Appendix 1

AGENDA

1. Election of Chairman
2. Adoption of agenda
3. Appointment of rapporteurs
4. Review of available documents
5. Review of small cetaceans in coastal waters of Africa
   - 5.1 Northern west Africa (Zone 1)
   - 5.2 Central west Africa (Zone 2)
   - 5.3 Southern west Africa (Zone 3)
   - 5.4 East Africa (Zone 4)
   - 5.5 Red Sea and Gulf of Aden (Zone 5)
6. Further consideration of the criteria for assessing the status of harbour porpoise populations
7. Global review of *Stenella coeruleoalba*
   - 7.1 Distribution, stock identity and migrations
   - 7.2 Abundance
   - 7.3 Directed takes
   - 7.4 Incidental takes
   - 7.5 Status
   - 7.6 Life history
   - 7.7 Ecology
   - 7.8 Other
8. Review of other presented information on small cetaceans
   - 8.1 Gillnet fishery mortalities
   - 8.2 Bycatch reduction measures
   - 8.3 ETP
   - 8.4 Pelagic trawl fisheries
   - 8.5 White whales
   - 8.6 Franciscana
   - 8.7 Other
9. Takes of small cetaceans in 1996
10. Progress on previous year's recommendations
    - 10.1 Vaquita
11. Priority topics for 1998, 1999 and 2000 meetings
12. Publication of documents
13. Any other business
14. Adoption of report

Appendix 2

SOME CONCERNS REGARDING THE USE OF ENSURING POPULATION GROWTH AS A CONSERVATION CRITERIA

P.R. Wade

Regarding methods for evaluating the conservation status of small cetacean populations which experience bycatch, it might be helpful to clarify the point that there is difficulty in pursuing a criteria based on ensuring population growth. The important issue is that the expected trend of a population is dependent upon its starting population size as well as on the level of fisheries bycatch it experiences. Consider the two following examples, under the usual assumptions of most density-dependent population models used for cetaceans.

First, a population that starts at K (carrying capacity, or its pristine level) will decline in abundance under any level of bycatch, however small. For example, Wade (1998) described a general method for evaluating bycatch (i.e., see fig. 9 and text regarding ML_K, the carrying capacity goal, in Wade (1998)) that could be used for a conservation objective such as ensuring that a population reaches equilibrium (under the bycatch) at or above a specified level (e.g. 90% of K). Obviously, a population that starts at K will decline under such bycatch on its way to 90% of K. One may even be 100% certain that it will decline, but a population at 90%K is unlikely to be considered deserving of conservation concern.

Second, consider a population starting in a severely depleted state, such as 5% of K, and a different level of bycatch. A bycatch level exists that would allow a population to increase, but only to a level of 10% of K. With high quality information, under such circumstances one may even be able to come to a conclusion in an evaluation process that a population will increase with 100% probability, but it will remain in a severely depleted state. A population at such a low level relative to its pristine level is likely to be considered deserving of conservation concern. Such a population could even be at risk of extinction from stochastic processes.

The concern here is to caution regarding the specific issue of establishing a conservation criteria that ensures population growth, but nothing else. These remarks also have implications for monitoring schemes designed only to detect trends in abundance from multiple surveys. Interpreting the meaning in trends in abundance without knowledge of where a population is, relative to its pristine level, is impossible. It should also be noted that Taylor and Gerrodette (1993) have pointed out additional problems in basing conservation assessment on trends in abundance for very rare populations, such as the vaquita. One of their conclusions was that a declining rare population might go extinct before a significant decline could be detected, because statistical power declines with population size.

Therefore, a conservation goal that only ensures population growth is inadequate. This indicates again the importance of establishing a specific and meaningful conservation goal in making evaluations of the conservation status of small cetaceans.

REFERENCES

Taylor, B.L. and Gerrodette, T. 1993. The uses of statistical power in conservation biology: the vaquita and northern spotted owl. *Conserv. Biol.* 7:489-500.

Wade, P.R. 1998. Calculating limits to the allowable human-caused mortality of cetaceans and pinnipeds. *Mar. Mammal Sci.* 14(1):1-37.

Appendix 3

CRITERIA FOR ASSESSING THE STATUS OF HARBOUR PORPOISES IN THE NORTH SEA AND ADJACENT WATERS: A SUGGESTED WAY FORWARD

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In 1995, the Small Cetacean sub-committee considered criteria for 'raising a flag of concern' when assessing the status of North Atlantic harbour porpoise stocks subject to bycatch. The sub-committee noted that there was some arbitrariness in its current criterion of bycatch above 1% of estimated abundance, and recommended further discussion. The sub-committee agreed that the PBR approach (Wade, 1998) was useful and represented an advance over the existing criterion. However, no consensus was reached on whether blanket application of criteria designed for US law, would be most appropriate in the context of the IWC's assessment of harbour porpoise stocks in and around the North Sea. We suggest that a way forward would be to conduct case-specific simulations incorporating the particular sources of uncertainty (such as stock structure) encountered in the North Sea area, where there are fairly good data. Implementation trials for commercial whaling have tried to account for hard-to-quantify uncertainties on a case-by-case basis, by specifying plausible hypotheses consistent with what is known, within a simulation framework. This paper suggests how such a simulation framework might be developed for harbour porpoises in the area of the North Sea and adjacent waters.

Our primary intention is that the simulation exercise should appraise current status, rather than test the application of some particular management procedure over a long period. The proposed exercise would provide a probability of abundance decline over a relatively short period (taken from repeated simulations) under a continuation of the present level and pattern of mortality, together with indications of the possible magnitude of any rate of decline or increase. This paper attempts to describe some of the ingredients and approaches needed to set up a usefully realistic but reasonably parsimonious simulation trial. The discussions below are not intended to be comprehensively detailed, and further data analyses would be needed to fully specify the simulations. Preliminary analyses may allow certain elements to be simplified, as discussed below.

There are five main components to the simulation:

(1) a population model, governing the time trajectory of population numbers;
(2) a range of plausible hypotheses about the spatial structure of stocks;
(3) a model governing within- and between-year movements for the stocks;
(4) a space-and-time model specifying bycatch mortality; and
(5) measures of performance describing how the population(s) respond to the specified pattern of bycatch over time.

(1) Population model

A reasonable starting point would be the age- and sex-structured approach used in the RMP implementation trials (IWC, 1993). Fully age-structured models would not be necessary for harbour porpoises, and would be hard to parameterise, but a stage-structured model with two or three life history stages should be feasible and adequately realistic. Uncertainty in parameters can be accommodated through random choices of maximum population growth rate, and of reproductive parameters, in each simulation. Given the lack of information on stage-specific survival, the model would presumably require an assumed probability distribution on maximum population growth rate. The choice of this distribution is liable to be key in driving the simulation outputs. Sex structure may be important, even if there is no difference in vital rates between the sexes, because there is genetic evidence that males may be more mobile than females, and may therefore be subject to different bycatch mortalities as they move between fishing areas.

An important parameter is the initial ratio of current abundance to carrying capacity. Some constraints on possible values for this parameter might be obtained from data on reproduction (i.e. how close the animals are to the maximum rate of reproduction). Historical data on levels of gillnet effort might also be used to investigate how far abundance might have been reduced through bycatch mortality.

(2,3) Stock structure and seasonal movements

Stock structure in and around the North Sea is uncertain, and a range of plausible hypotheses would need to be incorporated in the simulations. There is a considerable body of genetic and morphological evidence for distinctions between stocks (see e.g. IWC, 1995), but the discreteness of stocks on any particular space and time scale has not been fully resolved, and the extent of seasonal mixing remains uncertain. A reasonable model would therefore incorporate several stocks with some degree of interannual mixing. The extent of mixing would depend on the spatial extent of the stocks used, with larger areas having lower mixing rates. When modelling stock structure and seasonal movements, a set of randomly-parameterised models might be used, each being checked for compatibility with existing data. One constraint on such models is provided by the SCANS information on spatial distribution in summer.