEAs.*

- m. Chapter 1 of TR_014 Overview of the legislation and agreements...that apply to UK marine and maritime prehistoric and archaeological remains adequately explains much of the legislative framework surrounding submerged archaeology in the North Sea Basin. It does not, as it states, (not) deal with salvage law or law regarding 'wargraves'. The IFA comments include information regarding these subjects (IFA). *The information provided is noted.*

3.2.9 Issues raised on Section 10 Consideration of the effects of licensing

- a. Section 10.3.1.7 – Note that all members of UKOOA have agreed to comply with the JNCC Guidelines for minimising acoustic disturbance to marine mammals. In addition, the recently issued DTI 'Guidance notes for procedures for oil and gas surveys (including seismic surveys) and shallow drilling including Guidance implementing the Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001' state that as a condition of the granting of a permit all operators/seismic companies must follow the JNCC guidelines at all times for all seismic surveys. There are also draft guidelines available for use of explosives in offshore waters (JNCC). *The Regulations and Guidance are listed in Section 3 of SEA 3. The guidelines for explosives will be included in future SEAs.*
- b. Section 10.3.3.2 – Consideration should be given to physical disturbance to all biogenic reefs (JNCC). *Agreed. This was the intent of Section 10.3.3.2 and the sensitivity of Sabellaria spinulosa to physical disturbance is agreed.*
- c. Further analysis of intertidal and inshore sensitivities would have improved the SEA. In section 10.3.9.1, limited consideration has been given to intertidal habitats despite sensitive habitats such as saltmarsh being present in the SEA 3 area. *This noted. "Overall, incremental risk of oil spills associated with exploration and development is very low in the SEA 3 area, where production can be expected to involve gas."*
- d. No estimation of the significance of either the direct or indirect job creation as a result of the 21st licensing round is given (RSPB) *A general comment on the significance of the potential employment was made in Section 10.6.5 "Within the petroleum industry, the number of skilled employees is declining. Re-licensing of the SEA 3 area could lead to some increase in direct, indirect and induced employment within this industry, contributing to a slowing down of the decline in the UK workforce." For future SEAs it is intended to provide greater context.*
- e. MCS disagrees with the SEA 3 conclusions which that physical damage or significant behavioural disturbance of marine mammals is unlikely to occur. *See 3.2.7f above.*
- f. Recommends that the government should hold back licensing some blocks so that productive reserves are maintained for future generations to exploit (MCS) *This perspective is noted. SEA 3 was selected by the DTI as the next in the series because the geology of the area is prospective for gas and projections show the UK having a growing shortfall in gas supplied from the UKCS.*
- g. Marine Spatial Planning is needed in order for cumulative and synergistic effects of developments and activities in the North Sea to be properly assessed at the ecosystem level. Wildlife and Countryside Link have produced a discussion paper on Marine Spatial Planning (MCS). *The paper is noted. Section 11 of SEA 3 noted "Further to the integrated management recommendation made in SEA 2 the merits of an SEA at a cross sectoral level should be explored. This would support but not replace sectoral SEAs."*
- h. Section 10.3.3.1 – "The SEA 3 report on marine archaeology includes some initial suggestions for discussion of protocols and a reporting regime relevant to the oil and gas industry." English

Heritage is keen to be involved in such initiatives, and supports any suggestions for discussions of protocols and the development of guidelines (English Heritage). *The DTI appreciate English Heritage's response to SEA 3 and note their wish to be involved in future discussions.*

- i. Damage to marine archaeological remains is un-quantified and therefore not possible to accept that the ratio of information lost to the ratio of information gained is an acceptable compromise (English Heritage). *It is accepted that damage to marine archaeological remains from natural perturbation and human activity (such as fishing, aggregate extraction, oil and gas activities etc) in the North Sea is un-quantified.*
- j. Section 10.3.3.1 – The IFA considers that in order for the SEA programme to meet its obligations under international conventions, national legislation and best practice, the issue of submerged shipwreck and aircraft crash remains within the SEA 3 should be given the same level of consideration as that afforded to submerged prehistoric archaeology (IFA). *Noted and for future SEAs this aspect will be made more explicit. The immediate vicinity of chartered wrecks and lost aircraft (together with those identified during operational planning surveys) are normally avoided during oilfield operations but see response 3.2.91 below.*
- k. Section 10.3.3.1 – The SEA report recognises that the BMAPA and RCHME guidance is current best practice for seabed development, and the IFA recommends that the oil and gas industry consider developing a similar policy to suit its own activities. It should be recognised that that experience in other areas indicates that there is a very high probability that the SEA 3 area contains as yet undiscovered archaeological sites that are of regional, national and international importance. In these circumstances preservation *in situ* or at a minimum by record is appropriate (IFA). *This is noted. Section 11 of the SEA 3 recommended that “The subject of a reporting regime for prehistoric marine archaeological remains and access to suitable technical support and advice should be followed up with industry bodies and others as a mitigation measure for existing and potential future oil and gas activity in the North Sea.”*

3.2.10 Issues raised on Section 11 Conclusions

- a. The Wildlife Trusts and WWF-UK are not in complete agreement with the conclusions and recommendations of SEA 3. In particular, we believe that it is inappropriate to compare the impact of further offshore oil and gas licensing with existing impacts of a wide variety of other activities and conclude that the impact of new licensing will be negligible in comparison. The SEA process undertaken does not investigate systematically or in depth the impact of other activities. So while the impact of existing activities may in fact be greater no assessment has been undertaken that proves this to be the case. (JMP). *The 1993 and 2000 OSPAR Quality Status Reviews comprise an integrated overall assessment of the impact of anthropogenic activities in the North Sea and formed a basis of the SEA 3 assessment of the impact of other industries including the oil and gas industry. Alternative/additional mechanisms to further address this aspect in future SEAs will be discussed with the SEA steering group.*
- b. In the light of our new responsibility EH is seeking to ensure that research into the overall nature, condition and extent of the marine archaeological resource is supported in order to enable us to quantify the resource and the rate at which it is diminishing. The awareness of the value of the historic environment and the need to adequately report its discovery should be promoted as a matter of principle. It is not acceptable to only justify them as a form of mitigation. (English Heritage). Attention to archaeology is not merely an opportunity but an obligation under both the SEA directive and the EA directive (Wessex Archaeology). *Agreed and Section 11 concludes “The subject of a reporting regime for prehistoric marine archaeological remains and access to suitable technical support and advice should be followed up with industry bodies and others as a mitigation measure for existing and potential future oil and gas activity in the North Sea.”*

- c. Section 11.1 Physical damage of the seabed – Stated that ‘The predicted spatial scale of physical disturbance of the seabed...is very small in comparison with the total area of the North Sea’. With respect to SAC, cSAC and habitat which has the potential to be designated as an SAC, it should be stated that the scale of impacts from oil and gas activities have the potential to be of greater significance to a ‘relevant site’. For instance, as stated in section 10.3.5.5, 6th paragraph, ‘Circulatory residual currents around sandbanks result in accretions over bank crests and a proportion of water based mud cuttings discharges...may be deposited over such features’ which could have the potential to affect the integrity of a ‘relevant site’. The impacts of pipe laying on ‘relevant sites’ and surrounding areas should also be considered when considering licensing areas with habitat which has the potential to be designated as cSAC (JNCC). *The conclusions of SEA 3 could have made reference to discussion earlier in the document about the potential effects on various seabed habitats. However, the mechanisms to allow appropriate consideration of such effects at a project specific level are in place.*

3.3 SEA 2 Extension – Consultation issues

3.3.1 SEA process

- a. Stakeholders were not made aware that the document had been finalised or that it was available on the website. The recommended twelve week standard minimum period for consultation had not been adhered to. (RSBP). *Article 3 paragraph 3 of the SEA Directive allows that “minor modifications to plans and programmes shall require an environmental assessment only where the Member States determine that they are likely to have significant environmental effects” This is to be established on a case by case approach and the reasons are made available to the public. The consideration of issues document was placed on the SEA website as a news item, but for future documents of this nature, interested stakeholders will be notified directly.*

3.3.2 Issues raised on Section 3.1 Activities

- a. Multiple activity scenarios – Beneficial to have more than one predicted level of activity for the blocks/areas being licensed along with associated confidence levels. Alternatively adopt a worst-case scenario for the assessment (RSPB). *See response 3.2.6a above.*

3.3.3 Issues raised on Section 3.3 Environmental information

- a. The age of the seabird data, the gaps in coverage and the potential for ecological change to have occurred is a concern and should be addressed as a matter of priority (RSPB). *See response 3.2.7d above.*
- b. The potential use of hydrophones, as well as visual observations, especially in sensitive areas, has been suggested, in accordance with JNCC guidelines for minimising acoustic disturbance to marine mammals (JNCC). *Noted, and it is proposed to consider this at the activity specific consenting stage.*

3.3.4 Issues raised on Section 3.3.4 Conservation sites

- a. The JNCC would prefer no or limited licensing within territorial waters to minimise the risk to coastal and inshore sensitive nature conservation sites. *Noted.*
- b. Highlighted the potential for sites to be designated in the future under the Birds Directive. Potential designations can be divided into three key areas – seaward extensions of breeding colony SPAs below low water mark, inshore areas used by birds in non-breeding season and marine feeding areas. As analyses to identify important areas are not yet complete, not possible

to say whether SEA 2 extension blocks will be located close to or within a proposed SPA (JNCC).
This aspect was noted in Sections 3.3.4.2 and 3.3.4.3 in the SEA 2 Extension document

- c. Premature to say that JNCC are in the process of identifying possible offshore SPAs and SPAs likely to be in the SEA 2 extension area as JNCC are only in the process of consulting on draft guidelines for defining boundaries and these will be developed in parallel to site identification. Therefore for offshore sites neither the boundary criteria nor the site criteria has been fully developed (RSBP). *Noted.*

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APPENDIX

Additional information on:

- European eel
- Migratory salmonids (salmon and sea trout)
- Twaite and allis shad
- Twaite and allis shad

and their implications for SEA 3.

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European eel – Implications for SEA 3

General information

It is assumed that the European eel *Anguilla anguilla* spawns in spring in the Sargasso Sea between Bermuda and the Bahamas. Larvae drift from the Sargasso Sea in the Gulf Stream and North Atlantic Drift and become widely distributed around the shores of Europe and North Africa (Environment Agency website).

On reaching the continental shelf, the larvae metamorphose into glass eels which as they move closer inshore, become pigmented and are known as elvers. These enter freshwater during the spring, with the peak of the migration taking place on the increasing tides in April and May. Some eels remain in coastal waters where they feed and grow in the sea, while others may migrate to and from freshwater throughout their life (EA website).

Eels live on or near the bottom of rivers and lakes, migrating slowly upstream. During this period they are commonly referred to as yellow or brown eels due to their colour. Eels feed mainly on invertebrates, although larger individuals may also eat other fish.

Male eels stay in freshwater for between 7 and 12 years, maturing at a length of about 36cm. Females stay between 9 and 16 years, maturing at the slightly larger size of 46cm. As the fish mature, their skin takes on a silvery blue colour and these silver eels migrate seawards and once at sea, are assumed to migrate westwards at depth to the Sargasso Sea, where they spawn and die (EA website).

Main threats

Eels are exploited in all life stages present in continental waters. In Britain, elvers are caught in hand-held dip nets fished from the bank. Yellow eels are caught during the summer, when they are actively feeding, using fyke nets or small baited traps. Silver eels are caught in the autumn on their downstream migration, often in fixed traps associated with weirs.

Yellow eels are exploited in many areas in England and Wales, although East Anglia is the main centre for this activity. Methods of capture include a variety of traps (currently about 100 licences) and fyke nets (about 2,000 licences). There is limited trawling off the south coast and in the Thames estuary (one licence), although most inshore fishermen are thought to take some eels. Silver eels are also taken by traps, fykes and trawls, and also by fixed fishing weirs (15 licences). The eel fishery is the most valuable commercial inland fishery in England and Wales, providing significant benefits to the rural economy (Environment Agency – Consultation document on a proposed National Eel Management Strategy).

Other anthropogenic factors (habitat loss, contamination, and transfer of diseases) have had negative effects on the stock, possibly of a magnitude comparable to exploitation (ICES website).

European perspective

ICES advise that the eel stock is outside safe biological limits and current fisheries are not sustainable. Recruitment has been in decline since 1980 and reached a historical minimum in 2002. Fishing mortality is high both on juvenile (glass eel) and older eel (yellow and silver eel) in many water systems (ICES website).

The EC recognises the problem with eel recruitment, stock and the mortality associated with the various fisheries. Options appear to be to either introduce Europe-wide regulations to encourage greater escapement of silver eels, or to recommend that member states introduce national legislation tailored to their own circumstances. Most European countries agree that a comprehensive

management system is required and that measures should apply to all life stages and all fisheries (Environment Agency – consultation document on a proposed National Eel Management Strategy).

Management issues

ICES recommends the development of an international recovery plan for the whole eel stock, and to reduce exploitation to the lowest possible level until such a plan is agreed upon or implemented (ICES website).

The Environment Agency has developed a National Eel Management Strategy for eel fisheries in England and Wales (Environment Agency – consultation document on a proposed National Eel Management Strategy).

Given the many gaps which exist in the knowledge of eel biology, management methods and the effect of fishing on eel stocks and recruitment, the Environment Agency propose to adopt a precautionary approach for eel management.

Relevance to SEA 3

Within the SEA 3 area, there are a number of locations which support a commercial eel fishery. Eels are fished in the Rivers Humber, Tees and Wear and the main fishery uses fyke nets, eel criggs and pots, set from spring through to autumn in the Humber and its tributaries. Over-fishing, pollution and harbour developments have all been blamed for the decline of the fishery.

The eel fishery is particularly important in the Broads rivers and the Rivers Stour and Orwell, and 517 fyke nets were licensed by the Environment Agency in 2000. Falling catches since the 1970s have been attributed to over-fishing, pollution and the increasing incidence of disease.

Fyke nets and trawls are used to catch eels in many of the Essex rivers and estuaries, including the Thames. Brown/yellow eels are landed in spring and summer, and silver eels during autumn when they embark on their annual spawning migrations from freshwater to the sea. There has been little activity in the fishery since 2000 due to poor returns (Pawson *et al.* 2002).

There are no indications of an offshore fishery for eels in the SEA 3 area.

Implications for SEA

The seaward migration of eels around the North Sea occurs during late autumn and winter. Information relating to eel migration routes in offshore areas of the North Sea is very limited (McCleave & Arnold 1999). There is limited information available concerning eels within the offshore environment of SEA 3 area. However given that migratory eel are transitory and unlikely to remain in offshore areas of SEA 3 for an extended period, it is unlikely that there would be any detrimental effects of licensing.

Sources of information

Environment Agency – Consultation document on a proposed National Eel Management Strategy

Environment Agency website – <http://www.environment-agency.gov.uk/>

ICES website - <http://www.ices.dk/committe/acfm/comwork/report/2002/oct/wgeel.pdf>

McCleave JD and Arnold GP (1999). Movements of yellow- and silver-phase European eels (*Anguilla anguilla* L.) tracked in the western North Sea. *ICES Journal of Marine Science* **56**: 510-536

Pawson MG, Pickett GD and Walker P (2002). The coastal fisheries of England and Wales, Part IV: A review of their status 1999-2001. CEFAS Technical Report No. 116

Migratory salmonids (salmon and sea trout) – Implications for SEA 3

General information

Sea trout share a similar life history to salmon. Both are anadromous species, migrating from the sea to breed in freshwater. Spawning takes place in shallow excavations (redds), in shallow gravelly areas in clean rivers and streams. After a period of 1-6 years the young salmon migrate downstream to the sea as smolts. Salmon have a homing instinct and spawn in the river of their birth after 1-3 years in the sea (JNCC website).

Salmon rivers vary considerably in their ecological and hydrological characteristics and in the life-cycle strategies adopted by the salmon within them. The cool and wet climate in the north of the UK, and the presence of harder, more resistant rocks and steeper slopes, results in rivers that are sparsely vegetated, nutrient-poor and prone to sudden increases in flow (spates). As a result, in such rivers salmon may take several years to reach the smolt stage and migrate to sea. In the south, rivers flow across gentler terrain and softer rocks, in a warmer, drier climate and salmon often grow sufficiently quickly to smolt as yearlings (JNCC website).

On leaving the rivers, the movements of post-smolts seem to be highly dependent on speed and the direction of surface currents (cited in Holm *et al.* 2000). For the first few months at sea, post-smolts are passively transported northward (Jonsson *et al.* 1993, cited in Friedland *et al.* 2000). The geographic distribution of post-smolts conforms well with the main surface current patterns, in particular with the slope currents west and north of Scotland (Holm *et al.* 2000). The area around the Faroes appears to be an important feeding ground.

Salmon on the return migration to spawn are believed to enter the North Sea from the north, to move south and then inshore, before swimming north along the coast to their home rivers. Sea trout originating from these same rivers are thought to migrate southwards to feed in the southern North Sea and are also exploited as they migrate north to spawn (Pawson *et al.* 2002). Large numbers of sea trout are found off the coast of Norfolk feeding on sprat and sandeels prior to returning to their home rivers in North East England.

Main threats

Both species are subject to many pressures, including pollution, the introduction of non-native salmon stocks, physical barriers to migration, exploitation from netting and angling, physical degradation of spawning and nursery habitat, and increased marine mortality (JNCC website).

There has been a general decline in the abundance of salmon in many rivers since the 1960s. The reduction is particularly apparent in the numbers of multi-winter sea fish (those spending two to four winters at sea) which enter rivers before June. Scott (2001) has proposed a number of possible causes for the decline including; temperature, predation, salmon farming and stocking, UV radiation, and chlorinated organic compounds.

In terms of fishing, nets take the largest proportion of the salmon and sea trout catch, compared with the numbers caught by rod anglers. The rod catch of salmon for England and Wales in 2001 was 14,383 and a total of 43,243 were caught by the commercial net fisheries (Annual Assessment of Salmon Socks and Fisheries in England and Wales 2001). The Environment Agency regulates net and commercial fisheries for salmon and sea trout.

Despite the general decline, some UK estuaries have shown significant increases in the numbers of salmon since the 1970s because of improving water quality, access and active management of

freshwater habitats. Catches in the Thames Estuary increased from zero in the 1970s to a few hundred per year since 1982 (Environment Agency website).

European perspective

The Atlantic salmon is widely distributed within Europe, ranging from Portugal in the south to Sweden and Finland in the north. The UK salmon population comprises a significant proportion of the total European stock with Scottish rivers particularly important (JNCC website).

The decline in salmon and trout catches reflects environmental pressures, including unsustainable fishing activities. The International Atlantic Salmon Accord ratified in June 1998 through the North Atlantic Salmon Conservation Organisation (NASCO) aims to protect the fishery through both environmental and fishery improvements (Environment Agency website).

Management issues

Since 1973 there has been a prohibition on fishing for salmon in waters off England and Wales beyond the six-mile limit (Pawson *et al.* 2002). Since 1993 there has been a policy to phase out coastal salmon fisheries in England and Wales as existing licencees retire (Annual Assessment of Salmon Socks and Fisheries in England and Wales 2001).

Reflecting the European importance of UK salmon populations, a number of cSACs have been proposed (JNCC website).

The River Tweed cSAC supports a very large, high-quality salmon population. In recent years, the salmon catch in the river has been the highest in Scotland, with up to 15% of all salmon caught. Considerable work has been done by the Scottish Environment Protection Agency and the River Tweed Foundation in tackling pollution and easing the passage of salmon past artificial barriers in the river (JNCC website).

It should be noted that salmon is an Annex II species only in freshwaters throughout the EU, and therefore marine and estuarine sites are excluded from selection.

Relevance to SEA 3

In England and Wales, the river Tyne had the highest declared rod catch of salmon in 2001 (2,513 fish). The coastal net fisheries of the North East are responsible for the vast majority of salmon and sea trout catches (Table A-1).

Table A-1 - Declared salmon and sea trout net catches in SEA 3 area 2001

Region	Method	Licences issued	Salmon	Sea trout
NE Northumbria (N)	Drift nets	45	21,805	9,279
	T nets	26	3,264	10,666
NE Northumbria (S)	Drift nets	18	8,240	5,565
	T nets	1	80	774
NE Yorkshire	Drift nets	7	2,329	2,907
	T or J nets	12	397	6,741
Anglian	Drift nets	34	0	2,195
	Other nets	12	0	212

Source: Annual Assessment of Salmon Socks and Fisheries in England and Wales 2001

The establishment of the River Tweed cSAC reflects the importance of the North East region for salmon.

Implications for SEA

The timing and location of coastal movements into and out of rivers of salmon and sea trout is fairly well understood. Knowledge of the migration and geographic distribution of salmon in the North Sea is sparse although as post-smolts, their distribution appears to be related to the main surface currents. Given the migratory nature of salmon and sea trout and considering the projected location and scale of potential exploration and production activities, and the predicted hydrocarbons in the SEA 3 area, it is difficult to conjecture that further licensing would have a detrimental effect on either species. .

Sources of information

Annual Assessment of Salmon Stocks and Fisheries in England and Wales 2001. CEFAS and Environment Agency

Environment Agency website – <http://www.environment-agency.gov.uk/>

Friedland KD, Hansen LP, Dunkley DA and MacLean JC (2000). Linkage between ocean climate, post-smolt growth, and survival of Atlantic salmon (*Salmo salar* L.) in the North Sea area. *ICES Journal of Marine Science* 57: 419-429

Holm M, Holst Chr, and Hansen LP (2000). Spatial and temporal distribution of post-smolts of Atlantic salmon (*Salmo salar* L) in the Norwegian Sea and adjacent areas. *ICES Journal of Marine Science* 57: 955-964

JNCC website – www.jncc.gov.uk

Pawson MG, Pickett GD and Walker P (2002). The coastal fisheries of England and Wales, Part IV: A review of their status 1999-2001. CEFAS Technical Report No. 116

Scott D (2001). Chemical pollution as a factor affecting the sea survival of Atlantic salmon, *Salmo salar* L. *Fisheries Management and Ecology* 8: 487-499

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River and sea lamprey – Implications for SEA 3

General information

Lampreys are eel-like jawless fish with a simple cartilage skeleton and lack paired fins or scales. They can be distinguished from eels by their sucker-like mouth disc and seven pairs of gill slits. They are parasitic on other fish, scraping a hole through the prey's skin and drawing out blood.

Both the river lamprey *Lampetra fluviatilis* and the sea lamprey *Petromyzon marinus* migrate up rivers to spawn and spend the larval stage buried in muddy substrates in freshwater. Both species need clean gravel for spawning, and silt or sand for the burrowing juvenile ammocoetes (JNCC website). Once metamorphosis takes place, the adults migrate to the sea where they live as a parasite on various species of fish (UK Marine SAC website). Sea lampreys are thought to venture further out to sea and spawn in lower reaches of the rivers than the river lampreys (Carmarthen Bay cSAC website).

The sea lamprey is uncommon in the UK and although found around the coast, the main population centres are in the Bristol Channel. The river lamprey or lampern is widespread with substantial populations in some rivers and streams although not present in others where they used to be common. The main populations are probably those which migrate into the Severn estuary from the Bristol Channel and adjacent offshore waters (UK Marine SAC website).

Main threats

The sea lamprey has been commercially fished throughout its European range but this is now generally limited to some small local fisheries. The main reasons for the decline of both lamprey species are considered to be poor water quality, and obstructions in rivers which prevent migration for spawning rather than any impact associated with fisheries (UK Marine SAC website).

Pollution has caused many watercourses to lose their river lamprey populations. As well as direct toxic effects to fish, pollution can also smother spawning gravels and nursery silts (e.g. via eutrophication), as well as forming a barrier to migration (River lamprey Action Plan).

Engineering activities have also hindered spawning and migration. Channelisation and the removal or dredging of gravels and silt beds has caused loss of habitat. Increased water abstraction and land drainage has disturbed water levels in spawning and nursery areas, and the construction of dams and weirs has introduced obstacles to upstream migration (River lamprey Action Plan).

European perspective

The sea lamprey occurs in estuaries and easily accessible rivers over much of the Atlantic coastal area of western and northern Europe (from northern Norway to the western Mediterranean) and eastern North America. It has declined in some parts of its European range.

The river lamprey is found only in western Europe, where it has a wide distribution from southern Norway to the western Mediterranean. The UK populations are considered important for the conservation of the species at an EU level (JNCC website).

Management issues

Both the river and sea lamprey are Annex II species in the Habitats Directive and the UK populations of both species have been deemed important in a European context resulting in the designation of a number of cSACs (JNCC website).

For both species of lamprey, a number of sites with reliable records or that hold healthy populations and which contain the necessary habitat requirements for spawning and survival of juveniles, have been selected as cSACs. The SAC series encompasses the geographical range of the species and includes a range of high-quality river types in which it occurs. Marine sites that are considered important migration routes or feeding grounds for this species have also been selected, usually where they are adjacent to a freshwater site (JNCC website).

Identification of suitable sites in some parts of the UK has been hampered by the absence of comparative population data, and by difficulties in identifying juvenile lampreys.

Relevance to SEA 3

For the River Tweed and the Tweed Estuary cSACs both species of lamprey are listed as qualifying features but not the primary reasons for site selection.

Implications for SEA

The information available is regarded as sufficient to support assessment of the potential effects of licensing. The main threats to the fish are primarily related to the freshwater phase of their life cycles. The timing and location of movements into and out of rivers is fairly well understood and both species of lamprey are mainly found in estuarine or coastal waters rather than offshore areas of the North Sea. Considering the projected location and scale of potential exploration and production activities, and the predicted hydrocarbons in the SEA 3 area, it is judged unlikely that further licensing would have a detrimental effect on either species.

Sources of information

Carmarthen Bay cSAC website

http://www.carmarthenbaysac.org.uk/frames/species_frame.htm#Lampreys

Environment Agency website – <http://www.environment-agency.gov.uk/>

JNCC website – www.jncc.gov.uk

River lamprey Action Plan, Edinburgh Biodiversity Partnership

UK Marine SAC website - http://www.ukmarinesac.org.uk/activities/fisheries/f2_4.htm.

Twaité and Allis shad – Implications for SEA 3

General information

The twaité shad (*Alosa fallax*) and the allis shad (*Alosa alosa*) are both anadromous members of the herring family. Although relatively little is known of the preferred ecological habitats of these species, adults of both species are believed to live in coastal waters along the western European coastline and congregate in large shoals in or near estuaries prior to returning to rivers to spawn (UKBAP website).

Twaité shad migrate to freshwater from April to June and spawn from mid-May to mid-June. Although strongly migratory, they do not appear to penetrate far up river and generally spawn in tidal parts of rivers or just above. Adults generally die after spawning, but the UK populations appear to have a comparatively high proportion (25%) of repeat spawners, with surviving adults returning to the sea after spawning. Fry drift downstream after hatching and feed on invertebrates. Juveniles of both species are believed to develop in rivers and estuarine waters for their first and second years before migrating to the sea (Cheshire Region Biodiversity Programme). Male twaité shad are sexually mature at 3-4 years and females at 4-5 years (Fishbase website)

The allis shad grow in coastal waters and estuaries and migrate to rivers to spawn. They enter rivers in May and generally penetrate further upstream, swimming up to 800 km up river. Spawning takes place at night and the eggs settle in the gravelly substrate with the fry drift downstream after hatching.

Main threats

European populations of both species have declined significantly, with twaité shad now virtually absent in several rivers in the UK where it was previously believed to have spawned. The allis shad is now also rare in the UK and the only confirmed spawning site is in the Tamar Estuary (Devon/Cornwall) with several other British river systems no longer able to support breeding populations.

The main threats facing both species include pollution, river and estuary barriers, habitat modification and river management, incidental catches and environmental conditions. The twaité and allis shad are unable to easily traverse artificial river obstructions such as dams or weirs and these can prevent shad from returning to historic freshwater sites to spawn. Fish passes designed for salmonids may not be suitable for shads which prefer smooth laminar flow patterns. Habitat modifications and river management such as channelisation, weed clearance and removal of gravel shoals lead to a loss of refuge, spawning sites and food. Accidental capture by anglers and commercial boats are believed to have a detrimental effect on both species, while incidental catches through power station cooling water intake screens also pose a threat to adult fish. Development works resulting in gravel siltation can cause direct loss of habitat, while additional environmental factors such as drought can cause low dissolved oxygen levels and low water flows can exacerbate pollution (English Nature website, Kent Biodiversity Action Plan website)

European perspective

Both the twaité and the allis shad are declining throughout their range on the western coasts of Europe, from southern Norway to Spain (allis shad) and Morocco (twaité shad) and along the eastern Mediterranean towards Italy. While the twaité shad has declined substantially throughout Europe, the most successful breeding populations of allis shad are thought to be in western France and Portugal.

Management issues

Both Species are listed on Appendix III of the Bern Convention and Annexes II and V of the EC Habitats Directive as well as Section 9(4)(a) of the Wildlife and Countryside Act (1981), (amended April 1998). They are also protected under Schedule 5 of the Wildlife and Countryside Protection Act (1981) in respect of section 9(1). The allis shad is currently listed as critically endangered by the IUCN, while the twaite shad is listed as endangered (Kent Biodiversity Action Plan website)

At a national level, the Environment Agency, the Countryside Council for Wales and English Nature are all involved in a joint project to identify key river systems and spawning sites for both the twaite and the allis shad. To further understand the biology and ecological needs of these species, research has been conducted in the Severn and Wye, while initial work has been conducted on fish counts in the Rivers Wye and Usk to determine migration and spawning populations (Cheshire Region Biodiversity Programme 2002).

The UK Biodiversity Action Plan seeks to identify, protect and positively manage adult and juvenile shad habitat including unimpeded access to spawning grounds through the designations of appropriate parts of the catchment. In addition to this they seek to restore historical populations and spawning grounds by restoring conditions within river catchments, thereby encouraging shad to inhabit their former ranges and potentially extending their UK breeding distribution (UKBAP - website).

Relevance to SEA 3

Within the SEA 3 area, there are several Local Biodiversity Action Plans in place for both species, these are implemented by:

- Essex Biodiversity Partnership
- Kent Biodiversity Action Plan
- Working for Wildlife; the Northumberland Biodiversity Action Plan

These plans aim to survey shad habitat within their catchment area, as well as identify local factors likely to limit migration to suitable spawning grounds and record incidental catches by anglers and commercial boats (there is no commercial fishery for twaite or allis shad in the SEA 3 area).

The allis shad is listed as present in the Tweed Estuary cSAC but not a primary reason for site selection, or as a qualifying feature. There are no cSACs in the SEA 3 area that list either shad species as a primary reason for site selection or as a qualifying feature (JNCC website).

Implications for SEA

The available information concerning both shad species within the offshore environment of the SEA 3 area is sparse. However, the main threats to shad populations appear to be riverine or coastal, notably habitat modification, destruction and access to freshwater spawning sites. In view of this and the projected location and scale of potential exploration/production activities, and the predicted hydrocarbons in the SEA 3 area, it is considered unlikely that further licensing would have a detrimental effect on either species.

Sources of information

English Nature website – <http://www.english-nature.org.uk>

Fishbase website – <http://www.fishbase.org/search.html>

JNCC website – <http://www.gov.uk>

Kent Biodiversity Action Plan website – <http://www.kent.gov.uk/sp/biodiversity>

Cheshire Region Biodiversity Programme (Countdown 2002) website – <http://www.whitwell-it.i12.com/cheshire-biodiversity/fish-shad.htm>

UKBAP website – <http://www.ukbap.org.uk>