

## **CTHS0302: ALTERNATIVE FUTURE SCENARIOS FOR MARINE ECOSYSTEMS**

### **SUMMARY STATEMENT OF REQUIREMENT**

1. As an island state with a long maritime history, the United Kingdom is heavily invested in and dependent on marine ecosystems. However, society's detrimental influences on marine systems have become apparent in recent decades – for example, in fisheries declines and degradation of coastal environments. The same observation holds true for most marine ecosystems around the world.
2. Historically, management of marine ecosystems has been conceived as a series of parallel and independent activities – leading to a piecemeal management approach. Despite various national and international initiatives (Annex 1), there is no evidence that current policy responses will successfully resolve what can often be conflicting objectives. This is an opportune time for some radical thinking and research into the possibilities and options for marine ecosystems.
3. The goal of the project is to encourage debate about alternative futures for marine ecosystems, resulting in development of a series of future scenarios that can be used by Defra and others.

### **BACKGROUND**

4. Marine ecosystems are under a wide variety of stresses, well reviewed for both OSPAR<sup>1</sup> (Convention for the Protection of the Marine Environment of the North-East Atlantic) and the EU<sup>2</sup> as well as by various UK organisations (e.g., Inter-Agency Committee on Marine Science and Technology<sup>3</sup>).
5. At present, marine fisheries are receiving considerable attention, given they result in some of the greatest impacts on marine ecosystems<sup>4</sup>. To illustrate, global demand for fish protein continues to rise<sup>5</sup>, yet marine capture fisheries catches have declined globally since the 1980s<sup>6,7</sup>. A recent analysis<sup>8</sup>

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<sup>1</sup> OSPAR Quality Status Report 2000. OSPAR Commission, London, 2000.

<sup>2</sup> Reviewed in: Communication from the Commission to the Council and the European Parliament. Towards a strategy to protect and conserve the marine environment. COM(2002) 539 Final. Commission of the European Communities

<sup>3</sup> A new analysis of marine-related activities in the UK economy with supporting science and technology. August 2002.

<sup>4</sup> OSPAR Quality Status Report 2000: Region II North Sea. OSPAR Commission, London, 2000

<sup>5</sup> Colin Tudge, *Food for the future*, Dorling Kindersley, London. 2002.

<sup>6</sup> Watson and Pauly (2001). *Nature*, 414: 534-536.

<sup>7</sup> The State of the World Fisheries & Aquaculture, FAO, 2002.

<sup>8</sup> Myers and Worm (2003). *Nature*, 423: 280-283.

has shown 90% declines in the biomass of larger, predatory fish caused by fishing across both oceanic and shelf ecosystems.

6. However, there are other stressors, trends and factors (and combinations of these) that must be considered in developing an “ecosystem approach” for conceptualising and managing marine systems. To illustrate, physical and biological impacts from various stressors have led to, or compounded, the human problems facing the coastal zones and marine systems as the number and intensity of human uses increase<sup>9</sup>. Examples include: unemployment and social instability (e.g., fisheries) and competition between users for the resource (e.g., flood and coastal zone defence vs. aquaculture; tourism vs. other coastal zone uses).

7. There is international consensus about the need for an “ecosystems approach” to managing marine systems. This project will explore options for what an ecosystem approach might look like in the context of a range of alternative futures for marine ecosystems.

## **AIMS AND OBJECTIVES**

8. This project has the following objectives:

1. **To compile information to examine a full range of alternative futures for marine ecosystems.** The methods used should both build on the existing evidence base to examine possible futures (e.g., relevant trends, drivers and possible shocks) and explore the margins of thinking on this subject (e.g., foster discussion and elicit feedback).
2. **To develop a range of contrasting future scenarios for marine ecosystems.** These should be plausible and communicated clearly so they can be used by others to challenge and stimulate their thinking.
3. Based on objectives 1 & 2 (above), **make recommendations to use the project outputs to engage with people, improve policy and enhance communication.**

## **ISSUES AND SCOPE**

### **General**

9. The UK is signatory to a number of international agreements which commit us to an ecosystem approach (see Annex 1). Defra’s Marine Stewardship Report<sup>10</sup> and the related consultation paper<sup>11</sup> describe the key

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<sup>9</sup>Communication from the Commission to the Council and the Commission to the Council and the European Parliament. On integrated coastal zone management: A strategy for Europe. COM (2000) 547 final. Commission of the European Communities.

<sup>10</sup> Safeguarding Our Seas: A Strategy for the Conservation and Sustainable Development of our Marine Environment. May 2002. <http://www.defra.gov.uk/environment/marine/stewardship/default.htm>

<sup>11</sup> Seas of Change: the Government's consultation paper to help deliver our vision for the marine environment. November 2002

elements of an ecosystem-based approach. However, it is clear that a range of issues have yet to be resolved to enable this to be achieved.

10. Geographically, this project has its principal focus on marine ecosystems within the OSPAR area and other areas fished by the fleet from this area, however, the study should be set in an EU and global context. Marine ecosystems include coastal zones through to offshore areas. Temporally, this project should compile information and develop scenarios for a 20-30 year time horizon.

There are three main tasks:

**Task 1 - To compile information to examine a full range of possible futures for marine ecosystems**

11. Tenders should describe the proposer's approach and methods for the following components:

- Compile information about key drivers, trends and possible shocks potentially affecting marine ecosystems
- Categorise the information logically (e.g., type of trend, uncertainty, probability, nature, etc.)
- Analyse the information to identify the most significant of the drivers and trends (within a systematic framework), also allowing for potential shocks. It will be important for the project report to document how the key trends, drivers and shocks (and/or their interactions) were short-listed for examination in Task 2.

12. Tenders should also outline an approach for discussion and debate about the key trends, drivers and shocks, to explore the margins of current thinking.

13. Given the nature of this project, we aim to examine the full range of possibilities, as opposed to describing most likely or desired outcomes. It is expected that the contractor will be inclusive in their process of identifying the social, political, economic and environmental context that drive possible futures for marine ecosystems, including ideas that challenge our present management regimes.

14. Given the explicit goal of healthy marine ecosystems, the project will need to draw together the-state-of-play and/or options on how healthy marine ecosystems can be defined and assessed. This should be consistent with the national and international obligations such as the Convention on Biological Diversity, but consider new research and thinking. This effort to define an ecosystem approach should not become an end in itself<sup>12</sup>, but rather a way to ask questions to benefit the development of the scenarios.

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<sup>12</sup> Getting more (and less) from the sea, Research Fortnight, 9 July 2003.

15. Task 1 should be started with a project initiation meeting shortly after contract award, between Defra, representatives of a few other organisations and the project team (on the order of 8 participants, not including the project team). This task should be concluded with a meeting of key stakeholders (on the order of 15 participants, list to be developed with Defra) to agree that the task outputs are adequate and positioned to support scenario development in the next task. Defra will provide the meeting venues for these two meetings and the Contractor will organise the meetings and provide agendas/minutes.

## **Task 2 - Development of future scenarios for marine ecosystems**

16. Tenders should describe the approach that their team would take to deliver on objective 2. Much of the background work to support scenario development should have been done in Task 1.

17. The project should create future scenarios that span extreme outcomes, but also include intermediary possibilities; all scenarios should be coherent and plausible, but challenging. It is emphasised that the purpose of the scenarios is to stimulate thinking – not to predict the future or establish target scenarios. In view of this, the tenders should describe the type/format of scenarios their approach (might) result in and how they think the work should be tested and disseminated. Defra is looking for generic scenarios which can be widely applied to challenge current thinking, perhaps later at a specific geographic level (e.g., international, regional or site-specific level).

18. Careful consideration will need to be given to the level, scale and detail of input information and the resulting scenarios. Defra recognises that the breadth of this project is very wide, so the project is designed to think broadly (Task 1) and then focus on key trends and drivers (and consideration of shocks) during development of the scenarios (Task 2), with creativity on how these are developed. The challenge will be to target the information and scenarios at the right level (e.g., at the appropriate scale for ecosystems) – this topic should be discussed in the project initiation meeting, to develop guidance for the contractor.

19. An important component of this task is to design and deliver a stakeholder workshop (on the order of 20-30 participants [unless the Contractor recommends otherwise], including a wide variety of stakeholders to review and obtain feedback on the draft scenarios, and contribute to Task 3 (recommendations). It is expected that workshop participants will have the opportunity to review outputs from Tasks 1 and 2 well before participating in the event.

20. The date and venue for the workshop should be established early in the project, with invitations extended a minimum of eight weeks before the event. The Contractor will make all arrangements for the event (including the venue), with costs inclusive in their tender (including travel and subsistence costs for those attendees who need it). Defra can provide one of the facilitators.

21. Defra recognises there are other models for soliciting feedback on scenarios and, if proposers want to augment the stakeholder workshop, they should describe how in their proposal.

### **Task 3 - Recommendations**

22. It is expected that this project will make recommendations for future work, in particular, on further development and/or use of the scenarios developed by this project. For example, through these alternative futures, public and stakeholder views about possible policy options and operationalisation of the ecosystem approach could be explored. In the bigger picture, this project could contribute to other efforts to engage stakeholders and the public in the issues and provide them with information that helps them develop their own opinions. In addition, when making recommendations, the contractor should consider how to engage the international community on thinking about futures for marine ecosystems.

### **USES AND USERS OF THE RESULTS**

23. This project should complement and build on parallel initiatives (see para. 24), by “thinking outside the box” and producing scenarios of marine futures. These parallel initiatives, while clearly independent of the proposed work, may wish to contribute to the scenario development process (where timing permits). Within Defra, the outputs of this project could have a variety of uses, which need to be further explored. One identified use is as a contribution to Defra’s “State of the Seas” report, due at the end of 2004.

24. Schedules permitting, other possibilities for sharing information include:

- The Royal Commission on Environmental Pollution is conducting a study into the environmental effects of marine fisheries. The scoping stage and request for evidence are both complete and the main work of the Commission is now underway, due for completion in the Spring of 2004.
- The Strategy Unit, Cabinet Office recently initiated the “UK Fisheries Project” that aims to outline the options for a sustainable UK fishing industry, in the medium to long term. This project was out for consultation (ended June 10 2003) and aims to complete by the end of 2003.
- The Royal Society of Edinburgh is conducting an independent inquiry to investigate the crisis in the Scottish fishing industry, specifically the extent to which controls imposed on the Scottish fishing industry are scientifically robust. The expert Committee is expected to reach its conclusion by the end of 2003.

It is expected that all of these activities will be important contributions to the work proposed herein.

25. This project will provide a vehicle for discussion and appreciation of a wide range of plausible long-term scenarios for marine ecosystems. Out of

this debate will come a series of scenarios that can be used by others working on various components of the issue (e.g., communications, testing policy, informing decisions).

26. Such a debate would inform future UK Government policy and aid the UK to meet its commitments to the 5<sup>th</sup> North Sea Conference (Bergen Declaration, 2002), which emphasises the need to take an integrated ecosystem approach to the management of human activities affecting the North Sea.

27. This project should identify ways to contribute to the international debate on the direction of fisheries and marine ecosystem policies, and their plausible long-term outcomes. Tenders should give consideration to how this could be achieved.

## **OUTPUTS**

28. It is the intention of the Sponsors to publish the results of the work through one or more routes. Where it is required, the Defra Contract Manager will make submissions for Ministerial approval prior to the publication of outputs.

29. Due to the nature of the work, it is expected that this work will result in two reports: one a technical report documenting the complete project and a second report that is a summary for wider dissemination (which may be desk-top published). An outline of the reports should be developed at the appropriate time by the Contractor for discussion with the Departmental representative.

30. All reports will contain an executive summary of not more than three pages and should be written in Plain English. If appropriate, papers for referred scientific journals may also be prepared.

31. The contractor shall also provide a summary of the project and its principal findings, suitable for publication on the internet. This should be of no more than 100 words summarising the project.

32. The draft final reports (maximum 15 copies) will be submitted not less than two months before the end of the project. Following the receipt of the final reports and a decision on dissemination by the Department, the contractor will be asked to make any amendments or changes which may be required and will deliver the final text, together with the original artwork and photographs where appropriate, in a format in accordance with Departmental design standards. The Contractor will be responsible for proof-reading the final reports prior to publication. Delivery will be as a paper copy in its final proof read version and in an electronic format compatible with Departmental IT standards (ASCII).

33. New data sets created as a result of this project will be supplied to the Sponsors in a suitable format to be agreed with the Sponsors including where appropriate for use in CIS and the NBN gateway or both.

## **QUALITY ASSURANCE**

34. Tenders must display a good understanding of the quality assurance issues involved, taking into consideration that this is horizon scanning research. Tenders will provide a quality assurance plan that demonstrates how the quality of inputs and outputs will be ensured. Tenders should also provide an assessment of project risks and a risk management strategy.

35. Tenders should display the ability to edit and present written material in a clear, concise and informative style.

## **MANAGEMENT**

36. The Contract will be managed in accordance with the Standards Conditions for Services (T&C doc). The contractor will be managed by an official of the Department who will act as Contract Manager responsible for the management of the contract. The contractor will appoint a project manager who will act as the principal point of contact for the Department.

37. Given the nature of this work, the Contractor should expect that this project require a relatively high level of liaison with the Department. Monthly written progress reports will be required. Also, before the end of the contract, the contractor may be required to attend a meeting with the Department to discuss the management and performance of the contract with a view to informing each other of any strengths and weaknesses exposed.

## **TIMING**

38. The project should be timed to run for approximately eight (8) months in total. The tender should include a work programme identifying phased activities and outputs, which takes into account this specification.

39. A draft final report should be submitted no later than two months before the end of the project. After which a period of one month will be allowed for amendments to and publication of the final report.

## **PROGRAMME OF WORK AND MILESTONES**

40. Tenderers are invited to propose a work programme designed to meet the above objectives, requirements and timetable. Tenders should include a time schedule for the work that identifies the main tasks and key milestones that will be used to monitor progress and to make staged payments.

## **PROJECT TEAM (INCLUDING SUB CONTRACTORS)**

41. Details of the project team should be supplied indicating the experience of the individuals. The organisation of the project team should be linked to the work programme, indicating the grade of staff and number of days allocated to specific work areas.

42. The project team should include appropriate expertise across all areas of the work programme including expertise in marine ecosystems, fisheries, socio-economics, consultation, futures methods (e.g., scenario development, trends & drivers/wildcards analysis), communications/workshops, non-technical reporting and presentation, and project management. Where in-house expertise is not available, external sub-contractors should be appointed.

43. Research tenders from consortia of organisations are particularly welcome (e.g., futures work and ecosystem thinking), given the horizon scanning nature of the research. These should be submitted by a lead organisation with which the contract will be established. The working relationships of consortia members should be clear in proposals, particularly who is the main contact and how the team will be managed.

### **ELECTRONIC SECURITY**

44. Electronic media of any type or format supplied to the Sponsors by the Contractor must be checked for viruses before shipment.

### **EVALUATION CRITERIA**

45. Tenders will be evaluated in terms of scientific quality, the degree to which the tender exhibits a horizon scanning nature (see [www.defra.gov.uk/horizonscanning](http://www.defra.gov.uk/horizonscanning) to view Defra's strategy for horizon scanning), relevance to achieving the project's objectives and on best value for money. The latter will be judged on the basis of the extent to which tenders: are clearly written and meet the specified objectives; present a sound methodology, identify any potential problems; address outputs and ensure that these are in line with requirements; value for money and on proposed team composition, expertise and management. Specific evaluation criteria are provided as part of the competition package.

### **BUDGET**

46. The total budget available for the proposed work is £100,000. This funding is provided by Defra's horizon scanning programme.

### **MAKING AN APPLICATION (THE TENDER)**

47. Applications should be made using Defra form CSG7 and CSG7a. The forms are included in the competition pack, but are also available at <http://www.defra.gov.uk/science/forms>

48. Applicants are invited to submit two hard copies, including one with original signatures, and also an electronic version of the application (CD-ROM or 3.5" disk) to Emma Nawaz, Science Directorate, Areas 301, Cromwell House, Dean Stanley Street, London, SW1P 3JH.

49. If you require further technical input please contact [rohit.talwar@defra.gsi.gov.uk](mailto:rohit.talwar@defra.gsi.gov.uk) (unavailable August 11-15 and 25-29) or [Emma.Nawaz@defra.gsi.gov.uk](mailto:Emma.Nawaz@defra.gsi.gov.uk) for administrative advice.

**CLOSING DATE FOR RECEIPT OF APPLICATIONS**

**22 September 2003** at 18:00 h. Late applications will be returned unopened.  
Applications by fax or email are not acceptable.

## **Annex 1: Recent resolutions and agreements that call for an ecosystem approach.**

- UK's commitment to the 5<sup>th</sup> North Sea Conference (Bergen Declaration, signed by Michael Meacher, March 2002) emphasising the need to take an integrated ecosystem approach to the management of human activities affecting the North Sea. The Bergen Declaration invites "...the competent authorities to give high priority to research and studies allowing a better understanding of the structure and functioning of marine ecosystems and contributing to the operational application of an ecosystem approach to fisheries management".
- UN Conference on 'Responsible Fisheries in the Marine Environment' - Reykjavik (2001)
- The 6<sup>th</sup> Environment Action Programme (EU) stipulates the development of a thematic strategy for the protection and conservation of the marine environment<sup>13</sup> with the overall aim "*to promote sustainable use of the seas and conserve marine ecosystems*"
- Defra's Marine Stewardship Report<sup>3</sup> (2002) and the related consultation paper<sup>14</sup> describe the key elements of an ecosystem-based approach and ask for input over a consultation period
- English Nature's Maritime Status of Nature Report for England (2002): getting on an even keel<sup>15</sup>
- EU Marine Strategy (2002)<sup>16</sup>
- Reform of the EU Common Fisheries Policy, as a significant first step towards integrating an ecosystem-based approach into that policy
- World Summit on Sustainable Development<sup>17</sup> (Johannesburg, 2002; signed by M. Meacher) – the Summit's implementation plan agreed, *inter alia*, to encourage the application by 2010 of the ecosystem approach to oceans (among other commitments towards 'better management of the oceans, action to conserve fish stocks, and development of marine protected areas)
- International Council for the Exploration of the Seas - International Committee on Ecosystems (report for 2002<sup>18</sup>)
- Topic for discussion at Ministerial level at joint meeting of Convention of the protection of the marine environment of the Baltic Sea Area (Helsinki Convention) – OSPAR Convention for the Protection of the North-East Atlantic (June 23 and 27 2003)

In addition to these ecosystem initiatives, there is a wide range of other conventions and organisations related to activities that affect marine systems.

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<sup>13</sup> Communication from the Commission to the Council of and the European Parliament. Towards a strategy to protect and conserve the marine environment. COM(2002) 539 Final. Commission of the European Communities.

<sup>14</sup> Seas of Change: the Government's consultation paper to help deliver our vision for the marine environment, November 2002

<sup>15</sup> Covey, R. and Laffoley, D.dA. (2002), English Nature, Peterborough.

<sup>16</sup> Communication of the European Commission to the European Parliament and Council of Ministers "Towards a strategy to protect and conserve the marine environment" (COM (2002) 539 final)

<sup>17</sup> [www.defra.gov.uk/environment/sustainable/index.htm#WSSD](http://www.defra.gov.uk/environment/sustainable/index.htm#WSSD)

<sup>18</sup> [www.ices.dk/iceswork/ace.asp](http://www.ices.dk/iceswork/ace.asp)

These are summarised in the EU Marine Strategy<sup>19</sup> and fishbase<sup>20</sup>, including other human activities such as habitat destruction, hazardous substances, oil pollution, radionuclides, etc.

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<sup>19</sup> Communication of the European Commission to the European Parliament and Council of Ministers “Towards a strategy to protect and conserve the marine environment” (COM (2002) 539 final).

<sup>20</sup> [www.fishbase.org/topic/topic\\_treaty\\_list.cfm](http://www.fishbase.org/topic/topic_treaty_list.cfm) (Froese, R. and D. Pauly. Editors. 2003. FishBase. World Wide Web electronic publication).

