ASCOBANS
Conservation Objectives

ASCOBANS aims:

"*To achieve and maintain a favourable conservation status for small cetaceans in the Agreement area*".

To interpret that aim, it first set its conservation objective as: "to restore and/or maintain biological or management stocks of small cetaceans at the level they would reach when there is the lowest possible anthropogenic influence" – a suitable short-term practical sub-objective is to restore and/or maintain stocks/populations to 80% or more of the carrying capacity.

The general aim should be to "minimise (i.e. ultimately to reduce to zero) anthropogenic removals within some yet-to-be specified time frame, and that intermediate target levels should be set.

The longer term approach, which involves *inter alia* taking into account uncertainty in the available data, should be developed by the Advisory Committee.

It defined, for the present, "unacceptable interactions" as being, in the short term, a total anthropogenic removal above 2% of the best available estimate of abundance within an appropriate management region. However, If available evidence suggests that a population is severely reduced, then "unacceptable interaction" may involve an anthropogenic removal of much less than 2%.

(ASCOBANS Resolution 2.3 on Incidental Take of Small Cetaceans, at the 2nd Meeting of the Parties, Bonn, 1997)

Resolution 8.5 (Rev. MOP9, 2020) on ASCOBANS Conservation Objectives

(a) The general aim should be to minimise (i.e. ultimately to reduce to zero) anthropogenic removals (i.e. mortality), and in the short term, to restore and/or maintain biological or management units to/at 80 per cent or more of the carrying capacity;

(b) In order to reach this objective, the intermediate precautionary aim is to reduce bycatch to less than 1 per cent of the best available population estimate;

(c) A total anthropogenic removal (e.g. mortality from bycatch and vessel strikes) above 1.7 per cent of the best available estimate of abundance is to be considered unacceptable in the case of the harbour porpoise;

(d) If available evidence suggests that a population is severely reduced, or in the case of species other than the harbour porpoise, or where there is significant uncertainty in parameters such as population size or bycatch levels, then “unacceptable interaction” may involve an anthropogenic removal of much less than 1.7 per cent.

Biological Populations:

ASCOBANS did not define ‘biological units’ nor ‘stocks’, and these terms have been superseded within ASCOBANS by the employment of ‘management units’ (MUs), defined by the ASCOBANS-HELCOM Small Cetacean Population Structure Workshop in 2007, as:

“a group of individuals for which there are different lines of complementary evidence (e.g. morphometrics, life history parameters, photo-ID, in addition to genetics) suggesting reduced exchange (migration / dispersal) rates over an extended period (low tens of years)”.

While it is noted that ideally a quantitative target should be set for MUs (e.g. maximum of ten percent migration per generation), for most species we do not have that level of information, nor has the theoretical framework for integration of different evidence bases been fully developed.

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ASCOBANS held two workshops in April and May 2023, with the following three aims:

1. Review the appropriateness of current ASCOBANS **conservation objectives**. The general aim is to minimise (i.e. ultimately to reduce to zero) anthropogenic removals (i.e. mortality), and in the short term, to restore and/or maintain biological or management units to/at 80 per cent or more of the carrying capacity;

2. Evaluate the ASCOBANS **Intermediate precautionary aim** to reduce bycatch to less than 1 per cent of the best available population estimate, and that a total anthropogenic removal above 1.7 per cent of the best available estimate of abundance should be considered unacceptable in the case of the harbour porpoise. If available evidence suggests that a population is severely reduced, or in the case of species other than the harbour porpoise, or where there is significant uncertainty in parameters such as population size or bycatch levels, then “unacceptable interaction” may involve an anthropogenic removal of much less than 1.7 per cent;

3. Evaluate a Management Framework Procedure

ASCOBANS Conservation Objectives

Workshop 1 was held online on 24-25 April 2023, with 21 persons participating from 10 countries, including three from the US and one from the United Arab Emirates.

- Presentations were made by:
  Sinéad Murphy (History of ASCOBANS Conservation Objectives)
  Rus Hoelzel (Genetic Methods for Estimating Population Size & Identifying Management Units),
  Paul Wade (Approaches in the US for Setting Limits to Removals)
  Matthieu Authier (Approaches used within OSPAR for Setting Limits to Removals), and
  Oliver Manlik (Alternative Methods whilst also Incorporating Stochasticity)

Workshop 2 was held at the UN Campus in Bonn & online on 16-17 May 2023, with 35 persons participating from 18 countries, nine of whom had participated in the first workshop. Representatives from the European Commission, ICES, IWC, ACCOBAMS, and various government ministries attended.

- Presentations were made by:
  Sinéad Murphy (History of ASCOBANS Conservation Objectives)
  Justin Cooke (Quantifying the ASCOBANS Conservation Objectives: a way forward)
  Matthieu Authier (Approaches used within OSPAR for Setting Limits to Removals) and
  Paul Wade (Approaches in the US for Setting Limits to Removals)

ASCOBANS Conservation Objectives

Workshop 1, 24-25 April 2023

Discussion topics: *The meaning of carrying capacity and its use, time frames, probability, the interplay with other anthropogenic threats, and the role of environmental stochasticity.*

The importance of the spatial element of management was highlighted.

Several data sources and operating models were considered. Emphasis was placed upon the PBR (Potential Biological Removal) approach, but also other approaches such as RLA (Removals Limit Algorithm) and PVA (Population Viability Analysis). Approaches in Europe were compared with those in the US and elsewhere.

Conclusions: *The ASCOBANS Conservation Objective (to restore and/or maintain biological populations at or above 80% of carrying capacity) should remain, but some justification of the lower bound that is considered acceptable is needed so that it is not viewed as an entirely arbitrary value; More than one option for an appropriate time horizon may be worth considering and the probability value options of 80% vs 95%; the CO should be at least as stringent as required by the US MMPA; the CO should be implemented using a range of tools (e.g. PBR, PVA, RLA) depending upon the amount of data available for the species population/management unit. The 1.0% & 1.7% fixed percentages of best available abundance estimate should be discarded.*

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Carrying Capacity

- Definition: Carrying capacity (*K*) as the level that a population would reach in the absence of anthropogenic removals (such as bycatch, hunting, vessel strikes, fatal entanglements and other direct kills) and in the absence of anthropogenic effects that negatively impact reproduction such as disturbance, toxic pollutants, habitat destruction and competition for prey.

- The value of *K* is constantly affected by natural environmental variation and is difficult to determine directly. The range and carrying capacity of most populations are expected to change, anyway, over time.

- Approaches therefore to achieving the 0.8*K* target do not involve specifying a fixed value for *K*, but instead aim to ensure that anthropogenic removals are low enough that the population can be expected, under reasonable assumptions, to recover towards, or remain above, the 0.8*K* level.

US Marine Mammal Protection Act

Potential Biological Removal (PBR)

- Definition: "The maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population." It calculates an annual number of removals that would satisfy the goal of allowing populations to recover towards, or remain above, the maximum net productivity level (MNPL), assumed to be 50% of carrying capacity (0.5K)

$$\mathbf{PBR = N_{min} \times 0.5 \text{ of } R_{max} \times F_R}$$

where N_{min} is the minimum population estimate

R_{max} is the maximum net productivity rate (i.e. the assumed growth rate at low population sizes) and is usually taken as 0.04

F_R is a recovery factor between 0.1 and 1.0, where 0.1-0.3 is used for populations that are endangered or depleted; 0.4-0.5 is used for populations of unknown status; and up to 1.0 for well-known populations in a healthy state.

OSPAR & HELCOM

Modified Potential Biological Removal (PBR)

OSPAR Marine Mammal Expert Group interpreted the ASCOBANS Conservation Objective as to “restore and/or maintain biological or management units to/at 80 per cent or more of the carrying capacity” over a time horizon of 100 years and with an 0.8 probability.

Since the US MMPA aims for 50% of the carrying capacity, this required some modification when using PBR.

Based on simulations that covered the same set of scenarios and parameter values as used to test the original PBR formula, OMMEG recommended modified Recovery Factors of 0.1 for populations which are depleted or of unknown status, and up to 0.35 for well-studied populations with satisfactory status.

ASCOBANS Anthropogenic Removal Limits/Thresholds

1.7% & 1% Fixed Percentages

ASCOBANS Resolution 8.5 stated that a total anthropogenic removal (e.g. mortality from bycatch and vessel strikes) above 1.7 per cent of the best available estimate of abundance is to be considered unacceptable in the case of the Harbour Porpoise

- It was calculated by the IWC-ASCOBANS WG on harbour porpoise in 1999 as the deterministic bycatch rate that would stabilise the population at 0.8K assuming that the MNPL (maximum net productivity level) = 0.6K and R_{max} = 0.04.
- However, it takes no account of uncertainty in population structure, population size, bycatch levels, R_{max} or MNPL. It is linked to the "best available population estimate" which does not account for estimation error and is typically 15-30% higher than the N_{min} used in PBR calculations. The figure is also very sensitive to the assumptions made.
- Given our uncertainty over several parameters, it is also not precautionary. For example, the OSPAR threshold (using RLA) for N Sea harbour porpoises is 1,622 which would be equivalent to just 0.47% of best available estimate of abundance.

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Conclusions from the two workshops

- The general aim remains appropriate: to minimise (i.e. ultimately to reduce to zero) anthropogenic removals(i.e. mortality) over an unspecified timeframe, with a sub-objective to restore and/or maintain biological or management units to/at 80% or more of their carrying capacity.
- The fixed percentages of 1% and 1.7% of the best available population estimate, for the ‘intermediate precautionary level’ and ‘unacceptable interactions’ respectively were agreed to be inappropriate. They would not achieve the desired outcome.
- The PBR approach was recommended for general use, but modified from what is used in the US to align with the European ambition of restoring/maintaining to/at 80% or more of carrying capacity. RLA, PVA or other approaches are recommended where more data allow.
- There was disagreement over whether the time horizon considered should be 20 years or 100 years, and the probability of achievement aimed at 95% or 80%, and further model simulations were recommended to explore these options.