

EcoQOs on harbour and grey seal population trends

Background

It was agreed at the fifth North Sea Conference in 2002 (5NSC) that an Ecological Quality Element relating to seal population trends in the North Sea would be given an Objective: “No decline in population size or pup production of $\geq 10\%$ over a period of up to 10 years”. The further development of this Element and Objective was subsequently included in the work programme of BDC and at BDC 2003 UK agreed to act as the lead country for it. ICES was also requested to undertake work in relation to the Element (see BDC 04/2/2). The original EcoQO was for both seal species and following a recommendation, OSPAR 2005 agreed to divide the two seals and reformulate the grey seal EcoQO as: “*Taking into account natural population dynamics and trends, there should be no decline in pup production of grey seals of $\geq 10\%$ as represented in a five-year running mean or point estimates (separated by up to five years) within any of nine sub-units of the North Sea. These sub-units are: Orkney; Fast Castle/Isle of May; the Farne Islands; Donna Nook; the French North Sea and Channel coasts; the Netherlands coast; the Schleswig-Holstein Wadden Sea; Heligoland; Kjørholmene (Rogaland).*”

The harbour seal EcoQO was reformulated as: “*Taking into account natural population dynamics and trends, there should be no decline in harbour seal population size (as measured by numbers hauled out) of $\geq 10\%$ as represented in a five-year running mean or point estimates (separated by up to five years) within any of eleven sub-units of the North Sea. These sub-units are: Shetland; Orkney; North and East Scotland; South-East Scotland; the Greater Wash/Scroby Sands; the Netherlands Delta area; the Wadden Sea; Heligoland; Limfjord; the Kattegat, the Skagerrak and the Oslofjord; the west coast of Norway south of $62^{\circ}N$.*”

OSPAR 2006 adopted the agreement on the application of the EcoQO system in the North Sea (OSPAR agreement 2006-4). This sets out *inter alia* the work to produce evaluations of each EcoQO, which will form the basis of:

- a. in 2008, a first evaluation of the results of the application of the EcoQO system, leading to
- b. in 2009, an improved evaluation of the results of the EcoQO system, as a contribution to the QSR 2010.

Guidance on reporting formats for the seal EcoQOs was circulated to Contracting Parties on 20 December 2006.

This document evaluates the following issues: :

- a. whether the EcoQO is met, and if not, why not. This is based on an evaluation of the status of seals in the North Sea in relation to the EcoQO prepared by ICES following a request from OSPAR. (ICES, 2008);
- b. (potential) consequences of failing to meet the EcoQO (see paragraphs 14 – 17 of OSPAR agreement 2006-4);
- c. suitability of present monitoring and reporting;
- d. developments in harmonisation of monitoring and reporting schemes;
- e. costs of present monitoring and reporting;
- f. extra costs of harmonising the monitoring;

- g. performance of the EcoQO in terms of the ICES criteria for good EcoQOs and with regard to the Ecosystem Approach to management (both within OSPAR and the MSFD);
- h. the specific linkages with the MSFD and how the EcoQO might be used in relation to the MSFD initial assessment, drawing up programmes and measures and elaborating GES;
- i. gaps in knowledge, present conditions that hamper the implementation process and ways and means to overcome these problems;
- j. effectiveness of communication, *i.e.* amount of support and knowledge on this EcoQO among stakeholders; and
- k. if needed, a proposal for modification and improvement of the EcoQO, including consideration on whether the EcoQOs set originally in 1999 would require revision in the light of the timing for GES under the MSFD and are consistent with other regional agreements and legislation;
- l. proposals for possible milestones up to the achievement of the objective;
- m. potential applicability of the EcoQO in other OSPAR regions than the North Sea.

Overview of the results from recent monitoring

Results available to the UK from a variety of sources are shown below for grey seal pup production (Table 3.1) and harbour seal counts (Table 3.2).

Table 3.1: Grey seal pup production in sections of the North Sea and where known, pup production trends over the past five years. . (Based upon ICES 2008 unless otherwise indicated)

Location	Year 1	Pup production	Year 2	Pup production	Overall change Year 1–Year 2	Survey frequency	Average annual change Year 1–Year 2
Orkney, UK	2002	17 942	2006	19 332	+8%	annual	+1.9%
UK North Sea colonies							
<i>Fast Castle/Isle of May*</i>			2005	2718			+4.2%
<i>Donna Nook*</i>	2002		2005	1276		annual	-2.4%
Total		4 520	2006	5 322	+18%		+4.4%
French North Sea and Channel coasts*			2006	11	?		?
Netherlands coast	2002		2006	200	+50%	annual	
Schleswig-Holstein Wadden Sea			2007	58	+20%		
Heligoland*			2006	23			?
Kjorholmane (Rogaland)**			2006	170-200			
ICES IVa (Norway south of 62°N)			2003	35	stable	occasional	

*Data reported to OSPAR by relevant Contracting Party in 2007. **Individual animals (not a pup count)

Table 3.2: Recent moult counts of harbour seals in OSPAR region II (North Sea). The average annual change in absolute numbers counted over a five year period is given in the final column. (Based upon ICES 2008 unless otherwise indicated).

Location	Year 1	Moult Count	Year 2	Moult Count	Overall change Year 1–Year 2	Survey frequency	Average annual change Year 1–Year 2
Shetland, UK	2001	4 883	2006	3 057	–37%	4–5 yearly	–7.5%
Orkney, UK	2001	7 752	2006	4 256	–45%	4–5 yearly	–9.0%
East Scotland	1997		2005			4–5 yearly	
<i>North and East</i> ¹		1 709		1 169			–4.6%
<i>South-east</i> ²		749		650			–1.8%
Total		2 458		1 819	–26%		–3.2%
Greater Wash to Scroby Sands	2001	4 274	2006	2 784	–35%	annual	–7.0%
Netherlands delta area (report by Netherlands)	2002	173	2006	171			
The Wadden Sea							
<i>Netherlands</i>	2003	2 365	2007	4 159	+76%	annual	+19.0%
<i>Germany</i>		7 285		10 947	+50%		+12.6%
<i>Denmark</i>		1 160		2 499	+115%		+28.8%
Total		10 810		17 605	+62.9%		+15.7%
Heligoland (report by Germany)		?	2007	150-200			
Limfjorden, Denmark	2003	?	2007	879	–23%	annual	c. –4.6%
Kattegat, Skagerrak and the Oslofjord							
Kattegat	2003	?	2007	6 182	+35%	annual	c. +7.0%
Skagerrak		?		2 689	+20%	occasional	c. +4.0%
Norwegian Skagerrak (ICES IIIa)		?		291	+20%	occasional	?
West coast of Norway (south of 62° N ICES IVa)	2003	?	2006	685	–40%	occasional	c. –8.0%?

Notes: ¹Montrose to Cape Wrath; ²English Border to Montrose

Have the EcoQOs been met?

As can be seen from Tables 3.1 and 3.2, it is not possible to evaluate this question for all sub-units of the North Sea coast. For the grey seal, ICES have advised that the EcoQO was achieved for all sub-units where data are available (ICES 2008). There were no declines in pup production of 10% or greater, as represented by a five year running mean or point estimates. One section (Farne Islands) has experienced a decline in pup production believed to be associated with density dependence (there is no more space for seals to breed at this location) – this can be regarded as “natural population dynamics” and thus the EcoQO is met in this sub-unit also.

In contrast, ICES have advised that the EcoQO for Harbour seals was not met in the following sub-units due to declines of 10% or more (as represented by a five-year running mean or point estimates: Shetland, Orkney, east of Scotland (North and East Scotland; South-East Scotland), Greater Wash to

Scroby Sands, Limfjorden and the west coast of Norway south of 62° N (ICES, 2008). Of these areas only the Limfjorden has been affected by morbillivirus in recent years. The reasons for changes in the other areas are not yet clear.

Consequence of failing to meet the EcoQOs

If the EcoQOs are not met, then the best first step would be to determine why. Further actions would depend on the results of that research. The UK has started studies of the causes of the decline in harbour seals on the east coast of Scotland.

Suitability of present monitoring and reporting

As can be seen from Tables 3.1 and 3.2, not all Contracting Parties have submitted information, and for other the information submitted insufficient to evaluate whether the EcoQOs were being met or not. It is not known whether this was due to either insufficient monitoring and/or a breakdown in the reporting process.

Developments in harmonisation

In general, seal monitoring has evolved to best suit local circumstances in various areas of the North Sea – for instance monitoring of large numbers of small rocky islands in the Orkney Islands will have different challenges than those posed by seals using sand and mud banks in the southern North Sea. Luckily the nature of this EcoQO means that harmonisation is not required across the whole North Sea – what is required is consistency in monitoring within each sub-unit over time. It would though be useful to have the protocols in use at present within each sub-unit of the North Sea written down and on record within OSPAR so that any subtle variation in counting technique can be recorded and allowed for in assessing changes. This should be a relatively simple collation and editing task following contact with the groups of scientists undertaking the monitoring. This task might be undertaken by ICES or by an independent contractor, and there may be a more general task covering all EcoQOs where methods and standards are not currently on formal OSPAR record. It is recommended that the Secretariat investigates the scope of work across the EcoQOs and brings forward suggestions for undertaking this work.

Costs of present monitoring and reporting

Costs of seal monitoring in the UK by the Sea Mammal Research Unit vary, but are approximately £270 000 per year. This figure includes the extensive portion of the UK seal population that occurs in western UK (OSPAR Region III), but does not include the costs of monitoring by other organisations at several colonies on the UK's North Sea coast. Costs have not been obtained from other Contracting Parties.

Extra costs of harmonisation

These costs have not been evaluated, but as noted above, may not be relevant.

Performance of these EcoQOs

The performance of the two seal EcoQOs do not differ from the ICES evaluation of the combined seal EcoQO (OSPAR, 2006). In essence, the EcoQOs generally perform well, but are not tightly linked to a single manageable human activity. It is not believed that this short-coming affects their overall usefulness.

Specific linkages with the MSFD

Seals are not mentioned specifically in the MSFD, however, the status of seal stocks in the North Sea (and elsewhere) are certainly of concern to users of the marine environment and the general public. It would be surprising if seal numbers and trends were not reported as part of the MSFD initial assessment and in descriptions of GES. Seal numbers and trends are also reported under the 'Conservation Status' monitoring of the EU Habitats Directive (92/43/EEC). If the EcoQOs were not met, and following investigation into causes, the EcoQOs could be useful in indicating suitable measures that might be taken. Plainly, it is difficult to take measures against the epizootic-driven declines, but if in the future, causes were found to be directly related to anthropogenic activities, measures should be possible.

Gaps in knowledge

See above in relation to the supply of data by certain Contracting Parties. The full conditions hampering implementation of these EcoQOs are not known. A proposal to ask ICES to undertake evaluation of these EcoQOs at regular intervals was made to BDC 2007; this might make the collation of data from national sources a little more automatic than is evident at present. In addition, the composition of ICES Working Groups brings together the expertise often of those actually collecting the data, thus ensuring correct interpretation (with suitable caveats) and potentially helping in harmonisation of collection procedures.

Effectiveness of communication

The EcoQOs are not well known, but the general state of seal populations is reasonably well known among the general public and users such as fishermen. The overall communication of EcoQOs though is at present rather technical and scientific – with in many cases tracts of text with few figures. There are insufficient resources available at present to improve this, but it is recommended that the Secretariat examines options for improving this situation in the next round of reporting in 2009.

Proposals for modification and improvement of the EcoQOs

The earlier revision from the single seal 1999 EcoQO (as described above) was a distinct improvement. Grey seal numbers though have continued to increase in the UK, with breeding starting in new areas. For instance, in the past 5 - 6 years, grey seals have started to breed at two colonies in Norfolk, at Blakeney Point (north) and at Horsey/Winterton (east), with 234 pups born at Blakeney in 2006 and 133 at Horsey. It is thus recommended that the relevant EcoQO region be adjusted to become the 'Greater Wash' to conform with the area used for harbour seals. Similarly, new colonies in the Firth of Forth lead to the suggestion that 'the Isle of May and Fast Castle' should in future be referred to as 'Firth of Forth colonies' allowing other colonies in the area to be included. The revised grey seal EcoQO might therefore read:

"Taking into account natural population dynamics and trends, there should be no decline in pup production of grey seals of $\geq 10\%$ as represented in a five-year running mean or point estimates (separated by up to five years) within any of nine sub-units of the North Sea. These sub-units are: Orkney; Firth of Forth; the Farne Islands; the Greater Wash; the French North Sea and Channel coasts; the Netherlands coast; the Schleswig-Holstein Wadden Sea; Heligoland; Kjørholmane (Rogaland)."

Possible milestones up to the achievement of the objective

None seem necessary.

Potential applicability of the EcoQOs in other OSPAR Regions

Grey and harbour seals occur also in OSPAR Regions I and III. The potential for using these EcoQOs in these regions seems high. An evaluation would need to be made of the extra monitoring needs in these areas. It is known that suitable data exist for all UK coasts in Region III. ICES (2008) reported that if the EcoQO was applied in Regions I and II, the harbour seal EcoQO may not be met in the Outer Hebrides (a 13% decline between 2000 and 2003 has been reported) and the grey seal EcoQO may not be met in Iceland (a 30% decline between 2001 and 2006 has been reported).

References

ICES (2008). Advice on the status of seals and harbour porpoises in the North Sea. ICES Advice Book 2008 Book 1 Section 6.3.3.1 6pp.

OSPAR (2006). Report on North Sea Pilot Project on Ecological Quality Objectives. OSPAR Commission. Publication Number: 2006/239.

↪ *Go to full QSR assessment report on the evaluation of the OSPAR system of Ecological Quality Objectives for the North Sea (publication number 406/2009 (update 2010))*